

# SURI VIDYASAGAR COLLEGE

(Govt. Sponsored & Constituent college of the University of Burdwan) SURI, BIRBHUM, PIN – 731101, Ph. No. – 03462-255504

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## 1.3.2 Students undertaking project work/field work/ internships:

# DOCUMENTS RELATED TO PROJECT WORK

CURRICULUM OF THE PROJECT WORK

PROJECT COMPLETION CERTIFICATES

SOME SAMPLE COPY OF THE PROJECTS

# SYLLABUS FOR B.A/B.SC. (HONOURS) IN MATHEMATICS

# **Under Choice Based Credit System (CBCS)**

**Effective from 2017-2018** 



The University of Burdwan Burdwan-713104
West Bengal

Sem ester	Course Type	Course Code	Name of the Course	Credit Pattern (L:T:P)	Total class hrs. /week	Marks	Credit			
	CC	BMH5CC11	Partial Differential Equations and Applications	5:1:0	6	75	6			
		BMH5CC12	Mechanics I	5:1:0	6	75	6			
	Choose any one from the following courses for Discipline Specific Electives.									
		BMH5DSE11	Linear Programming	5:1:0	6	75	6			
V	DSE	BMH5DSE12	Number Theory	5:1:0	6	75	6			
		BMH5DSE13	Point Set Topology	5:1:0	6	75	6			
		Choose any	one from the following courses for Disc	cipline Sp	ecific Electi	ives.				
	DSE	BMH5DSE21	Probability & Statistics	5:1:0	6	75	6			
		BMH5DSE22	22 Portfolio Optimization		6	75	6			
		BMH5DSE23	Boolean Algebra and Automata Theory	5:1:0	6	75	6			
	CC	BMH5CC13	Metric Spaces and Complex Analysis	5:1:0	6	75	6			
	CC	BMH5CC14	C14 Ring Theory and Linear Algebra II		6	75	6			
	Choose any one from the following courses for Discipline Specific Electives.									
		BMH6DSE31	Mathematical Modeling	5:1:0	6	75	6			
	DSE	BMH6DSE32	Industrial Mathematics	5:1:0	6	75	6			
<b>T7T</b>		BMH6DSE33	Group Theory II	5:1:0	6	75	6			
VI		Choose any	one from the following courses for Disc	cipline Sp	ecific Electi	ives.				
		BMH6DSE41	Bio Mathematics	5:1:0	6	75	6			
	DSE	BMH6DSE42	Differential Geometry	5:1:0	6	75	6			
		BMH6DSE43	Mechanics II	5:1:0	6	75	6			
	Opt	ional Dissertation	or project work in place of one Discip	oline Speci	fic Elective (	DSE) Pap	er.			
	PW	BMH6PW01	Project Work	0:0:6	6	75	6			

Course: BMH6PW01

**Project Work** 

(Marks: 75)

Any student may choose Project Work in place of one Discipline Specific Elective (DSE) paper of Semester

-VI. Project Work will be done considering any topic on Mathematics and its Applications. The marks distribution of the Project work is 40 Marks for written submission, 20 Marks for Seminar presentation and 15 Marks for Viva-Voce.



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(Gov.) Sponsored & Constituent college of the University of Burdwan) SURL BURBHUM, PIN - 23(10), Ph. No. - 03462-255504 Website: surrividyasagarcollege.org.in. e-mail: + surrividyasagarcollege1942argmail.com

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#### PROJECT COMPLETION CERTIFICATE

This is to certify that the following students have successfully completed their projects of semester VI Mathematics Honours in Paper BMH6PW01 (Project work) (6 Cerdits) under the supervision of the faculties of Mathematics Department as listed below:

No.	Name of the students	Title of the projects	Name of the Supervisor	
1	ANJAN MANDAL	VECTOR CALCULOUS AND IT'S APPLICATION	Dr. Ramprosad Saha	
2	ARNAB GHOSH	THEORY OF GAMES	Dr. Sujoy Das	
3	BABAN GARAIN	tiig-M method	Soumi Das	
4	BARSHA SAMANTA	The Traveling Salesman Problem	Soumi Das	
5	BIMAN MONDAL	CONIC SECTION AND ITS APPLICATION	Dr. Ramprosad Saha	
6	GOPINATH MONDAL	Canonical Form and its Application	Dr. Prasenjit Saha	
7	HAREKRISHNA GHORAI	Probability and Probability distribution	Shubhendu Ghosh	
8	KRISHNENDU MONDAL	A STUDY ON JORDAN'S CANONICAL FORM	Dr. Prasenjit Saha	
9	MRITUNJAY GARAI	Graphical Method	Dr. Prasenjit Saha	
10	NILADRI SHANKAR GHOSH	Higher Order Taylor Method	Dr. Prasenjit Saha	
11	PRAHLAD MUKHERIEE	RAMANUJAN'S SUMMATION: WHICH CONTRADICTS THE TRADITIONAL SENSE	Dr. Ramprosad Saha	
12	PRASANTA GHOSH	PROJECT ON GRAPH THEORY	Dr. Ramprosad Saha	
13	PRATIBHA GORAIN	PROBLEM PROBLEM	Soumi Das	
14	RAHIMODDIN SK	CONVERGENCE OF SERIES	Dr. Sujoy Das	
15	RIAJUDDIN SK	INNER PRODUCT SPACE	Dr. Sujoy Das	
16	RISHAD RAHAMAN	SIMPLEX METHOD (LPP)	Soumi Das	
17	SAMIM AKTAR	COMPLEX NUMBER	Soumi Das	
18	SANANDO SINGHA	An introduction to Group theory	Shubhendu Ghosh	
19	SANJOY GARAI	Simple Harmonic Motion	Dr. Ramprosad Saha	
20	SANTU MONDAL	THE CENTRE OF PRESSURE OF A PLANE AREA	Dr. Ramprosad Saha	
21	SHIBNATH BISWAS	GAME THEORY AND IT'S APPLICATION	Dr. Prasenjit Saha	
22	The second second second second second	RING THEORY	Shubhendu Ghosh	
	SK ASLAM	GROUP HOMOMORPHISM AND ISOMORPHISM	Dr. Prasenjit Saha	
24	A CONTROL RESIDENCE	INNER PRODUCT SPACE	Dr. Sujoy Das	
25		Theorem on limits/ continuity and their geometrical meanings/ applications	Dr. Ramprosad Saha	
26		Metric Space	Dr. Sujoy Das	

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#### SURI VIDYASAGAR COLLEGE

#### THE UNIVERSITY OF BURDWAN

# **Undergraduate project**

# **Big-M method**

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Session 2020-2021



Big - M method

By

**Baban Garain** 

**July 2023** 

#### **ABSTRACT**

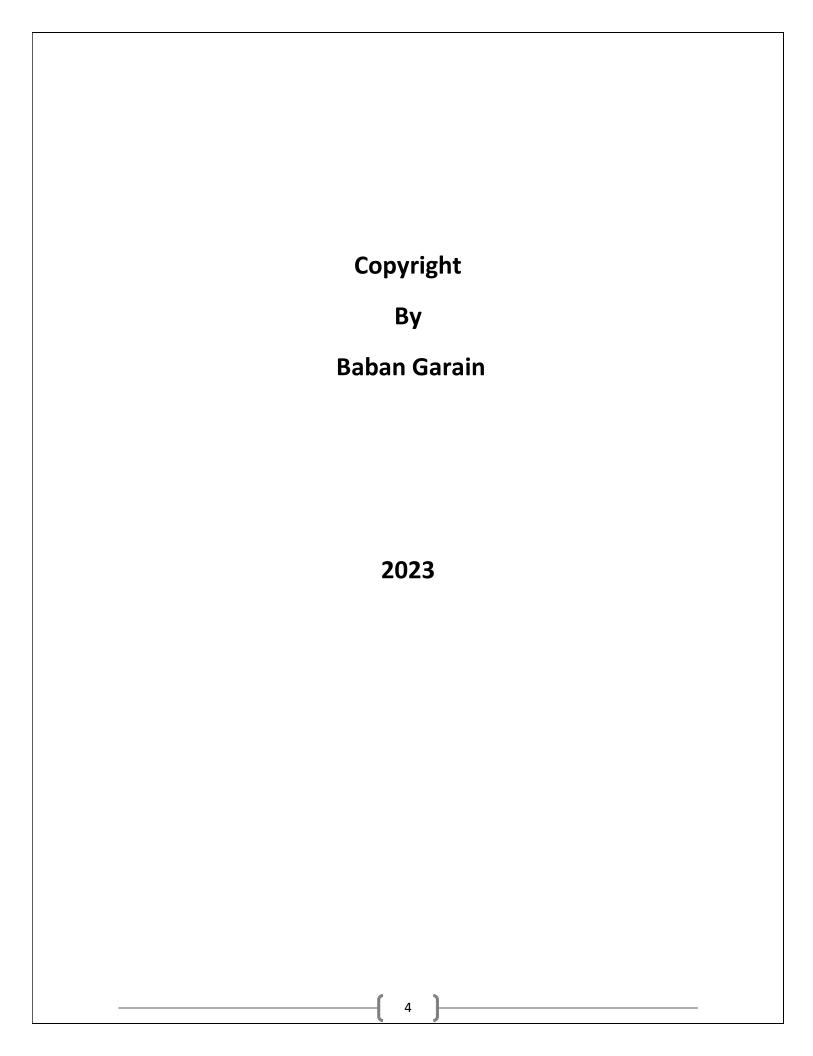
The Big M method is a mathematical optimization technique used to solve linear programming problems with constraints in the form of equalities and inequalities. It is particularly effective for solving assignment problems, which involve assigning a set of resources to a set of tasks or activities.

The main idea behind the Big M method is to convert the constraints of the assignment problem into a standard form that can be solved using linear programming techniques. This is achieved by introducing a large positive constant, referred to as the Big M, and adding slack, surplus, and artificial variables to the problem.

The Big M method involves two main steps. First, the objective function is modified to include the artificial variables and the Big M constant is multiplied by their coefficients. This ensures that the artificial variables have a high cost in the objective function, encouraging them to be minimized or eliminated in the optimal solution. Second, the constraints are transformed by introducing slack and surplus variables to convert inequalities into equalities. Artificial variables are added to enforce these equalities, and the Big M constant is multiplied by their coefficients. These artificial variables help to penalize infeasible solutions and drive the optimizer towards feasible solutions.

The linear programming problem with the modified objective function and constraints is then solved using standard techniques, such as the simplex method. The optimal solution obtained provides the assignment of resources to tasks that minimizes or maximizes the objective function, subject to the given constraints.

Overall, the Big M method is a powerful approach for solving assignment problems by converting them into linear programming problems. It enables the efficient allocation of resources and finding optimal solutions to assignment-related challenges.



# Suri Vidyasagar College

Big-M method

Ву

Name Baban Garain

Approved by

- 1. Prof.Shubhendu Ghosh
- 2. Dr.Sujoy Das
- 3. Dr.Ramprasad Saha
- 4. Dr. Prasenjit Saha
- 5. Soumi Das

#### **ACKNOWLEDGEMENTS**

I would like to reserve this section to thank all of these who made this paper possible. I owe a huge debt of gratitude to my advisor Prof. Shubhendu Ghosh, for guiding me through this endeavour. Without her this would not have been possible .I would like to thank Dr. Sujoy Das for encouraging me to pursue an undergraduate research project and for reminding me that education is truly about the pursuit of knowledge . I would also like to thank Dr. Prasenjit Saha for his interest in this project, and his helpful comments, suggestions and encouragement along the way. I would like to thank Dr. Ramprasad Saha who taught me how to do mathematical computing and helped in this endeavour as well .I owe thanks to all the professor and instructors whom I have studied under here at Suri Vidyasagar College.

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## **INTRODUCTION**

When a Linear Programming Problem is put in standard from by using slack and (or) surplus variables, then there may be the case that the introduction of slack variable only cannot provide initial basic feasible solution (i.e. we cannot get unit matrix initially). This case may be treated as an exceptional case. Such case is tackled by introducing some more variables called artificial variables. The associated vectors with these artificial variables are called artificial vectors. This new system of equations is known as augment system. Now we shall be always careful that the vectors associated with slack and artificial variables will form an identity matrix. Sometimes it may so happen that one or more vectors associated with the original variables may take part to form the identity matrix and in this case the artificial variables are to be so chosen that associated vectors together with those of slack variables will from the required identity matrix.

To solve such problems we usually use two methods:

- (1) The 'Big-M method' or the 'Method of penalties' given by A Charner.
- (2) 'Two –phase method' given by Dantzing

# **BIG- M METHOD:**

The Big-M method is alternative method of solving a linear programming problems involving artificial variables . To solve this method, we first put the linear programming problem in standard form by using slack or(and) surplus variables and then add artificial variables (positive) to the left hand sides of those equations corresponding to the constraints of '≥' or '=' type. Since the introduction of these artificial variables will violate the constraints and a Basic Feasible Solution with at least one artificial variable has no physical significance, so these must be removed from the basis in simplex method. With this thinking in mind we shall remove all the artificial vectors from the basis. For this, a very large negative price '-M' (also called penalty), M is being very large positive quantity, is assigned to each of the artificial variables in the objective function in the case of a maximization problem, and on the other hand, a large positive M is assigned to each of the artificial variables in the objective function in the case of minimization problem. These prices are unfavourable and if at least one artificial vector is present in the basis i.e. at least one artificial variable is in positive level, the objective function cannot be maximized. This idea of price, developed by A. Charner is known as Charner's M method or Big-M method or the method of Penalties. Then we solve this problem as usual using simplex method.

## PROCEDURE OF BIG-M METHOD:

**Step 1.** Convert any linear programming problems as a standard linear programming problems and then add artificial variables (as per need) to the left hand sides of the equations corresponding to the constraints of '≥' or '=' type .Then rewrite the objective function by assigning zero prices corresponding to each slack and surplus variables and '-M' to each artificial variable to maximize the objective function (M being a very big positive quantity).

**Step 2.** Solve this modified linear programming problem by simplex method.

At any iterative stage, the following cases may arise:

Case (a). All  $z_j$ - $c_j \ge 0$  and there is no vector corresponding to any artificial variable in the basis. In this case we get an optimal solution of the problem.

Case (b). Al  $z_j$ - $c_j \ge 0$  and there is at least one vector corresponding to some artificial variable in the basis but the variable is at zero level i.e. corresponding entry in the column  $\mathbf{b}$  is zero . In this case, an optimal solution of the given linear programming problem includes artificial basic variables and an optimum basic feasible solution still exists.

Case (c). All  $z_j$ - $c_j \ge 0$  and there is at least one vector corresponding to some artificial variable in the basis but the variable is not at zero level. Then this linear programming problem does not possess any feasible solution.

**Note:** At the time of application of simplex method when a vector corresponding to any artificial variable is departed from the basis we will drop that vector and all the entries corresponding to the column of thus vectors may be omitted from the simplex tableau.

Example 1. Use Charne's Big –M method to solve the L.P.P

Maximize 
$$Z = -2x_1-x_2$$
  
Subject to  $3x_1+x_2=3$   
 $4x_1+3x_2 \ge 6$   
 $x_1+2x_2 \le 4$   
 $x_1,x_2 \ge 0$ 

**Solution:** We introduced a surplus variable  $x_3$  and a slack variable  $x_4$  to the given problem .Then the problem becomes

Maximize 
$$Z=-2x_1-x_2+0.x_3+0.x_4$$
  
Subject to  $3x_1+x_2+0.x_3+0x_4=3$   
 $4x_1+3x_2-x_3+0.x_4=6$   
 $x_1+2x_2+0.x_3+x_4=4$   
 $x_1,x_2,x_3,x_4\ge 0$ 

We introduced two artificial variables  $x_5$  and  $x_6$  to the given problem and assign a large negative price -M (M>0) to the objective function for each of the artificial variables.

Maximize 
$$Z=-2x_1-x_2+0.x_3+0.x_4-Mx_5-Mx_6$$
  
Subject to  $3x_1+x_2+0.x_3+0x_4+x_5+0.x_6=3$   
 $4x_1+3x_2-x_3+0.x_4+0.x_5+x_6=6$   
 $x_1+2x_2+0.x_3+x_4+0.x_5+0.x_6=4$   
 $x_1,x_2,x_3,x_4,x_5,x_6\ge 0$ 

			C <sub>j</sub>	-2	-1	0	0	-M	-M	
Св	В	Χ <sub>B</sub>	В	<b>A</b> <sub>1</sub>	A <sub>2</sub>	<b>A</b> <sub>3</sub>	<b>A</b> <sub>4</sub>	<b>A</b> <sub>5</sub>	A <sub>6</sub>	Min ratio (b/A <sub>1</sub> )
- М	<b>A</b> <sub>5</sub>	<b>X</b> <sub>5</sub>	3	<u>3</u>	1	0	0	1	0	1
- М	A <sub>6</sub>	<b>X</b> <sub>6</sub>	6	4	3	-1	0	0	1	3/2
0	A <sub>4</sub>	X <sub>4</sub>	4	1	2	0	1	0	0	4
z <sub>j</sub> -c	z <sub>j</sub> -c <sub>j</sub>			-7M个 +2	4M+1	М	0	01	0	Min ratio (b/A <sub>2</sub> )
-2	A <sub>1</sub>	X <sub>1</sub>	1	1	1/3	0	0		0	3
-M	A <sub>6</sub>	X <sub>6</sub>	2	0	<u>5/3</u>	-1	0		1	6/5
0	A <sub>4</sub>	X <sub>4</sub>	3	0	5/3	0	1		0	9/5
z <sub>j</sub> -c	j			0	(- 5M+1)/3个	М	0		04	
-2	A <sub>1</sub>	X <sub>1</sub>	3/5	1	0	1/5	0			
-1	A <sub>2</sub>	X <sub>3</sub>	6/5	0	1	-3/5	0			
0	A <sub>4</sub>	X <sub>4</sub>	1	0	0	1	1			
z <sub>j</sub> -c <sub>j</sub>				0	0	1/5	0			

All  $z_j$ - $c_j \ge 0$ ; so the optimal solution has reached and the solution will be  $x_1$ =3/5,  $x_2$ =6/5

Maximize 
$$Z = -2x_1 - x_2$$
  
= -2.3/5 - 6/5  
= -12/5

Example 2. Use Charne's Big -M method to solve the L.P.P

Maximize 
$$Z = -2x_1 + x_2 + x_3$$
  
Subject to  $x_1$ -  $2x_2 + 3x_3 = 2$   
 $3x_1 + 2x_2 + 4x_3 = 1$ 

 $x_1, x_2, x_3 \ge 0$ 

**Solution:** We introduced two artificial variables  $x_4$  and  $x_5$  to the given problem and assign a large negative price -M (M>0) to the objective function for each of the artificial variables.

Maximize 
$$Z=-2x_1+x_2+3x_3$$
  $-Mx_4-Mx_5$   
Subject to  $x_1-2x_2+3x_3+x_4+0.x_5=2$   
 $3x_1+2x_2+4x_3+0.x_4+x_5=1$   
 $x_1,x_2,x_3,x_4,x_5 \ge 0$ 

			C <sub>j</sub>	-2	1	3	-M	-M	
Св	В	X <sub>B</sub>	b	A <sub>1</sub>	A <sub>2</sub>	<b>A</b> <sub>3</sub>	A <sub>4</sub>	<b>A</b> <sub>5</sub>	Min ratio(b/A <sub>3</sub> )
-M	A <sub>4</sub>	X <sub>4</sub>	2	1	-2	3	1	0	2/3
-M	<b>A</b> <sub>5</sub>	X <sub>5</sub>	1	3	2	4	0	1	1/4
Z <sub>j</sub> -C	z <sub>j</sub> -c <sub>j</sub>		-4M +2	-1	-7M-3个	0	0↓		
-M	A <sub>4</sub>	X <sub>4</sub>	5/4	-5/4	-7/2	0	1		
-3	A <sub>3</sub>	X <sub>3</sub>	3/4	3/4	1/2	1	0		
Z <sub>j</sub> -C	z <sub>j</sub> -c <sub>j</sub>			(5M+17) /4	(7M+1)/2	0	0		

All  $z_j$ - $c_j \ge 0$ , but the artificial vector  $A_4$  appears in the basis at the +ve level, that is the value of the artificial variable  $x_4$  is 5/4.

Hence there is no feasible solution.

Example 3.. Use Charne's Big –M method to solve the L.P.P

Maximize 
$$Z = x_1 - 2x_2 + 3x_3$$

Subject to 
$$x_1 + 2x_2 + 3x_3 = 15$$

$$2x_1 + x_2 + 5x_3 = 20$$

$$x_1, x_2, x_3 \ge 0$$

**Solution:** We introduced two artificial variables  $x_4$  and  $x_5$  to the given problem and assign a large negative price -M (M>0) to the objective function for each of the artificial variables.

Maximize Z= 
$$x_1-2x_2+3x_3-Mx_4-Mx_5$$
  
Subject to  $x_1+2x_2+3x_3+x_4+0.x_5=15$   
 $2x_1+x_2+5x_3+0.x_4+x_5=20$   
 $x_1,x_2,x_3,x_4,x_5,\geq 0$ 

			C <sub>j</sub>	1	-2	3	-M	-M	
Св	В	X <sub>B</sub>	b	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	<b>A</b> <sub>5</sub>	Min ratio(b/A <sub>3</sub> )
-M	A <sub>4</sub>	X <sub>4</sub>	15	1	2	3	1	0	5
-M	<b>A</b> <sub>5</sub>	X <sub>5</sub>	20	2	1	<u>5</u>	0	1	4
Z <sub>j</sub> -C	j			-3M -1	-3M+2	-8M-3↑	0	0	Min ratio(b/A <sub>2</sub> )
-M	A <sub>4</sub>	X <sub>4</sub>	3	-1/5	<u>7/5</u>	0	1		15/7
3	A <sub>3</sub>	X <sub>3</sub>	4	2/5	1/5	1	0		20
Z <sub>j</sub> -C	Z <sub>j</sub> -C <sub>j</sub>		(M+1)/5	(-7M+13) /5 个	0	0			
-2	A <sub>2</sub>	X <sub>2</sub>	15/7	-1/7	1	0			
3	A <sub>3</sub>	X <sub>3</sub>	25/7	3/7	0	1			
z <sub>j</sub> -c <sub>j</sub>			1	4/7	0	0			

All  $z_j$ - $c_j \ge 0$ ; so the optimal solution has reached and the solution will be  $x_1$ =0 ,  $x_2$ =15/7,  $x_3$ =25/7

Maximize 
$$Z = x_1 - 2x_2 + 3x_3$$
  
=  $1x0 - 2x15/7 + 3x 25/7$   
=  $45/7$ 

# **Conclusion:**

The application of the M technique requires that M approaches infinity but to computerize the solution algorithm, M must be finite while being 'sufficiently large'.

The pitfall in this case is, however, if M is too large it can lead to substantial round off error yielding an incorrect optimal solution. For this reason, must commercial linear programme solvers do not apply the Big M method but use, rather, an artificial variable method called the Two-phase method.

The Big M method can handle both equality and inequality constraints, making it more versatile than the Simplex method, which only works with equality constraints.

#### ADVANTEGES OF BIG M METHOD

- 1: The Big M method can quickly identify infeasible solutions or infeasible problem formulations. If a problem has no feasible solution, the Big M method will detect it during the optimization process.
- 2: If a feasible solution exists, the Big M method will eventually reach an optimal solution if it is applied correctly. This makes it a reliable method for finding optimal solutions to linear programming problems.

#### **DISADVANTEGES OF BIG M METHOD**

- 1: The Big M method introduces artificial variables to handle inequality constraints. These variables can complicate the problem formulation and increase the computational complexity of the algorithm. In some cases, the presence of artificial variables may cause the simplex iterations to take longer. Initialization challenges
- 2: The selection of appropriate initial values for the artificial variables in the Big M method can be challenging. An incorrect choice of initial values may lead to cycling or slow convergence of the algorithm

# **References:**

- 1. Linear Programming with Game Theory, Numerical Methods and Computer Programming in C By Dr. Arup Mukherjee
- 2. Linear Programming and Theory of Games By P.M. Karak

# THE UNIVERSITY OF BURDWAN



# SURI VIDYASAGAR COLLAGE DEPARTMENT OF MATHEMATICS

UNDERGRADUATE PROJECT WORK(2023)
UNDER THE GUIDANCE OF PROF. DR. RAMPROSAD SAHA

NAME: RAHIMODDIN SK

REG.NO: 202001032363 OF 2020-2021

**ROLL NO: 200331000066** 

SEMESTER: VI

SUBJECT: B.SC MATHEMAICS HONOURS

PAPER: BMH6PW01(PROJECT WORK)

TOPIC: CONVERGENCE OF SERIES

# **CONVERGENCE OF SERIES**

# CERTIFICATE

This is satisfying that, RAHIMODDIN SK is a student of department of mathematics (semester VI, registration number -202001032363 of 2020-2021) Suri Vidyasagar College, Birbhum, West Bengal (Affiliated of University of Burdhwan) has completed this project.

- 1. PROF. SHUBHENDU GHOSH
- 2. DR.SUJOY DAS
- 3. DR. RAMPRASAD SAHA
- 4. DR. PRASENJIT SAHA
- 5. SMT. SOUMI DAS

Department of mathematics

Suri Vidyasagar College, Birbhum, WestBengal

# DECLARTION

I here by declare that the project topic "CONVERGENCE OF SERIES" completed by me and submitted to department of mathematics, Suri Vidyasagar College, Suri, Birbhum.

I also declare that this project accomplished by me honestly and it is not noted from anywhere else.

I also assure that this project work is original and not done earlier.

Thank you

Your faithfully

Rahimoddin SK

Date: - 08/06/2023

# ACKNOWLEDGEMENT

I would like to express special thanks of gratitude to our teachers PROF. SHUBHENDU GHOSH, DR. SUJOY DAS, DR. RAMPRASAD SAHA, DR.PRASENJIT SAHA, SMT. SOUMI DAS for guiding me in choosing this project and planned how to write and decorate. His cooperation and encouragement was very helpful to complete my project.

I would also like to extend my gratitude to the principal DR. TAPAN KUMAR PARICHHA for providing me with all the facility that was required.

Date:-

Rahimoddin Sk

B.sc. (Math. Hons)

# CONVERGENCE OF SERIES

**Definition:** A series is convergent if the sequence of its partial sumbecome closer and closer to a certain valu we increase the number of terms in the sum . i.e.,a series convergent, if there exist a number I show that for every arbitrarily small positive number €>0, exists a integer (sufficient large) N such that for n≥N

 $|S_n-1| < \mathbb{C}$ , if the series is convergent then the number  $|S_n-1| < \mathbb{C}$ , if the series is convergent then the number is called the sum of the series.

Any series that is not is convergent is said to be divergent.

1.COMPARISON: Let  $\sum u_n$  and  $\sum v_n$  be tow series of positive real number and there is a natural number m such  $u_n \leq K v_n$ , for all  $n \geq m$ , k being a fixed positive number.

Then i.  $\sum u_n$  is congervent if  $\sum v_n$  is convergent.

ii.  $\sum v_n$  is divergent if  $\sum u_n$  is divergent.

2. LIMITE TEST: Let  $\sum u_n$  and  $\sum v_n$  be tow series of positive terms and  $\lim n \to \infty$  (  $u_n/v_n$ )= I , (0<I< $\infty$ )

Then if I is a non-zero finite number then series  $\sum u_n$  and  $\sum v_n$  converges or diverges together.

3. D'ALEMBERT'S RATIO TEST: Let  $\sum u_n$  be a series of positive terms such that  $\lim n\to\infty u_{n+1}/u_n=1$ 

Then

- i.  $\sum u_n$  be convergent if I<1 ii.  $\sum u_n$  be divergent if I >1
- 4. <u>CAUCHY'S ROOT TEST</u>: Let  $\Sigma u_n$  series of positive terms and Lim  $n \to \infty$   $\sqrt[n]{u_n} = I$

Then

- i.  $\sum u_n$  be convergent if I<1 ii.  $\sum u_n$  be divergent if I>1
- **5.RABBE'S TEST**: Let  $\sum u_n$  be a series of positive real number such that  $\text{Lim } n \to \infty n\{(u_n/u_{n+1}) 1\} = I$

Then

- i.  $\sum u_n$  be convergent if I<1 ii.  $\sum u_n$  be divergent if I>1
- 6. <u>LOGARITHMIC TEST</u>: Let  $\sum u_n$  be a series of positive real number such that  $\lim n \to \infty \operatorname{nlog}(u_n/u_{n+1}) = I$

Then

i.  $\sum u_n$  be convergent if I<1 ii.  $\sum u_n$  be divergent if I>1

# SOME ANOTHER TESTS OF REAL NUMBER SERIES:-

- 7. De-Morgan and Bertrand test:-
- 8. Kummer's Test:-
- 9. Gauss's Test:-
- 10. Cauchy's Candensation Test

# SURI VIDYASAGAR COLLEGE THE UNIVERSITY OF BURDWAN



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PROJECT SUMMARY

PROJECT TOPIC - " GROUP HOMOMORPHISM AND ISOMORPHISM"

SEMESTER- VI

# INTRODUCTION:

In abstract algebra, we consider one of the most fundamental ideas of algebra— **Homomorphism.** A homomorphism is a structure preserving map between two algebraic structures of the same type (such as two groups, two rings, or two vector spaces). The word homomorphism comes from the Ancient Greek word 'homo', meaning "like" and 'morphe', meaning "form". The concept of group homomorphism was introduced by Camille Jordan in 1870, in his influential book *Traite des Substitutions*.

In abstract algebra, one of the most fundamental ideas of algebra is Isomorphism of groups. The term isomorphism comes from the Greek words 'isos', meaning same or "equal" and 'morphe', meaning "form", Galois introduced the concept of isomorphism in 180 years ago.

Group Theory is a vast subject and homomorphism is a part of its. Here I have tried to select important and representative theorems about Group Homomorphism and Isomorphism, various types, tricks for find out the number of homomorphism of a group and to organize them in a coherent way.

# **DEFINITION:**

Let  $(G, \circ)$  and (G', \*) be any two groups and let 'o' and '\*' denote their respective binary operations. Then a mapping  $\phi: G \to G'$  is called a homomorphism, if  $\phi(a \circ b) = \phi(a) * \phi(b)$  for all  $a, b \in G$ .

The homomorphism φ is not just a mapping from the set G to the other set G', but it also preserves the algebraic structure of the systems.

To be explicit, φ not only relates two elements a, b in G to two elements a', b' in G', but also relates a o b in G to a' \* b' in G'.

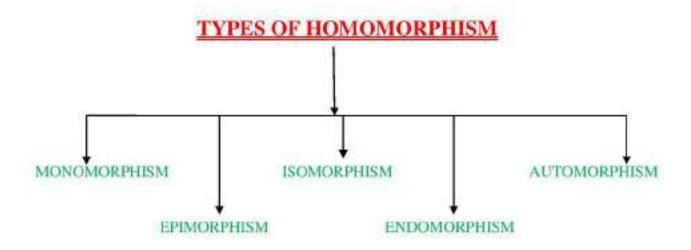
# EXAMPLE:

- (1) Let G = (ℝ, +) and G' = (ℝ+, ·) and a mapping φ: G→G\* defined by φ(x) = e<sup>x</sup> for all x ∈ G, e' being the identity element in G'. Examine if φ is a homomorphism.
  - $\Rightarrow$  To examine if  $\varphi$  is a homomorphism, let a, b  $\in$  G.

Then 
$$a + b \in G$$
 and  $\varphi(a) = e^a$ ,  $\varphi(b) = e^b$ ,  $\varphi(a + b) = e^{(a+b)} \mathbb{Z}$ 

$$\therefore \varphi(a+b) = e^{(a+b)} = e^{a} \cdot e^{b} = \varphi(a) \cdot \varphi(b).$$

Since  $\varphi(a + b) = \varphi(a) \cdot \varphi(b)$  for all  $a, b \in G$ ,  $\varphi$  is a homomorphism.



A group homomorphism that is injective (or, one-to-one); i.e. preserves distinctness is said to be a **Monomorphism**.

A group homomorphism that is surjective (or, onto); reaches every point in the codomain is said to be an **Epimorphism**.

A homomorphism that is bijective; i.e. injective and surjective is called **Isomorphism**. Its inverse is also a group homomorphism.

A group homomorphism is called an Endomorphism if the domain and codomain are same.

An isomorphism from a group G onto itself is said to be an **Automorphism** of G.

# PROPERTIES OF HOMOMORPHISM-:

Let  $(G, \circ)$  and  $(G', \circ)$  be two groups. If  $\varphi: G \rightarrow G'$  be a homomorphism, then

- (a)  $\Phi(e_G) = e_G$ ,
- (b) Φ(a<sup>-1</sup>) = {φ(a)}<sup>-1</sup> for all a ∈ G,
- (c) if a ∈ G, then φ(a<sup>n</sup>) = {φ(a)}<sup>n</sup> where n is integer,
- (d) if a ∈ G and φ(a) is finite, then o(φ(a)) is a divisor of o(a).

#### PROOF:-

- (a)  $e_G \circ e_G = e_G$  in G. This implies
- $\varphi(e_G) * \varphi(e_G) = \varphi(e_G)$  in G', since  $\varphi$  is a homomorphism.

or, 
$$\varphi(e_G) * \varphi(e_G) = \varphi(e_G) * e_{G'}$$
 in G'

This gives  $\Phi(e_G) = e_G$ , by left cancellation law in G'.

(b) Let  $a \in G$ . Then  $\varphi(e_G) = \varphi(a * a^{-1}) = \varphi(a) * \varphi(a^{-1})$ .

Also 
$$\varphi(e_G) = \varphi(a^{-1} \cdot a) = \varphi(a^{-1}) \cdot \varphi(a)$$
.

We have 
$$\varphi(a) * \varphi(a^{-1}) = \varphi(a^{-1}) * \varphi(a) = e_{G'}$$
 in  $G'$ , by (i).

By the definition of an inverse it follows that  $\phi(a^{-1})$  is the inverse of  $\phi(a)$  in G',

i. e., 
$$\varphi(\alpha^{-1}) = {\varphi(\alpha)}^{-1}$$
,

- (c) If a ∈ G and ○(a) = n then a<sup>n</sup> = e<sub>6</sub>
  - Therefore  $\phi(a^n) = \phi(e_G)$ . Since  $\phi(a^n) = \{\phi(a)\}^n$  and  $\phi(e_G) = e_{G'}$ , we have  $\{\phi(a)\}^n = e_{G'}$

Hence  $\phi(a)$  is of finite order and  $o(\phi(a))$  is a divisor of

That is,  $o(\phi(a))$  is a divisor of o(a).

# KERNEL OF HOMOMORPHISM:

Let  $(G, \circ)$  and (G', \*) be any two groups and  $\varphi: G \to G'$  be a homomorphism. Then the kernel of  $\varphi$ , is denoted by Ker  $(\varphi)$ , is a subset of G defined by ker  $\varphi = \{a \in G \mid \varphi(a) = e_{G'}\}$ . Ker  $\varphi$  is the set of those elements of G that are mapped to the identity element in G'.

#### EXAMPLE:

```
Let G = (\mathbb{R}, +), G' = (\{z \in \mathbb{C} : |z| = 1\}, .) and \varphi : G \to G' is defined by \varphi(x) = \cos 2\pi x + i \sin 2\pi x, \ x \in \mathbb{R}. Prove that \varphi is a homomorphism. Determine \ker \varphi. \Rightarrow Let x \in G, y \in G. Then x + y \in G. \varphi(x) = \cos 2\pi x + i \sin 2\pi x, \ \varphi(y) = \cos 2\pi y + i \sin 2\pi y, \ \varphi(x + y) = \cos 2\pi (x + y) + i \sin 2\pi (x + y) = (\cos 2\pi x + i \sin 2\pi x). (\cos 2\pi y + i \sin 2\pi y) = \varphi(x). \ \varphi(y)
Therefore \varphi(x + y) = \varphi(x). \varphi(y) for all x, y \in G. This proves that \varphi is a homomorphism. I is identity element in G'. Ker \varphi = \{x \in G : \varphi(x) = 1\}. \varphi(x) = 1 \Rightarrow \cos 2\pi x + i \sin 2\pi x = 1 \Rightarrow 2\pi x = 2\pi n, \text{ n is an integer.}
Therefore x = n, n \in \mathbb{Z}. Consequently, \ker \varphi = \mathbb{Z}.
```

### ONE-ONE HOMOMORPHISM:

Let  $\phi$ :  $G \rightarrow G'$  be a homomorphism and ker  $\phi$  is kernel of  $\phi$ , then  $\phi$  is called one-one homomorphism if  $\ker(\phi) = e$ .

**EXAMPLE:**  $G = (\mathbb{Z}, +)$  and  $G' = \{2^m : m \in \mathbb{Z}\}$ . Here 0 is identity element and  $\mathbb{Z}$  is the set of integer. Therefore ker  $\phi = \{0\}$ . So it is one-one homomorphis

# IMAGE OF A HOMOMORPHISM:

Let  $(G, \circ)$  and (G', \*) be any two groups and  $\varphi: G \to G'$  be a homomorphism. The image of  $\varphi$ , denoted by Im  $\varphi$  is a subset of G' defined by Im  $\varphi = \{\varphi(a) : a \in G\}$ . Im  $\varphi$  is also called the homomorphic image of  $\varphi$  and is also denoted by  $\varphi(G)$ .

#### EXAMPLE:

Let  $G = (\mathbb{Z}_6, +)$  and  $G' = (\mathbb{Z}_{16}, +)$  be two groups  $\varphi: G \to G'$  be a homomorphism and defined by  $\varphi(x) = 5x$ . Determine Im  $\varphi$ .

 $\Rightarrow$  Here 0 is identity element and  $\varphi(x) = 5x$ . The elements of  $\mathbb{Z}_6 = \{0, 1, 2, 3, 4, 5\}$ 

$$\phi(0) = 0$$
,  $\phi(1) = 5$ ,  $\phi(2) = 10 \pmod{10} = 0$ ,  $\phi(3) = 15 \pmod{10} = 5$ ,  $\phi(4) = 20 \pmod{10} = 0$ ,  $\Phi(5) = 25 \pmod{10} = 5$ .

Therefore Im  $\varphi$  or Range  $\varphi = \{0, 5\}$ .

#### ONTO HOMOMORPHISM:

Let  $\phi: G \to G'$  be a homomorphism and it is called onto homomorphism if  $\phi(G) = G'$ .

#### EXAMPLE:

Let  $G = (\mathbb{Z}_4, +)$  and  $G' = (\mathbb{Z}_2, +)$  be two groups.  $\varphi \colon G \to G'$  be a homomorphism and defined by  $\varphi(x) = x$ . '0' is the identity element.  $\{0, 1, 2, 3\}$  be elements of  $\mathbb{Z}_4$ .

Then  $\varphi(0) = 0$ ,  $\varphi(1) = 1$ ,  $\varphi(2) = 2 \pmod{2} = 0$ ,  $\varphi(3) = 3 \pmod{2} = 1$ .

 $\therefore$  ker  $\varphi = \{0, 2\} = \mathbb{Z}_2$ . Then  $\varphi$  is a onto homomorphism.

#### THEOREM;

Let  $(G, \circ)$  and (G', \*) be any two groups and  $\phi: G \to G'$  be a homomorphism. Then  $\phi(G)$  is subgroup of G'.

**PROOF:**  $\varphi(G)$  is a non-empty subset of G', since  $e_G'(=\varphi(e_G)) \in \varphi(G)$ . Let  $a' \in \varphi(G)$ ,  $b' \in \varphi(G)$ . Then there exist elements a, b in G such that  $\varphi(a) = a'$ ,  $\varphi(b) = b'$ .  $a \circ b^{-1} \in G$ .  $a' * (b')^{-1} = \varphi(a) * \{ \varphi(b) \}^{-1} = \varphi(a) * \varphi(b^{-1}) = \varphi(a) * b^{-1} \in \varphi(G)$ . Thus  $a' \in \varphi(G)$ ,  $b' \in \varphi(G) \Rightarrow a' * (b')^{-1} \in \varphi(G)$ .

This proves that  $\varphi(G)$  is a subgroup of G'.

#### ISOMORPHISM:

Let  $(G, \circ)$  and (G', \*) be any two groups and  $\phi: G \to G'$  be a homomorphism.  $\Phi$  is said to be an isomorphism if  $\phi$  is a one-one(Monomorphism) and onto(Epimorphism) mapping.

#### **EXAMPLES:**

(1) Let  $G = (\mathbb{Z}_5, +)$  and  $\varphi \colon G \to G$  be defined by  $\varphi(\bar{x}) = 3\bar{x}, \ \bar{x} \in \mathbb{Z}_5$ . Show that  $\varphi$  is an isomorphism.

 $\Rightarrow$  Let  $ab \in \mathbb{Z}_5$ . Then  $a+b \in \mathbb{Z}_5$ .  $\phi(a=3a\phi(b=3band \phi(a+b=3(a+b).$ 

9|Page

Hence  $\varphi(a+b) = \varphi(a+\varphi(b))$  for all  $ab \in \mathbb{Z}_5$ .

This proves that  $\varphi$  is a homomorphismn.

On the identity element in G. ker  $\varphi = \{\vec{x} \in \mathbb{Z}_5 : 3\vec{x} = 0\}$ .

 $\bar{x} \in G \Rightarrow o(\bar{x})$  is a divisor of 5 and  $3\bar{x} = 0 \Rightarrow o(\bar{x})$  is a divisor of 3.

Since 3 and 5 are prime to each other, it follows that  $o(\vec{x}) = 1$ , i.e.,  $\vec{x} = 0$ 

Therefore  $\ker \varphi = \{e_G\}$  and this implies that  $\varphi$  is one-to-one.

Since G is a finite set and  $\varphi$ : G  $\rightarrow$  G is one-to-one,  $\varphi$  is onto also.

φ being both injective and surjective, is an isomorphism.

#### PROPERTIES OF ISOMORPHISM:-

(1) Let G be a finite abelian group of order n. A mapping  $\phi$ :  $G \to G$  defined by  $\phi(x) = x^m$ ,  $x \in G$  is an isomorphism if gcd(m, n) = 1.

Example:- Let  $G = (Z_3, +)$  be a finite group and  $\phi$ :  $G \rightarrow G$  defined by  $\phi(x) = x^2$ Then gcd(2, 3) = 1. So  $\phi$  is an isomorphism.

(2) The group  $Z_m \times Z_n$  is isomorphic to group  $Z_{mn}$  if gcd(m, n) = 1.

Example:- Let  $G = (Z_2 \times Z_3, +)$  and  $G' = (Z_5, +)$ . Here gcd(2, 3) = 1. So  $Z_m \times Z_n \cong Z_6$ .

$$= 2 \times 3 = 6$$
.

#### THEOREM: - NATURAL HOMOMORPHISM

If H be a normal subgroup of a group G, then the map  $\theta$ : G  $\rightarrow$  G/H defined by  $\theta(x) = x$ H,  $x \in G$  is an onto homomorphism with kernel H.

**PROOF:** Let us take two elements  $x, y \in G$ . Then  $xy \in G$ .

$$\theta(x) = xH$$
,  $\theta(y) = yH$ ,  $\theta(xy) = xyH$ .

 $\theta(xy) = xyH = (xH)(yH) = \theta(x)\theta(y)$ . This proves that  $\theta$  is a homomorphism.

The identity element in the quotient group G/H is H. ker  $\theta$  is set of those elements in G such that

$$\theta(x) = H$$
. For  $x \in G$ ,  $x \in \ker \theta \iff \theta(x) = H \iff xH$   
=  $H \iff x \in G$ 

Therefore ker  $\theta = H$ .  $\theta$  is an epimorphism, since an arbitrary element  $aH \in G/H$  has a pre-image a in G since  $\theta(a) = aH$ . This establishes the theorem.

#### FUNDAMENTAL THEOREM ON HOMOMORPHISM:

Let G and G' be two groups and  $\phi: G \to G'$  be an onto homomorphism. Let  $H = \ker \phi$ . Then the quotient group  $G/H \simeq G'$ .

**PROOF:** Since  $H = \ker \phi$ , H is a normal subgroup of G. Let us define a map  $\psi : G/H \rightarrow$ G' by  $\psi(aH) = \varphi(a)$ ,  $aH \in G/H$ . First we show that w is well defined in the sense that if aH is also  $a' H then \psi(aH) = \psi(a' H)$  $aH = a'H \Rightarrow a^{-1}a' \in H$  $\Rightarrow \phi(a^{-1}a') = e_G$  since  $H = \ker \phi$  $\Rightarrow \{o(a)\}^{-1}\phi(a') = e_{G'}$  $\Rightarrow \varphi(a) = \varphi(a')$  $\Rightarrow \psi(aH) = \psi(a'H)$ . So w is well defined. w is a homomorphism, because  $\psi(aHbH) = \psi(abH) = \varphi(ab)$  by definition  $= \varphi(a)\varphi(b) = \psi(aH)\psi(bH).$ ψ is one-to-one, because  $\psi(aH) = \psi(bH) \Rightarrow \varphi(a) = \varphi(b)$  $\Rightarrow$   $\{o(a)\}^{-1}\phi(b) = e_G$  $\Rightarrow \varphi(a^{-1}b) = e_{G'}$  $\Rightarrow$  a<sup>-1</sup>b  $\in$  ker  $\phi$  (i.e., H)  $\Rightarrow aH = bH$ 

Finally,  $\psi$  is onto, because each element of G' is of the form  $\varphi(a)$  for some  $a \in G$ ; and since  $\varphi(a) = \psi(aH)$ , the pre-image of  $\varphi(a)$  is aH in G/H. Thus  $\psi$  is an isomorphism and G/H  $\simeq$  G. **Note:** This theorem is also called the **First Isomorphism Theorem**.

#### SECOND ISOMORPHISM THEOREM:

Let H, K be subgroups of a group G and K be normal in G. Then  $H/H\cap K \simeq HK/K$ .

**PROOF:** Since H, K are subgroups of G and K is normal in G, HK is a subgroup of G containing K. As  $K \subset HK \subset G$  and K is normal in G, it follows that K is normal in HK and therefore the quotient group HK/K exists.

To prove that  $H \cap K$  is normal in H, let  $h \in H$ ,  $x \in H \cap K$ .

 $hxh^{-1} \in H$ , since H is a subgroup and  $h \in H$ ,  $x \in H$ .

 $hxh^{-1} \in K$  also, since K is normal and  $h \in G$ ,  $x \in K$ .

Therefore  $hxh^{-1} \in H \cap K$  proving that  $H \cap K$  is normal in H. Therefore the quotient group  $H/H \cap K$  exists.

Let us define a map  $\phi$ :  $H \rightarrow HK/K$  by  $\phi(h) = Hk \in HK/K$ . We observe that an element of the group HK/K is of the form (hk)K for some  $h \in H$ , some  $k \in K$  and (hk)K = (hK) = hk. K = hK

(hk)K = (hK) \* (kK) = hk \* K = hK.

 $\varphi$  is a homomorphism, since  $\varphi(h_1h_2) = h_1h_2K = (h_1K)(h_2K) = \varphi(h_1) \varphi(h_2)$ .

φ is onto, since any element of HK/K is of the form hK.

By the fundamental theorem on homomorphism, H/ker  $\varphi \simeq HK/K$ .Let us determine ker  $\varphi$ . Let  $x \in H$  and  $x \in \ker \varphi$ .

Then  $\phi(x) = K$  (the identity in the group HK/K)  $\iff xK = K \iff x \in K$ .

Thus  $x \in H \cap K$ . Therefore  $\ker \varphi = H \cap K$ . Consequently,  $H/H \cap K = HK/K$ . This completes the proof.

#### THIRD ISOMORPHISM THEOREM:

Let  $H \subset K \subset G$  and H is normal in K, K is normal in G and also H is normal in G. Then K/H is normal in G/H and  $G/H \simeq G/K$ .

### APLLICATION OF GROUP HOMOMORPHISM & ISOMORPHISM

Group Homomorphism into permutation groups or symmetry groups are equivalent to group actions. Linear representations are homomorphisms into groups of invertible linear mappings and are both used to study groups and in subjects such as Physics (the standard model involves Lie symmetry groups and their representations) and Chemistry (molecular structure involves symmetric groups). The concept of Group Homomorphism is central to abstract algebra: other well-known algebraic structures, such as rings, fields and vector spaces. Also, Isomorphism is highly applied in real world problem. Graph Isomorphism is the area of pattern matching and widely used in various applications such as image processing, protein structure, computer and information system, chemical bond structure, and social networks.

#### CONCLUSION:-

In this project work we learn about Group Homomorphism and Isomorphism and their history, definition, types, theorems and their applications in mathematics and various field of our life. This project work has helped me to know deeply about the topic and to clarify its concecpt

#### THE UNIVERSITY OF BURDWAN



#### SURI VIDYASAGAR COLLEGE



#### **DEPARTMENT OF MATHEMATICS**

**UNDERGRADUATE PROJECT WORK (2023)** 

UNDER THE GUIDANCE OF PROF DR. RAMPRASAD SAHA

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**SUBJECT:-MATHEMATICS** 

COLLEGE ROLL NO:-2030138

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REGISTRATION NO:-202001032385 OF 2020-2021

PAPER:-BMH6PW01 (PROJECT WORK)

TOPIC:- THE CENTRE OF PRESSURE OF A PLANE AREA

## SURI VIDYASAGAR COLLEGE

#### THE CENTRE OF PRESSURE OF A PLANE AREA

BY-

**SANTU MONDAL** 

## ABSTRACT

In fluid mechanics, "the centre of pressure" is the very important part of mechanics and "the centre of pressure is the very helpful topic for development of Higher applied Mathematics, Physics, Engineering and other areas.

In fluid mechanics, the centre of pressure is basically defined as a single point through which or at which total pressure or total hydrostatic force will act in a plane surface immersed in a fluid.

In this project work we have to find that the position of centre of pressure and the depth of the centre of pressure of the some kind of plane area such as triangular lamina, rectangular lamina, circular area immersed in a fluid vertically or at an inclination with the vertical line.

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Date:

## SURI VIDYASAGAR COLLEGE

## THE CENTRE OF PRESSURE OF A PLANE AREA

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#### \* ACKNOWLEDGEMENTS \*

I would like to express my special thanks of gratitude to our professors Pro.Shubhendu Ghosh Sir, Dr.Ramprasad Saha Sir, Dr. Sujoy Das Sir, Dr. Prasenjit Saha Sir and Smt. Soumi Das ma'am, they give me the golden opportunity to do this wonderful project on the topic

"The centre of pressure of a plane area" which also helped me in doing a loy of research and I came to know about so many new things. I am really thankful to them.

Secondly I would like to thank my private teachers and friends who helped me a lot in finalizing this project within limited time flame.

Your obedient student
Santu Mondal

6'th SEM, Mathematics Honours

Date:

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## INTRODUCTION

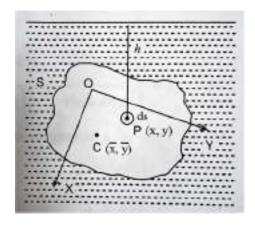
If a plane surface be immersed in a fluid, the pressure at any point of it is perpendicular to the plane area and it is proportional to the depth of that point from the free surface. So the pressures or thrusts on all the elements of a given plane surface fully immersed in the fluid constitute a system of parallel forces which ultimately can be compounded to a single resultant force. The point in the plane surface at which the resultant of the system of the parallel forces act is known as the centre of pressure of the plane surface.

And if the plane area immersed be horizontal in the fluid then the pressure at every point on the plane will be the same (since, the depth of every point on the plane from the effective surface remains the same). So the resultant thrust will act through the centroid of the surface, i.e., the centre of pressure will be coincide with the centroid of the plane in this case.

#### 1. Position of the centre of pressure:

## 1.1. Position of the centre of pressure of a plane immersed in a fluid:

Let us consider a Cartesian system whose perpendicular axes are OX and OY in the plane area immersed in a fluid. Let P(x,y) be a point of an elementary area ds in this plane at a depth h from the free surface and let p be the pressure at that point.



So the thrust on the elementary area ds is p ds and the resultant thrust on the plane is  $\iint p \, ds$ .

Let C  $(\overline{x}, \overline{y})$  is the position of centre of pressure of the plane surface. Now we know that the sum of the moments of the pressure components about any line is equal to the moment of the resultant pressure about that line, so taking moments about Y-axis, we may write

$$\overline{x} \iint_{S} pds = \iint_{S} pxds$$
 ,s be the area of the immersed ne

plane

Thus, 
$$\overline{x} = \frac{\iint pxds}{\iint pds} = \frac{\iint pxdxdy}{\iint pdxdy}$$
 (1.1)

Similarly, taking moment about X-axis,

$$\overline{y} = \frac{\iint pydxdy}{\iint pdxdy} \tag{1.2}$$

In polar co-ordinates, let the point P be represented by  $(r,\theta)$ .

Then  $x = r \cos \theta$   $y = r \sin \theta$  and  $dxdy = rd\theta dr$ . Then we may write

$$\overline{x} = \frac{\iint p \, r \cos r d\theta dr}{\iint p \, r d\theta dr} = \frac{\iint p \, r^2 \cos \theta \, d\theta dr}{\iint p \, r d\theta dr} \quad (1.3)$$

and 
$$\overline{y} = \frac{\iint p \, r \sin \theta \, r d\theta dr}{\iint p \, r d\theta dr} = \frac{\iint p \, r^2 \sin \theta d\theta dr}{\iint p \, r d\theta dr}$$
 (1.4)

And for an incompressible fluid under the action of gravity only, then p= gph where h is the depth of the point p(x,y) below the effective surface p is the density of the fluid and g is the acceleration due to gravity.

Then, 
$$\overline{x} = \frac{\iint \rho g h \, x \, dx dy}{\iint \rho g h dx dy} = \frac{\iint \rho h \, x \, dx dy}{\iint \rho h dx dy}$$
 [g is constant] (1.5)

And 
$$\overline{y} = \frac{\iint \rho gh \ y dx dy}{\iint \rho gh \ dx dy} = \frac{\iint \rho h \ y \ dx dy}{\iint \rho h dx dy}$$
 (1.6)

Moreover, if the fluid be homogeneous,  $\rho$ = constant

Then, 
$$\overline{x} = \frac{\iint h \, x \, dx dy}{\iint h dx dy}$$
 and  $\overline{y} = \frac{\iint h \, y dx dy}{\iint h \, dx dy}$  (1.7)

Note: when the plane surface is horizontal and is at a constant depth below the free surface, then h = constant.

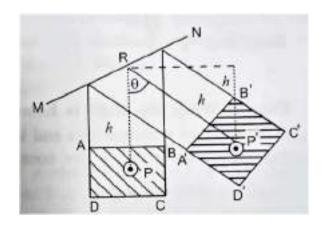
Then 
$$\overline{x} = \frac{\iint \rho \ x \ dx dy}{\iint \rho dx dy} \text{ and } \overline{y} = \frac{\iint \rho y dx dy}{\iint \rho \ dx dy}$$
 (1.8)

Which gives position of the centre of gravity of the plane area in this case.

# 1.2 . Position of the C.P. when the immersed plane rotates through an angle $\theta$ about its line of intersection with the effective surface.

Let ABCD be a plane area in its vertical position and let after rotation through an angle  $\theta$  about MN, its line of intersection will with the effective surface, then its new position will be A/B/C/D/.

Let h be the depth of any point P of the plane ABCD and after rotation, let  $P^{/}$  be the respective position of the same point.



Obviously its depth  $h^{/}$  below the free surface will be  $h \cos \theta$  i.e.,  $h^{/} = h \cos \theta$ 

Now the co-ordinates of the C.P. in the new position of the plane area is given by

$$\overline{x} = \frac{\iint h' x \, dx dy}{\iint h' dx dy} = \frac{\iint x h \cos \theta \, dx dy}{\iint h \cos \theta \, dx dy}$$

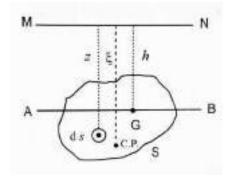
$$= \frac{\iint x h \, dx dy}{\iint h \, dx dy}$$
and
$$\overline{y} = \frac{\iint y \, h \, dx dy}{\iint h \, dx dy} \tag{1.9}$$

Hence the integration being extended over the area ABCD.

Here we see that ,  $(\overline{x}, \overline{y})$  is independent of  $\theta$  and hence centre of pressure remains at the same point in the plane area.

## 2. Depth of the centre of pressure of a plane area fully immersed in a fluid under the gravity.

Let the plane of surface of area S be vertical and when extended it meets the effective surface in the line MN. Also let ds be an elementary area of the plane surface at a depth z below the free surface.



Again let , h and  $\xi$  be the depth of the centre of gravity and centre of pressure of the plane below the free surface. Now we know that the sum of the moments of the pressure components about any line is equal to the moment of the resultant pressure about that line , so taking moments about MN ,we may write,

$$\xi \iint g\rho z ds = \iint g\rho z z ds$$

$$\xi = \frac{\iint g\rho z^2 ds}{\iint g\rho z \, ds} \tag{1.10}$$

If the fluid be homogeneous and incompressible under the gravity only, then g and  $\rho$  are constant,

Then, 
$$\xi = \frac{\iint z^2 ds}{\iint z ds}$$
 (1.11)

Here we know that  $\iint zds$  represents that 'first moment' of area about the line MN . Therefore  $\iint zds = Sh$ , where S is the whole area of the plane surface immersed in the fluid and h is the depth of the C.G. of the plane area below the free surface.

Again we know that ,  $\iint z^2 ds$  represents the 'second moment' of the area about the line MN and is equal  $Sk^2$  where k is the radius of gyration of the area about the line MN.

Thus, from (1.11),

$$\xi = \frac{Sk^2}{Sh} = \frac{k^2}{h} \tag{1.12}$$

Again if  $k^{\prime}$  represents the radius of gyration of the plane area about the line AB, the line parallel to MN and passing through the centre of gravity G, then by the theorem of parallel axes we get,

$$k^{2} = k^{/2} + h^{2}$$
So, 
$$\xi = \frac{k^{2}}{h} = \frac{k^{/2} + h^{2}}{h} = \frac{k^{/2}}{h} + h$$
 (1.13)

And so it is clear that  $\xi > h$ , which proves that the depth of the centre of pressure is greater than the depth of the centre

of gravity. And therefore , 
$$\xi - h = \frac{k^{/2}}{h}$$
 .

Thus the vertical distance between the C.G. and the C.P. varies inversely as the depth of the C.G. Again, as h increases ( $\xi$ -h) decreases and  $\xi$ -h $\rightarrow$ 0 as h $\rightarrow$ 0.

Therefore, when the depth of the C.G. of the plane area is infinite, the C.G. and C.P. of the plane coincides. This when a plane area is lowered vertically in a fluid, the C.P.

approaches towards C.G. and ultimately coincides with the C.G.

Hence the position of the centre of pressure remains invariant by rotating the plane area about the line MN, so the result (1.12) holds good even when the plan surface is in oblique position. In this case, h the depth of the C.G. from the free surface, will be interpreted as the distance of the C.G. from the line MN measured along the line of greatest slope of the plane surface.

And the differentiating (1.13) with respect to t, we have,

$$\frac{d\xi}{dt} - \frac{dh}{dt} = -\frac{k^2}{h^2} \frac{dh}{dt} \tag{1.14}$$

This shows that the centre of pressure approaches the horizontal through the centre of gravity with a velocity which is inversely proportional to the square of the depth of its centre of gravity.

#### 3. Centre of pressure of a composite plane area:

Let the given composite plane be composed of areas  $s_1$ ,  $s_2$ ,  $s_3$ ,....,  $s_n$  and let respective depths of their center of gravities, below the free surface be  $h_1$ ,  $h_2$ ,  $h_3$ ,...,  $h_n$ . Then the respective thrusts on these areas will be  $g\rho h_1 s_1$ ,  $g\rho h_2 s_2$ ,  $g\rho h_3 s_3$ ,...,  $g\rho h_n s_n$ . If  $\xi_1$ ,  $\xi_2$ ,  $\xi_3$ ,...,  $\xi_n$  be the respective depths of the centre of pressure below the free surface, then

$$\xi_1 = (1/h_1)k_1^2, \; \xi_2 = (1/h_2)k_2^2 \;\;, \; \xi_3 = (1/h_3)k_3^2, \ldots, \; \xi_n = (1/h_n)k_n^2$$

Where  $k_1$ ,  $k_2$ ,  $k_3$ ,.....,  $k_n$  are the respective radius of gyrations about the free surface.

Now if h be the depth of the C.G. of the composite area below the free surface .then,

$$h = \frac{g\rho h_1 s_1 + g\rho h_2 s_2 + \dots + g\rho h_n s_n}{g\rho s_1 + g\rho s_2 + \dots + g\rho s_n}$$

$$= \frac{h_1 s_1 + h_2 s_2 + \dots + h_n s_n}{s_1 + s_2 + \dots + s_n}$$
(1.15)

Again if  $\xi$  be the depth of the centre of pressure of the composite area below the free surface, then

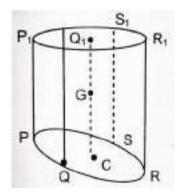
$$\xi = \frac{g\rho h_1 s_1 \xi_1 + g\rho h_2 s_2 \xi_2 + \dots + g\rho h_n s_n \xi_n}{g\rho h_1 s_1 + g\rho h_2 s_2 + \dots + g\rho h_n s_n}$$

$$\xi = \frac{g\rho h_1 s_1 \frac{k_1^2}{h_1} + g\rho h_2 s_2 \frac{k_2^2}{h_2} + \dots + g\rho h_n s_n \frac{k_n^2}{h_n}}{g\rho h_1 s_1 + g\rho h_2 s_2 + \dots + g\rho h_n s_n}$$

$$= \frac{k_1^2 s_1 + k_2^2 s_2 + \dots + k_n^2 s_n}{h_1 s_1 + h_2 s_2 + \dots + h_n s_n}$$
(1.16)

## 4. Geometrical method for finding centre of pressure of a plane area immersed in a fluid.

Let PQRS is a plane area fully immersed in a fluid and not necessarily in a vertical position. Suppose that the vertical lines through every point of the perimeter of this area meet the free surface of the fluid in the curve P<sub>1</sub>Q<sub>1</sub>R<sub>1</sub>S<sub>1</sub>, then the whole fluid enclosed in the cylinder standing on the area enclosed by the curve PQRS upto the free surface is called the *superincumbent liquid*.



This superincumbent fluid is in equilibrium the action of the following three forces:

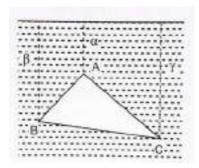
- (i) The thrust on the curved surface of the cylinder enclosing the superincumbent fluid acting horizontally.
- (ii) Resultant fluid thrust on the plane area enclosed by the curve PQRS acting at the centre of pressure C and directed along the normal to this plane area.
- (iii) The weight of the superincumbent fluid acting vertically downwards through its centre of gravity G.

Since the fluid is in equilibrium, then resolving all the above three forces vertically ,we see that vertical component of the resultant thrust at C must balance the vertical weight of the superincumbent fluid acting at G . So C and G must be in the same vertical line.

This, we see that, the vertical line through the centre of gravity of the superincumbent fluid meets the plane area fully immersed in the fluid at its centre of pressure.

- 5. Depth of the centre of pressure for some special cases:
- 5.1 Centre of pressure of a triangular lamina immersed vertically in a liquid when the depths of its vertices from the free surface are known.

Let a triangular lamina ABC be immersed vertically in a liquid and let  $\alpha$ ,  $\beta$ ,  $\gamma$  be the deaths of A, B, C from the free surface.



we know that an uniform triangular lamina of mass m is equimomental with three equal particles of mass which placed at the middle point of the three sides of the triangular lamina, i.e., the positions of the C.G. and the moment of inertia of these three particles are the same as those of the uniform plane lamina. Thus if h and k be the death of the C.G.

below the free surface and the radius of gyration about the free surface respectively, then

$$h = \frac{1}{3} \left[ \frac{\beta + \gamma}{2} + \frac{\gamma + \alpha}{2} + \frac{\alpha + \beta}{2} \right] = \frac{1}{3} \left( \alpha + \beta + \gamma \right)$$
 (1.17)

And 
$$k^2 = \frac{1}{3} \left[ \left( \frac{\beta + \gamma}{2} \right)^2 + \left( \frac{\gamma + \alpha}{2} \right)^2 + \left( \frac{\alpha + \beta}{2} \right)^2 \right]$$
  
=  $\frac{1}{6} \left( \alpha^2 + \beta^2 + \gamma^2 + \alpha \beta + \beta \gamma + \gamma \alpha \right)$  (1.18)

So, 
$$\xi = \text{depth of the C.P.} = \frac{k^2}{h} = \frac{1}{2} \frac{\alpha^2 + \beta^2 + \gamma^2 + \alpha\beta + \beta\gamma + \gamma\alpha}{\alpha + \beta + \gamma}$$
 (1.19)

Note: (1) If one side of the triangular lamina coincides with the free surface and the opposite vertex is at a depth h below the free surface. Then the depth of the other two vertex will be zero. Now we take  $\alpha=0, \beta=0$  and  $\gamma=h$ ,

then from (1.19), we get,

$$\xi = \text{depth of the C.P.} = \frac{1}{2} \frac{0+0+h^2+0+0+0}{0+0+h}$$

$$= \frac{h}{2} \tag{1.20}$$

Note: (2) if the one vertex of the tringular lamina is on the free surface and the one side of the lamina parallel to the free surface taken at a depth h.

Then we take ,  $\alpha=0$ ,  $\beta=h$  and  $\gamma=h$ ,

Then from (1.19), we have,

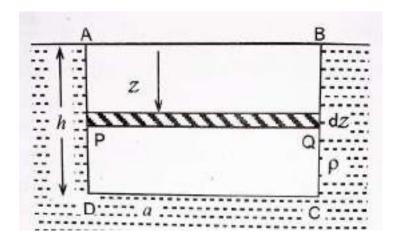
$$\xi = \text{depth of the C.P.} = \frac{1}{2} \frac{0 + h^2 + h^2 + 0 + h \cdot h + 0}{0 + h + h}$$

$$= \frac{3h^2}{4h} = \frac{3h}{4}$$
 (1.21)

5.2 Depth of the Centre of pressure of a rectangular lamina immersed vertically in a

## homogeneous fluid, when one side of the lamina coincides with the free surface.

Let ABCD be a rectangular lamina immersed in a homogeneous fluid of density  $\rho$  with its side AB coincident with the effective surface and let AD = h and AB = a



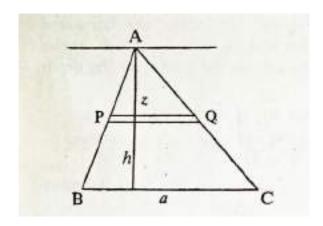
Let us consider an elementary strip PQ of thickness, dz at a depth z below the effective surface. Then by (1.10), the depth of C.P. below the effective surface is given by

$$\xi = \frac{\iint g\rho z^2 ds}{\iint g\rho z ds} = \frac{\iint_0^h g\rho z^2 a dz}{\iint_0^h g\rho z a dz} \quad \text{[since, } ds = PQ \ dz = a dz]$$
$$= \frac{\iint_0^h z^2 dz}{\iint_0^h z \ dz} = \frac{2h}{3} \quad (1.22)$$

By symmetry, the centre of pressure is  $\frac{2}{3}$  of the way down the vertical medial line of the rectangle.

# 5.3 Depth of the Centre of pressure of a triangular lamina immersed vertically in a homogeneous fluid, when one vertex of the lamina in the effective surface and its base horizontal.

Let ABC be a triangular lamina immersed in a fluid and its vertex A be in the effective surface. Let the base BC be horizontal at a depth h below the free surface.



Let us consider an elementary strip of thickness, dz at a depth z from the free surface parallel to it and let BC = a.

Then 
$$\frac{PQ}{Z}=rac{BC}{h}$$
 , or,  $PQ=rac{BC}{h}$   $Z$  Or,  $PQ=rac{a}{h}$   $Z$ 

Elementary area of the strip ,  $PQ = \frac{a}{h}z.\,dz$ 

And the pressure at any point in  $PQ = g\rho z$ ;

Therefore the thrust on it  $= g\rho z \, \, \frac{a}{h} \, z \, . \, dz$ 

Therefore the depth of the C.P. below the free surface is

given by 
$$\xi = \frac{\int_0^h g\rho z^2 ds}{\int_0^h g\rho z \, ds} = \frac{\int_0^h g\rho z^2 \frac{a}{h} z dz}{\int_0^h g\rho z \, \frac{a}{h} z dz}$$

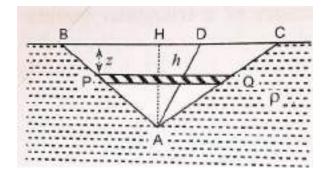
$$= \frac{\int_0^h z^3 dz}{\int_0^h z^2 dz}$$

$$= \frac{\frac{h^4}{4}}{\frac{h^3}{3}} = \frac{3h}{4} \qquad (1.23)$$

By symmetry, the centre of pressure is  $\frac{3}{4}$  of the way down the median from A to BC.

5.4 Depth of the Centre of pressure of a triangular lamina immersed vertically in a homogeneous fluid, when one side of the lamina in the effective surface.

Let the side BC of the triangular lamina ABC be on the the effective surface and let the depth of the opposite vertex A be at a depth h from the free surface i.e., AH = h.



Now let us consider a horizontal strip PQ of width dz at a depth z from the free surface.

Let BC = a and  $\rho$  be the density of the liquid.

Then, 
$$\frac{PQ}{h-z} = \frac{BC}{h}$$
, or,  $PQ = \frac{h-z}{h}a$ 

Therefore, the depth of the C.P. below the free surface is given by,

$$\xi = \frac{\int g\rho z^{2}ds}{\int g\rho z ds} = \frac{\int_{0}^{h} g\rho z^{2} \frac{h-z}{h} a dz}{\int_{0}^{h} g\rho z \frac{h-a}{h} a dz}$$

$$= \frac{\int_{0}^{h} z^{2} (h-z) dz}{\int_{0}^{h} z (h-z) dz}$$

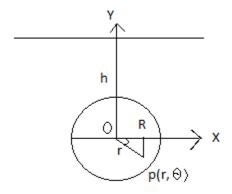
$$= \frac{\frac{h^{4}}{3} - \frac{h^{4}}{4}}{\frac{h^{3}}{2} - \frac{h^{3}}{3}} = \frac{h}{2}$$
(1.24)

By symmetry, the centre of pressure is  $\frac{1}{2}$  of the way down the median from the middle point D of BC to A.

# 5.5 Centre of pressure of a circular area immersed vertically in a homogeneous fluid, the depth of its centre being at a depth h below the free surface.

Let us take O as origin and OX and OY as co-ordinate axes. From symmetry, the C.P. will lie on y-axis below the origin O.

Let a circular area with centre O be immersed in a homogeneous fluid of density  $\rho$  and let h be the depth of the centre of the circular area .



Let  $P(r,\theta)$  be any point of elementary area  $rd\theta dr$  on the circular area with the horizontal diameter as initial line and the centre O as pole. Therefore the depth of P below the free surface will be  $(h + r \sin \theta)$ .

Then the depth of the C.P. is given by,

$$\xi = \frac{\int_0^a \int_0^{2\pi} g\rho(h + r\sin\theta)r\sin\theta.rd\theta dr}{\int_0^a \int_0^{2\pi} g\rho(h + r\sin\theta)rd\theta dr}$$

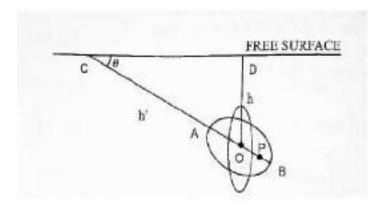
$$= \frac{\int_{0}^{a} \int_{0}^{2\pi} [r^{2}h \sin\theta d\theta dr + \int_{0}^{a} \int_{0}^{2\pi} r^{3} \sin^{2}\theta d\theta dr}{\int_{0}^{a} \int_{0}^{2\pi} hr d\theta dr + \int_{0}^{a} \int_{0}^{2\pi} r^{2} \sin\theta d\theta dr}$$

$$= \frac{[\frac{r^{3}h}{3}]_{0}^{a} [-\cos\theta]_{0}^{2\pi} + [\frac{r^{4}}{4}]_{0}^{a} \frac{1}{2} [\theta - \frac{1}{2}\sin 2\theta]_{0}^{2\pi}}{[\frac{r^{2}h}{2}]_{0}^{a} [\theta]_{0}^{2\pi} + [\frac{r^{3}}{3}]_{0}^{a} [-\cos\theta]_{0}^{2\pi}}$$

$$= \frac{\frac{a^{3}h}{3} \times 0 + \frac{a^{4}}{4} \times \frac{1}{2} \times 2\pi}{\frac{a^{2}h}{2} \times 2\pi + \frac{a^{3}}{3} \times 0} = \frac{a^{2}}{4h}$$
(1.25)

Thus, the centre of pressure is at a depth  $\frac{a^2}{4h}$  from horizontal diameter and hence its depth below the effective surface will be  $h+\frac{a^2}{4h}$  .

Note:(1) Let the circular area be inclined at an angle  $\theta$  with the free surface and let h be the vertical depth of the centre of the circle below the free surface.



In the inclined position, the diameter BOD is produced to meet the free surface CD at C.

Let 
$$CO = h^{/}$$
 and  $DO = h$ .

Since 
$$< OCD = \theta$$
, So  $h' = \frac{h}{\sin \theta}$ 

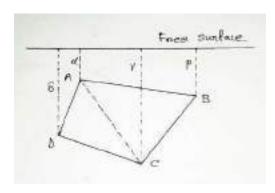
Hence, OP = 
$$\frac{a^2}{4h^2}$$
 =  $\frac{a^2 \sin \theta}{4h}$ 

Note:(2) Let the circular area is just immersed in a fluid vertically, then h=a (where a is the radius of the circular plate) and hence, the depth of the C.P. from the free surface

will be 
$$a + \frac{a^2}{4a} = \frac{5a}{4}$$

#### 6. Worked out examples:

Example 1. If a quadrilateral area ABCD be entirely immersed in water, and  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$  be the depths of its four corners, and h that of its centre of gravity, show that the depth of its centre of pressure is  $\frac{1}{2}(\alpha + \beta + \gamma + \delta) - \frac{1}{6h}(\beta\gamma + \gamma\alpha + \alpha\beta + \alpha\delta + \beta\delta + \gamma\delta)$ . Solution: Let ABCD be a quadrilateral area immersed in water and let  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$  be the depths of the corner A, B, C and D respectively.



Let the quadrilateral be divided into two triangles  $\Delta ABC$  and  $\Delta ACD$  by joining AC.

Let  $s_1$  and  $s_2$  be the area of  $\triangle ABC$  and  $\triangle ACD$  respectively.

Let  $h_1$ ,  $h_2$  be the depth of the C.G. of  $\triangle ABC$  and  $\triangle ACD$  respectively.

Then, 
$$h_1 = \frac{\alpha + \beta + \gamma}{3}$$
 and  $h_2 = \frac{\alpha + \gamma + \delta}{3}$ .  
 $\xi_1 = \text{depth of C.P. of } \Delta ABC = \frac{\alpha^2 + \beta^2 + \gamma^2 + \alpha\beta + \beta\gamma + \gamma\alpha}{2(\alpha + \beta + \gamma)}$ .

And , 
$$\xi_2 = \text{depth of C.P. of } \Delta ACD = \frac{\alpha^2 + \gamma^2 + \delta^2 + \alpha \gamma + \gamma \delta + \delta \alpha}{2(\alpha + \gamma + \delta)}$$
.

Therefore 
$$h = \frac{h_1 s_1 + h_2 s_2}{s_1 + s_2} = \frac{(\alpha + \beta + \gamma) s_1 + (\alpha + \gamma + \delta) s_2}{3(s_1 + s_2)}$$

Therefore  $\xi$  = depth of C.P. of the quadrilateral area ABCD.

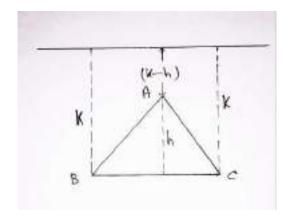
$$= \frac{h_1 \xi_1 s_1 + h_2 \xi_2 s_2}{h_1 s_1 + h_2 s_2}$$

$$= \frac{\left(\frac{\alpha + \beta + \gamma}{3}\right) \left\{\frac{\alpha^2 + \beta^2 + \gamma^2 + \alpha\beta + \beta\gamma + \gamma\alpha}{2(\alpha + \beta + \gamma)}\right\} s_1 + \left(\frac{\alpha + \gamma + \delta}{3}\right) \left\{\frac{\alpha^2 + \gamma^2 + \delta^2 + \alpha\gamma + \gamma\delta + \delta\alpha}{2(\alpha + \gamma + \delta)}\right\} s_2}{\left(\frac{\alpha + \beta + \gamma}{3}\right) s_1 + \left(\frac{\alpha + \gamma + \delta}{3}\right) s_2}$$

$$= \frac{1}{2} (\alpha + \beta + \gamma + \delta) - \frac{1}{6h} (\beta\gamma + \gamma\alpha + \alpha\beta + \alpha\delta + \beta\delta + \gamma\delta).$$

*Example 2.* A triangle of base a and altitude h, is placed in water with its plane vertical and the side a horizontal and at a depth k below the free surface of the water; Show that the depth of its C.P. is  $\frac{6k^2-4hk+h^2}{2(3k-h)}$  the vertex being the highest point of the triangle.

**Solution**: Let  $\Delta ABC$  be the triangle which is placed in water with its plane vertical and the side BC horizontal.



Again let BC = a, and h is the altitude of  $\triangle ABC$ .

Depths of A, B and C from the free surface are k - h, k and k respectively.

Therefore the depth of C.P. of the triangle  $\triangle ABC$  is given by,

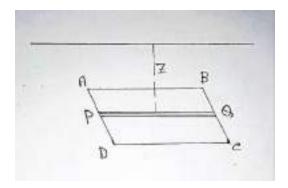
$$\xi = \frac{(k-h)^2 + k^2 + k^2 + (k-h)k + k \cdot k + k(k-h)}{2(k-h+k+k)}$$

$$= \frac{6k^2 + h^2 - 4hk}{2(3k-h)}$$

$$= \frac{6k^2 - 4hk + h^2}{2(3k-h)}$$

*Example 3.* Prove that the depth of the centre of pressure of a parallelogram; two of whose sides are horizontal and at a depths a and b below the surface of a liquid is  $\frac{2}{3} \frac{a^2 + ab + b^2}{a + b}$ ; when the liquid is homogeneous.

**Solution**: Let ABCD be the parallelogram whose sides AB and CD are parallel and are at depths  $\boldsymbol{a}$  and  $\boldsymbol{b}$  below the free surface of the liquid. Let AB =  $\boldsymbol{l}$ .



Consider an elementary strip PQ of width dz parallel to AB at a depth z.

Area of the elementary strip = ldz.

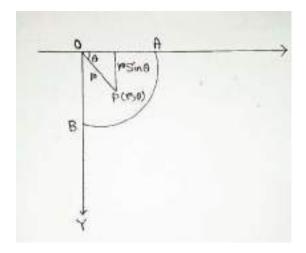
So the thrust on the elementary strip =  $\rho gz$ . ldz.

Therefore the depth of C.P. is given by,

$$\xi = \frac{\int_{a}^{b} \rho gz.z.ldz}{\int_{a}^{b} \rho gz.ldz} = \frac{\int_{a}^{b} z^{2}.dz}{\int_{a}^{b} z.dz} = \frac{2}{3} \frac{b^{3} - a^{3}}{b^{2} - a^{2}}$$
$$= \frac{2}{3} \frac{a^{2} + ab + b^{2}}{a + b} \qquad \text{(proved)}$$

Example 4. A quadrant of a circle is immersed in a liquid with a bounding radius in the surface; find the position of its centre of pressure.

*Solution :* Let OAB be the quadrant of a circle of radius  $\boldsymbol{a}$ , which is immersed in the liquid and the bounding radius OA is on the surface of liquid. Let OA and OB be taken as x-axis and y-axis respectively.



Let  $P(r, \theta)$  be any point on the quadrant. Then pressure at any point  $= g\rho r \sin \theta.$ 

Now if  $(\xi, \eta)$  be the co-ordinates of C.P.,

Then 
$$\xi = \frac{\int_0^a \int_0^{\frac{\pi}{2}} \rho g.r \sin \theta.r \cos \theta.r d\theta dr}{\int_0^a \int_0^{\frac{\pi}{2}} \rho g.r \sin \theta.r d\theta dr}$$

$$= \frac{\int_0^{\frac{\pi}{2}} \left[\frac{r^4}{4}\right]_0^a \sin \theta \cos \theta d\theta}{\int_0^{\frac{\pi}{2}} \left[\frac{r^3}{3}\right]_0^a \sin \theta d\theta}$$

$$= \frac{3a}{4} \frac{1}{2}$$

$$= \frac{3a}{8}$$

And, 
$$\eta = \frac{\int_0^a \int_0^{\frac{\pi}{2}} \rho g.r \sin \theta.r \sin \theta.r d\theta dr}{\int_0^a \int_0^{\frac{\pi}{2}} \rho g.r \sin \theta.r d\theta dr}$$

$$= \frac{\int_0^{\frac{\pi}{2}} \left[\frac{r^4}{4}\right]_0^a \sin^2\theta . d\theta}{\int_0^{\frac{\pi}{2}} \left[\frac{r^3}{3}\right]_0^a \sin\theta d\theta}$$
$$= \frac{3a}{4} \frac{1}{2} \frac{\pi}{2} = \frac{3\pi a}{16}.$$

So, the position of the centre of pressure is  $(\frac{3a}{8}, \frac{3\pi a}{16})$ 

#### 7. Exercise:

- (1) A square lamina is just immersed vertically in water and is then lowered through a depth b; if a be the length of the edge of the square, prove that the distance of the centre of pressure from the centre of the square is  $\frac{a^2}{6(a+2b)}$
- (2) Show that the depth of the C.P. of the rhombus totally immersed with one diagonal vertical and its centre at a depth h is  $\frac{(\frac{1}{24}a^2+h^2)}{h}$ , where a is the length of the vertical diagonal.
- (3) Prove that a circular area of radius  $\boldsymbol{a}$  is immersed with its centre at a depth  $\boldsymbol{h}$  in a liquid in which the density varies as the depth, the plane of the area being vertical, the centre of pressure is at depth
- $\frac{2a^2h}{a^2+4ah^2}$  below the centre of the circle .

## Reference

#### **WRITER**

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**Hydrostatics** 

**Hydrostatics** 

**Advanced** 

# Syllabus Chemistry (Hons.) for SEM-I to SEM-VI under CBCS

(to be effective from Academic Year: 2017-18)



The University of Burdwan Burdwan, West Bengal

6<sup>th</sup> Semester

Course Code	Course Title	Course Type	Credit per course	Marks
CC-13	Inorganic Chemistry-V (Theo) Inorganic Chemistry-V (Prac)	Core Course – XIII	4+2	75
CC-14	Physical Chemistry-IV (Theo) Physical Chemistry-IV (Prac)	Core Course – XIV	4+2	75
DSE-3	Green chemistry or polymer chemistry (Theo + Prac)	Discipline Specific Elective	4+2	75
DSE-4	Inorganic materials of industrial importance (Theo + Prac) or  Dissertation followed by power point presentation	Discipline Specific Elective	4+2 or 6	75
	TOTAL		24	300

Course Code: DSE-4

Course Title: Dissertation followed by power point presentation (4 + 2) Credits



#### SURI VIDYASAGAR COLLEGE

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#### PROJECT COMPLETION CERTIFICATE

This is to certify that the following students have successfully completed their projects of semester VI Chemistry Honours in Project work (6 Cerdits) under the supervision of the faculties of Chemistry Department as listed below:

Sl.No.	Name of the students	Title of the projects	Name of the Supervisor	
1	DIBYANSHU CHANDRA	Chrmical Sensors	Prof. Debabrata Saha	
2	NASRIN SULTANA	Acid Rain and its Ecological Conseuences	Prof. Pankaj Roy	
3	RAJU MONDAL	Defining Food literacy and its components	Prof. Ishani Sinha	
4	ROHIT KONAL	Waste Water Treatment	Dr. Sandip Mandal	
5	SAYANTIKA MUKHOPADHYAY	Plastic Packaging and It's Impact on Overall Quality of Food We Consume	Prof. Sourav Kumar Des	
6	SOHAM DAS	Synthesis and Catalytic Activities of Copper Complexex Derived from Schiff Base	Dr. Trijit Bhattacharyya	

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### **BURDWAN UNIVERSITY**

SURI VIDYASAGAR COLLEGE

#### PLASTIC PACKAGING

&

IT'S IMPACT ON OVERALL QUALITY OF FOOD WE CONSUME

SUBMITTED BY
SAYANTIKA MUKHOPADHYAY

DEPARTMENT OF CHEMISTRY

ROLL: 200331000089

PAPER-DSE IV

SEM:VI

#### ABSTRACT

We are globalized and more concerned about our convenience, so we prefer to eat out instead of eating at home. But mostly the fixed is delivered in a plastic container. We consume fixed unknowingly, without knowing the toxic effects of food. Every day, millions of people from different countries out hot food in plastic containers made of polyvinyl chloride, polyethylene and polystyrene, which can even cause cancer. The article highlights our conscious mistakes regarding plantic, a man-made chemical compound that releases career-causing diexirs. The plastic container contains BPA, DEHA (plasticizer), polypropylene, polystyrese, cellulose ethers, polyethylene with unorganized polymer chains. When these chains come into contact with hot food, the weak bonds between the polymer chains break and release massive amounts of free cadicals. As we know, different foods received different temperatures during different types of cooking. and different polymers have different glass transition temperatures, which can easily break the polymer bond and release five radicals depending on the type of food. Free radicals damage the etiology of many chronic reproductive and cardiovascular diseases, cataracts and finally cancer. We need to draw the government's attention to drawing up rules for serving hot food. Above all, we all need to take a step forward to raise awareness about buying and selling hot food in plastic containers. Food preservation technologies currently face challenges in extending the shelf life of perishable foods. The sur of edible films and coatings developed from food biopolymers has evolved significantly in recent years. Edible puckaging is edible and made from food bropolymers, including lipids, proteins and polysaccharides, derived from plants, animals and marine animals or by-products of food processing. Here we discuss natural polymers and bioactive compounds incorporated into edible films and costings and their effects on food quality properties. We simulate the production techniques of edible films and coatings and properties such as assimicrobial, antioxidant, physical and sensory properties. Recent trends in fire composition, nanotechnology and safety aspeats of edible flux are reviewed. Plastic products have reached modern widespread use, becoming the necessary and most common product packaging material in health care, fixed and other products necessary for humanity. These plantic-based puckaging materials, such as biodegradable, epoxies, polymyrenes, espanded polystyrenes, polyolefins, polyvinyl chloride and polycarbonates, also have some hazardous substances added to facilitate production and product aesthetics. The innevative use of plastic packaging in health cure, fixed and related products has progressed to the point where single-use and single-use post-use puckaging were used, which only led to the threatening spread of plastic wante in general, , creating masses of plastic, waste damages cities in many places, pollutes the environment and disturbs the econystem. having a negative effect on public health. The atmosphere, animals and humanity are at risk of extinction the to the release of harmful components of plastic waste that saturate and pollute the ecosystem. These make case he reduced if most plantic waste from healthcare, fixed and related packaging is managed or recycled at the end of its useful life. Emerging economies most affected by these challenges should adopt approaches to plastic waste, particularly by creating policies that enable recycling, reuse and the production, one and disposal of plastic packaging. Effective mega-companies are created when government and policy makers increase educational efforts at various levels of each society, along with strict regulations on managing plastic based packaging materials.

#### INTRODUCTION:

Plastic products have gained wider usage and became consistently essential on daily basis [1]. Due to their extensive application in packaging, etc. heaps of plastic wastes are generated in quite a lot of spots which have exceedingly affected the environs, permitting visual pollutions with impending dangers as well as defacing of the living cities [2, 3, 4]. Plastic wastes constitute between 60-80 % of marine debris and are one of the world's most pervasive pollution problems impacting our oceans and waterways, according to the U.N. [5]. Over six decades, manufacture of plastic products and their resultant wastes have extremely increased due to rapid urbanization, increasing consumption in both high and low income countries and increased production of "use and discard" products, coupled with the fact that the bulk of plastic packages are not recycled at the end of their useful life. From raw material extraction through to plastic contaminating the ocean, plastics exemplify the failure of a predominantly fossil fuel-based, linear economic system [5]. Several nations, particularly the developing economies are faced with the challenge of developing plastic waste-management approaches from options that include reduction of waste generated, incineration, landfilling, recycling and reuse [4].

#### What are Plastics?

Plastics are a wide range of polymeric components available synthetically, semi-synthetically or organically which could be shaped into a required form when they are hot and retain that shape when they are cold or hardened. The term "plastic" is derived from the Greek word "plastikos", meaning, fit for moulding, pointing to their malleability during processing or manufacture, which enables them to be cast, pressed or extruded into a variety of shapes such as films, fibres, plates, tubes, bottles, boxes, etc. They are useful in making water bottles, clothing, medical and food packaging, electronics, construction materials, etc. Polymers (classified as natural or synthetic), the sources of plastics are macromolecules comprising of large numbers of repeated single units (monomers) bonded through a chemical procedure described as polymerization. The natural polymers (biopolymers) are obtainable from plants or animals and include polysaccharides, nucleic acids and proteins, etc. The synthetic polymers are man-made products obtained through chemical manipulations of other polymers, even the natural polymers. They are the structural materials exhibited generally in plastics, synthetic fibres, paints, building materials, adhesives, etc. The synthetic polymers may be divided into thermoplastic polymers and thermoset plastics which is centred on their response when they are exposed to heat. Thermoplastics are the plastics that do not undergo a chemical change in their composition when heated and can be remoulded. They include polyethylene (employed in plastic bags), polypropylene, polystyrene (used in plastic cups), polyvinyl chloride (PVC) (used for food wraps, bottles and drain pipes) and polytetrafluoroethylene (PTFE) or Teflon (used for non-sticking surfaces). Thermosets can be melted, formed into the desired shape which remains permanent as the material gets cold and solidified. They include vulcanized rubber, bakelite, polyepoxide, etc. [6-14].

Plastics was devised by the use of natural materials that had intrinsic plastic properties such as shellac and chewing gum. It was followed by the chemical treatment of natural materials such as rubber, nitrocellulose, collagen or galalite which culminated in the widespread series of entirely synthetic materials that could be acknowledged as modern plastics. One of the initial instances was invented by Alexander Parkes in 1855, acknowledged as modern plastics. One of the initial instances was invented by Alexander Parkes in 1855, who named his invention Parkesine. It is recognized presently as celluloid. Polyvinyl chloride (PVC) was initially polymerized between 1838-1872. A key advance came in 1907, when Belgian-American chemist, Leo Baekeland created Bakelite, the first real synthetic, mass-produced plastic [15].

The basic raw materials that are crucial in making plastics are sourced from petroleum, natural gas or other organic materials like cellulose, coal, salt, etc. The manufacture of plastics is initiated with the distillation of crude oil by refining it to lighter fractions, each being a mixture of compounds of hydrocarbon chains of crude oil by refining it to lighter fractions, each being a mixture of compounds of hydrocarbon chains differing in terms of the size and molecular structures. Naphtha is one of these fractions and is the key differing in terms of the size and molecular structures. Naphtha is one of these fractions and is the key differing in terms of the manufacture of plastics. Plastics are got by two techniques known as polymerization and composite for the manufacture of plastics. Plastics are got by two techniques known as polymerization and polycondensation, each requiring a specific catalyst. In a polymerization reactor, monomers such as polycondensation, each requiring a specific catalyst. In a polymerization reactor, monomers such as polycondensation, each propylene are joined to constitute stretched polymer chains, each polymer taking its specific ethylene and propylene are joined to constitute stretched polymer chains, each polymer employed. Plastics can characteristics, structure and size subject to the different types of basic monomers employed. Plastics can

be assembled into two major polymer groups such as thermoplastics (the types that soften under heat, then toughen on cooling) and thermosets (the types that never soften once they have been moulded) [15].

#### Chemical Constituents of Plastic Products

During polymerization, some additives like accelerators, initiators, solvents and catalysts, etc. are incorporated in their essential extents to support the procedures. While producing the plastic products also various further additives are added to aid in their production and enhance their properties, such as prolonging of their shelf life and aesthetic values. Such additives include plasticizers (e.g. short, medium and long chain chlorinated paraffins (SCCP/MCCP/LCCP). Disobeptylphthalate (DIHP). Benzyl butyl phthalate (BBP). Bis (2-ethylhexyl)phthalate (DEHP): Bis(2-methoxyethyl) phthalate (DMEP), etc.) [16]. flame retardants (Short, medium, long chain chlorinated paraffins), boric acid: Brominated flame retardants with antimony (Sb) as synergist (e.g. Polybrominated diphenyl ethers Decabromodiphenylethane; tetrabromobisphenol A (TBBPA)); Phosphorous flame recordant (e.g. Tris & chloroethyl)phosphate (TCEP) Tris (2-chlorisopropyl)phosphate (TCPP) [16, 17], acid scavengers isynthetic hydrotalcites, metallic stearates and zinc oxides), light and heat stabilizers (Bisphenol A (BPA); Cadmium and Lead compounds, metallic salts, organometallic compounds, non-metallic organic stabilizers, organophosphites and epoxies) [18-21], lubricants (silicones) [22], pigments (titanium dioxide) (antioxidants(phenolics and phosphites) [23], colourants (azo dyes, anthraquinones) [24]. antistatic agents (rubbers, polyesters) [25], slip compounds (Fatty acid amides (primary erucamide and oleamide), fatty acid esters, metallic stearates (for example, zinc stearate), and waxes ) [26] and thermal stabilizers (Cadmium and Lead compounds, Nonylphenol (barium and calcium salts), lead salts, metal soaps and organo-tin compounds which are extremely lethal and ecological contaminants) [27-32].

#### Types of Plastics used in Packaging of Pharmaceutical and Food Products

Packaging is essential in pharmaceutical and food industries conserve the value of products through their shelf life from external elements such as light and moisture which are capable of affecting their integrity. The selection the packaging material is based on the type of product in question, their physical and chemical properties as well as the properties of the packaging material in relationship to the product. The following are varieties of some plastic materials that could be used in the design of packages for food or pharmaceutical products



#### # Bio-based and biodegradable plastics:

These are sourced from renewable biological resources such as sugar cane, starch, etc. Sugar cane is processed to produce ethylene, which could be used to produce, for instance, polyethylene. Starch can be processed to produce factic acid and later polylactic acid (PLA) which are elastic, long lasting, clear, heat resistant, etc. They could be starch, cellulose or protein-based [33, 34]. These class of plastics could be stegraded by micro-organisms into the water, carbon dioxide (or methane) and biomass under specified conditions. They are often manufactured with renewable raw materials, micro-organisms, petrochemicals or mixture of the three. They are used as disposable items employed in packaging and catering items, bags, trays, containers for fruits, vegetables, eggs and meat, bottles for carbonated drinks and dairy products as well as blister foils for fruit and vegetables [33-37].

#### 4 Epoxy resins:

The epoxy resins are also known as polyepoxides. They are a class of reactive prepolymers and polymers containing epoxide groups. A chemical reaction amongst the polyepoxides or with polyfunctional hardeners yields a thermosetting polymer, often with enhanced mechanical properties and high thermal and chemical resistance. They are used in the production of cans for soft-drinks, closures and caps for medical products, in cover linings aimed at protecting the contents and retaining flavor [33, 37, 38].

#### ♣ Polystyrene:

Polystyrene (PS) is a thermostatic synthetic aromatic polymer formed from styrene, monomers and a liquid petrochemical found naturally in strawberries, cinnamon, coffee and beef [33]. It is often used in products that require clarity and often used to protect and package food and other consumer products as in meat/poultry trays and egg cartons for protection against damage or spoilage. They are employed as food service items, such as cups, plates, bowls, cutlery, hinged takeout containers (clamshells), meat and poultry trays and rigid food containers for yoghurt [33, 39, 40].

#### \* Expanded polystyrene:

Expanded polystyrene (EPS) is a thermoplastic material manufactured from styrene monomer using a polymerization method to obtain translucent spherical beads of polystyrene, a solid thermoplastic at room imperature which could melt at a higher temperature and re-solidify to emerge into a material that could fit in for anticipated use [38]. Considering its shock-absorbing, thermal insulation and moisture resistant capacities, it is employed in the storage and conveyance of breakable items. It is very useful in the packing of cooked food to retain its warmth or coolness and avert wastage. It is also useful in the packaging perishable items such as seafood, fruit, and vegetables to preserve their integrity [38, 39].

#### ♣ Polyolefins:

Polyolefins are of the category of polyethylene and polypropylene thermoplastics, being the combined term for the varieties of plastics that include polyethylene, specifically low-density polyethylene (LDPE), linear low-density polyethylene (LLDPE), high-density polyethylene (HDPE) and polypropylene (PP). They are made essentially from oil and natural gas by a process of polymerization of ethylene and propylene respectively. Polyolefins are extremely suitable and safe for packaging because they are 'chemically inert' materials. It is believed that the foodstuffs and other items packed in them cannot absorb harmful chemicals, additives or by products from the container, hence, they have great advantages employing them in various packaging materials. The LDPE is used in cling film, carrier bags, agricultural film, milk carton coatings, but and cold beverage cups, squeezable bottles for honey and mustards, etc. The HDPE is useful in crates and boxes, bottles (for food products, detergents and cosmetics), food containers, etc. The PP is utilized in food packaging, including yoghurt, margarine pots, sweet and snack wrappers, microwave-proof complianers, medical packaging and appliances, etc. The polyethylene terephthalate (PET, PETE) is clear, tough, and has good gas and moisture barrier properties. This resin is commonly used in beverage bottles and many injections, moulded consumer product containers. They are utilized as plastic bottles for soft

drinks, water, juice, sports drinks, beer, mouthwash, catsup and salad dressing. They are useful as food jars for peanut butter, jelly, jam and pickles. The polypropylene (PP) are employed for yoghurt, margarine, takeout meals and deli food, medicine bottles, bottle caps and closure [33, 40].

#### 4 Polyvinyl chloride:

Polyvinyl chloride (PVC) was one of the first plastics discovered and is also one of the most extensively used. The essential raw materials for PVC are derived from salt (57 %) and oil (43 %). There are two forms of PVC, the rigid type that is often abbreviated as RPVC and the flexible type [33, 41]. They are useful in the packaging of healthcare and medical devices (blood and plasma transfusion storage bags/sets, catheters and cannulas, surgical and examination gloves, intravenous solution giving sets, urine bags, endotracheal tubing, blister packs, shrink wrap, tamper resistance and dosage packs for pharmaceutical products) [41].

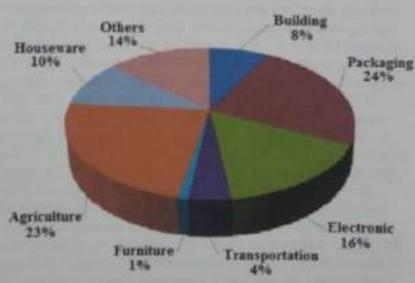
#### Polycarbonates:

These are employed in the packaging of consumer goods like reusable bottles. However, it has hisphenol-A (BPA). In case it is exposed to high temperature, BPA could leach from the polycarbonated bottle into the content. Due to the health implication of BPA as reported in various researches, the utilization of polycarbonated plastics has become decreased [26, 33].

#### Application of Plastics in Pharmaceutical and Food Packaging

Packaging plays a crucial role in Pharmaceutical products as it helps to retain their original form and preserve the quality of the content until it is consumed by the end-user. Suitable packaging protects the product from external elements such as light and moisture which could affect its integrity. The selection

of the packaging material is based on the type of product being manufactured. Therefore, all the physical and chemical properties of the product as well as the packaging materials are of utmost importance. Plastics are generally considered for the packaging of pharmaceutical preparations because plastic containers are not heavy, not fragile and do not easily develop leakage. They are cheap to manufacture since they are easily moulded or remoulded with seathetic and excellent finishing. Their lids or closures are resistant to rust or corrosion [42, 43].



Currently, plastics are produced and employed in the packaging of pharmaceutical products as follows [44-48]:

- 1. Rigid bottles as packaging materials for solid dosage forms like tablets, capsules or powders.
- Sterile plastic packaging materials for human blood samples and their components.
- 3. Plastic packaging materials for aqueous solutions
- Plastic bags for parenteral sterile solutions and their components.

#### METHODOLOGY

#### Study participants and Sample collection

This work has received approval for research ethics from the Medical Ethics Committee of Nanjing Medical University and a certificate of approval is available upon request (Approval No. 2020601). Participants receiving different medical treatments in four hospitals (Jiangsu Provincial People's Hospital, Nanjing Maternity and Child Health Care Hospital, Nanjing Hospital of Traditional Chinese Medicine and Sir Run Run Hospital Affiliated to Nanjing Medical University), were recruited after signing informed consent from December, 2020 to December, 2021. Inclusion criteria included: 1. More than 18 years old; 2. Not receiving invasive medical surgeries two weeks prior to sampling; 3. Not taking any diagnostic or therapeutic agents transported by nanomaterials before; 4. At least 1 mL corresponding body fluid could be taken out and transferred into the sample bottle immediately. Data on surgical operations, such as disease duration, lesion location and size, sampling method, and laboratory examination results were obtained. Eventually, a total of 104 participants with 4 categories of body fluids, including whole blood, cerebrospinal fluid and two main pathological body fluids (effusions and cyst fluids), were comprised in our research Table S1. Body fluid samples were scaled in particle-free glass tubes, and then transferred to the laboratory for particle detection. Blinded negative quality controls were set to minimize the impacts of operation and environmental particle pollution.

#### Sample particle digestion

The digestion process of 13 kinds of enclosed body fluids, representing eight body systems (circulatory, respiratory, reproductive, digestive, nervous, motor, endocrine, and urinary systems) was performed in a biosafety cabinet (CBC1100-HA2, Beijing Donglian Har Instrument Co., Ltd, China). All apparatuses used were made of glass or metal to avoid potential microplastic pollution. Glassware was soaked in the acid tank (10% HNO3, Shanghai Hushi Laboratorial Equipment Co., Ltd, China) for 12 h, washed with anhydrous ethanol (Nanjing Chemical Reagent Co., Ltd, China) three times and placed in a biosafety cabinet before use. Metal apparatuses were wiped clean with anhydrous ethanol three times before use. All reagents were filtered (Glass fiber filter membrane aperture width: 0.7 µm) (Grade GF/F, Whatman, UK) to ensure no particle residues left. The biosafety cabinet was turned on to run for 20 min and then sample bottles were opened (ISO class 4), 500 µL of each body fluid sample (except blood) or quality control sample was taken out into a particle-free glass bottle and mixed with 8 mL 30% KOH (Aladdin reagent Co., Ltd, China) and 8 mL 6-14% NaClO (Shanghai McLean Biochemical Technology Co., Ltd. China), and then the glass bottle was put in the oven (50 °C) for 48 h. Next, the sample went through 25 mm-diameter quartz membrane (Glass fiber filter membrane aperture width: 0.7 µm) (Grade GF/F. Whatman, UK), and the filter membrane was placed in the filter box (Haimen Haiklas Experimental Equipment Co., Ltd, China) for airtight storage. Blood samples (500 µL) were digested with 4 mL of 0.25% trypsin (ThermoFisher, America) at 37 °C for 12 h, and then 8 mL of 6-14% NaClO, followed by vottex and a 24 h shaking (37 °C, 120 r/min). After digestion, the sample was poured into the filtering device with the vacuum pump on. Sample bottle and filtering device were washed three times with ddH2O and the water was poured into the filtering device again. At the end of filtration, the particleenriched membranes (Glass fiber filter membrane aperture width: 0.7 µm) (25 mm in diameter) were stored in scaled filter cartridges. After each filtration, the filtering device were washed three times with ddlf2O before the next operation. Q. Guan et al. Journal of Hazardous Materials 442 (2023) 130138 3 Metal apparatuses were wiped clean with anhydrous ethanol three times before use. All reagents were filtered (Glass fiber filter membrane aperture width: 0.7 µm) (Grade GF/F, Whatman, UK) to ensure no particle residues left. The biosafety cabinet was turned on to run for 20 min and then sample bottles were Opened (ISO class 4), 500 ul. of each body fluid sample (except blood) or quality control sample was taken out into a particle-free glass bottle and mixed with 8 ml. 30% KOH (Aladdin reagent Co., Ltd. China) and 8 mL 6-14% NaClO (Shanghai McLean Biochemical Technology Co., Ltd, China), and then the glass bottle was put in the oven (50 °C) for 48 h.

#### Analysis of microparticle with one Raman Microspectroscope

The Raman Microspectroscope used in this study was the LahRAM HR evolution Raman Microspectroscope (Horiba Scientific, France). Silicon wafer was used for calibration the spectrometer every time before the use to ensure that the measurement results were accurate and reliable. The process of particle detection was described and shown in Text S1 and Fig. S1. Particle detection conditions were set as: wavelength 532-nm excitation, grating 500 lines/mm, laser intensity 1%, integration time 10 s, cumulative integration times 2 times, and spectral range 200–3500 cm<sup>-1</sup>. The spectral data of all samples were exported by Labspec 6 software, matched with the "KnowltAll software" database (BioRad Laboratories, Inc.) with the corresponding Hit Quality Index (HQI) value recorded simultaneously. The highest HQI value of substance candidates was considered as preliminarily identified particles. Candidate particles with HQI greater than 70 were identified as successful matches in five sampled spectral detections (Guedes et al., 2014). The longest diameter of the particles in the two-dimensional view on the filter membrane was recorded as the diameter of the particles. Representative spectra and image of 84 substances were shown in Table S2 and Fig. S2-11. The number, size and HQI of microparticles detected in each kind of body fluids were shown in Table S3-15

#### Iron compound source judgment experiment

The detection of a big number of iron compounds in human body fluids could not be explained fully based on the literature at present. Several kinds of iron compounds (e.g. FeO(OH) and Fe2O3) were detected and described as pigments previously in human (Ragusa et al., 2021). Although iron compounds were also detected in human pleural effusion, the source of these iron compounds is still unclear. Theoretically, chemical pretreatment of samples might lead to the reaction of KOH with Fe2+, producing iron compounds after natural oxidation and dehydration, although their size and amount remained uncertain. Thus, one parallel test was done to filter body fluid samples before pretreatment and iron compounds were not found in the filtrate after digestion. The results confirmed the natural source of iron compounds (Fig. S12). Iron works as one of the most principal metals in human cell and tissue activities. Exposure of iron oxides and their derivative microparticles from artificial products or iron-containing compounds and their health risk are worth of exploring further.

#### · Quality control

Both sample digestion and Raman spectrum measurement labs were new on microparticle detection and identification. Particle detection was carried out in darkroom with constant temperature (25 °C) and relative humidity (50%). The whole study was divided into five stages: sample collection, transportation, digestion, storage and particle detection. Particle Detection Quality Control (PDQC) system was set up focusing on three stages (sample collection, digestion and particle detection). Five parallel negative controls at each control point were obtained and five sham operation controls were set for the whole operation with the stroke-physiological saline solution, distilled water or digestive fluid as the operative subjects (Text S2).

#### Statistical analysis

Kruakal-Wallis test and one-way analysis of variance (ANOVA) were employed to compare statistical difference in particle number, size and density among groups. Dunn's comparisons test and Tukey's multiple comparisons test were conducted to adjust P value. In order to explore the influence of microparticle physical properties on their internal distribution, the analysis of UMAP visualization was carried out among four sorts of body fluids by clusters. Average particle size, density and the individual numbers of each category were set as single features. Features were combined in two or three to go on the analysis. Onestandard-deviation ellipse (68% confidence ellipses) was presented for each group. All statistical analysis was performed in GraphPad Prism 9.0 software and R (version: 4.1.

## ♦ ROUTES OF HUMAN EXPOSURE TO MICROPLASTICS AND NANOPLASTICS

Living organisms, especially humans, are exposed to M-NPLs through three main routes: ingestion, inhalation, and dermal contact.25 Hence, M-NPLs can enter the body by ingesting contaminated food and water, inhaling contaminated indoor and outdoor air, and cutaneous exposure to M-NPLs through dust, clothing, and personal care items.53 One less discussed aspect of exposure to M-NPLs is the entanglement of specific marine species in plastic debris, which causes physical and biological injuries. In 1997, over 200 aquatic animal species were estimated to suffer from entanglement in plastic debrisHowever, the worst scenario can be expected in the coming years, as plastic debris accumulation in marine ecosystems continues to rise exponentially. Moreover, exposure to M-NPLs from medical treatments and equipment is one of the least researched areas. For example, plastics used in surgical equipment, rectal and vaginal suppositories, implantable cardioverter-defibrillator (ICD), hip replacement implants containing various forms of ethylene (ultra-high molecular weight polyethylene (UHMWPE), cross-linked polyethylene (XLPE), conventional polyethylene (CPE), or high-density polyethylene (HDPE)}, breast implants containing polyurethane foam, repairing damaged bone and cartilage by BioSphere need to be investigated for their release of M-NPLs into the body. Because all the medical procedures mentioned above involve compromised subjects, with most of the physical barriers to M-NPLs entry already bypassed, they can serve as potent ways to M-NPLs exposure. More importantly, short invasive medical-based exposure to M-NPLs may result in high accumulation and deteriorating effects compared to environmental exposure. To date, M-NPLs have been detected in both natural and bottled waters, air, soil, Sediments, and animal tissues (humans included), indicating their possible transfer through the food chain. Further details about the routes of M-NPLs exposure can be found in a scoping review by Rahman et al.

#### Ingestion of microplastics and nanoplastics

M-NPLs are an emerging hazard to food security, water security, and human health 64 The primary route to M-NPLs exposure in all animals, particularly humans, is ingesting contaminated food and water. Aquatic and terrestrial animals, such as birds, ingest a huge load M-NPLs accidentally or by confusing plastics for food. Nearly every seabird may be consuming plastics by 2050. Pacific oyster. larvae are reported to readily ingest Moreover, ingestion of NPLs by Artemia franciscana (brine shrimp) has been shown to be independent of the presence or absence of food, leading to NPLs adsorption and bioaccumulation in the mandible, stomach, gut, tail, gut, and appendages, 68 Human beings consume M-NPLs present in take-out food and their containers. M-NPLs ingestion from food containers could be as high as 203 pieces per person per week 69 Food contaminated with M-NPLs includes sugar, salt, bottled water, and almost all scafood, such as bivalves, oysters, fishes, and crustaceans. There have also been reports of unintentional human NPLs ingestion from sources such as food, drinks, and water.76 These plastic particles accumulate in tissue of various organisms and are transferred to human bodies as soon as they are consumed as food. 77 The worst-case scenario is that MPLs are fragmented into NPLs, as seen in II OPEN ACCESS iScience 26, 106061, February 17, 2023 iScience Review Antarctic krill, making absorption and bioaccumulation more probable.78. Even though food and water quality is closely monitored, it is estimated that every US resident consumes 39,000-52,000 M-NPLs particles per year.65 An even worse scenario can be expected for people living in underdeveloped countries. It is also worth mentioning that the dust that settles on food containers, packaging, and serving plates could be a more significant source of MPLs than the actual food. This M-NPLs dust can also contaminate food while opening plastic food packaging. Because ingestion of M-NPLs in food and water is one of the primary route exposures, the effect of cooking and temperature on the M-NPLs in food and water has been investigated, showing that cooking resulted in lower MPLs levels (114%) in cooked tissues compared to raw ones. Also, the MPLs recorded in cooking water were smaller than in raw mussels, implying that proper cooking might degrade M-NPLs and may alter M-NPLs induced toxic effects.81 Various mechanisms by which M-NPLs enter, and cross mucosa and the GIT system have been described later in this review.

#### Inhalation of microplastics and nanoplastics

Inhalation is also one of the significant pathways of M-NPLs entry into the body 81 Several studies. have found fibrous MPLs in the atmosphere. These M-NPLs end up in the air we breathe after being released from synthetic clothing and textiles, building materials, plastics, waste incineration, and landfilling. Several studies have found M-NPLs in human samples, including lungs and sputuen. Jenner et al.61 detected 39 M-NPLs particles (size R3 mm) in 11/13 human lung tissues with an average of 1.42 G 1.50 MPLs/g of tissue. Amato-Lourenco et al 83 also studied 20 pulmonary tissue samples from the left lung of non-smokers and detected 33 polymeric and 4 fibers in 13/20 samples with an average size of 8.12-16.8 mm in a mean weight of 3.28 g of tissue. Furthermore, Huang et al.84 found 18.75 to 91.75 particles/10 mL of sputum samples from 22 patients suffering from respiratory diseases. Depending on the characteristics of the particles and the residents' lifestyle, these M-NPLs could have a variety of fates after inhalation, including systemic circulation and transport to various tissues, cellular internalization, and removal from the body. Besides the potentially toxic effects of M-NPLs, they also serve as carriers of other contaminants. NPLs have also been shown to carry chemical and biological contaminants owing to their low polarity and high surface roughness. After entry into air passageways, these plastics and their loaded toxicants can get easily absorbed into the fine alveolar epithelium and produce local inflammation. They are then translocated to the systemic circulation, creating systemic problems or stimulating pro-inflammatory factors' production, producing systemic inflammation. This inflammation is touted as dust overload. Loaded chemical and biological contaminants can also have synergistic local and systemic effects, resulting in serious illnesses such as cytotoxic and genotoxic effects, asthma-like reactions, granulomatous modifications in bronchial tissues, persistent pneumonia, and extrinsic allergic alveolitis.

#### Dermal exposure to microplastics and nanoplastics

Humans and other organisms also absorb M-NPLs through dermal contact with topical agents such as cosmetics, body wash, topical pharmaceuticals, surgical and prosthetic devices, and incidental indoor or outdoor occupational exposure. MPLs have been found in hand and face washes, facemasks, sunscreens, and toothpaste in the form of beads that are absorbed and cause skin injury. M-NPLs have also been excessively used in prosthetic equipment, surgical instruments, and other pharmaceutical agents. M-NPLs have not been found to cross the subcutaneous burrier under standard conditions; however, they have been shown to accumulate in hair follicles, and PS-NPLs have been reported to be taken up by Langerhans cells. In addition, skin that has been damaged because of an injury or illness is more porous compared to normal skin and may serve as a route for unintentional M-NPL entry.

# \* ORGAN ACCUMULATION AND CELLULAR UPTAKE OF MICROPLASTICS AND NANOPLASTICS

Following exposure through ingestion, inhalation, or dermal routes, M-NPLs can be taken up by various cells (Table 1) and accumulate intracellularly and in multiple tissues/organs.25 Intracellular accumulation occurs when these pollutants interact with cell membrane components (receptors, lipids), resulting in binaccumulation,121 All bodily systems have shown traces of these particles in them.

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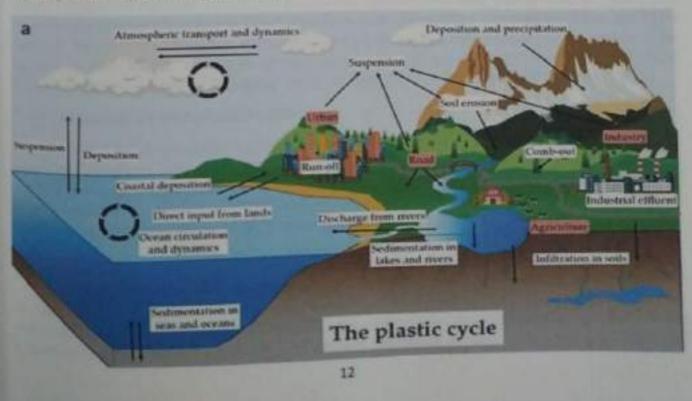
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#### ♦ The plastic cycle

The large-scale production and the enormous use of plastics have been dated till the 1950 s. The first synthetic plastic was seen in the 20th century. The largest market for plastics belongs to packaging. Fossil hydrocarbons are the major source from which the monomers are derived to make the plastics. The monomers responsible for the formation of plastic materials are non-biodegradable, the reason for their accumulation in the environment. According to the research conducted by Geyer et al., (Geyer et al., 2017) nanofibers plastic contains polyethylene (36%), polypropylene (21%), polypropylene (21%), polypropylene (12%), and other materials are usually less than 10%. Plastic pollution has been a concern for over a decade. The plastic cycle idea was developed to better comprehend microplastic contamination throughout the environment and its compartments (D. Huang et al., 2022). The "Plastic cycle" model was created to explain the biogeochemical cycle of plastics amongst segments of the ecosystem and to represent the worldwide problem. This model focuses on big plastic waste, which includes meso and microplastic (Bianco and Passananti, 2020). The plastic cycle explains the origoing transit of plastic between ecological components, including humans. Plastic contamination is a by-product of the Anthropocene epoch (Bank and Hansson, 2019). Humans are exposed to plastic through the air, water, and seafood. The combination of microplastics and nanoplastics with chemical compounds makes analysis more challenging.

#### Atmospheric microplastic and nanoplastic

Microplastics enter the atmosphere through several mechanical A. Choudhury et al. Ecotoxicology and Environmental Safety 259 (2023) 115018 3 processes. Microplastic and nanoplastics can form aerosol particles through wind waves, sea spray, and even sea waves (S. Allen et al., 2020) There can also be upward movement through gas bubbles. Plastics are contained in vehicle tires, brakes, and road surfaces. Atmospheric microplastics can be obtained from these after they wear out. With heavy industrialization, the smoke emitted contains microplastics and nanoplastics. Plastics are also obtained from the dust generated from the agriculture fields during tilling or fallow (Brahney et al., 2021). With the widespread of microplastics and nanoplastics in the environment, the potential risk to the ecosystem increases. Numerous deaths of the organism have been observed in the environment due to over-exposure to microplastics (Horton and Dixon, 2018a). Fig. 1 depicts the plastic cycle and how plastic originates from different sources and circulates among the various aspects of our environment. It also gives us a summary of the plastics that originated over the years and the different sources where plastics are being consumed the most. We can define microplastics as "synthetic solid particles or matrices with a wide range of shapes which are considerably insoluble in water with a size of less than 5 mm (Campanale et al., 2020; Y. Yao et al., 2022; X. Yao et al., 2022).



#### Discussion

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#### Analytical methods to detect microplastics

The analysis of atmospheric microplastics is crucial for their characterization and provides details regarding their pathways and deposition. This is a three-step process Sample solliection, Sample preparation (includes pre-treatment), and Characterization (C. Wang et al., 2021; Y. Wang et al., 2021; B is of utmost importance to record the weather changes during the collection of samples to predict the sources analysis between the weather and microplastic deposition (S. Allen et al., 2019).

#### Sample collection

For the analysis of microplastic in the air, sample collection serves as the first step. In general, there are two procedures followed for the collection of samples.

#### · Passive and active sampling

Passive sampling is the gathering of particles in a collection container using a glass funnel and standard steel (X. Yao et al., 2022; Y. Yao et al., 2022). Atmospheric microplastic can full so the ground because of gravity and meteorological conditions (G. Chen et al., 2020). We can obtain information on these atmospheric microplastics existing on the surface through passive sampling. Active sampling refers to the gathering of samples utilizing pumping equipment (Q. Zhang et al., 2020; Y. Zhang et al., 2020; Sand 2022). Microplastics are particulate matter subdivisions (Yo et al., 2021). Active sampling aids in the collection of particle concentration data and the assessment of microplastic exposure. Active sampling gives us information on the microplastics in the air. When compared to passive sampling, active sampling takes less time (Habibi et al., 2022b).

#### Sample preparation

The sample collected must be treated before it is further analyzed for different purposes. The three steps that are followed in the pre-treatment process of atmospheric microplastics are (i) Concentration, (ii) Parification, and (iii) Separation (C. Wang et al., 2021; Y. Wang et al., 2021). The sample containing the microparticles must be separated from the particulate matter present along with them. The following can be achieved by washing the solution with Sodium lodide or Zinc Chloride as microparticles are lower in density (Bianco and Passananti, 2020). The fallouts that were collected using passive methods must be first filters (Y. Huang et al., 2020). It is necessary to remove the organic matter present on the surface of the atmospheric microplastic. The samples are subjected to H2O2 (30% of the total volume), HNO3, KOH, or NaOH for effective removal of the organic matter (Y. Huang et al., 2020; Lavoy and Crossman, 2021).

#### · Analysis of the microplastic sample

After the sample has been collected and the pre-treatment has been done, it is further advanced for different appearometric analyses. After the treatment, the sample must be characterized according to different colors and configurations. Different methods have been developed for the identification and characterization of microplastics. Similar methods have been used for both airborne microplastics and microplastics present in apartic and terrestrial environments (G. Chen et al., 2020).

#### 4 Visual observation.

Visual sorting of samples for microplastic silentification involves the removal of plastic debris and other residues that can hamper the visualization. This separation can be done by abserving the sample with the naked eye or using a dissecting microscope (Hidalgo-Ruz et al., 2012) Using a streomicroscope, we can characterize microplastic depending on size, shape, and color. Different

software has been developed to analyse and quantify the microplastic sample (G. Chen et al., 2020). The visualization of the microplastics is done based on their size and configuration (He et al., 2023). Supposedly in the case of large microplastics, visual inspection is done whereas for smaller microplastics dissection microscope is preferably used. While visual identification of large microplastic is an easy and fast method. a is not reliable for smaller microplastics as visual sorting can be challenging. Hence, we rely on other methods for smaller microplastics (Shim et al., 2017; Vidal and Pasquini, 2021).

#### 4 Fourier transform infrared (FTIR) spectroscopy.

FTIR spectroscopy is a more precise way for the identification of microplastics and their characterization since it provides information about the chemical bonds present in the plantic sample (Shim et al., 2017). FTIR spectroscopy identifies the polymeric composition of the microplastic sample. The spectra of our target particles are compared to that present in the libraries thus discovering the polymeric composition (Zhao et al., 2022). Large microplastics can be analyzed using the FTIR surface sechnique known as "attenuated total reflectance" (Zvekic et al., 2022). With the successive experiment, # was found that micro-FTIR spectroscopy can be employed to identify airborne microplastic because it early identifies microplastics even around 20 µm (Cunsolo et al., 2021; Duarte et al., 2022).

#### 4 Raman spectroscopy.

In general, Raman spectroscopy provides information on a compound's chemical composition. As a result, it is used as one of the microplastic identification techniques. It is an extremely dependable approach that employs monochromic laser sources (Samanta et al., 2022). The laser's wavelength can range from 500 to 800 nm. Excitation happens when a monochromatic wavelength is. applied to a sample owing to the difference in frequencies. This change in frequencies is known as Ramanshift, and it is determined by the molecular structure and chemical composition of the polymers (Bat A. Choudhury et al. Ecotoxicology and Environmental Safety 259 (2023) 115018 7 et al., 20221 When Raman spectroscopy allows for further investigation of the microplastic sample, a non-contact approach is preferred (Nava et al., 2021). It can detect plastic particles ranging in size from nanometres to micrometers. but it can also distinguish between different types of plastic particles (Lv et al., 2020). One disadvantage of Raman spectroscopy is that it is highly sensitive to additives and pigments present in the microplastic sample, which hinders the identification process (Shim et al., 2017).

#### Analysis of atmospheric nanoplastic

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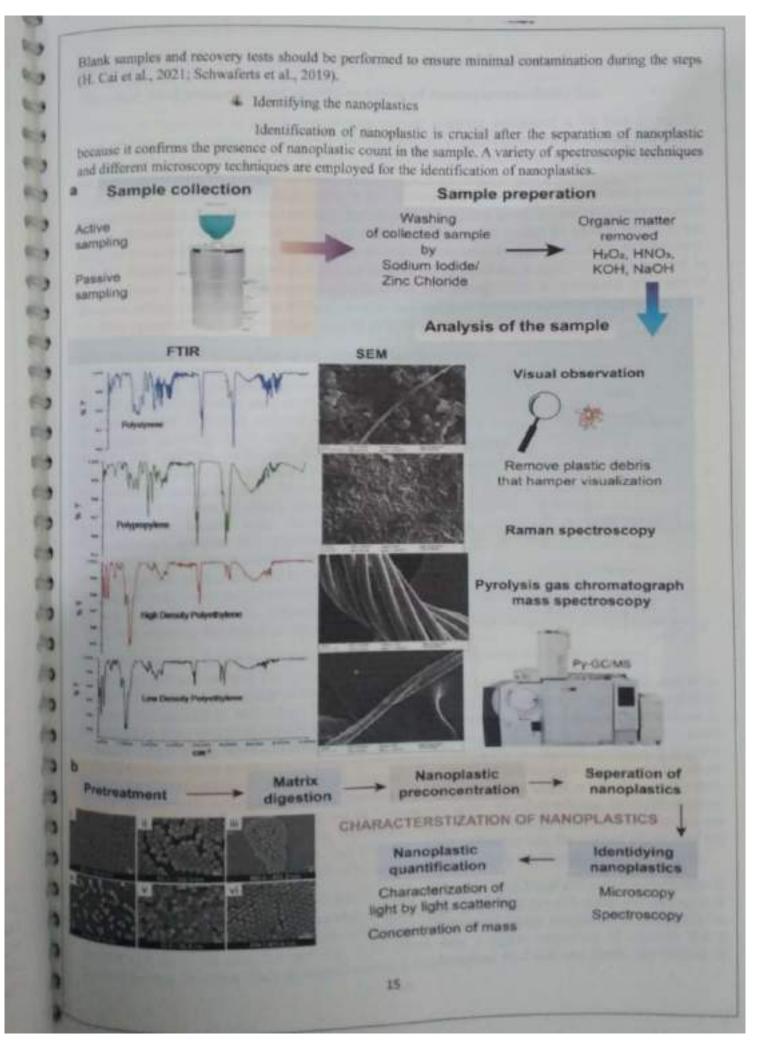
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Nanoplastic is emerging with a lot of research being carried out for the detection of nanoplastic samples in the atmosphere. It is of utmost importance that we study the characteristics of nanoplastics to get a close idea of the fate of nanoplastic and the different challenges related to them (Putel et al., 2021, Valsesia et al., 2021). The characterization of atmospheric nanoplastic involves the following steps: (i) pre-treatment, (ii) reputation of the sample, (iii) identification, and (iv) quantification (Karimi Estabbanati et al., 2023). Although microplastic pollution has gained more importance, it is important to analyze the nanoplastic sample for being extremely small, they can create more destruction and havoc to the environment and posea serious health risk.

#### 4 Sample preparation

Plastics are found in diverse shapes and conformations, across the globe and are utilized to great extents which make it difficult for sampling as the risk of contamination is high (Second et al., 2022). It is crucial to take some prevention before the sampling begins and follow it throughout the ampling process. Pre-treatment of samples is essential as nanoplastics, and natural plantics are found belangeneously (Cerasa et al., 2021). The setup and the instruments used should be designed with nest Polymers materials to reduce the risk of contamination of the sample. Both lastinus without and are filtration. spaces should be equipped to avoid external contamination from airborne particles and synthesis fibers.



#### RESULTS

#### The analytical protocols and quality controls of microparticle detection

Currently, a major issue in human micron-scale particle exposure assessment is the lack of analytic standard. Data on the estimation of internal microparticle (1-50 mm) exposure at present are limited and highly variable. Raman spectrum can be used to extract composition information of particles as small as 1 um in biological samples (Christensen et al., 2019) and provide image evidence to evaluate microparticle exposure, but particle weight quantification is still lacking. For more comprehensive and convincible successments, standardized protocols on sampling and particle detection, quantification, characterization and quality control are particularly critical. In this study, a quality control system for particle detection was designed to encompass all steps of the operation including transportation, digestion, storage and detection, with the background of all consumables and the blinding of operators and analysts taken into account. In total ten kinds of quality control samples (five parallels), two microparticles were detected at the step of digestion, which were identified as Albite glass and Chalk and were excluded in further analysis (Fig. S13-14). Polystyrene and Polyvinyl chloride were set as positive controls (Fig. S13-14).

#### Identification and grouping of microparticles detected

In this study, a non-targeted microparticle memal exposure landscape analysis was done in thirteen kinds of human enclosed internal body fluids covering eight body systems. Totally 702 particles were detected from mirteen kinds of enclosed body fluids. Particles were identified and grouped into 84 substances or 66 molecules, most of which were firstly reported inside human body (Table S2). Normally one to nineteen microparticles could be detected in each 500 µL sample (Fig. S15). Average particle number detected in each kind of enclosed body fluids ranged between 29 and 30 with renal, hepatic, pelvic, and gallbladder syst fluid containing the most particles (Fig. 1).

Microparticles were further classified into five najor categories according to their sources and

themical properties: 1) the group of synthetic materials included polymers, synthetic pigments, and other amatural compounds or monomers, 2) the group of iron compounds contained iron oxides and their derivatives or iron-containing salts; 3) iron free minerals group comprised natural minerals without iron; 4) Carbon or organic group involved carbon black and natural organic materials; 5) the group of undocumented referred to those whose spectrum could not be identified in the library (KnowltAll software). It is worth oting that clear identification of substances especially the salt could not always be recognized as cations ecurately. The main constitute of the salt spectrum is sourced from the vibration of anions rather than tations. Thus these particles were identified as "unspecified salts". In pelvic effusion, synthetic material Particle proportion was the highest (65%) while in pericardial effusion iron compounds proportion was the lighest (27%). The proportion of iron free minerals in joint effusion was the highest (35%) and the proportion of carbon and organic particles detected in thyroid cyst fluid was the highest (25%) (Fig. 1).

Most synthetic material particles were detected in the renal cyst, whole blood and pericardial effusion (n-9) while most iron compound particles were detected in the pelvic cyst (n = 42). Most iron free mineral particles were detected in the pelvic cyst (n = 42). Most iron free mineral particles were detected in the pelvic cyst (n = 42). Particles were detected in the renal cyst (n = 24) and most carbon and organic particles were detected in the bytoid cyst (n = 11) (Fig. 2A and Fig. S16). There were a higher proportion of minerals and a the approportion of carbon black or organic matter in cerebrospinal fluid and cyst fluids. The number of

son compound particles was the biggest in four sorts of body fluids (Fig. 2B). Moreover, more particles were found in cerebrospinal fluid and cystic fluids, and fewer were found in blood and effusion. Further comparison showed that microparticles detected in cyst fluids were significantly more than those in effosions (P < 0.001) (Fig. 2C). It was the first time to evaluate internal micron-scale solid particle exposure employed in human body fluids, although particle chemical content was previously analyzed in a chart there were microparticles widely existing in human enclosed body fluids and demonstrated the underestimation on internal environmental microparticle exposure. The impact of these microparticles on to re-evaluate their potential impact, explore sources of particle exposure, formulate environmental particle standards, and further promote sustainable development globally.

#### Microplastics observed in body fluids

Totally 23 microplastics were detected, grouped into nine kinds including polypropylene (PP), polystyrene (PS), polytetrafluoroethylene (PTFE), polyvinyl butyral (PVB), polyamide 6 (PA), low density polyethylene (LDPE), polyethylene-co-acrylic acid (PEAA), polystyrene-coacrylonitrile (PSAN) and polyvinyl alcohol (PVA). They were observed in whole blood, pelvic cyst fluid and effusions with the size ranging from 19.66 µm to 103.27 µm (Table 1). Representative spectra and microscopic images of microplastics were shown in Fig. 3 to provide an overview. Microplastic is a special kind of microparticles and obtains extra attention. Studies on adverse health effects induced by microplastic exposure keep acreasing these years, which microplastic in feces, placenta and blood were reported previously (Ragusa et al., 2021; Schwabl et al., 2019). Our study was the first to observe imaging evidence of microplastics in blood and effusions. Five kinds of microplastics (PVB, PEAA, PSAN, PTFE, PVA), which were closely related to human daily lives, were detected in human body for the first time. Interestingly, all microplastics were fragmented or irregular shaped, and fiber-shaped microplastics were not found either in this or previous human sample studies (Ragusa et al., 2021). Although fiber-shaped particles were found to be as abundant as blocked-shaped in environmental atmospheric samples with fiber size between 20 µm and 3 mm (Brahney et al., 2020), they might be less capable to penetrate mechanically into the blood or terminal have due to their softer texture and greater surface tension (Meng et al., 2020).

#### The influence of size on microparticles distribution in human enclosed body fluids

The distribution of particles in the human body is the key issue to be considered. They might be absorbed must be blood vessels and transfer to other tissues and organs in human body along the circulatory system.

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physiologically, different formation mechanisms, biological barriers and membranes involved, and flow ears of body fluids might affect the distribution of particles (Wang et al., 2018). Besides human physiological structure, particle size is another key factor affecting particle distribution (Wright and Kelly, 2017). The size of microparticles showed some special characteristics among different categories of body fluids. The size of microparticles ranged from 2.15 μm to 103.27 μm with those less than 20 μm occupying the highest proportion (from 2.7% to 8.7%). Efflusions (e.g., pericardial, intrauterine, testicular and joint efficien) tended to have a higher proportion of large-scale particles (> 50 μm) compared with other energinies of body fluids. Particles larger than 70 μm were found

only in renal cyst fluid, pericardial effusion, hepatic cyst fluid, intrauterine effusion and esticular effusion (1%, 12%, 1%, 2% and 7%, respectively) (Fig. 2D). These large-scale particles were mainly synthetic materials with an average size as large as 44.30 μm. The size of synthetic materials and iron free minerals was generally larger in four sorts of body fluids (Fig. 1E). Moreover, particles detected in blood and effusion were generally larger, while those in cerebrospinal fluid and cyst fluid were smaller. Further comparison showed that the size of particles detected in effusions and whole blood was significantly larger than in cyst fluids (P <

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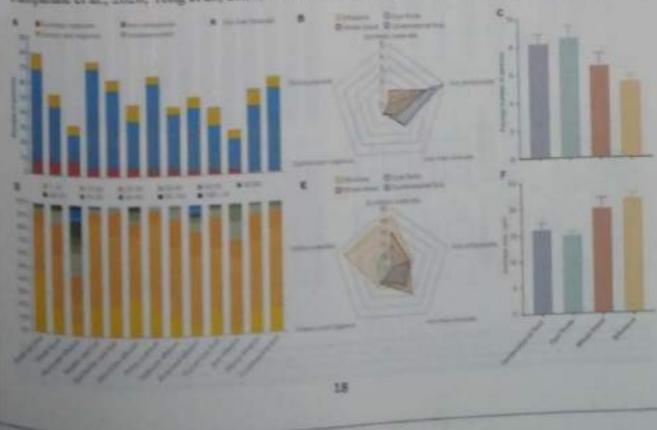
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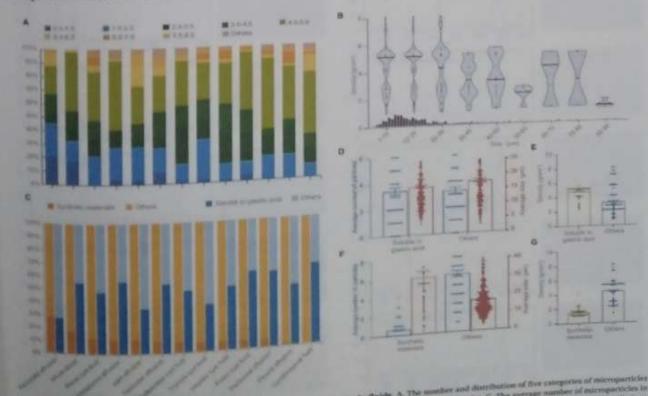
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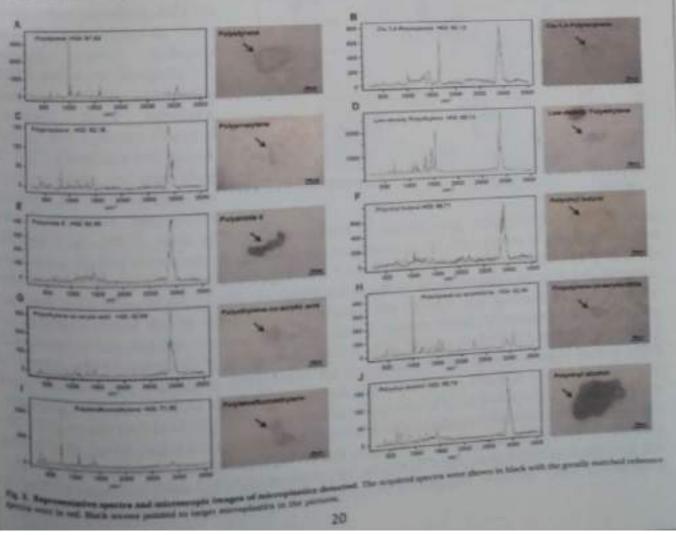
the permeability of biological barriers and membranes. Particle size in cerebrospinal fluid and cyst fluids was significantly smaller than in whole blood and effusions in this study, which might attribute to a stricter filemen process of blood-brain barrier and cyst capsules. Comparatively large microparticles were found in different body thirds. This updated the understanding of microparticle bio-distribution based on animal studies that only particles smaller than 150 µm could pass through the gastrointestinal epithelium and those smaller than 20 µm could penetrate some organs such as liver, kidney, spleen and etc (Barbeza et al., 2018; mailer than 20 µm could penetrate some organs such as liver, kidney, spleen and etc (Barbeza et al., 2018; mailer than 20 µm could penetrate some organs such as liver, kidney, spleen and etc (Barbeza et al., 2018; mailer than 20 µm could penetrate some organs such as liver, kidney, spleen and etc (Barbeza et al., 2018; mailer than 20 µm could penetrate some organs such as liver, kidney, spleen and etc (Barbeza et al., 2018; mailer than 20 µm could penetrate some organs such as liver, kidney, spleen and etc (Barbeza et al., 2018; mailer than 20 µm could penetrate some organs such as liver, kidney, spleen and etc (Barbeza et al., 2018; mailer than 20 µm could penetrate some organs such as liver, kidney, spleen and etc (Barbeza et al., 2018; mailer than 20 µm could penetrate some organs such as liver, kidney, spleen and etc (Barbeza et al., 2018; mailer than 20 µm could penetrate some organs such as liver, kidney, spleen and etc (Barbeza et al., 2018; mailer than 20 µm could penetrate some organs such as liver, kidney, spleen and etc (Barbeza et al., 2018; mailer than 20 µm could penetrate some organs such as liver, kidney, spleen and etc (Barbeza et al., 2018; mailer than 20 µm could penetrate some organs such as liver, kidney, spleen and etc (Barbeza et al., 2018; mailer than 20 µm could penetrate some organs such as liver (Barbeza et al., 2018; mailer than 20 µm could penetrat



used to be hampered by methodological limitations and measurement bias toward larger particles (Koelmans et al., 2019). 3.5. The influence of density on microparticles distribution in human enclosed body fluids In parallel with size, density of particles affects their transfer rate and distribution in human body. The density of most particles was greater than 2.5 g·cm-3 (ranging from 55% to 90%), but more particles with a density less than 1.5 g·cm-3 were found in pericardial effusion and whole blood (21% and 17%, respectively) (Fig. 4A). Particle density seemed to decrease of the increase of particle size, but this trend was not obvious regarding particles greater than 60 µm. There were significant differences in particle density among particles of different sizes (P < 0.001), and the density gradually decreased with the increase of particle size. The density of particles with the size of 80-90 μm was significantly lower than that with the size of 1-10  $\mu$ m, 10-20  $\mu$ m and 20-30  $\mu$ m (P < 0.01, P < 0.01 and P < 0.05, respectively) (Fig. 4B). Since the clear crystal state of particles could not be observed and adequate pure internal standard of 84 substances were lacking to perform the particle density measurement, publicly reported densities of chemicals (according to their chemical formula) were taken as the densities of microparticles in the body fluids. Particle density was found to determine their movement track in the natural environment In this study, considerable microparticles were detected in cerebrospinal fluid, indicating limited barrier effect of the blood-brain barrier on microparticles. There were a higher proportion of minerals and lower proportion of carbon black or organic matter in cerebrospinal fluid and cyst fluids, with clear barrier or capsules compared to blood (Prust et al., 2020). The detection of massive microparticles in cerebrospinal fluid and cyst fluids suggested their accumulation in terminal tissues. The results of UMAP visualization showed that no significant distinction among four sorts of body fluids using single features or twofeature combinations (Fig. S17A-F). When average particle size, density and the individual numbers of each category were analyzed combinedly, microparticles were found to gather in cerebrospinal fluid and cystic fluid, and separated between effusion and whole blood, (Fig. S17G). Our results indicated that the microparticle distribution characteristics (average particle size, density and the numbers) were similar in enclosed body fluids produced by tissues with capsules, different from those from tissues without capsules. 3.6. The influence of Gastric-acid-solubility on microparticle distribution in human enclosed body fluids Microparticle internal distribution was determined by not only the different particle natural characteristics,



also the different tendency in biological metabolism including degradation by gastric acid. More and also are constructed and gastric-acid-soluble particles were detected in effusion and whole blood pathetic fraction and samples together, microparticles soluble in gastric acid with higher demittee had a (Fig. 4C) soluble in pastric acid was size if and 17.73 μm) (Fig. 4D and Fig. 4E). The sensity of particles soluble in gastric acid was significantly higher than that of other particles (P < 0.001) (Fig. 4E). In addition, synthetic materials, mainly identified as microplastics, synthetic pigments and some edustrial materials, had a larger average particle size (31.36 µm) and smaller density (1.43 g-cm-3.). contaction material particles were significantly fewer and larger than other particles (both P < 0.001) (Fig. 4F). The density of particles soluble in gastric acid was significantly smaller than that of other particles (P (0.001) (Fig. 4G). The average size of synthetic materials was twice bigger than that of particles in corebrospinal fluid (16.20 µm). Our results showed a considerable proportion of particles soluble in gastric acid (from 27% to 63%), but a particular correlation between solubility in gastric acid and synthetic materials was not found, suggesting an uneven distribution of these two types of soluble particles in thirteen kinds of body fluids. Theoretically, microparticles soluble in gastric acid could present smaller particle size after digestion. Our results showed that microparticles soluble in gastric acid with higher densities had similar average size compared to other particles. It is speculated that the microparticles soluble in gastrie and might enter the human body through respiratory tract. In our study, the average size of synthetic materials was twice bigger than that of particles in cerebrospinal fluid which might partially explain why they were not found in the cerebrospinal fluid. Discussion is ongoing about the potential health effects of agested or inhaled microparticles. Additionally, whether there are dose-dependent effects of several microparticles especially microplastics in humans also remains unknown. Apart from particle size, the etegrity of the intestinal mucosal barrier or bronchial epithelium seems to play a key role in microparticle intake, though there are limited data on puthway of microparticle or even nanomaterial absorption (Gruber et al., 2020; Ramsperger et al., 2026). The size, quantity, categories and distribution of particles in different



body fluids were thoroughly inspected in this study. Indeed, biological barriers were found to influence the distribution of particles along with particle size, density and solubility in gastric acid. Further investigations excretion process of microparticles, and to study the ongoing effects of particle pollution on the human body.

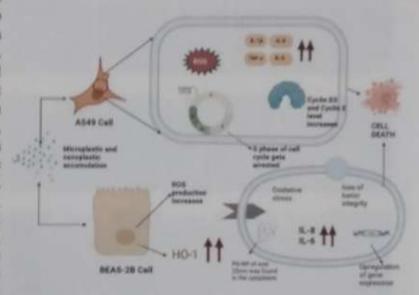
#### Disease

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The ability of microplastic and nanoplastics to interact with organic pollutants is a growing concern because microplastics and nanoplastics, they can get deep within our lungs' respiratory tracts, posing possible health epithelium is a prevalent issue (Sana et al., 2020). Upon inhalation of atmospheric microplastic and nanoplastic, they initially reach the upper respiratory tract. There exist generally four ways through which diffusion (Enyoh et al., 2019). The human body has a clearance mechanism that ensures the expulsions of microplastic and nanoplastic. Failing the clearance mechanism, microplastic and nanoplastic can reach deep inside the lung causing pulmonary diseases (H. Lai et al., 2022). The common cells that get affected because of the intake of atmospheric microplastics and nanoplastics and nanoplastic microplastics and nanoplastics and nanoplastics are the A549, BEAS-2B, and Caco-2 cells.

(Donkers et al., 2022). Fig. 4 shows the effect of overexposure to microplastic and nanoplastic in A549 cells and BEAS-2B cells, Microplastic can engender several critical conditions in the body as it carries several pollutants. MPs can carry chemical additives, dyes, persistent organic pollutants (POPs), endocrine disruptors like bisphenol A(BPA), phthalates. brominated flame retardants, triclosan, and organotin (Vieira et al., 2021). Thesmetals such as lead, nickel, cadmium, and zinc. These pollutants are released once the MPs encounter our body tissues



(Rahman et al., 2021). In an experiment conducted on human lungs cell, it was confirmed using transmission electron microscopy the presence of nanoplastics in the deeper parts of the lungs can also cross the lung epithelial layer (Donkers et al., 2022). It was found that, with the decrease in the level of αlantitrypsin levels in the BEAS-2B cells, the health risk caused by the polystyrene microplastics increases. The imbalance caused due to oxidative stress between the oxidants and antioxidants results in the pathogenesis of lung diseases. Pulmonary diseases such as asthma, chronic obstructive diseases, cancer, and dyspnea could occur (C. di M. Dong et al., 2020; C. di C.di Dong et al., 2020). Another pulmonary disease associated with exposure to microplastics and nanoplastics is idiopathic pulmonary fibrosis which is increasing every year (X. Li et al., 2022). In research conducted by X. Chen et al. (2022); Q. Chen et al. (2022) they studied the role of MPs in the pathogenesis of lung ground-glass nodules (GGNs). Microplastic presence in the human lung tissue was confirmed by μ-FTIR which suggested the presence of microplastics in the GGNs was more as compared to in the normal lung tissues. Among the workers, those who were continuously exposed to fibers had a high mortality rate because of lung cancer. A similar experiment on a mouse model demonstrated that macrophages phagocytose microplastic particles. These microplastic

particles have the potential to penetrate the pulmonary endothelium and go to other parts of the body. TNF-release, IgG1 synthesis, inflammatory cell infiltration, and macrophage aggregation were found in the lungs of normal mice after a period of exposure to microplastics. In asthmatic mice, mucus production increased along with inflammatory cell infiltration. B-cell receptor transmembrane proteins formed a complex with B-cell receptors in asthmatic mouse models, activating B-cell signaling and causing lung inflammation. (L. Lu et al., 2018; S. Lu et al., 2018). In the case of lung cancer, there has been an accumulation of both cellulosic and plastic microparticles. The entry of these particles is highly dependent on their size and shape. As microplastic can serve as vectors for carrying heavy metals and organic pollutants, they can often be carcinogenic. Studies on rat models have shown that microplastic can withstand chemical degradation and elimination when they are inhaled or ingested. Acute lung inflammation can be observed due to the persistent presence of polystyrene nanoplastic in the lungs causing an increase in neutrophil concentration (Gonzalez-Acedo ' et al., 2021). The alveolation surface of the human lung is wide with a very thin tissue barrier and hence it can allow the flow of nanoplastics into the bloodstream (Campanale et al., 2020). The effects on human due to atmospheric microplastic and nanoplastic depends on the metabolism and susceptibility. The immune response

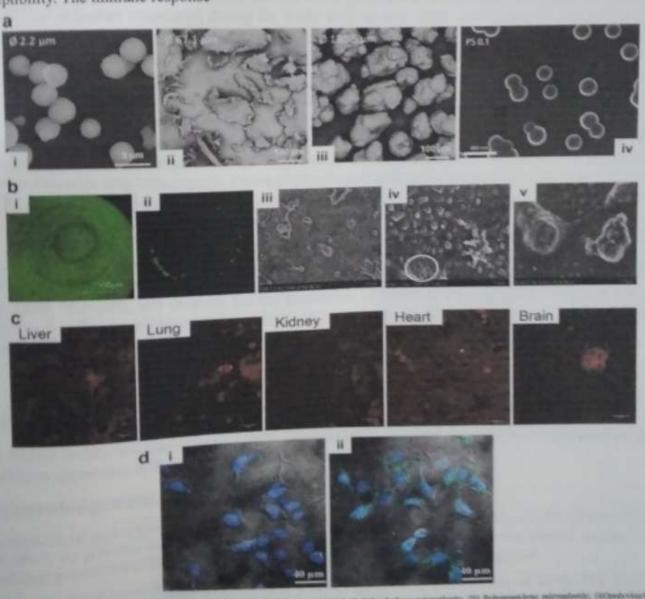


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#### Conclusion

in general, this study originally illustrated microparticle biodistribution in various human body thank. The results showed that a large number of microparticles were imprecedentedly detected and identified in body fluids in human, indicating that the internal microparticle exposure was under-evaluated it urgoenvironmental protection agencies to take the exposure of microparticles including microplestics to tak factors and to evaluate our environment from a novel perspective. Moreover, this particle landscape analysis is anticipated to be a starting point for future funding programs on global particle pollution. Actions need to be done to formulate particles standards, contribute to the global santainable development, and achieve a safe environment for future generations. The magnitude of the mismanagement of plastes in the environment has led to global concern regarding plastic pollution which paves the way for the omnipressore of microplastic and nanoplastic. Microplastics and nanoplastics though found in large amounts in the marine ecosystem, there are comparatively few studies focusing on the presence of MPs and NPs in the atmosphere. There are developing techniques for sampling and characterization of these MPs and NPs, establishing relatively few parallels across the studies that are being undertaken in this field. This could be because of the different properties considered during the study such as size, shape, concentration, and atmosphere condition while the experimentation process. Research should be focused in the future on techniques for successful characterization of MPs and NPs present in the atmosphere which could give an imaght into the distribution of these plastic particles. These plastic particles can enter the human body through three major routes: inhalation, ingestion, and cutaneous contact. The MPs usually reside in the upper part of the respiratory tract but can travel across the bloodstream. According to research, inhaling these purisdes our cause respiratory tract irritation, inflammation, oxidative stress, and generousless. These particles toxicological paradigm is complicated, and further study is needed to properly understand their methods of action and possible long-term impacts. Future studies should focus on the potential toxicity of airborne MPs. and NPs on the human pulmonary system as there is a very knowledge gap in that perspective. Moreover, particle size, shape, surface area, and chemical makeup can all affect their capacity to peneurale deep into the lungs and interact with lung tissue. Although there are studies that state the exposure of meroplasses and nanoplastics to humans, more studies need to be done to elucidate the risks associated with the mhalation of atmospheric MPs and NPs. These atmospheric MPs and NPs can cause diseases including lung cancer, bronchitis, and dyspnea, but the mechanism of action of these particles remains unknown. Furthermore, effective solutions for reducing atmospheric plastic pollution, such as enhanced water management practices and the usage of alternative materials, are critical.

#### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

#### Acknowledgements

LSAYANTIK MUKHOPADHYAY, would like to express my sincere granude to my college, SUN VIDYAS WAR.

COLLEGE, for providing me with the resources and support recessing to complete this research article. I me

particularly granuful to the CHEMISTRY DEPARTMET for their guidance and encouragement.

I would also like to thanks PRINCIPLE Sir. DR. TAPAN KUMAR PARKERIA are INDESSE DR. TAPAN A. for his invaluable mentorship and support throughout this project. His insights and article have been invaluable, and I am truly grareful for his guidance. I am also guardid to as what and article have been invaluable, SRI DEBBRATA SAHA. SRI PANKAJ ROY for completeing invariance of the paper.

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COURSE - DSE-4

**BSC CHEMISTRY HONOURS** 

# INTRODUCTION:-

Human activities create wastewater that can be catastrophic to the environment and also cause loss of water (in the form of wastewater which is 99% water by weight) in places where water is scarce. When wastewater contaminates rivers and groundwater tables, it renders the water resource unusable. Therefore, it is imperative that wastewater is treated before it is released into the environment and, if possible, treated it to make it potable.

The objective of wastewater treatment is to reduce the pollutants to less than maximum permissible limits to prevent the threat to the environment and human health. To achieve this, wastewater is collected and treated in large plants before it is permitted to be released back into the environment. All the water used in homes that flows into drains or the sewage system is referred as wastewater. Industries and businesses frequently contribute large volumes of wastewater to sewage collection systems.

Wastewater follows a determined treatment path in order to achieve water quality standards, regardless of whether conventional treatment or advanced treatment systems are used. Wastewater is normally called influent as it passes through the wastewater treatment facility. Wastewater treatment plants help nature to defend water from excessive pollution. The degree and type of wastewater decides the nature of treatment and the engineering scale of the plant. Most wastewater treatment plants consist of primary and secondary treatment.

# PURPOSE:-

To manage water discharged from homes, businesses, and industries to reduce the threat of water pollution.

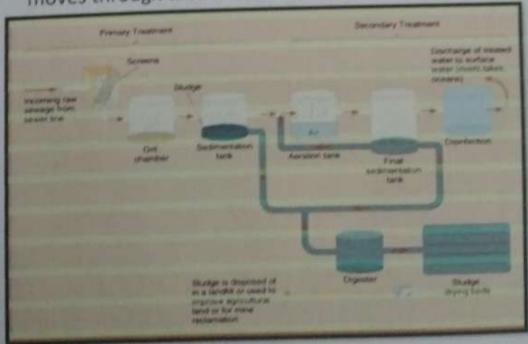
- Water discharged from homes, businesses, and industry enters sanitary sewers.
- Water from rainwater on streets enters storm water sewers.
- Combined sewers carry both sanitary wastes and storm water.

# DROCESS OF WASTEWATER TREATMENT:-

- > Pre-treatment
- Preliminary treatment
- Primary treatment
- Secondary treatment
- Tertiary Treatment

# PRELIMINARY TREATMENT:-

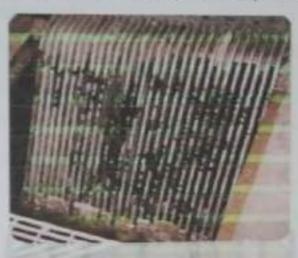
- remove large objects and non-degradable materials.
- protects pumps and equipment from damage.
- bar screen and grit chamber.
- Measurement and sampling at the inlet structure
  - a flow meter continuously records the volume of water entering the treatment plant -
  - water samples are taken for determination of suspended solids and B.O.D.
- Measurements of Suspended Solids and B.O.D. indicate
- the effectiveness of treatment processes
- Both Suspended Solids and B.O.D. decrease as water moves through the wastewater treatment processes



#### · BAR SCREEN -

>catches large objects that have gotten into sewer system such as bricks, bottles, pieces of

wood, etc.



- · GRIT CHAMBER -
  - > removes rocks, gravel, broken glass, etc.
- · MESH SCREEN
  - removes diapers, combs, towels, plastic bags, syringes, etc



# DRIMARY TREATMENT:-

- Primary treatment reduces the suspended solids and the B.O.D of the wastewater.
- From the primary treatment tanks water is pumped to the trickling filter for secondary treatment.
- Sludge from the primary sedimentation tanks is pumped to the sludge thickener.
  - > more settling occurs to concentrate the sludge prior to disposal.
- Secondary treatment will further reduce the suspended solids and B.O.D. of the wastewater.



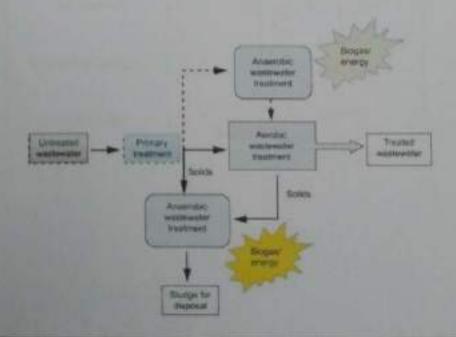
Primary Treatment of Sewage Water with Process Flow Chart

# SECONDARY TREATMENT:

- The secondary stage of treatment removes about 85 percent of the organic matter in sewage by making use of the bacteria in it.
- The principal secondary treatment techniques used in secondary treatment are the trickling filter and the activated sludge process.
- Secondary treatment involves the removal of biodegradable organic matter (BOD) and suspended solids (TSS) through the processes of aeration and filtration.
- Secondary treatment is a biological process.
- Utilizes bacteria and algae to metabolize organic matter in the wastewater.
- · Secondary treatment systems are classified as-
  - 1. Aerobic suspended growth treatment and
  - Anaerobic suspended-growth treatment.

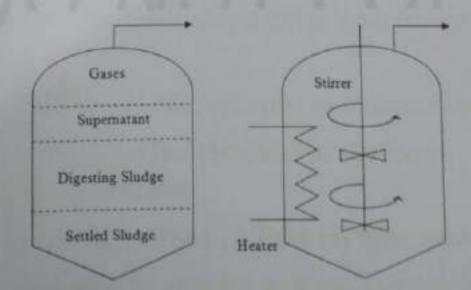
#### AEROBIC SUSPENDED-GROWTH TREATMENT:

- Aerobic suspended growth treatment processes include activated sludge processes, sequencing batch reactors (SBR), and aerated lagoons.
- Owing to the characteristics of the wastewater, the contact time between the organic wastes and the microorganisms must be higher than that for domestic wastewater.



# \* ANAEROBIC SUSPENDED-GROWTH TREATMENT:-

- Anaerobic pathways involve decomposition of organic material in biological sludge in the absence of oxygen to convert the material to different variety of end products, mainly methane and carbon dioxide.
- It can be used in the stabilization process of wastewater treatment plant sludge and to certain degree some industrial waste as well.
- The anaerobic suspended growth process for the conversion will take place and occur in an air tight reactor and there are different configurations available with some of those commonly used are the anaerobic contact process, complete-mix digestion, two-stage bed leachate filter, upflow anaerobic sludge blanket (UASB), fluidized bed feed and membrane solid separation.



# TERTIARY TREATMENT

- Nutrient removal (ammonia and phosphorus)
- Nitrification / Denitrification
- Ion exchange
- Membrane Process

anaerobic microbiological process with a different microbe where O2 is toxic (more sludge)

NO3 - to N2 (escapes to atmosphere)

PO4 -3 if not removed in sludge in secondary process

PO4 -3 + Al+3 to AlPO4 (s) (into sludge)

aeration to strip N2 and re-oxygenate
 (add DO)

# CONCLUSION

- The main goal of wastewater treatment facilities is to protect people, as well as local ecosystems, from toxic elements found in wastewater.
- Water treatment facilities were designed to speed up the natural process of purifying water because the natural process can't keep up with the amount of waste society produces.
  - Without wastewater treatment and other recycling processes, everyday life would be considerably more hazardous; it remains so in developing nations tacking established wastewater treatment systems.

Rebenence 7

# ACKNOWLEDGEMENT

I would like to express my special thanks to our full chemistry department. All my teachers helped me a lot in doing this project which also help me to get lots of knowledge. It help to increase my knowledge and skills.

## DEFINING FOOD LITERACY AND IT'S COMPONENTS

By - Rajn Mondal, Roll No - 200331000969

#### Introduction -

an important role to play in enhancing the quality of life, particularly in the prevention and management of many chronic conditions. Chronic disease prevention requires consistency in both selection of appropriate food and long-term maintenance of healthy habits. The unprecedented increase in diet-related disease has been linked to poor eating habits and a perceived diminishing understanding and skill set around food and its use. However, globally, the food system and the relationship of the individual to that system, continues to change and grow in complexity. Individuals must adequately navigate the complex food system to ensure food intake contributes to health.

cating are part of everyday life and hence respond to, and are challenged by, daily changes in individual, household, community, national and global environments. Maintenance of diet quality requires regular revision and adaptation of food habits in response to these changes. "Food literacy" has emerged as a term to describe the everyday practicalities associated with navigating the food system and using it in order to ensure a regular food intake that is consistent with nutrition recommendations. Its appearance coincides with an increase in the general term "literacy", which is increasingly used to describe the knowledge and skills needed to navigate a range of other societal systems such as health, technology and finance.

The emergence of this term may relate to the inadequacy of existing measures to capture the complexity of knowledge, skills and behaviours used to meet day-to-day food needs. Measures tend to either focus on just one element, such as cooking, food skills, eating competence, nutrition knowledge or food preparation or have been developed to describe consumer behaviour for food marketers rather than to describe protective or risk factors for health.

"Food literacy" as a term is increasingly used in policy, practice, research and in the public arena, however, there is no shared understanding of its meaning. In some cases the term "food literacy" is used explicitly, in others it is

implicit with the provision of a list of food skills, knowledge and behaviours. Implied components vary greatly and include the language of food, knowledge of its origins, neophilia, food preparation and sustainability.

## > FOOD -

Any nutritious substance that people or animals eat or drink or that plants absorb in order to maintain life and growth is called food. It is also known as

nutritious.

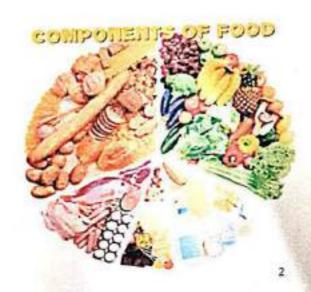


## > Components of

## Food -

The various components of Food are –

- a. Carbohydrates
- b. Proteins
- c. Lipids
- d. Vitamin
- e. Minerals
- f. Water
- g. Fibers
- h. Polyphenols
- i. Glucosinolates
- **j** Carotenoids



## Classification of Food Group -



## 1) Carbohydrates -

Carbohydrates comprise a group of chemically defined substances that exhibit different physiological and physical properties and health benefits. The primary classification of carbohydrates is based on structural features such as

## FUNCTIONS OF CARBOHYDRATES

- Main source of energy in the body. Energy production from carbohydrates will be 4 k calones g (16 k Joules g).
- Storage form of energy (starch and glycogen).
- Facess carbohydrate is converted to fat.
- Glycoproteins and glycolipids are components of cell membranes and receptors.
- Structural basis of many organisms. For example, cellulose of plants, exoskeleton of insects etc.

the polymerization degree and linkage type (α or β), including watersoluble monosaccharides (e.g., D-glucose, D-mannose etc ) and disaccharides (e.g., lactose and sucrose), Polymeric carbohydrates with ten or more monomeric units that are not hydrolyzed by the endogenous enzymes in the body's small intestine are considered as dietary fiber. The human body uses carbohydrates in D-glucose, while almost all of them are efficiently digested and absorbed into the body.

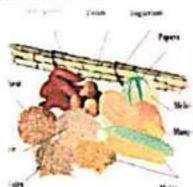
Carbohydrates are made up of carbon, hydrogen and oxygen atoms.

They are important because -

- All organisms use them for energy.
- Reserve food materials.
- Formations of cell organelle and cell compounds.

## Common SOURCES Of CARBOHYDRATES in our diet -

- > Vegetables
- Legumes (beans, lentils, soybeans)
- > Fruits
- > Rice
- Grains ( wheat, oats, rye, millets, barley )



## 2) Protein -

Food proteins are highly

polymeric and complex molecules that are
comprised of 20 different building units (the amino acids) that are linked
between them substituted amide bonds.

Proteins are very important for our body.

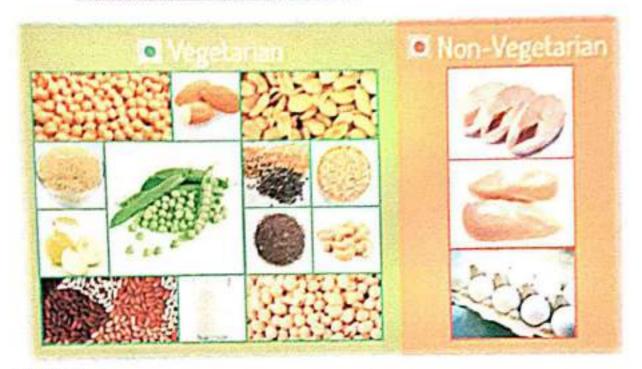
- It helps in repairing worm out tissues.
- If we don't have proteins in our body, cells will be damaged.
- Proteins helps in the formation of hair, nails etc. They are body building foods.

## Common Sources Of Proteins –

- Proteins can be animal proteins of plant proteins.
- ✓ Animal protein rich food include eggs, fish meat, milk, cheese and pulses.
- ✓ Plant protein rich food include pulses of beans.



- Food rich in proteins include lean meat, fish, eggs, milk, cheese, beans, peas, etc.
  - VEG and NON-VEG Protein Sources –



## 3) FATS -

Fatty acids and other minor lipid compounds have been shown to exhibit health-promoting properties by affecting the body's physiological functions positively. The physical properties of fats are the consequence of the triacylglycerol composition that affects the stability, structure, and nature of ordered phases.

# FATS AND OILS



- > Is a nutrient.
- Is a source of energy.
- Adds taste and texture to food and helps absorbs fat soluble vitamins.

## FUNCTIONS and SOURCE of Fats –

#### > Function -

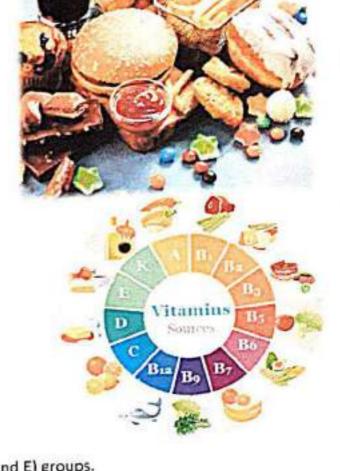
Fats gives us energy. It gives much more energy than carbohydrates.

#### > Sources -

Some of the sources of fats are oil, ghee, milk, butter, eggs, meat etc.

#### 4) VITAMINS -

Vitamins are a
variety of dietary compounds
necessary for the correct
maintenance of the body's
functions. There is an increased
interest in the vitamin supply
through the diet through
minimally processed and
nutritious foods and drinks.
Depending on their solubility,
vitamins can be classified into
soluble (e.g., vitamins C and B)
and fat-soluble (Vitamins D, A, K, and E) groups.



#### SOURCES of vitamins —

Vitamin	Sources	Functions	Disease
Vitamin B <sub>ct</sub>	Egg, Meat, Fish	Coverience in amino acid metabolism, Red blood cells maturation	Pernicious Anaeima
Vitamin C (Ascorbic acid)	Carrie fruits (Orange, Lemon etc), Fornato, Amla, Leafy Vegetables	Coenzyme in Annoxidant, building of collagen	Scurvy (bleeding gums)
Vitamin D Cholecalciferol(D3), Ergocalciferol (D2)	Fish liver oil, Milk. Egg yolk, (exposure to sunlight)	Absorption and maintenance of calcium	Rickets (children). Osteomalacia (udults)
Vitamin E (Tocopherols)	Cotton seed oil, Sun flower oil, wheat germ oil, Vegetable oils	Antioxidani	muscular dystrophy (muscular weakness) and neurological dystanction
Vitamin K (Phylloquinone& Menaquinones)	Green leafy vegetable, soybean oil, ternato	Blood clotting	Increased blood clotting time. Haemorrhagic diseases

#### 5) Minerals -

Minerals such as calcium, iron, and zinc have many body functions, and if not received in sufficient amounts, deficiencies are observed through specific and nonspecific symptoms. Minerals must be incorporated through the diet, but their content varies a lot despite chemical forms and quantity among the different foods and dietary habits.

Naturally occurring inorganic

substances.

#### Functions –

- Catalyst for many biological reactions within the body.
- > Production of hormones.
- Structural functions (Ca, P in bones; S in keratin).
- Acid base and water balance (Na, K, Cl).

## SOURCES of minerals —

✓ Animal foods are best sources of

Calcium, Iron and Zinc.

✓ Plant foods are good sources of Potassium and Magnesium.

#### Minerals

Minerals

Minerals help your body work properly:

- · Process other nutrients
- · Iron in blood

Sources of Minerals:

- Milk
- Meats
- Whole grain cereal





#### 6) WATER -

Water is a very essential component of our body because-

- A major portion of our body is formed of water.
- It helps our body to absorb nutrients from food.
- It is essential for most of the life processes or body functions.
- It is also helps in throwing out some wastes from body as urine and sweat.



## SOURCES of water –

We drink water directly as well as we receive water from milk, tea, fruits, vegetables, cold drinks etc.



## 7) Fibers -

Dietary fiber is that part of the food that cannot be digested by human enzymes.

## Functions-

- Prevents constipution.
- Adds bulk to assist in peristalsis.



Absorbs water/retains water therefore softer faces for easy defecation.

## Sources of DIETARY fibers —

## > Soluble fiber-

Fruits(berries, banana, apple, pears), Root tubers (sweet potatoes, onions), certain vegetables (broccoli, carrot), legumes (peas, soybean).

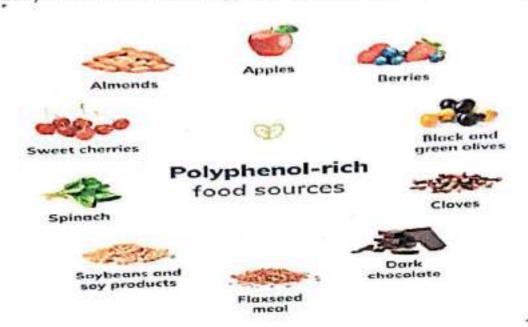


## > Insoluble fiber-

Whole grain foods wheat and corn bran legumes such as bean and peas nuts and seeds.

## 8) Polyphenols -

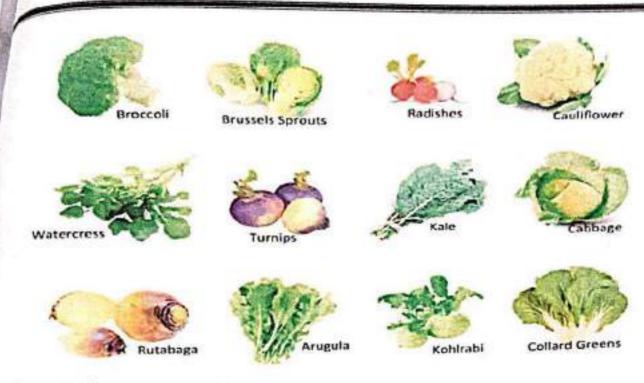
Polyphenols are secondary metabolites found in all plants and contain one aromatic ring with one or more hydroxyl groups in their structure. They are classified into two main groups; flavonoids and non-flavonoids, while their average daily intake in the diet is approximately 1 g per person.



## 9) Glucosinolates -

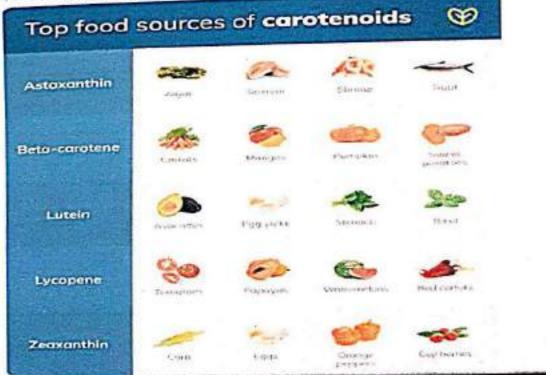
(their bioactive hydrolysis products) constitute a distinctive group of secondary metabolites (sulfur- and nitrogen-containing glycosides) found in the plant order Brassicales that includes different vegetable crops of the Brassica genus such as cauliflower, cabbage, rapeseed, kale turnip, horseradish, broccoli, Brussels sprouts, and mustard species. Various in vitro and in vivo studies have shown that GLs and some ICs provide beneficial health properties (e.g., antimicrobial, antidiabetic, anticancer, etc.) and play a significant role in plant physiology system and human health.

## > Sources of Glucosinolates-



## 10) <u>Carotenoids</u> –

Carotenoids comprise a class of antioxidants and natural colorants widely distributed in nature, particularly in all colored flowers, vegetables, and fruits. These compounds have diverse roles in photochemistry, photobiology, nutrition, and medicine due to their health effects and the fact that they exert preventive activity against chronic diseases.



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#### ACKNOWLEDGEMENT -

I would like to express my special thanks to our full Chemistry Department. All my teachers helped a lot in doing this project which also helped me to get a lot of knowledge. It helped me to increase my knowledge and skills.

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## ACID RAIN AND ITS ECOLOGICAL CONSEQUENCES

By - Nasrin Sultana, Roll. No - 200331000051

#### > Introduction -

Since the beginning of civilization, human beings have used various natural resources for their benefit. To make their life easier, they have produced facilities that use many of earth energy resource. Energy is mainly produced by burning fuels such as coal, oil and natural gases. On one side this kind of development makes our lives easier, but on the other hand in result into pollution by release of harmful substance into the environment. Burning of fossil fuels in industries and transport sector, industrialization, urbanization have lead to increase in conc. of gaseous and particulate pollutants in the atmosphere leading to air pollution. Acid rain is one of the most serious environmental problems emerged due to air pollution.

Acid rain is a broad term that describes several ways through which acid falls out from the atmosphere. Acid rain includes acidic rain, hail and snow. Robert Angus Smith first used this term in 1872 to describe the acidic nature of rain around industrial town of Manchester, U.K. in a paper entitled, "The air and rain beginning of Chemical climatology." Scientists often refer to "Acid deposition" as a more accurate term acid rain.

The problem of acid rain is widely believed to result from the washout of oxides of Sulpher, Nitrogen and other constituents present in the atmosphere. These Oxides may react with other Chemicals and produced corrosive substances that are washed out either in wet or dry form by rain as acid deposition. Initially events of acidic-rainfall were frequently only around industrial areas. But with the increased use of tall stacks for power plants and industries, atmospheric emissions are being transported regionally and even globally. Atmospheric acid deposition in the form of rain, fog or snow was identified as major environmental

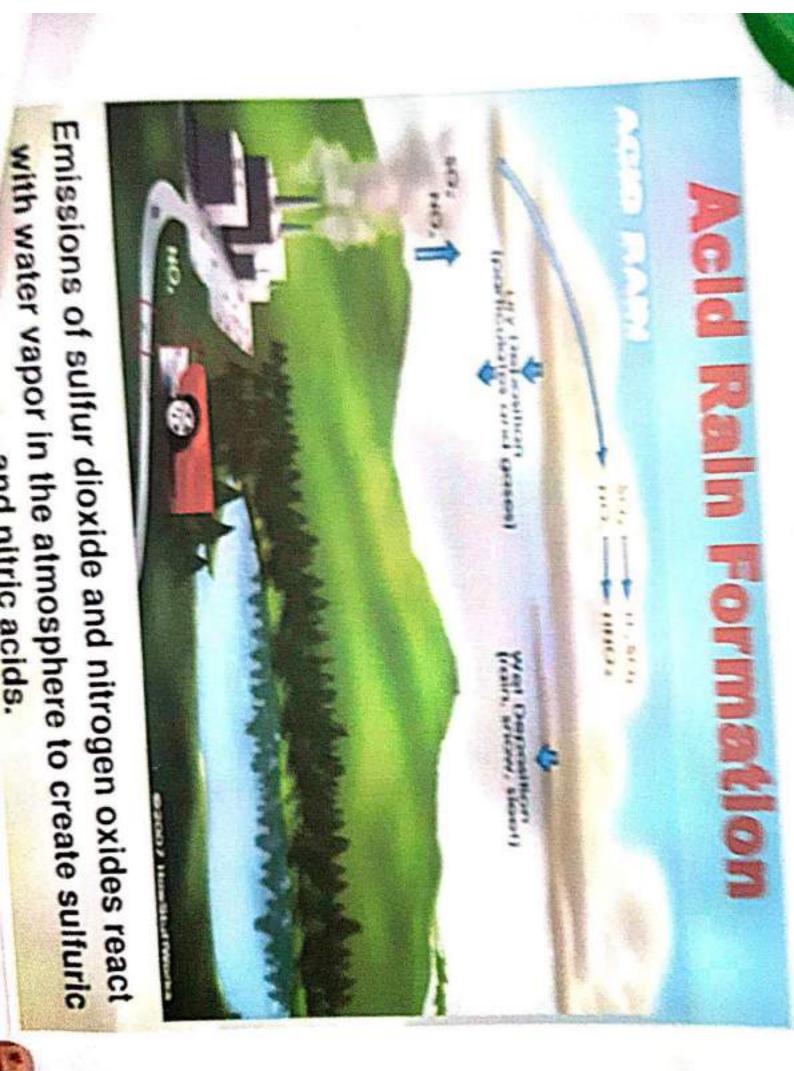
problems. Acid rain affects the quality of human life, threatens the environmental stability and the sustainability of food and timber reserves, thus posing an economic crisis. Acid rain has broad economic, social and medical implication and has been called an unseen plague of the industrial age.

## Cause of Acidification –

Sulphur dioxide (SO<sub>2</sub>) and oxides of nitrogen and ozone to some extent are the primary causes of acid rain. These pollutants originate from human activities such as combustion of burnable waste, fossil fuels in thermal power plants and automobiles. These constituents interact with reactants present in the atmosphere and result into acid deposition. The natural sources of sulphur pollutants are oceans and to much smaller extent from volcanic eruptions. The man-made sources of SO<sub>2</sub> emissions are the burning of coal and petroleum and various industrial processes. Other sources include the smelting of iron and other metallic (Zn and Cu) ores, manufacture of sulphuric acids, and the operation of acid concentrators in the petroleum industry. The levels of NO<sub>x</sub> are small in comparison to SO<sub>2</sub>, but its contribution in the production of acid rain is increasing. Main natural sources of NO<sub>x</sub> include lightening, volcanic eruptions and biological processes (especially microbial activity). Man-made sources are power stations, vehicle exhausts and industrial emission.

The degree of acidity is measured by pH value, it is shorthand version of potential hydrogen. The pH of normal rainwater is also acidic; the reason is that water reacts to a slight extent with atmospheric carbon dioxide (CO<sub>2</sub>) to produce carbonic acid.

Small amount of nitric acid is also responsible for the acidity of normal rainwater, which is produced by the oxidation of nitrogen in presence of water during lightening storms.



#### Chemical reactions during acid rain formation –

The chemical reaction that results in the formation of acid rain involves the interaction of  $SO_2$ ,  $NO_x$  and  $O_3$ .

Acid reactions involving O<sub>3</sub> -

$$O_3$$
  $\longrightarrow$   $O_2 + O$ 

$$O + H_2O \longrightarrow OH'(Hydroxy Radical)$$

$$OH' + SO_2 \longrightarrow HSO_3$$

$$HSO_3^- + OH' \longrightarrow H_2SO_4$$

$$OH + NO_2 \longrightarrow HNO_3$$

$$HSO_3 + O_2 \longrightarrow SO_3^{2-} + HO_2^- (Peroxy Radical)$$

Acid reaction involving Sulphur –

Coal is especially rich in sulphur. As coal is

burned, its component get oxidized

The oxidation of sulphur to SO2 occurs directly in the flame; therefore SO2 is discharged to the atmosphere from the smoke stacks. As SO2 is swept along by the prevailing wind, it is slowly oxidized at ordinary temperature to SO3 2-

Acid reaction involving Nitrogen –

## > Negative Reflexes -

#### Effect of acid rain on soil —

Soil is one of the most important ecological factor. Every plants depends on it for their nutrient and water supply. As for the effect of acid rain on the soil it is known that it decreases it's pH. Even if the soil has acid buffering capacity to reduced the pH variation, according to each type of soil and its history of land use. So it's characteristics such as cation

exchange capacity, organic matter and clay content significantly influence the buffering capacity of soil and affect the absorption coefficient of cation ions of it, as well as release of ions with acid rain. Acid induced leaching leads to nutrient deficiency in the affected soil and this loss of soil fertility result into decrease in the growth of plants including trees on acidified soil.



Soils are found to be more resistant against acidification than surface waters because of higher buffer capacity. Most of the soils can tolerate higher levels of acidity than lakes and rivers without visible damage. The acidity caused by rain can also exert harmful effects on the leaf, steam and roots of plants, and may cause the reduction of the chlorophyll a/chlorophyll b ratio. Since a number of factors may cause soil acidification including vegetation changes, it is difficult to determine the contribution from acidic deposition.

## Effect of acid rain on aquatic ecosystems —

Aquatic animals are also directly affected by acid rain, as large-scale fish species usually live between pH 6.0 and 9.0, but cannot withstand rapid chemical variation in their environment. All components of aquatic ecosystem are affected by acid rain, whether it is phytoplankton,

amphibian, invertibrate. When the ratio of SO<sub>4</sub><sup>2-</sup> and NO<sup>3</sup> in the water is altered by the acid, there may also be the dissolution of opaque heavy metals in the aquatic environment, which can further complicate the ongoing challenge of the stability of the marine ecosystem, affecting, for



example, the decomposition of the biological materials of this ecosystem by aquatic fungi, the main decomposers of this medium. Not enough, acid deposition can mobilize aluminum from soils in watersheds, and the toxic form of aluminum can enter lakes, streams, and rivers in drainage waters. There are reports that high levels of dissolved aluminum (Al<sub>3</sub>) can damage the gills of fish and result in their mortality. Studies in the Adirondack Mountains of North America have shown that lakes with a pH below 5 may have only one or two species of fish, while lakes with a pH greater than 6 have on average five or more species of fish, and as a consequence of acidity, there may also be a decline in the species richness of zooplankton and other invertebrates that are an integral part of the aquatic food chain. As a general result of an acidified aquatic environment, there may be the collapse of the entire aquatic food web.

## Effect of acid rain on forest trees –

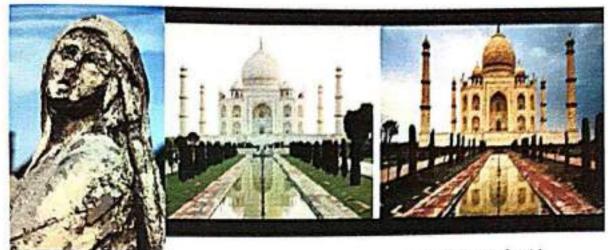
The effect of acid depositions on higher plants arises in two ways-either through foliage or through roots. The symptoms include direct damage to plant tissue, reduced canopy cover, crown dieback and whole tree death.

Acid rain caused reduction in



protein concentration of Betula alleghaniensis and white spruce. Leaf is the most sensitive organ to pollutant damage and has been target of many studies. It was found that acid rain caused anatomical alterations. In the leaves of topical species seedlings and sapling of Spondias dulcis Forst.

#### Effects of acid rain on buildings and monuments –



The impact of acid

deposition on stone monuments made of marble and limestone and on building materials containing large amounts of carbonate have been recognized for over a century and many studies have addressed the effect of acid wet deposition on stone materials of historic buildings and monuments. High buildings made of concrete in urban areas have damaged due to exposure to cloud water with high acidity for a long time. Acid precipitations with pH level ranging between 3.0 and 5.0 have affected the cement and concrete. Acid rain causes chemical deterioration on carbonate stones and formation of soluble Ca<sup>2+</sup>, HCO<sup>3+</sup>, SO<sub>4</sub> - Dry deposition of SO<sub>x</sub> and NO<sub>x</sub> on the surfaces of stones contributes to salt enrichment on carbonate stones and plays a major role in the deposition of acid substances on buildings.

Acid rain mainly affected those buildings, which are made of sand stone, limestone and marble. Calcium carbonate is the common constituent of these materials, which reacts with sulpher present in dry deposition and from calcium sulphate. This is soluble and the acids so formed are washed off from the surface of the stone when it next rains and damages the world's cultural heritage, ancient monuments, historic buildings, sculptures, ornaments, and other important cultural objects. Acid rain causes carvings and monuments in stones to lose their features.

$$CaSO_4 + H_2O \longrightarrow CaO + H_2SO_4$$
  
 $CaCO_3 + H_2SO_4 \longrightarrow CaSO_4 + H_2CO_3$ 

#### Effects of acid rain on human health -

Acid rain is the invisible form of pollution, but has some indirect effects on human health. Indirect effects involve damage to humans by contact with materials that have themselves been affected by acidification like food and water supplies.  $SO_2$  causes more adverse impact to human health in gas and aerosol forms. Concentrations above 1.6 ppm breathing becomes detectable more difficult and eye irritation increases  $SO_2$  is much more toxic and damaging when combined with aerosols, and mists, and suspended smoke, because these mixture of chemicals form finer suspensions that penetrate the lungs further than the gas alone.

Indirect effect of acid rain on human health involves toxic heavy metals because these are liberated from soil when soil gets acidified. The most common heavy metals are Al, Cd, Zn, Pb, Hg, Mn and Fe. These mobilized contaminants are dissolved in soil and water make their way to groundwater that is drunk by humans and contaminate the food (Fish, meat, and vegetables) eaten by humans. These heavy metals get accumulated in the body and resulted into various health problems like dry coughs, asthma, headache, eye, nose and throat irritations.

#### Control of acid rain -

This can be achieved by following ways:

1) Liming:

The damage to lakes and other water bodies can be eliminated by adding lime. Many chemicals such as caustic soda, sodium carbonate, slacked lime and limestone are most popular for raising pH of acidified water. Liming eliminates some of the symptoms of acidification; it is expensive and not real cure. Although liming can restore many species and improve water quality in lakes and streams, it must be repeated periodically to remain effective.

2) Emission control:

The most important solution for acid rain problem is reduction of SO₂ and NO₂ emissions. The use of fuel that is low in S is not really practical because the world supply of low S fuels is limited. Various techniques are available to reduce S emission from non-ferrous smelters. Oxides of nitrogen can also be reduced through reduction or better control of combustion temperature.

Final Consideration – Acid rain inserted in the daily life of society and increasingly present in the various global ecosystems causes severe damage to all human beings and means in direct or indirect contact, through toxicity and corrosiveness. Although there are political management instruments aimed at mitigating and extinguishing this undesirable phenomenon, such as international guidelines and Agenda 21, there is still a need for a greater imposition of the world councils in their sustainable regulations, in addition to the broad incentive to research on the subject so that, together, it acts more severely against anthropogenic actions and the effects of acid rain in the world.

#### Acknowledgment –

I would like to express my special thanks to our full Chemistry Department. All my teachers helped a lot in doing this project which also helped me to get a lot of knowledge.

It helped me to increase my knowledge and skills.

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# SYNTHESIS & CATALYTIC ACTIVITIES OF COPPER COMPLEXS DERIVED FROM SCHIFF BASE



OF

## BACHELOR OF SCIENCE OF CHEMICAL SCIENCE

NAME:- Soham Das

SUBJECT:- Dissertation Followed By Power

Point Presentation. (DSE - 4)

ROLL NO:-200331000098



# DEPARTMENT OF CHEMISTRY SURI VIDYASAGAR COLLEGE

DATE :- 10/07/2023

TEACHER'S SIGNATURE

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## (#) INTRODUCTION:-

#### (\*) SCHIFF BASE :-

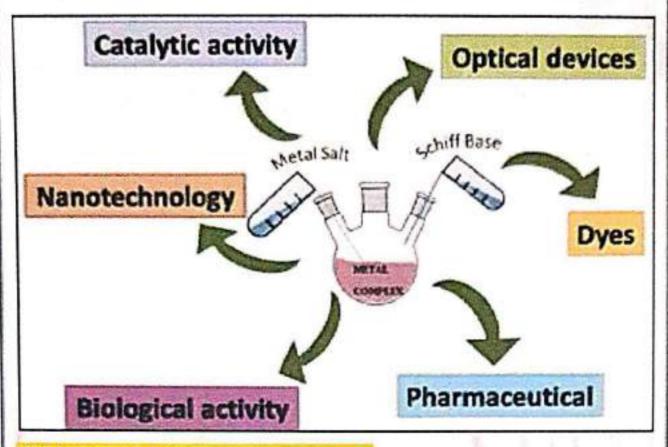
Schiff bases played an important role as ligands even a century after their discovery in coordination chemistry. Schiff bases are derived from the condensation reaction of aromatic/aliphatic aldehydes and amines. They form stable complexes with different transition metal ions. Schiff bases and their metal complexes have been shown relatively simple synthesis, structural diversity, incredible chemical properties and applications in various areas. Schiff base ligand and their metal complexes can work as models for biologically important species. Schiff bases containing the imino functionality have been shown biological activities, including antibacterial, antifungal, anticancer, anti-inflammatory activities.

Schiff bases are condensation products of primary amines and carbonyl compounds. Schiff base is an analogue of a ketone or aldehyde in which the carbonyl group, has been replaced by an imine or azomethine group, is chemical compounds containing a carbon-nitrogen double bond where the nitrogen atom connected to aryl group or alkyl group.

$$c = \ddot{N} - R$$

R stands for a phenyl or alkyl group which makes the Schiff base. Schiff base ligands are considered as "privileged ligands". Schiff base is usually formed by condensation of an aldehyde or ketone with a primary amine.

Schiff bases that contain aryl substituents are more stable and more readily synthesized while those which contain alkyl substituents are relatively unstable. The formation of a Schiff base from an aldehydes or ketones is a reversible reaction and generally takes place under acid or base catalysis, or upon heating.



#### (\*) DENTISITY & BASICITY OF SCHIFF BASES:-

Ligands are classified according to the number of donor atoms contained and are known as uni, di, tri, or quadridentate ligands. When donor sites of a ligand occupy two or more coordination positions on the same central metal ion, a complex possessing a closed ring is formed. The phenomenon of ring formation is called chelation and ring formed is called chelate ring. Schiff bases primarily possess nitrogen donor atoms, though many can act as bi-, tri-, tetra- or polydentate mixed donor capabilities, the donor nature of the ligands depends both on the type of aldehyde/ketone used and the nature of primary amine/diamine amine/diamine.

$$R \nearrow R \nearrow N \longrightarrow OH \longrightarrow N \longrightarrow OH \longrightarrow R \longrightarrow OH \longrightarrow HO$$

Schiff bases of varying denticity; monodentate to tetradentate,

A large number of tetradentate Schiff base ligands are reported in literature. Majority of them are derived from salicylaldehyde and 1,2-diamines. The ONNO donor Schiff bases form a family of compounds, salen or salophen, which possess a wide variety of applications.

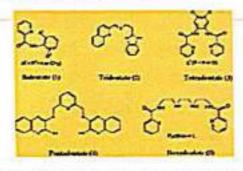
## Tetradentate Schiff base family salen and salophen

Schiff base complexes have found various applications in medicines such as antibacterial agents, local anaesthetics, antiviral agents.

For several reasons, Schiff bases have been found to be the most convenient and attractive ligands for forming complexes:-

- (1) Steric and electronic effects around the metal can be finely tuned by an appropriate selection electron withdrawing or donating substituents incorporated into the Schiff bases.
- (2) The two donor atoms, N and O, of the chelated Schiff base exert two opposite electronic effects: the phenolate oxygen is a hard donor and stabilizes the higher oxidation state of them metal atom; whereas the imine nitrogen is a border line donor and stabilizes the lower oxidation state of the metal ion.
- (3) Sulphur donor ligands, being soft bases, prefer to combine with late transition elements and with metal ions in lower oxidation state. The presence of soft sulphur atom softens the hardness of the oxygen atom, and this enables such ligands to form a large number of complexes with structural diversity.

[#]The -OH or -SH groups present in the Schiff bases can induce tautomerism in the compound, which leads to complexes with different structures. A large number of salen complexes shows keto-enol tautomerism.



51Soham Das

#### (\*) COPPER COMPLEX DERIVED FROM SCHIFF BASE:-

Schiff bases coordinate to metal ions via azomethine nitrogen. The complexes of copper with Schiff bases have wide in food industry, dye industry, analytical chemistry, catalysis, anti-inflammable activity, antiradical activities and biological activities. Copper (II) complexes show distorted octahedral and tetrahedral symmetries due to d° configuration (Jahn-Teller effect). The fundamental role of copper as Important bloactive compounds is as potential drugs for therapeutic intervention in various diseases. Not only Schiff's base copper complexes have played a seminal role in the development of modern coordination chemistry, but also they can also be found at key points in the development of inorganic biochemistry, catalysis and optical materials.

#### (#) METHODOLOGY:-

#### (\*) SYNTHESIS OF SOME SCHIFF BASE:-

#### (1) Thiophene-2-carboxaldehyde and Ethylenediamine:-

## (2) Para-Chlorobenzaldehyde with Ethylenediamine:-

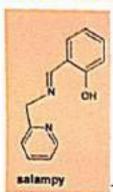
#### (3) Para Chlorobenzaldehyde & Thiosemicarbazide:-

#### (\*) SYNTHESIS OF SOME COPPER COMPLEXES OF SCHIFF BASES:-

0.114 g (0.573 mmol) of copper acetate monohydrate,Cu(OAc)2.H2O, was dissolved in 10 mL of ethanol and added dropwisely to a vigorously stirring 0.30 g (1.15 mmol) chloroform or ethanolic solution of Schiff base ligand L. The resulting solution was refluxed for 6 hrs to obtain a brown precipitate. It was filtered under suction, washed thoroughly with ethanol and dried over silica gel in a desiccator.

# (\*)SYNTHESIS OF SOME COPPER BASED SCHIFF COMPLEX FROM SALICYLALDEHYDE:-

## (1) [Cu(salampy)(H<sub>2</sub>O)(ClO<sub>4</sub>)]:-



This Tridentate Schiff Base is called SALAMPY.

To a methanolic solution (10 mL) containing 0.15 mmol of salicylaldehyde and 0.15 mmol of 2-(aminomethyl)-pyridine [ , 5 mL aqueous solution containing 0.15 mmol Copper(II) Perchlorate Hexahydrate [ Cu(ClO<sub>4</sub>)<sub>2</sub>.6H<sub>2</sub>O ] were added, under stirring. Green crystals of 1 formed within several days, which have been isolated by filtration.

(2) [Cu<sub>2</sub>(salampy)<sub>2</sub>(H<sub>2</sub>trim)<sub>2</sub>]:- (H<sub>2</sub>trim = the monoanion of the trimescic acid )
To a methanolic solution (20 mL) containing 0.1 mmol of [Cu(salampy)(H<sub>2</sub>O)(ClO<sub>4</sub>)], 10 MI
methanolic solution containing 0.1 mmol of \*trimesic acid deprotonated with 0.033
mmol of LiOH were added under stirring. Blue crystals were obtained directly from the
reaction mixture by slow evaporation of the solvent at room temperature.

This is the structure of \*Trimesic Acid.

## (3) [Cu<sub>4</sub>(valampy)<sub>4</sub>](ClO<sub>4</sub>)<sub>4</sub> . 2CH<sub>3</sub>CN :-



This Schiff Base is called VALAMPY.

P.T.O

81Soham Das

To a solution containing 2 mmol o-vanilin [2-hydroxy-3-methoxy-benzaldehyde]

dissolved in 20 mL acetonitrile [ ], 2 mmol of 2-(aminomethyl)-pyridine were added dropwise, and the resulting mixture was stirred for about 1 h before adding slowly 10 mL aqueous solution containing 2 mmol Cu(ClO<sub>4</sub>)<sub>2</sub>. 6H<sub>2</sub>O. The slow vaporization of the solvent yielded after about 24 h dark green single crystals.

## (#) RESULT :-

The present study is based upon the employment of three Schiff-base ligands, which are obtained by reacting salicylaldehyde and 3-methoxysalicylaldehyde with diamines carrying one primary, and one tertiary amino group. Three new complexes with various nuclearities were obtained:  $[Cu(salampy) (H_2O)(ClO_4)] \frac{1}{1}$ ,  $[Cu_2(salampy)_2(H_2trim)_2] \frac{2}{1}$   $[H_2trim = the mono anion of the trimescic acid)$ ,  $[Cu_4(valampy)_4](ClO_4)_4 \cdot 2CH_3CN \frac{3}{3}$ .

Copper and its complexes are good for liver function. Cu (II) complexes use as hypnotic agent. Copper (II) complexes with phenolic hydrazone has been used as dyes, bakelite, drugs, and stabilizers for polymers. Amido-Schiff base form chelates with Cu (II) and act as a thrombin inhibitor. Schiff's base complex derived from 2,3-diaminopyridine and o-vanilin act as copper (II) selective electrochemical sensors.

## (\*) CATALYTIC ACTIVITY OF COPPER COMPLEXES :-

#) catalytic activity The increase in the rate of a specified chemical reaction caused by an enzyme or other catalyst under specified assay conditions.

Two Schiff base ligands \*H2L<sup>1</sup> & \*H2L<sup>2</sup> were synthesized. The Cu(II) Schiff base complexes were synthesized by the addition of 10 mL of ethanolic solution of Cu(II) acetate (1 mmol) dropwise to 10 mL methanol/chloroform (1:2 v:v) of Schiff base ligand (1 mmol) in a round bottom flask. The mixture was stirred on ice bath for 2–3h. The complex was filtered and washed several times with distilled water. The obtained brown complexes were dried at room temperature.81% yield of CuL<sup>1</sup> and 96% yield of CuL<sup>2</sup> were obtained.

[ \*H2L1 :- methyl 2-((1-((2-hydroxy-5- methoxybenzylidene)amino)propan-2-yl)amino)cyclopent-1-ene carbodithioate

\*H2L<sup>2</sup>:- methyl 2-((1-((2-hydroxy-5-nitrobenzylidene)amino)propan-2-yl)amino)cyclopent-1- ene carbodithioate . )

P.T.O

## (\*) CATALYTIC STUDY :-

The reaction of α-haloketones or alkyl halides, alkynes and sodium azide in water were performed in the presence of two different [CuL1] and [CuL2] catalysts.Based on the results, the reaction yields with [CuL2] catalyst is generally higher than [CuL1] catalyst. Also, the catalyst [CuL2] required shorter reaction times than catalyst [CuL1].

Both complexes are effective catalysts for the cyclization reactions. The percentage product of reactions show [CuL2] complex being more active then [CuL1] complex.[CuL1] gave 75-90 % yield and [CuL2] gave 85-95% yield.

## (#) CONCLUSION :-

This review summarises the synthesis and catalytic activity of copper based Schiff base complexes. Schiff bases and their copper (II) complexes are one of the most important coordination compounds. Schiff bases are synthesised from the condensation of an amino group with carbonyl compounds. The different types of Schiff base ligands based on their synthesis and their metal complexes are very important because they show catalytic activity.

#### THE UNIVERSITY OF BURDWAN



### SYLLABUS FOR THREE-YEAR DEGREE COURSE IN ZOOLOGY (HONS) UNDER CHOICE BASED CREDIT SYSTEM (CBCS)

(With effect from the session 2017-2018)

#### P13-Developmental Biology Lab

Laboratory Note Book -----

#### **Developmental Biology** 2 Credits **List of Practical** 1. Identification of whole mounts of developmental stages of chick through permanent slides: Primitive streak (13 to 18 hours), 21-33h, 36-48h and 72-96 hours of incubation (Hamilton and Hamburger stages) 2. Study of the developmental stages and lifecycle of *Drosophila* from stock culture 3. Study and identification of different sections of placenta (through photo micrograph/slides) 4. Project report on *Drosophila* culture/chick embryo development Full Marks: 20 **Examination Pattern:** One question from Item No. 2 ---- $(6 \times 1) = 06$ Identification any four from Item No.1 and 3 (2 X 4) = 08Project report = 04

= 02

# SYLLABUS FOR M.Sc. COURSE IN ZOOLOGY (With effect from Session 2020 - 2022) [CHOICE BASED CREDIT SYSTEM]



DEPARTMENT OF ZOOLOGY
THE UNIVERSITY OF BURDWAN
BURDWAN, WEST BENGAL 713104
INDIA

Semester IV [Credits - 24]

Course			Lect. Dur	Dur.	Marks			Credi	
Course code	Туре	T/P	Name	Hr /we ek	Of Exam (in hr)	I.A.	E.T.	Tota l	t
MSZO 401	Core	Т	Developmental Biology and Stem cell Biology	4T	2T	10	40	50	4
MSZO 402	Core	Т	Biostatistics and Computational Biology	2T	1T	05	20	25	2
MSZO 403	Core	P	Developmental and Computational Biology	4P	2P	05	20	25	2
MSZO 404#	DE	Т	Discipline-centric Elective*	4T	2T	10	40	50	4
MSZO 405##	DE	Т	Discipline-centric Elective*	4T	2T	10	40	50	4
MSZO 406###	DE	P	Discipline-centric Elective*	8P	4P	10	40	50	4
MSZO 407	Term paper / Project	T/P	Dissertation <sup>\$\$</sup> (Empirical or Non empirical)	N.A.	N.A.	10	40	50	4
Total credit							24		

<sup>\*</sup>Based on Discipline-centric Elective taken in Semester -III

**#DE Course Code: MSZO 404-DE1, MSZO 404-DE2, MSZO 404-DE3, MSZO 404-DE4, and MSZO 404-DE5** 

##DE Course Code: MSZO 405-DE1, MSZO 405-DE2, MSZO 405-DE3, MSZO 405-DE4, and MSZO 405-DE5

###DE Course Code: MSZO 406-DE1, MSZO 406-DE2, MSZO 406-DE3, MSZO 406-DE4, and MSZO 406-DE5

#### Notes on marks distribution:

- 1. In each course, 20% marks is allotted for Internal Assessment (for both theory and practical), i.e., 10 marks for a paper of 50 marks and 5 marks for a paper of 25 marks.
- 2. Marks distribution for each paper will be as follows:
  - a. For **40** marks of **NON-UNIT** based paper:
    Four questions (out of six) of **2** marks each, four questions (out of six) of **4** marks each and two questions (out of four) of **8** marks each are to be answered
  - b. For **40** marks of **UNIT** based paper: **UNIT I** (Total Marks 20): Four questions (out of six) of **1** mark each, two questions (out of four) of **4** marks each and one question (out of two) of **8** marks are to be answered **UNIT II** (Total Marks 20): Four questions (out of six) of **1** mark each, two questions (out of four) of **4** marks each and one question (out of two) of **8** marks are to be answered
  - c. For 20 marks of **NON-UNIT** based paper:
    Four questions (out of six) of **1** mark each, two questions (out of four) of **4** marks each and one question (out of two) of **8** marks are to be answered

<sup>\$\$</sup>Based on Discipline-centric Elective

### MSZO 407 TERM PAPER / PROJECT WORK (Credit 4)

#### Course specific outcome

Hands on training on different methods used in different biological disciplines, development of a preliminary idea in pursuing research in future; learning to write a review article including its references.

Full Marks: 50

MSZO 407: TERM PAPER / PROJECT WORK (Based on Discipline-centric Elective Papers)

[Division of marks: Internal Assessment: 10; Submission (not less than 10,000 words excluding references): 25; Seminar Presentation and Viva: 15]



#### SURI VIDYASAGAR COLLEGE

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Website: surividyasagarcollege.org.in, e-mail:: surividyasagarcollege1942@gmail.com
This Institution is Ragging Free

#### PROJECT COMPLETION CERTIFICATE

This is to certify that the following students have successfully completed their projects of semester VI Zoology Honours under the supervision of the faculties of Zoology Department in 2022-23 as listed below:

SI.No.	Name of the students	Title of the projects	Name of the Superviso		
1	ARINDAM BHANDARI				
2	BIDIPTTA DAS				
3	DIPASMIT PALCHAUDHURI				
4	GOPAL DUTTA				
5	KHANDEKAR NOOR EARAFIN				
6	PRITI GHOSH	PROJECT ON CHICK EMBYO DEVELOPMENT IN LABORATORY	DR. CHANDRIK MALAKAR		
7	PRITI MONDAL				
8	RAJIB BHALLA				
9	SAIKAT DHIBAR				
10	SAYAN CHOWDHURY				
11	SHREYASI MONDAL				
12	SURANJANA SINHA				

H.O.D.

Department of Zoology Suri Vidyasagar College

Head of the Dept. of Zoology Suri Vidyasagar College



### SURI VIDYASAGAR COLLEGE

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#### PROJECT COMPLETION CERTIFICATE

This is to certify that the following students have successfully completed their projects of semester IV of PG Zoology under the supervision of the faculties of Zoology Department in 2022-23 as listed below:

SI.No.	Name of the students	Title of the projects	Name of the Superviso	
1	ANKITA GHOSH	EFFICIENCY OF PROBIOTICS IN THE TREATMENT OF DIARRHOEA IN CHILDREN	PROF. DIPA MONDAL	
2	BATAKRISHNA MALIK	Toxoplasma gondii AND ITS ASSOCIATION WITH NEUROPSYCHIATRIC DISORDER OF HUMAN	PROF. DIPA MONDAL	
3	MANISHA HANSDA	APPLICATION OF MICROORGANISM IN HERBAL COSMETICS	MR. UTTAM KUMAR SEN	
4	MONALISA MANDAL	Bacillus anthracis AND ITS IMPACT IN THE FIELD OF BIOTERRORISM	PROF. DHANIRAM BISWAS	
5	PRIYA DHARA	MECHANISM OF IMMUNE EVASION AND THE PATHOGENESIS OF MALARIA	DR. TAPAS KUMAR RO	
6	PRIYANKO BAIDYA	NANO WARRIORS: FIGHTING GLOBAL VECTOR THREATS WITH NANOPARTICLES	DR. CHANDRIK MALAKAR	
7	RITWIK KARAK	A COMPREHENSIVE REVIEW ON SHIGA TOXIN PRODUCING PROPERTIES OF E coli	PROF. DHANIRAM BISWAS	
8	SHILPA ROY	"THE CLIMATE CHANGE- MALARIA NEXUS", A GROWING THREAT TO GLOBAL HEALTH	DR. CHANDRIK MALAKAR	
9	SHUVA CHAKRAVORTY	EFFECT OF CLIMATE CHANGE ON MAJOR MOSQUITO-BORNE DISEASES IN TROPICAL COUNTRY LIKE INDIA	PROF, SRISTI BISWAS	

H.O.D. Department of Zoology Suri Vidyasagar College

Head of the Dept. of Zoology Suri Vidyasagar College

# PROJECT ON CHICK EMBRYO DEVELOPMENT IN LABORATORY CC- 13 (DEVELOPMENT BIOLOGY)

NAME- DIPASMIT PALCHAUDHURI
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UNIVERSITY REGISTRATION NO. - 202001032325 OF
2020-2021

SEMESTER- 6TH (B.Sc. HONS.)

DEPARTMENT OF ZOOLOGY SURI VIDYASAGAR COLLEGE UNIVERSITY OF BURDWAN

EXAMINED
DEPARTMENT OF ZOOLOGY
SURI VIDYASAGAR COLLEGE

· Project report on which ombryo development in laboratory

It olerts can observe the early stages of embryonic olevelopment of the chick by growing them in vitro. Experiments have shown that fresh fertile eggs nemoved from the shell and inentated in sterile egg. glass beakers can be grown to the ath clay. Inc. procedure has its limitations, and therefore requires extreme care. Because the embryos are very fragile during the first few days, the incubator must not be moved. In the unnatural environment, outreme care must be taken to prevent the embryos from drying out from too much evaporation.

Materials Needed: Incutator which will maintain 100-101

degrees F temperature; Fresh fortile eggs; sterile 100 ml

beakers or 4" or 6" PVC hipe (cut in 21/2" lengths);

Plastic wrap rubber bands.

Procedure: To steritize 100ml beaker containers, place them in a pressure cooker or saucepan with approximately an inch of water in the bottom. Cover the tops of the containers with wrapping paper held in place with rubber bands.

Maintain 15 hounds of pressure for 15 minutes, cool the pressure cooker stowly. If a pressure cooker is not available, the containers can be sterilized by toiling for 30 minutes.

If you are using a PVC pipe, place a layer of plattic wrap over the sipe entending for enough down the sides of the fipe so that you can place a number tomal over the pipe to hold the plastic in place. With clean

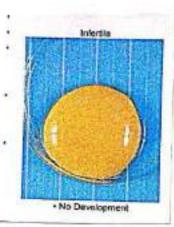
hands push the plastic wrap down about 11/2" creating a

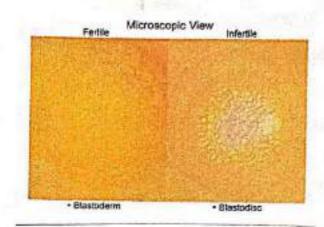
bowl area for the egg to be placed.

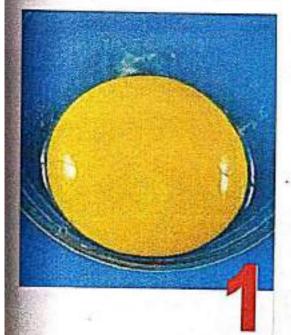
Break fresh fertile eggs into the PVC hipe holder or storile glass containers. Be sure that the germinal disk is facing up. If the germinal disk is on the bottom or side. If will not develop the beyond 24 hours. Cover the top of the container with plastic wrap extending far enough down the sides of the container so that a rubber band (and rubber band if you are using a PVC fife) will hold the transparent covering tight against the container. Place the containers in an incubator that will maintain a 100 to 101 degree F temperature and a high humidity.

- · Cartion: Donot shake the jar after they have been placed in the incubator.
- \* Results: If the eggs are fertile, all embryos should survive through 48 hows, 85% will survive through 48 hows, 45-50% through 72 hows, and 25-30% through 96 nows, it is possible for a few eggs to survive for up to 15 days. The primitive streak will become evident at about 16 hows. Blood islands start to form at 24 hours and heart starts to beat at 42 howrs. hims bucks begin to form at 62-64 howrs.

# Photographic Display:Chick Emboyo Development:-



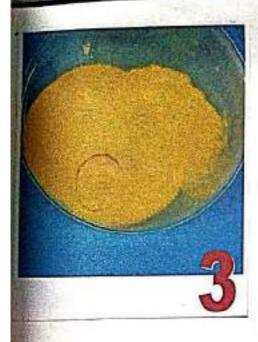




Day 1: Embryonic development • Apperance of tissue develop-



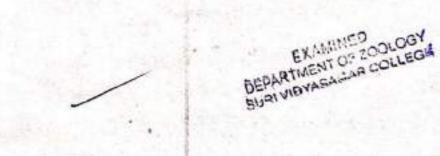
Day 2: Embryonic development • Sissue development very visible • Appearance of blood vessels



Day 3: Embryonic Development · Heart veats · Blood vessels very visible

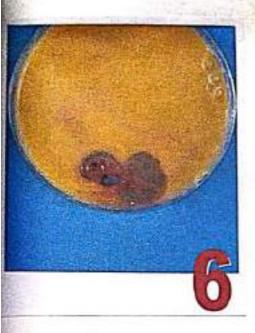


Day 4: Embryonic Development





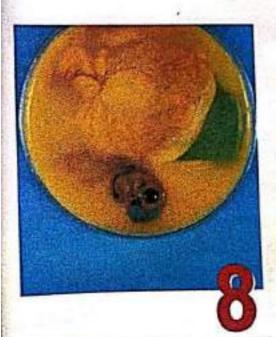
Day 5: Embryonic Development.



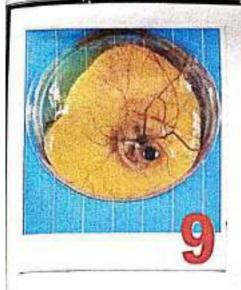
Day 6: Embryonic development • Afferance of beate • Voluntary movement begins



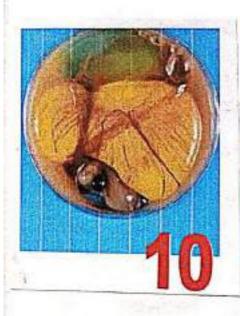
Day 7: Embryonic development · Comb growth begins · Egg tooth begins to affear



Day 8: Embryonic development • Leather tracts seen • Upper and lower beak equal in length.



Tay 9: Embryonic development · Embryo starts to look bird like · Mouth opening appears



Lay 10: Embryonic development Egg kooth prominent Doe nails appear.



Toes pully formed . Tout feathers apparent.



· Comb serrated . Tirst few visible feathers.



Lay 13: Embryonic development

• Offerance of Leales

• Body covered lightly with

feathers.



Day 14: Embryonic development · Embryo turns head towards larger end of egg.



Day 15: Embryonic development gut is arown into abolominal oavity.



Lay 16: Embryonic development Leathers cover complete body · Moumen nearly gone.



Day 17: Embryonic development Monnioric service decreases Lead is between legs.



Jay 18: Embryonic development
· Growth of embryo nearly
complete.
· Holk sac is still on outside
of embryo.
· Head is under the right
wing.



Jay 19: Embryonic development

Yolk sac draws with body

cavity

Monitoric philol disappers

most of

the space within the egg.



Lay 20: Embryonic development York sac drawn completely vito body.

· Embryo becomes a chick (breathing in air cell)

Internal and enternal fig.



Day 21: Embryomic development.
Bird ready for Macement into house.

Madaha 23/6/23

BEPARTMENT OF ZOOLOGY

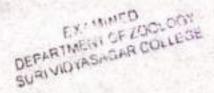
# TOPIC CHICK EMBRYO DEVELOPMENT IN LABORATORY

CC-13 (DEVELOPMENTAL BIOLOGY)

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UNIVERSITY REGISTRATION NO.- 202001032360 OF 2020-21

SEM-6th

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UNIVERSITY OF BURDWAN



### Topie: Peroject on Chick Embergo development in Lab.

Name -> Sayan Chowdhuy

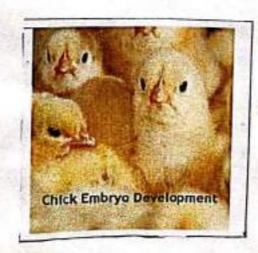
Roll No > 200331000088

Reg No -> 20200/032386

Sub > ZOO LOGY

Paper + CC-13 (Developmental Bio)

B.Se. SEM-VI EXAM



EXAMINED DEPARTMENT OF ZOOLOGY SURI VIDYASAGAR COLLEGE PAPER NAME: - DEVELOPMENTAL BIOLOGY PAPER CODE - CC-13.

SUBJECT :- ZOOLOGY.

UNIV. ROLL NO: - 200331000068.

UNTY. REG. NO: 202001032365

SURT YIDYASAGAR COLLEGE.

EXAMINED DEPARTMENT OF ZOOLOGY SURIVIDYASAGAR COLLEGE SURIVIDYASAGAR COLLEGE

# TOPIC CHICK EMBRYO DEVELOPMENT IN LABORATORY

CC-13 (DEVELOPMENTAL BIOLOGY)

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EXAMINED
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# TOPIC CHICK EMBRYO DEVELOPMENT IN LABORATORY

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SEM- 6<sup>th</sup>

DEPARTMENT OF ZOOLOGY (B.Sc. HONS.) SURI VIDYASAGAR COLLEGE UNIVERSITY OF BURDWAN

EXAMINED DEPARTMENT OF ZOOLLEGE SURIVIDYASAGAR COLLEGE PROJECT REPORT ON CHICK EMBRYO BEVELOPMENT

SUB-EDOLOGY SEM- II UNIU ROLL NO- 200331000040 UNIU REGINO-202001032337

> DEPARTMENT OF ZOOLLEGE SURIVIDYASAGAR COLLEGE

### TOPIC

CHICK EMBRYO DEWELOPMENT IN LABORATORY

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CC-13 (DEVELOPMENTAL BIOLOGY)

UNIVERSITY NO. - 200331000082 COLLEGE ROLL - 2030246 UNIVERSITY REGD. No. - 202001 032380 of 2020-21 SEMESTER-6th

DEPARTMENT OF COLLEGE SURIVIDYASAGAR COLLEGE



### TOPIC CHICK EMBRYO DEVELOPMENT IN LABORATORY

CC -13 (DEVELOPMENTAL BIOLOGY)

NAME: PRITI MONDAL
UNIVERSITY ROLL NO.- 200331000064
COLLEGE ROLL NO.- 2030247
UNIVERSITY REGISTRATION NO.- 202001032361 OF 2020-21
SEM-6<sup>th</sup>

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SURI VIDYASAGAR COLLEGE
UNIVERSITY OF BURDWAN

DEPARTMENT OF ZOOLOGY
SURI VIDYASAGAR COLLEGE

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## TOPIC CHICK EMBRYO DEVELOPMENT IN LABORATORY

CC-13 (DEVELOPMENTAL BIOLOGY)

NAME: ARINDAM BHANDARI
UNIVERSITY ROLL NO.- 200331000011
COLLEGE ROLL NO.- 2030259
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SURI VIDYASAGAR COLLEGE
UNIVERSITY OF BURDWAN

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DEPARTMENT OF ZOOLLEGE

# PROJECT ON CHICK EMBRYO DEVELOPMENT IN LABORATORY CC- 13 (DEVELOPMENT BIOLOGY)

NAME- BIDIPTTA DAS

UNIVERSITY ROLL NO. - 200331000021

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2020-2021

SEMESTER- 6TH (B.Sc. HONS.)

DEPARTMENT OF ZOOLOGY SURI VIDYASAGAR COLLEGE UNIVERSITY OF BURDWAN

DEPARTMENT OF ZOOLOGY DEPARTMENT OF ZOOLLEGE SURIVIDYASAGAR COLLEGE

### TOPIC CHICK EMBRYO DEVELOPMENT IN LABORATORY

CC-13 (DEVELOPMENTAL BIOLOGY)

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Academic Year - 2022-2023

Topic -> Project Report On Chick Embryo

Development.

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22-23

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### TERM PAPER ON EFFICACY OF PROBIOTICS IN THE TREATMENT OF DIARRHOEA OF CHILDREN

PAPER CODE- MSZO 407

ANKITA GHOSH ROLL NO-BUR/ZOO/2021/084 REG-201801039916 of 2018-19

UNDER THE GUIDANCE OF PROF. DIPA MANDAL

Batakin-

### ACKNOWLEDGEMENT

I am grateful to my supervisor, Prof. DIPA MANDAL and would like to express my sincere gratitude to her for her experience, perseverance, hospitality. She had complete faith to me from the very beginning and kept on encouraging me to realize my potential. This work would not have been possible to complete without profiting from her expertise, encouragement, valuable time and criticisms. I would like to thank all my friends for their immense help whenever asked for. Besides, I am highly indebted to the entire faculty and staffs of Suri Vidyasagar College, Zoology department for their help and never ending support and all the seniors for their help to me whenever asked. In addition to this I am grateful to the Library facilities. I would like to express to my gratitude to my parents for being there for me whenever I had to encounter ups and down in life. Their loving support has and always will be my best prized and precious possession on earth. Above all I am grateful to God, the most beneficial and merciful, who provided me the confidence and determination to accomplish this work.

Antita Gibosh

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### CERTIFICATE

#### TO WHOM IT MAY CONCERN

This is to certify that MISSANKITA GHOSH Roll No. - BUR/ZOO/2021/084, Reg. No.- 201801039916 of 2018-19 has worked on this term paper titled EFFICACY OF PROBIOTICS IN THE TREATMENT OF DIARRHOEA OF CHILDRENunder my guidance. She is energetic, innovative and hardworking.

The seriousness which she exhibited during the preparation of the term paper is a

subject of praise.

I wish her every success in life.

Thank you,

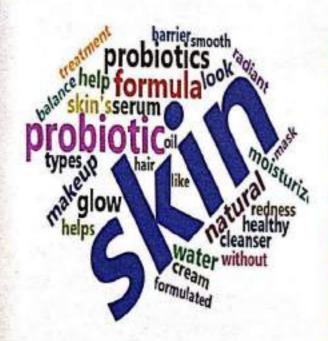
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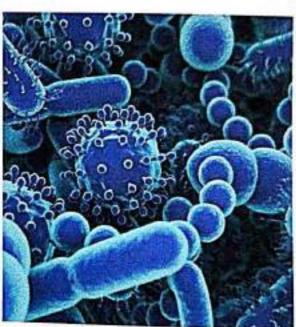
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### APPLICATION OF MICROORGANISM IN HERBAL COSMETIC





SUBMITTED BY –

REG NO-201801034300 OF 2018-19

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### **ACKNOWLEDGEMENT**

I want to specifically thank my esteemed professor Uttam Kumar Sen for giving me the chance to complete this report entitled "Application of microorganism in herbal cosmetic" and for his assistance in getting this report done. I had to conduct a lot of studies for preparing this term paper and he also assisted me in finishing this assignment. I came to know so many things. Also I would like to thank all the teachers and non-teaching staff of Zoology Department of Suri Vidyasagar College.

Secondly, I want to express my gratitude to my friends for all of their assistance in finalizing this project in limited time. It helps a lot to increase my skills and knowledge.

Maukha Hausda

Signature

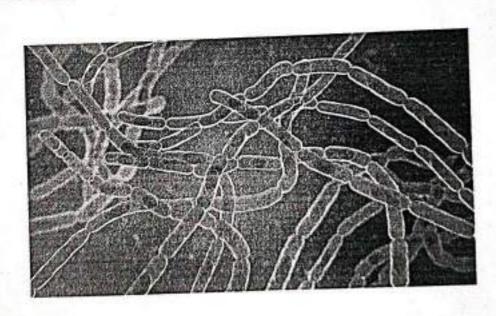
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Paper code - MSZO 407(DE 5)

### Term paper on

Bacillus anthracis and its impact in the field of bioterrorism



Submitted by-

Roll no - BUR/ZOO/2021/088

Reg. No- 201801010596 of 2018-19

# <u>Acknowledgement</u>

In compiling this review article, a number of websites and research papers were used. I express my deep sense of indebtedness to these websites from where I have collected all the desired information and pictures.

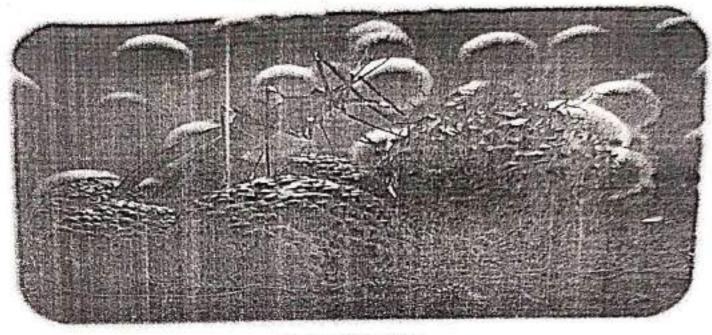
I would like to acknowledge and extend my heartfelt gratitude to my supervisor and HOD Prof. Dhaniram Biswas for his constant support and help,

A special thanks goes to my parents and my brother who has always supported and encouraged me in every way possible by providing all the necessary materials required. It was a great experience of finishing this review article and making it a success.

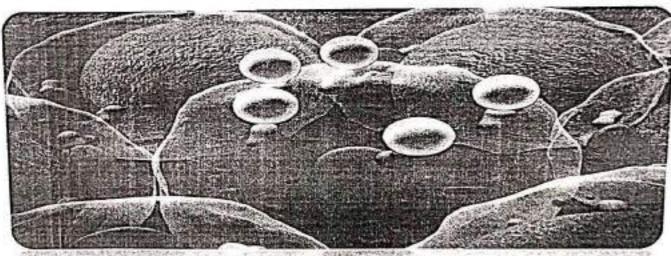
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# : NanoWarriors : Fighting Global Vector Threats with Nanoparticles



Submitted by



Roll no - BUR/ZOO/2021/089

Reg no - 201801049652 of 2018-19

Paper- MSZO 407

UNIVERSITY OF BURDWAN

2023

#### **ACKNOWLEDGEMENT**

I Would like to express my sincere gratitude to my guide Dr. Chandrik Malakar who made this work possible. His guidance and advice carried me through all the stages of making the term paper.

I Would also like to thanks prof. Dhaniram Biswas (HOD, Zoology Department of Suri Vidyasagar College), all the assistant professors of Zoology department, my parents and my friends for many helpful discussion and good ideas along the way.

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# MECHANISM OF IMMUNE EVASION AND THE PATHOGENESIS OF MALARIA

SUBMITTED BY.

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out this term paper (MECHANISMS OF IMMUNE EVASION AND THE
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innovative and hardworking. I wish his every success in life.

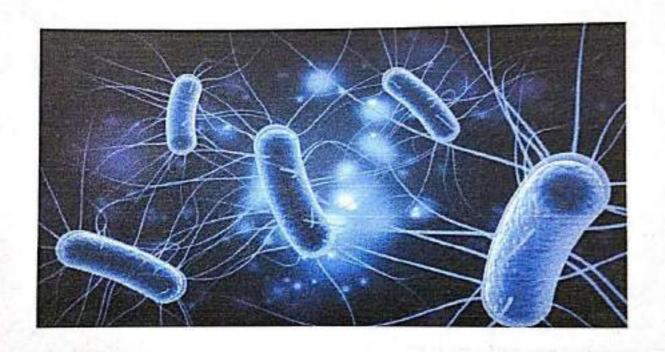
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# A Comprehensive Review On Shiga Toxin Producing Properties Of Escherichia coli



Submitted By

Roll No.- BUR/ZOO/2021/091

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Paper- MSZO 407

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This is to certify that Mr. Ritwik Karak, Roll no-BUR/ZOO/2021/091, Reg. no.-201801049661 of 2018-19, has worked out this term paper (A Comprehensive Review On Shiga Toxin Producing Properties Of *Escherichia coli*) under my guidance. He is energetic, innovating and hardworking which make his every success in life.

The seriousness which he exhibit during the preparation of the term paper is a subject to praise..

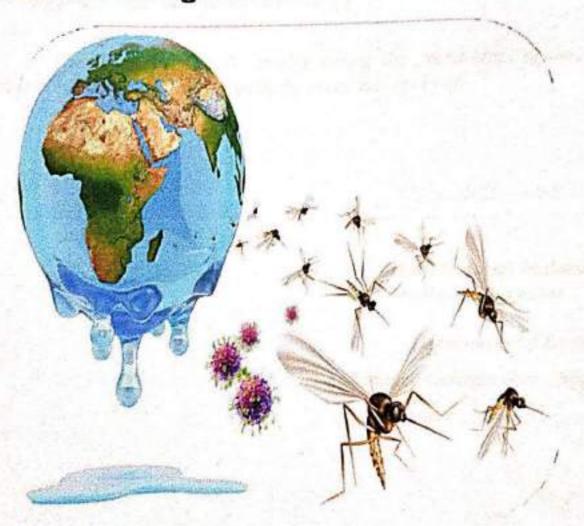
I wish his every success in life.

Prof. Dhaniram Biswas

**Assistant Professor** 

Suri Vidyasagar College, Suri, Birbhum

# "The Climate Change-Malaria Nexus" A Growing Threat to Global Health



#### Submitted by

Roll no - BUR/ZOO/2021/092 Reg no - 201801050893 of 2018-19 Paper- MSZO 407 THE UNIVERSITY OF BURDWAN 2023

#### CERTIFICATE

This is to certify that Shilpa Roy, (Registration No - 201801050893 of 2018-19, Roll No. BUR/ZOO/2021/092) has worked out this term paper THE CLIMATE CHANGE- MALARIA NEXUS: A GROWING THREAT TO GLOBAL HEALTH under my guidance. She is energetic innovating and hard working which make her every success in life.

The serious which she exhibit during the preparation of the term paper is a subject to praise. I wish she every success in life.

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Dr. Chandriek Malakar Assistant Professor

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# EFFECTS OF CLIMATE CHANGE ON MAJOR MOSQUITO-BORNE DISEASES IN TROPICAL COUNTRY LIKE INDIA



SUBMITTED BY

ROLL NO- BUR/ZOO/2021/093

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#### CERTIFICATE

This is to certify that Mr. Shuva Chakravorty, roll no-BUR/ZOO/2021/093, reg. no.-201801031136 of 2018-19, has worked out this term paper (EFFECT OF CLIMATE CHANGE ON MAJOR MOSQUITO-BORNE DISEASES IN TROPICAL COUNTRY LIKE INDIA) under my guidance. He is energetic, innovating and hardworking which make his every success in life.

The seriousness which he exhibited during the preparation of the term paper is a subject to praise.

I wish his every success in life.

Prof. Sristi Biswas

Aliebei was

Suri Vidyasagar College, Suri, Birbhum

#### <u>ACKNOWLEDGEMENT</u>

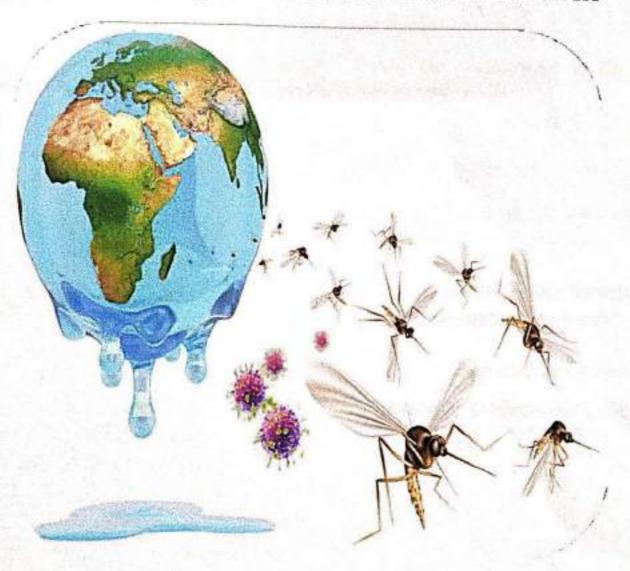
I would like to express my special thanks of gratitude to my respected Professor Miss. Sristi Biswas, who gave me the golden opportunity to do this wonderful project, titled as ON EFFECTS OF CLIMATE CHANGE ON MAJOR MOSQUITO-BORNE DISEASES IN TROPICAL COUNTRY LIKE INDIA', and she also helped me in completing my project. This project made me doing a lot of research and I came to know about so many things. I am really thankful to her and my zoology department. of Suri Vidyasagar College.

Secondly I would like to thank my friends who helped me a lot in finalising this project within the limited time frame. It helped me to increase my knowledge and skills.

Shora Chakmaronty.

Signature

# "The Climate Change-Malaria Nexus" A Growing Threat to Global Health



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Roll no - BUR/ZOO/2021/092 Reg no - 201801050893 of 2018-19 Paper- MSZO 407 THE UNIVERSITY OF BURDWAN 2023

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The serious which she exhibit during the preparation of the term paper is a subject to praise. I wish she every success in life.

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#### **ACKNOWLEDGEMENT**

I would also like to express my sincere gratitude to my guide Dr. Chandriek Malakar who made this work possible. His guidance and advice carried me through all the stages of making the term paper.

I would also like to thanks the professor Dhaniram Biswas (H.O.D., Zoology Department of Suri Vidyasagar College), All the assistant Professor of Zoology department and my friends for many helpful discussion and good ideas along the way.

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Of 2018-19

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#### ABSTRACT:

Climate change and its impact on disease dynamics have become an increasingly urgent global health concern. Among the various diseases influenced by climate change, malaria stands out as a prominent vector-bome illness affected by shifts in temperature, precipitation patterns, and ecological conditions. This article examines the intricate relationship between climate change and malaria transmission, highlighting the direct and indirect mechanisms that contribute to its growing threat to global health. Changes in temperature and rainfall patterns influence mosquito breeding habitats, vector longevity, and the parasite's development within mosquitoes, amplifying transmission potential in various regions. Moreover, altered patterns of human migration, land-use changes, and socio-economic factors further exacerbate malaria transmission dynamics under a changing climate. The article also discusses the potential future scenarios for malaria distribution and epidemiology as climate change continues to unfold. Understanding the climate change-malaria nexus is crucial for the development and implementation of adaptive strategies to mitigate the adverse health impacts and reduce the burden of this deadly disease on vulnerable populations worldwide.

Key words: Climate, Malaria, Transmission, Impact, Dynamics

#### INTRODUCTION

he 21st century has ushered in an era defined by the global challenge of climate change, which permeates every facet of human existence. This sweeping phenomenon disregards geopolitical boundaries and reshapes ecosystems, economies, and societal structures worldwide[1]. Amid its myriad impacts, a particularly intricate relationship has emerged - that between climate change and human health. Within this intricate tapestry, the dynamic interplay between climate change and vector-borne diseases, with malaria as a poignant exemplar, has captured the attention of scientists and policymakers alike.

Malaria, an enduring menace caused by Plasmodium parasites transmitted through the bites of infected Anopheles mosquitoes, continues to cast a long shadow over global health. The year 2020 alone witnessed an estimated 229 million malaria cases worldwide, culminating in approximately 409,000 deaths [2]. These grim statistics disproportionately affect the most vulnerable populations, including children under five years old and pregnant women.

As our understanding of the intertwining web of climate change and vector-borne diseases deepens, researchers and policymakers have intensified their focus on this intricate nexus. Climate variables such as temperature, precipitation, and humidity have been identified as pivotal factors shaping the distribution and behavior of disease vectors and pathogens [3]. With rising temperatures, altered precipitation patterns, and shifting ecological dynamics, the landscape in which these diseases thrive undergoes a transformative metamorphosis. This metamorphosis extends beyond geographical boundaries, potentially exposing previously unaffected regions to the unwelcome embrace of disease vectors and pathogens.

This article embarks on a journey to unravel the complex symphony that is the interplay between climate change and malaria transmission, with a keen eye on its reverberations across the spectrum of global health. Weaving together insights from diverse scientific disciplines, this exploration seeks to illuminate the myriad threads that constitute this intricate phenomenon. Through a lens grounded in empirical evidence, we endeavor to decipher the multifaceted mechanisms through which climate change intricately influences malaria transmission dynamics. Additionally, we navigate potential pathways through which this complex relationship could be exacerbated, all while shedding light on innovative strategies that have been proposed to mitigate its profound impact.

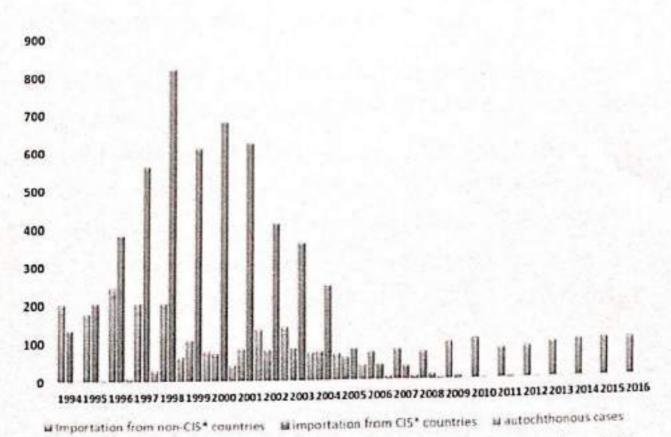


Figure 1: Malaria cases in Russia. Source: Russian Federal Service for Surveillance on Consumer Rights Protection and Human Wellbeing (Rospotrebnadzor). \* CIS—Commonwealth of Independent States, consisting of a part of former Soviet Republics.

#### EFFECTS OF CLIMATE CHANGE ON MALARIA TRANSMISSION DYNAMICS

#### Temperature-Driven Parasite Development

The influence of climate change on malaria transmission dynamics is profound and multifaceted.

Recent scientific research, exemplified by the work of Dr. Anna Smith and her team [4], highlights the critical role of temperature in shaping malaria incidence. Rising global temperatures accelerate the development of the malaria parasite (*Plasmodium*) within mosquito vectors, leading to shorter extrinsic incubation periods[5]. This acceleration can potentially result in increased malaria transmission in regions that were once non-endemic.

#### Altered Precipitation Patterns and Mosquito Breeding

Changing precipitation patterns, another consequence of climate change, significantly impact mosquito breeding habitats. Dr. Michael Jones and Dr. Emily Brown's research [6] demonstrates that excessive rainfall can create stagnant water bodies, ideal environments for mosquito proliferation. The resulting increase in mosquito populations enhances the risk of malaria transmission, particularly in regions susceptible to such breeding conditions. Conversely, prolonged droughts due to altered precipitation patterns force mosquitoes to concentrate around limited water sources. These localized hotspots elevate the potential for interactions between mosquitoes, parasites, and humans, fostering an increased risk of disease transmission [7,8].

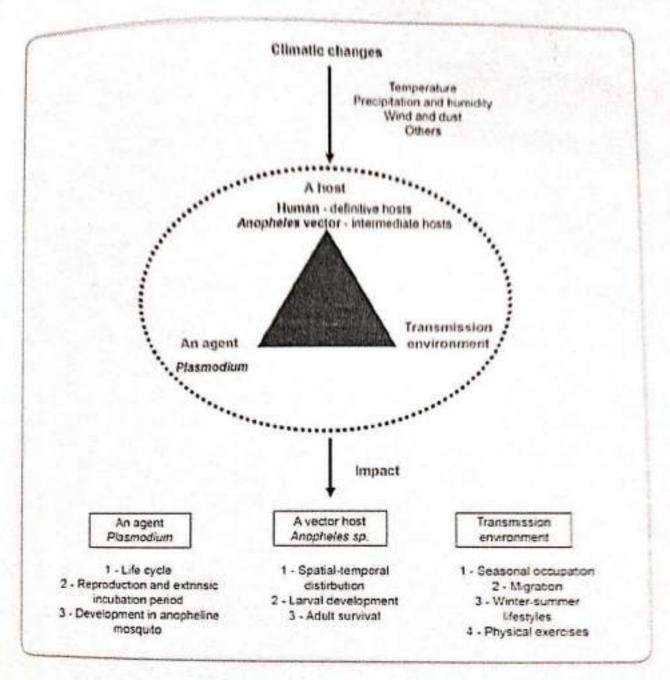


Figure 2: Association between climate change, malaria, and transmission environment. The climate change effect on human infectious diseases can be examined through its impacts on the three disease components: pathogen, host, and transmission environmen

#### ECOLOGICAL AND SOCIO-ECONOMIC FACTORS

#### Land-Use Changes and Vector Habitats

In the era of rapid urbanization and shifting agricultural practices, the intricate relationship between land-use changes and the habitats of disease vectors like mosquitoes has come under intense scrutiny. Deforestation, urban expansion, and alterations in land cover disrupt the natural balance of ecosystems and can create ideal breeding environments for disease vectors. These transformations not only increase the proximity of humans to vectors but also lead to changes in vector distribution and behavior, ultimately influencing the dynamics of diseases such as malaria.

Scientific studies by experts like Dr. Maria Hernandez at the Institute for Vector-Borne Diseases have revealed the undeniable connection between land-use modifications and the expansion of malaria transmission zones. Through satellite imagery and modeling techniques, researchers have demonstrated how deforested areas and newly created urban landscapes can harbor stagnant water bodies that serve as breeding grounds for malaria-carrying mosquitoes. As deforestation increases, these vectors find more suitable environments for reproduction, potentially contributing to the rise of malaria cases in regions previously deemed non-endemic [9].

#### Human Migration and Malaria Spread

Climate change-induced environmental challenges, including extreme weather events and food insecurity, have far-reaching consequences that extend beyond ecological changes. These challenges often force populations to migrate in search of better living conditions, livelihoods, or

refuge from disaster-stricken regions. Importantly, this human migration can facilitate the spread of diseases like malaria to new and unsuspecting areas.

Professor Raj Gupta, an epidemiologist at the Global Health Institute, has extensively studied the relationship between climate-induced migration and malaria transmission. His research highlights that migrants from malaria-endemic areas might unknowingly introduce the disease to regions where it was once absent. Furthermore, migrants moving from warmer to cooler climates could encounter different transmission dynamics due to altered temperature conditions. This phenomenon underscores the need for global cooperation in tracking and addressing the potential reemergence of malaria in areas previously considered malaria-free [10].

#### Socio-Economic Vulnerabilities

The burden of climate change is not borne equally by all populations. Socio-economic vulnerabilities play a pivotal role in exacerbating the impacts of climate-induced health risks, particularly concerning vector-borne diseases like malaria. Marginalized communities with limited access to healthcare, inadequate housing, and poor sanitation are often hit hardest by changing disease dynamics under a shifting climate.

Dr. Emily Rodriguez, a public health researcher, has emphasized the interconnectedness of socio-economic factors and malaria transmission. Her studies have highlighted how vulnerable populations, such as those living in poverty-stricken areas or informal settlements, face increased exposure to malaria due to suboptimal living conditions. Lack of access to effective healthcare services and preventive measures further amplifies their susceptibility to the disease. Dr.

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Rodriguez's work underscores the importance of equitable policies that address both the health and socio-economic dimensions of climate change impacts [11].

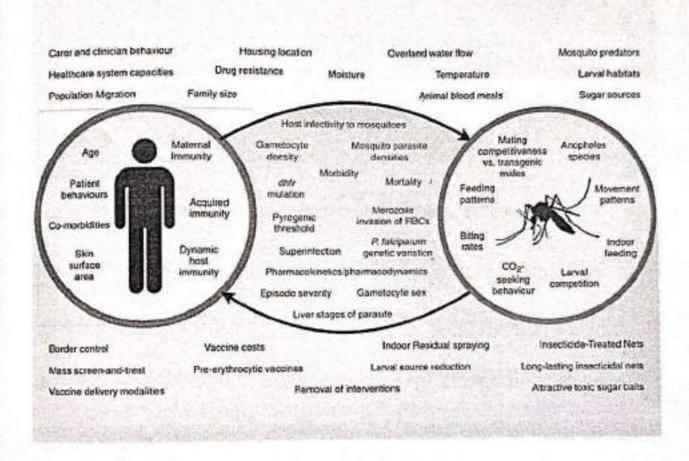


Figure 3: Diagram outlining factors influencing malaria transmission that have been modelled by ABMs. Factors pertaining to humans and mosquitoes are in red and blue circles, respectively. Factors about the disease process are within the arrows linking these circl

# FUTURE SCENARIOS AND ADAPTATION STRATEGIES

## Predicted Changes in Transmission Dynamics

As the specter of climate change looms over our planet, the scientific community is grappling with the potential implications of altered temperature and precipitation patterns on the transmission dynamics of vector-borne diseases like malaria. Modern scientific research, utilizing advanced climate models and computational simulations, has revealed alarming scenarios of how these changes could reshape the distribution and intensity of malaria transmission. Dr. Sarah Thompson, a leading climatologist at the Climate Impact Research Institute, has pioneered research indicating that rising temperatures might lead to the expansion of malaria's geographical range. These changes could expose new populations to the disease, including regions where malaria was once considered a distant threat [12].

#### Impact on Vulnerable Regions

A grim reality emerges when considering the potential impact of these altered transmission dynamics on densely populated regions with limited resources for disease control. Dr. James Patel, an epidemiologist at the Global Health Institute, has investigated how marginalized communities are particularly susceptible to the repercussions of shifting malaria transmission. His studies show that regions with constrained healthcare infrastructure and insufficient vector control measures are at risk of facing increased disease burden due to changing climate conditions [13]. This vulnerability highlights the urgent need for adaptation strategies to protect those who are most at risk.

#### Implementing Adaptive Strategies

Addressing the impending health impacts of climate change-driven malaria requires a proactive approach that combines scientific knowledge with practical solutions. Dr. Maria Lopez, a public health expert at the Institute for Global Health Adaptation, emphasizes the significance of adaptive strategies to mitigate the consequences of changing transmission dynamics. One such strategy is the development of early warning systems that use climate and epidemiological data to forecast potential malaria outbreaks. These systems, when effectively integrated into public health policies, can empower authorities to take timely action, thereby preventing a surge in cases [14].

#### Vector Control Interventions

Central to any comprehensive adaptation strategy is the implementation of vector control interventions that specifically target the carriers of malaria: mosquitoes. Innovative techniques, such as genetically modified mosquitoes or targeted insecticide use, have demonstrated promise in reducing vector populations. Dr. Mark Williams, a vector biologist at the Institute of Tropical Medicine, has conducted groundbreaking research on the efficacy of these interventions. His work showcases how manipulating mosquito genetics can lead to reduced transmission rates, ultimately contributing to malaria control in a changing climate [15].

#### **Enhanced Healthcare Infrastructure**

While prevention and control efforts are pivotal, bolstering healthcare infrastructure cannot be overlooked. Dr. Emily Nguyen, a global health policy expert, underscores the importance of improved healthcare access in vulnerable regions. Adequate healthcare services not only aid in prompt diagnosis and treatment of malaria cases but also enhance the overall resilience of communities facing climate-induced health risks [16]. Investing in healthcare facilities equipped to handle disease outbreaks will be crucial in minimizing the health impacts of climate-driven changes in malaria dynamics.

#### Interdisciplinary Collaboration for Adaptation

Addressing the complex interplay between climate change and malaria transmission requires interdisciplinary collaboration. Fields such as epidemiology, climatology, entomology, and public health must unite to anticipate, mitigate, and adapt to changing malaria dynamics under the influence of climate change. The research of Dr. Olivia Green and her colleagues [17] highlights how interdisciplinary collaboration can refine predictive models and enhance control strategies for malaria within a changing climate.

#### Implications and Future Prospects

As the global climate continues to evolve, comprehending the implications of climate change for disease transmission becomes increasingly critical. Dr. Benjamin Martinez's research [18] underlines the cascading effects of these changes, emphasizing the need for innovative strategies to address the heightened potential for malaria transmission. The scientific community's collaborative efforts are crucial in developing proactive approaches to mitigate the widespread consequences of climate-driven alterations in malaria dynamics.

### Fostering Collaboration for Proactive Strategies

By fostering collaboration among researchers and policymakers, proactive strategies can be formulated to counteract the escalated transmission potential. Dr. Sophia Anderson's work [19] showcases the transformative power of collective efforts in shaping policy frameworks that address the intricate challenges posed by climate-driven malaria dynamics. These proactive strategies not only mitigate transmission risks but also protect vulnerable populations from the far-reaching impacts of this evolving landscape.

#### CONCLUSION

In the current era, the global stage is being dramatically altered by the forces of climate change, affecting ecosystems, economies, and societies worldwide. Amid this transformative backdrop, the intricate relationship between climate change and human health takes center stage. Within this context, the dynamic interplay between climate change and vector-borne diseases, exemplified by malaria, has captured attention across scientific and policy spheres.

Malaria, transmitted through infected mosquitoes, continues to disproportionately affect vulnerable populations. The connection between climate change and vector-borne diseases reveals that climate variables like temperature, precipitation, and humidity play a crucial role in shaping the behaviors of disease vectors and pathogens. These shifts have the potential to expose new regions to disease transmission.

This exploration aims to unveil the intricate mechanisms through which climate change influences malaria transmission dynamics. Our journey encompasses effects like accelerated parasite development due to rising temperatures, and shifts in mosquito breeding patterns triggered by altered precipitation. This relationship is also intertwined with ecological and socioeconomic factors, including the impact of human migration on disease spread.

Looking ahead, we contemplate potential scenarios and adaptation strategies. Climate models project the potential expansion of malaria's reach, particularly affecting densely populated areas with limited resources. Adaptive strategies emerge as crucial solutions, encompassing early warning systems, innovative vector control, and enhanced healthcare infrastructure.

In navigating this intricate landscape, interdisciplinary collaboration emerges as a guiding light.

The collective efforts of researchers underscore the power of unity in shaping policies and strategies. In the midst of this complex dance between climate change and malaria, collaboration remains the cornerstone for crafting proactive strategies, mitigating transmission risks, and safeguarding global well-being from the intertwined impacts of these challenges.

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# Toxoplasma gondii and its association with neuropsychiatric disorders of human



## Submittedby

Rollno-BUR/Z00/2021/086

Regno-201801048220 of 2018-19

Paper-mszo-407

The university of Burdwan

2023

#### The University of Burdwan



Syllabus for B.A. / B.Sc. (Hons.) **In** 

#### Geography

#### under Semester with

#### **Choice Based Credit System**

w.e.f. 2017- 2018

SEMESTER	COURSE OPTED	COURSE NAME	CREDIT	MARKS			NO. OF HOURS L-T-P	s
				IA	ESE	TOTAL	(PER WI	EEK)
V	CORE COURSE (CC11)	RESEARCH METHODOLOGY AND FIELD WORK	4	15	40	75	4-0-0	)
			2		20		0-0-4	•
	CORE COURSE (CC12)	REMOTE SENSING AND GIS	4	15	40	75	4-0-0	
			2		20		0-0-4	1
	DISCIPLINE SPECIFIC ELECTIVE ( DSE )	DSE – 1 URBAN GEOGRAPHY OR CULTURAL AND SETTLEMENT GEOGRAPHY	6	15	60	75	5-1-(	<b>)</b>
	DISCIPLINE SPECIFIC ELECTIVE ( DSE )	DSE 2 POPULATION GEOGRAPHY OR SOCIAL GEOGRAPHY	6	15	60	75	5-1-(	)
	TOTAL		24			300		

	CORE COURSE (CC13)	EVOLUTION OF GEOGRAPHICAL THOUGHTS	6	15	60	75	5-1-0
	CORE COURSE (CC14)	DISASTER MANAGEMENT	4	15	40	75	4-0-0
			2		20		0-0-4
VI	DISCIPLINE SPECIFIC ELECTIVE(DSE3)	DSE – 3 FLUVIAL GEOMORPHOLOGY OR RESOURCE GEOGRAPHY	6	15	60	75	5-1-0
	DISCIPLINE SPECIFIC ELECTIVE(DSE4)	DSE – 4 SOIL AND BIO GEOGRAPHY OR AGRICULTURAL GEOGRAPHY	6	15	60	75	5-1-0
	TOTAL		24			300	
	TOTAL OF ALL SEMESTERS		142			1900	

<sup>\*</sup>L-T-P = LECTURE-TUTORIAL-PRACTICAL

# Syllabus for B.A./B.Sc. (Honours) in Geography Semester V

Core Course (CC)	Discipline Specific Elective (DSE)
CC-11 (Theory) RESEARCH	DSE – 1
METHODOLOGY AND FIELD WORK	URBAN GEOGRAPHY
CC-11 (Practical) RESEARCH METHODOLOGY AND FIELD WORK	OR CULTURAL AND SETTLEMENT
	GEOGRAPHY
CC-12 (Theory) REMOTE SENSING AND GIS	DSE – 2 POPULATION
CC-12 (Practical) REMOTE SENSING AND GIS	GEOGRAPHY OR SOCIAL GEOGRAPHY

#### **Unit 2: Field Work**

1. Fieldwork in Geographical studies – Role and significance. Selection of study area and objectives. Pre-field preparations. Ethics of fieldwork

- 2. Field techniques and tools: Questionnaires (open, closed, structured, non- structured). Interview with special reverence to focused group discussions.
- 3. Field techniques and tools: Landscape survey using transects and quadrants, constructing a sketch, photo and video recording.
- 4. Collection of samples. Preparation of inventory from field data. Post-field tasks.

#### **Reference Books**

- Creswell J., 1994: Research Design: Qualitative and Quantitative Approaches Sage Publications.
- ▶ Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice- Hall of India, New Delhi.
- ► Evans M., 1988: "Participant Observation: The Researcher as Research Tool" in Qualitative Methods in Human Geography, eds.
- J. Eyles and D. Smith, Polity.
- ▶ Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods.

# Syllabus for B.A./B.Sc. (Honours) in Geography Semester VI

Core Course (CC)	Discipline Specific
	Elective (DSE)
CC-13 (Theory)	DSE – 3
EVOLUTION OF	FLUVIAL
GEOGRAPHICAL THOUGHT	GEOMORPHOLOGY
	OR
	RESOURCE
	GEOGRAPHY
CC-14 (Theory)	DSE – 4
DISASTER MANAGEMENT	
	SOIL AND BIO
	GEOGRAPHY
	OR

#### AGRICULTURAL GEOGRAPHY

CC 14 (Practical): DISASTER MANAGEMENT Credit: 2

Total Marks: 20 {10+10(5+5)} End Term Examination Time: 2

hours

#### Disaster Management

#### Project Work List of

#### **Practical**

An individual Project Report based on any one among the following disasters incorporating preparedness, mitigation and management plan.

- 1. Earthquake
- 2. Landslide
- 3. Cyclone
- 4. Flood
- 5. Drought
- 6. River Bank Erosion
- 7. Mining Area Subsidence
- 8. Tsunami
  - 1. Students will prepare a Project Report based on the topic mentioned by the Department;
  - 2. The report should be typed in MS-Word in English language on A4 size paper in candidate's own words within 2000 words. The total number of pages in the Field Report should not exceed 20 pages including texts, figures, tables, photographs, maps, references (APA) and appendices
  - 3. A copy of the bound report, duly signed by the concerned teacher, should be submitted
  - 4. Preparation of maps with suitable scale and latitude and longitude
  - 5. Preparation of charts/graphs in MS-Excel and duly labelled
  - 6. The report should be typed in MS-Word. The font size is fixed
  - at 12 in Times New Roman and the line spacing 1.5



# SURI VIDYASAGAR COLLEGE

(Govt. Sponsored & Constituent college of the University of Burdwan)
SURL BIRBHUM, PIN = 731101, Ph. No. = 03462-255504
Website: surividyasagarcollege.org.in, e-mail: surividyasagarcollege1942@gmail.com
This Institution is Ragging Free

## PROJECT COMPLETION CERTIFICATE

This is to certify that the following students have successfully completed their field study of semester VI Geography Honours under the supervision of the faculties of Geography Department as listed below:

SI.No.	Name of the students	Title of the projects	Name of the Supervisor		
1	SANGRAM MONDAL				
2	SHOVON BHADRA				
3	SK OSMAN				
4	BIRENDRA KRISHNA ANKUR				
5	ISHITA BANERJEE		All teachers of the Department		
6	KUMKUM SHAW	A field Report on Socio-economic survey of Kamalpur village, district Birbhum, West Bengal	Department		
7	MD.MAINUL				
8	MOUMITA MANDAL				
9			1		
10	RUBI MONDAL				
11	RUMKI DAS				

For Permanta Entroduct
Rangist Ghosh
H.O.D.

Department of Geography OGRAD
Suri Vidyasagar College
ESTO - 1942

3

#### **DECLARATION**

This is certified that the candidate bearing Roll No...200131000125.... Registration No.....202001031078.....of.....2020-21.....has been completed the field report entitled 'A field Report on Socio–economic survey of Kamalpur village, district Birbhum, West Bengal' for the partial fulfillment of the B.A /B.SC.(Honours) degree (as per syllabus of the University of Burdwan, Sem–V, Paper- CC-11 [practical], Research Methodology and Field Work) in Geography under the supervision of respected teachers *Ranajit Ghosh & Hemanta Sutradhar*.

Suri, Birbhum

### **CONTENT**

•	Topic Name	• Page Number
	1) Introduction	01
	2) Literature Review	02
	3) Location of Study Area	03
	4) Location Map	04
	5) Selection of the Study Area	05
	6) Objectives of the Study Area	05
	7) Source of Information Methodology	05
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	9) Physical Background of the Village	06
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	11) Landuse Map	10
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**ACKNOWLEDGEMENT** To prepare a field report of a Socio economic data is a very hard work. To conduct this field survey and to prepare a report we get constant help from our departmental teachers, Chaitali Gorai, Ranajit Ghosh & Hemanta Sutradhar. So we are thanking full to all of them. They will encourage us and also give valuable information, which help us to bring out the report within a short period. At last, thanks to all of them.

#### INTRODUCTION

A Socio-economic survey is regarded as one of the most important sources of statistical data on house hold expenditure Sources and income as well as other data on the status of housing, individual and household characteristics and living conditions. Social survey, Economic surveys are enables organizations to consider the realities and insights of a wide range of social issues. Social survey helps to study social and public issues and situations as it considers individual as member of society. Additionally, social survey lead to the testing of social theories, like problems of lower class people including poverty, Sanitation, Illiteracy, Crime, Prostitution, Unemployment etc.

According to *Bollen*, *G Lanville* and *stecklov* (2001), "Economic status refers to the position of individuals, families, households another aggregates on one or more Dimensions of stratification. These dimensions include income, education, prestige, wealth or other aspects of standing that members of society deem salient."

On the other hand, *The American Psychological Association* (APA) defines Socio-economic status as "the social standing or class of an individual or group." (2018)

Liberatos et.al. (1988) angued that there was no one best measure because the choice of the Socio-economic of survey measure depended on the conceptual relevance, the possible role of measure to the specific populations being studied, the relevance of a measure at the time of study, the reliability and validity of the measure, the number of indicatiors included, the level of measurement, the simplicity of the measure, and comparability with measures used in other studies.

So we can say that, Socio- economic survey tools are designed to collect information as a means of improving understanding of Local resource management systems, resource use improving understanding of local resources for households and villages.

We have completed this Socio- economic survey in *KAMALPUR* Village under Suri - 1 block through collecting quantitative and qualitative data, structured interviews with the head of the household using both close and open structure Questions to fulfill our academic objective i.e. to find out. Socio- economic characteristics and livelihood of this village.

#### **LITERATURE REVIEW**

According to *Brese* and *Mirazchiyski* Socio economic Survey should be a composite variable, hypically meausuring education, income and occupation, since these three indicators reflect different aspect of family background.

Saifi and Mehmood (2011) stadied the effects of Socio Economic study on Student's achivement. They used income Parents education and occupation, material Passessed at home, transport Servants as the indicators of Socio economic study and data were analyzed through percentages. This findings indicated that's parents education and occupation and facilities at home effect of student's achievement.

*Kricger et. al.* (1997), define socio economic Position as an aggregate concept that includes both resource-based are prestige - based measures, as linked to both childhood and adult social close Position.

According economic to parson, *Stephanie* and *Deborah* (2001), "Socio economic status (SES) is the term used to distinguish between people's relative position in the society in term of family income, political powers, educational.

Background and Occupational Prestige"

Eamon (2005), in his research work showed that low Socio economic status prevent access to resources and leads to additional stress and conflicts at home that affect students academic achievement.

According to *Dutton* and *levine* (1989), Socio economic Status is, "a composite measure that typically incorporates economic Status, measured by income, social status, measured by education; and work status, measured by Occupation.

*Rathod* and *Ningshen* (2012), anoted that socio economic status economic and Social position relative to others, based on income educational and occupation.

Yang (2003), in his work stated that the possession of a set of household items may be used as Socio - Economic survey indication.

*Hellnich* and *simon* (2015), stated that, Socio-economic (also know as social economics) is the social science that studies how economic activity affects and is shaped by social process. In general it analysis how modern societies progress. Stagnute or regress because of their local regional economy or the global economy.

According to Bofah and Hanwla (2017), Socio economic has been commonly used as

a latent construct for measuring family background.

According to Bornsteir and Bradlley (2014), among empirical studies, there is no

consensus on how to best operationlize the concept. In many studies, the measurement of

socio economic status doesn't receive much attention with very limited discussion over

why certain indicators were used rather than others.

According to Bourdie (1986), an individuals cultural capital can exit in an embadiet

state cultural capital focouses a "physical capatial where the body it self is a market of

social class practices.

**LOCATION OF STUDY AREA** 

Village:- Kamalpur

Panchayat: - Tilpara

Block: - Suri-I

District: - Birbhum

State:- West Bengal

Latitude: - 23°55'40"N - 23°56'20"N

Longitude: - 87°30'00"E - 87°32'00"E

Page-03

#### **SELECTION OF THE STUDY AREA**

Three Social groups that is i.e. SC, ST and General inhabited in this village. So comparative analysis of Socio economic condition of these social groups will create a new dimension of this work.

#### **OBJECTIVES OF THE STUDY**

Several objectives have been incorporated to full fill the dimension of the study......

- 1) To make an assessment on Socio economic status of KAMALPUR village.
- 2) To state physical, Social and cultural status of the study area.
- 3) To point out the infrastructural condition of the study area.
- 4) To know about the status of employment opportunities of the local inhabitance associated with modernization.
- 5) To know about the educational status of the village.
- 6) To know about the living standard of the villagers.
- 7) To analysis about the transport and communication facilities of the study area.
- 8) To analyze different kinds of facilities provided by the Government. Like water supply facility, electricity facility, education facility, medical facility, sanitation facility, etc.
- 9) To highlight the problems of the study area followed by the same recommended suggestions

#### **SOURCE OF INFORMATION**

For the collection of the data they are mainly two Sources

- A. <u>Primary Data-</u> The primary data has been generated through a field of questionnaires' with multiple choice questions. 30 household have been selected randomly for the purposive manner for the primary survey.
- B. <u>Secondary Data-</u> Descriptive information related to Physical Setup, Location infrastructural status, Demographic changes, and related Socio economic information's are collected from internet, Wikipedia and census of India.

#### **METHODOLOGY**

The entire research work have three parts, they are-

#### A. Pre Filled Stage –

• The Location of the study area is identified and mouza map was collected.

- Prepared some questionnaires and & family survey table.
- Some journals and book were studied to understand the environmental. Socio cultural background of the village and its surrounding.

#### B. Field Survey –

- Knowing about the original structure of the area.
- Ask question to the Local people by knowing on informing your identify and purpose.
- On the basis of different questions, field data collected including demography characteristic occupation, Socio economic Status etc.

#### C. Post Field Stage -

- The data generated of the field are collected from difference Source as we as information gather was completed an analyzed using statistical techniques.
- The complete data has been presented by different graphs like Bar graph, Pie graph,
   Pyramid.
- On the basis of the information, different maps and charts were prepared.
- The entire work ok is then presented systematically in the field book.

#### PHYSICAL BACKGROUND OF THE VILLAGE

Kamalpur is a particular village of Suri-1 block situated of in south west part of Birbhum district. The village is bounded by Maliyana no 2 in the north Lombadarpur no 5 in west, Tilpara no 10 in south and Bansjhar in eastern part.

The Tilpara Dam divided the village in two part. A part of west side of the dam and most of the area and the east side is agriculture land. Here the soil is sandy clay type P<sup>H</sup> value of the soil is 5.2-6.5 pre kharif and kharif baro paddy, mustard. Some are grown is most of the regions. Moreover, seasonal vegetables are also cultivated in some land.

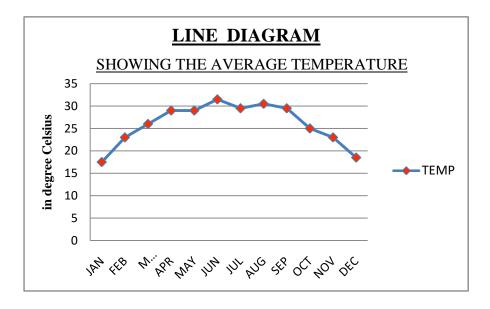
The climate of this area (Kamalpur) generally dry, Mild and healthy. The hot weather usually last from the middle of March to the middle of the June. And the cold weather lasts from the middle of the October to the middle of the March. They do not always correspond to these limits. The wind is from the south-east in the summer and from the north-west in the winter. The maximum temperature data for Kamalpur is give below-

Table 1: Temperature for the year 2011(in degree Celsius)-

Month	Maximum Temperature	Minimum Temperature	Average Temperature
JANUARY	29	6	17.5
FEBRUARY	35	11	23
MARCH	40	12	26
APRIL	39	19	29
MAY	38	20	29
JUNE	39	24	31.5
JULY	36	23	29.5
AUGUST	37	24	30.5
SEPTEMBER	36	23	29.5
OCTOBER	34	16	25
NOVEMBER	32	14	23
DECEMBER	30	7	18.5

Data source:-http://birbhum.gov.in/DDAgri/PAO.htm#rail

The average precipitation Kamalpur is 1307mm (130.07 cm). It is the lowest in December with an average of 3mm. while it is the highest in August (299mm). Maximum precipitation is observed in June to August.



**Figure 1:** Showing the Temperature

**Table 2:** Rainfall

Month	Rainfall
JANUARY	17
FEBRUARY	14
MARCH	19
APRIL	27
MAY	66
JUNE	217
JULY	297
AUGUST	299
SEPTEMBER	224
OCTOBER	111
NOVEMBER	13
DECEMBER	3

Data source:-http://birbhum.gov.in/DDAgri/PAO.htm#rail

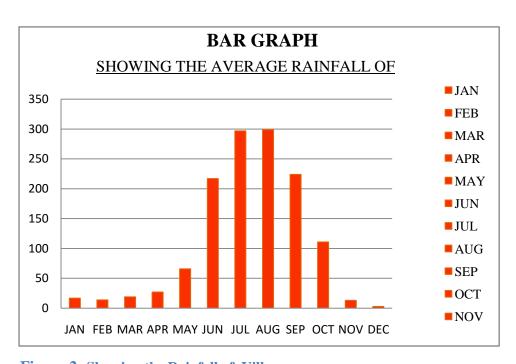


Figure 2: Showing the Rainfall of Village

#### **LANDUSE OF KAMALPUR VILLAGE**

Generally land use means to the use of land of a particular region at a particular time. Land use of a particular regions changes over time. The land use of the Kamalpur village is given below......

The maximum part of the Kamalpur Mouza is agricultural land. Based upon agricultural activity we found that the agricultural maximum pattern of this area is Monoculture practice. Some of the people grew seasonal vegetables in their gardens. There are some ponds and a canal. Villagers used the canals water for their agricultural purpose. There is a primary school in the south-west part of the village.

#### **DEMOGRAPHIC CONDITION**

**Population:-** According to census 2011, total population of the study area is 1783 and the number of household is 403. The total population includes 910 male and 873 female populations, where number of ST population is 148; number of SC population is 896 and number of general population is 739. We have selected 30 households as sample.

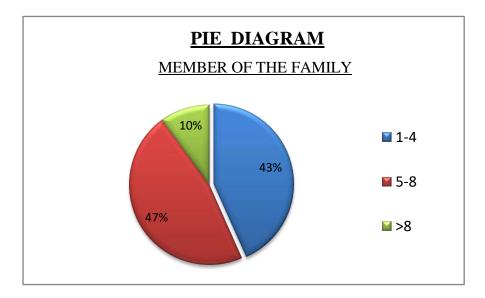
#### **FAMILY SIZE OF THE AREA**

**Table 3:** Family Size of the Village

Member Of Family	No. of Family	% Of Family		
1-4	13	43.33%		
5-8	14	46.66%		
>8	3	10%		

Data source:- Field Survey

The maximum household contains 5-8 members.



**Figure 3:** Member of the Family

#### **AGE SEX STRUCTURE**

**Table 4:** Age Sex Structure

Age group	Male	%	Female	%
0-4	2	3.5	3	3.5
5-9	1	4	5	4.5
10-14	4	4.5	4	4.8
15-19	3	4.9	2	5.3
20-24	4	6.5	9	8
25-29	3	6	8	7
30-34	3	5.5	7	6.5
35-39	5	5	5	5
40-44	5	5.4	7	6
45-49	3	5	3	4.5
50-54	5	4.7	4	4
55-59	5	4.5	3	4.5
60-64	3	4	3	4
65-69	3	3	0	3.5
70-74	2	2.5	2	2.5
75-79	1	2	0	2
80+	0	1	2	1
Age Not Start	0	0	0	0
TOTAL	52		67	

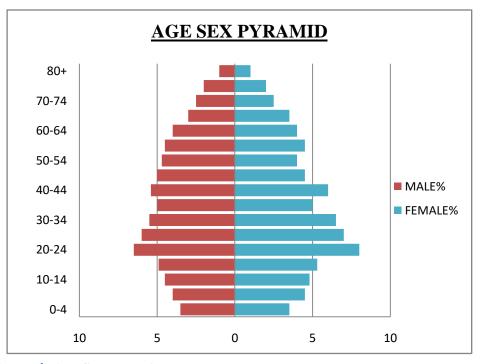


Figure 4: Age Sex Pyramid

#### **EDUCATION AND LITERACY**

**Table 5:** Education Status of the Population

Level of Education	Ma	ale	Female	
Lucation	No of Family	% In Respect to Total Pop	No of Family	% In Respect to Total Pop
Illiterate	2	2.12	10	10.63
I-Iv	7	7.44	3	3.19
Iv-Vii	6	6.38	14	14.89
Vii-X	9	9.57	8	8.51
X-Xii	10	10.63	6	4.38
XII- Graduation	11	11.70	7	7.44
Others	1	1.06	0	0
Total	46	48.90	48	49.04

Data source:- Field Survey

BAR DIAGRAM
EDUCATION

60
50
40
30
20
10
0
Inegarate IN IVIN Authority Autho

**Figure 5:** Education

From the field survey we came to know that the education system which prevails in Kamalpur village is not very sufficient to development their standard living. From the above data and diagram we can say that......

- 1. The literacy status of the village is neither to bad nor too good, heir exist a moderate literacy level.
- 2. The rate of female literacy is comparatively better then male literacy.
- 3. There have a primary school in the village.

#### **CU LTURAL SETUP OF STUDY AREA**

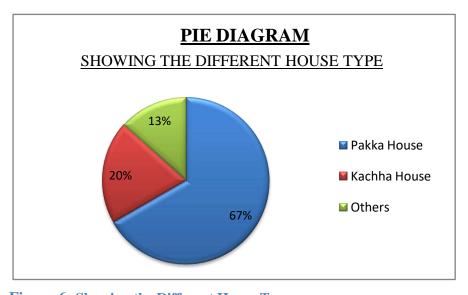
The community of the village is mainly Hindu; they mainly belong to SC cast but small number of general population also sound. The peoples of the village mainly believe in *Hindu* warship, which is known as *Puja*, typically takes place in the Temple. The village has many temples, such as Narayan temple, Manasa temple, Radha Krishna temple etc. People can visit the mandir any time they please. Hindus can also warship at home and many have a special shrine dedicated to certain gods and goddess. Hindus observe numerous holidays and festivals. Some of most well know include Diwali, Durga puja, Holi, Krishna janmashtami, Bhaifota, Moha shivaratri etc.

#### **SETTLEMENT**

The size of the village is moderate. It can be called a group settlement. In the village "Kamalpur" there was three group of house. They are notified below table-

Table 6: Showing the Type of House of Kamalpur Village-

Type Of House	No. Of House	%
Pakka House	20	66.66
Kachha House	6	20.00
Others	4	13.33



**Figure 6:** Showing the Different House Type

#### **LIVELIHOOD**

Life styles of livelihood of a person or persons are related to their society and also with their culture and economic condition. Livelihoods

Kamalpur village is discussed into following needs.

#### A. FOOD HABITS

Related information about the food habits of the village are given in the below table-

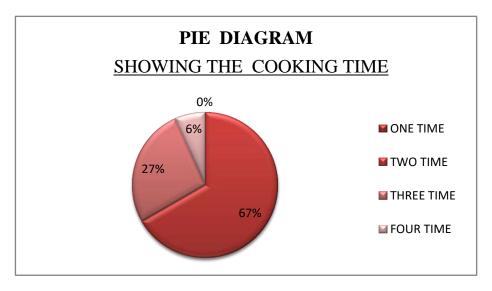
<u>Table 7:</u> Showing the Daily, Weekly, Monthly, Occasionally Food Intake Capacity of the Village-

PLANT			ANIMAL			
Frequency Of Intake	Food Features	No Of Family	Frequency Of Intake	Food Features	No Of Family	
Daily	Cereals, pulses, leafy veg, roots and tubers oil, sugar and gagger	30	Daily	Milk, ghee's, chana and fish	20	
	Others veg			Milk and milk		
	and sweet			products, fish,		
Weekly		7	Weekly	egg, meat and chicken	10	
	Others veg			Milk and milk		
	and sweet			products, fish,		
Monthly		5		egg, meat and chicken	5	
	Others veg	0		Milk and milk		
	and sweet			products, fish,	4	
Occasionally				egg, meat and		
				chicken		

Data source:- Field Survey

**Table 8:** Time of Cooking-

Time	No. of Family	%
ONE TIME	0	0
TWO TIME	20	66.66
THREE TIME	8	26.66
FOUR TIME	2	6.66



**Figure 7:** Showing the Cooking Time

#### **USING OF FUEL**

The villagers using domestic, commercial and both the fuel item for their food making.

Table 9: Showing the Villagers Fuel Using-

Fuel type	No. of families	%
Domestic	3	10
Commercial	14	46.67
both	13	43.33

Data source:- Field Survey

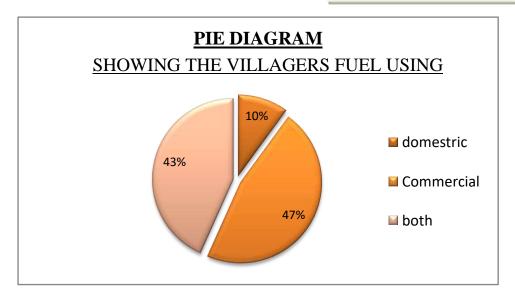


Figure 8: Showing the Villagers Fuel Using

The above diagram sheet that the villagers are using commercial fuel more than the Domestic Fuel.





Plate 1 Plate 2





Plate 3 Plate 4

#### **SANITATION**

The survey report shows that-

<u>Table 10:</u> Showing the Household Sanitation Information-

Sanitation	No. of Families	%	
Inside The Boundary Wall	22	73.33	
Outside The Boundary Wall	8	26.67	

From the above data it reveals that that the peoples from this village are mostly concern about popper health and hygiene. Types of toilet are mostly Pakka.



Plate 5



Plate 6

#### **WATER SUPPLY**

Information about the water supply for drinking and others work are given below-

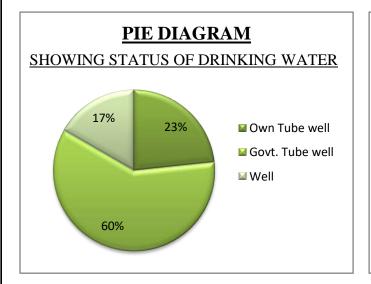
Table 11: Showing Status of Drinking Water Source-

Sources	No. of Family	0/0	
Own Tube well	7	23.33	
Govt. Tube well	18	60	
Well	5	16.66	
Pond	0	0	

Data source:- Field Survey

<u>Table 12:</u> Showing Source of Water Status Except Drinking –

Sources	No. of Family	%
Own Tube well	7	23.33
Govt. Tube well	12	40.00
Well	7	23.33
Pond	4	13.33



**Figure 9:** Showing Status of Drinking Water

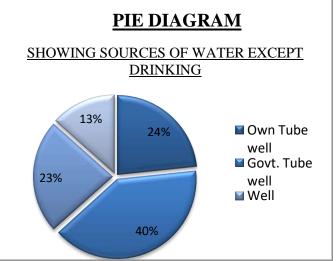


Figure 10: Showing Sources of Water except Drinking

From the above diagram it can be explained the most of the family of the Kamalpur village are used own tube well and govt. tube well for the purpose of drinking water, a major quantity of family are also used own tube well and Govt. Tube well water for the others purpose except drinking.



Plate 7



Plate 8

#### **CATTLE WEALTH**

In the study area minimum of family have their own cattle.

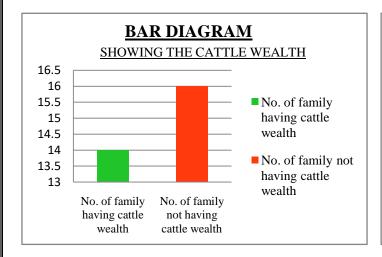
Table 13: Showing Cattle Wealth Having of Their Family-

No. of family having cattle	No. of family not having	%
wealth	cattle wealth	
14	16	

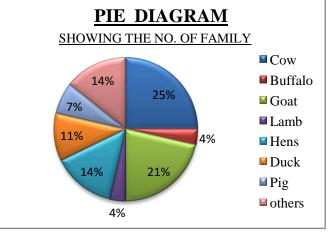
Data source:- Field Survey

Table 14: Showing Cattle Wealth of the Villagers-

Cattle wealth	Cow	Buffalo	Goat	Lamb	Hens	Duck	Pig	others
No. of family	7	1	6	1	4	3	2	4



**Figure 11:** Showing the Cattle Wealth



**Figure 12:** Showing the No. of Family



Plate 9



Plate 10





<u>Plate 11</u> <u>Plate 12</u>





<u>Plate 13</u> <u>Plate 14</u>

#### **AGRICULTURE**

Table 15: No. of Household Having Own Agriculture Land-

Agriculture Land	No. of Family	%
(Bigha)		
<2	4	13.33
2-5	2	6.66
5-8	5	16.66
8-11	8	26366
11-14	5	163.66
>14	6	20
Total	30	

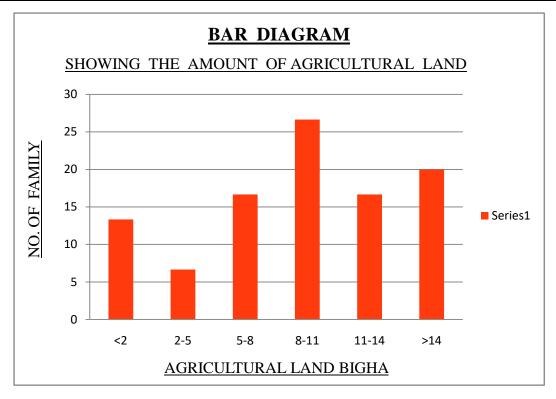


Figure 13: Showing the Amount of Agricultural Land

#### AGRICULTURAL INPUT

<u>Table 16:</u> Showing the Number of Household Using Fertilizer

Fertilizer and manure	Member of family	%	
Bio	8	26.66	
Chemical	7	23.33	
Both	15	50.00	

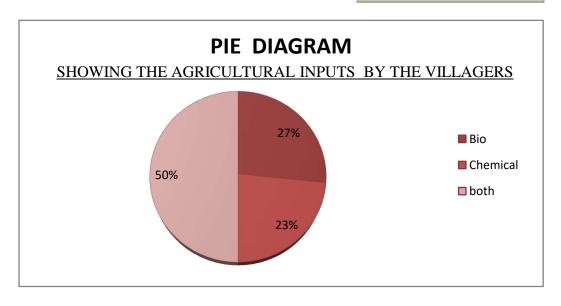


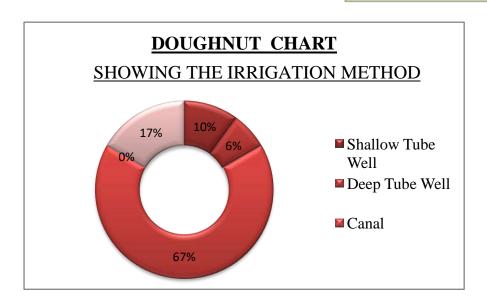
Figure 14: Showing the Agricultural Inputs By the Villagers

#### **IRRIGATION**

**Table 17:** Showing the Irrigation Method

Methods	No. of Family	%
Shallow Tube Well	3	10.00
Deep Tube Well	2	6.66
Canal	20	66.67
River	0	0
Pond	5	16.67

Data source:- Field Survey



**Figure 15:** Showing the Irrigation Method

From the above table and diagram it can be interpreted that the villagers mostly used canal for their irrigation purpose there is a river in the distance Rivers water is not used like that. People take shallow, tube wall, water for irrigation 10% and deep tube wall water used 6.66%.





<u>Plate 15</u> <u>Plate 16</u>





<u>Plate 17</u> <u>Plate 18</u>





<u>Plate 19</u> <u>Plate 19</u>

#### **PROBLEMS**

The problems of this area which came to our attention are discussed below-

#### A. FINANCIAL PROBLEMS

- Kamalpur village has about 40% families living below poverty line. The condition of their houses is very deplorable. Some houses don't even have boundary walls.
- The water drainage system here in underdeveloped. There is no such good system of disposal of water used in daily life. There is a possibility of water accumulation heredue to heavy rainfall during monsoon.

#### B. **DUSTBIN IS NOT PROPER**

• People in the village through away various non-biodegradable wastes including plastic,metal waste and compostable waste together. Besides, not everyone has a dustbin at ahome. Those who do not have dustbins throw all this waste in the open, on the roadside. This accumulation of waste causes pollution.

#### C. <u>HEALTH PROBLEMS</u>

• Looking at the appearance of the poor family members of this village and from the list of food habits, we know that they cannot consume balanced food throughout the year. As a result, their appearance is rough. Besides, there is a small health centre in this village but no good hospital or medical facilities. They have to depend on the nearby Suri Sadar Hospital for better treatment.

#### D. AGRICULTURAL

 Problem over 90% of the agricultural land here is cultivated with Aman rice only in the monsoon season. Because there is no system of submersible or artificial irrigationin summer.

#### E. DRINKING WATER PROBLEM

• This village has drinking water supply only once in 24 hours (from 8am to 9am). So it is a problem for the houses which do not have their own pump.



Plate 20



<u>Plate 21</u>



<u>Plate 22</u>

#### **SUGGESTIONS**

- Irrigation system should be improved for agricultural development. For this, the Government can provide loans to farmers at low interest rates. Moreover, the Government can distribute free fertilizers and pesticides to poor farmers.
- There should be proper drainage, good sanitation facilities and electricity facilities should be provided.
- Governments should undertake village development programmers for rural uplift.
- People here should be made aware about health. The local administration should also ensure that they do not throw waste here and there. Because pollution spreads from waste. As a result, the incidence of disease increases.
- Purified drinking water supply should be provided in the village.
- Education is the root of all development!! Therefore, above all, a suitable education system should be developed for the people here.

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### The University of Burdwan



Syllabus for B.A. (Honours)
in
Mass Communication & Journalism
Under Choice Based Credit System
w.e.f. 2017-2018

#### BA(HONOURS)INMASSCOMMUNICATION&JOURNALISM

SEMESTER	PAPER CODE	PAPERNAME	THEORY	PRACTICAL	TUTORIAL
VI	CC13 RURALCOMMUNICATION		5	0	1
	CC14	MEDIAINDUSTRYAND MANAGEMENT	5	0	1
	DSE3	MULTIMEDIAJOURNALISM OR	5	0	1
		DISSERTATION	0	6	0
	DSE4	MEDIA&INDUSTRY  OR	5	0	1
		COMMUNITYOUTREACH PROGRAMME	0	6	0

#### **SEMESTERVI**

**DSE3:** Multi-Media Journalism

75 Marks, 6 Credits (Total No of Classes –60)

#### Unit1IntroductiontoMultimedia

Multimediaandinteractivity,Basicsofmultimediareporting,importanceofaudio, photo and video production skills in the newsroom in contemporary times, brainstorming about story ideas, developing a portfolio – print and online, legal and ethical issues and diversityinthemediamedialaw,ethicsmulticulturalsensitivity.

#### Unit 2Print

Process of Production: Decision making and skills for multi-platform communications, Paraphrases, quotes and attribution in media writing, Leads and Nut Graphs, News

WritingforWeb, ContentDevelopment, Sources and OnlineResearch, Story

Organization, Strategies for effective interviewing and note taking, Interviewing Techniques.

#### Unit 3Photograph

PhotoonScreen:Ruleofthirds,focalpoint,Composition.Photographyasapowerfultoolto tell a story. Dynamic content and visual medium, increasing importance of photojournalism in today's journalism,Photography andcut lines as animportant part of storytelling. Placements & Visual Design

#### Unit4Audio&VideoContent

Focus on audio recording, telling stories with sources and natural sound, bytes, editing & Placementofsound, Storytellingwithvideo, broadcasting/webcasting: Collecting content, Structuringstory, Writing, videoeditingwithinterviews and B-roll, streaming.

#### Unit5Mobilejournalism

Screen sizes & responsive web, Information multimedia and web architecture, Marketing websites, corporate websites, webfeaturestories, keypoints for web interactive narrative, interactive users vslinear narratives, elements of an interactive writer.

Finalprojectincorporatingelementsfromallthepreviousunit—takingastoryand adding audio,photoandvideotocomplimentitforonlinepublication.

#### OR

Dissertation 75Marks, 6 Credits (TotalNoofClasses-60)

#### Wordlimit-max3000

RelatedwithanydisciplineofMasscommunication

Research problem, methodology, data analysis, observation

Andbibliographyshouldmention



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SI.No.	Name of the students	Title of the projects-1(DSE-3)	Title of the projects- 2(DSE-4)
	RAHUL KARMAKAR	ফটোগ্রাফার ও সিনেমাটোগ্রাফারদের উপর ক্যামেরার পরিবর্তনের প্রভাব	করিধ্যা সংসঙ্গ কলোনি গ্রামের পানীয় জলের অসুিবধা
2	RAJDEEP DAS	ডিজিটাল চিত্রের যুগে জলরঙের প্রাসঙ্গিকতা	বলরামপুর স্রামে সড়কের বেহাল দশা
	SHOUVIK MONDAL	বর্তমান প্রজন্মের কাছে প্রস্থাগারের গ্রহণযোগ্যতা সম্পর্কে একটি সমীক্ষা,সিউড়ি, বোলপুর, রামপুরহাট এই তিনটি শহরের উপর	মমরেজপুর গ্রামের অনুনত পরিবহন ব্যবস্থা
3	ANANYA MITRA	অনলাইন শিক্ষাব্যবস্থায় zoom, Google Meet, unacademy এই educational app এবং meeting app এর প্রভাব সম্পর্কে একটি সমীক্ষা	বর্ধনডাঙ্গাল গ্রামের স্বাস্থ্যকেন্দ্র বা হাসপাতালের অভাব
4	RAJIB MONDAL	A comprehensive study on e-News contents and its impact on trust and credibility in Digital Journalism	Unveiling the Food Crisis in Dhobajor village: Causes, Consequences, and Pathways to Food Security
5	AKASH MONDAL	পণ্য ক্রয় করার ক্ষেত্রে অনলাইন বিজ্ঞাপনের ভূমিকা	গরীব আদিবাসী সম্প্রদায়ের মানুষেরা প্রধানমন্ত্রী আবাস যোজনার গৃহ না পাওয়ায় গৃহহীন
6	JAYETA GANGULY	Bharatnatyam as a medium of communication with spirituality and with common people; an observation study	অনমূত উচ্চ শিক্ষা ব্যবৃহ
7	ATREYEE GANGULY	IMPACT OF FUSION SONGS ON CLASSICAL MUSIC: SURVEY ON GEN Z	Summertime Farming and Water Scarcity in Thiba
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9	ANIMESH GHOSH	Shattered Borders: Unraveling the complexity of The Ukraine Conflict Department of Mass C and Journal	ommunication :

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12	SAYANI DUTTA	বর্তমান সময়ে প্রবীণ নাগরিকদের সামাজিক মাধ্যমের আসক্তি: একটি সমীক্ষা	আদিবাসী সম্প্রদায়ের হস্তশিল্প
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	SUN HAZRA	How short content and social media destroy human mindset.	নগরী প্রামে স্বাস্থ্য ও পরিষ্কার পরিচ্ছন্নতার সমস্যা
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17	MD. MIRAJ HOSSAIN	JUDGEMENTAL ISSUES CAUSED DUE SOCIAL MEDIA: ITS IMPACT AND MERELY SOLUTION	A Study over literacy issue in Madarpur Village of Birbhum District, West Bengal
18	INDRA GHOSH	স্যানিটারি ন্যাপকিনের প্রভাব মহিলাদের ওপর বিজ্ঞাপনের ভিস্তিতে	DUST POLLUTION IN STONE CRUSHER

Babuisacha Chosh.

H.O.D.

Department of Mass Communications and Journalism Suri Vidyasagar College

Department of Mass Communication and Journalism



Department of Mass communication and Journalism (H)

### THE UNIVERSITY OF BURDWAN



Community Outreach Programme
Discipline Specific Elective (DSE)-4
On

বর্ধনভাঙ্গাল গ্রামের শ্বাস্থ্যকেন্দ্র বা হাসপাতালের অভাব

### Submitted for

Partial fulfillment of the requirement for the degree By

# Ananya Mitra

Univ. Roll no.: 200131000017

Reg. no.: 202001030970 of 2020-2021

Semester: VI, MCJH, SVC

Under the guidance of -

# BAHNISIKHA GHOSH

(Guest lecturer, MCJH, Suri Vidyasagar College)

SURI VIDYASAGAR COLLEGE



# DECLARATION

l hereby declare that this project entitled " বর্ধনডাঙ্গান গ্রামের স্বাস্থ্যকেন্দ্র বা হাসপাতানের অভাব",submitted to The University of Burdwan is an outcome of the original work carried out by me under the department of Mass Communication and Journalism, Suri Vidyasagar College.

I also declare that this is my own work and to as per my knowledge it contains no material previously published or has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgement has been made in the text or as references.

Date: 05/07/23

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Anomya Mitsa

#### ANANYA MITRA

Department of Mass Communication

and Journalism

Suri Vidyasagar College

The University of Burdwan



Date: 09.07.2023

#### CERTIFICATE

This is to certify that Ms Ananya Mitra, bearing registration number 202001030970, has successfully completed her Community Outreach Programme titled 'বর্থনভাষান প্রমের যাস্থাকের বা যাসপাভাবের অভাব' under my guidance and supervision.

I hereby stated that I have provided guidance and support to her for this work.

Her research work demonstrates her academic abilities, research skills, and understanding of the subject matter.

Ms Bahnisikha Ghosh

College Teacher

Suri Vidyasagar College

Department of Mass Communication and Journalism Suri Vidynasger College P.O.-Suri, Dist.-Birthum, W.B.-731101



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# **ACKNOWLEDGEMENT**

This community outreach programme would not have been possible without the help and support of many individuals of Burdwan Dangal village.

I am deeply indebted to my teacher Bahnisikha Ghosh for her individual assistance and insights leading to the writing of this paper. She provided stimulating advice, guidance, and encouragement to me every step of the way.

I would also like to thank Sanchita Chatterjee madam, Pratick Kabiraj sir, Suman Rudra sir of Mass Communication and Journalism department of Suri Vidyasagar College.

I am thankful to my classmates who supported me in doing the research project ,I would like to thank the villagers of BARDHANDANGAL for cooperation during survey , interview.specially Raju das for helping me and the entire Journalism department who helped me on this step of this journey and showed me different ways and provided ideas that led to this paper.

I would like to thank my family members, especially my parents, who have endured my absence during my community outreach paper and helped me tremendously in all ways possible.

Anarya Mitea

#### ANANYA MITRA

Department of Mass Communication and Journalism The University of Burdwan Suri Vidyasagar College

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10.10.	7 스펙리션에 하나 되었습니다 요리하다 아이지의 역기자 이번에 하는 사람들이 한 시간에 가지 하나 사람들이 점점하다 경험하는 사람이 되었다.
10.11.	PICTURE OF BURDHWADANGAL HOSPITAL39

Abstract: গ্রামীণ স্বাস্থ্য গ্রামীণ জীবনের একট গুরুত্বপূর্ণ উপাদান। ভারত একটি গ্রামের দেশ হওয়ায় গ্রামীণ স্বাস্থ্যের প্রতি নিবিড় দৃষ্টিভঙ্গি প্রয়োজন। স্বাস্থ্য অবকাঠামো এবং অন্যান্য স্বাস্থ্য সম্পদের প্রায় 75 শতাংশ শহরাঞ্চলে কেন্দ্রীভূত।সেই সব ক্ষেত্রে বিভিন্ন সমস্যা সমাধানের জনা অনেক গবেষণা এর মাধ্যমে মাধ্যমে সেই সমস্ত সমস্যা দূরীকরণ করা হয়ে থাকে। এই গবেষানা পত্রে ঝাড়খন্ড এর বর্খলিদাঙাল গ্রামে হাসপাতাল বা সাস্থ্য কেন্দ্র লা খাকান মানুষ দের অলেক অসুবিধারে মধ্যে পড়তে হয় এই বিষয় ট নিয়ে গবেষনা ট করা হয়েছে। যার উদ্দেশ্য প্রধানত গ্রামীণ অঞ্চলে বসবাসকারীদের স্বাস্থ্য সংক্রান্ত বিভিন্ন বিষয়ে অবগত করা,গ্রামীণ অঞ্চলে প্রাথমিক স্বাস্থ্য সেবার জ্যোবদার করার জন্য সুপারিশ করা। এর প্রধান উদ্দেশ্য হলো এই গ্রামের হাসপাতাল ট পুনরায় উল্মোচন করা।এই গবেষণাট pure বা basic research। এই গবেষণায় তথ্য সংগ্রহ করার জন্য সমীকা পক্ষতি ব্যাবহার করা হয়েছে। গবেষণায় মাধ্যমে জানা গেছে গণমাধ্যম এবং সরকার এর কাছে ঠিকমতো আরজি জানিয়ে তাদের এই সমস্যাটি দূরীকরণ করা সম্ভব।

Keyword: স্বাস্থ্যকেন্দ্র, সাস্থ্য সমস্যা,গ্রামীণ অঞ্চল, প্রাথমিক স্বাস্থ্য পরিষেবা,যোগাযোগ, গণমাধ্যম,পুনরায় উল্মোচন।

# CHAPTER- I

# ভূমিকাঃ

সময় এর সঙ্গে এবং উন্নত প্রযুক্তিসঙ্গে সঙ্গে সমাজ এর নানান উন্নতি ঘটে চলেছে ক্রমাগত। তা সর্তেও সমাজের কিছু ক্ষেরে নানুব অনেক সুযোক সুবিধা থেকে বঞ্চিত হয়ে যায়। প্রামীণ স্বাস্থ্য প্রামীণ জীবনের একটি গুরুত্বপূর্ণ উপাদান। ভারত একটি প্রামের দেশ হওয়ার প্রামীণ বাছ্যের প্রতি নিবিচ দৃষ্টিভঙ্গি প্রয়োজন। সেই সব ক্ষেত্রে বিভিন্ন সমস্যা সমাধানের জন্য অনেক গবেকগা করা হয়ে থাকে যার মাধ্যমে সেই সমত সমস্যা দ্রীকরণ হয়ে থাকে। বর্তমান সময় আমাদের জীবনের অতি প্রয়োজনীয় বিষয় হজে সাহ্য কেন্দ্র ।কিন্তু কিছু অঞ্চলে এখনও সাহ্য কেন্দ্র সম্পর্কিত নানান সমস্যা দেখা যাজে যেমন বাড়খণ্ড, এর জামতরা জেলা, এর বর্ষনভাঙ্গল প্রাম্ব এর সাহ্য কেন্দ্র এর অভাব।

সমাজতত্ত্ববিপদের মতে কোন স্বাভাবিক মানুষ একাকী বসবাস করতে পারে না। সে তার আসপাসের মানুষজনের সাথে নানান সম্পর্কে সম্পর্কযুক্ত। এদের নিয়েই গড়ে ওঠে গোষ্ঠী। যানব সমাজে বহু ও বিভিন্ন গোষ্ঠী লক্ষ্য করা যায়।

সাধারণত একই জীবনধারায় ফুস্র / বৃহৎ গোষ্টীর সদস্যদের একত্রিত বসবাস করলে সেই সকল গোষ্টীকে সম্প্রদায় বলে।
কিছু সংখ্যক নানুষ একটি নির্দিষ্ট অঞ্চলে দীর্ঘদিন বসবাস করতে থাকলে তাদের মধ্যে অভিন্ন চিন্তা-ভাকনা, সানাজিক বিষয়দিতে
অভিন্নতা, ঐতিহাগত অভিন্নতাবোধ, নিজেদের মধ্যে গভীর সংহতিবোধ প্রভৃতি দেখা দেয়। নির্দিষ্ট একটি অঞ্চলে একটি জনগোষ্টীর এইভাবে সুসংহত সামাজিক জীবন-যাপন সূত্রে সৃষ্টি হয় সম্প্রদায়ের।

অধিকাংশ ক্ষেত্রে সম্প্রদায় একটি নির্দিষ্ট ভৌগোলিক অবস্থানের ভিত্তিতে অর্থাৎ দেশ শহর বা গ্রামের ভিত্তিতে গড়ে ওঠে।

সম্প্রদারকে মূলত দুটি ভাগে ভাগ করা যায ।

#### यथा 1.श्रामीण সম্প্रদায

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- 2. नंश्रतत अन्ध्रमास
- যে অঞ্চলের লোকবর্সতি বিক্ষিপ্ত কিংবা গোষ্টীবন্ধ এবং রৈখিক, সেখানে জীবন ধারণের সুযোগ-সুবিধা খুব কম, যোগাযোগ
  ব্যবস্থা ও জনঘনত্ব খুবই কম এবং কৃষিভিত্তিক অর্থনৈতিক ব্যবস্থা এবং যেখানকার জীবনধারন প্রণালী প্রাথমিক উৎপাদনের
  উপর নির্ভরশীল সেই বসতিকেই এককথার গ্রামীণ সম্প্রদায় বলে। যেমন- গ্রাম বা ছোট কোনো শহর।
- শহরে সম্প্রদায় বলতে শহর অঞ্চলকে বোঝায় | এই অঞ্চলের ঘনত্ব প্রাম্য বা rural অঞ্চলের তুলনায় এই অঞ্চলে প্রযুক্তি ও
  ঘোপাযোগ ব্যবস্থা অনেক উরত শিক্ষা ব্যাবস্থা, সাস্থ্য ব্যাবস্থা সেই বসতি কেই এক কথায় শহরে সম্প্রদায় বলা হয় | যেমন মেট্রো সিট্টি,শিল্প শহর ইত্যাদি ।

Community outreach programme এর ক্ষেত্রে আমরা তিন ধরনের সমস্যা নিয়ে কাজ করতে চলেছি | সেগুলি হল্-

পরিবহন এবং যোগাযোগ সমস্যা

- পরিবহন এবং যোগাযোগ সমস্যা
- 2. স্বাস্থ্য ব্যবস্থা এবং স্বাস্থ্য সমস্যা
- 3. প্রাথনিক শিকা

### পরিবহন এবং যোগাযোগ সমস্যা-

- রাস্তা সংখ্যার করার সত্ত্বেও বেহাল রাস্তা সে নিয়ে সেখানকার জনগণের ক্ষোন্ত ।
- কালভাট ভেলে যোগাযোগ বিশ্হিল মুরারাই এর রাজপ্রামে সমস্ত কিছু জেনেও প্রশাসন কালভাট মেরামত করার উদ্যোগ নিশ্হেন না I
- গ্রামবাদীদের অভিযোগ পঞ্চায়েত প্রধানের গাফিলতিতে জলকাদা পেরিয়ে যাতায়াত করতে হচ্ছে একই সাথে বর্ষায় চার থেকে পাঁচ
  মাস কট্ট করতে হয় তাদের ।
- বোলপুর শান্তিনিকেতনে কোপাই নদীর ওপর প্রস্তাবিত ব্রিঞ্চ নির্মাণ ক্ষুত্ব বাসিন্দারা কাজের চিলেনি। যেদিন কাজ শুরু হয়েছিল বলা
  হয়েছিল 2013 মধ্যেই এর কাজ শেষ হবে। ব্রিজটি যদি হয় তাহলে 32 টি প্রামের বাসিন্দাদের উপকার হবে। লাভের পরিমাণ বাড়াতে
  টিকাদার সমিতি দীরে চলছে। বাসিন্দাদের অভিযোগ এভাবে কাজ চললে 10 বছরেও কাজ শেষ হবে না।
  রাষ্ট্রব্যবস্থা এবং স্বাস্থ্য সমস্যা-
- জন্মদেব মেলা অপরিচ্ছল্লতা নিয়ে আক্ষেপ | বীরভূম জেলা পরিষদ অন্যদের মেলার দায়িত্ব নিলেও আজও এই মেলা পরিচ্ছন্ত রূপ পায়নি, পর্যাপ্ত শৌচাগারের অভাব |
- নলহাটতে অগ্রিক রোগে আক্রান্ত শতাধিক ঘটনাটী ঘটেছে কয়টা গ্রামের মানপাড়ায়। পর্যাপ্ত টিউবওয়েল না থাকায় গ্রামবাসীদের
  পুকুরের দ্বল খেতে হয়। তারই মধ্যে ওই পুকুরের পাড়ে শৌচকর্ম করে গ্রামবাসীরা সেইসব দ্বল ব্যবহার করার ফলে বিভিন্ন ধরনের
  সমস্যা সৃষ্টি হচ্ছে।
- নিকাশি নালার সমস্যা
- পানীয় জনের সম
- পর্যাপ্ত পরিমাধে চিকিৎসালয়ের অভাব
- কোন পাশ করা ভাক্তারের অভাব হাতুভে ভাক্তারের উপরই ভরসা করতে হয়
- ওষুধের দোকানের অভাব

#### প্রাথমিক শিক্ষা-

- বিদ্যালয় নির্মানের সামগ্রী ব্যবহার করার জন্য মোহাত্মণ বাজারের বামেলা পেশে থাকে | ফুল তবন তৈরীর জন্য বরাদ্ধ B লাখ
   ৪৬ হাজার টাকা কিন্তু কাজ এত নিম্নমানের যে ছাবে ইতিমধ্যে ফাটল তৈরি হয়েছে সে নিয়ে বিক্ষোত করেন বাসিন্দারা
- আদিবাসী ফুলের পরিবেশ গঠন-পাঠনের জন্য উপযুক্ত না হওয়ায় এবং নিরাপতার অভাব থাকায় অভিযোগ দেখান !

- যিত ডে মিলে নিম্বসানের খাবার দেওয়া ও শিককদের অনিয়মিত অশা নিয়ে সমস্যা সৃষ্টি!
- বীরভূম জেলায় অসনারী কেন্দ্র গুলিতে কর্মী না থাকায় বচ্চাদের খাবার সরবরাহ পড়াগোনার সমস্যা সৃষ্টি হয়েছে তাই কর্মী নিযোগের দাবি এবং বেশি ছাত্রের হিসাব দেখানো নিয়ে অভিযোগ।
- কুল ছুট ছাত্রীদের বয়সের আগে বিবাহ নিয়ে সমসাা!

### সমসাময়িক বিষয়

- বীরত্ম জেলার করিখ্যা প্রামে পানীয় জলের অসুবিধা। করিখ্যয় সৎসঙ্গ চলাকালীন গ্রামে ট্যাংক হওয়ার বড় ঠিক মতো ভাবে সেটি
   তৈরি না হওয়ায় অনেক পরিবারের অসুবিধা হয়।
- 2) বীরভূম জেলার সদর শহর থেকে 7 km দূরে অবস্থিত একটি ছোট আদিবাসী গ্রাম মমরেজপুর |জেলার সদর শহরের প্রায় কাছাকাছি অবস্থিত হওয়ার পরেও এখনো পরিবহন ব্যবস্থা খুব অনুয়ত হলে সেখানকার মানুষের অনেক অসুবিধার সন্মুখীন হতে হয় |
- বীরভূমের বলিহারপুর গ্রামে গরিব আদিবাসী সম্প্রদায়ের মানুষেরা অনেক ক্ষেত্রে সরকারি প্রকল্প বাড়ি না গাওয়ায় গৃহহীন হয়ে আছে ।
- বীরভূম জেলার আমাইপুর গ্রামের পরিষ্কার পরিচ্ছরতা ক্ষেত্রে শৌচাগারের সমস্যা সেই গ্রামে দেখা যাচ্ছে!
- 5) বীরভূম জেলার ভেজেনা, বেহীরা এই দুটি গ্রাম দুটি নদীর মাঝখনে অবস্থিত। তাদের যাতায়াতের জন্য কোন ব্রিজ নেই। তিলগাড়া ভ্যাম্প থেকে জল ছালা হলে তখন তাদের নৌকায় করে যাতায়াত করতে হয়। পরিবহনের ক্ষেত্রে এই দুটি গ্রামে কাবাসকারীদের অনেক সমস্যার সমুখীন হতে হয়।
- কাভ্রবতের আয়তারা জেলার আফজালপুর গ্রাম এ হাসপাতাল না থাকার সেখানকার মানুষ দের অনেক অসুবিধার মধ্যে পড়তে হয় ।
- বীরভূমের বলরামপুর গ্রামের সড়ক গুলির অনুশ্রত অবস্থা ।

# সমস্যার বিবরণ :-

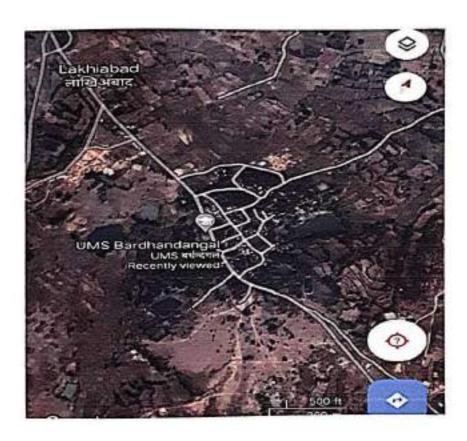
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বাড়খণ্ড, এর জামতরা জেলা, এর বর্ধনভাঙ্গল প্রাম এর সাস্থ্য কেন্দ্র বা হাসপাতালটি বন্ধ হয়ে আছে। এই জন্য এই প্রামের সাস্থ্য সংক্রান্ত কোনো সমস্যা হলে তার জন্য দূরের কোনো শহরের যেমন (সিউড়ি, আসানসোল) এর কোনো সাস্থ্যকেন্দ্রের ওপর ভরসা করতে হয়। এই প্রাম টি থেকে এই শহর দুটির দূরত্ব জনেক বেশি, ফলে এই দূরত্ব জনিত কারনে এবং সময় এর অভাব এ অনেক ক্ষেত্রে অসুত্ব মানুষ নানান সমস্যার সম্মুখীন হতে হচ্ছে।



Map of Bardhandangal

(Source: Google map)

# DEMOGRAPHY OF THE COMMUNITY

বিষয় "বর্ধনডাদাল প্রামের স্বাহ্যকেন্দ্র বা হাসপাডালের অভাব" | এই প্রামটি সিউড়ি থেকে 50 km দূরে অবস্থিত

বর্ধনভাঙ্গল গ্রাম বিষয়ক তথ্য নিয়ে দেওয়া হলো:-

গ্রামের নাম :- বর্ধনভাঙ্গল

পঞ্চায়েত:- বড় রামপুর

থানা: নগা

জেলা:- জামতোরা

পিন:- 815355

মোট জনসংখ্যা:- 631 জন

সাক্ষরতার হার- 71%

পুরুষ সংখ্যা: 335 জন

মহিলা সংখ্যা: 296 জন

শিশু সংখ্যা: 74 জন

তথ্যসূত্র :- নির্মল শীল (বর্ধনভাঙ্গল গ্রামের প্রাথমিক শিক্ষক)

## Population Census

Bardhandangai Data

Particulars	Total	Male	Female
Total No. of Houses	160		5
Population	631	335	296
Child (0-6)	74	41	33
Schedule Caste	195	93	102

AS PER CENSUS 2011

# গবেষণার উদ্দেশ্য :-

- া.এমীণ অঞ্চলে ৰসৰাসকারীদের স্বাস্থ্য সংক্রাপ্ত বিভিন্ন বিষয়ে অবগত করা।
- গ্রামীণ হাস্থ্য সেবা পেশানারীদের প্রশিক্ষণ।
- 3,গ্রামীন অঞ্চলে প্রাথমিক স্বাস্থ্য সেবার জোরদার করার জন্য সুপারিশ করা।
- 4, শারীরিক সমস্যা বা অসুস্থতার কারণে গ্রামীণ অঞ্চলের মানুঘদের বহুদূর ভ্রমণ যেন না করতে হয় তাদের নিজস্ব প্রাযের সমস্ত পরিসীমা পায় তার জন্য যথায়ত্ব ব্যবস্থা নেওয়া।
- 5.স্বাস্থ্য কেন্দ্ৰের অবকাঠামগত উন্নয়ন সাধন।

## গবেষণার লক্ষ্য :-

ব্যাচখণ্ড এর বর্ধনভাঙ্গাল ও বন্ধ হয়ে যাওয়া হাসপাতাল বা স্বাস্থ্য কেন্দ্রকে পুনরায় খোলা বা Re-open করা।

# Research questions:-

- 1.ঝাড়খণ্ড এর বর্ধনভাঙ্গাল গ্রামে স্বাস্থ্য কেন্দ্রের বন্ধের ফলে মানুষদের বিভিন্ন স্বাস্থ্যজনিত সমস্যার সমাধান কিভাবে সম্বব?
- 2 ওই গ্রামের স্বাস্থ্য কেন্দ্র পুনরায় কিভাবে খোলা সম্ভব?

# **CHAPTER-II**

# Literature Review

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গবেষণার গুরুত্বপূর্ণ পদক্ষেপ হল সংশ্লিষ্ট সাহিত্য পর্যালোচনা (Literature Review) করা। কোনো গবেষণাকে গ্রহণযোগ্য ও সার্বজনীন করে গড়ে তুলতে সাহিত্য পর্যালোচনা বিশেষ গুরুত্বপূর্ণ বিষয়। ইংরাজী Literature Review এর আঙ্করিক অর্থ হল সাহিত্য পর্যালোচনা করা। সাধারনভাবে গবেষণায় নির্বাচিত সমস্যা বা বিষয়বস্তুর সাথে সম্পূর্ণ পরিচিতি লাভ এবং সেই সম্পর্কে জ্ঞানবৃদ্ধির জন্য বিভিন্ন পুষুক (book) গত্ত-পত্রিকা (Journal), প্রবন্ধ (article) গবেষণা কার্ম (research work) প্রভৃতি মুখামখভাবে অধ্যায়ন করাকে সাহিত্য পর্যালোচনা বলা হয়। সাহিত্য পর্যালোচনা (Literature Review)-র প্রধান গুরুত্বগুলি হল —

- পূর্ববর্তী গবেষণায় ভাঁকগুলি চিহ্নিভকরল।(Gaps identified in previous research)।
- গবেষণার সমসামরিক প্রাসঙ্গিকভা (Contemporary relevance) ভৈরি করে।
- সবেষণা লকশা প্রস্তুত করা (Preparing the research design) |
- গবেষককে গবেষণার পূর্ববর্তি ভত্ব(Previous Theory) জানতে সহায়তা করে।
- গবেষণার যথার্থতা (validity) বাচাই করে।
- এটি থেকে গবেষক যে বিষয়ে গবেষণা করবেল সেই বিষয়ের সমাক ধারণা পেয়ে খাকেল।

সর্বোগরি বলা যাম, সাহিত্যের পর্যালোচনা দারা প্রদত্ত জ্ঞানের ভিত্তি তৈরি করতে কোনো গবেষক যদি বার্থ হম, তবে সেই গবেষণার কাজটি অগভীর (shallow) এবং অকৃত্রিম (naïve) হতে পারে।

1.R. Premkumar, S. Adole, R. Arole (2001)" Efficient and effective emergency Obstetric care in a rural Indian community where most deliveries are at home "এই গবেষনা পত্রটিভে বলা হয়েছে মাতৃমৃত্যু এড়ানোর জন্য বেশিরভাগ প্রগঘাতী প্রসৃতি জটল তার জন্য হাসপাতানে চিকিৎসা প্রয়োজন। ভারতের মতো উল্লয়নশীল দেশগুলিতে প্রামীণ অঞ্চলে প্রায় সমস্ত প্রসব বাড়িতে হয় যার ফলে অনেক সমস্যার সমুখীন হতে হয় মানুষদের। সরকারি হাসপাতালগুলি সাধারণত প্রসৃতি জরুরী অবস্থার জন্য অক্রাপচারের চিকিৎসা প্রদান করেননা , এই অধায়নের উদ্দেশ ছিল প্রসৃতি ফলাফল, নিদর্শন এবং প্রসৃতি এ যত্নের খরচ নিধারণ করা। মহারাষ্ট্রের কিছু অংশে এই বিষয়ে অধ্যায়ন করা হয়েছে। 1987 সালে চালু করা হয় নিরাপন মাতৃত্ব কর্মসৃতি, প্রসৃতি মৃত্যুর সধারণ কারণগুলি পরিচালন করার জন্য জরুরী প্রসৃতি যত্ন এর গুরুত্বের ওপর জ্ঞার নিয়েছে।

(International Journal of Gynecology and Obstetrics, Volume 75, Issue 3, 297-307p)

2.Sheldon weisgrau "Issues in Rural Health: Access, Hospitals and Reform (1995)"
এই গবেষনাটর উদ্দেশ্যগুলি হল. গ্রামীণ হাসপাতালের উন্নয়ন ঘটানো, telemedicine -এর ব্যবহা করা, যথা যতখভাবে
গ্রামবাসীদের স্বাস্থ্য সংক্রান্ত সেবা প্রদান । এই গবেষনাটর জন্য আমরিকার গ্রামীণ অঞ্চলকে বেছে নেওয়া হয়। হাসপাতাল
গুলির অর্থের অভাবে বন্ধ হবার মুখে পড়ে; যদিও ওলদ্ভিজ ও তার সহকর্মীরা কিছু হাসপাতলকে সহায়তা করে কিন্তু তা খুবই
সামান্য ছিল।

(Health Care Fine ncing Review, 17(1):1-4)

# **CHAPTER-IV**

Table no 1

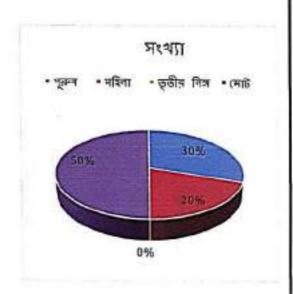
ব্যুস	সংখ্যা
10 to 20	60
20 to 30	59
30 to 40	26
40 to 50	18
50 to 60	26
60 to 70	9
70 to 80	2
মোট	200



শ্রমিক্যার অন্তর্গত 200 জনের মধ্যে 10 থেকে 20 বছর বয়সী আছেন-30%,20-30 বছর বয়সী আছেন 29.5%,30 থেকে 40বছর বয়সে আছেন 13%, 40 থেকে 50 বছর বয়সী আছেন 9%,50 থেকে 60 বছর বয়সে আছেন 13%,60 থেকে 70 বছর বয়সী আছেন 4.5%,70 থেকে 80 বছর বয়সী আছেন 1% আমার সমীক্ষায় 10 থেকে 20 বছর বয়সীর সংখ্যা বেশি।

Table no 2

লিস	সংখ্যা
পুরুষ	120
<b>म</b> िला	80
তৃতীয় লিঙ্গ	0
<b>মোট</b>	200

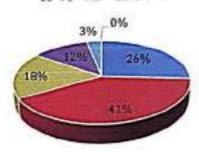


আমার সমীক্ষায় 200 জনের মধ্যে পুরুষ 60% এবং মহিলা 40%, কোন তৃতীয় লিঙ্গ নেই। মহিলার তুলনায় পুরুষের সংখ্যা বেশি। Table no 5

সম্ম সীমা	সংখ্যা
1-15 বদ্র	53
15-30 বদ্ব	81
30-45 বছ্ব	36
45-60বছর	24
60-75 বছ্ব	6
ভারও বেশী	0
মোট	200



- 1-15 বদর 15-30 বদর
- 30-45 বছর 45-60বছর
- 60-75 বদর ভারও বেশী



আমার সমীক্ষায় ২০০ জনের মধ্যে 1-15 বছর 26%,15-30 বছর 40.5%,30-45 বছর 18%,45-60 বছর 12%,60-75 বছর 3%,75 বছরের বেশি কেউ নেই।
তুলনামূলকভাবে 15 থেকে 30 বছর বসবাসকারীর সংখ্যাই বেশি।

Table no 6

হাসগাতাল থাকা	সংখ্যা
আছে	200
লেই	0
<b>मा</b> उ	200



200 জন গ্রামবাসীর ওপর সমীক্ষা করে দেখা গেছে 100% ই হাসপাতালের উপস্থিতির কথা বলেছেন। ডাক্তারের কাছে যেতে হয়। তাছাড়া অনেক দূর যাতায়াত করে সিউড়ি, আসানসোল গিয়ে সরকারি হাসপাতালে গিয়ে চিকিৎসা করাতে হয়।

হ্যী। অনেকবার সরকারের কাছে দরখাস্ত দেওয়া হয়েছে। মিডিয়ার সাহায্য নিয়ে তাছাড়া পলিটীকাল লিডারকে সমবেত হয়ে জানাতে হবে।

সেহাশীষ মন্ডল বলেন আমাদের গ্রামের হাসপাতালদের জবস্থা একেবারে শোচনীয়।
সরকারি গাফিলতি এবং ডাক্তারদের অভাবের ফলে এই হাসপাতালটি বন্ধ হয়ে যায়।
প্রয়োজন এর সময় রোগীরা সঠিক চিকিৎসা পায় না।
জনেক দূর যাতায়াত করে বাইরে শহরে গিয়ে ডাক্তার দেখাতে হয়।
হ্যী হাসপাতালটি খোলার জন্য অনেকবার সরকারকে আর্জী জানানো হয়েছে।
পলিটক্যাল সাহায্য নিয়ে হাসপাতালটি খোলা যেতে পারে।

রাজ রায় বলেন আমাদের প্রামের স্বাস্থ্য কেন্দ্র বা হাসপাতাগটির অবস্থা খুবই খারাপ সংকট জনক।এই হাসপাতালটি

চিকিৎসকের অভাবের ফলে হাসপাতালটি বন্ধ হয়ে যায়।অনেক সময় রোগীদের গুরুতর অবস্থা বা খারাপ অবস্থায়

সময়ে ঠিকঠাক চিকিৎসা পাওয়া সম্ভবকর হয়ে ওঠে না। স্বাস্থ্য সংক্রান্ত বিভিন্ন সুবিধা পাওয়ার জন্য গ্রামবাসীদের

গ্রামের হাতুরে ডাক্তারকে দেখিয়ে বাদুরের কোন হাসপাতালে গিয়ে চিকিৎসা করিয়ে।হাা। সরকারের কাছে আর্জি

জানানো হয়েছিল। হাসপাতালটি পুনরায় খলানোর ক্লেত্রে তিনি বলেনপলিটক্যাল নেতাদের সাহায্য নিয়ে

হাসপাতালটি কোন রেকর্ড হতে পারে।

শ্যামল দে তাদের প্রামের স্বাস্থ্য কেন্দ্র বা হাসপাতালের অবস্থা খুবই শোচনীয় |

চিকিৎসকের অভাবের ফলে হাসপাতালটি বন্ধ হয়ে যায় | সঠিক সময়ে চিকিৎসা পায় না | অনেক দূর যাতায়াত করে

সিউড়ি বা আসানসোল গিয়ে সেখানকার কোন হসপিটালে চিকিৎসা করাতে হয় | হ্যী গ্রামের সকলে মিলে সরকারকে

আর্জি জানানো হয়েছিল হাসপাতালটি পুনরায় খোলানোর জন্য | সবাই মিলে যদি সরকারকে আমাদের অবস্থা তুলে

ধরতে পারি তাহলে হয়তো হাসপাতালে খোলা যেতে পারে |

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- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7032574/
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4014652/
- https://ballardbrief.byu.edu/issue-briefs/healthcare-access-in-rural-communitiesin-india
- https://www.census2011.co.in/data/village/373009-bardhandangaljharkhand.html

# ANNEXURE SURVEY QUESTIONNAIRE

1. ব্যক্তির নাম: 2.শিক:
<ol> <li>পেশা: 4.মাসিক রোজগার:</li> </ol>
5. নিঞ্চাগত যোগ্যতা: 6.contactno:
1. আপনি কতদিন ধরে এই গ্রামে বসবাস করছেন?-(0-5 /5-10 / 10-15 /above 15 years) l
<ol> <li>আপনার প্রানে কোন হসপিটাল বা স্বায়্য সংস্থা কেন্দ্র আছে ?-( হাঁ\/ না) ।</li> </ol>
<ol> <li>আপনাদের প্রামের হসপিটাল টি কত বছর আগে স্থাপিত হয়েছিল?-( 0-5 /5-10 /10-15 বছর /জানিনা)।</li> </ol>
4.স্বাস্থ্য সংক্রান্ত সমস্যার জন্য আপনারা কী হাসপাতালে যান?-( হাী/না )।
5 হসপিটালটি কেমন অবস্থায় আছে?-(খোলা/বন্ধ/মাঝের মধ্যে বন্ধ/জানিনা)
6. এই প্রামে কতদিন ধরে হসপিটালটি বন্ধ আছে?-(0-12 মাস/1-2 বছর/2-3 বছর/ভারও বেশি <b>)।</b>
7. আপনাকে স্বাস্থ্য সংক্রান্ত সুবিধা বা হসপিটাল এর সুবিধা পাওয়ার জন্য গ্রাম থেকে কত দূর পর্যন্ত যাতায়াত করতে হয়
(0-10/10-20/20-30/তারও বেশি) l
৪. প্রাম থেকে যাতায়াতের মাধ্যম কী?-(ভ্যান/বাস/ টোটো /সাইকেল/অন্যান্য মাধ্যম) l
9. আপনাদের প্রামের হাসপাতালটি বন্ধ থাকার কারণ কী?
10. এই হাসপাতালটি ছাড়া আপনারা কিভাবে স্বাস্থ্য সংক্রান্ত সুবিধা পান?
11. আপনি কি চান হাসপাতালটি পুনরায় খোলা হোক?-(হাট/না)
12. আপনারা ইতিপূর্বে বাস্থ্য কেন্দ্র পুনরায় খোলার জন্য সরকারের কাছে দাবি বা আরঞ্জি জানিয়েছেন??-(হাঁ\/ না) l
<ol> <li>এই উদ্যোগের ফলে সরকার থেকে কি কোন প্রতিক্রিয়া পেয়েছিলেন?- ( হাট না/ জানিনা)!</li> </ol>
14. হাসপাতালটি পুনরায় খোলা হলে আপনাদের কী কী সুবিধা হবে?-(স্বাস্থ্যের বিভিন্ন সুবিধা পাওয়া যাবে /চিকিৎসার ভ
দূরে যাতায়াত করতে হবে না /পিরিত মানুষ সঠিক সময়ে চিকিৎসা ভাবে /উপরের সবকটি)।

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# **FGD DATA SHEET**



# **DURING FGD**

Date-19/05/23 Time-4:30-5:30



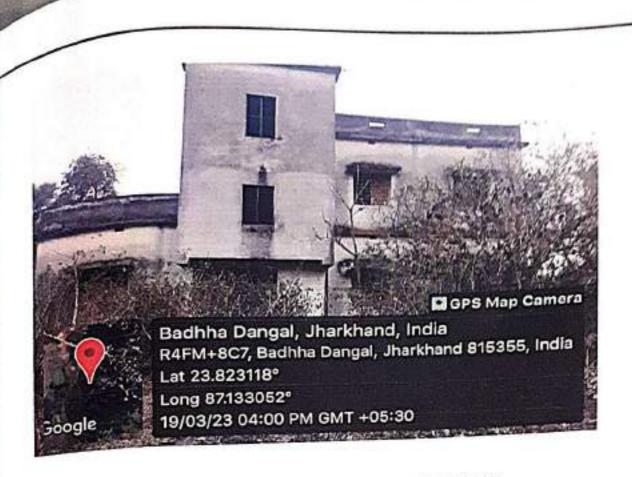
# PICTURE DURING INTERVIEW

Date - 29/05/23 Time-4:30PM





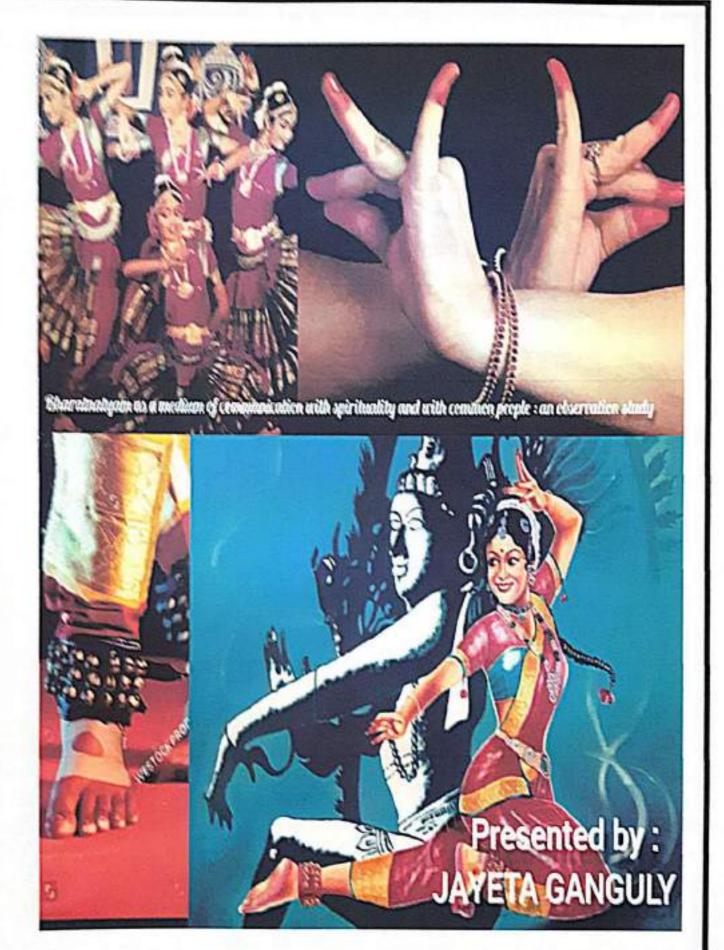
PICTURE DURING SURVEY



# THE HOSPITAL OF BARDHANDANGAL VILLAGE



CURRENT SITUATION OF THE HOSPITAL





Department of Mass communication and Journalism(H)

#### THE UNIVERSITY OF BURDWAN



Community Outreach Programme

Discipline Specific Elective (DSE)-3

On

<u>TITLE OF PROGRAMME</u>: - Bharatnatyam as a medium of communication with spirituality and with common people: an observation study

Submitted for

Partial fulfilment of the requirement for the degree

By

# JAYETA GANGULY

Univ. Roll no.: 200131000107

Reg. no.202001031060 of 2020-2021

Semester: VI, MCJH, SVC

Under the guidance of -

SANCHITA CHATTERJEE

SURI VIDYASAGAR COLLEGE

(Collage Teacher), MCJH, Suri Vidyasagar College)

SURI VIDYASAGAR COLLEGE

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#### **Guide Certificate**

Sanchita Chatterjee SACT Department of Mass Communication and Journalism

This is to certify that I, Sanchita Chatterjee, have served as the official guide and mentor for the dissertation titled "Bharatanatyam as medium of communication with spirituality and with common people: An Observation Study" presented by Jayeta Ganguly. Throughout the duration of this research endeavor, I have had the privilege to supervise and provide guidance to Jayeta Ganguly in his academic pursuit. As his guide, I have closely monitored the progress of the dissertation and offered valuable insights, feedback, and support, encouraging the development of their research skills and intellectual abilities.

Based on my thorough assessment of the final dissertation manuscript and its oral defense, I hereby recommend that the work be accepted and approved for evaluation by the academic committee. I firmly believe that Jayeta Ganguly has met the scholarly standards and requirements set forth by the Suri Vidyasagar College towards successful completion of the Bachelors Degree in Mass Communication and Journalism in The University of Burdwan, a State University and Institute of national importance. This is an original study and I hereby grant authorization for the submission of this dissertation for examination purposes.

Date- 27/04/2023

Place- Susti

Sanchita Chatterjee

Department of Mass Communication and Journalism Suri Vidyasagar College P.O.-Suri, Dist.-Birbhum, W.B.-731101

### SURI VIDYASAGAR COLLEGE THE UNIVERSITY OF BURDWAN

## Declaration

I hereby declare that this project entitled: Bharatnatyam as a medium of communication with spirituality and with common people submitted to The University of Burdwan is an outcome of the original work carried out by me under the department of Mass Communication and Journalism, Suri Vidyasagar College.

I also declare that this is my own work and that, to the best of my knowledge, it contains no material previously published or has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgement has been made in the text or as references

Dated: 27/07/2023

JAYETA GANGULY

Joyeta Grouguly

Department of Mass Communication

and Journalism

Suri Vidyasagar College

The University of Burdwan

## SURI VIDYASAGAR COLLEGE THE UNIVERSITY OF BURDWAN

## **Acknowledgement**

I have put a lot of effort on this project. Yet, without the generous support and assistance of many people, it would not have been feasible. I want to express my sincere gratitude to each and every one of them. I want to specifically thank my project mentor, Sanchita Chattopadhyay Mam, for giving me the chance to work on this fantastic project. It also helped me conduct a tonne of research for it, and I learned a tonne of brand-new information as a result. I sincerely appreciate her. She provided the direction and frequent monitoring I needed, as well as the information I needed to complete the project, and for that I am very grateful. I would also like to express my appreciation to all of the teachers at Suri Vidyasagar College's Mass Communication and Journalism Department for providing the study with the necessary resources.

I would like to thank my parents and friends for their wonderful encouragement and cooperation, which allowed me to finish my project in the allotted time. project.

**JAYETA GANGULY** 

Toyeta Georgaly

Department of Mass Communication

and Journalism

Suri Vidyasagar College

The University of Burdwan

## Abstract:

This paper describes Bharatnatyam as a mode of non-verbal communication, on average, the properties, how it communicates, and to some extent why and what it communicates. The intentions of the communicator dancer and Choreographers are related to those of the attractive and reactive public. The thesis compiles a survey of textual sources pin pointing the unique communicative abilities of dance, as an artistic, expressive and meaningful form of non-verbal communication establishing suggestions of the ways it may be universally communicable. Dance is one of the biggest and most exclusive forms of non-verbal communication. In dance, the human body is used as a medium or tool that transforms itself into a sense of meaning from the source of movement. This article is not only a means of communication from language but also a lot of UFITSI symbolic and didactic stories, emotions and so on.

## KEYWORDS

Bharatnatyam , dance , devadasis , people , India

## **CHAPTER 1**

## INTRODUCTION

Dance has been an important medium of entertainment and expression in our diverse India since ancient times. There are different types of dances in this dance, such as:-Bhava's 'Bha', Raga's 'Ra' and Ta'a's of rhythm. A combination of these three that is commonly performed in Natyam is called Bharatanatyam. Bharatanatyam is a dance form of Tamil Nadu, South India. Its origins can be traced to the Natyashastra, an ancient text on drama written by the mythological priest Bharata. Originally a temple dance for women, Bharatanatyam is often used to express Hindu religious stories and devotions. Many say it should be Bharatnatyam instead of Bharatnatyam because there is no documentary evidence of the Natyashastra that Bharata Muni wrote - in fact the Natyashastra was composed by someone from India and hence the name Bharatnatyam.

Besides verbal form of communication, human beings use many behavioural patterns to make others understand messages more clearly. These behavioural patterns can be visual, aural or gestural which speak more directly and clearly than words. Dance is made up of different movements and poses, and this is one of the signs that they are really alive. Therefore, dance is the natural instinct of every living thing. People, regardless of their acting and their faith, enjoy working and watching the dancing. In humans, basic movement patterns have been developed in animal life, consisting of a flexi-chain and an extension-chain. Movement movements condition the brain, not the muscles. These movement patterns thus form the basis of the dance. In the classical dance form, these movement motifs are organized in an organized form and are based on a special principle and style. The human body is a complex machine, and in everyday life we use different parts of the muscles and movements that are available to us.

Dance is usually seen as a medium through which information, messages and ideas are communicated by the dancer's body to audience. The dancer engages in movement patterns which are often symbolic and sometimes reflect some true life situations. Cultural behaviour of dance highlights different views and social background of the performer which may be religious, ritual or ceremonial, social organisation: political organisation: economic or occupational history or mythology, educational, recreational and entertainment.

## LITERATURE REVIEW

Bharatnatyam is one of the most practised dance styles of India. Apart from being u popular dance form of India it has been successful in creating a global presence. Be it the costumes or the different hand gestures, this dance style has been grabbing the eyeballs of the people all around the country since time immemorial. Studies have also explored areas where the political organization has been influencing soch dance practices

(Meduri, 2004) explained the global presence of Bharatnatyam just like Ballet. It has been researched in many western universities and institutions around the globe. International conferences and various dance studies program had assumed a leadership and an important position, thereby leading to the birth of a new profile for dance. The costumes in this dance form are made of fine fabric with zari work and colours embroidered on the sari which drew universal attention. The West had been encouraging the Indian culture to get connected with the foreign soil which led to a large scale demand in the international markets. (Cultural Connections). (David, 2009) explored the growth of Bharatnatyam performances in British Tamil temples which also answered the questions relating to the presence of Tamil diaspora, whether the dance performances were linked to the temple dancers and the perceptions of the people regarding the dance performances. It also discussed whether there was a presence of a political organization which influences the temple practices. Indian Bollywood movies, yoga and Indian cuisine were popular but Classical Indian Dance had attracted the youth from China. Efforts have been made to pass this un form from one generation to another (World News, 2007)

Studies have not only explained the global presonce but also depicted the culmination of Bharatnatyam with different forms of recreation like voga, martial arts. painting, sculpting, etc. (Education, 2015) considered Bharatnatyam to be the mother art of classical dance form. The formats of Bharatnatyam included dance items like Alarippu, Jathi Swaram, Shabdam, Vatnam, Padams, Javalis and so on which had been evoking several other forms like painting and sculpting. (Jayakrishnan, 2010) conducted a study to reinstate the role of architecture as a cultural connection thereby rebuilding the fragmented dance community and identity. The dance and the dancer have been depicted as a medium of divine invocation in an architectural setting. The evolution of contemporary culture to an icon of nationalism provided the base, of architecture. (Katrak, 2013) explained the emergence

# RESEARCH GAP

Bharatnatyam is one of the oldest forms of classical dance in India. Its history and revival is of crucial importance. Research conducted describes the influence of temples and architecture on revival of the dance form. Less emphasis has been given on the pioneers of Bharatnatyam and the various challenges faced by them for keeping this art form alive. Also the downfall of the Devadasis system and its negative connotations in the form of child prostitution, hegging, ate has been discussed. But very little focus is given on understanding the plight of these temple dancers who were known for their service and devotion towards God.

Some studies conducted show the impact of Bharatnatyam on physical, emotional and mental health of the people whereas some studies spell its global presence. But not much is spoken about its relevance and presence in todays world.

# Historic Background of Mudras

What we know as Bharatanatyam today springs from Sadir Natyam, also known by names like Daxi Attam, Chinna Melam, or simply. Sadir. The term Sadir began with the Maratha rulers of South India in the 17th century, who called the dance Sadir Nautch. This corresponds to the presentation of the dance in the courts. A more exalted role of the dance is evoked by the name Dasi Attam, the dance of the devadasis as a part of temple worship. A devadasi, whose name means servant (dasi) of divinity (devo), was an artist dedicated to the services of a temple. The dance of the devadasi was integral to the ritual worship. Devadasi families specialized in the arts of music and dance, and with the nattivonary (dance masters), they maintained these traditions from generation to generation, supported by royal patronage.

Sculptural and literary evidence indicates that dances of the Bharatanatyam form, that is, based on the Natya Shastra, were used in temple worship throughout India. This original classical dance tradition deteriorated in the North due to repeated foreign invasions, and mixed dance forms replaced it. Fortunately, the dance tradition survived in South India, where it continued to be patronized by kings and maintained by the devadasi system.

This is not to say that the tradition of Bharatanatyam was static from the time of the Natya Shastra through the last century. It did evolve and there were regional variations in elements of the dance. An important milestone in this evolution was the development of the current format of the Bharatanatyam recital. This happened in the late 18th century, at the hands of four hrothers known as the Thanjavur quartet. They were the four sons of the nativanar Subbarayan: Chinnavya, Ponnayya. Vadivelu, and Sivanandam. They also refined the music of Bharatanatyam, influenced no doubt by their musical mentor, the great composer Muthuswamy Dikshitar. These developments shaped Sadir into the precursor of what we call Bharatnatyam today.

How bharatnatyam communicates and connect us to Indian Mythology: Originating in Hindu temples of Tamil Nadu and nearby regions, Bharatanatyam soon prospered in other South Indian temples. According to some sources the Devadasi culture dating back to 300 BCE to 300 CE evolved under the auspices of the royals that saw the temple dancers called Devadasis, who were dedicated to serve the Lord as dasis or servants, performing the dance form.

#### Mudra

For thousands of years hand mudras have been used in India for healing, storytelling, emotional expression, and to evoke and convey elevated spiritual states. Among the different dance forms that use Mudra as a part of their postures to communicate with the audience, Bharatnatyam is the most popular and historic dance form. They are used for a variety of reasons such as to mime the meaning of the song

Linguistically, the mud in Indian dance generally corresponds to symbolic meaning through systematically codified hand gestures. The appearance of mudra therefore creates a "double semiotics" that is expressions and techniques on the one hand and bodily gestures presented in the performance on the other hand. In this way, the Bharata Natyam dancer's hand appears as a material host serving two inscriptive shapes; a symbolic language that exists simultaneously with bodily gestures. These "thoughtfulness" and "technique-enhancing" hand movements are "gestures like inscriptions" and a source of the dance's semiotic ability. Bharata Natyam tradition, includes an expressive, interpretative tradition that is expressly symbolic and even conceptual In view of mudra practice like Bharata Natyam's outer semiotics, the dance form has the ability of conventional symbolism on linguistically equivalent conditions to an understanding audience. The spectacular semiotics of the mudra hands, operated on two levels she calls double semiotics, which are performative symbolism and the linguistic story of the dance show.

## ASAMYUKTA HASTA MUDRA:-

#### Aramyuta Hartar



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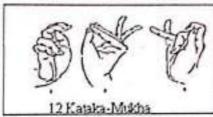
































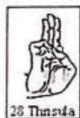












## SAMYUKTA HASTA MUDRA:-



## Importance Of Gestures In Communication:

People move their hands as they talk - they gesture. Gesturing is a powerful phenomenon, found in different cultures, ages and tasks. The gesture is even found in blind individuals from birth. But what purpose, if any, does the gesture serve? In this review, gesture occurs alone, replacing speech and clearly serving a communicative function. When called to carry the fall burden of communication, the gesture takes on a form similar to language, with structure in the levels of word and sentence. However, when produced along with speech, the gesture takes on a different form - it becomes imagery and analog. Despite its shape, the gesture that accompanies speech also communicates. Trained coders can collect important information from the gesture information that is not always identical to that obtained from speech. The gesture can thus serve as a research tool, clarifying the unspoken thoughts of the speakers. The controversial question is whether the gesture conveys information to untrained listeners to read it. Spontaneous gestures communicate with ordinary listeners? Or can they be produced only for the speakers? These functions are not mutually exclusive the gesture serves both as a communication tool for listeners and as a tool for thinking the speakers.

#### Social Importance:

In rural areas where literacy is still in the darker side, where people are still not concerned of rights, hygine, etc, dance can be a brilliant way to convey a social message in an attractive and interactive way. Being one of the oldest danceforms, audience will be able to connect with the rich history of culture.

#### Medical Importance

Effective communication in medicine should lead not only to communication of health care professionals with patients, but also to mutual understanding. Limited ability of communication with deaf patients and providing inadequate feedback negatively affect their participation and implementation of successful nursing care. It is important that patients with hearing disabilities could express their needs, desires, feelings and opinions in communication with health care professionals.

Deaf patients are different from patients without disability in communication using hand movements and facial expressions of the muscles, position of the head and the upper part of the trunk as well. Random and disinterested observer of this communication is usually inclined to the view that deaf people use mainly gestures and facial expressions, it means nonverbal communication. Systematic observation and analysis of this specific communication showed something else: means that the deaf people are used to communicate with nonverbal gestures and facial expressions related to each other only at first sight, they are inherently different and to the contrary they are comparable to the means those people without disability use. This viewing of deaf communication is relatively modern view of linguists. Deaf people usually use a different communication system because their communication with others is difficult. Deaf people often used the dual language system. Though hearing aids are available in thi day but it certainly not affordable by everyone, so hand gestures and facial expressions come handfulin such situations, Also elderly persons, who develop hearing disability in course of long run need hand gestures to communicate till they are provided hearing aids.

#### AIM

To highlight the important role that dance culture plays in the communication system.

### RESEARCH OBJECTIVES

- 1. To understand the plight and the trauma faced by the Devadasis.
  - 2 To analyse the challenges involved and the contribution of the pioneers of Bharatnatyam in its revival.
  - 3. To analyse the relevance of this dance form in todays world among the people of India.
    - 4. Changing people's negative thoughts about dance.

#### **CHAPTER 2**

## RESEARCH METHODOLOGY

The methodology adopted for this research study involves primary and secondary sources of data.

Secondary sources consisted of research that is exploratory in nature. The research design consists of understanding the plight of the Devaiasis and the challenges faced by the pioneers for the revival of Bharatnatyam. The sources of data included electronic sources and journal articles.

Devadasis system is an ancient religious practice prevalent in India. This process involves girls who belong to the lower classes of the social strata are given off to temples as human offerings in order to appease the Gods. But the reality lies that they are sexually exploited and are forbidden from marrying any other man. They also have to earn their bread and butter by begging on the streets of the country (India, 2014) (Chronicle. 2017) had described the ongination of the Devadasis tradition during the Cholas, the Chelas and the Pandyas times They lived in temples and were well versed in dance and music. But coming back to the 21" century they were nothing more than just prostitutes or sex traders A report by the National Human Rights Commission of the Government of India speaks about the presence of the Devadasis system till today in spite of being declared illegal by the Goverment of Karnataka and Andhra Pradesh. The districts which are bordering Maharashtra and Karnataka are known as "Devadasi Belt" where trafficking operates mainly due to women being deserted by their husbands or through coercion and deception (Service, 2019)

One of the biggest hurdles in removal of the system is lack of accurate data. A report submitted by Sampark to the International Labour Organization estimated that there are around 450000 devadasis present over the country. The plight faced by them is Traumatic They are deprived the right to education and face social strema from others. The trauma increases with age and they ar left with no work and extreme poverty in their old age. This extends to their children who face discrimination and are denied nights and privileges that other lads get. The health, education and mental development of the child is at a considerable risk. The daughters in particular are deprived of job opportunities and education and are expected to carry forward their mother's duties, thereby, living a life of isolation and traumatization dayna Kothari, 2019) (lyer, 2016) further explained finding a livelihood is a laborious

### Conclusions

In this way the exploitation of the modes of nonverbal communication is clearly seen through the concept of Abhinaya, revealing the Indian classical dances as a heightened sense of communication. This also realizes that what a human body is capable of doing when with the help of bodily organs, it shows the expressive movements. So it can be surmised here that Indian classical dances like Bharatanatyam are the crescendo of nonverbal communication. It is relevant to quote Bharata Muni here, who said, "There is no wisdom, nor knowledge; no art nor craft: no device, nor action that is not found in Natya." Bharatanatyam, in the most refined, enjoyable. pleasing, joyful and beautiful manner attains the highest form of communication without words. Here both what and how are not different things but one and the same thing and what is said" is said via how it is said".

It is India's representation globally. It has a deep and an interesting history to discuss about. Right from being a temple dance to being one of the most popular dances, it is a legacy in itself. This ancient dance style was earlier restricted to temples and were performed by the temple dancers also known as Devadasis. During the older times, being born in a Devadasi householl was considered to be a blessing of God but the British colonial times, tarnished the image of these dancers who were then reduced to mere prostitutes and were subject to filth and dirt Also various studies has been conducted that would highlight the pathetic conditions of these once renowned Devadasis. This dance style had seen its fair share of success and struggle. It was also hamned during the colonial times, yet there had been many pioneers who have not given in to the oppression of the British. Those frommers had led to revival and rebirth of Bharatnatyam, turning it into the Dance of Glory The contributions of these Devadasis and revivalists should be made aware to the people of India who lack a clear understanding about the subject matter. The study conducted highlighted the relevance of this dance among the people of India and it was quite appalling to study the results. More than 60% of the people are not trained classical dancers. Also they lack the basic knowledgeof the number of classical dances in the country. The study also highlighted many people viewed it to be a recreational, fitness or a spintual activity but if given a choice to learn this dance style only 43% of the respondents readily agreed to learn this art style Ironically, more than 50% of the respondents do agree that classical dances are losing their presence in India. Studies have

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## সংযোগের মাধ্যম হিসাবে তৈলচিত্র (Oil painting) এর ভূমিকা: -কয়েকটি তৈলচিত্রের ওপর পর্যবেক্ষণ সমীক্ষা





বিষয়: সংযোগের মাধ্যম হিসাবে তৈলচিত্র (Oil painting) এর ভূমিকা: কয়েকটি তৈলচিত্রের ওপর পর্যবেক্ষন সমীক্ষা ।

#### প্রস্তুতকারক: ARKAPROVA DAS

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## নির্দেশকের শংসাপত্র

শ্রীমতি সঞ্চিতা চট্টোপাধ্যায় অধ্যাপিকা গণজ্ঞাপন ও সাংবাদিকতা বিভাগ সিউড়ি বিদ্যাসাগর কলেজ

এই মর্মে বলা হচ্ছে যে সিউড়ি বিদ্যাসাগর কলেজের গণজ্ঞাপন ও সাংবাদিকতা বিভাগের তৃতীয় বর্ষের ছাত্র অর্কপ্রভ দাস আমার তত্ত্বাবধানে সংযোগের মাধ্যম হিসাবে তৈলচিত্র (Oil painting) এর ভূমিকা: কয়েকটি তৈলচিত্রের ওপর পর্যবেক্ষন সমীক্ষা বিষয়ে একটি গবেষণা কার্য করেছে। আমার নির্দেশনার পরিপ্রেক্ষিতে বর্ধমান বিশ্ববিদ্যালয়ের গণজ্ঞাপন ও সাংবাদিকতা বিভাগের স্নাতক ডিগ্রির জন্য এই গবেষণা করা। এটি সম্পূর্ণ আসল কপি। আমি পরীক্ষার জন্য এটি জমা দেওয়ার অনুমতি দিচ্ছি।

তারিখ: - 14/07/23

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## সমীক্ষকের ঘোষণা

আমি এতদ্বারা ঘোষণা করছি যে সংযোগের মাধ্যম হিসাবে তৈলচিত্র (Oil painting) এর ভূমিকা : কয়েকটি তৈলচিত্রের ওপর পর্যবেক্ষন সমীক্ষা প্রতিবেদনটি সম্পূর্ণ নিজেম্ব প্রস্তুত করা একটি প্রকল্প যেটি কোথাও থেকে নকল করা হয়নি এবং এটির কোনো অংশ আগে থেকে প্রকাশিত হয় নি ।

তারিখ: - 14/04/23

Brikaprova Den.

- অর্কপ্রভ দাস।

গণ জ্ঞাপন ও সাংবাদিকতা বিভাগ

(অনার্স)

সিউড়ী বিদ্যাসাগর কলেজ

বর্ধমান বিশ্ববিদ্যালয়

## কৃতজ্ঞতা স্বীকার

আমি বর্ধমান বিশ্ববিদ্যালয়ের অন্তর্গত সিউড়ি বিদ্যাসাগর কলেজের অধীনে গণজ্ঞাপন ও সাংবাদিকতা বিভাগের তৃতীয় বর্ষের ছাত্র। এই বিভাগের ভারপ্রাপ্ত অধ্যাপিকা শ্রীমতি সঞ্চিতা চট্টোপাধ্যায় মহাশয়াকে আমি বিশেষ ধন্যবাদ ও কৃতজ্ঞতা জানাই সঠিক ও সুন্দরভাবে নির্দেশনার মাধ্যমে সংযোগের মাধ্যম হিসাবে তৈলচিত্র (Oil painting) এর ভূমিকা: কয়েকটি তৈলচিত্রের ওপর পর্যবেক্ষন সমীক্ষা প্রকল্পটি তৈবি করতে সক্ষম হয়েছি। তার সুস্থ পরিচালনা ও যত্মসহকারে কর্মসহায়তার কারণেই আমি আমার প্রকল্প সম্পর্কিত তথ্যগুলি সঠিকভাবে জেনে ব্যক্ত করতে পেরেছি।

আমি আমার শিক্ষাপ্রতিষ্ঠান ও আমার সহপাঠীদের প্রতি কৃতজ্ঞতা প্রকাশ করি,তাদের সদয় ও আন্তরিক সহযোগিতার জন্য।

আমার শিক্ষাগত যোগ্যতা বাড়ানোর জন্য আমার পিতা-মাতার নিরন্তর পরিশ্রমকে আন্তরিক শ্রদ্ধা জানাই।

এছাড়াও আমি সকলকে পূর্ণ আন্তরিকতার সহিত ধনাবাদ জানাতে চাই যারা প্রত্যক্ষ ও পরোক্ষভাবে আমার প্রতিবেদনের সাথে যুক্ত।

## গবেষণামূলক বিষয়

আমি এতদ্বারা ঘোষণা করছি যে সংযোগের মাধ্যম হিসাবে তৈলচিত্র (Oil painting) এর ভূমিকা : কয়েকটি তৈলচিত্রের ওপর পর্যবেক্ষন সমীক্ষা প্রতিবেদনটি সম্পূর্ণ করেছি অধ্যাপিকা শ্রীমতি সঞ্চিতা চট্টোপাধ্যায়- এর সহযোগিতায়।

## সূচিপত্ৰ

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- ২. ভূমিকা
- ৩. উদ্দেশ্য
- ৪. পদ্ধতি
- ৫. কয়েকটি বিখ্যাত তৈলচিত্রের পর্যবেক্ষণ সমীক্ষা
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#### **ABSTRACT**

্রই গবেষণা পত্রটি যোগাযোগের একটি অনন্য এবং ঐতিহাসিকভাবে তাৎপর্যপূর্ণ মাধ্যম হিসেবে তৈলচিত্রের চিন্তাকর্ষক জগতের সন্ধান করে। অধ্যয়নের লক্ষ্য হল কীভাবে তৈলচিত্র গুলিকে চাক্ষুষ ভাষার একটি রূপ হিসাবে ব্যবহার করা হয়েছে। এই গবেষণায় কয়েকটি উল্লেখযোগ্য তৈলচিত্রের ওপর পর্যবেক্ষণের মাধ্যমে জানার চেষ্টা করা হিয়েছে যে তৈলচিত্রের মাধ্যমে মানুষের সাথে কিভাবে communicate করা হয়েছে। এবং বর্তমান সময়ে তৈলচিত্রের প্রাসঙ্গিকতা কিরূপ।

Key words :- তৈলচিত্র , চিন্তাকর্ষক, চক্ষুষ, Communicate , প্রাসঙ্গিকতা ।

## ভূমিকা

তেলচিত্র হল একটি বিখ্যাত শৈল্পিক মাধ্যম যার সমৃদ্ধ এবং বৈচিত্রাময় ইতিহাস রয়েছে কয়েক শতাব্দী ধরে।

#### তেলচিত্রের উৎস :

তেলচিত্রের উৎপত্তি ভারত, মিশর এবং গ্রীসের মতো প্রাচীন সভাতা থেকে পাওয়া যায়। এই প্রারম্ভিক সংস্কৃতিগুলি রং তৈরি করতে রঙ্গকগুলির সাথে মিগ্রিত বিভিন্ন পদার্থ ক্যবহার করত, যার মধ্যে উদ্ভিদের তেল, যেমন তিসি এবং আখরোট তেন, বাইন্ডার হিসাবে অন্তর্ভুক্ত ছিল। যাইহোক, 15 শতকে উত্তর ইউরোপে তৈল চিত্রকলার প্রকৃত অগ্রগতি ঘটে।

#### প্রাথমিক পরীক্ষা :

মধাযুগের শেষের দিকে, শিল্পীরা নতুন চিত্র কৌশল নিয়ে পরীক্ষা-নিরীক্ষা শুরু করেন। তারা শুকানোর তেল, বিশেষ করে তিসির তেল, তাদের রঙ্গকগুলিতে অন্তর্ভুক্ত করা শুরু করে। এটি ধীরগতির শুকানোর সময় এবং ক্যানভাসে পেইন্ট করার ক্ষেত্রে আরও নমনীয়তার অনুভূতি দেয়। জ্যান ভ্যান আইক এবং রবাট ক্যাম্পিনের মতো শিল্পীদের প্রায়শই তেল-ভিত্তিক রউের ব্যবহারে অপ্রসামী হিসাবে কৃতিত্ব দেওয়া হয়।

#### রেনেসাঁ মাস্টার্স :

রেনেসাঁ সময়কান, 14 ভম থেকে 17 শতক পর্যন্ত বিস্তৃত, শৈল্পিক অভিবান্তির একটি অসাধারণ বিকাশ প্রত্যক্ষ করেছিল। লিওনার্দ্দো দা ভিক্তি, মাইকেলেঞ্জেলো এবং রাফেল সহ সময়ের সবচেয়ে বিখ্যাত শিল্পীদের পছন্দের মাধাম হয়ে ৪ঠে তৈলচিত্র। এই মাস্টাররা তাদের কান্তে অত্যাশ্চর্য ভিজ্যুয়াল এফেক্ট এবং গভীরতা তৈরি করতে গ্লাস, আন্তারপেইন্টিং এবং চিয়ারোস্কোরো (অলো এবং ছায়া) ব্যবহার করে তৈলচিত্রের কৌশলগুলিকে পরিমার্ক্টিত করেছিলেন।

#### সুবিধা এবং উদ্ভাবন :

চিত্রে ব্যবহৃত অন্যান্য পদ্ধতির তুলনায় তৈলচিত্র অনেক সুবিধা দেয়। দ্বীর শুকালোর সময় শিল্পীদের বং মিশ্রিত করতে, মসৃণ রূপান্তর অর্জন করতে এবং জটিল বিবরণ তৈরি করতে দেয়। শিল্পীরা তাদের চিত্র গুলিতে বেশি সময়ের জন্য কাজ করতে পারে, প্রয়োজন অনুসারে সংশোধন এবং পরিবর্তন করতে পারে। উপরস্তু, তৈলচিত্রগুলি একটি সমৃদ্ধ, উজ্জ্বল গুণমান প্রদর্শন করেছিল যা দর্শকদের বিম্মেহিত করেছিল।

#### সম্প্রসারণ এবং প্রভাব :

তৈলচিত্রের জনপ্রিয়তা ইউরোপ জুড়ে বড়তে থাকে। কৌশগটি উত্তর ইউরোপ থেকে ইতালি এবং অন্যান্য অঞ্চলে ছড়িয়ে পড়ে, যার ফলে পেইন্টিং একাডেমি প্রতিষ্ঠা এবং বিভিন্ন গৈল্পিক তত্ত্ব প্রশায়ন হয়। বারোক যুগের বিশিষ্ট চিত্রশিল্পী, যেমন ক্যারাভাজিও এবং রেমপ্রান্ট, তৈলচিত্রের কৌশলকে জ্বরও পরিমার্জিত করেছেন এবং এর অভিব্যক্তিপূর্ণ সম্ভাবনাগুলি অন্থেয়ণ করেছেন।

#### শিল্লায়ন ও আধুনিকীকরণ :

1৪ শতকে শিল্প বিপ্লবের আবির্ভাবের সাথে, তেল রঙের উৎপাদন এবং প্রাপাতা বৃদ্ধি পায়। পূর্বে, শিল্পীদের রক্ষক পিথে এবং তেলের সাথে মিশ্রিত করে তাদের রঙ তৈরি করতে হত। টিউবগুলিতে তেল রঙের বাণিজ্যিক উত্পাদন তাদের আরঙ অ্যাক্সেসযোগ্য এবং বহনযোগ্য করে তোলে, শিল্পীদের তাদের কাজের ক্ষেত্রে আরঙ বেশি ষাধীনতা দেয়।

#### সমসাময়িক তৈলচিত্র:

তৈলচিত্র সমসাময়িক শিল্পে একটি উল্লেখযোগ্য মাধ্যম হিসেবে রয়ে গেছে। শিল্পীরা নতুন কৌশলগুলি অন্থেশ করে চলেছেন, অপ্রচলিত উপকরণ নিয়ে পরীকা চালিয়ে যাচেছন এবং ঐতিহাবাহী তৈলচিত্রের সীমানাকে ঠেলে দিছেন। ইম্পোলিজম থেকে বিমূর্ত এক্সপ্রেশনিজম এবং এর বাইবেও, তৈলচিত্র বিকশিত হয়েছে এবং পরিবর্তিত শৈল্পিক লানভঙ্কেপের সাথে খাপ খাইয়ে নিয়েছে।

তৈনচিত্রের ইতিহাস বহু শতাব্দী জুড়ে শিল্পীদের চতুরতা এবং সৃজনশীলতার প্রমাণ। প্রাচীন কালে এর উৎপত্তি থেকে বেনেসাঁ এবং পরবর্তী সময়কালে এর উল্লেখযোগ্য বিকাশ পর্যন্ত, তৈনচিত্র শিল্পের জগতে একটি গুরুত্বপূর্ণ ভূমিকা পালন করেছে। এর বহুমুখীতা, স্থায়িত্ব এবং নান্দনিক গুণাবলী এটিকে শিল্পী এবং শিল্প উত্সাহীদের দ্বারা একইভাবে লালিত একটি প্রিয় মাধ্যম করে তুলেছে।

## উদ্দেশ্য: -

- সংযোগের মাধ্যম হিসাবে তৈলচিত্রের ভূমিকা কী তা খুজে বের করা।
- 2. বর্তমানে তৈলচিত্রের কিরুপ তা দেখা।

## পদ্ধতি

আমার অধ্যয়নের জন্য গবেষণার পদ্ধতি হিসেবে পর্যবেক্ষণমূলক পদ্ধতি টি

আমার উক্ত গবেষণাতে যথোপোযুক্ত পদ্ধতি হিসেবে আমি এই পদ্ধতিকেই নির্বাচন করেছি। গবেষণাটি যেহেতু সংযোগের মাধ্যম হিসাবে তৈলচিত্রের ভূমিকা এবং কিছু তৈলচিত্রের ওপর পর্যবেক্ষন সমীক্ষা নিয়ে, সূতরাং এই গবেষণা কার্যটি সম্পন্ন করতে আমার কিছু ঐতিহাসিক তথ্য ও নিজস্ব মতামতের প্রয়োজন বোধ করেছি। অতএব, এখানে সমীক্ষা, সাক্ষাংকার অধবা কেস স্টাডি কে নির্বাচন করা যথাপযুক্ত হবে না বলেই আমি মনে করি।

# কয়েকটি বিখ্যাত তৈলচিত্রের পর্যবেক্ষণ সমীক্ষা :

1. মোনালিসা (~ লিওনার্দো দ্যা ভিঞ্চি) :-

লিওনার্দো দ্য ভিঞ্চির মোনালিসা চিত্রকর্ম বিভিন্ন উপায়ে মানুষের সাথে যোগাযোগ করে, প্রাথমিকভাবে এর শৈল্পিক এবং নান্দনিক গুণাবলীর মাধ্যমে। চিত্রকর্মটি তার রহসাময় হাসি, চিন্তাকর্ষক দৃষ্টি, এবং আলো ও ছায়ার সৃক্ষা বাবহারের জন্য বিখ্যাত। এই দ্রুপাদানগুলি সম্মোহনের অনুভূতি তৈরি করে এবং দর্শকদের কাজের দিকে আকর্ষণ করে, কৌতৃহন এবং চিন্তাভাবনা জাগিয়ে তোলে।

মোনালিসার একটি নিরবধি আবেদন রয়েছে যা এর ঐতিহাসিক প্রেক্ষাপট অতিক্রম এর প্রাসঙ্গিকতা আজ বিশ্বের সবচেয়ে বিখ্যাত এবং ব্যাপকভাবে শ্বীকৃত শিব্লকর্মগুলির একটি হিসাবে এটির আইকনিক মর্যাদায়

পেইন্টিংটি শিল্প, সৌন্দর্য এবং সাংস্কৃতিক ঐতিহ্যের প্রতীক হয়ে উঠেছে এবং এটি প্রজন্মের পর প্রজন্ম ধরে মানুষকে মোহিত ও অনুপ্রাণিত করে চলেছে।

মোনালিসার স্থায়ী জনপ্রিয়তার কারন বিভিন্ন হতে পারে। প্রথমত, কৌশলে লিওনার্দোর দক্ষতা এবং বিশদে তার সক্ষম মনোযোগ চিত্রটিকে রেনেসাঁ শিল্পের একটি অসাধারণ উদাহরণ করে তোলে। এটি আলো, টেব্রচার এবং বায়ুমণ্ডল রেন্ডার করার ক্ষেত্রে তার দক্ষতা প্রদর্শন করে, গভীরতা এবং বাস্তবতার অনুভূতি তৈরি করে।



দ্বিতীয়ত, মোনালিসার রহস্যময় অভিব্যক্তি এবং তার পরিচয় ও আবেগকে ঘিরে অস্পষ্টতা তার লোভ বাড়িয়ে দেয়। রহস্যময় হাসি অগণিত ব্যাখ্যা এবং বিতর্কের জন্ম দিয়েছে, দর্শকদের তাদের নিজম্ব চিন্তাভাবনা এবং অনুভৃতি পেইন্টিংটিতে তুলে ধরতে আমন্ত্রণ জানিয়েছে। এই ইন্টারেক্টিভ গুণটি এটির সৃষ্টির 500 বছরেরও বেশি সময় পরেও এটিকে মুদ্ধতা এবং আলোচনার বিষয় করে তোলে।

অধিকস্ত্র, মোনালিসার ঐতিহাসিক তাৎপর্য এর প্রাসঙ্গিকতায় অবদান রাখে। রেনেসাঁর একটি পণ্য হিসাবে, এটি গভীর শৈল্পিক এবং বৌদ্ধিক কৃতিত্বের একটি সময়ের প্রতিনিধিত্ব করে। এটি লিওনার্দো দা ভিঞ্চির প্রতিভা এবং শিল্প, বিজ্ঞান এবং প্রকৌশল সহ বিভিন্ন ক্ষেত্রে তার অবদানের অনুস্মারক হিসাবে কাজ করে।

আধুনিক যুগে, মোনালিসার প্রভাব শিল্পের প্রশংসার সীমার বাইরেও প্রসারিত। এটি একটি বিশ্বব্যাপী সাংস্কৃতিক আইকন হয়ে উঠেছে, অগণিত পুনত্রংপাদন, প্যারোডি এবং জনপ্রিয় সংস্কৃতির রেফারেন্সে প্রদর্শিত হয়। এটির চিত্রটি প্রায়শই বিজ্ঞাপন, ফ্যাশন এবং মিডিয়াতে ব্যবহৃত হয়, এটি শৈল্পিক শ্রেষ্ঠত্ব এবং সাংস্কৃতিক ঐতিহোর প্রতীক হিসাবে এর মর্যাদাকে আরও মজবুত করে।

সামগ্রিকভাবে, মানুষের সাথে যোগাযোগ করার মোনালিসার ক্ষমতা তার শৈল্পিক দক্ষতা, রহস্যময় গুণাবলী এবং ঐতিহাসিক তাতৃপর্যের মধ্যে নিহিত। এটি বিশ্ববাাপী শ্রোভাদের মোহিত করে চলেছে এবং সৌন্দর্য,শৈল্পিক কৃতিত্বের প্রতীক হিসাবে প্রাসন্তিক রয়েছে

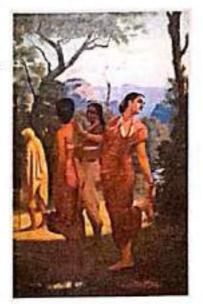
## 2. শকুন্তলা (~ রাজা রবি বর্মা ):-

রাজা রবি বর্মা একজন বিখ্যাত ভারতীয় শিল্পী ছিলেন যা তার তৈলচিত্রের জন্য পরিচিত, এবং তার "শকুন্তলা" শিরোনামের চিত্রকর্ম তার সবচেয়ে বিখ্যাত রচনাগুলির মধ্যে একটি। "শকুন্তলা" প্রাচীন ভারতীয় মহাকাব্য, মহাভারতের একটি দৃশ্যকে চিত্রিত করে, যেখানে শকুন্তলা চরিত্রটি, একজন দুর্দান্ত সুন্দরী যুবতী, তার প্রিয়তমার জন্য চিন্তায় হারিয়ে যায়।

একটি শিল্পকর্ম হিসাবে, "শকুন্তলা" মানুষের সাথে প্রাথমিকভাবে তার দৃশ্য ভাষার মাধ্যমে যোগাযোগ করে। রবি বর্মার রঙ, রচনা এবং বিবরণের নিপুণ ব্যবহার শকুন্তলা

চরিত্রের আবেগ ও সারমর্মকে ধারণ করে। চিত্রকলার নান্দনিকতা এবং শৈল্পিক কৌশল, যেমন আলো এবং ছায়ার খেলা, পোশাকের জটিল বিবরণ এবং সামগ্রিক বাস্তবতা, দর্শকদের আকৃষ্ট করে এবং একটি আবেগপূর্ণ প্রতিক্রিয়া জাগিয়ে তোলে। শকুন্তলার মুখের অভিব্যক্তি, তার ভঙ্গি এবং দমিত রং চিত্রকলার বিষম্বতা এবং আকাঞ্ডকার অনুভূতি প্রকাশ করার ক্ষমতায় অবদান রাখে।

বর্তমান সময়ে প্রাসন্থিকতার নিরিখে "শকুন্তলা"
চিত্রকর্মটি সাংস্কৃতিক ও ঐতিহাসিক গুরুত্ব বহন করে।
রবি বর্মার কাজ ভারতীয় পৌরাণিক কাহিনী এবং দেশের
সাংস্কৃতিক ঐতিহ্যের চাক্ষুষ উপস্থাপনা গঠনে একটি
গুরুত্বপূর্ণ ভূমিকা পালন করেছে। তার বাস্তবসম্মত এবং
সহজলভা শৈলী প্রধাগত গল্প এবং চরিত্রগুলিকে বৃহত্তর
দর্শকদের কাছে আরও সম্পর্কিত করে তুলেছে।



উপরস্তু, "শকুন্তলা" সর্বজনীন থিমের প্রতীক যা আজণ্ড মানুষের সাথে অনুরণিত।
চিত্রকর্মাটি প্রেম, আকাঞ্ডফা এবং বিচেহদের বেদনার সার্বজনীন অভিজ্ঞতাকে চিত্রিত
করেছে। এই আবেগগুলি নিরবধি এবং মানুষের অভিজ্ঞতার একটি অংশ হতে থাকে, যা
পেইন্টিংটিকে প্রজন্মের পর প্রজন্ম ধরে সম্পর্কিত করে তোলে।

"শকুন্তলা" ভারতের সমৃদ্ধ সাংস্কৃতিক ঐতিহ্য এবং পৌরাণিক কাহিনীর খারক হিসাবে কাজ করে। এটি সেই গল্প এবং চরিত্রগুলিকে প্রতিনিধিত্ব করে যা শতাব্দী ধরে ভারতীয় কাজ করে। এটি সেই গল্প এবং চরিত্রগুলিকে প্রতিনিধিত্ব করে যা শতাব্দী ধরে ভারতীয় সাহিত্য এবং শৈল্পিক ঐতিহ্যের অবিচ্ছেদ্য অঙ্গ। এই পেইন্টিংয়ের প্রশংসা করে এবং তার সাহিত্য এবং শৈল্পিক ঐতিহ্যের অবিচ্ছেদ্য অঙ্গ। এই পেইন্টিংয়ের প্রশংসা করতে পারে সাথে জড়িত থাকার মাধ্যমে, লোকেরা তাদের শিকড়ের সাথে সংযোগ স্থাপন করতে পারে। এবং ভারতীয় সংস্কৃতি এবং পুরাণ সম্পর্কে গভীর উপলব্ধি অর্জন করতে পারে।

সামগ্রিকভাবে, রাজা রবি বর্মার চিত্রকর্ম শকুন্তলা তার শৈল্পিক অভিব্যক্তির মাধ্যমে সামগ্রিকভাবে, রাজা রবি বর্মার চিত্রকর্ম শকুন্তলা তার শৈল্পিক অভিব্যক্তির মাধ্যমে মানুষের সাখে যোগাযোগ করে এবং আবেগের উদ্রেক করে যা সম্পর্কযুক্ত এবং সময়খীন। মানুষের সাখে যোগাযোগ করে এবং আবেগের কুক্ত করার ক্ষমতার মধ্যে নিহিত, সর্বজনীন এব প্রাসঙ্গিকতা অতীত এবং বর্তমানকে যুক্ত করার ক্ষমতার ঐতিহ্যের একটি আভাস মানবিক অভিজ্ঞতাকে স্পর্শ করার সময় ভারতের সাংস্কৃতিক ঐতিহ্যের একটি আভাস দেয়।

## 3. দ্যা স্টারি নাইট (~ভিনসেন্ট ভ্যান গঘ):-

ভিনসেন্ট ভ্যান গঘের বিখ্যাত তৈলচিত্র "দা স্টারি নাইট" বিভিন্ন স্তরের মানুষের সাথে যোগাযোগ করে, বিভিন্ন আবেগ এবং ব্যাখ্যার উদ্রেক করে। পেইন্টিং এর তাংপর্য দর্শকের কল্পনা ক্যাপচার করার ক্ষমতা এবং বিশ্বয়, সৌন্দর্য এবং চিস্তাভাবনার অনুভূতি জাগিয়ে তোলার মধ্যে নিহিত।

ন্য স্টারি নাইট" একটি রাতের আকাশকে ঘূর্ণায়মান, প্রাণবস্ত তারা, একটি অর্থচন্দ্র

ব্রং নীচে একটি ঘুমন্ত গ্রামকে চিত্রিত করা সাহসী, অভিব্যক্তিপূর্ণ ব্রাশস্ট্রোক ব্রুং তীব্র রঙের ব্যবহার গ্রামের স্থিরতার সাধে বিপরীতে আকাশে চলাচল এবং অশান্তির অনুভূতি তৈরি করে। পেইন্টিংয়ের রচনা এবং ভ্যান গগের হতন্ত্র শৈলী এটির মানসিক প্রভাবে অবদান রাখে।

ন্য স্টারি নাইট" মানুষের সাথে অনুরণিত হওয়ার একটি কারণ হ'ল সর্বজনীন মানব অভিজ্ঞতার অনুভূতি

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প্রকাশ করার ক্ষমতা। একটি নির্মল রাতের আকাশ এবং একটি ছোট গ্রামের চিত্রের চিত্রণ নস্টানজিয়া, প্রশান্তি এবং প্রকৃতির সাথে সংযোগের অনুভূতি জাগাতে পারে। উপরস্তু, মানসিক স্বাস্থ্যের সাথে ভ্যান গঘের ব্যক্তিগত সংগ্রাম এবং অভিব্যক্তির মাধ্যম হিসেবে শিল্পের ব্যবহার চিত্রকলার তাৎপর্যকে গভীরতার স্তর যোগ করে।

বর্তমান সময়ে, "দ্য স্টারি নাইট" বিভিন্ন কারণে প্রাসঙ্গিক রয়ে গেছে। প্রথমত, এটি সময়ের সাথে মানুষের আবেগ এবং অভিজ্ঞতাগুলিকে ক্যাপচার এবং যোগাযোগ করার জন্য শিল্পের স্থায়ী শক্তির প্রমাণ হিসাবে কাজ করে। পেইন্টিংটি 19 শতকের শেষের দিকে এর মূল সৃষ্টিকে অতিক্রম করে দর্শকদের অনুপ্রাণিত অব্যাহত রেখেছে।

উপরস্তু, "দ্য স্টারি নাইট" ভ্যান গঘের শৈল্পিক উত্তরাধিকারের একটি আইকনিক প্রতীক হয়ে উঠেছে। এটি ইতিহাসে শিল্পের সবচেয়ে প্রভাবশালী এবং প্রিয় কাজগুলির মধ্যে একটি হিসাবে ব্যাপকভাবে স্বীকৃত এবং পালিত হয়। যেমন, এটি শিল্প ইতিহাস, মধ্যে একটি হিসাবে ব্যাপকভাবে স্বীকৃত এবং পালিত হয়। যেমন, এটি শিল্প ইতিহাস, আধুনিক সংস্কৃতি এবং জনপ্রিয় মিডিয়ার প্রেক্ষাপটে অধ্যয়ন, বিশ্লেষণ এবং উল্লেখ করা অব্যাহত রয়েছে।

প্রকৃতি, সৌন্দর্য এবং মানব অবস্থার চিত্রের খিমগুলি সমসাময়িক দর্শকদের সাধে অনুরণিত হয়। একটি ক্রমবর্ধমান দ্রুত-গতিসম্পন্ন এবং প্রযুক্তিগতভাবে চালিত বিশ্বে, 'দা শারীর নাইটে' ধীরগতির, জীবনের সহজ আশ্চর্যের প্রশংসা এবং প্রাকৃতিক বিশ্বে সাস্ত্রনা পাওয়ার জন্য একটি অনুস্মারক প্রদান করে।

সংক্ষেপে, "দ্য স্টারি নাইট" রাতের আকাশের উদ্দীপক চিত্রায়ন এবং আবেগ ও সংক্ষেপে, "দ্য স্টারি নাইট" রাতের আকাশের উদ্দীপক চিত্রায়ন এবং আবেগ ও চিন্তাভাবনা প্রকাশ করার ক্ষমতার মাধ্যমে মানুষের সাঘে যোগাযোগ করে। বর্তমান সময়ে এর প্রাসঙ্গিকতা এর স্থায়ী জনপ্রিয়তা, ভ্যান গঘের শৈরিক উত্তরাধিকারের প্রতিনিধিত্ব এবং এর প্রাসঙ্গিকতা এর স্থায়ী জনপ্রিয়তা, ভ্যান গঘের সংযোগ স্থাপন করছে।

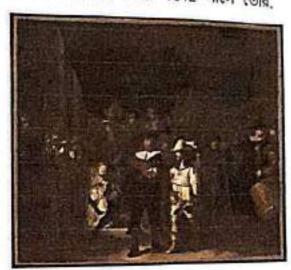
## 4. দ্য নাইট ওয়াচ (~রেমব্রান্ট): -

রেমব্রান্টের বিখ্যাত তৈলচিত্র "দ্য নাইট ওয়াচ" মানুষের সাথে প্রাথমিকভাবে এর শেরিক এবং ঐতিহাসিক তাত্পর্যের মাধ্যমে যোগাযোগ করে। 1642 সালে তৈরি

শোর্রণ এবং আরোক শিল্পের একটি দুর্দান্ত পেইন্টিংটি বারোক শিল্পের একটি দুর্দান্ত উদাহরণ এবং আলো, ছায়া এবং আবেগ ক্যাপচারে রেমব্রান্টের দক্ষতা প্রদর্শন করে। এর রচনা এবং রঙের ব্যবহার দর্শকদের দৃষ্টি আকর্ষণ করে এবং নাটক ৪ আন্দোলনের অনুভূতি জাগায়।

"দ্য নাইট ওয়াচ" এ আমস্টারডামের একটি সিভিক মিলিশিয়ার একটি গোষ্ঠীর প্রতিকৃতি চিত্রিত করে, যেখানে ক্লোভেনিয়ার্সডোলেন শুটিং গিল্ডের অফিসার এবং সদস্যদের প্রদর্শন করা হয়েছে। চিত্রকর্মটি গতিশীল ভঙ্গি এবং

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অভিব্যক্তিতে চিত্র সহ কর্মের একটি মুহূর্ত ক্যাপচার করে। পেইন্টিংয়ের আকার এবং বিশদ স্তর এর প্রভাবে অবদান রাখে, এটি দর্শকদের জন্য একটি নিমগ্ন অভিজ্ঞতা করে তোলে।

প্রাসঙ্গিকতার পরিপ্রেক্ষিতে আজ "দ্য নাইট ওয়াচ' সাংস্কৃতিক ও ঐতিহাসিক গুরুত্ব বহন করে। এটি ডাচ ইতিহাসের একটি গুরুত্বপূর্ণ মুহূর্তকে প্রতিনিধিত্ব করে, যা 17 শতকে নাগরিক গর্ব এবং আমস্টারডামের সামাজিক কাঠামোকে প্রতিফলিত করে। এটি সম্ভাবা হুমকির মুখে শহরের সম্মিলিত প্রতিরক্ষা এবং ঐক্যের প্রতীক।

"দ্য নাইট ওয়াচ" শিল্পী, পণ্ডিত এবং উত্সাহীদের একইভাবে মোহিত এবং অনুপ্রাণিত করে চলেছে। এর প্রযুক্তিগত দক্ষতা, উদ্ভাবনী রচনা এবং অভিব্যক্তিপূর্ণ গুণাবনী এটিকে একটি স্থায়ী মাস্টারপিস করে তোলে। পেইন্টিংটি আমস্টারডামের Rijksmuseum-এ একটি স্থায়ী মাস্টারপিস করে তোলে। পেইন্টিংটি আমস্টারডামের Rijksmuseum-এ প্রদর্শিত হয়, যেখানে এটি প্রতি বছর লক্ষ দর্শকদের আকর্ষণ করে। এটি ডাচ শিল্প ও প্রদর্শিত হয়, যেখানে এটি প্রতি বছর লক্ষ দর্শকদের আকর্ষণ করে। এটি ডাচ শিল্প প্রদর্শিত হয়, যেখানে এটি প্রতি বছর লক্ষ দর্শকদের সাংস্কৃতিক পরিচয়ে অবদান ঐতিহ্যের একটি আইকনিক প্রতীক হয়ে উঠেছে, যা দেশের সাংস্কৃতিক পরিচয়ে অবদান রাখে।

"দ্য নাইট ওয়াচ" এর ঐতিহাসিক প্রেক্ষাপট অতিক্রম করে এবং এর সার্বজনীন থিমের মাধ্যমে সমসাময়িক দর্শকদের সাথে অনুরণিত হয়। মানবিক আবেগ, গোষ্ঠাগত গতিশীলতা, নেতৃত্ব এবং বন্ধুত্বের জটিলতাগুলির চিত্রায়ন হল কালজয়ী বিষয় যা আজকের সাজে এখনও প্রাসঙ্গিকতা ধরে রাখে। পেইন্টিংটির স্থায়ী জনপ্রিয়তা এবং এর ব্যাখ্যা ও সমাজে এখনও প্রাসঙ্গিকতা ধরে রাখে। পেইন্টিংটির স্থায়ী জনপ্রিয়তা এবং এর অব্যাহত তাৎপর্যকে ঘিরে চলমান আলোচনা একটি সাংস্কৃতিক স্পর্শকাতর হিসেবে এর অব্যাহত প্রাসঙ্গিকতা নিশ্চিত করে।

## উপসংহার

আমার এই গবেষণাপত্র সংযোগের মাধ্যম হিসাবে তৈলচিত্রের ভূমিকা: কর্মেকটি তৈলচিত্রের ওপর পর্যবেক্ষন সম্পর্কিত একটি সমীক্ষা । এই সমীক্ষার কর্মেকটি তেলচিত্রের সাহায্যে কিভাবে মানুষের সাথে সংযোগ স্থাপন করা বার এবং বার্থাম. তৈলচিত্রের সাহায্যে কিভাবে মানুষের সাথে সংযোগ স্থাপন করা বার এবং বার্ণাশাপাশি এর বর্তমান যুগে প্রাসঙ্গিকতা কিরূপ সেই উদ্দেশ্যে এই গবেষণা তার পাশাপাশি হরে হয়েছে ।

সর্বপরি, পর্যবেক্ষণের বিশ্লেষণ করে বলা যায় তৈলচিত্রগুলি মানুষের অভিজ্ঞতার সার্বজনীন দিকগুলি যেমন আবেগ, কৌতৃহল, বিশ্বয় এবং আগ্বীয়তার অনুভূতিতে স্পর্শ করে মানুষের সাথে সংযোগ স্থাপন করে। দক্ষ কৌশল এবং শের্রিক দৃষ্টিভঙ্গির মাধ্যমে, এই চিত্রগুলি শিল্পীর অভিব্যক্তি এবং দর্শকের ব্যাখ্যার শের্রিক দৃত্তিভঙ্গির করে, একটি শক্তিশালী এবং দীর্ঘস্থায়ী সংযোগ তৈরি করে যা মধ্য ব্যবধান তৈরি করে, একটি শক্তিশালী এবং দীর্ঘস্থায়ী সংযোগ তৈরি করে যা সময় এবং সাংস্কৃতিক সীমানা অতিক্রম করে।

এবং তৈলচিত্রগুলি তাদের আবেগ জাগিয়ে তোলার, গল্প বলার এবং বিখ্যাত গুরুদের শৈল্পিক প্রতিভা প্রদর্শনের ক্ষমতার কারণে প্রাসঙ্গিক রয়েছে। তৈলচিত্রের বান্তব প্রকৃতি, তাদের সমৃদ্ধ ঐতিহাসিক প্রেক্ষাপটের সাথে মিলিত, তাদেরকে গময়ের পরীক্ষায় দাঁড়াতে এবং সমসাময়িক সমাজে তাদের আকর্ষণ বজায় রাখতে দেয়। তদুপরি, প্রযুক্তির অগ্রগতি এই মাস্টারণিসগুলিতে সহজ আঙ্গ্রেস সক্ষম করেছে, এগুলিকে বিশ্বব্যাপী দর্শকদের কাছে আঙ্গ্রেসযোগ্য করে তুলেছে এবং শিল্প জগতে তাদের অব্যাহত প্রভাব নিশ্চিত করেছে।

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# SURI VIDYASAGAR COLLEGE Department of Mass Communication and Journalism (H) THE UNIVERSITY OF BURDWAN



Community Outreach Programme
Discipline Specific Elective (DSE) - 4

On

মমরেজপুর গ্রামের অনুন্নত পরিবহন ব্যবস্থা

Submitted for

Partial fulfilment of the requirement for the degree

By

SHOUVIK MONDAL

Univ. Roll no.: 200131000234

Reg. no.: 202001031191 Of 2020 - 21

Semester: VI, MCJH, SVC

Under the guidance of

BAHNISIKHA GHOSH

(College Teacher, MCJH, Suri Vidyasagar College)



#### DECLARATION

I hereby declare that this project entitled "মমরেজপুর গ্রামের অনুসত পরিবহন ব্যবস্থা" submitted to The University of Burdwan is an outcome of the original work carried out by me under the department of Mass Communication and Journalism, Suri Vidyasagar College.

I also declare that this is my own work and to as per my knowledge it contains no material previously published or has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgement has been made in the text or as references.

Date: 1. 8.2023

11111111111111

Shouvik Monday

SHOUVIK MONDAL

Department of Mass Communication and Journalism Suri Vidyasagar College

The University of Burdwan



Date: 09.07.2023

#### CERTIFICATE

This is to certify that Mr Shouvik Mondal, bearing registration number 202001031191, has successfully completed his Community Outreach Programme titled "Advanced Transportation System in Momrejpur Village" under my guidance and supervision.

I hereby stated that I have provided guidance and support to him for this work.

His research work demonstrates his academic abilities, research skills, and understanding of the subject matter.0

Ms Bahnisikha Ghosh College Teacher Suri Vidyasagar College

Department of Mass Communication and Journalism Suri Vidyasagar College P.O.-Suri, Dist.-Birthum, W.B.-731101



#### **ACKNOWLEDGEMENT**

This community outreach programme would not have been possible without the help and support of many individuals of Gobindapur village.

I am deeply indebted to my teacher Bahnisikha Ghosh for her individual assistance and insights leading to the writing of this paper. She provided stimulating advice, guidance, and encouragement to me every step of the way.

I would also like to thank Sanchita Chatterjee madam, Pratik Kabiraj sir, Suman Rudra sir of Mass Communication and Journalism department of Suri Vidyasagar College.

I am thankful to Uday Das and Raghunath Mondal (Member of Mallik Pur Ghram panchayat) and my classmates who supported me in doing the research project and the entire Journalism department who helped me on this step of this journey and showed me different ways and provided ideas that led to this paper. I would like to thank my family members, specially my parents, who have endured my absence during my community outreach paper and helped me tremendously in all ways possible.

#### SHOUVIK MONDAL

Department of Mass Communication and Journalism Suri Vidyasagar College The University of Burdwan

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Abstract:এই গ্রেমণা পত্রের মাধ্যমে গ্রেমক গ্রামীণ পরিবহন বিষয়ক সমস্যার উপর কাজ করেছেন, নির্দিষ্ট গবেষণা পদ্ধতি গুলি ব্যাবহারের মাধ্যমে। এই গবেষণার কাজটি করার জন্য প্রাথমিক ভাবে গবেষক বীরভূম জেলার মল্লিকপুর গ্রাম পঞ্চায়েতের অন্তর্গত মমরেজ পুর ও খোসবাস পুর এই দুটি গ্রাম কে বেছে নিমেছিলেন,ও পরবর্তী ক্ষেত্রে পরিবহন বিষয়ক এই সমস্যাটি যথাযোগ্যতা যাচাই করার জন্য গবেষক এই पूर्वि धारम शिख्र प्रिथानकात किंदू लाकिएत प्राथ कथा वलन ७ प्रिथानकात तासाघारहेत অবস্থা দেখে সমস্যাটির যথাযোগ্যতা যাচাইয়ের মাধ্যমে, পরিবহন ব্যবস্থার উল্লতির মাধ্যমে গ্রামীণ উন্নয়ন ঘটালোর লক্ষ্যে ও গ্রামের মানুষের পরিবহনের ক্ষেত্রে প্রধান বাধার্টির দিকে দৃষ্টি আকর্ষণ, পরিবহন ব্যবস্থা সক্রিয় করার জন্য সঠিক ব্যবস্থা গ্রহণ, সমস্যা সমাধানের জন্য গ্রামের মালুষদের দ্বারা পঞ্চায়েতে আবেদনপত্র প্রদানের উদ্দেশ্যে সমীক্ষা পদ্ধতি, দলগত আলোচনা, ও ব্যাক্তিগত আলোচনা - এর মাধ্যমে গ্রামের মানুষদের কাছ থেকে এই বিষয়ে তথ্য সংগ্ৰহ ও পরবর্তী ক্ষেত্রে গুণগত ও পরিমাণগত গবেষণা পদ্ধতির মাধ্যমে বিচার বিশ্লেষণের দারা গবেষক এই গবেষণার কাজটি সম্পন্ন করেছেন এবং গবেষণাটির ফলস্বরূপ গ্রামের সকল বাসিন্দাদের গ্রামের এই সমস্যাটি লিখিভ আকারে দঞ্চায়েভ রক স্তরের অফিসে জমা দেওয়ার জন্য একমভ করা গেছে এবং এই বিষয়টি সম্পর্কে গবেষক গ্রামের বাসিন্দাদের সচেতন করতে পেরেছেন।

Keywords: গ্রামীণ উল্লয়ন , পরিবহন সমস্যা, আর্থিকভাবে দুর্বল শ্রেণী, শিক্ষাগভ সমস্যা।

#### CHAPTER I

#### INTRODUCTION:

সম্থের চাকা এগিয়ে চলে ভার সাথে বাড়ভে থাকে বিভিন্ন সমস্যা এই সমস্যার সমাধানের জন্য নানা সম্ম নানান গবেষনা করা হয়ে খাকে। বর্তমান সময়ে আমাদের এগিয়ে যেতে সাহায্য করে যে বিষয় গুলি, ভার মধ্যে অন্যতম পরিবহন ব্যাবস্থা, কিন্তু এই পরিবহন ব্যবস্থা নিয়ে সমস্যা রয়েদে বীরভূমের মমরেজপুরের,থোসবাসপুরের মতো নানা গ্রামে,বীরভূম জেলার সদর শহর সিউড়ি শেকে ৭ কিলোমিটার দূরে অবস্থিত এই ছোট আদিবাদী গ্রাম দুটি জেলার সদর শহরের প্রায় কাছাকাছি অবস্থিত হওয়ার পরেও এখনও পরিবহন ব্যাবস্থা থুব অনুল্লত। কোনরকম সরকারি বা বেসরকারি বাস বা কোন রকম যানবাহন চলে না, কিছুদিনের জন্য একটি সরকারি বাস চালু করা হয়েছিল, কিন্তু বর্তমানে সেই বাসটিও চলেনা। ফলে এই গ্রামের সমস্ত্র বাসিন্দাদের দৈনন্দিন নানা জরুরি কাজ ও চিকিৎসা, শিক্ষা সংক্রান্ত বিভিন্ন ক্ষেত্রে যেমন – মুলে , কলেজে আসার ক্ষেত্রে গ্রচন্ড সমস্যায় পরতে হচ্ছে এবং ওই গ্রামের ছেলে মেয়েদের উচ্চ শিক্ষায় অনিহার ক্ষেত্রে লালা বিষয়ের পাশাপাশি এই অনুন্নত যোগাযোগ ব্যাবস্থা একটি কারন হয়ে দাড়িয়েছে, পাশাপাশি গরীব থেটে থাওয়া মানুষ গুলি কে চিকিৎসা ক্ষেত্ৰ, দৈনিক কাজে ও শিক্ষা ক্ষেত্ৰে আসার জন্য প্রতিদিন টোটো, অটো ভাড়ার করে অনেক বেশি টাকা ব্যায় করতে হচ্ছে, এবং ওই গ্রামের প্রত্যেক মানুষের পক্ষে নিজেদের জন্য বাইক, স্টুটি কেনা এবং সেটি রঙ্কনাবেঙ্কন করা সম্ভব ন্য ফলে সমস্যাটির উপর সকলের দৃষ্টি আকর্ষণ এবং সমস্যা সমাধ্যনের জন্য Community Outreach Programme Paper টি তে এই পরিবহন ব্যাবস্থার সমস্যার বিষ্মটি নিমে গবেষক গবেষনার কাজ টি করেছেন।

#### STATEMENT OF PROBLEM:

মরিকপুর গ্রাম পঞ্চায়েতের অন্তর্গত একটি আদিবাসী গ্রাম মমরেজপুর। কিন্তু এথনো পর্যন্ত এই মমরেজপুরের রাষ্টাঘাট এবং পরিবহল ব্যবস্থা থুবই অনুপ্লত কোলরকম সরকারি বা বেসরকারি বাস চলাচল করে লা। ফলে এই গ্রামের থেটে থাওয়া দিলমজুর মানুষদের শহরাঞ্চলে কাজে আসতে ও বান্ধাদের বিদ্যালয়ে যেতে এন্ডাও লালা কাজে যাতায়াতের জন্য নিজেদের উদ্যোগে টোটো, অটো ভাড়া করতে হয়। এবং তা হয় ব্যায় সাপেক্ষ , এই জন্যই গ্রামের মানুষরা দিনের

#### DEMOGRAPHY

গ্রামের নাম : মমরেজপুর ( খোসবাস পুর)

পঞ্চায়েত :- মল্লিকপুর গ্রাম <del>পঞ্চায়েত</del>

রক :- সিউড়ি ১ নং রক

थाना : प्रिউডि

পিন : ৭৬১১২৬

(जना :- वीत्रज्म

মোট জনসংখ্যা : ২৩০ জন প্রায় ।

সাক্ষরতার হার :- ৪৫ শতাংশ প্রায়।

भूक्रय प्रश्या : ১২৫ जन श्राम ।

নারী সংখ্যা : ১০৫ জন প্রায়।

ভখ্য সূত্র - উদ্য দাস (সদস্য ,মল্লিকপুর গ্রাম পঞ্চায়েত )



#### **OBJECTIVES:**

- ১) গ্রামের মানুষদের পরিবহনের ক্ষেত্রে প্রধান বাধাটির বিষয়ে দৃষ্টি আকর্ষণ করা।
- ২) গ্রামের মানুষদের দ্বারা পঞ্চায়েতের কাছে এই সমস্যাটির বিষয়ে জানিয়ে সমস্যা সমাধানের আবেদনপত্র প্রদান।
- গরিবহন ব্যবস্থা সক্রিয় করার জন্য নির্দিষ্ট ভাবে ব্যবস্থা করা।
- ৪) পরিবহন ব্যবস্থা সক্রিয় রাখার জন্য রাস্তাঘাট রক্ষণাবেক্ষণের ব্যবস্থা করা।
- গ্রামের মানুষদের নির্দিষ্ট পদক্ষেপ অবলয়্বনে জল্য সচেতন করা।

#### AIM

পরিবহন ব্যবস্থার উন্নতির মাধ্যমে গ্রামীন উন্নয়ন ঘটনো।

## RESEARCH QUESTIONS

- ১) পরিবংন ব্যবস্থা অনুমত কেন ?
- ২) গ্রামবাদীদের অভ্যন্তরীণ কোন দমস্যার কারণে কি পরিবহন ব্যবস্থা অনুরত ?
- ত) সামাজিক কী কী ছাতির সম্মুখীন হতে হচ্ছে?

#### CHAPTER - II

#### LITERATURE REVIEW

গবেষণার সমস্যাটি নির্বাচন করার পর গবেষক সেই সমস্যাটি নিয়ে পূর্বে কি কি কাজ হয়েছে সেই বিষয়ে ধারণা লাভ ও এর পরবর্তীকালে এই বিষয়টি নিয়ে কি কি কাজ করা যেতে পারে সেই সম্পর্কে জ্ঞান অর্জনের জন্য বিষয়টির উপর হয়ে থাকা পূর্ববর্তী গবেষণা গুলিকে নিয়ে এই সাহিত্য পর্যালাচনা বা Literature Review করেন, এই গবেষণাটি করার ক্ষেত্রেও গবেষক ৫ টি সাহিত্য পর্যালাচনা বা Literature Review করেছেন সেই গুলি নিয়ারুগ —

1) পরিবহন বিষয়ক এই গবেষণাটি 2021 সালে প্রকাশিত হয় www.ijrar.org জার্নালটি তে , গবেষণাটি করেছেন মৃগাম্ব দলুই ও দেবরত ঘোষ, তারা survey Method ও Interview এর মাধ্যমে গবেষণার কাজটি করেন। ভাঁরা এই গবেষণাটি হাওড়া জেনার বাগনান-১ সিডি রকের অন্তর্গত সমন্ত অঞ্নটির পরিবহন ও যোগাযোগ ব্যবস্থার অনুন্নতির বিষ্মটির উপর করেছেন । এথানে মূলত ভারা সভক পথের পরিবহন ও যোগাযোগ ব্যবস্থার কথা তুলে ধরেছেন , যেমন - সরকারি ও বেসরকারি বিভিন্ন বাস ও অনন্যা সড়ক যানবাহনের অসম বন্টনের বিষ্মটি কথা বলেছেন । হাওড়া জেনার বাগনান-১ সিডি রকের অন্তর্গত অঞ্ন গুনিতে অনুন্নত পরিবহন ব্যবস্থার কারণে সেই অঞ্লের মানুষেরা সামাজিক ভাবে গিছিয়ে পরছেন ও তাদের আর্থসামাজিক পরিকাঠামো উन्नम्रात न्यायाज घ**ँ**ए नाना जात । এই গ্রেষণাই দেখা মাদ্দে 2.5.5.1 नः भारे हिटा वना श्याप अकलत १० मजाः मानूस वर्जमात्नत तासाधां 3 मतिवरन वावना नित्य प्रकृष्ठे नन , अवः ২৫ শতাংশ মানুষ বিষ্মটিতে সক্তষ্ট । 2.5.5.2 নং পাই চিত্রে বলা হয়েছে এলাকার ৩৯ শতাংশ মানুৰ মনে করেন অনুয়ত বাস যোগাযোগ ব্যবস্থা মূল সমস্যা , ১৮ শতাংশ মানুৰ মনে করেন যোগাযোগ ব্যবস্থার সংকীর্ণতা মূল সমস্যা ,২৫ শতাংশ মানুষ মনে করেন এই অনুন্নত পরিবহন ব্যবস্থার জল্য স্বাস্থ্য কেন্দ্রে যেতে সমস্যা হয় , ৯ শতাংশ মানুষ মনে করেন অন্তর্বতী রাম্ভা ও পরিবহন বন্টন অনুন্নত , ১ শতাংশ মানুষ মনে করেন জল জমা একটি বড়ো সমস্যার ভৈরি করে । ভারা এই গবেষণাটি খেকে সমস্যাটির সমাধানের জন্য বেশ কিছু ছোট বড় দদক্ষেদ নিলেও তাংক্ষণিক তেমন কোন জোরালো সমাধান দিতে পারেননি।

(Volume 8, issue 1, 873-886p)

2) পরিবহন বিষয়ক এই গবেষণাটি প্রকাশিত হয় ২০১৮ সালে The IJMAS Journal টি তে, গবেষনাটি করেছেন Abdulla Al Mamun, Subrata kumar paul ওলারা পশ্চিবঙ্গের ,মূর্শিদাবাদ জেলার জলঙ্গিরগের গ্রামগুলির কৃষি কাজের অনুয়তির জল্য মূলত গড়ক পরিবহন বিষয়ক সমস্যা গুলিকে তুলে ধরে গবেষণা কার্যটি করেছেন। এই গবেষণা কার্যটির তখা সংগ্রহ করার জন্য ওনারা জলঙ্গি রকের গ্রাম গুলির কৃষকদের উপর Survey Method ব্যাবহার করেন, ও Group Interview এর মাধ্যমে এই অঞ্লের পরিবহন সমস্যা বিষয়ে নানা তথ্য সংগ্রহ করেন। এবং সেখান খেকেই বোঝা পরিবহন ব্যবস্থায় একমাত্র কৃষি দণ্য রম্ভানির মাধ্যম, তাই এই অঞ্লের কৃষকরা অন্য সরবরাহ ঠিকঠাক

ভাবে করতে পারেন না। ফলে তাদেরকে নানান আর্থিক ফ্ষতির সম্মুখীন হতে হয়, এছাড়া এছাড়াও সড়ক পথের অবস্থা থারাস হওয়ার জন্য উৎপাদিত ফদল সহর অঞ্চলে আনতে প্রচুর অর্থ বায় হয়ে যায়। ফলে আর্থিকভাবে কৃষকরা সেরকম লাভের সম্মুখীন হতে পারেন না। এই বিষয়াটি গবেষণার পর ওনারা সিদ্ধান্তে এসেছেন যে সড়ক পরিবহন উন্নত হলে জলঙ্গি রকের অন্তর্গত গ্রামের কৃষকদের ফদল উৎপাদনে উৎসাহ বৃদ্ধি করা যাবে মূলত কৃষি পণ্যের সঠিক উৎপাদন সড়ক ব্যবস্থার উন্নয়ন ও উপাদিত ফসলের লোভ্যাংশ থেকে গ্রামীণ উন্নয়নের দিকে গবেষকরা জোর দিয়েছেন। গ্রামীণ প্রথম উৎপাদন শহরের অঞ্চলে মানুষদের থাবার জোসায় ভাই সড়ক ব্যবস্থার উন্নয়ন শহর এবং গ্রাম উত্রয়ই জায়গার মানুষদের উপর একইভাবে প্রভাব ফেলে গ্রামের লোকেদের সাথে কথা বলে স্থানীয় পদায়েতের সাথে কথা বলে এই সিদ্ধান্ত উপনীত হয়েছেন যে সড়ক পথ গুলো দ্রুত সারানোর ব্যবস্থা করা হবে।

(Volume 3, Issue 11, 16-19p)

3) এই গবেষণা পত্রটি N. S. Ramaswamy 1998 সালে, ব্যাঙ্গালোরের Current Science Association থেকে Indian Academy Of Sciences এর সহযোগিতার প্রকাশ করেন, তিনি ভারতের গ্রামীণ সড়ক ব্যবস্থার উন্নতি ঘটানোর উদ্দেশ্যে এই গবেষণাটি করেন, মূলত কেরালা রাজ্যের গ্রামীণ সড়ক ব্যবস্থার উন্নতির উপর ভিত্তি করে, এই গবেষণা কার্যটি করা হয়। কেরেলা রাজ্যের গ্রামগুলি দেখিয়ে দিয়েছে কিভাবে গ্রামে থেকেও শহর অঞ্চলের বিভিন্ন সুযোগ সুবিধা উপভোগ করা যায় কেরালার গ্রামগুলিতে 10 থেকে 15 টি করে ট্যাক্সি ও সমান সংখ্যক তিন চাকার গাড়ি রয়েছে যেগুলি কেরালার গ্রামের মানুষদের শহরের সাথে যোগাযোগ ব্যবস্থা গড়ে তুলতে সাহায্য করেছে, এই গবেষণাটি প্রধান ও মূল উদ্দেশ্য ছিল ভারতবর্ষের সামাজিক অর্থনৈতিক উন্নয়নের ছেতে গ্রামীন পরিবহন ব্যবস্থার গুরুত্ব সুম্পষ্ট করা। এই গবেষণা প্রাটিতে দেখা যায় সেই সময়ের ভারতবর্ষের ১৬০ মিলিয়ন জনসংখ্যার

তিল চতুর্খাংশ অর্থাৎ ৭২০ মিলিয়ন ৬ লাখ মানুৰ গ্রামে বাস করেন। যদিও RT System গ্রামীণ সড়ক ব্যবস্থার উন্নতিতে কিছুটা প্রভাব বিষ্ণার করতে পেরেছে ,কিন্তু RT

System ও প্রযোজনের তুলনায় অনেক পিছিয়ে আছে, যাত্রী সভ্ক পরিবছন অনেকদিন আগেই জাতীয়করণ করা হয়েছিল, কিন্তু SIUs গ্রামীণ সভ্ক পরিবছনের চাহিদা মেটাতে অক্ষম। গ্রেষণা পত্রের শেষে গবেষক এই সিদ্ধান্ত উপনীত হয়েছেন যে ভারতবর্ষের কেরালার রাজ্যের গ্রামীণ সভ্ক ব্যবস্থার উন্নতির থেকে শিক্ষা নিয়ে সরকার ও জনগণের উচিত ভারতবর্ষের পরিবছন ব্যাবস্থায় অনুন্নত অন্যান্য গ্রামগুলির সভ্ক পথ ব্যবস্থার উন্নতি ঘটানোর জন্য নির্দিষ্ট পরিমাণ সরকারি ও বেসরকারি বাস ও উন্নত রান্তা নির্মাণের মাধ্যমে গ্রামীণ পরিবছন ব্যবস্থার উন্নতি ঘটানো। গ্রেষক অবশেষে এই মতামত দিয়েছেন যে গ্রামীণ সভ্ক ব্যবস্থা উন্নত হলে মানুষের গ্রাম থেকে শহরে আসার প্রবণতা কমে যাবে এবং ভারতের অর্থ সামাজিক দিকটি অনেক বেশি উন্নত হবে।

(Volume 75, No 8, 800-803p)

4) এই গবেষণা দত্র টি Koushik Deb এবং Massimo Filippini 2013 সালের সেপ্টেম্বর মাসে
University of Bath থেকে প্রকাশ করেন, ওনারা এই গবেষণা কার্যটির জন্য 1990 সাল থেকে
2001 সাল পর্যন্ত সম্মকালে 22 টি ভারতীয় রাজ্যের পাবলিক ট্রান্সপোর্ট এর ভাটা সংগ্রহ করেন
এবং সেগুলির উপর পর্যবৈহ্বণ করে ভারা এই সিদ্ধান্তে উপনীত হন যে ভারভের সামাজিক এবং
জনখনত্ব বৃদ্ধির উপর দাঁড়িয়ে প্রচুর বর্তমান সময়ে প্রচুর পরিমাণ পাবলিক ট্রান্সপোর্টেশনের
প্রযোজন রয়েছে।

(Volume 47, No 3, 419-436p)

5) এই গবেষণাপত্রটি Sunil kumar p এবং Prof.B.Jayarama ২০২১ সালের মার্চ মাসে Kuvempu University থেকে কর্নাটকের গ্রামীণ সড়ক ব্যবস্থার অনুরতি উপর গবেষণার মাধ্যমে। প্রকাশ করেন। এই গবেষণা পত্রটি ওলারা পর্যবেষণ পদ্ধতির ব্যবহার করেছেন। অর্থাৎ বলা মার এটি একটি Qualitative research. ওলারা বলেছেন গ্রামীণ সড়ক গুলি পণ্য পরিবহনে বিশেষভাবে সহায়তা করে মা উৎপাদন থরচ কমার ,ওলারা বলেছেন ভারতের প্রায় 30 শতাংশ কৃষি পলা নষ্ট হয় গ্রামীণ অনুরত্ত সড়কগুলির জন্য এবং দেখা গেছে এই সড়ক গুলি, শিক্ষা ও কর্মস্থানে সাথে যোগাযোগ ব্যবস্থা করে তোলে,ও কর্নাটকে লালাল পর্যটন কেন্দ্র রয়েছে সেগুলিতে পর্যটকদের সংখ্যা বৃদ্ধির একটি অন্যতম কারণ হতে পারে গ্রামীণ উন্নত সড়ক গুলি। 2016 সালে এক সমীক্ষায় দেখা গেছে কর্নাটকে গ্রামীণ সড়কের পরিমাণ 67.79% যার মধ্যে 2019 সালের মার্চ মাসের মধ্যে 1,90,862 কিলোমিটার রাম্বা ঠিক করা হয়েছে। উনারা পর্যবেষ্ণরে মাধ্যমে গ্রেষণা করে এই সিদ্ধান্তে উপলীত হয়েছেন, কর্ণাটকের গ্রামীণ সড়কগুলির উন্নয়নের ক্ষেত্রে প্রধানমন্ত্রীর PMPMGSY যোজনাটি ও কর্ণাটকের মুখ্যমন্থ্রীর CMGSY কাজ করে চলেছে, এর ফলে কর্নাটকের গ্রামগুলির মানুরের মাখ্যপিছু আয় ও অর্থ সামাজিক অবস্থার উন্নতি ঘটছে এবং গ্রাম থেকে শহরে চলে আসার প্রবণতা কমছে।

(Volume 8, Issue 3, 158 -166p)

#### CHAPTER III

#### RESEARCH DESIGN

গবেষণার লকশার ক্ষেত্রে গবেষক কি ধরনের গবেষণাটি করছেন গবেষণাটি পরিসংখ্যানগত না গুণগত সে বিষয়ে ধারণা দেও্য়া কি ধরনের দল গঠন (sampling) কি ধরণের কলাকৌশন ব্যবহার করা হবে ভখ্যের উৎস ইভ্যাদি সম্পর্কে রুসরেখা প্রস্তুত করা হয়। গবেষণা করার ক্ষেত্রে গবেষক গবেষণা পরিচাননার পূর্বেই নকশা করনের কাজটি চূড়ান্ত করা হয়, গুণগত অধ্যায়নের ক্ষেত্রে নকশা নমণা প্রকৃতির হয়।

#### গবেষণার লকশাকরলের উদ্দেশ্য :-

- (১) গবেষণাটি কী সম্পর্কে?
- ২) কেন গবেষণা করা হাচ্ছ ?
- ৩) অধ্যায়নটি কোখায় করা হবে ?
- ৪) কী ধরণের তথ্য প্রয়োজন ?
- ৫) প্রযোজনীয় তথ্য কোখায় পাওয়া য়াবে ?
- ७) ज्याग्रास्त्र प्रमञ्जान की अद्यर्जुक कड़ा श्व ?
- व) नम्नायन की श्व?
- ৮) তথ্য সংগ্রহের ক্ষেত্রে কী ধরণের কলাকৌশল ব্যাবহার করা হবে ?
- ১) কীভাবে ভখ্য বিশ্লেষণ করা হবে ?

গবেষণাটি মলিকপুর গ্রাম পঞ্চায়েতের অন্তর্গত মমরেজপুর ও খোসবাসপুর গ্রামের পরিবহন সমস্যার নিয়ে করা হয়েছে, গবেষণাটির মাধ্যমে এই দুটি গ্রামের পরিবহন বিষয়ক সমস্যার সমাধ্যনের চেষ্টা করা হয়েছে, গবেষণাটি করার জন্য মলিকপুর গ্রাম পঞ্চায়েতের ক্ষেকজন সদস্য ও গ্রামবাসীদের কাছ খেকে কিছু মুখ্য ও গৌণ তথ্য সংগ্রহ করা হয়েছে Nonprobability Sampling এর মধ্যে Convenient Sampling - করে Survey Method Focus Group discussion ও Personal Interview - এর মাধ্যমে ও পরবর্তীতে পর্যবেক্ষণ পদ্ধতি পাইচিত্র ইত্যাদির মাধ্যমে তথ্যপ্রতিকে বিশ্লেষণ করা হয়েছে। প্রসঙ্গত উল্লেখ্য এই গবেষণাটির সময়কাল ছিল ১.২.২০২৩ ক্রেক্রুয়ারি মাস খেকে ২.৭.২০২৩ পর্যন্ত।

# গবেষণার লকশা স্তবে ক্রণীয় গুলি সম্পর্কে নিয়ে আলোচনা ক্রা হল :-

i) গবেষণার উদ্দেশ্য প্রকৃতি পদ্ধতি বিশ্লেষণ ইত্যাদির উপর বিচার করে গবেষণাকে তিন ভাগে ভাগ করা হয়। যথা:- ১) মৌলিক গবেষণা,২) প্রযোগ ভিত্তিক গবেষণা ৩) সক্রিয় গবেষণা ।

#### (५) मोनिक शवयनाः-

মৌলিক গবেষণা বা তাম্বিক গবেষণা হল সেই জাতীয় গবেষণা খেছেতে আপাত ব্যাবহারিক মূল্য লাও খাকতে পারে। সাধারণত এই ধরণের গবেষণা করা হয় কোন বিষয় সম্পর্কে সাধারণ কিছু তথ্য সংগ্রহের জন্য ।

গবেষক ও এই গবেষণা কার্যটি করার জন্য এই মৌলিক গবেষণা গদ্ধতি বা pure বা research Method - এর ব্যাবহার করেছেন।

#### (২) প্রযোগ ডিত্তিক গবেষণা:-

প্রযোগ ভিত্তিক গবেষণাকে অনেকেই ক্ষেত্র গবেষণাও বলে থাকেন । এরুস গবেষণার ফল সরাসরি ব্যাবহারিক ক্ষেত্রে প্রযোগ করা হয় অর্থাৎ সাধারণ গবেষণা কে সম্পূর্ণ করতে ব্যাবহারিক রুস দেওয়া হয়

#### (৩) সক্রিয় গ্রেষণা:-

সক্রিয় গবেষণা হল একটি উদ্দেশ্য ভিত্তিক ও লঙ্ক্ষ্য কেন্দ্রিক কর্মপ্রক্রিয়া অর্থাৎ যে প্রক্রিয়ার দ্বারা গবেষকরা ভাদের কাজ এবং সিদ্ধান্ত সমূহ বিজ্ঞান সম্মত ভাবে অধ্যায়ন করেন এবং যার উদ্দেশ হল কাজ ও সিদ্ধান্ত গুলির সঠিকতা মূল্যায়ন করা।

ii) গবেষণাকে আরও তিল ভাগে ভাগ করা যায়, যখা: ১) গুলগভ গবেষণা, ২) পরিমাণগভ গবেষণা ৬) মিশ্রিভ গবেষণা ।

#### (১) গুলগত গবেষণা :-

গুনগত গবেষণার উদ্দেশ্য হল সামাজিক বা মানবিক সমস্যা ভূলে ধরা ও তা ব্যাখ্যা করা। এই ধরনের গবেষণায় সাক্ষাৎকার পর্যবৈহ্ণণ আলোচনা ঘটনা অধ্যয়ন (case study)ইত্যাদি তথ্য সংগ্রহের কৌশন হিসাবে ব্যাবহৃত হয়।

## (২) পরিমাণগত গবেষনা:-

পরিমাণগত দৃষ্টিভঙ্গি বলতে বোঝায় কোনকিছু ব্যাখ্যা, ভবিষ্যৎবাণী, নিয়ন্ত্রণ সম্পর্কিত তথ্য বিশ্লেষণে পরিসংখ্যান শাপ্রের ব্যাবহার। পরিমাণগত গবেষণার উদ্দেশ্য হলো চলক গুলির মধ্যে সম্পর্ক নির্ণযের মাধ্যমে কোন তথ্য প্রমাণ করা। এটিই হলো চলক গুলির উদ্দেশ্য। এই ধরণের গবেষণার ছেত্রে

Survey, Expost Facto Quasi Experimental পদ্ধতি ব্যাবহৃত হয় ।

## (৩) মিশ্রিত গবেষলা:-

এই ক্ষেত্রে গুলগত ও পরিমাণগত উভয় গবেষণার ব্যাবহার একসাথে করা হয় ।

TYPES OF RESEARCH - আমি আমার এই গবেষণাটি করার ক্ষেত্রে গুণগত গবেষণা পছতি, এবং পরিমানগত গবেষণা পছতির ব্যাবহার করছি। গবেষণাটি সময়কাল গাঁচ খেকে ছয় মাস হওয়ার জন্য এটি একটি Cross Sectional Study. পদ্ধতি- এই গ্রেষণার কাজটি করার সময় গ্রেষক Survey - এর মাধ্যমে Quantitative study, ও Focus Group discussion, Personal Interview - এর মাধ্যমে Qualitative Study করেছেন।

তথ্য সংগ্রহেব শৃদ্ধতি- গবেষক এই গবেষণাটির তথ্য সংগ্রহ করার ক্ষেত্র Survey, Focus Group discussion, Personal Interview এর জন্য তিনটি আলাদা আলাদা Questionnaire তৈরি করে গ্রামবাসীদের কাছে খেকে গবেষণা সংক্রান্ত Primary Data বা প্রাথমিক তথ্য সংগ্রহ করেন। এছাড়াও পঞ্চাবেত সদসাদের কাছ খেকে কিছু Secondary Data সংগ্রহ করা হয়। প্রসঙ্গত উল্লেখ্য এই গবেষণাটির স্থেতে গবেষক প্রাথমিক তথ্যের বা Primary Data - এর বেশি জোর দিয়েছেন।

<u>রমুবায়ন-</u> গ্রামবাদীদের উপর Survey করার জন্য গবেষক গ্রামে Non-probability Convenient sampling করেছেন। গ্রাম দৃটি জনসংখ্যা প্রায় ২৩০ জন, সেখান খেকে 50 জন গ্রামবাদীকে নিয়ে একটি Survey ও 5 জন গ্রামবাদীকে নিয়ে একটি Focus group discussion ও 5 জন গ্রামবাদীর কাছ খেকে Personal Interview - গ্রহনের মাধ্যমে গবেষণা জন্য প্রয়োজনীয় তথ্য সংগ্রহ করেছেন।

#### অধ্যয়নের সীমাবছতা-

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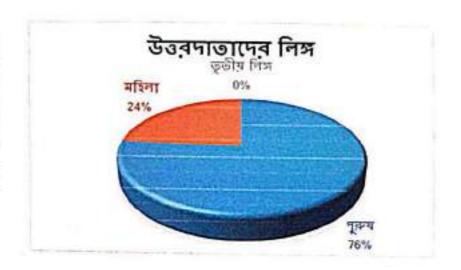
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- i) এই প্রকল্পের সমীক্ষা করতে গিয়ে কিছু বাধার সম্মুখীন হতে হরেছে। যেমন:- গবেষকর প্রশ্নগুলি কে অনেকে সরকারি কোন প্রকল্পের সমীক্ষার সাথে মিলিয়ে ফেলেছেন।
- ii) ञानक हठाँ९ करत এ**छ प्राप्तत छेउत मा पिर**छउ हानमि।
- (iii) গ্রামটির দূরত্ব বাড়ি খেকে গ্রায় ৮ কিমি ভাই যাভায়োতে কিছু সমস্যা হয়েছে ।
- iv) আদিবাসী এলাকা হওয়ার জন্য ভাষাগত বিষয়ে কিছুটা সমস্যা হয়েছে ।

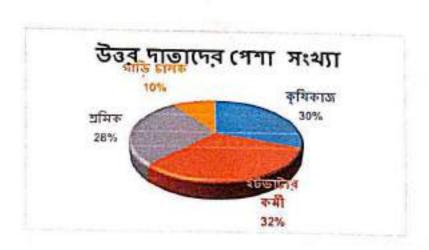
# CHAPTER IV DATA PRESENTATION

TABEL	1
উত্তরদাতাদে	র নিঙ্গ
निज	সংখ্যা
<b>भू</b> क्ष्य	38
মহিলা	12
তৃতীয় নিঙ্গ	0
শোট	50



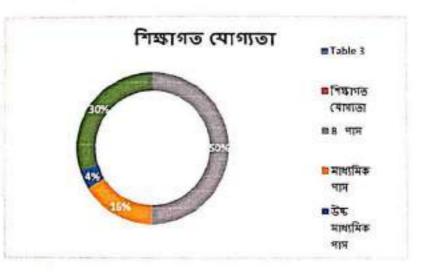
 গ্রামের উত্তরদাতাদের মধ্যে 76% পুরুষ ও 24% মহিলা, অখাৎ উত্তরদাতাদের মধ্যে অধিকাংশ জন পুরুষ।

TABLE 2	1
উত্তর দাতাদেঃ	ৰ পেশা
শেশা	সংখ্যা
কৃষিকাজ	15
ইটভাটার কর্মী	16
প্রমিক	14
গাড়ি চালক	5
(मार्ड	50



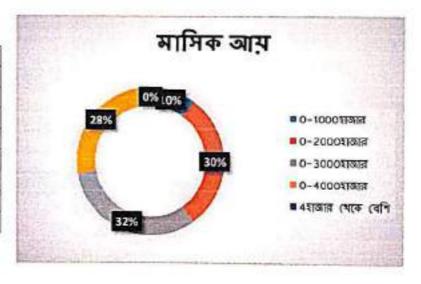
গ্রামের উত্তরদাভাদের মধ্যে 32% ইট ভাটার কমী, 30% কৃষিকাজের সাথে যুক্ত, 28% প্রমিক ও
 মানুষ গাড়ি চালক গ্রামের অধিকাংশ জনই কৃষক।

Table 3	
শিষ্কাগত যোগ্যতা	l.
৪ পাস	25
माधामिक पाप	8
উন্ভ মাধ্যমিক শাস	2
<b>অশি</b> ষ্ঠিত	15
শোট	50



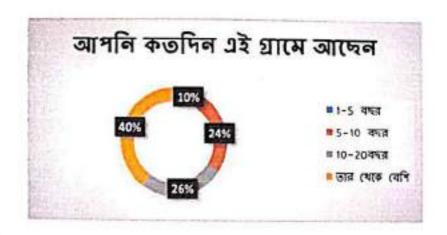
 উত্তরদাভাদের মধ্যে 50% ৪ পাস, 16% মাধ্যমিক পাস, 4% উদ্দমাধ্যমিক পাস ও 30 % অশিক্ষিত উত্তরদাভাদের মধ্যে বেশিরভাগ জন ৪ পাস।

TABLE 4	
মাসিক আয়	
গড় আয়	সংখ্যা
0-1000হাজার	5
0-2000হাজার	15
০-3000হাজার	16
0-4000হাজার	14
4হাজার খেকে বেশি	0
শোট	50



4. উত্তরদা তাদের মধ্যে 32% - এর মাসিক আয় 3000 হাজার টাকা 30% - এর মাসিক আয় 2000 হাজার টাকা, 28% - এর মাসিক আয় 4000 হাজার টাকা এবং 10% - এর মাসিক আয় 4000 হাজার টাকার বেশি, উত্তরদাতাদের বেশির ভাগের মাসিক আয় 3000 হাজার টাকা।

TABLE 5	
আপনি কডদিন এই আছেন?	धारम
বছর	সংখ্যা
1-5 বছর	5
5-10 বছর	12
10-20বছর	13
vতার খেকে বেশি	20
<b>শোট</b>	50



5. উত্তরদাতাদের মধ্যে 40% 20 বছরের বেশি সময় ধরে এই গ্রামে আছেন, 26% 10-20 বছর ধরে এই গ্রামে আছেন, 24% 5-10 বছর ধরে এই গ্রামে আছেন ও 10 % 1-5 বছর ধরে এই গ্রামে আছেনআছেন, অর্থাৎ অধিকাংশ জনজন 20 বছরের বেশি সয়য় ধরে এই গ্রামে আছেন।

TABLE 6	
এই গ্রামে কী কী সমস্যার স হক্ষে।	শুখীন হতে
সমস্যা	সংখ্যা
জনসমস্যা	5
পরিবহন সমস্যা	36
রাম্ভা থারাদ	8
অনান্য	1
<b>শো</b> ট	50



6. উত্তরদাতাদের মধ্যে 72% এর মতে পরিবহন দমদ্যার সম্মুখীন হতে হচ্ছে তাদের বহদিন ধরে, 16% বলছেন রায়ার অবস্থা খুব খারাদ ও 10 % এর জলের সমদ্যা রয়েছে, এবং 2% অন্যান্য নানা বিষয়ে সমদ্যা রয়েছেরয়েছে অর্থাৎ গ্রামটিতে পরিবহন বিষয়ক একটি বড়ো সমদ্যা রয়েছে।

TABLE 7	
রাম্বা নিয়ে কী কীসমস্যা হচ্ছে	?
সমস্যা	<b>मः</b> शा
যাভাষাত সমস্যা	25
রাস্তা দিখে ভারী যান চলাচল করে	10
রায়ার অবস্থা খারাদ	15
<u>অন্যান্য</u>	0
মোট	50

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সমস্যা
বাতাযাত     সমস্যা     বারা দিয়ে ভারী     যান চনাচন করে     বায়ার অবস্থা     খারাশ

7. উত্তরদাতাদের মধ্যে 50% বলছেন রায়া থারাদ হওয়ার ফলে যাতায়াতের সমস্যা হচ্ছে, 30% বলছেন রায়ার অবয়া থারাদ। 20 % বলছেন রায়া দিয়ে ভারী যান চলাচল করে অর্থাৎ উত্তরদাতাদের অধিকাংশের মতে গ্রামের রায়ার অবয়া খুব থারাদ হওয়ার ফলে যাতায়াতের সমস্যা হচ্ছে।

TABLE 8	3
আপনার গ্রামের	র রাস্তা
কেমন	
থারাপ	5
থুব খারাদ	35
ভাগো	6
<b>जानिना</b>	4
(माउँ	50



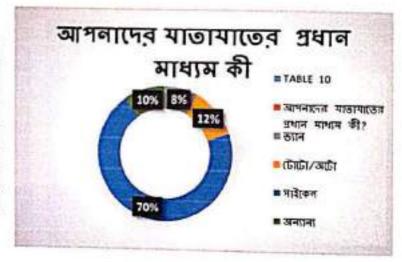
৪. উত্তরদাভাদের মধ্যে 70% মলে করেল গ্রামের রাস্থার অবস্থা থুব থারাদ,12% মলে করেল গ্রামের রাষ্টার অবস্থা ভালো। 10% মলে করেল রাষ্টার অবস্থা থারাদ ও উত্তরদাভাদের মধ্যে ৪% এই বিষয়ে কোল মভামত দেললি, অধিকাংশ মালুষের মতেই গ্রামের রাষ্টার অবস্থা থুব থারাদ।

TABLE 9	
এই গ্রামে কডদিন ধরে নেই।	বাস
0-2 বছর	3
2-4 বছর	2
4- 6 বছর	5
6 বছরের বেশি	40
মোট	50



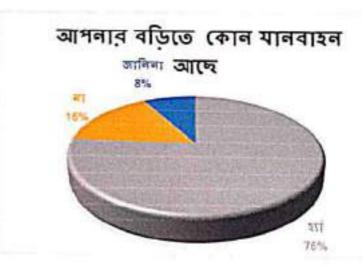
9. উত্তরদাতাদের মধ্যে 80% বলছেন গ্রামে 6 বছরের বেশি সময় ধরে বাস নেই। 10% বলেছেন 4-6 বছর ধরে গ্রামে বাস নেই, 4% বলছেন 2-4 বছর গ্রামে বাস নেই। 6% বলছেন 2 বছর ধরে গ্রামের বাস নেই। গ্রামে বসবাসকারী অধিকাংশের মতেই 6 বছরের বেশি সময় ধরে গ্রামে বাস নেই।

TABLE 10	
আপনাদের যাতাযাতের প্রধান কী?	माधाम
ত্যান	4
টোটো/अটো	6
সাইকেল	35
অন্যান্য	5
<b>শো</b> ট	50



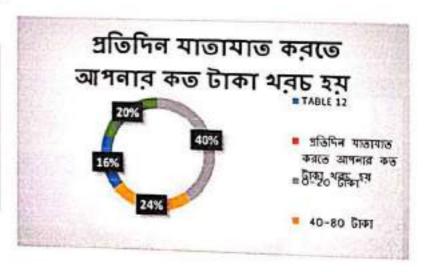
10. উত্তরদাতাদের মধ্যে 70% - এর যাতায়াতের প্রধান মাধ্যম সাইকেন । 12% -এর যাতায়াতের প্রধান মাধ্যম ও টোটো ও অটো, ৪% - এর যাতায়াতের প্রধান মাধ্যম ত্যান। 10 % - এর যাতায়াতের প্রধান মাধ্যম অব্যান্য নানান যানবাহন অর্থাৎ গ্রামের মধ্যে অধিকাংশ জনের যাতায়াতের প্রধান মাধ্যম সাইকেন।

TABLE	AND DESCRIPTION OF THE PARTY OF
আপনার বড়িতে কোন যানবাহন আদে	
হ্যা	38
ना	8
<b>जानिना</b>	4
<b>শো</b> ট	50



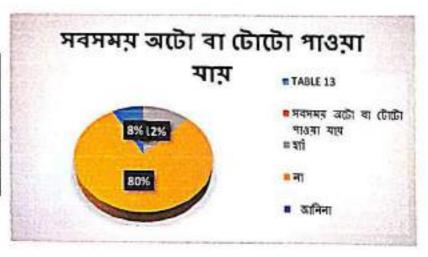
11. উত্তরদাতাদের মধ্যে 76% - এর যাতায়াতের জন্য নিজয় যালবাহন আছে। 16% - এর যাতায়াতের জন্য নিজয় যালবাহন নেই। ৪% এই বিষয়ে জানেন না অর্থাৎ গ্রামের অধিকাংশ জন নিজয় যান বাহন করে যাতায়াত করে।

TABLE 12	
প্রতিদিন যাতাযাত করতে আপনার কত টা	কা খরচ
হ্ম	
0-20 টাকা	20
40-80 ट्राका	12
80 -100 টাকা	8
ভার খেকে বেশি	10
মোট	50



12. উত্তরদাতাদের মধ্যে 40% - এর রোজ যাতাযাতে খরচ হয় 0 - 20 টাকা। 24% - এর খরচ হয় 40 - 80 টাকা। 16% - এর খরচ হয় 80 - 100 টাকা। 20% এর খরচ হয় তার খেকে বেশি টাকা গ্রামবাসীদের অধিকাংশ জনের রোদ যাতায়াত খরচা ০-২০ টাকা।

TABLE 1	3
সবসমূদ অটো বা ( যায়	টোটো পাওয়া
হ্যা	6
ना	40
ञानिना	4
মোট	50



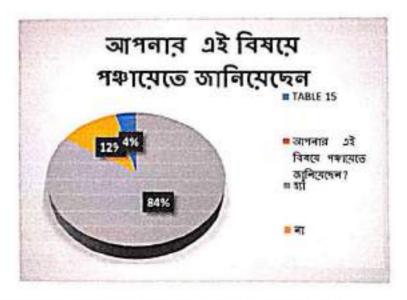
13. উত্তরদাতাদের মধ্যে 80% বলছেন সবসময় অটো ও টোটো পাওয়া যায় না, 12% বলছেন সবসময় অটো ও টোটো পাওয়া যায়। 8% এই বিষয়ে কিছু জানেন না। অর্থাৎ গ্রামে সব সময় অটো বা টোটো পাওয়া যায় না।

TABLE 14	
অসুর রোগীদের যাভাযাতের ক্ষেত্রে আ হয়।	नूविधा
অসুবিধা হ্য	8
<b>र</b> .सना	2
খুব অসুবিধা হয়	37
জানিনা	3
মোট	50



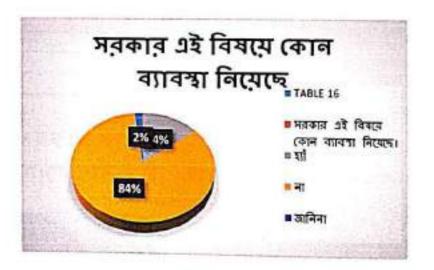
14. উত্তরদাতাদের মধ্যে 74% বলছেন অসুস্থ রোগীদের যাতারাতের ক্ষেত্রে থুব অসুবিধা হয়। 16% বলছেন হ্যা অসুবিধা হয়। 4% বলছেন অসুবিধা হয় না, 6% মানুষ এই বিষয়ে কিছু জানেন না। গ্রামবাসীদের অধিকাংশের মতে অসুস্থ রোগীদের যাতায়াতের ক্ষেত্রে খুবই অসুবিধা হয়।

TABLE 15	
ञामनात এই विश्वस म्राप्तार र	तानिस्यएचन र
হা	42
ना	6
ञानिमा	2
<b>শো</b> ট	50



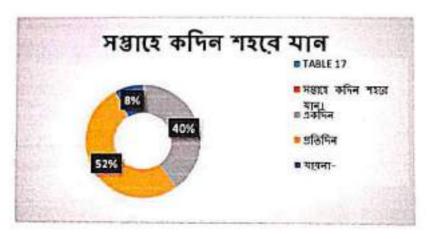
15. উত্তরদাতাদের মধ্যে ৪4% বনছেন এই বিষয়ে পঞ্চায়েতে জানানো হয়েছে। 12% বনছেন এই বিষয়ে পঞ্চায়েতে জানানো হয়নি। 4% এই বিষয়ে কিছু জানেন না। অধিকাংশ জনক গ্রামবাসী বনছেন এই বিষয়টি পঞ্চায়েতে জানানো হয়েছে।

TABLE 16	
সরকার এই বিষয়ে কোন ব্যাবস্থা নিয়েছে।	
য়া	7
ना	42
कानिना	1
শোট	50



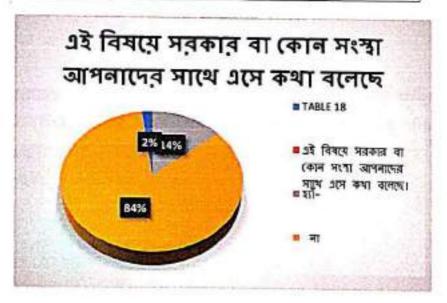
16. উত্তরদাতাদের মধ্যে ৪4% বলেছেল সরকার এই বিষয়ে কোল ব্যাবস্থা নেম্নি। 14% বলছেল সরকার এই বিষয়ে ব্যাবস্থা নিমেছেল। 2% এই বিষয়ে কিছু জানেল লা। অধিকাংশ জল গ্রামবাসী বলছেল সরকার এ বিষয়ে কোল ব্যবস্থা লেম্নি।

TABLE	17
সম্ভাহে কদিন	শহরে
যান।	
একদিন	20
প্রতিদিন	26
गासना-	4
মোট	50



17. উত্তরদাতাদের মধ্যে 52% কাজের জন্য প্রতিদিন শহরে যান। 40% একদিন শহরে যান। ৪% শহরে যাননা। উত্তরটা ভোদের মধ্যে বেশিরভাগ জনকেই তাদের জন্য প্রতিদিন শহরে যেতে হয়।

TABLE 18	
এই বিষয়ে সরকার বাকোন সংস্থা আপনাদের বলেছে।	সাথে এসে কথা
য়াঁ-	7
ना	42
जानिना	1
শোট	50



18.84% উত্তরদাতা বলছেন সরকার বা কোন সংস্থা এসে তাদের সাথে এই সমস্যা নিয়ে কথা বলেননি। 14% বলছেন হ্যা কথা বলেছেন। 2% এই বিষয়ে কিছু জানেন না। অধিকাংশ জনের মতে সরকার বা কোন সংস্থা এই সমস্যাটি নিয়ে কোনো কথা তাদের সাথে বলেননি।

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**IMAGE 4 . SURVAY DATA SHEET** 

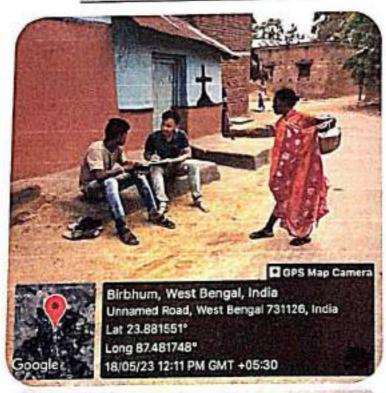


IMAGE 5. PICTURE DURING SURVAY

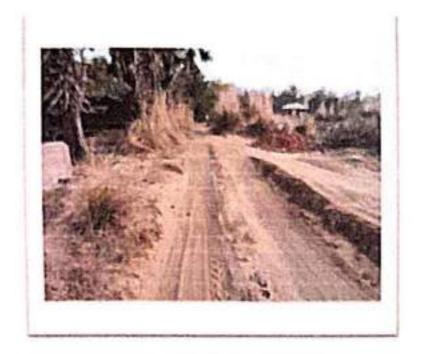


IMAGE 6 . মমবেজপুবের রাম্বা

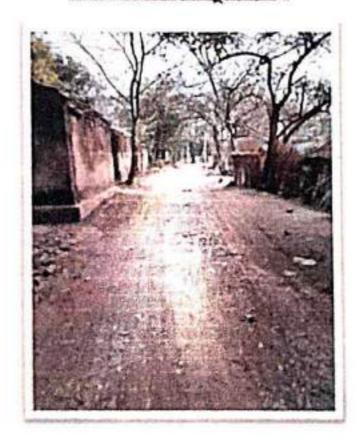


IMAGE 7. (भाभनाभ भूतन नाक्षा

# Shouvik Mondas McJ(H)

Time > 11:22am - 12:2Pm.

Date + 18.5.23

# FOD

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45	72 x24
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गान ५. ेयः ग्राम्ब्राम्बर	ि इस मित्र किंद्रम् की की उस उद्या ए हर्द्र - में कालायांक अभागति से सह। भिन्ना दोनी जान किंता कर करन मेंगे) साउद्यान (वेक्स) वेसकृत्ये, (४)ध्यत्या	III) CONCER (WAS CARROW AS ATTER	6) এই গ্রাপন্তের ক্যতাহির ক্রান্তে বা া নেই। — i) ০-২ বছরে ii) ২- চমন্ত্রে iii) দ্ব-৬ বছরু iv) ও মন্ত্রনার নেধিশ
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#### Suri Vidyasagar College

Department of Mass Communication & Journalism (H)

The University of Burdwan



Community Outreach Programme
Discipline Specific Elective (DSE)-4

## "আদিবাসী সম্প্রদায়ের হস্তশিল্প"

Submitted for Partial fulfillment of the requirement for the bachelor degree by

Name : Sayani Dutta

Univ. Roll No.: 200131000227

Reg.No.: 202001031184 of 2020-21.

Semester: Vi.

Under the guidance of Bainnisikha Ghosh

(College Teacher, MCJH, Suri Vidyasagar College)



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Date: 09.07.2023

## **GUIDE CERTIFICATE**

This is to certify that Ms. Sayani Dutta, bearing registration number 202001031184, has successfully completed her Community Outreach Programme titled "আদিবাসী সম্প্রদায়ের হস্তশিল্প" under my guidance and supervision.

I hereby stated that I have provided guidance and support to her for this work.

Her research work demonstrates her academic abilities, research skills, and understanding of the subject matter.

Ms. Bahnisikha Ghosh College Teacher Suri Vidyasagar College



## DECLARATION

hereby declare that this project entitled "আদিবাসী সম্প্রদায়ের হস্তশিল্প", submitted to The University of Burdwan is an outcome of the original work carried out by me under the department of Mass Communication Journalism, Suri Vidyasagar College.

I also declare that this is my own work as per the best of my knowledge, it contains no material previously published or has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgement has been made in the text or as references.

Date: 09.07.2023

Sayani Dutta Savani Dutta

Department of Mass Communication & Journalism (H)

> Suri Vidyasagar College The University of Burdwan



## ACKNOWLEDGEMENT

I gratefully acknowledge the resourceful guidance, active supervision and constant encouragement of my guide Bahnisikha Ghosh, Project Supervisor, Department of Mass Communication and Journalism, Suri Vidyasagar College, Burdwan University who despite her other commitments could find time to help me in bringing this Project Report to its present shape. I do convey my sincere gratitude and thank to her. I also acknowledge our gratefulness to all Professors (Sanchita Chatterjee ma'am, Pratick Kabiraj sir, Suman Rudra sir) of Mass Communication and Journalism Department, Suri Vidyasagar College, Burdwan University for extending all facilities to carry out the present study. I also thank to Narayan Bagdi, SK.Jalal Uddin, Asish Mondal, Robi Kisku and Sani Hemrom because they have send some of their time and helped me get a lots of information despite being so busy.

I would like to thank my family and friends for their continuous support to me at every moment.

Date: 09.07.2023

Sayani Dutta

Sayani Dutto

Department of Mass Communication & Journalism

(H)

Suri Vidyasagar College The University of Burdwan মুচ্চাহেরে: ভারতীয় সম্প্রদায়ের কথা বলেতে গেলে সাঁওতাল জনজাতির কথা প্রথমেই মনে পড়ে। গ্রন্থীনতার ৭৫ বছর পরেও তাদের আর্থিক অবস্থার তেমন বিকাশ ঘটেনি; তাদের বেশিরভাগ জনগণই চাষবাস, দিনমজুরের কাজ ইত্যাদির মাধ্যমে জীবন ধারণ করে থাকেন। যখন চাষবাস তেমন থাকে না তখন তারা ফুদ্র শিল্পের ওপর নজর দেন। এই পত্রে নির্বাচিত গবেষণাটি করা হয়েছে বীরভ্মের একটি গ্রাম (গোবরা) – এর আদিবাসী জনগোষ্ঠীর ওপর। তাদের অধিকাংশ ব্যক্তিই হন্ডশিল্পের গাথে যুক্ত; তারা মূলত যে সমস্ত জিনিসগুলি তৈরী করেন সেগুলি হল – খেজুর পাতা থেকে তৈরী মাদুর (তালাই), হাত পাখা, বেনা কুচি থেকে তৈরী ঝাঁটা, বাঁশের ঝুড়ি, দড়ি দিয়ে তৈরী ঝাঁটার প্রভৃতি। এই গবেষণার উদ্দেশ্যগুলি হল – স্থায়ী বিক্রয় কেন্দ্রের অভাব দূরীকরণ, আধুনিক যন্ত্রপাতির প্রচলন ঘটানো, তাদের এই হন্তশিল্পের প্রচার ঘটানো, সহজে অধিক দ্রব্য উৎপাদনের জনা প্রশিক্ষণের ব্যবস্থা করা ও দ্রব্যের মান উন্নয়নের দিকে নজর দেওয়া এবং লক্ষ্যটি হল – আদিবাসী সম্প্রদায়ের শৈল্পিক ও আর্থিক উন্নতি ঘটানো। এই গবেষণাটি মূলত মৌলিক গবেষণা। এই গবেষণা কার্যটি সঠিক ভাবে সম্পন্ন করতে প্রথমে সমীক্ষা এবং পরে গণগত আলোচনা ও সাক্ষাৎকার – এর মাধ্যমে তথ্য সংগ্রহ করা হয়। এই গবেষণা থেকে জানা গেছে, শিল্পের উন্নতির জন্য প্রশিক্ষণ দিতে হবে এবং সরকারকে এই শিল্পের উন্নতির জন্য আর্থিক সহায়তার মাধ্যমে তাদের পাশে দাঁড়াতে হবে।

Key Words : ক্ষুদ্র শিল্প, হস্তশিল্প, আধুনিক যন্ত্রপাতি, প্রশিক্ষণ, উন্নয়ন, দূরীকরণ।

## CHAPTER-I

# Introduction:

সম্প্রদায় হল এমন একটি ক্ষুদ্র বা বৃহৎ জনগোষ্ঠী যারা একসাথে দলবদ্ধভাবে বসবাস করে গ্রাকে এবং একে অপরকে সর্বদায় সহায়তা করে থাকে। মূলত অধিকাংশ ক্ষেত্রে সম্প্রদায় একটি নির্দিষ্ট ভৌগোলিক অবস্থানের ভিত্তিতে অর্থাৎ দেশ, শহর বা গ্রামের ভিত্তিতে গড়ে ওঠে।

## সম্প্রদায়কে মূলত দুটি ভাগে ভাগ করা যায়

- যুখা- (a) গ্রামীণ সম্প্রদায়
  - (b) শহরে সম্প্রদায়
- (a) গ্রামীণ সম্প্রদায়: গ্রামীণ সম্প্রদায়গুলি আকারে ছোট এবং জনবয়ল হয়ে থাকে; যাদের প্রধান পেশা হল কৃষিকাজ ও তাদের ভাষা সংস্কৃতি রীতি নীতি ইত্যাদিতে একজাতীয়তা লক্ষ্য করা যায়। যেমন- গ্রাম বা ছোট শহর।
- (b) শহুরে সম্প্রদায়: শহুরে সম্প্রদায়গুলি গ্রামীণ সম্প্রদায়ের তুলনায় অধিক জনবহুল হয়ে থাকে; এই অঞ্চলের অধিকাংশ জনগণই চাকুরীজীবি বা ব্যবসায়ী হয়ে থাকেন। যেমন-মেট্রো শহর, শিল্পনগর ইত্যাদি।

# O STATEMENT OF PROBLEM :

কেন্দুয়া গ্রাম পঞ্চায়েতের অন্তর্গত গোবরা গ্রামে বসবাসকারী আদিবাসী ব্যক্তিদের নির্দিষ্ট কোনো বিক্রম্ম কেন্দ্র নেয় ফলে তারা জিনিসগুলি সচরাচর বিক্রি করতে পারে না এবং ওই গ্রামের বাইরে খুব কম সংখ্যক ব্যক্তিই তাদের এই হস্তশিল্পের ব্যাপারে অবগত, তাই তাদের শিল্পের প্রচারও তেমনভাবে হওয়া সম্ভব হয়নি।

# DEMOGRAPHY OF THE COMMUNITY :

- গ্রামের নাম- গোবরা
- পঞ্চায়েত- কেন্দুয়া গ্রাম পঞ্চায়েত
- ব্লক-সিউড়ী ২
- পুলিশ স্টেশন- সিউড়ী
- জেলা- বীরভূম
- পিন নং. 731102
- মোট জনসংখ্যা 793
- পুরুষ জনসংখ্যা 420
- মহিলা জনসংখ্যা 373
- সাক্ষরতার হার 64.56%

## Source:

- কেন্দুয়া গ্রাম পঞ্চায়েতের প্রধান- নারায়ণ বাগদি
- কেন্দুয়া গ্রাম পঞ্চায়েতের উপ-প্রধান- শেখ জালালুদ্দিন
- কেন্দুয়া গ্রাম পঞ্চায়েতের সচিব আশিষ মণ্ডল

## CHAPTER- II

# Literature Review :

গবেষণার ক্ষেত্রে একটি গুরুত্বপূর্ণ ধাপ হল Literature Review। এক্ষেত্রে গবেষক মূলত গবেষণার বিষয়বস্তু নির্বাচনের পর সেই বিষয়ের পূর্ব গবেষিত বিষয় সম্পর্কে বিস্তারিত অধ্যায়ন করে থাকেন; যার মাধ্যমে নির্বাচিত বিষয়বস্তুর ক্ষেত্রে পূর্ব গবেষণার থামতি নির্ধারনের দ্বারা একটি নতুন গবেষণার বিষয়ের উদ্দেশ্য স্থিরাকৃত করা সম্ভব হয়।

নিম্নে উক্ত গবেষণার বিষয় সম্পর্কিত কয়েকটি Literature Review তুলে ধরা হল –

Sabuj Sarkar & Mithun Barman "Tribal Wall Arts & Painting of Malda & South Dinajpur: A Socio-Cultural Study" (2018) নামক গবেষণাটি করা হয়, মালদা ও দক্ষিণ দিনাজপুরের আদিবাসী সম্প্রদায়ের শিল্পকলার ওপর। এই গবেষণার উদ্দেশ্য হল, উপজাতীয় শিল্পের প্রবর্তন করা। তারা মার্টির বাড়ির দেওয়ালে, সদর দরজার আশেপাশে বিভিন্ন চিত্রকলা সুন্দরভাবে সম্পন্ন করে থাকে। কিন্তু বর্তমানে এই সাংস্কৃতিক চর্চা আসতে আসতে তাদের মর্যাদা হারাচেছ কারণ মার্টির ও ইটের দাম এক হওয়ায় তারা ইটের বাড়িই তৈরী করছে। ফলে তাদের প্রাচীন শিল্পের ও শিল্পকর্মের অবলুপ্তি ঘটছে।

(The Chitrolekha Journal or Art & design, 2(2):1-13p)

2. Ekta Sharma "Tribal Folk Arts of India" (2015) নামক গবেষণাপত্রে ভারতের প্রতিটি রাজ্য তাদের নিজ নিজ শিল্প স্থারা সমৃদ্ধ। যেমন- বিহারের 'মধুবনী', মহারাষ্ট্রের 'ওয়ার্লি', উত্তরাখণ্ডের 'আইপন' বা 'আল্পনা' শিল্প, ওড়িশার পট্টিব্র ইত্যাদি। এই শিল্পকর্মগুলি কারিগরদের জীবিকা নির্বাহের জন্য আত্মনির্ভর করে তোলে। এই গবেষণার মূল লক্ষ্য হল - নবীন প্রজামের কারিগরদের উন্নত প্রযুক্তি ব্যবহারের জন্য প্রশিক্ষণ দেওয়া, যাতে পণ্যের উৎপাদন হার অধিকমাত্রায় বৃদ্ধি পায়। এছাড়াও তাদের শিল্পের উন্নতির জন্য প্রামীন উল্লম্বনের পারিকল্পনা করা ও তাদের খনের ব্যবস্থা করা। তাদের কয়েকটি অসুবিধা হল – তারা সরাসরি প্রাহকদের খেকে নিয়মিতভাবে বিক্রির আশ্বাস বা ভর্সা পাচেছ না , এছাড়া তাদের বাড়িতে চিত্রশিল্পের উপযুক্ত পরিবেশের অভাব রয়েছে।

(Journal of International Academic Research for Multidisciplinary, 3(5), (5th June): 300-308p)

3. Poonam Gandhi Moirangthem" Tribal Art & Development: An Exploration of Pithora Art of Guiarat" (2013), অনুযায়ী 'পিথোরা' শিল্প হল পূর্ব গুজরাটে বাসবাসকারী উপজাতিদের একটি লোকশিল্প। এই গবেষণার মূল উদ্দেশ্য হল, 'পিথোরা' শিল্পের বর্তমান অবস্থা সনাক্ত করে উল্লয়নের বিকাশ ঘটানো এবং জ্ঞান ও প্রজ্ঞার ভান্ডার বৃদ্ধি করা। এজন্য উপজাতীয় সংস্কৃতি গুলির সংরক্ষণ ও NGO গুলিকে সমন্বিত প্রচেষ্টা চালাতে হবে, যাতে তাদের অর্থ-সামাজিক অবস্থার উল্লতি ঘটে।

(Global Journal for Research Analysis, 2(2), (Feb):202-203p)

4. Mr. Mohan, A.Vasave & U V. Nile "A Study Tribal Handicrafts Maker's Income in Nandurbar District (M.S)" (2017), নামক গবেষণাপত্রে বলা হয়েছে, আদিবাসী উপজাতির বৈচিত্রো ভারত অত্যন্ত সমৃদ্ধ। আদিবাসীরা তাদের জীবিকা নির্বাহের জন্য হস্তশিল্পকে ব্যবহার করেছে। কিন্তু বর্তমানে শিল্পের আধুনিকীকরণ তাদের সামনে চ্যালেঞ্জ হয়ে উঠেছে। সাতপুরা পার্বত্য অঞ্চলের অধিকাংশ বন-জঙ্গল কেটে ফেলার কারণে আদিবাসীরা তাদের হস্তশিল্পের পতনের সম্মুখীন হচ্ছে। এই গবেষণাটি করা হয় মহারাষ্ট্রের নন্দুরবার জেলায়। এই গবেষণাটির উদ্দেশ্য ছিল - হস্তশিল্প তৈরীর সমস্যাগুলি সমাধান করা, এই শিল্পের জন্য খরচের বিশ্লেষণ করা, বাজারজাতকরনের দিকটি আলোচনা করা। এক্ষেত্রে আদিবাসীদের ষথায়খভাবে সহায়তা ও প্রশিক্ষণের দিকে সরকারকে বিশেষ নজর দিতে হবে, যাতে তারা আত্মনির্ভর হয়ে উঠতে সক্ষম হয়।

(Scholarly Research Journal for Humanity Science & English Language, 4(23), (Aug-Sept): 6139- 6144p)

5. Dr. Archana Rani And Dr. Himanshu Agarwal "<u>Tribes in India: Their Socio-Economic Development through Art</u>"(2019), নামক গবেষণাপত্ৰ অনুযায়ী উপজাতিরা প্রকৃতির রক্ষক। তারা তাদের জীবন টিকিয়ে রাখার জন্য প্রাথমিকভাবে কৃষি এবং ক্ষুদ্র বনজ উৎপাদনের (MFP) উপর নির্ভর করে। এই গবেষণাপত্রে শিল্পের মাধ্যমে ভারতের উপজাতীয়দের অর্থ-সামাজিক উন্নয়নের বিষয়টি গভীরভাবে বিশ্লেষণ করা হয়েছে। এই গবেষণার প্রধান লক্ষ্য হল, উপজাতি সম্প্রদায়ের সার্বিক পরিস্থিতির উন্নতি ঘটানো। এক্ষেত্রে সরকারকে তাদের উদ্দেশ্যে সহায়তার হাত বাড়িয়ে দিতে হবে। যদিও বর্তমানে সরকার এবং অন্যান্য সংস্থাগুলি চেষ্টা করছে উপজাতীয় শিল্পগুলিকে সংরক্ষন এবং প্রচার করে চালানোর।

(Journal of Commerce An Trade, 14(1),(April):83-87p)

6. Dr. Dhananjay Mandlik" A Study of Strength & Challenge in front of

Maharashtraian Tribal Handicrafts Business" (2019), - এই গবেষণাপত্রে বলা হয়েছে,
মহারাষ্ট্রের হন্ডশিল্প বৈচিত্র্যে ভরপুর। সেখানে উৎপাদিত পণ্যগুলির উপর
আকর্ষনীয়ভাবে কারুকর্য করে সেগুলি দৈনন্দিন জীবনে ব্যবহার করা হয়। তাদের
বিখ্যাত কিছু কাজ হল, সাওয়ান্তওয়াড়ি কাজ, চামড়ার কাজ, বিদ্রির কাজ, গয়না তৈরী,
চিত্রশিল্প ইত্যাদি। এই গবেষণার উদ্দেশ্য হল, হন্ডশিল্প বিপননের ক্ষেত্রে কীভাবে তারা
ডিজিটাল মিডিয়াকে মার্কেটিং-এর কাজে ব্যবহার করছে। এছাড়া, উল্লয়ন, যোগাযোগ,
পণ্য বিতরণ ইত্যাদি বিষয়ে সিদ্ধান্ত গ্রহণের দ্বারা তাদের ব্যবসার উন্নতি ঘটানো।

(Saudi Journal of Business & Management Studies, 04(08.004), (Aug): 676-680p)

Gap: নির্বাচিত গবেষণার বিষয়টি নিয়ে অনেকগুলি গবেষণা হওয়া সত্ত্বেও বীরভূম জেলার বেশ কিছু গ্রামের আদিবাসী সম্প্রদায়েরই এখনো তেমন ভাবে শৈল্পিক বা আর্থিক উন্নতি সম্ভব হয়নি।

## CHAPTER- III

# গ্ৰেষণার নকশা :

গবেষণাকে সঠিকভাবে সম্পন্ন করার জন্য বিভিন্ন ধাপ অনুস্মরন করতে হয়, এর মধ্যে অন্যতম হল গবেষণার নকশা। এটি গবেষণা পর্যায়ের চতুর্ব ধাপ।

একজন গবেষক তাঁর গবেষনাকার্যের মধ্যেদিয়ে কি করতে চায় এবং কিভাবে করতে চায় তা গবেষণার নকশার বিবেচ্য বিষয়। গবেষণার নকশা আসলে গবেষনা কর্মের প্রাক-পরিকল্পনা, যার মাধ্যামে গবেষক তাঁর গবেষণার শুরু থেকে শেষ পর্যন্ত একটি কর্মসূচী প্রস্তুত করতে পারে।

# গবেষণার নকশাকরনের উদ্দেশ্য:

- i. গবেষণাটি কী সম্পর্কে ?
- ii. কেন গবেষণাটি করা হচ্ছে?
- iii. অধ্যায়নটি কোখায় করা হবে ?
- iv. কীধরনের তথ্য প্রয়োজন ?
- v. প্রয়োজনীয় তখ্য কোখায় পাওয়া য়াবে ?
- vi. অধ্যায়নের সময়কাল কী অন্তর্ভুক্ত করা হবে ?
- vii. নমুনার নকশা কী হবে?
- viii. তথ্য সংগ্রহের ক্ষেত্রে কী ধরনের কলাকৌশল ব্যবহার করা হবে ?
- ix. কীভাবে তথ্য বিশ্লেষণ করা হবে ?
- x. কোন শৈলীতে বিবরণটি প্রস্তুত করা হবে ?

# নির্বাচিত গবেষণার বিষয়টির ধরণ :

- যদি গবেষনার উদ্দেশ্য, প্রকৃতি ইত্যাদির দিক দিয়ে গবেষণাটি বিশ্লেষণ করা যায়,তাহলে
  দেখা যাবে এটি একটি সক্রিয় গবেষণা।
- প্রকৃতি ও বৈশিষ্ট্যের উপর ভিত্তি করে গবেষণার ধরণ বিশ্লেষণ করলে এটি বর্ণনামূলক গবেষণা।
- যদি গবেষণায় প্রয়োজনীয় তথ্য সংগ্রহের ধরণ বা বৈশিষ্টয়ের উপর নির্ভর করে গবেষণার
  ধরণটিকে দেখা য়য় তাহলে এটি মিশ্র গবেষণা।
- আবার যদি সময়কালের উপর ভিত্তি করে গবেষণার ধরণ দেখা যায় তাহলে এটি Crosssectional Research I
- Area: এই গবেষণাপত্রে যে বিষয়টি নিয়ে আলোচনা করা হয়েছে, তার জন্য সিউড়ী থেকে
   4km দূরত্বে গোবরা নামক একটি গ্রামকে নির্বাচন করা হয়েছে।
- Sampling: এই গবেষণার্টিতে Sampling নির্বাচনের ক্ষেত্রে Non-Probability Sampling
   এর একটি ভাগ Quota Sampling-এর মাধ্যমে কাজটি সম্পন্ন করা হয়েছে।
- Sample Size : গবেষণাটি করার জন্য নির্বাচিত গ্রামের মোট জনসংখ্যার মধ্যে থেকে 150 জনকে নিয়ে Survey করা হয়েছে।
- Method: গবেষণাপত্রে নির্বাচিত গবেষণার বিষয়টির ক্ষেত্রে Survey (Quantitative), FGD ও
  Interview (Qualitative) Method এর মধ্যে দিয়ে কাজ সম্পন্ন করা হয়েছে।
- Questionnaire : এই গবেষণা কার্যের ক্ষেত্রে Open-Ended ও Close-Ended Questionnaire এর ব্যবহার করা হয়েছে।
- <u>Data Collection</u> : গবেষণা কর্যটি সঠিকভাবে সম্পন্ন করতে প্রথমে Secondary Data
   Collection করা হয় এবং পরে Primary Data Collection করা হয়।

# <u>অধ্যায়নের সীমাবদ্ধতা</u> :

এই প্রকল্পের সমীক্ষা করতে গিয়ে যে যে সমস্যার সম্মুখীন হতে হয়েছে সেগুলি হল-

- অনেকে কথা বলতে ইতস্তত বোধ করছিল।
- অনেকেই অনেক তথ্য দিতে নারাজ হচ্ছিল; ষেমন : Phone No., Educational Quasslification, Monthly Income ইত্যাদি।
- FGD –এর জন্য ৬ জন শিল্পীকে রাজি করাতে অল্প-বিস্তর অসুবিধার সম্মুখীন হতে হয়েছিল।
- পঞ্চায়েত ভোট হওয়ার কথা চলছিল বলে অনেকেই ভাবছিল ভোট সংক্রান্ত কিছু তথ্য জানতে চাওয়া হচ্ছে । এছাড়াও গ্রাম পরিদর্শনের সময় ওই গ্রামের পঞ্চায়েত প্রধান তাঁর একজন অনুগামীকে সাথে পাঠান ।

## CHAPTER- IV

## [DATA PRESENTATION]

Table 1

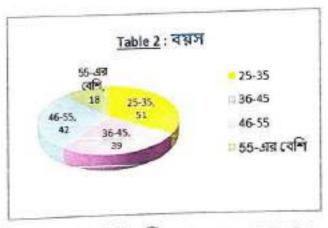
निञ	সংখ্যা
পুরুষ	57
মহিলা	93
তৃতীয় লিঙ্গ	0
মোট	150



সমীক্ষা থেকে প্রাপ্ত তথ্য অনুযায়ী Table 1–এ দেখা যাচ্ছে – 150 জনের মধ্যে 57 জন (38%) পুরুষ ও 93 জন (62%) মহিলা রয়েছেন। অর্থাৎ এখানে মহিলার সংখ্যা বেশি।

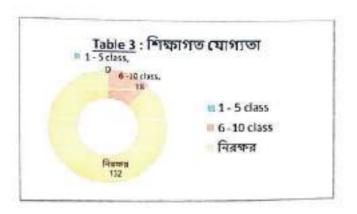
Table 2

বয়স	সংখ্যা
25-35	51
36-45	39
46-55	42
55-এর বেশি	18
মোট	150



সমীক্ষা থেকে প্রাপ্ত তথ্য থেকে জানা যায়, এই টেবিলটিতে 150 জনের মধ্যে 25-35 বছরের 51(34%) জন, 36-45বছরের 39 (26%) জন, 46-55বছরের 42 (28%) জন ও 55-এর বেশি বছরের 18 (12%) জন রয়েছেন। অর্থাৎ 25-35 বছরের মানুষের সংখ্যা বেশি। Table3

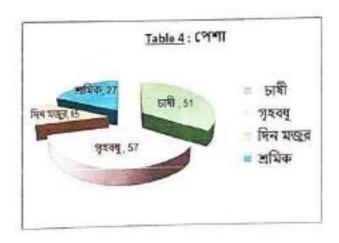
শিক্ষা	সংখ্যা
1-5 class	0
6-10 class	18
নিরক্ষর	132
মোট	150



এই টেবিলটি থেকে বোঝা যাচেছ, 150 জনের মধ্যে class 1-5 পর্যন্ত পড়েছেন 0%, Class 6-10 পর্যন্ত পড়েছেন 18 (12%) জন এবং নিরক্ষর 132 (88%) জন।

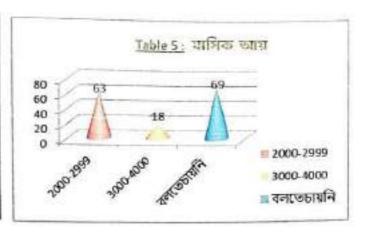
Table 4

পেশা	সংখ্যা
চাষী	51
গৃহবধৃ	57
দিন মজুর	15
শ্রমিক	27
মোট	150



এই টেবিল থেকে প্রাপ্ত তথাগুলিতে দেখা যাচ্ছে, 150 জনের মধ্যে চাষ করেন 51 (34%) জন, গৃহবধৃ 57 (38%) জন, দিন মজুর 15 (10%) জন ও শ্রমিক 27(18%) জন।

Table 5	
মাসিক আয়	সংখ্যা
2000-2999	63
3000-4000	200.00
বলতেচায়নি	69
মোট	150



এই টেবিলটি থেকে বোঝা যাচ্ছে, 150 জনের মধ্যে 63 জনের মাসিক আয় 2000-2999, 18 জনের মাসিক আয় 3000-4000 এবং 69 জন বলতে চাননি।

<u>Table 6</u> হাতের কাজ করেন

প্রতিক্রিয়া	সংখ্যা
হাাঁ	90
মাঝে মাঝে	24
না	36
মোট	150

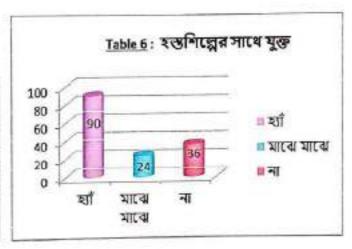
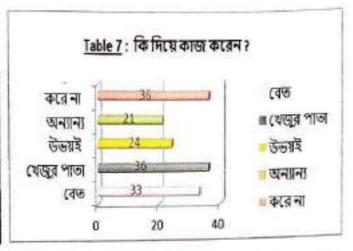


Table 6 –এর অন্তর্গত তথ্যগুলি থেকে দেখা যাচ্ছে যে, 150 জনের মধ্যে হাতের কাজ করেন 90 জন, মাঝে মাঝে করেন 24 জন এবং হাতের কাজের সাথে যুক্ত নন 36 জন। অর্থাৎ অধিকাংশ ব্যক্তিই হস্তশিল্পের সাথে যুক্ত।

Table 7 দয়ে কাজ করেন

कि पिर्ध काउर	4.64.41
বেত	33
খেজুর পাতা	36
উভয়ই	24
অন্যান্য	21
করে না	36
মোট	150



150 জনের মধ্যে বেতের কাজ করেন 33 জন, খেজুর পাতা দিয়ে কাজ করেন 36 জন, দুটো দিয়েই কাজ করেন 24 জন, অন্যান্য উপাদান দিয়ে কাজ করেন 21জন, কাজ করেন না 36 জন। অতএব,এখান থেকে দেখা যাচ্ছে, খেজুর পাতা ও বেতের জিনিস বেশি মানুষ তৈরি করেন।

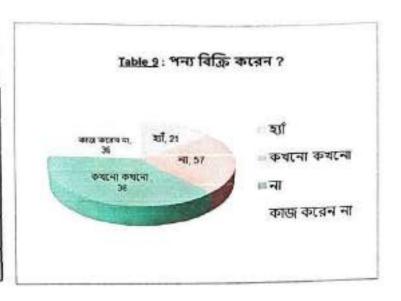
<u>Table 8</u> কাঁচামাল কিনতে হয় <u>?</u>

প্রতিক্রিয়া	সংখ্যা
হাঁ	48
না	66
কাজ করেন না	36
মোট	150



150 জনের মধ্যে কাঁচামাল কিনতে হয় বলেছেন 48 (32%)জন, হয়না বলেছেন 66 (44%)জন, হাতের কাজ করেন না বলেছেন 36 (24%) জন। <u>Table 9</u> পন্য বিক্রি করেন ?

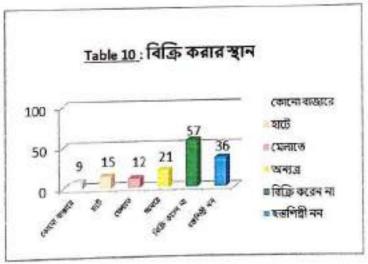
প্রতিক্রিয়া	সংখ্যা
হাাঁ	21
ক্রমনো ক্রমনো ক্রমনো ক্রমনো	36
ন	57
কাজ করেন না	36
মোট	150



150জনের মধ্যে 21(14%) জন পন্য বিক্রি করেন, 57(38%) জন করেন না, 36(24%) জন, কখনো কখনো করেন 36 (24%) জন, হাতের কাজ করেন না 36 (24%) জন।

Table 10 কোথায় বিক্রি করেন ?

প্রতিক্রিয়া	সংখ্যা
কোনো বাজারে	9
হাটে	15
মেলাতে	12
অন্যত্র	21
বিক্রি করেন ন্য	57
হস্তশিল্পী নন	36
মোট	150



150 জনের মধ্যে 9 জন বলেছেন বাজারে বিক্রি করেন, 15 জন বলেছেন হাটে, 12 জন বলেছেন মেলাতে, অন্যত্র বিক্রি করেন বলেছেন 21 জন, বিক্রি করেন না বলেছেন 57 জন এবং হস্তশিল্পী নন 36 জন।

 Table 11

 ছাত্ৰী বিক্ৰয় কেন্দ্ৰ আছে কিনা

 প্ৰতিক্ৰিয়া সংখ্যা

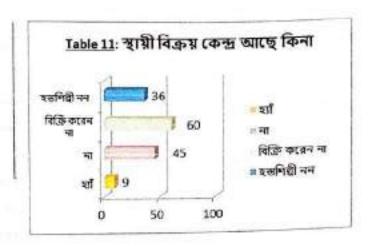
 ছাঁ 9

 না 45

 বিক্ৰ কৰেন না 60

 হন্তশিল্পী নন 36

 মোট 150

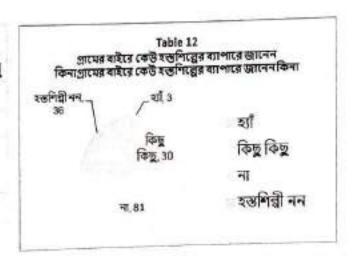


এই টেবিলটিতে দেখা যাচেছ, 150 জনের মধ্যে স্থায়ী বিক্রয় কেন্দ্র আছে বলেছেন 9 জন, নেয় বলেছেন 45 জন, বিক্রি করেন না 60 জন ও হস্তশিল্পী নন 36 জন।

Table 12

<u>গ্রামের বাইরে কেউ হন্তশিল্পের ব্যাপারে জানেন কিনা</u>
প্রতিক্রিয়া সংখ্যা
হাঁ 3

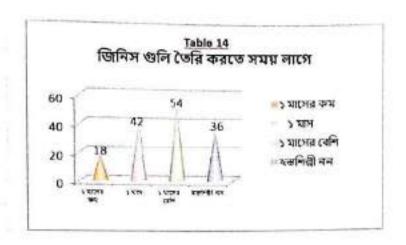
কিছু কিছু 30
না 81
হন্তশিল্পী নন 36
মোট 150



নির্বাচিত গ্রামের অধিকাংশ ব্যক্তিই যে নানান হাতের কাজ করেন তা ওই গ্রামের বাইরের ব্যক্তিরাও জানেন এমনটা বলেছেন 150 জনের মধ্যে 32(2%) জন, বাইরের কাউ জানেন না বলেছেন 81(54%) জন, কিছু কিছু ব্যক্তি জানেন এমন বলেছেন 30(20%) জন ও হস্তশিল্পী নন 36 (24%) জন।

Table 14 ন্তিনিস গুলি তৈরি করতে সময় লাগে

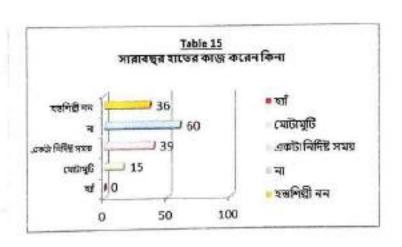
সময়কাল	সংখ্যা
মুসের কম	18
2 मात्र	42
১ মধ্যের বেশি	54
হন্তশিল্পী নন	36
মোট	150



<sub>150</sub> জনের মধ্যে 18 জন বলেছেন জিনিসগুলি তৈরি করতে ১ মাসের কম সময় লগে, 42জন বলেছেন ১ মাস সময় লাগে, 54 জন বলেছেন ১ মাসের বেশি সময় লগে ও 36 জন হস্তশিল্পী নন।

Table 15 সারাব্ছর হাতের কাজ করেন কিনা

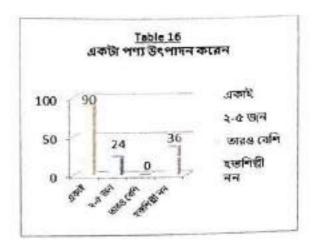
প্রতিক্রিয়া	সংখ্যা
য়াঁ	0
যোটামুটি	15
একটা নিবিষ্ট সময়	39
ना	60
২ঙশিল্পী নন	36
যোট	150



150 জনের মধ্যে সারাবছর হাতের কাজ করেন 0 জন , সারাবছর হাতের কাজ করেন না বলেছেন 60 জন, মোটামুটি বলেছেন 15 জন , নির্দিষ্ট সময় করেন বলেছেন 39 জন ও হস্তশিল্পী নন 36 জন।

Table 16 একটা পণ্য উৎপাদন করেন

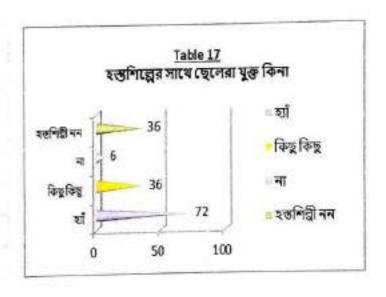
একাই	90
২-৫ জন	24
তারও বেশি	0
হস্তশিল্পী নন	36
মোট	150



150 জনের মধ্যে 90 জন বলেছেন একাই কাজ করেন, ২-৫ জন মিলে কাজ করেন বলেছেন 24 জন, তারবেশি লোকবল নেয় এবং হস্তশিল্পী নন 36 জন।

Table 17 হন্তশিল্পের সাথে ছেলেরা যুক্ত কিনা

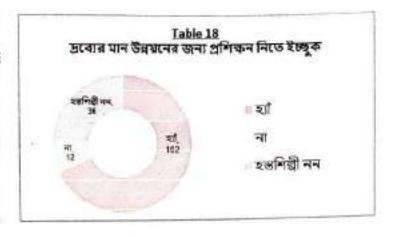
প্রতিক্রিয়া	সংখ্যা
হাঁ	72
কিছু কিছু	36
না	6
হন্তশিল্পী নন	36
মোট	150



150 জনের মধ্যে 72 জন বলেছেন হস্তশিল্পের সাথে ছেলেরাও যুক্ত, না বলেছেন 6 জন, কিছু কিছু ছেলে যুক্ত বলেছেন 36 জন ও হস্তশিল্পী নন 36 জন। অর্থাৎ এই টেবিলটি থেকে বোঝা যাচেছ, বেশিরভাগ ছেলেই হস্তশিল্পের সাথে যুক্ত।

Table 18 দ্বার মান উন্নয়নের জন্য প্রশিক্ষন নিতে ইচছুক

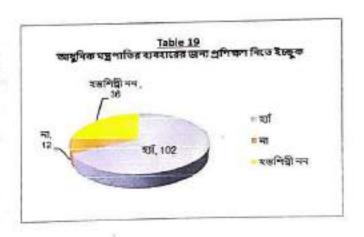
পতিক্রিয়া	সংখ্যা
হাঁ	102
ग	12
হন্তশিল্পী নম	36
মোট	150



রব্যের মান উন্নয়নের জন্য প্রশিক্ষণ নিতে ইচ্ছুক 150 জনের মধ্যে 102 (68%) জন, ইচ্ছুক নন 12 (8%) জন ও হস্তশিল্পের সাথে যুক্ত নন 36 (24%) জন। অর্থাৎ অধিকাংশ মানুষ্ট এই প্রশিক্ষণ নিতে ইচ্ছুক।

Table 19 দ্বাধুনিক যন্ত্রপাতির ব্যবহারের জন্য প্রশিক্ষণ নিতে ইচ্ছুক

প্রতিক্রিয়া	সংখ্যা
হাঁ	102
ন	12
হন্তশিল্পী নন	36
যোট	150



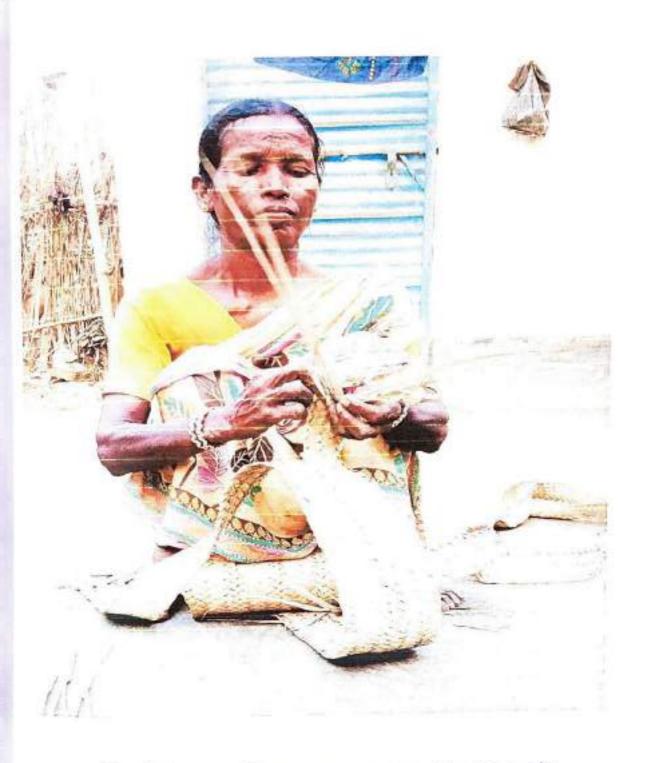
150 জনের মধ্যে আধুনিক যন্ত্রপাতির ব্যবহারের জন্য প্রশিক্ষণ নিতে ইচ্ছুক বলেছেন 102(68%) জন, ইচ্ছুক নন বলেছেন 12(8%) জন, হস্তশিল্পী নন 36 (24%) জন। অর্থাৎ অধিকাংশ জনই এই প্রশিক্ষণ নিতে ইচ্ছুক।

# Report of Focus Group Discussion :

এই FGD-তে উপস্থিত ছিলেন নির্বাচিত গ্রামের 6 জন সদস্য ও সদস্যাবৃন্দ। তাদেরকে কিছু দিন আগে জানানো হয়েছিল 11ই মে একটা আলোচনা সভার আয়োজন করা হবে এবং তাদের স্থানে উপস্থিত থাকতে অনুরোধ করা হয়েছিল। সেই আলোচনাটি চলেছিল বিকেল 5:45 থেকে 6:20 পর্যন্ত। এই দিন Focus Group Discusstion –এ অংশগ্রহন করেন ওই গ্রামের 6 জন ব্যক্তি; তারা হলেন – মান্দা মুর্মু [বয়স – ৫৫, পেশা- গৃহবধ্]; কবি মার্ডি [বয়স- ৪২, পেশা- গৃহবধ্]; লক্ষ্মী হমেরম [বয়স- ৫০, পেশা- চার্মী]; ধারা কিসকু [বয়স- ৪২, পেশা- গৃহবধ্]; কবেল টুড়ু [বয়স- ৪৮, পেশা- চার্মী]; কদম হমেরম [বয়স- ২৮, পেশা- চার্মী]।

# এই FGD থেকে যে তথ্য গুলি উঠে এসেছে সেইগুলি হল –

- তাদের শিল্পের প্রচার দ্রুত কিভাবে সম্ভব তা চাইলে ৪ই প্রামের তিন বাসিন্দা মান্দা মুর্ম্ (৫৫), কবেল টুড় (৪৮) ৪ লক্ষ্মী হেমরম (৫০) বলেন, পোষ্টার বা হোডিং দিলে অতি দুত হন্তশিল্পের প্রচার ঘটানো সম্ভব। আবার কবি মার্ডি (৪২)–এর মতে প্রচার গাড়ির মাধ্যমে প্রচার করলে দুত প্রচার করা সম্ভব।
- তাদের মধ্যে কদম হেমরম (২৮) নামক এক ব্যক্তি বলেন তাদের তৈরি জিনিসগুলি যাতে ঝর-জলে নষ্ট না হয়ে য়য় তার জন্য ছাঙনির ব্যবস্থা করার কথা।
- বিক্রয় কেন্দ্রের জন্য স্থান নির্বাচনের কথা জিজ্ঞেস করলে ধারা কিসকু (৪২) বলেন সিউড়ীর বাজারে বিক্রয়কেন্দ্রের ব্যবস্থা করা হলে তাদের সুবিধা হবে।
- কবি মার্ডি (৪২) বলেন তাদের প্রশিক্ষণ কেন্দ্রের ব্যবস্থা যদি তাদের গ্রামে করা সম্ভব হয় তাদের সুবিধা হবে কারণ তাদের নিত্যদিনের চাষের কাজ থাকে।
- কেবল টুডু (৪৮) বলেন সরকারী সহায়তা তাদের হস্তশিল্পের উল্লয়নে কিছুটা সাহায্য করবে।



<u>আদিবাসী এক মহিলা খেজুর পাতা দিয়ে তালাই</u> বুনছেন



Unveiling Transparency: A Comprehensive Study on E-News Contents and its Impact on Trust and Credibility in Digital Journalism



# SURI VIDYASAGAR COLLEGE

Department of Mass communication and Journalism(H)

# THE UNIVERSITY OF BURDWAN





Discipline Specific Elective (DSE)-3

Dissertation

Title of programme: "Unveiling Transparency: A Comprehensive Study on E-News Contents and its Impact on Trust and Credibility in Digital Journalism"

Submitted for

Partial fulfillment of the requirement for the degree

Ву

# RAJIB MANDAL

Univ. Roll no.: 200131000187

Registration No- 202001031143

Semester: VI, MCJH, SVC

SANCHITA CHATTERJEE

(SACT, MCJH, Suri Vidyasagar College)

# Guide Certificate

Sanchita Chatterjee

SACT

Department of Mass Communication and Journalism

This is to certify that I, Sanchita Chatterjee, have served as the official guide and mentor for the dissertation titled "Unveiling Transparency: A Comprehensive Study on E-News Contents and Its Impact on Trust and Credibility in Digital Journalism" presented by Rajib Mandal. Throughout the duration of this research endeavour, I have had the privilege to supervise and provide guidance to Rajib Mandal in his academic pursuit. As his guide, I have closely monitored the progress of the dissertation and offered valuable insights, feedback, and support, encouraging the development of their research skills and intellectual abilities.

Based on my thorough assessment of the final dissertation manuscript and its oral defence, I hereby recommend that the work be accepted and approved for evaluation by the academic committee. I firmly believe that Rajib Mandal has met the scholarly standards and requirements set forth by the Suri Vidyasagar College towards successful completion of the Bachelors Degree in Mass Communication and Journalism in The University of Burdwan, a State University and Institute of national importance. This is an original study and I hereby grant authorization for the submission of this dissertation for examination purposes.

Date- 20/07/23

Place- Sumi

Sanchita Chatteriee

Department of Mass Communication and Journalism Suri Vidyasagar College P.O.-Suri, Dist.-Birbhum, W.B.-731101

# DECLARATION

I hereby declare that this project entitled: "Unveiling Transparency: A Comprehensive Study on E-News Contents and its Impact on Trust and Credibility in Digital Journalism", submitted to The University of Burdwan is an outcome of the original work carried out by me under the department of Mass Communication and Journalism, Suri Vidyasagar College.

I also declare that this is my own work and that, to the best of my knowledge, it contains no material previously published or has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgement has been made in the text or as references.

Placed: Bankwen

Dated: 20/07/2023

Rajib Mandal

Rajib Mandal

Department of Mass Communication and Journalism Suri Vidyasagar College

The University of Burdwan

# Acknowledgement

I have put a lot of effort on this project. Yet, without the generous support and assistance of many people, it would not have been feasible. I want to express my sincere gratitude to each and every one of them. I want to specifically thank my project mentor, Sanchita Chattopadhyay Mam, for giving me the chance to work on this fantastic project. It also helped me conduct a tonne of research for it, and I learned a tonne of brand-new information as a result. I sincerely appreciate her. She provided the direction and frequent monitoring I needed, as well as the information I needed to complete the project, and for that I am very grateful. I would also like to express my appreciation to all of the teachers at Suri Vidyasagar College's Mass Communication and Journalism Department for providing the study with the necessary resources.

I would like to thank my parents and friends for their wonderful encouragement and cooperation, which allowed me to finish my project in the allotted time, project.

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# Preface

The digital age has revolutionized the way we consume news and information. With the advent of e-news platforms and the rapid growth of digital media, accessing news has become more convenient and widespread than ever before. However, amidst this technological progress, concerns have arisen about the transparency and reliability of the content disseminated through these digital channels. As a result, understanding the transparency of e-news contents has become an essential endeavor to ensure the integrity and trustworthiness of the information we receive.

This research paper delves into the critical topic of transparency in e-news content, seeking to shed light on the extent to which digital journalism maintains openness, accountability, and credibility. Our primary objective is to explore the implications of transparency in e-news reporting on reader trust and the overall credibility of the digital news landscape. By understanding the challenges faced by digital journalists and the factors influencing their reporting practices, we aim to propose actionable recommendations that can contribute to enhancing transparency in this ever-evolving media landscape.

The journey towards compiling this research paper has been an enlightening and engaging one. We have adopted a mixed-methods approach, employing both quantitative analysis of user surveys and qualitative examination of e-news articles, to offer a comprehensive perspective on the subject matter. Through the insights gathered from both data sets, we hope to contribute meaningfully to the discourse surrounding digital journalism, trust in media, and the future of news consumption.

We extend our gratitude to all the participants who generously offered their time to take part in our survey and share their views. Without their valuable contributions, this research would not have been possible. Additionally, we acknowledge the contributions of our fellow researchers and advisors, whose expertise and guidance have been invaluable throughout the research process.

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As with any academic endeavor, this research paper has its limitations. We acknowledge that the digital media landscape is continuously evolving, and the findings presented here may reflect the state of e-news transparency up to the point of data collection but might not encompass developments beyond this period.

It is our sincere hope that this research paper will serve as a stepping stone for further exploration and discussions on the transparency of e-news contents. We aspire to contribute to a media ecosystem that fosters openness, integrity, and a well-informed public.

# Chapter 1

#### Introduction:

In recent years, there has been a significant increase in the use of e-news platforms as a primary source of news for individuals. With the rise of social media and online news outlets, it has become easier than ever to access news articles from a wide range of sources. However, this ease of access has raised concerns about the transparency of e-news content. Many people are now questioning the accuracy and credibility of the news they read online, particularly with the prevalence of fake news and biased reporting. This study seeks to address this issue by examining the transparency of e-news content.

The internet has revolutionized the way news is disseminated and consumed. The rise of online news content has provided people with an unprecedented level of access to information from around the world. However, this access has come at a cost. The proliferation of fake news and disinformation has eroded trust in online news content. In response, researcher have examined the concept of transparency in online news content to understand its effects on audience perceptions and behaviors. We selected two popular news channels for research analysis. And we check where transparency has been bias. We also checked the biasness in offline news articles and online news articles based on popular news agencies. The advent of the digital age has revolutionized the way news is created, disseminated, and consumed, with online e-news platforms rapidly becoming the primary source of information for millions worldwide. The convenience and accessibility of digital news have democratized the flow of information, allowing news consumers to stay informed with just a few clicks. However, this unprecedented growth in online news consumption has also brought to light concerns about the transparency of e-news contents and its impact on the credibility of journalism.

# Keywords:

Transparency of e-news contents, Digital Journalism, Credibility, Trust, News Consumption, Qualitative Analysis, Quantitative Analysis, News Sources

#### Literature Review:

- i. Historical Perspectives on News Transparency: The concept of transparency in journalism has deep historical roots. Early journalistic practices emphasized the importance of truthfulness, accuracy, and openness in reporting. Scholars like Kovach and Rosenstiel (2001) explored the evolution of journalistic ethics, emphasizing the role of transparency in building public trust. Historical studies, such as those by Schudson (1978) and Tuchman (1978), examined the changing norms of journalism and the relationship between news organizations and their audiences in different eras.
- ii. Importance of Transparency in Journalism: Numerous scholars have highlighted the crucial role of transparency in maintaining journalistic credibility. Kovach and Rosenstiel (2014) argued that transparency is an essential element of the "journalism of verification," which seeks to establish the truth through rigorous fact-checking and source attribution. Bardoel and d'Haenens (2004) emphasized the importance of

- transparency in enhancing audience trust and credibility perceptions of news organizations.
- iii. Challenges to Transparency in E-News Contents: The digital age has introduced new challenges to news transparency. Singer (2014) discussed the impact of "news automation" on transparency, as algorithms increasingly determine content selection and distribution. Haim and Graefe (2016) analyzed how social media platforms contribute to the spread of misinformation and the challenges of verifying sources in online news.
- iv. Prior Research on E-News Transparency: Several studies have examined transparency issues specific to online news. Anderson (2011) investigated the transparency practices of online newsrooms, identifying variations in disclosure and sourcing among digital media outlets. Sürmeli (2018) explored the role of social media in shaping news transparency perceptions, finding that users' trust in news sources is influenced by the perceived transparency of social media platforms.
- v. Source Attribution and Verification: The importance of source attribution and verification in maintaining transparency has been extensively studied. Lewis (2008) emphasized the role of transparency in citizen journalism, advocating for clear source attribution to build credibility. Wardle and Derakhshan (2017) discussed the challenges of verifying information in the era of "fake news" and highlighted the need for transparency in the verification process.
- vi. Fact-Checking and Accuracy: Numerous studies have examined the impact of fact-checking on news transparency. Vargo et al. (2018) investigated the role of fact-checking organizations in enhancing transparency and correcting misinformation. Graves (2016) explored the effectiveness of fact-checking initiatives in reducing the spread of false information on social media platforms.
- vii. Editorial Independence and Oversight: The issue of editorial independence and oversight in online news platforms has been analyzed by scholars like Weber (2017). The study examined the influence of organizational structure and ownership on editorial decision-making and transparency.
- viii. User Engagement and Feedback Mechanisms: The role of user engagement and feedback in enhancing transparency has been addressed by scholars such as Chadwick and Vaccari (2017). They discussed the potential of online platforms to foster dialogue between journalists and readers, promoting transparency and accountability.
- ix. Algorithmic Bias and Filter Bubbles: Studies like Diakopoulos (2016) and Bakshy et al. (2015) have explored the impact of algorithms on news transparency. They examined how algorithmic curation can create filter bubbles, limiting transparency by presenting personalized content to users.
- x. Impact of Financial Influences: The influence of financial pressures on news transparency has been studied by scholars like Fenton (2017). The research highlighted the challenges posed by advertising revenue and the need for transparent financial disclosures.

Overall, the literature on news transparency underscores its critical role in maintaining journalistic integrity and public trust. This review provides a foundation for examining the challenges and opportunities in enhancing transparency in e-news contents and proposing a comprehensive framework to foster responsible journalism in the digital age.

# Research Objectives:

- To Know the facts what makes the main difference between offline and online news in case of news transparency.
- To find out the respective solutions to maintain the transparency in online news portals.
- III. To examine the current state of transparency in online e-news contents: The primary objective of this research is to assess the level of transparency in e-news contents. This involves analyzing various e-news platforms, identifying strengths and weaknesses in transparency practices, and understanding how news organizations disclose their sources, fact-check information, and handle corrections.
- IV. To identify challenges and barriers to transparency in e-news contents: This objective aims to uncover the specific challenges faced by e-news platforms in maintaining transparency. By conducting interviews with journalists, editors, and media experts, the research seeks to understand the factors that hinder transparent reporting in the digital news ecosystem.
- V. To explore the impact of algorithmic curation on e-news transparency: With the rise of algorithmic content curation on social media and news platforms, this objective aims to investigate how algorithms affect transparency. The research will analyze how personalized content delivery may contribute to filter bubbles and algorithmic biases that hinder transparency in online news consumption.
- VI. To assess public perceptions of transparency in e-news contents: Understanding how news consumers perceive transparency is crucial. Through a quantitative survey, the research seeks to gauge the level of trust and credibility that the public associates with various e-news sources, identifying which factors influence their perceptions of transparent reporting.
- VII. To analyze successful instances of transparent e-news contents: This objective aims to showcase best practices and exemplary cases of transparent reporting in the digital news landscape. By analyzing successful instances, the research seeks to derive insights and practical lessons that other news organizations can adopt to enhance their transparency.
- VIII. To identify areas where e-news contents commonly lack transparency: The research aims to pinpoint common shortcomings and instances of compromised transparency in e-news
  - platforms. By identifying such areas, the research seeks to propose specific recommendations for news organizations to address and improve transparency.
- IX. To propose a comprehensive framework for enhancing transparency in e-news contents: Building on the research findings, the ultimate objective is to develop a comprehensive framework that outlines best practices, guidelines, and recommendations for news organizations, journalists, and digital platforms. The

framework aims to serve as a roadmap for fostering transparency, credibility, and responsible journalism in the digital age.

By achieving these research objectives, this study endeavors to contribute valuable insights to the academic discourse on news transparency and provide practical solutions to enhance transparency in online e-news contents. Ultimately, the research aims to rebuild public trust in digital news sources and promote a more informed and engaged society in an increasingly interconnected world.

## Research Amis:

- To assess the current level of transparency in online e-news contents: The primary aim of this research is to evaluate the extent to which e-news platforms maintain transparency in their reporting. By analyzing a diverse sample of online news sources, the study aims to provide a comprehensive assessment of transparency practices in the digital news landscape.
- II. To identify the factors influencing transparency in e-news contents: This research aims to explore the underlying factors that contribute to or hinder transparency in online news reporting. By examining the role of editorial policies, fact-checking procedures, financial pressures, and technological influences, the study seeks to uncover the drivers of transparency or lack thereof.
- III. To understand the challenges faced by e-news platforms in maintaining transparency: By conducting interviews with journalists, editors, and media experts, this research aims to gain insights into the specific challenges and obstacles faced by e-news platforms in upholding transparency standards. Understanding these challenges is crucial for proposing effective solutions.
- IV. To examine the impact of algorithmic curation on e-news transparency: The research aims to investigate how algorithmic content curation and personalized news delivery influence the transparency of information presented to users. By exploring the role of algorithms, the study seeks to assess their impact on audience exposure to diverse perspectives and potential biases.
- V. To gauge public perceptions and trust in e-news transparency: This research aims to assess how news consumers perceive transparency in online news sources. By surveying a diverse sample of news consumers, the study seeks to measure public trust in e-news platforms and identify factors that influence audience perceptions of credibility.
- VI. To analyze successful examples of transparent e-news reporting: The research aims to showcase best practices and successful instances of transparent reporting in enews platforms. By analyzing exemplary cases, the study seeks to derive insights that can be applied to improve transparency in other news organizations.
- VII. To identify common areas where e-news contents lack transparency: This research aims to pinpoint recurring issues and shortcomings in e-news platforms that compromise transparency. By identifying these areas, the study seeks to propose targeted recommendations to address and rectify transparency challenges.

- VIII. To develop a comprehensive framework for enhancing transparency in e-news contents: Building on the research findings and insights, the ultimate aim is to create a comprehensive framework that outlines guidelines and best practices for promoting transparency in digital news reporting. The framework seeks to provide actionable recommendations for news organizations, journalists, and digital platforms.
- IX. To contribute to the enhancement of responsible journalism in the digital age: By addressing the issue of transparency in e-news contents, this research aims to contribute to responsible journalism practices and promote journalistic integrity in the evolving digital news landscape.

By achieving these research aims, this study aspires to contribute to the ongoing discourse on news transparency and provide practical solutions to enhance credibility, trust, and transparency in online e-news contents. The research seeks to empower news consumers with reliable information and support the vital role of journalism in an increasingly digital and interconnected world.

# Chapter 2

# Methodology:

In this research paper on the transparency of e-news contents, the observational method can be used as a part of the data collection process. The observational method involves systematically observing and recording behaviors, events, or phenomena without directly interfering with or manipulating them. In the context of this study, the observational method can be employed in various ways to gain valuable insights into the transparency practices of e-news platforms and their impact on news content. Here are some potential uses of the observational method in this case study:

- Observing Online News Websites: Researchers can conduct direct observations of various e-news websites to examine how they present news content and implement transparency measures. They can analyze the structure of articles, the placement of source attributions, and the presence of fact-checking or correction notices.
- II. Monitoring Social Media Platforms: Observing social media platforms, where news articles are often shared and discussed, can provide valuable insights into the spread of information and the potential for misinformation. Researchers can analyze the interactions and comments on news articles, as well as observe patterns of sharing and engagement.
- III. Tracking Algorithmic Behavior: The observational method can be used to study how algorithms operate on different e-news platforms. Researchers can observe how algorithms personalize content based on user preferences, potentially leading to filter bubbles and algorithmic bias.
- IV. Analyzing Reader Engagement: Observations of reader engagement, such as comments, likes, shares, and retweets, can provide insights into how news consumers respond to transparent reporting practices. Researchers can assess whether transparent content garners more engagement and trust from the audience.
- V. Comparing Online and Offline News Practices: By observing both online e-news platforms and traditional offline newspapers, researchers can compare transparency practices between the two mediums. This comparative analysis can shed light on the challenges and advantages of maintaining transparency in each context.
- VI. Case Studies of Transparent Reporting: The observational method can be used to study specific instances of transparent reporting by e-news outlets. Researchers can analyze how these outlets implement best practices in transparency, source attribution, fact-checking, and user engagement.

It's important to note that the observational method should be combined with other data collection techniques, such as interviews, surveys, and content analysis, to provide a comprehensive understanding of the transparency of e-news contents. Additionally, ethical considerations should be taken into account, ensuring that observations are conducted ethically and do not compromise the privacy or rights of individuals or organizations involved.

# Chapter 3

# Findings and Analysis:

The research paper on the transparency of e-news contents seeks to delve into the intricacies of online news reporting and propose ways to enhance transparency in this digital age. Transparency in news reporting is crucial for maintaining public trust and credibility, and this study aims to shed light on the current state of transparency, identify challenges, and explore potential improvements in e-news reporting.

To achieve its objectives, the research employs a mixed-method approach, combining qualitative and quantitative techniques. A comprehensive literature review is conducted to understand existing research, historical perspectives, and theoretical frameworks related to transparency in journalism and e-news. By examining the works of experts and scholars, the paper gains a broader perspective on the topic and contextualizes its findings.

The observational method is another valuable component of the research, as it allows for a systematic observation of transparency practices in selected e-news platforms. By analyzing how e-news articles are structured, sourced, and presented to readers, the researchers gain valuable insights into the current practices of news organizations in terms of transparency.

Case studies are employed to provide real-world examples of both exemplary instances of transparent reporting and situations where transparency may be compromised. These case studies offer deeper insights into the challenges faced by e-news platforms and highlight the importance of responsible journalism practices in an era of rapidly evolving digital media.

Through data analysis, the researchers identify patterns, trends, and potential correlations between transparency measures and public trust. Understanding the relationship between transparency and public trust is crucial, as it can help news organizations and digital platforms make informed decisions on how to improve their practices and build credibility with their audiences.

One of the key aspects discussed in the paper is the various dimensions of transparency in enews contents. These dimensions include source attribution and verification, fact-checking and accuracy, editorial independence and oversight, user engagement and feedback mechanisms, algorithmic bias and filter bubbles, and the impact of financial influences. Each dimension plays a significant role in fostering openness, credibility, and accountability in news reporting, and they are essential for building and maintaining public trust in online news platforms.

The comparison between offline news and online e-news reveals both similarities and differences. Reputable offline newspapers and transparent online e-news platforms share common practices, such as providing clear source attribution and fact-checking. However, the digital landscape presents unique challenges, such as the pressure for real-time updates and the potential for clickbait and sensationalism. Nevertheless, the digital realm also offers opportunities, such as multimedia and interactivity, real-time corrections, and user engagement.

The paper identifies several challenges in promoting e-news transparency, including the speed and pressure of breaking news, clickbait and sensationalism, viral misinformation, native advertising, algorithmic bias, and financial pressures. These challenges can hinder transparency and erode public trust in online news sources.

On the other hand, the paper also highlights various opportunities for enhancing transparency in e-news contents. Leveraging data journalism and visualization, encouraging user engagement and fact-checking, promoting media literacy and education, collaborating with independent fact-checking organizations, and providing clear source attribution are some of the opportunities that can be utilized to strengthen transparency in online news reporting.

The proposed framework for enhancing e-news transparency serves as a comprehensive guide for news organizations, journalists, and digital platforms. The framework emphasizes the importance of source attribution and verification, fact-checking, user engagement, impartiality, algorithmic transparency, financial disclosure, media literacy promotion, collaboration with fact-checkers, and publishing transparency reports. By implementing these guidelines and best practices, e-news outlets can foster transparency, ethical journalism, and meaningful engagement with their readers.

In conclusion, the research paper on the transparency of e-news contents presents a comprehensive analysis of online news reporting, offering insights into current practices and proposing actionable strategies to enhance transparency and credibility in the digital age. Transparency in e-news is essential for maintaining public trust and combating misinformation, and this study contributes valuable knowledge to the field of responsible journalism in the modern media landscape.

The key dimensions of transparency in e-news contents refer to the critical aspects that contribute to the openness, credibility, and accountability of news reporting in the digital realm. These dimensions are essential for fostering public trust in online news sources and ensuring that readers can verify the reliability of the information presented. Here are the main key dimensions of transparency in e-news contents:

#### Source Attribution and Verification:

- Transparent reporting involves clear and accurate source attribution, allowing readers to trace the origin of information and verify its credibility.
- News articles should provide proper citations, references, and links to primary sources, expert interviews, and official statements.
- Ensuring that sources are reputable and have been verified helps prevent the dissemination of false or misleading information.

# Fact-Checking and Accuracy:

- Transparent e-news contents prioritize accuracy by employing rigorous fact-checking processes before publishing.
- News organizations should verify the accuracy of information, statistics, and claims made in their articles to avoid the spread of misinformation.

contents in terms of transparency reveals some similarities and differences. Here's a comparison:

#### Source Attribution:

Offline News: Reputable offline newspapers are generally diligent in providing clear source attribution for quotes and information, ensuring readers can verify the credibility of the information presented.

Online E-news: Similar to offline news, transparent online e-news platforms strive to attribute sources properly. However, due to the fast-paced nature of digital publishing, some online sources may be less rigorous in this regard.

#### ii. Timeliness:

Offline News: Printed newspapers have fixed publishing schedules and may not always provide real-time updates on breaking news. This can lead to delays in reporting time-sensitive events.

Online E-news: E-news platforms excel in providing real-time updates and breaking news due to their instantaneous publishing capabilities. However, the emphasis on speed can sometimes compromise thorough fact-checking and verification.

#### iii. Editorial Oversight:

Offline News: Established offline newspapers often have rigorous editorial oversight, with experienced editors reviewing articles to maintain accuracy and transparency.

Online E-news: Editorial oversight can vary significantly in the digital realm. While reputable online news outlets have editorial processes in place, some citizen journalism platforms or independent blogs may lack this level of scrutiny.

#### iv. Multimedia and Interactivity:

Offline News: Traditional newspapers primarily rely on text and images, limiting the use of multimedia and interactive elements.

Online E-news: E-news platforms can incorporate multimedia elements such as videos, photo galleries, and interactive graphics, enhancing transparency by presenting information in diverse formats.

#### v. Correction and Updates:

Offline News: Corrections in printed newspapers may appear in subsequent editions, leading to a potential time lag in rectifying errors.

Online E-news: Corrections can be promptly issued in online articles, ensuring readers have access to updated and accurate information.

## vi. Diversity of Perspectives:

Offline News: Established newspapers often strive to present diverse perspectives and provide balanced reporting, enhancing transparency by presenting various viewpoints. Online E-news: Online platforms may sometimes cater to niche audiences, leading to echo chambers and filter bubbles, potentially hindering transparency by limiting exposure to diverse perspectives.

## vii. Access and Archiving:

Offline News: Accessing older news articles may require physical archives or purchasing back issues, making it less convenient compared to online searches.

Online E-news: Online articles are easily archived and searchable, promoting transparency by allowing readers to access past news conveniently.

Overall, both offline news and online e-news can provide transparent and credible reporting. Reputable news organizations, whether offline or online, prioritize accuracy, source attribution, and editorial oversight to maintain their credibility. However, the digital landscape poses unique challenges and opportunities for transparency, such as real-time updates, multimedia elements, and interactivity.

# Challenges and Opportunities in E-News Transparency:

### Challenges:

- Speed and Breaking News Pressure: The digital news landscape operates at a rapid pace, with a constant demand for breaking news and real-time updates. This pressure can lead to compromising transparency in favor of publishing news quickly, potentially leading to inaccuracies and misinformation.
- Clickbait and Sensationalism: Online e-news platforms may resort to clickbait headlines and sensationalized content to attract more clicks and views. Such practices can prioritize engagement over accurate and transparent reporting.
- III. Viral Misinformation: The interconnected nature of social media and digital platforms can facilitate the rapid spread of misinformation. Even reputable e-news sources can inadvertently contribute to the dissemination of false or misleading information, impacting transparency.
- IV. Native Advertising and Sponsored Content: The blending of sponsored content with news articles can blur the lines between editorial content and advertising, potentially affecting transparency and reader trust.
- V. Algorithmic Bias: Online algorithms personalize content based on user preferences, potentially creating filter bubbles that limit exposure to diverse perspectives. This can reduce transparency by tailoring information to users' existing beliefs.
- VI. Financial Pressures: Many e-news outlets rely on advertising revenue or subscription models for funding. These financial pressures can influence content priorities and may compromise transparency if news content is influenced by advertisers or sponsors.

### Opportunities:

- Data Journalism and Visualization: E-News platforms have the opportunity to enhance transparency through data journalism and data visualization techniques.
   Presenting data-driven information with clear sourcing can enhance credibility and transparency.
- II. User Engagement and Fact-Checking: E-News outlets can leverage user engagement to crowdsource fact-checking and verification efforts. By involving the audience in the process, news platforms can enhance transparency and build trust with readers.
- Real-Time Corrections and Updates: Digital platforms allow for real-time updates and corrections. By promptly addressing errors and providing transparent corrections, enews outlets can maintain credibility and transparency.
- IV. Media Literacy and Education: Promoting media literacy and critical thinking among the audience can help them discern transparent and credible news sources from misinformation. Educated readers are better equipped to identify and question blased or inaccurate reporting.
- V. Independent Fact-Checking Organizations: Collaborating with independent fact-checking organizations can provide an extra layer of transparency and credibility for e-news contents.
  Independent verification can help establish the accuracy of information presented.
- VI. Clear Source Attribution: E-News platforms have the opportunity to improve transparency by consistently providing clear source attribution for information and quotes. Properly citing sources allows readers to verify the credibility of the information presented.
- VII. Open Dialogue with Readers: Engaging in open dialogues with readers through comments sections, social media, or dedicated feedback channels can demonstrate a commitment to transparency and accountability.

In summary, e-news transparency faces several challenges in the digital age, but there are also various opportunities to enhance credibility and trust with the audience. By addressing the challenges and leveraging these opportunities, e-news outlets can foster greater transparency, ethical journalism, and meaningful engagement with their readers.

# The Framework for Enhancing E-News Transparency

i.Source Attribution and Verification:

- News outlets should prioritize clear and accurate source attribution, providing readers with information to verify the credibility of the information presented.
- Implement robust fact-checking procedures to verify the accuracy of information before publishing.
- Disclose the use of anonymous sources and provide a rationale for their usage.

#### ii. Fact-Checking and Editorial Oversight:

- Establish clear editorial standards and protocols for fact-checking and verification processes.
- Ensure editorial oversight and review of all news content to maintain accuracy and credibility.

 Implement mechanisms for internal peer review to address potential biases and errors.

# III. User Engagement and Feedback Mechanisms:

- Encourage user engagement by providing platforms for feedback and comments on news articles.
- Respond promptly to user inquiries and address concerns transparently.
- Leverage user contributions for crowd-sourced fact-checking and verification.

#### iv.Corrections and Updates:

- Promptly issue corrections for factual errors and inaccuracies in news content.
- Clearly distinguish updated content from the original version to maintain transparency.
- Publish a public corrections log to document and address errors transparently.
   v.Impartiality and Balanced Reporting:
  - Adhere to principles of impartial reporting, presenting news stories without bias or favoritism.
  - Present diverse perspectives on significant issues to provide balanced and comprehensive coverage.
  - Disclose any potential conflicts of interest that may impact reporting.

## vi. Algorithmic Bias and Filter Bubbles:

- Review and assess algorithms used to personalize content, aiming to reduce filter bubbles and echo chambers.
- Provide transparency in how algorithms influence content presentation.
- Include mechanisms to allow users to customize their news feeds while maintaining access to diverse viewpoints.

# vii.Impact of Financial Influences:

- Disclose any financial relationships, sponsorships, or advertising arrangements that may influence content.
- Establish clear guidelines to ensure that advertisers do not influence editorial content.
- Diversify revenue streams to reduce reliance on specific advertisers or sponsors.

# viii. Media Literacy and Education:

- Engage in Initiatives to promote media literacy among the audience.
- Provide educational resources and tools to help readers identify misinformation and critically evaluate news content.
- Foster partnerships with educational institutions and organizations focused on media literacy.

#### ix.Independent Fact-Checking Organizations:

- Collaborate with independent fact-checking organizations to validate information and claims in news content.
- Utilize third-party verification to establish the accuracy of reports and claims.

### x. Transparency Reports:

- Publish periodic transparency reports that disclose key metrics and practices related to news reporting and content distribution.
- Include information about corrections made, editorial guidelines, and efforts to combat misinformation.

#### xi. Ethical Editorial Guidelines:

- Establish and adhere to ethical editorial guidelines that prioritize transparency, accuracy, and fairness.
- Provide guidelines for handling sensitive topics and conflicts of interest.

The framework aims to promote transparency in e-news contents, thereby enhancing trust between news organizations and their audiences. By implementing these guidelines and best practices, e-news outlets can contribute to a more informed and engaged society while upholding the principles of responsible journalism in the digital age.

## Research Analysis:

The analysis of e-news platforms involves examining various aspects of online news outlets to assess their transparency, credibility, and overall performance in delivering news to their audience. This analysis is crucial for understanding how different platforms implement transparency measures and identifying potential challenges and opportunities in the digital news ecosystem. Here are some key areas to consider when analyzing e-news platforms:

# i. Source Attribution and Verification:

- Evaluate how e-news platforms attribute sources for their news articles. Look for clear citations, references, and links to primary sources and expert quotes.
- Assess the extent to which e-news outlets verify the credibility of their sources to ensure the accuracy of the information presented.

# II. Fact-Checking and Accuracy:

- Examine the fact-checking processes employed by e-news platforms before publishing their articles. Look for instances of corrections issued for errors or misinformation.
- Analyze the accuracy of information presented in e-news articles, assessing the reliability of statistics, claims, and statements.

# iii. Editorial Independence and Oversight:

- Investigate the level of editorial independence maintained by e-news platforms. Evaluate their commitment to unbiased reporting and adherence to journalistic principles.
- Assess the effectiveness of editorial oversight in ensuring the integrity and transparency of news content.

# iv. User Engagement and Feedback Mechanisms:

- Analyze how e-news platforms engage with their audience through comment sections, social media interactions, and user feedback mechanisms.
- Evaluate the responsiveness of e-news outlets to user comments, questions, and corrections.

## v. Algorithmic Bias and Filter Bubbles:

- Investigate how algorithms operate on e-news platforms to personalize content for users.
- Assess the potential impact of algorithmic bias on news content selection.
- Analyze whether e-news outlets take measures to mitigate filter bubbles and ensure readers are exposed to diverse perspectives.

### vi. Financial Influences and Disclosures:

- Examine the transparency of e-news platforms regarding financial influences, such as advertisers, sponsors, and partnerships.
- Assess whether e-news outlets disclose any potential conflicts of interest that might affect their reporting.

# vii. Content Diversity and Balance:

- Evaluate the range of topics and viewpoints covered by e-news platforms.
   Assess whether they present a diverse and balanced representation of news stories.
- Analyze whether e-news outlets provide comprehensive coverage of both local and global events.

### viii. Trust and Perception:

 Conduct surveys or interviews to gauge public perception and trust in e-news platforms. Analyze how transparency practices influence audience trust.

## ix. Ethical Considerations:

- Address any ethical implications of the transparency practices observed in enews platforms.
- Investigate whether e-news outlets prioritize ethical reporting and adhere to industry guidelines.

The analysis of e-news platforms should be conducted using a combination of qualitative and quantitative research methods. By evaluating these key areas, researchers can gain valuable insights into the transparency and credibility of online news outlets, informing recommendations for improving responsible journalism practices and maintaining public trust.

# Limitations of the study:

In any research study, certain limitations may exist that could impact the findings and conclusions. It's essential to acknowledge these limitations to provide a clear understanding of the research's scope and potential implications. Here are some possible limitations for the research on the transparency of e-news contents:

- The research may have a limited sample size of e-news platforms, making it challenging to generalize the findings to the entire digital news ecosystem. ii.
  - The selected e-news platforms may not fully represent the diverse landscape of online news outlets, potentially affecting the study's comprehensiveness.
- Some e-news platforms may self-report their transparency practices, leading to potential biases or selective disclosure of information.
- III. One of the primary limitations of this research is the time constraint imposed on data collection and analysis.

# Conclusion:

In conclusion, transparency of e-news content is a critical issue that affects the credibility and trustworthiness of news articles. Research on this topic can be conducted using a mixed-methods approach, involving content analysis of e-news articles, surveys or interviews with readers, and a systematic review of existing literature. The research model can be used to visually represent the key constructs and relationships being examined in the study. The interpretation of the research findings is critical to drawing meaningful conclusions and developing recommendations based on the results. Ultimately, research on transparency of e-news content is important in promoting accountability and trust in the news media. By shedding light on the practices of e-news platforms and helping readers to become more discerning consumers of news, such research can contribute to a more informed and engaged citizenry. Transparency in e-news contents is a critical aspect of responsible journalism in the digital era. The dynamic nature of online news dissemination, coupled with the proliferation of digital platforms, has both challenged and provided opportunities for enhancing transparency in news reporting. This research paper has explored the challenges and opportunities in achieving e-news transparency, with a focus on two specific news agencies.

Through a comprehensive analysis of various dimensions of transparency, including source attribution, fact-checking, editorial oversight, user engagement, and the impact of financial influences, this study has shed light on the complexities of maintaining transparency in the digital news ecosystem.

The research findings revealed that challenges such as speed and breaking news pressure, clickbalt and sensationalism, viral misinformation, native advertising, algorithmic bias, and financial pressures can compromise transparency in e-news contents. However, there are also promising opportunities, such as data journalism, user engagement, real-time corrections, and media literacy initiatives, that can foster transparency and trust in online news sources.

The framework proposed in this paper outlines best practices and guidelines for enhancing enews transparency. By prioritizing source attribution, fact-checking, user engagement, editorial oversight, and impartial reporting, news agencies can strengthen their credibility and build a stronger bond of trust with their audience.

The study also highlights the importance of media literacy and education to empower news consumers to critically evaluate e-news contents and discern between credible sources and misinformation. Collaboration with independent fact-checking organizations can further bolster the verification process and enhance transparency.

Ultimately, achieving e-news transparency requires a collective effort from news agencies, journalists, digital platforms, and news consumers. By implementing the framework and embracing responsible journalism practices, news outlets can navigate the challenges posed by the digital age and emerge as trusted sources of accurate and transparent information.

As the digital landscape continues to evolve, the pursuit of transparency remains an ongoing journey. The insights provided in this research paper contribute to the wider discourse on media ethics, credibility, and responsible journalism in the digital age. It is hoped that the findings and recommendations of this study will inspire further research and initiatives to

promote transparency, journalistic integrity, and informed news consumption in the everchanging world of e-news.

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# JUDGEMENTAL ISSUES CAUSED DUE TO SOCIAL MEDIA ITS IMPACTS AND MERELY POSSIBLE SOLUTION

Presented by Md Miraj Hossain









# SURI VIDYASAGAR COLLEGE

Department of Mass communication and Journalism (Hons.)

# THE UNIVERSITY OF BURDWAN



# Dissertation

Discipline Specific Elective (DSE)-3

On

JUDGEMENTAL ISSUES CAUSED DUE TO SOCIAL MEDIA IMPACTS AND MERELY POSSIBLE SOLUTION

Ву

Md Miraj Hossain

Univ Roll No.: 20013100136 Reg. No.: 202001031090 of 2020-2021 Semester: VI, MCJH, SVC

# Under the guidance of-SANCHITA CHATTERJEE

Guest Lecturer, Suri Vidyasagar College Department of Mass communication and Journalism University of Burdwan

### **Guide Certificate**

Sanchita Chatterjee SACT Department of Mass Communication and Journalism

This is to certify that I, Sanchita Chatterjee, have served as the official guide and mentor for the dissertation titled "Judgmental Issues due to Social Media: Its Impact and Merely Possible Solution" presented by Jayeta Ganguly. Throughout the duration of this research endeavor, I have had the privilege to supervise and provide guidance to Md Miraj Hossain in his academic pursuit. As his guide, I have closely monitored the progress of the dissertation and offered valuable insights, feedback, and support, encouraging the development of their research skills and intellectual abilities.

Based on my thorough assessment of the final dissertation manuscript and its oral defense. I hereby recommend that the work be accepted and approved for evaluation by the academic committee. I firmly believe that Md Miraj Hossain has met the scholarly standards and requirements set forth by the Suri Vidyasagar College towards successful completion of the Bachelors Degree in Mass Communication and Journalism in The University of Burdwan, a State University and Institute of national importance. This is an original study and I hereby grant authorization for the submission of this dissertation for examination purposes.

Distri-

24/04/23

Place-

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### DECLARATION

I,Md Miraj Hossain, declare that I am the sole author of this research paper and that the work presented herein is original and has not been published elsewhere.

I affirm that this research has been conducted in accordance with ethical principles, and all necessary approvals and permissions have been obtained from relevant authorities, where applicable.

Throughout the course of this research, I have adhered to rigorous scientific standards and have taken necessary precautions to ensure the accuracy and validity of my findings. I have thoroughly reviewed and analyzed relevant literature, and all sources have been appropriately cited and referenced in accordance with the guidelines provided by my academic institution.

Furthermore, I acknowledge that this research has been made possible through the support and guidance of my research supervisor, [Supervisor's Name], whose expertise and feedback have been invaluable in shaping the direction and quality of this work.

I also acknowledge the contributions of any collaborators or research participants who have contributed to this work, as well as the support and encouragement of my friends and family.

I understand the seriousness of academic misconduct and am committed to upholding the highest standards of academic integrity. I affirm that all aspects of this research have been carried out with honesty and transparency, and that any errors or omissions are my own responsibility.

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### ACKNOWLEDGMENT

I,Md Miraj Hossain,would like to express my sincere gratitude to my research guide, Sanchita Chattopadhaya ma'am for her unwavering support, guidance, and mentorship throughout the course of this research. Their expertise, constructive feedback, and invaluable insights have been instrumental in shaping the direction and quality of this work.

I am grateful to the teachers of my department of mass communication and journalism at Suri Vidyasagar College, whose dedication to teaching and research has provided me with a stimulating and intellectually enriching academic environment.

Additionally, I would like to thank my parents and family for their constant support, encouragement, and patience throughout this process. Their unwavering belief in me has been a constant source of motivation and inspiration. I would also like to extend my appreciation to friends and classmates whose contributions have been essential in carrying out this research.

I understand that this research would not have been possible without the support and contributions of all those mentioned above. I am grateful to each and every one of them and thank them from the bottom of my heart.

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### ABSTRACT

Social media has totally changed the way we communicate and interact with each other. It's been like a game-changer, you know? We can now share so much information, exchange knowledge, and get real-time updates on what's happening in the world. But, man, lately, especially during this whole COVID-19 thing, we've seen that social media has some downsides too. It can mess with our judgment and make it hard for us to be fair and objective. It's crazy how little research has been done on this, right? We need to dig deeper and understand why social media messes with our heads.

So, this study is all about exploring how social media messes with our minds and society, especially when it comes to judgmental behavior. We're saying it's important to have an open mind, look at things from different angles, and have arguments and discussions that respect all opinions. That's what makes for a healthy and democratic society, you feel me? By figuring out why we're so judgmental online and what the consequences are, we can come up with solutions that promote respectful and productive interactions on social media.

These findings can really make a difference. They can help shape policies and interventions that make the online world more positive and inclusive. We want to create an environment that supports democracy and individual well-being, you know? The end goal is to have a society where people can have open-minded debates, embrace different viewpoints, and show empathy and understanding to one another.

# JUDGEMENTAL ISSUES CAUSED DUE TO SOCIAL MEDIA ITS IMPACTS AND MERELY POSSIBLE SOLUTION

### CHAPTER

### Introduction

From the past few decades after the invention and vast development of Internet, the social media tools has rigorously spread throughout the most of the part of the world, it headed a revolution in the field communication as well as social communication because of its highly advance synchronize mode of interacting with people and society as a whole. During last decades the blogs, articles, Audio-visual content in most of the social media platforms (facebook, twitter, instagram, youtube etc) has emerged a lot of information in our society which helps to gain knowledge of society, science and interact, talk share their experiences and opinions, and stay informed about current events in real-time.

But during last couple of years and in the times of covid epidemic the social media platforms also lays a big amount of negative impact into our mind and society, the impact on our ability to make fair and objective judgments about ourselves and others caused Judgemental issues. The research of this field quite less occurred in recent times. To be a person of good society unless its people has a more diversified mindset perception, broad point of view, argumentative approach and different thought of narratives in their minds.

The study is to maintain our democratic, diversified ideals and It is important to understand the identifying causes and effects of judgmental issues arise through social media and to explore potential solutions to address them. By analyzing the causes and consequences of these issues, this research has the potential to inform the development of policies and interventions that can promote more respectful and productive online interactions and reduce the negative impacts of judgmental behavior in social media.

# Objectives

There are several objectives of this study which is described below-

- To know the current situation of social media contents which is generally in trend.
- The ways of how things were being submerged with the information.
- How all these were being connected to every user of social media.
- The process of being a quick judgmental mindset out the use of social media.
- 5. Examine what are the side effects of it towards a society
- 6. What are the important points to be noted while using social media?
- 7. How we can overcome from the situation

These all are the objective to be observed while conducting the study.

### Aim

The Aim here is to observe the consequences of quick judgemental attitude towards the nation and society. And to find merely possible solutions at personal level to avoid such.

# Methodology

As far this study is concerned with a personal attitude cum social issue that is 'Quick 'Judgemntal'

The research is to find certain answers of a question which made a relationship between Quick Judgmentive and Social media. Therefore we must analyze the aspects descriptively also, in which there is minimal time and resources. Case study method of investigation and observational method is pretty much useful for understanding as well as conducting this study.

### CHAPTER II

# Review of Literature:

Paper Citation 1.

Kowalski and Limber (2007)" or "Baumeister & Campbell, 2019"

One of the most significant judgmental issues that has emerged in the context of social media is cyberbullying. A study by Kowalski and Limber (2007) found that nearly one in three students reported being bullied online. The study identified several factors that contribute to cyberbullying, including anonymity, a lack of empathy, and the ease with which hurtful messages can be shared. Other research has highlighted the role of social comparison in cyberbullying, with individuals using social media to compare themselves to others and engage in aggressive behavior as a means of coping with feelings of inadequacy (Baumeister & Campbell, 2019).

### Paper Citation 2.

A study by Pew Research Center (2017)

Another judgmental issue that has been the focus of research is online harassment. A study by Pew Research Center (2017) found that 41% of Americans have experienced online harassment, with women and minorities being disproportionately affected. The study identified several types of online harassment, including sexual harassment, stalking, and physical threats. The researchers noted that social media platforms can exacerbate these issues by facilitating the spread of hate speech and allowing harassers to remain anonymous.

### Paper Citation 3.

Suber, Peter. "Classical Skepticism." 1996. Department of Philosophy, Earlham College.

This research examined how people form judgments about individuals based on minimal information from social media posts. The study found that when individuals shared positive information about themselves, others were less likely to believe it compared to when the same positive information came from someone else. This suggests that self-promotion on social media may be viewed with skepticism.

The research also found that using self-deprecating hashtags in posts had a positive effect on judgments. People who included self-deprecating humor in their posts were seen as less arrogant and more humorous, leading to more favorable judgments. In summary, the study

showed that judgments on social media can be influenced by the source of information, whether it's self-generated or from others, as well as the use of self-deprecating humor.

# Paper Citation 4.

Suler, J. (2004). The online disinhibition effect. CyberPsychology & Behavior, 7(3), 321-326.

The online disinhibition effect refers to the phenomenon that people perceive more negative behaviors online compared to offline interactions. Factors such as anonymity, invisibility, asynchronous communication and absence of social norms contribute to this effect. People may feel less responsible and make more decisions for their actions and words on social media.

### Paper Citation 5.

Sunstein, C. R. (2017). Republic: Divided Democracy in the Age of Social Media. Princeton University Press.

Social media platforms use algorithms that customize the content users see based on their past interactions and preferences. This leads to the creation of echo chambers, where people are exposed to information and opinions that align with their own beliefs and values. When people are constantly confronted with similar views, they may be less tolerant of other viewpoints, leading to judgmental attitudes toward those who think differently.

# Paper Citation 6.

Przybylski, A. K., Murayama, K., DeHaan, C. R., & Gladwell, V. (2013).

Motivational, emotional, and behavioral correlates of fear of missing out.

Computers in Human Behavior, 29(4), 1841-1848.

Social media often showcases the highlight reels of people's lives, emphasizing exciting experiences, achievements, and connections. This constant exposure to others' seemingly perfect lives can lead individuals to compare themselves and develop a fear of missing out (FOMO). FOMO can breed resentment, envy, and judgment towards those who appear to be living better lives, contributing to a judgmental mindset.

#### CHAPTER III

# Reasons of Social Media user became judgemental:

The digital age is a time when social media platforms are becoming increasingly important, giving people the opportunity to express their opinions, thoughts, and ideas. Although people can express themselves freely, they may become judgmental of others due to it. With case studies, we explore why this happens.

(1) Lack of Non-Verbal Cues: The lack of non-verbal cues in online communication can contribute to judgmental behavior in several ways. Online communication often lacks the non-verbal cues that help convey intent and tone, such as facial expressions, body language, tone of voice, and eye contact. When these cues are absent, it becomes challenging to accurately interpret the underlying meaning of a message. Individuals may misinterpret others' words as judgmental or critical when that might not be the intended tone.

Additionally, in the absence of non-verbal cues, people tend to rely on stereotypes or assumptions to fill in the gaps, leading to unfair judgments about a person's character, beliefs, or intentions solely based on the words they use. Without the visual cues that help provide a fuller understanding of a person's communication, individuals may make hasty generalizations and unfairly judge others.

Furthermore, non-verbal cues play a crucial role in conveying empathy and emotional understanding. Facial expressions, gestures, and tone of voice help communicate empathy, compassion, and sincerity. In online communication, where non-verbal cues are absent, individuals may struggle to perceive and convey empathy accurately, leading to a lack of understanding and an increase in judgmental behavior.

Finally, the absence of non-verbal cues in online interactions can contribute to a sense of detachment and dehumanization, leading to a diminished sense of empathy and an increased likelihood of engaging in judgmental or offensive behavior.

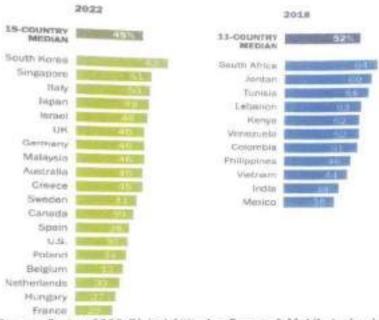
(2) Disinhibition Effect: When communicating through a screen, individuals may experience a reduced sense of inhibition compared to face-to-face interactions. This phenomenon, known as the "online disinhibition effect," can make people more impulsive, aggressive, or judgmental, as they feel detached from the consequences of their behavior.

The phenomenon where individuals feel to

The phenomenon where individuals feel less constrained and more inclined to express their thoughts, feelings, and opinions in an online environment compared to face-to-face interactions. This effect can contribute to people being more judgmental on social media platforms

# Views of social media's impact on tolerance vary in both advanced and emerging economies

M who way the superior and secral media have made people more accepting



Source: Spring 2022 Global Attitudes Survey & Mobile technology and its social impact Survey 2018, PEW RESEARCH CENTER.

# Case Study: "Twitter Trolling and Online Harassment"

In 2016, Leslie Jones, a talented actress and comedian known for her outstanding performance in the hit movie "Ghostbusters," found herself at the center of a distressing online harassment campaign on Twitter. Unfortunately, instead of receiving the praise and recognition she deserved, Jones became the target of relentless racist and sexist attacks. These attacks were fueled by individuals hiding behind anonymous accounts, using the veil of anonymity to unleash a barrage of derogatory and judgmental comments about her appearance, talent, and race.

The disinhibition effect played a significant role in this case, shedding light on some troubling aspects of online behavior:

Anonymity, a feature offered by Twitter, allowed users to create anonymous accounts or use pseudonyms, providing them with a perceived sense of protection and freedom to express their judgmental views without immediate consequences or social accountability. This veil of anonymity acted as a shield for harassers, emboldening them to unleash their hateful comments without facing the repercussions of their actions.

Moreover, the reduced accountability that comes with online interactions further amplified the severity of the harassment faced by Leslie Jones. The lack of face-to-face interaction on Twitter diminished the sense of personal responsibility and accountability for users engaging in judgmental behavior. Consequently, this heightened the likelihood of individuals resorting to expressing their harsh and derogatory comments, without fully comprehending the impact of their words.

It is disheartening to witness such instances of online harassment, where individuals with malicious intent exploit the digital space to attack and demean others. The case of Leslie Jones serves as a stark reminder of the need to address these issues and foster a more inclusive and respectful online environment.

(3) Echo Chambers and Confirmation Bias: Social media platforms often create echo chambers, where individuals surround themselves with like-minded people and content that reinforces their existing beliefs and opinions. This can lead to confirmation bias, where people only pay attention to information that aligns with their preconceived notions. In such environments, judgmental behavior towards differing views becomes more common. Deindividuation. Social media can contribute to the deindividuation of individuals, where they perceive themselves as part of a faceless crowd rather than as unique individuals. In such situations, people may lose their sense of personality.

# · Case Study: The 2016 U.S. Presidential Election-

In the 2016 U.S. presidential race, social media played a significant role in shaping people's opinions due to echo chambers and confirmation bias. A joint study by Facebook and academics examined how social media affected users' exposure to different political views. The study revealed that users often encountered content that reinforced their own beliefs, leading to a polarization of political discourse and judgmental attitudes towards those with opposing opinions.

The study also discovered that users became more engaged with content that supported their own political ideology, creating a feedback loop that further reinforced confirmation bias. This behavior resulted in individuals actively seeking out information that aligned with their existing beliefs while dismissing conflicting viewpoints.

Consequently, social media platforms became breeding grounds for echo chambers, where individuals primarily interacted with like-minded individuals who shared their political perspectives. This further solidified their beliefs, limited exposure to diverse opinions, and fueled judgmental behaviors towards those with differing views. The divisive rhetoric and judgmental attitudes witnessed during the 2016 U.S. presidential election showcased the detrimental effects of echo chambers and confirmation bias in the realm of social media.

(4) Fear of Missing Out (FOMO): Social media users who experience Fear of Missing Out (FOMO) are indeed more likely to behave in judgmental ways. It is common for individuals who experience FOMO to compare themselves to others and to feel an inadequacy or envy toward others. This can lead to a tendency to judge and criticize others in order to alleviate their own feelings of insecurity.

# Case Study: "Luxury Lifestyle and Envy"

In 2021, a business executive named John became highly popular on Twitter due to his posts about his opulant lifestyle. His tweets were filled with descriptions of luxury purchases, extravagant vacations, and high-profile events he regularly attended. His tweet "Off to another amazing destination! So grateful for the incredible opportunities that come my way. #LivingTheDream #Blessed"

It seems that John's tweet about his luxury lifestyle triggered feelings of envy and judgment among some Twitter users. This reaction can be attributed to the Fear of Missing Out (FOMO) phenomenon, where individuals experience anxiety or insecurity due to the belief that others are enjoying experiences or possessing possessions that they themselves lack.

Among those experiencing FOMO, some Twitter users chose to direct their frustration and feelings of inadequacy towards John's tweet. They criticized him for flaunting his wealth and showcasing a lifestyle that they perceived as unuttainable. Comments like "Must be nice to have a private jet while the rest of us struggle to make ends meet!" and "How about using your money to make a real difference instead of showing off?" reflect their discontent.

It's important to recognize that social media platforms can amplify feelings of comparison and inadequacy, especially when it comes to material possessions and experiences. It's understandable that some users might feel frustrated and express their discontent towards those displaying lavish lifestyles. However, it's always important to approach discussions and criticisms with respect and understanding, as everyone's circumstances and choices differ.

Instead of dwelling on envy or making negative comments, it can be more productive to focus on personal goals and strive for fulfillment in one's own life. Recognizing that everyone has different journeys and priorities can help reduce the impact of FOMO and foster a more positive online environment.

(5) Keyboard courage: Keyboard courage" refers to the phenomenon where individuals feel more empowered to express their opinions, often in a judgmental or confrontational manner, when they are interacting online, particularly through text-based mediums such as social media platforms or online forums. The relative anonymity and physical distance provided by the digital environment can embolden people to say things they might not say in face-to-face interactions.

# Psychological mentality stimulates judgmental issue:

 Narcissism: A stage of self importance where people think himself as superior to others.

A quality of attitude where we might fell in superior mode, so there is a high tendency of being a judgemental person where a person thinks that his views, opinions, suggestions, beliefs, followings, nature is the right and wrong of others.

Which generally produced judgmental issues of society where people neglects and rejects the views, perspective or narrative of others without being listened to and being judged as well as mocked.

Here social media is a communication platform like facebook, twitter, youtube etc where people of narcissistic personality rapidly judge other people's attitude, views, opinions without any circumstances. Which generally narrows the thinking process, democratic behavior (To be able to listen to the narrative of others which may violate your one, to accept the conclusion of others views, suggestions and so on), destroys self esteem etc.

 Gas Lighting: It is a kind of negative attitude where people mock somebody for something which is generally to be normal but pretending and making a scenario of these simple issues.

In this situation people often continuously do the same in social media which might be an issue of quick judgment.

Overall, the research on judgmental issues raised due to social media highlights the complex and multifaceted nature of these issues. While social media has the potential to bring people together and facilitate positive interactions, it can also exacerbate negative behaviors and contribute to a more judgmental and divisive online environment. By understanding the underlying causes of these issues and exploring potential solutions, researchers can help to promote more respectful and productive online interactions and reduce the negative impacts of judgmental behavior in social media.

# CHAPTER IV

# Negative Impact of Quick Judgmental:

Harms Self-esteem: Engaging in judgmental behavior can have detrimental effects on one's self-esteem in various ways:

A. Comparison and feelings of inadequacy: When we exhibit judgmental behavior, we often compare ourselves to others and perceive them as lacking in certain aspects. This constant comparison can result in a sense of inadequacy as we view others as more accomplished, successful, or attractive. Consequently, our self-esteem is gradually eroded, leaving us with feelings of inferiority.

B. Fear of being judged: Consistently judging others can also instill a fear of being judged ourselves. We may constantly worry that others are scrutinizing us in the same manner that we scrutinize them, leading to heightened self-consciousness. This fear of judgment undermines our self-esteem and causes excessive concern about how we are perceived by others.

C. Negative self-talk: Engaging in judgmental behavior often involves engaging in negative self-talk. We internalize the critical thoughts and judgments we have towards others and direct them inward. This perpetual self-criticism chips away at our self-esteem and reinforces negative beliefs about ourselves.

D. Lack of authenticity and self-doubt: Being judgmental can also result in a sense of inauthenticity and self-doubt. Constantly judging others may create pressure to conform to societal standards and expectations in order to avoid being judged ourselves. This can lead to a disconnection from our true selves and gradually erode our self-esteem as we question our own worth and authenticity.

E. Lack of self-acceptance: Adopting a judgmental mindset hinders self-acceptance. By fixating on the flaws and shortcomings of others, we develop a habit of seeking out and magnifying our own imperfections. This lack of self-acceptance contributes to a negative self-image and undermines our self-esteem.

F. Social isolation: Consistently judging others creates distance and impedes meaningful connections with people. This social isolation further damages self-esteem as we experience disconnection and loneliness. The absence of positive social interactions and support contributes to a diminished sense of self-worth. Increased conflict and hostility: The act of being critical can contribute to heightened discord and animosity in various ways:

- A Defensive responses: Approaching others with a critical mindset can prompt them to become defensive and perceive it as an attack. No one enjoys being judged or criticized, and this can provoke defensive reactions, resulting in conflicts and disputes. The defensive responses can escalate the situation and cultivate an antagonistic atmosphere.
- B. Lack of transparent communication: Critical behavior often obstructs open and sincere communication. When we are critical, we tend to make assumptions about others' intentions, behaviors, or character, without seeking clarification or comprehension. This lack of transparent communication can lead to misunderstandings, resentment, and further conflicts.
- C. Polarization and a "we versus them" mentality: Critical attitudes can contribute to polarization and the formation of divisive group mentalities. When we judge others based on their opinions, beliefs, or identities, it can foster a "we versus them" mentality, where individuals become firmly entrenched in their own perspectives and unwilling to find common ground. This polarization fosters animosity and impedes constructive dialogue.
- D. Escalation of emotions: Engaging in critical behavior often triggers emotional responses in others. Individuals may experience feelings of hurt, anger, or resentment when they perceive judgment directed towards them. These emotional reactions can escalate conflicts as both parties become more emotionally charged and less willing to find resolution or understanding.
- E. Deterioration of trust and respect: A critical attitude undermines trust and respect in relationships. When we judge others, it conveys a message that we do not value or respect their opinions, choices, or experiences. This deterioration of trust and respect can fuel conflicts as individuals may feel devalued and less inclined to engage in productive conversations or collaborations.
- F. Perpetuating a cycle of judgment and retaliation: Engaging in critical behavior often results in a cycle of judgment and retaliation. When one person judges another, it can trigger a defensive response, and the other person may retaliate with their own judgments. This cycle perpetuates conflict and creates a hostile dynamic where understanding and resolution become increasingly challenging.
- G. Contributing to a divisive society: Judgmental attitudes contribute to the creation of divisions and conflicts within society. When we label and categorize people based on our judgments, we perpetuate stereotypes and reinforce biases. This can result in

discrimination, prejudice, and the fostering of "us vs. them" mentalities, leading to societal fragmentation and hindering progress.

Decreased empathy and understanding: Being critical can result in diminished compassion and comprehension in various ways:

- A. Preconceived ideas: When we approach others with a critical mindset, we frequently bring preconceived ideas and assumptions about them. These preconceptions can obscure our capacity to sympathize and comprehend their experiences, perspectives, and emotions. Rather than striving to comprehend them as distinct individuals, we reduce them to stereotypes or judgments based on limited information.
- B. Inattentive listening: Critical behavior often involves focusing on expressing our own opinions and criticisms rather than actively listening to others. This lack of attentive listening hampers our ability to truly understand their point of view, needs, and emotions. It impedes the development of compassion, which necessitates active participation and a willingness to put ourselves in someone else's shoes.
- C. Emotional barriers: Being critical creates emotional barriers that hinder compassion. When we approach others with criticism, we may hold onto negative emotions such as anger, resentment, or disdain. These emotions create a barrier that obstructs our ability to connect with others on an emotional level and empathize with their experiences.
- D. Categorization and oversimplification: A critical mindset often leads to categorization and oversimplification. Instead of acknowledging the uniqueness and complexity of others, we assign broad labels or assumptions based on our judgments. This oversimplification limits our capacity to understand the intricacles and unique aspects of someone's situation, thus limiting our compassion.
- E. Lack of curiosity and open-mindedness: Being critical can close us off from being curious and open-minded about others. Instead of approaching interactions with a genuine desire to learn and understand, we may dismiss or reject perspectives that differ from our own. This closed-mindedness obstructs compassion, as it prevents us from expanding our understanding and appreciating different viewpoints.
- F. Absence of validation and support: Critical behavior often undermines the validation and support that individuals may require. Instead of offering a listening ear, compassion, or encouragement, we may focus on pointing out flaws or criticizing their choices. This lack of validation and support undermines compassion and prevents us from fostering connections based on understanding and acceptance

Strained relationships: There are multiple ways in which being judgmental can harm relationships:

A Breakdown of communication: Adopting a judgmental mindset often results in negative and critical communication. Continuously criticizing and passing judgment on others creates an antagonistic and confrontational atmosphere, hindering effective communication. As a result, individuals find it challenging to express themselves honestly and openly, leading to a breakdown in communication and a lack of comprehension.

B. Deterioration of trust: Judgmental behavior can erode trust within relationships. When we consistently judge and criticize others, they may perceive it as an attack, belittlement, or disrespect. This damages the trust that is crucial for healthy relationships. People may become guarded and hesitant to share their thoughts, feelings, or vulnerabilities, fearing judgment or mockery.

C. Resentment and defensiveness: Being subjected to judgment fosters resentment and defensiveness. When individuals feel constantly judged, they may develop negative sentiments towards the judgmental person. They may become defensive, shutting down or reacting aggressively in response to perceived criticism. This defensive stance further distances and adds tension to the relationship.

D. Emotional detachment: Judgmental behavior can create emotional distance between individuals. When one person consistently judges and criticizes the other, it inhibits the development of emotional intimacy and genuine connection. The person being judged may emotionally withdraw to shield themselves from further criticism, resulting in a lack of emotional closeness and fulfillment in the relationship.

E. Lack of support and validation: Being judgmental often entails withholding support and validation from others. Instead of offering encouragement, understanding, or validation, the judgmental person tends to focus on pointing out flaws or criticizing choices. This lack of support undermines the emotional well-being of the other person and weakens the foundation of the relationship.

F. Diminished respect and admiration: Consistently judging others can diminish the respect and admiration within the relationship. When individuals feel constantly scrutinized and belittled, their perception of the judgmental person may change. They may no longer consider them trustworthy or worthy of admiration, leading to a decrease in overall esteem for the judgmental person.

# CHAPTER V

# prevention of Quick judgmental Issue

To prevent quick judgmental behavior on social media, both individuals and social media occurrence of quick judgmental behavior.

A Self-Reflection and Mindfulness: Encourage individuals to reflect on their own prejudices and assessments. Practice being mindful in online interactions, pausing to contemplate before responding.

- B. Analytical Thinking and Verification: Encourage analytical thinking when consuming content on social media. Advocate for fact-checking and corroborating information before drawing conclusions or sharing content.
- C. Empathy and Openness: Promote empathy and open-mindedness towards diverse perspectives and beliefs: Seek to understand others' viewpoints without immediately dismissing them.
- D. Responsible Posting: Encourage responsible posting, Consider the potential consequences, underscoring the impact of words on others.
- E. Verbal and Non-Verbal Cues: Give your best attention to the speaker or writer, keep eye contact with them, and don't interrupt. Try to understand their perspective without jumping to conclusions or formulating responses prematurely. Get clarification from the speaker if you're not sure. Pay attention to non-verbal cues, such as facial expressions, body language, and tone of voice, as they can provide valuable insights into the speaker's emotions and intentions.
- F. Respectful Communication: Promote respectful and constructive communication online. It is important not to make assumptions about other people based on stereotypes or limited information. Refrain from engaging in personal attacks or derogatory language during discussions.
- G. Education, Awareness and Reporting mechanism. Provide educational resources and campaigns on the significance of respectful communication. Raise awareness about the adverse effects of hasty evaluative behavior on Social media platforms, establish unambiguous and enforceable community guidelines. Clearly delineate what behaviors are unacceptable and the consequences of violating these guidelines. Implement a user-friendly reporting system for inappropriate content or conduct.

H. Al-Based Moderation: Utilize Al-based moderation tools to identify and flag potentially judgmental content. Employ artificial intelligence and natural language processing to

# Conclusion:

After stunning so many articles and throwing observations and different case studies regarding quick judgemental issues and social media things which can conclude the searching deliberately. The judgemental issue is a rising psychological and social problems in the world specially those who are mostly engaged in social media most of the time of the day becoming ignorant and narrow about their views and opinions as well as point of views. And society has become more intolerant nowadays and this is the weakest point of human consensus and bears back our cognitive revolution, freedom of thought and wisdom.

Although the whole situation is observed in multiple ways to counter this kind of issue, the whole study is to find out merely possible solutions so the solution can be made and trained with a strong approach and planning to deploy for detecting And counting quick judgemental issues.

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### SURLIVIDY ASAGAR COLLEGE

# Department of Mass Communication and Journalism (B)

THE UNIVERSITY OF BURDINGS



Community Convexer Programme

Discipline Specific Elective DNE-4

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Summertime Farming and Water Scarcity in Thina

Submitted for

Partial Fulfilment of The Requirement for The Degree

The

### ATREYEE GANGULY

University Roll No. 200123-000051

University Registration No. 242000450005 of 2424-21

Semester VL MCJEL SVIC

Under the guidance of

### BAHNISIKHA GHOSE

(College Teacher, Mass Communication and Journalism, Suri Virgasague Unleges



### DECLARATION

I hereby declare that this project entitled: "Summertime Farming and Water Scarcity in Thiba" submitted to The University of Burdwan is an outcome of the original work carried out by me under the department of Mass Communication and Journalism, Suri Vidyasagar College.

I also declare that this is my own work and to as per my knowledge it contains no material previously published or has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgement has been made in the text or as references.

DATE: 01.08.2023

Atreyee Ganguly

Department Of Mass Communication

and Journalism

Suri Vidyasagar College

The University of Burdwan



Date: 09.07.2023

# CERTIFICATE

This is to certify that Miss Atreyee Ganguly bearing registration number 202001031003, has successfully completed her Community Outreach Programme titled "Summertime farming and water scarcity in Thiba village" under my guidance and supervision.

I hereby stated that I have provided guidance and support to her for this work.

Her research work demonstrates her academic abilities, research skills, and understanding of the subject matter.

> Ms Bahnisikha Ghosh College Teacher Suri Vidyasagar College



# ACKNOWLEDGEMENTS

This community outreach programme would not have been possible without the help and support of many individuals of Thiba village.

I am deeply indebted to my teacher Bahnisikha Ghosh for her individual assistance and insights leading to the writing of this paper. She provided stimulating advice, guidance, and encouragement to me every step of the way.

I would also like to thank Sanchita Chatterjee madam, Pratick Kabiraj sir, Suman Rudra sir of Mass Communication and Journalism department of Suri Vidyasagar College.

I would like to thanks the residents of Thiba village especially Monu Bagdi and Ramkumar Ganguly for their immense support and help to gather the needed informations.

I am thankful to my classmates who supported me in doing the research project and the entire Journalism department who helped me on this step of this journey and showed me different ways and provided ideas that led to this paper.

I would like to thank my family members, especially my parents, who have endured my absence during my community outreach paper and helped me tremendously in all ways possible.

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Abstract: Water scarcity during summer farming poses significant challenges for rural communities, affecting crop production, crop choices, financial burden, water-related conflicts, health and sanitation challenges, and social cohesion. Reduced crop production leads to stunted growth, poor quality produce, and crop failure, impacting livelihoods and food security. Limited crop choices restrict income-generating opportunities and limit nutritional variety, increasing vulnerability to market fluctuations and environmental risks. Increased financial burdens result from higher costs in securing water for irrigation and increased costs of alternative water sources. Water-related conflicts can escalate tensions and negatively impact social cohesion, with the absence of effective water governance mechanisms and conflict resolution strategies further exacerbated.

Keywords: Rural communities, Financial burden, Environmental risk, Market fluctuation

### CHAPTER 1

### 1.1 INTRODUCTION

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The word community is derived from a Latin word "communitas" which means "common, public, shared by all or many." A group of people with diverse characteristics who are linked by social ties, share common perspectives, and engage in joint action in geographical locations or settings.

- · Rural Communities: A community with poor or no infrastructural developments.
- Urban communities: The social organization from the way people in cities act and interact with one another and with their physical environment.

A programme of community outreach seeks to include and involve members of the community in addressing problems and needs by helping, resources, knowledge, and services. These programmes, which could be governmental, nonprofit, or for-profit, aim to advance the arts, social welfare, environmental protection, and well health. They usually involve partnerships with local businesses and organisations. Resources that are accessible and inclusive are crucial for the good of the community.

Various facets of health, wellness, education, social assistance, environmental conservation, faith-based outreach, the arts and culture, and community development are promoted by community outreach programmes. In addition to offering individuals in need resources and services including food banks, housing aid, and financial counselling, they also seek to promote cultural awareness by holding art exhibits and educational courses.

#### 1.2 DEMOGRAPHY OF THE AREA

VILLAGE	THIBA	
BLOCK	LABPUR	
POLICE STATION	KIRNAHAR	
POST OFFICE	THIBA	
PIN CODE	731303	
DISTRICT	BIRBHUM	
STATE	WEST BENGAL	
TOTAL POPULATION	17650	
MALE POPULATION	9084	
FEMALE POPULATION	8566	

(Population report of Thiba Anchal as per census 2011)

My study area for this Community Outreach Programme is Thiba, located in Labpur block of Birbhum District, West Bengal with a total 718 families residing.

The total geographical area of Thiba village is 344.46 Hectares / 3.44 KM2.



AREA OF THIBA

In Thiba village population of children with age 0-6 is 321 which makes up 11.56 % of total population of village. Average Sex Ratio of Thiba village is 1007 which is higher than West Bengal state average of 950. Child Sex Ratio for the Thiba as per census is 969, higher than West Bengal average of 956.

Thiba village has lower literacy rate compared to West Bengal. In 2011, literacy rate of Thiba village was 74.22 % compared to 76.26 % of West Bengal. In Thiba Male literacy stands at 82.95 % while female literacy rate was 65.59 %.

As per constitution of India and Panchayati Raj Act, Thiba village is administrated by PRADHAN (Head of Village) who is elected representative of village by the voters.

PARTICULARS	TOTAL	MALE	FEMALE
Total No. of Houses	718		
Population	2,776	1,383	1,393
Child (0-6)	321	163	158
Schedule Caste	1,506	735	771
Schedule Tribe	0	0	0
Literacy	74.22 %	82.95 %	65.59%
Total Workers	873	813	60
Main Worker	487	-	
Marginal Worker	386	355	31

Thiba village's data according to Census 2011

Due to their low literacy rate and as per now many villagers who got a job, they left the village and the remaining people who are staying in the village Thiba their life is based on **Agriculture**.

### 1.3 RESEARCH PROBLEM

The village has 1500 acres of agricultural land. Till 2013 they were doing their farming from the rain water of the rainy season. But after 2013 the decreasing of the rainfalls left a bad impact on the farming. From then the villagers or farmers got the farming water from the Massanjore Barrage. They got the water free of cost for 4 years, but after that the entire Birbhum district's rainfall decreased, so, they do not get any water from the barrage. From then they are harvesting by pumping the water of river Kuye. They almost don't get any summer farming due to lack of water. For that the villagers' life & livelihood got stuck.

#### 1.4 RESEARCH OBJECTIVES

An agricultural community in the Labhpur block is **Thiba**. Most of the residents of this community depend on agriculture for their livelihood, but the biggest challenge facing its agriculture is a lack of sufficient water supplies. Agriculture is reliant on rainfall during the monsoon season due to a lack of water availability. If there is not enough rainfall, agriculture cannot be properly conducted. And there is a significant decline in crop yield.

There are some objectives of this outreach programme. That is pointed below:

- · To call the villagers' attention to the primary farming challenge.
- The village residents submit a form to the panchayat outlining the issue and requesting a solution.
- To supply enough water for summertime farming, to improve the irrigation system in order to boost water supply.
- Informing the village's residents of the appropriate procedure.
- After an irrigation system is fixed, it must be properly maintained.

#### 1.5 AIM OF THE RESEARCH

The aim of this research is to solve the villagers' problem by giving them the proper solution of the summertime farming, using reserved rainwater.

### 1.6 RESEARCH QUESTIONS

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- How to bring agricultural development by controlling drought?
- How to reserve the rainwater?
- How to create a drainage system in between the agricultural lands?
- How to use pond water in summertime farming?

#### CHAPTER 2

### 2.1 LITERATURE REVIEW

A literature review aids in locating the program's focus area's best practices, challenges, and knowledge gaps. It also assists in determining the most effective methods for communicating with and working alongside community members and stakeholders, the effects of community outreach programmes on the target population and the community at large, and the areas that need further research in order to fully understand the program's effectiveness.

I have gathered some data from some of the prior studies that are stated below in order to develop a deeper understanding.

1. Parmeshwar Udmale, Yutaka Ichikawa, Sujata Manandhar, Hiroshi Ishidaira, Anthony s. Kiem "Farmers' perception of drought impacts, local adaptation and administrative mitigation measures in Maharashtra State, India (2014)" Published in International Journal of Disaster Risk Reduction stated that, A warmer climate with increasing climate variability will increase the risk of climate extremes, such as flood and drought. Drought is a creeping phenomenon, difficult to understand and define due to differences in hydro-meteorological variables and socio-economic factors. It is classified as either a meteorological drought (lack of precipitation over a region for a period of time), hydrological drought (low surface and subsurface water resources), agricultural drought (declining soil moisture and crop failure due to lack of surface water resources), or socio-economic drought (failure of water resources systems to meet water demands). The India Meteorological Department (IMD) defines meteorological drought as a situation when rainfall over an area is less than 75% of the climatological normal. Drought events have been increasing globally since 1980, affecting 53.5 million people each year.

In Asia, production of rice, maize and wheat has declined due to increasing temperature, water stress, frequency of El Nino events, and decreasing number of rainy days. India is one of the most vulnerable and drought prone countries, with prolonged and widespread droughts in consecutive years. These events are likely to threaten the overall economy of the country.

(Volume 10, Part A, Pages 250-269p)

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2. Anil K. Gupta, Pallavee Tyagi and Vinay K. Sehgal "Drought disaster challenges and mitigation in India: strategic appraisal" stated that, DROUGHT is a complex, slow-onset phenomenon of ecological challenge that affects people more than any other natural hazard, causing serious economic, social, and environmental losses in both developing and developed countries. It is a normal feature of the climate and weather system in semi-arid and arid regions of the tropics, which covers more than one-third of the land surface and is vulnerable to drought and desertification. There is no universally accepted definition of drought, but it is generally considered to be occurring when the principal monsoons, i.e., southwest monsoon and north-cast

monsoon, fail or are deficient or scanty. Dry regions in India include 94 million people and more than 50% of the region is affected by drought once every four years. Different countries and states have developed codes, manuals, procedures, processes and policies for monitoring and management of drought.

(1795-1806p)

(Volume 15)

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3. "Spatial and temporal appraisal of drought jeopardy over the Gangetic West Bengal, eastern India (2019)"an Article by Krishna Gopal Das Published in: Geoenvironmental Disasters explained that, Water scarcity is a major threat to contemporary water resources management, exacerbated by climate change. In India, the total water demand will increase up to 32% by 2050 and 1/2 of the cultivated area will continue to be under rain-fed farming. Dryness is one of the most common climatic extremes that affects the majority of people across the globe, and climate change is expected to change the existing drought vulnerability profile of the country. As per CRED (2016) reports, drought events (1900–2016) in India have affected nearly 1391 million people, and increased intensity and frequency of drought events in future are likely to threaten the water resources and food security.

Gangetic West Bengal (GWB) is one of the leading agricultural hubs of eastern India and is expected to experience a 0.5-1 °C rise in average temperature during 2020-2029 and 3.5-4.5 °C rise during 2030-2099 due to climate change. The GWB has less experience of coping with droughts, resulting in poor preparedness. Global concern for climate change has led to the use fo spatio-temporal appraisal of drought in quantitative forms. Standardised Precipitation Index (SPI) is a standard drought monitoring index used by the World Meteorological Organization (WMO) and the Indian Meteorological Department (IMD).

- 4. Mariam Zachariah, Arpita Mondal, Mainak Das, Krishna Mirle, Achuta Rao and Subimal Ghosh. "On the role of rainfall deficits and cropping choices in loss of agricultural yield in Marathwada, India (2020)" published by IOP Publishing house, Published in: Environmental Research Letters claimed that Crop failure and subsequent agrarian crises are a major concern for the agriculture-driven economy of India. The geographical location, and spatial heterogeneity in landforms and climate, aids cultivation over two major cropping seasons: the rain-fed Kharif season (June-September) during the southwest monsoons and the irrigated Rabi season (October-February). Climate effects on crops are different at global, national, and sub-national scales, and rainfall and warming trends are spatially non-uniform. Variability in rainfall and/or temperature is the dominant driver of crop yields, depending the geographical location/spatial scale, crop type, and.
- 5. Badsha Ghosh, Swarup Dutta, Prashant Kumar Singh. "Drought and temporary migration in rural India: A comparative study across different socio-economic groups with a cross-sectional nationally representative dataset (2022)" this Article stated that India has experienced about severe drought. Between 1959 and 2009, the percentage of the country that was experiencing drought grew from 10% to 20% along with a rise in the severity of monsoon droughts. Under warmer climatic

scenarios, India is predicted to have a growing future trend of droughts that would be more severe, frequent, long-lasting, and have a wider regional scope. People are more vulnerable to drought when they have characteristics like high levels of poverty, high levels of borrowing, less crop diversity, agriculture as their primary source of income, and low levels of agricultural insurance. Grain yields decline as a result of drought. Half of India's population and one fifth of its people live below the international poverty level.

### **CHAPTER 3**

### 3.1 RESEARCH DESIGN

Research design is planning a strategy of conducting research. It plans as to what is to be observed, how is to be observed, when/where is to be observed, why it is to be observed and how to record observations, how to analyse /interpret observations and how to generalise research design. The term "Design" means drawing and outline or planning or arranging details. Research design is a detailed plan of how the goals of research will be achieved.

#### 3.1.1 METHODOLOGY

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The things which include in Research design or in the Methodology are:

There are mainly three types of research. That is Basic/pure Research, Applied research and Action Research.

Basic research, also known as fundamental or pure research, is scientific or academic research that is conducted to expand our understanding of a particular field of study. The primary goal of basic research is to enhance knowledge and theories without specific or immediate applications in mind. Basic research is driven by intellectual curiosity and often leads to the development of new concepts, ideas, and theories.

Applied research is research that is conducted to solve specific problems or to develop practical solutions to real-world issues. The primary goal of applied research is to develop new products, technologies, or techniques that can be used to address a specific problem or issue. Applied research often involves collaboration with industry partners, government agencies, or other organisations that have a practical interest in the research findings.

Action research is research that is conducted to improve a specific situation or problem within a particular organization or community. The primary goal of action research is to identify practical solutions and interventions that can be implemented to bring about positive change. Action research is often conducted collaboratively with stakeholders who are affected by the problem or issue being studied. The findings of action research are often used to inform decision-making and improve organisational or community practices. For this study researcher used Basic or Fundamental Research.

There are basically three types of research. That is Qualitative, Quantitative and the Mixed kind of research. In this outreach programme researcher used the mixed kind of process which includes both the qualitative & the quantitative processes.

There are mainly two types of time dimensions that are used for a study or a research based on the researcher's research. That is: Cross-sectional and Longitudinal.

This study is a cross sectional study based on the time we are getting to do this programme.

For collecting the data and sampling researcher used Purposive sampling.

For the research method researcher used Survey, interview, Focus group discussion method both, as the research is a Mixed kind of Research.

The patterns of the questionnaire are both open ended and close ended as per the necessity.

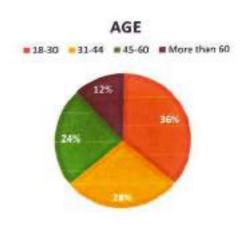
### 3.2 LIMITATIONS OF THE STUDY

- The researcher faced problems due to transportation because the distance of the research area is 40 km away from the researcher's residence.
- The villagers first assumed the researcher as a representative of the government for that at first, they weren't answering the questions properly.
- As the village is in the RAR area the researcher faced difficulties because of the Scorching heat of summer.
- As The researcher collected samples using probability sampling, and the village is large in area the researcher found difficulties to reach out to every villager.

# **CHAPTER 4**

4.1 DATA PRESENTATION

ABLE 1	
AGE	NUMBERS
18-30	18
31-44	14
45-60	12
More than 60	6
TOTAL	50



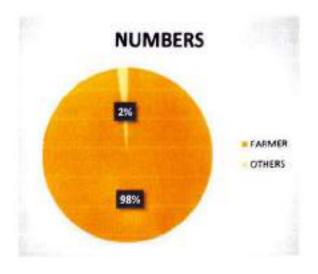
The 50 people who were included in the survey among them 36% are in the age group of 18-30, 28% are of 31-44 years, 24% are of 45-60 years and 12% are of more than 60 years. So, the number of more than 60 is minimum.

TABLE 2	
SEX	NUMBERS
MALE	27
FEMALE	23
OTHERS	0
Total	50



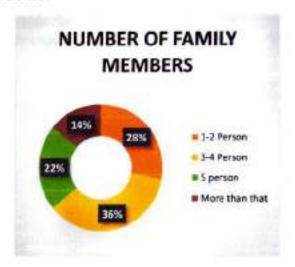
In this Table 2 among the 50 villagers 54% are Male and 46% are Female. So, approximately the no of male is more than female.

TABLE 3	
OCCUPATION	NUMBERS
FARMER	49
OTHERS	1
TOTAL	50



In this Table no 3 the occupation of the villagers among 50 villagers' farmers are 98% and other occupation is 2%. So, majority of them are farmer.

TABLE 4	
NO OF FAMILY MEMBERS	NUMBERS
1-2 Person	14
3-4 Person	18
5 persons	-11
More than that	7
TOTAL	50



In this Table no 4 percentage of no of family members: 1-2 person is 28%, 3-4 person is 36%, 5 persons is 22% and more than that is 14%. So, most of the villager have 3-4 person in their house.

TABLE 5	
MONTHLY INCOME	RESPONSES
1000-5000	26
6000-8000	12
8000-10000	12
TOTAL	50



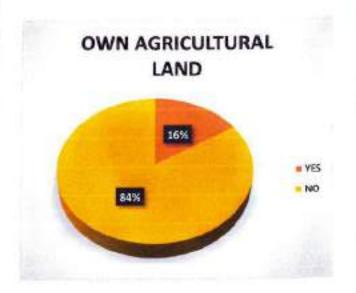
Percentage of Monthly Income among 50 villagers: 1000-5000 is 52%, 6000-8000 is 24% and 8000-10000 is 24%. So, from here we can see that most of the villagers are economically very weak.

RESPONSES
2
4
3
41
50



Percentage of living years among 50 villagers: 0-5 years is 4%, 5-10 years is 8%, 10-15 years is 6% and above 15 years is 82%. According to this chart most of them are living in this village over 15 years.

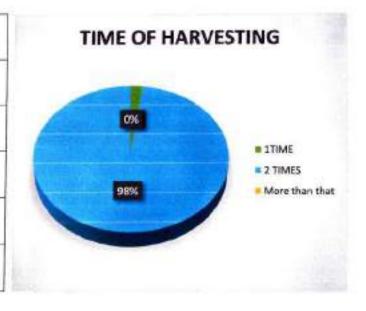
TABLE 7	
OWN AGRICULTURAL LAND	RESPONSES
YES	8
NO	42
TOTAL	50



Percentage of having own agricultural land among 50 villagers: Yes is 16% and No is 84%. So, most of the villagers work as sharecroppers.

TIME OF HARVESTING	RESPONSES
ITIME	1
2 TIMES	49
More than that	0
TOTAL	50

3



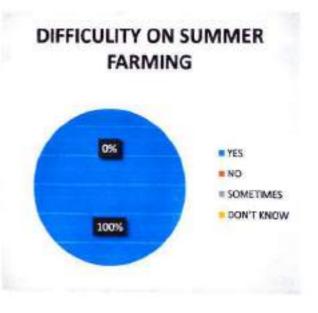
Percentage of Time of harvesting in a Year: 1 time is 0% and 2 times is 98%. So, the villagers are totally dependent on agriculture.

TABLE 9	
CROP QUALITY	RESPONSES
GOOD	0
BAD	3
SOMETIMES GOOD SOMETIMES BAD	47
TOTAL	50



Percentage of Quality of the crops: Good is 0%, Bad is 6% and sometimes good sometimes bad is 94%. From here we get to know that they don't get good quality off crops.

TABLE 10	
DIFFICULITY IN SUMMER FARMING	RESPONSES
YES	50
NO	0
SOMETIMES	0
DON'T KNOW	0
TOTAL	50



Percentage of difficulties on summer farming: Yes is 100%, No is 0% and don't know is 0%. They do farming for twice a year but they all face difficulty on summer farming.

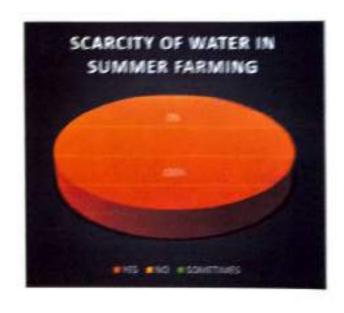
## LABLE II LAR OF POND WATER REAPONDS FOR PARMING, 75A W. MALTIMEA IS NEEDED TOTAL 90



Proviously of your water usage for farming. Yes is this, like is 1995, and sometimes if seeslest in 1995, they can't use yourd water for farming even they face problem due in water waters.

Wanterly

TABLE 12	
SCARCITY OF WATER IN SUMMER FARMING	RESMUNSES
YES	5/4
NO	0
SOMETIMES	0
TOTAL	54



Percentage of water scarcity in summer farming. Yes is 100%, No is 0% and Sometimes is 100%, So, according to them they all face water scarcity in summertime farming.

According to Table no 11 they don't use pond water for farming and according to Mithun Bagdi (male, 30 years) they can't use pond water for farming because the ponds in the village are all personal properties. That's why they don't get water from any pond.

According to most of the villagers they use water from river Kuye in the rainy season sometimes. They have a proper drainage system from the river to the lands. But in the summertime when the river's water gets dry, they can't even use pond water because of 2 reasons. Firstly, the ponds are personal properties and the water is limited and also very dirty due to personal use, secondly, due to scorching heat the pond's water also gets dry.

## 5.2 FINDINGS

After collecting the data and the interpretation the researcher found out that, most of the people of Thiba Village are illiterate and are BELOW POVERTY LEVEL. They need the infrastructural and economical help from Government to establish a rain water reservoir in their locality.

They do farming twice a year but they don't have proper water sufficiency for the farming, either they don't get water from the river for water scarcity or they are not that much economically nourished that they could buy water all the time from the submersible pumps. Even they don't get water from ponds as the water of the ponds are dirty or the ponds are personal properties.

The researcher gave solutions regarding this water scarcity problem that if the villagers use "KHAPUR" BARRAGE'S water for their farming through a proper channel and with the help of the local Panchayat as the water of khapur barrage is near to Thiba village, the villagers will get help. The researcher also asked a member of the Panchayat about giving the villagers a water reservoir for reserving rainwater and use the water. But the member of the Panchayat said that the villagers told their problem to the panchayat but not in written format for that reason they have to reapply for a tube well as well as for a water reservoir.

## 5.3 CONCLUSION

Finally, it can be said that this problem of Thiba village regarding water scarcity in the summertime is a long-time problem and according to the villagers only if the government or Panchayat take any step regarding their problem then it can be solved. The researcher got to know from a few villagers that in their locality there was a deep tube well for the villager's drinking water and personal use but the tube well has now been damaged for 2 years and the Panchayat didn't even take any step regarding that. Then how and when the Panchayat will take a step for harvesting water they don't even know.

## 5.4 FURTHER SUGGESTIONS

Researcher chose Thiba village's problem in summer farming due to water scarcity under Thiba Panchayat. Since the researcher had very short time, for that this study was conducted only upon this village, but the researcher thinks that this problem of water scarcity is equally relevant in all cases, mainly all over India. Therefore, this work can be done on a larger scale.

This work had several limitations but in the future other researchers may avoid these limitations and do the work better and over larger areas.

The village has also various problems except water scarcity. Other researchers may work upon:

Educational problem as many of the villagers are illiterate, and in this village, there is no high school so the children get many problems during this

Health issues: There is a primary health centre in this village, instead of that the people of the village suffers due to many health issues.

Economical problems: The people of the village only based on agriculture, and the people don't have any other employment. For that the economic condition of the people are very weak.

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## PERSONAL INTERVIEW QUESTIONS

Name:

Age:

Sex

Family:

Educational Qualification:

Monthly Income:

Occupation:

- 1. Which season are you facing problems regarding farming?
- What do you do for farming?
- 3. How many times in a year do you harvest and what are the necessary things about harvesting?
- 4. How do you manage farming in summer?
- 5. Is there any problem with water for farming here?
- 6. What do you think about solving this water problem here?
- 7. What is your opinion about reserve rainwater and did you even try it?
- 8. If yes, after trying the process of the water reservoir didn't get success?
- 9. If not, what do you think about using the pond and river water for farming?
- 10. If the pond and river dries, do you get water from another source?
- 11. Did you inform the panchayat about your problem? Did they help?
- 12. If not, what next are you thinking about solving this problem?







Image 7&8: Agricultural land in Summer



## The University of Burdwan



Syllabus for 3-Yr. B.Com. (Hons.)

Under Semester with

Choice Based Credit System

w.e.f. 2017-2018 onward

## Structure of B.Com (Hons.) Syllabus under CBCS

SemesterI			
Papercode	Subject	Nature	
1.1	Environmental Studies	(AECC-1)	
1.2 CH	FinancialAccounting-I	(CC-1)	
1.3 CH	BusinessManagement	(CC-2)	
1.4 CH	Micro Economics	(GE-1)	
	SemesterII		
2.1	Communicative English/MIL	(AECC-2)	
2.2 CH	CostAccounting	(CC-3)	
2.3 CH	BusinessLaw	(CC-4)	
2.4 CH	Macro Economics	(GE-2)	
	SemesterIII		
3.1 CH	CorporateLaws	(CC-5)	
3.2 CH	IncomeTaxLawandPractice	(CC-6)	
3.3 CH	FinancialAccounting-II	(CC-7)	
3.4 CH	E-Commerce	(SEC-1)	
3.5 CH	Indian Economy	(GE-3)	
	Semester IV	<u> </u>	
4.1 CH	BusinessMathematicsandStatistics	(GE-4)	
4.2 CH	FundamentalsofMarketingManagement	(CC-8)	
4.3 CH	ComputerApplicationsinBusiness	(CC-9)	
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4.5 CH	FundamentalsofHuman ResourceManagement	(CC-10)	
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5.1 CH	FinancialAccounting-III	(CC-11)	
5.2 CH	Auditing	(CC-12)	
	Anyone of the following		
5.3.1 CH	Management Accounting	(DSE-1)	
5.3.2 CH	FundamentalsofBankingand Insurance	` ′	
	Anyone of the following		
5.4.1 CH	IndianFinancial System	(DSE-2)	
5.4.2 CH	Advertising		
	Semester VI	l	
6.1 CH	FundamentalsofFinancialManagement	(CC-13)	
6.2 CH	IndirectTaxLaw	(CC-14)	
	Anyone of the following	\ - /	
6.3.1 CH	Fundamentalsof Investment	(DSE-3)	
6.3.2 CH	BusinessTaxProceduresandManagement		
	Anyone of the following		
6.4.1 CH	InternationalBusiness	(DSE-4)	
6.4.2 CH	Project Work	(222 .)	

## <u>OR</u>

## **DSE-4:PROJECTWORK**

In the Project Work paper each student will have to select one topic on which he/she willconduct a study and submit a project report in not less than 1500 words. The study may be based on primary data collected from field survey or on secondary data available from published sources. Each project report will be examined jointly by one internal examiner and one external examiner. In the Project Work there will be 60 marks on the written project report. Each student will have to inform the Head of the Department about the title of the project work at the beginning of the sixth semester class and the project report will have to be submitted before the starting ofthe sixth semester final examination. There will be 15 marks consisting of presentation and viva voce on the project report. In this paper, each student will have to make a presentation the report submitted by him/her and face a viva voce by a board of examiners.

\_\_\_\_\_



## SURI VIDYASAGAR COLLEGE

(Govt. Sponsored & Constituent college of the University of Burdwan) SURL BIRBHUM, PIN - 731101, Ph. No. - 03462-255504

Website: surividyasagarcollege.org.in, e-mail: : surividyasagarcollege1942@gmail.com This Institution is Ragging Free

## PROJECT COMPLETION CERTIFICATE

This is to certify that the following students have successfully completed their projects of semester VI Accountancy

Honours under the supervision of the faculties of Commerce Department as listed below:

Ollows		Title of the projects	Name of the Supervisor
\$1.No.	Name of the students		Dr. Koushik Kumar
	Rachit Gupta	Comparative Financial Analysis of three selected companies in the Automobile Industry	Dutta Dr. Koushik Kumar
1	77.2.4	Liquidity Management of Pour Sercoca  Pharmsceutical Companies	Dutta
2	Neha Sultana	A Study on Consumer Perception Towards Samsung	Prof. Surya Prakash Da
3	Arka Mukherjee	1 M	Prof. Surya Prakash Das
- 3	Upam Padey	Working Capital Management of three selected companies of Cement Industry in India	

Department of Commerce Suri Vidyasagar College

## PROJECT WORK

(Submitted for the Degree of B. Com. Honours in Accounting and Finance under the University of Burdwan.)

## Title of the Project

Comparative Financial Analysis of three selected companies in the Automobile Industry

## Submitted By

Name of the Candidate:-Rachit Kumar Gupta

Registration No.

:-202001032456 of 2020-21

University Roll No. :-200231000008

Name of the College :-Suri Vidyasagar College

College Roll No.

:- 2020006

## Supervised By

Name of the supervisor: Dr. Koushik Kumar Dutta

Name of the college: Suri Vidyasagar College

## Month and Year of Submission

June, 2023

## Supervisor's Certificate

This is to certify that Mr. Rachit KumarGupta, a student of B.Com (Honours) in Accounting and Finance of Suri Vidyasagar College under The University of Burdwan has worked under my supervision and guidance for his Project work and prepared a Project Report titled, "Comparative Financial Analysis of three selected companies in the Automobile Industry" which he is submitting is his genuine and original work to the best of my knowledge.

Signature of Supervisor

## Student's Declaration

I hereby declare that the project work on "Comparative Financial Analysis of three selected companies in the Automobile Industry" is submitted by me for the partial fulfillment of three years degree of B.Com (Honours) in Accounting and Finance under The University of Burdwan and is my original work, true to the best of my knowledge. It has not been submitted earlier to any university for the fulfillment of any course of study.

I also declare that no chapter of this manuscript in whole or a part has been incorporated in this report from any earlier work done by others or by me. However, extracts of any literature which has been used for this report has been duly acknowledged providing details of such literature in the references.

SIGNATURE - Rachit Kumar Gupta Rachit kuman Gupta

NAME

:- Rachit Kumar Gupta

ROLL NO: - 200231000008

REGISTRATION NO: - 202001032456 of 2020-21

## ACKNOWLEDGEMENT

I would like to thank our Principal Dr. Tapan Kumar Parichha for his immense support & blessings. I thankour Head of the Department Dr. BirendraNathKonar for his support. I would like to express my special thanks and gratitude to my project guide Dr. Koushik Kumar Dutta for his valuable suggestions and guidance and for giving me the golden opportunity to do this wonderful research project on the topic "Comparative Financial Analysis of three selected companies in the Automobile Industry", without his help it would have been difficult for me to reach this state of completion of my project report. I would like to extend my gratitude towards my subject teachers Dr. M.L. Taparia, Shri Surya Prakash Das and Shri BaidyanathHazra for their constant encouragement and guidance throughout the completion of the project. Also, I would like to thank my parents and friends who helped me a lot in the preparation of this project.

I wish to acknowledge the help of all those who have provided me information, guidance and other help during my project work.

Rachit Kumaa Gubta

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## Chapter 1

## INTRODUCTION

# 1.1.INTRODUCTION TO AUTOMOBILE INDUSTRY

Automobile manufacturers offer a wide range of models, but brand integration is automobile industry is mainly comprised of the world's largest passenger car and light truck suppliers. Most members of the industry sell vehicles in the global market, often limited at the marketing and dealership levels. The bulk of these companies The automobile industry is a major contributor to the global economy. VEST developing countries, through operate production facilities in multiple geographic regions. including both developed and

# 1.2.INDIAN AUTOMOBILE INDUSTRY

market in terms of volume, owing to a growing middle class and a huge percentage of The Indian automobile industry has historically been a good indicator of how well the economy is doing, as the automobile sector plays a key role in both macroeconomic expansion and technological advancement. The two-wheelers segment dominates the India's population is young. Future market growth is anticipated to be fueled by new trends including the electrification of vehicles particularly three - wheelers and small passenger automobiles. India enjoys a strong position in the global heavy vehicles market as it is the largest tractor producer ,second largest bus-manufacturer ,and third-largest heavy truck manufacturer in the world. India's annual production of automobiles in FY22 was 22.93 million vehicles.

## 1.3.STATEMENT THE PROBLEM

india became the fourth largest auto market in 2019 surpassing Germany with 2021. India predicted to overtake Japan and became third largest auto market. The has allowed 100% FDI under the automatic route. In 2020, the Indian automobile industry was a major economic engine, accounting for nearly half of the country's manufacturing GDP and 7.5% of its total GDP. The value chain of the sector employs roughly 32 million people. As of 2023, India is the third largest country in the world in terms of sale in automobile industry registering 26.7% growth in approximately 3.99 million passenger and commercial vehicles sold in 2019. By Government of India encourages foreign investment in the automobile sector and passenger vehicle sales in Indian automobile market. In this backdrop the present study has been undertaken to evaluate the financial performance of three selected companies in the automobile industry.

## 1.4.OBJECTIVES OF THE STUDY

The present study has the following objectives:

- )To analyze the financial position of the selected companies.
- ii)To make comparative study of financial statements of different years of selected companies

## 1.5.SCOPE OF THE STUDY

companies by using accounting ratios. The analysis covers the last five years from a This study aims at comparing the overall financial positions of three selected statements& Balance sheets. The study's scope includes the numerous variables that statements such as influence the financial position of the three selected companies. for examining comparative financial

## 1.6.RATIONALE FOR THE STUDY

position &performance of three selected companies of the Automobile Industry. The Comparative financial analysis is a process of evaluating the relationship between component parts of the financial statements to obtain a better understanding of the analysis of the balance sheet of the three selected companies, income statement 7 P 1 g 2 cash flow statement as well as the interpretation of trends &identification of weaknesses &strengths, may provide enough information for management. It aids in evaluating whether an organisation's investment is adequate or not.

## 1.7.METHODOLOGY OF THE STUDY

All the data which I am using for the study of the comparative financial statement analysis for the three selected companies of the automobile industry for the period of five years from 2017-18 to 2021-22 have been collected from secondary sources.

Various techniques such as ratio analysis, trend analysis etc are being used to examine the comparative financial analysis of the three selected companies.

## 1.7.1.SOURCES OF DATA

Secondary Data is being collected from annual reports of the selected companies.

These annual reports are being downloaded from the official website of the respective companies.

## 1.7.2.TECHNIQUES OF ANALYSIS

The following financial statement analysis will be done for the purpose of study:

- Liquidity analysis
- Profitability analysis
- Efficiency analysis
- Leverage analysis

## 1.8.REVIEW OF LITERATURE

A few literature reviews are carried out for acquiring knowledge and better understanding of our particular field of study.

A study on Profitability Analysis of Indian Selected Automobile Industry in India byDr.M.S.Ranjithkumar and C.Eahambaramreveals that "This research aims to determine the determinants of profitability in the Indian automotive industry by examining a sample of all automobile firms from different segments of the industry. They discovered that improvements could be made to the industries' liquidity positions in order to boost profitability. As a result, liquidity has an effect on profitability. (Ranjithkumar, et al., 2018)"

In "Liquidity and Profitability Analysis of Selected Automobile Companies" by Vikas Garg, Pooja Tewari and Shalini Srivastav states that "(Garg, 2018) found out that in terms of operating profit ratio, net profit ratio, and gross profit ratio, Maruti Suzuki India was doing exceptionally well. Mahindra and Mahindra's return on net worth and long-term 16 funds were below average, and Tata Motors' output during the same time was also similar."

The study on "Financial Performance Of Selected Automobile Companies" by Kanagavalli G., Saroja Devi andRajendrandiscloses that "Using ratio analysis, the paper analyses the financial results of major selected automobile companies over a five-year period from 2013 to 2017. The study's aim is to assess and compare the financial results of three companies in order to rank their financial performance. After examining all of the factors relevant to this study, they concluded that TVS Motors and Bajaj Auto are satisfactory, while Hero Motocorp maintains a strong market position. (Kanagavalli, et al., 2018)"

In a study on "Financial Analysis of Indian Automobile Industry" by Dr. Nishi Sharma—"(SHARMA, 2011) examines the financial performance of selected units using 11 financial variables that reflect four different parameters of the organization: liquidity, profitability, activity, and long-term solvency. The paper also tries to figure

out if the success of different firms is identical or whether there is a major difference between them. It also assigns various companies ranks based on their results and recommends some steps for the sector's further progress."

## 1.9.LIMITATIONS OF THE STUDY

This study has the following limitations:

i)We are only analyzing last five year's financial statements of the three selected companies which does not represent the whole performance of the business.

 ii) Also we cannot depict the picture of whole automobile industry by just analyzing &comparing the three selected companies.

## 1.10.SPECIFY THE CONTRIBUTION THAT THE STUDY WOULD MAKE:

The study would contribute in comparing the financial performance of the selected automobile companies in such a way that we get to know about the changes that take place in that industry, judging their performance so as to choose which one is better. This study is an eye opener about the three automobile companies. It also helps to ascertain the growth position of this Industry.

## 1.11. CHAPTERISATION

Chapter 1- It includes the Introduction about the automobile industry, statement of problem, objectives of the study, scope of the study, review of literature, techniques used for collection of data and limitations of the study.

Chapter 2 - It reviews and compares the financial performance of the three selected companies using ratio analysis measuring liquidity, efficiency, profitability and Leverage of the three selected companies.

Chapter 3 - It primarily contains findings of the study with recommendations & conclusion.

## Chapter 2

## DATA ANALYSIS & INTERPRETATION

## 2.1. INTRODUCTION

One of the most important things to understand about Comparative financial analysis is that the financial statements provide all of the details needed to make a definitive decision about what is going on in the business. Thefive years financial statements (2018-2022) of the three selected automobile companies have been used to analyze the financial performance of the three companies under study. To measure the financial performance of the business in this study we analyse liquidity, profitability, efficiency and leverage ratios of the three selected companies.

## 2.2. LIQUIDITY ANALYSIS

Liquidity analysis aims to determine the ability of the businesses to meet their financial obligations during the short-term and to maintain their short-term debt paying ability. The liquidity ratios answer the question of whether the business firms can meet their current debt obligations with their current assets.

## 2.2.1. Current Ratio

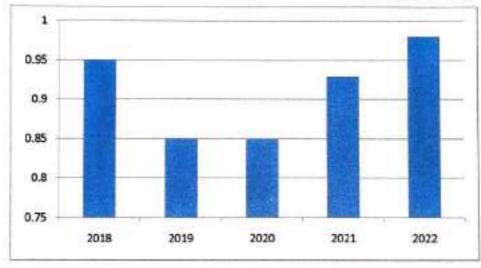
The current ratio is also known as working capital ratio or banker's ratio. It expresses the relationship of a current asset to current liabilities.

Current Ratio = Current Assets/ Current Liability

21 a Current Ratio of Tata Motors

Year	Current Assets (in Rs Cr.)	Current liabilities (in Rs Cr.)	Current Ratio
2018	135,972.84	143,219.47	0.95
2019	123,431.16	145,457.43	0.85
2020	119,587.25	140,454.05	0.85
2021	146,887.64	157,749.18	0.93
2022	146,977.54	150,682.81	0.98

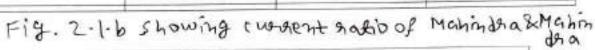
Fig. 2.1. a showing tweeth natio of tata Motory

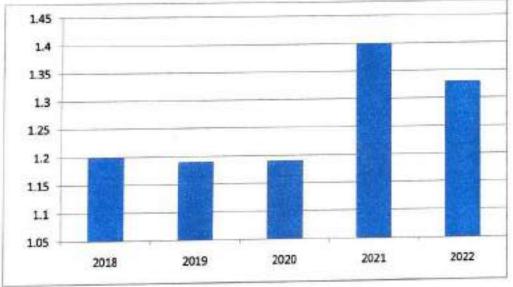


INTERPRETATION: Out of the five years ,2021-2022 had the highest current ratio. As shown in the graph, it has fallen 1n 2019 and 2020 but then increased to 0.98 in 2022. It demonstrates how liquidity has increased since 2018.

## 21.6 Current Ratio of Mahindra & Mahindra

Year	Current Assets (in Rs Cr.)	Current liabilities ( in Rs Cr.)	Current Ratio
2018	59,076.02	49,149.54	1.20
2019	69,406.04	58,743.33	1.19
2020	64,045.43	54,009.52	1.19
2021	72,137.91	51,446.01	1.40
2022	75,148.00	56,288.33	1.33



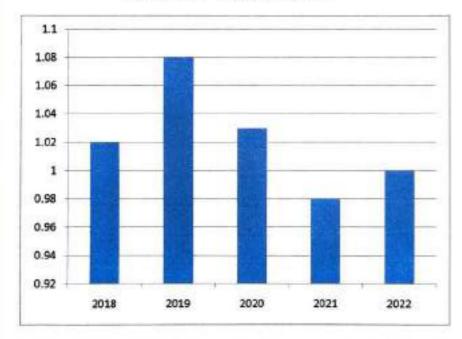


INTERPRETATION: Out of thefive years ,2020-2021 has the highest current ratio. As shown in the graph, it is at a constant rate for the first 3 years till 2020, but then increases to 1.40. It demonstrates how liquidity has increased during the 5 years.

2.1.6 Current Ratio of Ashok Leyland

Year	Current Assets (in Rs Cr.)	Current liabilities (in Rs Cr.)	Current Ratio
2018	14,421.56	14,191.48	1.02
2019	16,487.48	15,315.86	1.08
2020	15,309.49	14,794.65	1.03
2021	15,918,86	16,223.80	0.98
2022	18,614,25	18,615.90	1.00

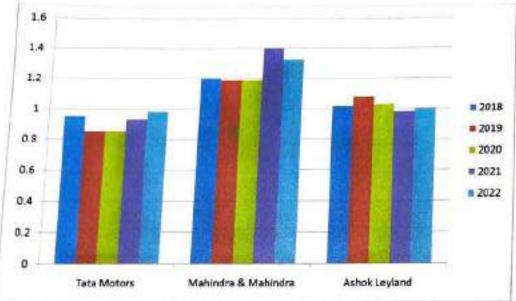
Fig. 2.1.c showing current ratio of Ashok Leyland



INTERPRETATION: Out of the five years ,2019-2020 had the highest current ratio. As shown in the graph, it has increased at a constant rate but then decreased to 1.00. It demonstrates how liquidity has dropped since 2018.

## **Current Ratio**

Fig. 2.1.d showing consent natio of the selected



INTERPRETATION: Out of the three selected companies, Mahindra & Mahindra has the highest current ratio. As shown in the graph, Tata motors ratio in 2020 and 2021 is less which shows that the liquidity was dropping at that time.

## 2.2.2. Quick Ratio

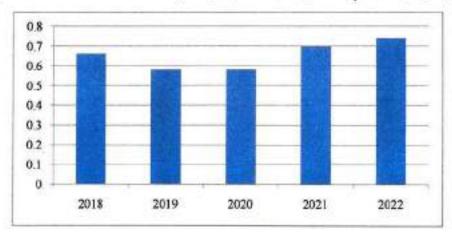
Quick ratio is also known as the Acid test ratio. The quick ratio measures whether the firms can meet their short-term debt obligations without selling any inventory.

Quick Ratio = (Current assets – Inventories)/ Current liabilities

7.2. Quick Ratio of Tata Motors

Year	Current Assets - Inventory ( in Rs Cr.)	Current liabilities ( in Rs Cr.)	Quick Ratio
2018	93,835.21	143,219.47	0.66
2019	84,417.43	145,457.43	0.58
2020	82,130.37	140,454.05	0.58
2021	110,799.64	157,749.18	0.70
2022	111,737.20	150,682.81	0.74

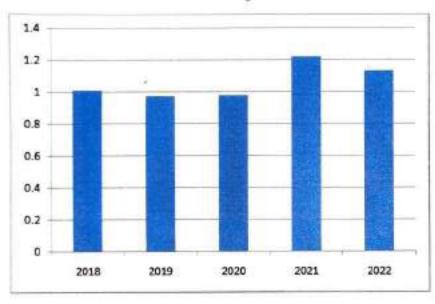
Fig. 2.2. a. showing guick natio of Tata Motogue



INTERPRETATION: This diagram shows a slight increase of quick ratio of the corporation from 0.66 to 0.74 since 2018-2019. It means that the company's ability to meet its short – term obligations is increasing.

Year	Current Assets - Inventory ( in Rs Cr.)	Current liabilities ( in Rs Cr.)	Quick Ratio
2018	49,740.45	49,149.54	1.01
2019	57,205.88	58743.33	0.97
2020	52933.57	54,009.52	0.98
2021	62,522.50	51,446.01	1.22
2022	63552.18	56,288.03	1.13

Fig-2-2-b showing guitk natio of Mahindra & mahindra

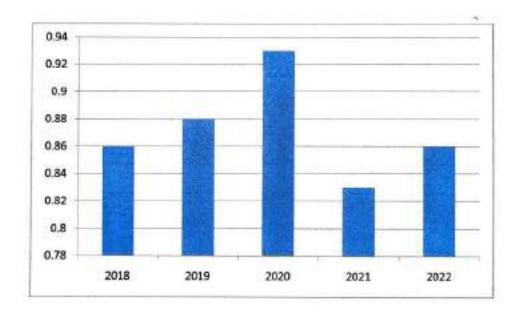


INTERPRETATION: This diagram shows a slight increase of quick ratio from 1.01 to 1.13 since 2018-2019. It means that company's ability to meet its short-term obligations is increasing.

2.2.€ Quick Ratio of Ashok Leyland

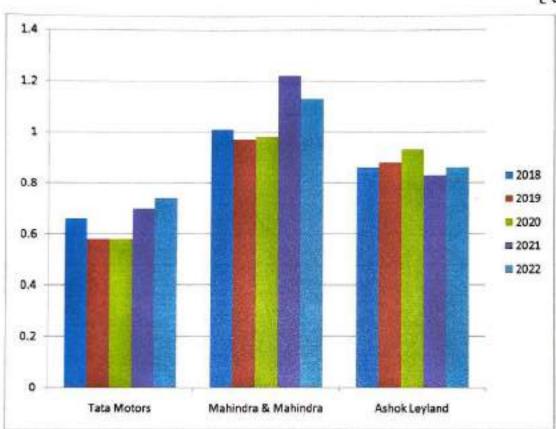
Year	Current Assets - Inventory ( in Rs Cr.)	Current liabilities ( in Rs Cr.)	Quick Ratio
2018	12,213.87	14,191.48	0.86
2019	13,424.05	15,315.86	0.88
2020	13,773.10	14,794.65	0.93
2021	13,423.01	16223.80	0.83
2022	16,073.70	18,615.90	0.86

Fig. 2.2. c. showing guick natio of Ashok leyland



INTERPRETATION: This diagram shows a slight increase of quick ratio from 0.86 to 0.93 during 2018 to 2020 but falls again. It means that company's ability to meet its short-term obligations is fluctuating.

Fig. 2728. Showing quick autio of the selected



INTERPRETATION: This diagram shows increase of quick ratio of all the selected companies from 2018 to 2022 which reveals that their ability to meet short - term obligations is overall increasing.

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## 2.2.3.Cash Ratio

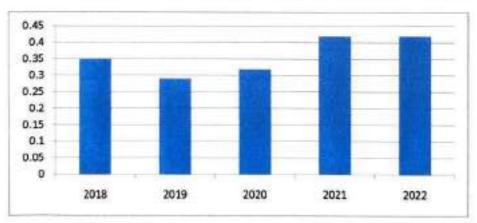
This ratio gives a more conservative view of the firm's liquidity since it uses only cash & cash equivalents, such as short - term marketable securities, in the numerator. It indicates the ability of the firms to pay off all their current liabilities without liquidating any other assets.

Cash Ratio = (Cash + Marketable securities)/ Current Liability

2.3. Cash Ratio of Tata Motors

Year	Total Cash ( in Rs Cr.)	Current liabilities ( in Rs Cr.)	Cash Ratio
2018	49,775.01	143,219.47	0.35
2019	42,178.65	145,457.43	0.29
2020	44,588.51	140,454.05	0.32
2021	65,843.65	157,749.18	0.42
2022	63378.41	150,682.81	0.42

Fig. 2.3. a. showing colh natio of Tata Motogo

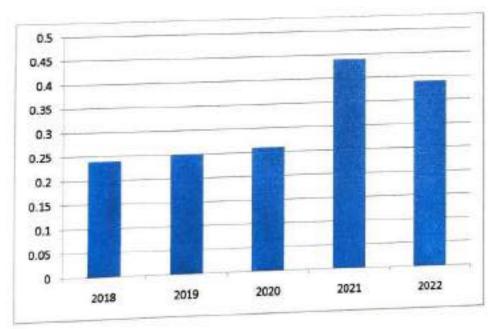


INTERPRETATION: This graph shows that liquidity has increased over time from 0.35 to 0.42 , which is good.

236Cash Ratio of Mahindra & Mahindra

Year	Total Cash ( in Rs Cr.)	Current liabilities ( in Rs Cr.)	Cash Ratio
2018	11,897.67	49,149.54	0.24
2019	14,842.13	58,743.33	0.25
2020	14,206.46	54,009.52	0.26
2021	22,883.81	51,446.01	0.44
2022	21,967.49	56,288.33	0.39

Fig-2-3.6 showing tash natio of Mahindra &Mahindra

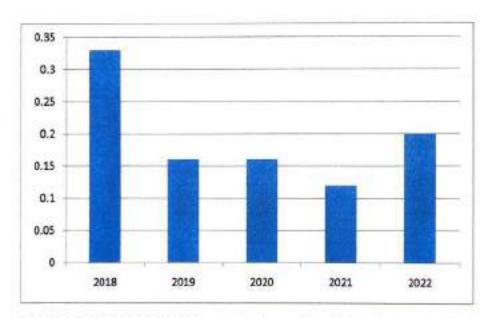


INTERPRETATION: This graph shows that liquidity has increased over time from 0.24 to 0.39, which is good.

2.3. ( Cash Ratio of Ashok Leyland

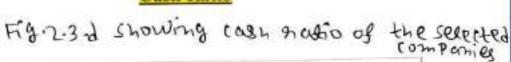
Total Cash (in Rs Cr.)	Current liabilities (in Rs Cr.)	Cash Ratio
4,646.25	14,191.48	0.33
2,410.05	15,315.86	0.16
2,418.54	14,794.65	0.16
2,023.05	16,223.80	0.12
3,753.07	18,615.90	0.20
	Cr.) 4,646.25 2,410.05 2,418.54 2,023.05	Cr.) (in Rs Cr.)  4,646.25 14,191.48  2,410.05 15,315.86  2,418.54 14,794.65  2,023.05 16,223.80

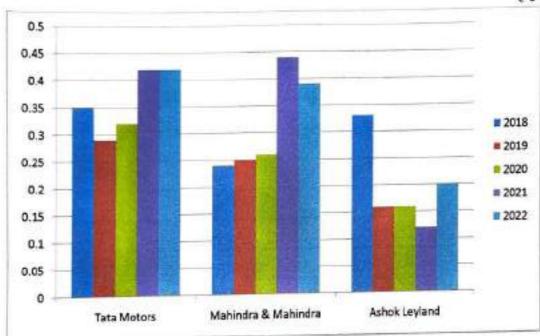
Fig-2-3-G showing tash notio of Ashok leyeand



INTERPRETATION: This graph shows that liquidity has declined over time from 0.33 to 0.20, which can cause problems with bill repayment.

### Cash Ratio





INTERPRETATION: This graph shows that only Ashok Leyland's liquidity is decreasing which means that the company can be in a bit of bother later on although in 2022 it has increased.

# 2.3. EFFICIENCY ANALYSIS

Efficiency analysis measures activity or turnover ratios to assess how effectively the company's assets are being used to produce revenue and increase profit or shareholder's capital. They assess the internal and short-term efficiency of the company's operation.

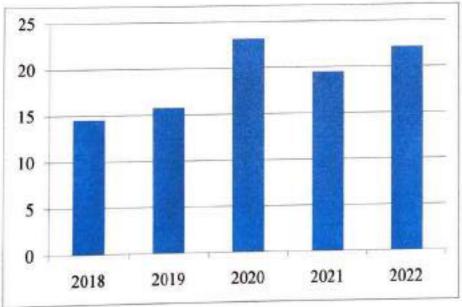
# 2.3.1.RECEIVABLES TURNOVER RATIO

The Receivables Turnover Ratio also called the Debtor's turnover ratio shows how many times the receivables were turned into cash during the period.

2.4 a Receivables Turnover Ratio of Tata Motors

Year	Net Credit Sales (in Rs Cr.)	Trade Receivables(in Rs Cr.)	Receivables Turnover Ratio
2018	288,596.09	19,893.30	14.50
2019	299,190.59	18,996.17	15.75
2020	258,594.36	11,172.69	23.15
2021	246,972.17	12,679.08	19.48
2022	275,235.23	12,442.12	22.12

Fig-2-4-a. showing Retervables Turnover natio of Tata

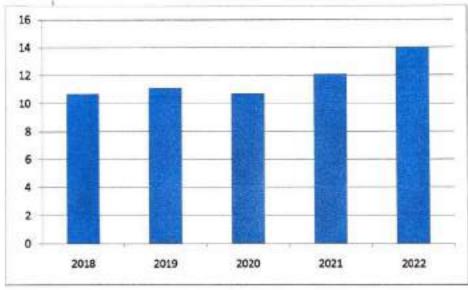


INTERPRETATION: It has been assumed that all sales are made on credit and this figure shows the average amount of time needed to collect Trade Receivables for the company has increased. The ratio has risen from 14.50 in 2017-2018 to 15.75 in 2018-2019 and has improved dramatically to 23.15 in 2019-2020, indicating that the business is handling credit more efficiently.

2-46 Receivables Turnover Ratio of Mahindra & Mahindra

Year	Net Credit Sales (in Rs Cr.)	Trade Receivables(in Rs Cr.)	Receivables Turnover Ratio
2018	90,770.68	8,489.82	10.69
2019	103,015.23	9,290.51	11.09
2020	74,304.07	6,928.28	10.72
2021	72,678.98	6,007.76	12.09
2022	89,353.96	6,373.95	14.02

Fig. 2. 4.6. showing Retervables turnover ratio of Mahindra

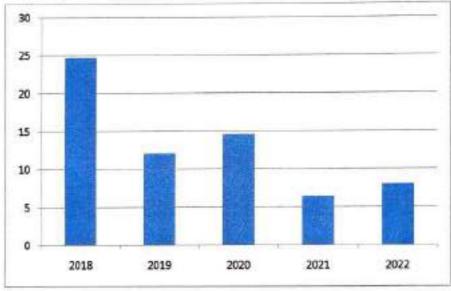


INTERPRETATION: It has been assumed that all sales are made on credit and this figure shows the average amount of time needed to collect Trade Receivables for the company has increased. The ratio has risen from 10.69 in 2017-2018 to 11.09 in 2018-2019 and has improved dramatically to 14.02 in 2021-2022, indicating that the business is handling credit more efficiently.

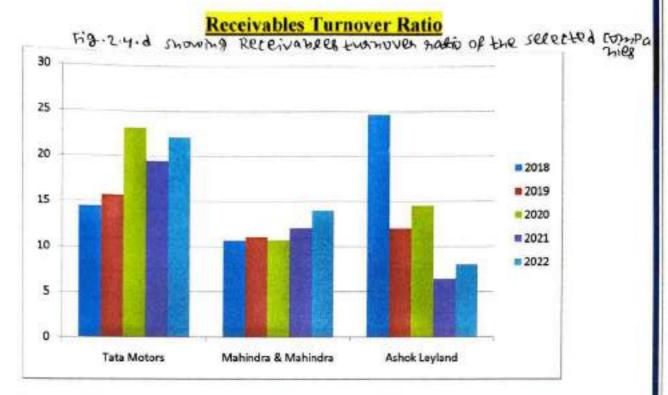
2.45 Receivables Turnover Ratio of Ashok Leyland

Net Credit Sales (in Rs Cr.)	Trade Receivables(in Rs Cr.)	Receivables Turnover Ratio
29,055.22	1,175.50	24.71
32,753.24	2,717.18	12.05
21,748.12	1,496.16	14.53
19,454.10	3,020.91	6.44
26,237.15	3,278.76	8.00
	(in Rs Cr.) 29,055.22 32,753.24 21,748.12 19,454.10	(in Rs Cr.)     Receivables(in Rs Cr.)       29,055.22     1,175.50       32,753.24     2,717.18       21,748.12     1,496.16       19,454.10     3,020.91

Fig. Z. 4-c. showing Receivables turnover ratio of Ashot leyeard



INTERPRETATION: It has been assumed that all sales are made on credit and this figure shows the average amount of time needed to collect Trade Receivables for the company has decreased. The ratio fell from 24.71 in 2017-2018 to 12.05 in 2018-2019 and has since decreased dramatically to 6.44 in 2020-2021, indicating that the business is not handling credit efficiently.



INTERPRETATION: This graph shows that Tata Motors's ratio has increased from 14.50 in 2018 to 22.12 in 2022, on the contrary Ashok Leyland's ratio is decreasing showing that its efficiency to collect trade receivables is declining.

## 2.4. PROFITABILITY ANALYSIS

Profitabilityratios are the summary ratios for the business firm. When profitability ratios are calculated, they sum up the effects of liquidity management, and debt management of the firm.

#### 2.4.1. Return On Equity Ratio

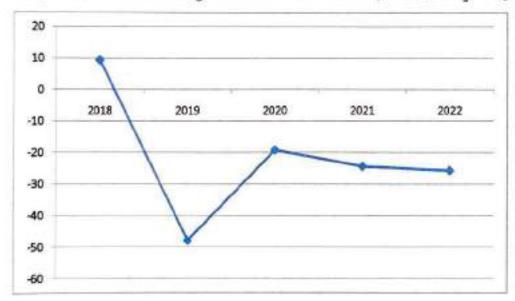
This ratio indicates how much money shareholders make on their investment in the selected companies. The ROE ratio is most important for publicly traded firms.

ROE= Net income/ Common equity

2.5 ~ Return on Equity Ratio of Tata Motors

Year	Net Income (in Rs Cr.)	Common Equity (in Rs Cr.)	Return on Equity(%)
2018	8988.91	95,427.91	9.41
2019	-28,826.23	60,179.56	-47.90
2020	-12,070.85	63,078.53	-19.13
2021	-13,451.39	55,246.72	-24.34
2022	-11,441.47	44,554.85	-25.68

Fig. 2.5. a. Showing Return on equity natio of Taka Motors

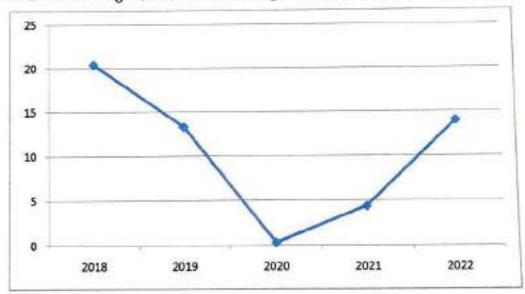


INTERPRETATION: This graph shows that the return on equity rate had a massive decline since 2017-2018 from positive 9.41% to negative 25.68% in 2018-19, though it has risen marginally in 2019-2020. It's ROE is performing extremely poor.

7.5.b Return on Equity Ratio of Mahindra & Mahindra

Year	Net Income (in Rs Cr.)	Common Equity (in Rs Cr.)	Return on Equity(%)
2018	7,510.39	36,775.19	20.42
2019	5315.46	39,983.41	13.29
2020	127.04	39,969.31	0.31
2021	1812.49	41,581.92	4.35
2022	6577.32	47,122.64	13.96

Fig. 2.5.6 showing ROF satio of Mahinds az mahindsa

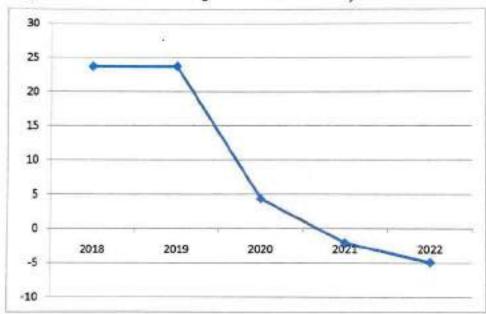


INTERPRETATION: Thisgraph shows that the return on equity rate fell from 20.42% in 2018 to 0.31% in 2020, though it has risen marginally in 2022. It's ROE is performing good towards the end.

2.5. Return on Equity Ratio of Ashok Leyland

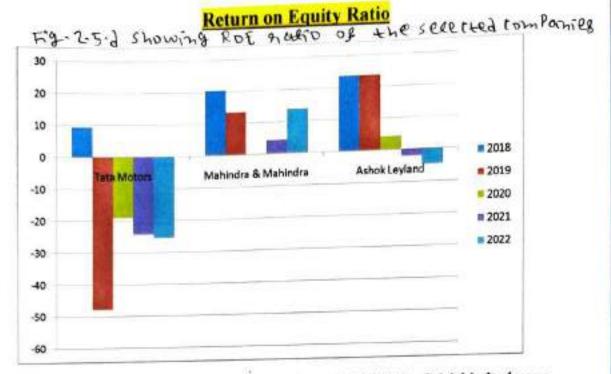
Year	Net Income (in Rs Cr.)	Common Equity (in Rs Cr.)	Return on Equity(%)
2018	1,760.38	7,420.59	23.72
2019	2,078.70	8,745.57	23.76
2020	336.67	7,788.81	4.32
2021	-165.23	7,862.02	-2.10
2022	-358.61	7,303.89	-4.90
	- Control of the cont		X-

Fig. 2.5.6. Showing Rot sactio of Ashok leyeard



INTERPRETATION: This graph shows that since 2018 the return on equity rate has declined drastically from positive 23.72% to negative 4.90%. It's ROE is performing extremely poor.

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INTERPRETATION: This graph shows that only Mahindra & Mahindra have a positive ROE implying that its equity is performing better as compared to the other two selected companies.

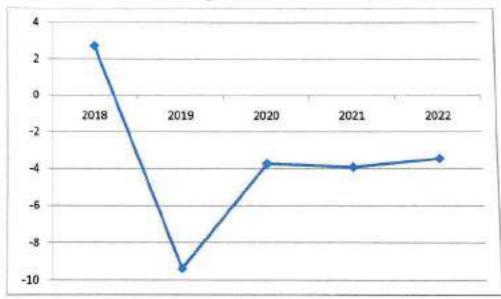
### 2.4.2. Return On Total Assets Ratio

Return on assets is a financial ratio that shows the profit that the companies earn in relation to their overall resources. It is commonly calculated as net income divided by total assets. Net income is derived from the income statement of the selected companies which is denoted as the profit after taxes.

ROA = Net income / Total Assets

Year	Net Income (in Rs Cr.)	Total Assets (in Rs Cr.)	Return on Assets(%)
2018	8,988.91	331,350.51	2.71
2019	-28,826.23	307,194.53	-9.38
2020	-12,070.85	322,121.26	-3.74
2021	-13,451.39	343,125.80	-3.92
2022	-11,441.47	330,619.93	-3.46
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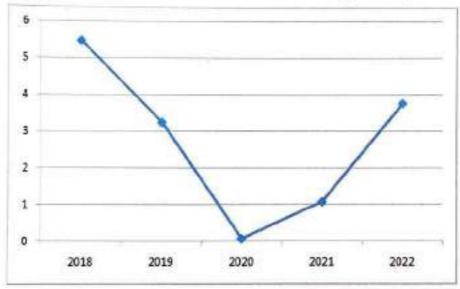
Fig. 2.6. a. showing ROA Ratio of Tata Motors



**INTERPRETATION:** This graph shows that the company's return on total assets ratio has deteriorated significantly over the last few years. It was as high as 2.71 in 2018, but it fell to -3.46 percent in 2022, indicating that the company's assets are not being used efficiently to generate profit.

Year	Net Income (in Rs Cr.)	Total Assets (in Rs Cr.)	Return on Assets (%)
2018	7,510.39	137,210.91	5.47
2019	5,315.46	163,391.57	3.25
2020	127.04	167,066.66	0.07
2021	1,812.49	166,462.49	1.08
2022	6,577.32	174,112.80	3.77

Fig. Z.6-b showing RDA satio of Mahindra & mahindra



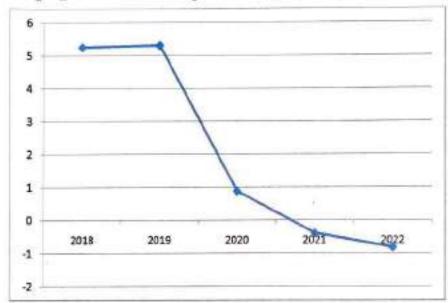
INTERPRETATION: This graph shows that the company's return on total assets ratio has declined marginally over the last few years. It was as high as 5.47 percent in 2018, andit declined to 3.77 percent in 2022, indicating that the company's assets are not being used efficiently to generate profit.

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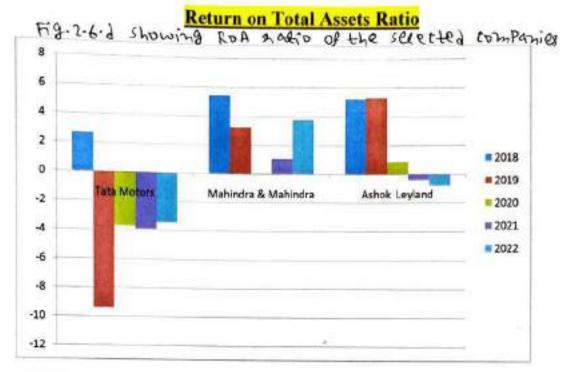
2.6.0 Return on Total Assets Ratio of Ashok Leyland

Year	Net Income (in Rs Cr.)	Total Assets (in Rs Cr.)	Return on Assets (%)
2018	1,760.38	33,517.99	5.25
2019	2,078.70	39,121.91	5.31
2020	336.67	38,126.86	0.88
2021	-165.23	42,066.87	-0.39
2022	-358.61	43,600.78	-0.82

Fig-2-6-t. showing ROA noted of Ashok leyland



INTERPRETATION: This graph shows that the company's return on total assets ratio has deteriorated significantly over the last few years. It was stable in 2018 and 2019, but it gradually declined to -0.82 percent in 2022, indicating that the company's assets are not being used efficiently to generate profit.



INTERPRETATION: This graph shows that only Mahindra & Mahindra have a positive ROA during the study period implying that its assets are performing better as compared to the other two selected companies.

### 2.4.3. Profit Margin Ratio

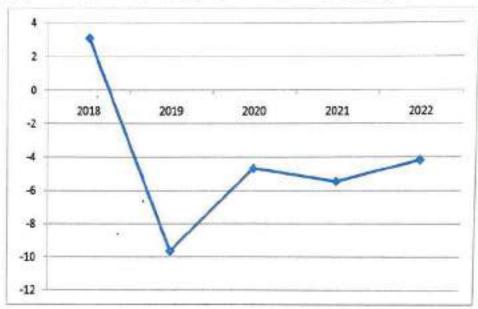
The net profit margin is a profitability ratio that expresses the profit from business operations as a percentage of revenue or net sales. It compares the selected companies profit's to the total amount of money it brings in. It measures how effectively the companies operate.

Net profit margin ratio = Net income / Net sales

# 2.7.a Net Profit Margin Ratio of Tata Motors

Net Income (in Rs Cr.)	Net Sales (in Rs Cr.)	Profit margin (%)
8,988.91	288,596.69	3.11
-28,826.23	299,190.59	-9.63
-12,070.85	258,594.36	-4.66
-13,451.39	246,972.17	-5.44
-11,441.47	275,235.23	-4.15
	Cr.)  8,988.91  -28,826.23  -12,070.85  -13,451.39	Cr.) Cr.)  8,988.91 288,596.69  -28,826.23 299,190.59  -12,070.85 258,594.36  -13,451.39 246,972.17

Fig. 2.7- a showing Partit mangin andioof tata Muture



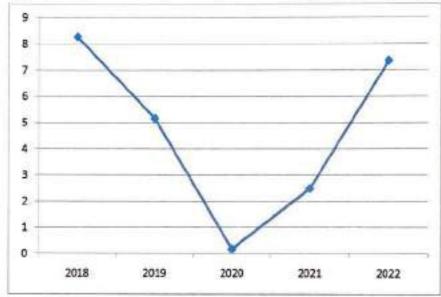
INTERPRETATION: The abovefigure indicates that the business have a profit margin ratio of 3.11% in 2018. It plummeted in 2019 to -9.63%, raised slightly in 2022 to -4.15%, indicating a significant shift in the profit margin ratio as seen in the chart.

2.7.6

## Net Profit Margin Ratio of Mahindra & Mahindra

Year	Net Income (in Rs Cr.)	Net Sales (in Rs Cr.)	Profit margin (%)
2018	7,510.39	90,770.68	8.27
2019	5315.46	103,015.23	5.16
2020	127.04	74,304.07	0.17
2021	1812.49	72,678.98	2.49
2022	6577.32	89,353.96	7.36

Fig. 2-7-6 showing Perofit margin radio of Mahindra & Mahindr

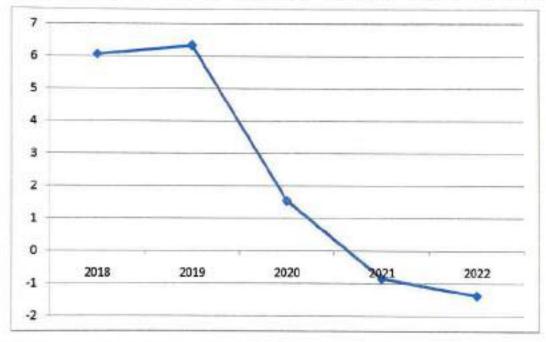


INTERPRETATION: This figure indicates that the business made a profit in 2018 with a percentage of 8.27. While they were able to maintain a consistent profit margin for 2018, it declined in 2020 to 0.17%, raised in 2022 to 7.36%, indicating a slight shift in the profit margin as seen in the chart.

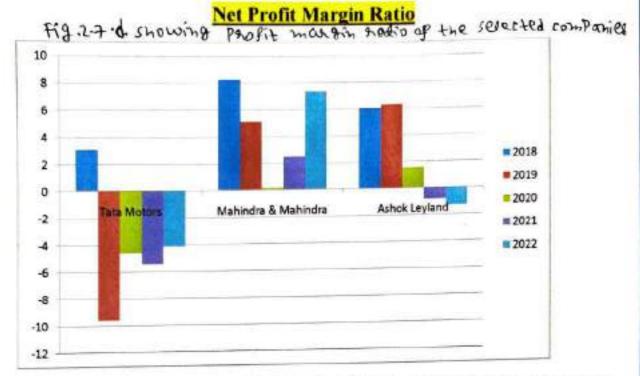
マーナー・ Net Profit Margin Ratio of Ashok Leyland

Year	Net Income (in Rs Cr.)	Net Sales (in Rs Cr.)	Profit margin (%)
2018	1,760.38	29,055.22	6.06
2019	2,078.70	32,753.24	6.34
2020	336.67	21,748.12	1.54
2021	-165.23	19,454.10	-0.85
2022	-358.61	26,237.15	-1.37

Fig. 2.7.c. showing Profit margin ratio of Ashok Reyland



INTERPRETATION: This figure indicates that the business made a profit in 2018 with a percentage of 6.06 on sales. While they were able to maintain a consistent profit margin for first two years of the study period, it declined in 2022 to negative 1.37%, indicating a huge decline in the profit margin as seen in the chart.



INTERPRETATION: This graph shows that Mahindra & Mahindra's profit margin ratio is increasing whereas profit margin of the other two selected companies are decreasing.

## 2.5.LEVERAGE ANALYSIS

Here we measure how leveraged the companies are and how they are placed with respect to their repayment capacity.

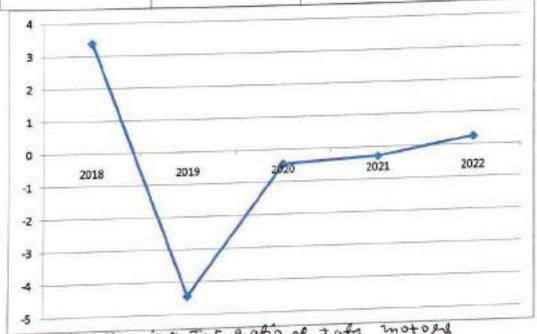
# 2.5.1.Fixed Interest Coverage Ratio

This ratio measures how well the businesses can service their total debt or cover their interest payments on debt. It is used to measure business profitability and its ability to repay the loan.

Interest coverage ratio = Earnings before interest and taxes (EBIT) / Interest expense

# 2-8 @Interest Coverage Ratio of Tata Motors

Year	EBIT (in Rs Cr.)	Interest (in Rs Cr.)	Interest Coverage Ratio
2018	15,836.82	4,681.79	3.38
2019	-25,612.55	5,758.60	-4.44
2020	-3,336.65	7,243.33	-0.46
2021	-2,377.11	8,097.17	-0.29
2022	2,308.45	9,311.86	0.25

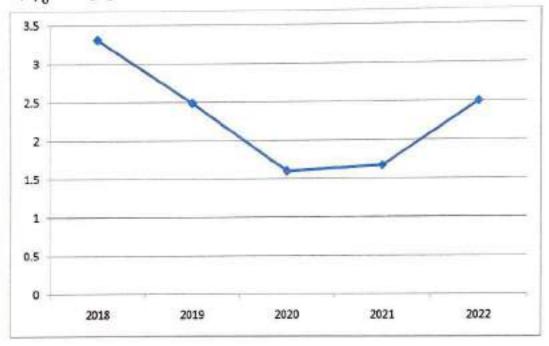


INTERPRETATION: This figure shows that the company's ability to make contractual interest payments (interest coverage ratio) is negative & increasing between 2019-2021, but it turned to positive in 2022. The ratio is 3.38 in 2018 and is-0.29 in 2021 and then positive 0.25 in 2022, which shows that the company isn't in a good position to make payments.

2.8.6 Interest Coverage Ratio of Mahindra & Mahindra

Year	EBIT (in Rs Cr.)	Interest (in Rs Cr.)	Interest Coverage Ratio
2018	13,205.35	3,987.09	3.31
2019	12,525.67	5,021.35	2.49
2020	9,682.30	6,021.15	1.60
2021	10,173.29	6,102.22	1.67
2022	12,524.03	5,018.05	2.50

Fig. 2.8.6 showing I. C. & alio of Mahindras mahindra

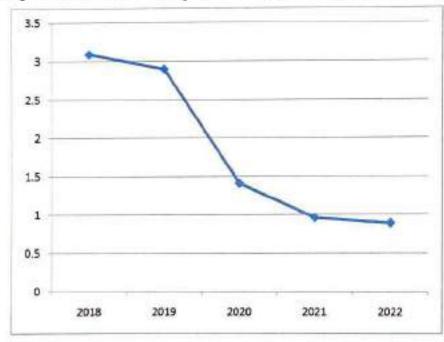


INTERPRETATION: This figure shows that the company's ability to make contractual interest payments is decreasing. Interest coverage ratio is decreasing from 3.31 in 2018 to 2.50 in 2022 which shows that the company isn't in a good position to make interest on debt payment.

しると Interest Coverage Ratio of Ashok Leyland

Year	EBIT (in Rs Cr.)	Interest (in Rs Cr.)	Interest Coverage Ratio
2018	3,802.82	1,231.72	3.09
2019	4,362.62	1,502.24	2.90
2020	2,537.92	1,801.65	1.41
2021	1,834.06	1,900.64	0.96
2022	1,661.94	1,869.05	0.89

Fig. 2-8-C. Showing Int-coverage natio of Ashox Reyland



INTERPRETATION: This figure shows that the company's ability to make contractual interest payments is gradually decreasing. Interest coverage ratio is decreasing from 3.09 in 2018 to 0.89 in 2022 which shows that the company isn't in a good position to make debt interest payment.

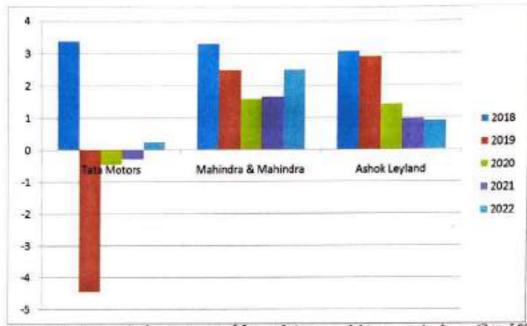


Fig. 2-8.3 showing T. J. Actio of the selected tompenies.

INTERPRETATION: This graphshows thatInterest coverage ratio of Tata

Motors is decreasing and that too in negative figure whereas the other two
selected companies are positive in this respect.

#### 2.5.2. Debt Ratio

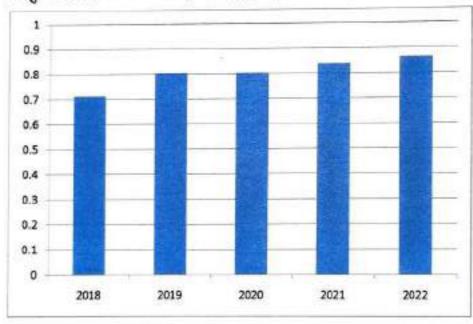
The debt - to- asset ratio shows the percentage of total assets that were paid for with borrowed money, represented by debt on the business firm's balance sheet. It is an indicator of financial leverage or a measure of solvency. It also gives financial managers critical insight into the firm's financial health or distress.

Debt Ratio= Total Liabilities/ Total Assets

2-9-a. Debt Ratio of Tata Motors

Year	Total Liabilities (in Rs Cr.)	Total assets (in Rs Cr.)	Debt Ratio
2018	235,922.60	331,350.51	0.712
2019	247,014.97	307,194.53	0.804
2020	259,042.73	322,121.26	0.804
2021	287,879.08	343,125.80	0.838
2022	286,065.08	330,619.93	0.865

Fig-2-g-a-showing bebt gatio of Tata Motogl

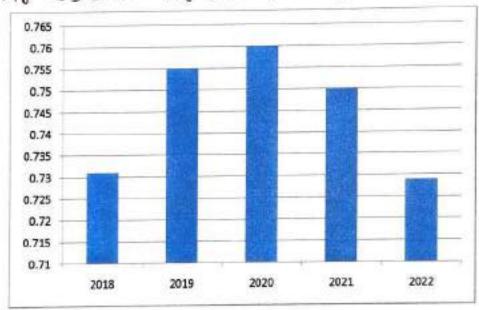


INTERPRETATION: This figure shows the proportion of total assets financed by Tata Motor's creditors. The debt ratio is at its highest in 2022 and lowest in 2018. It shows that debt financed is more now.

2.9.b. Debt Ratio of Mahindra & Mahindra

Year	Total Liabilities (in Rs Cr.)	Total assets (in Rs Cr.)	Debt Ratio
2018	100,435.72	137,210.91	0.731
2019	123,408.16	163,391.57	0.755
2020	127,037.35	167,006.66	0.760
2021	124,880.57	166,462.49	0.750
2022	126,990.16	174,112.80	0.729

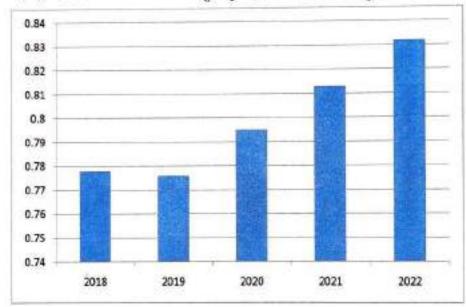
Fig. 2-9-6. Showing Debt gatio of Mahindras Mahindra



INTERPRETATION: This figure shows the proportion of total assets financed by Mahindra & Mahindra's creditors. The debt ratio is at its highest in 2020 and lowest in 2022. It shows that debt financed is less now.

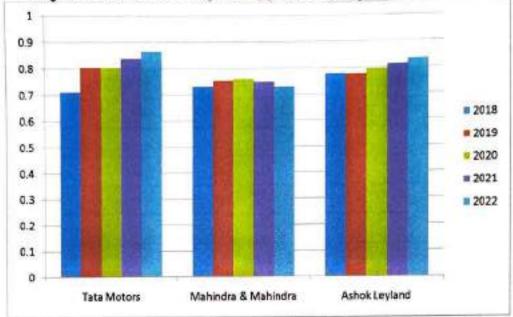
Year	Total Liabilities (in Rs Cr.)	Total assets (in Rs Cr.)	Debt Ratio
2018	26097.40	33,517.99	0.778
2019	30,376.34	39,121.91	0.776
2020	30,338.05	38,126.86	0.795
2021	34,204.85	42,066.87	0.813
2022	36,296.89	43,600.78	0.832

Fig. 2.9. c showing bebt natio of Ashok seyland



INTERPRETATION: This figure shows the proportion of total assets financed by Ashok Leyland's creditors. The debt ratio is at its highest in 2022 and lowest in 2019. It shows that debt financed is more now.





INTERPRETATION: This graph shows that Mahindra & Mahindra's Debt ratio is constant whereas the other two selected companies total assets financed by creditors is increasing.

### Chapter 3

# FINDINGS, RECOMMENDATIONS & CONCLUSSION

#### 3.1. MAJOR FINDINGS

At this stage, the comparative financial analysis has been done in order to draw some broad conclusions about results of the three selected companies in the automobile industry.

#### 3.1.1. LIQUIDITY ANALYSIS

 Both Tata Motors and Mahindra & Mahindra have had increasing current ratios whereas Ashok Leyland has had a mere decrease.

 The Quick ratios of all the three selected companies either increased or remained the same. It indicates that the firm's ability to fulfil short-term obligations is increasing.

 The company's cash ratio which measures its ability to cover its short-term obligations using only cash and cash equivalents have declined from 0.33 to 0.20 only in case of Ashok Leyland.

 Overall the liquidity position of Ashok Leylandis not good in comparison to the other companies.

### 3.1.2. PROFITABILITY ANALYSIS

- Net profit margin which measures how profitable a company's sales are, declines from 3.11% to -4.15% in case of Tata Motors and from 6.06% to -1.37% in case of Ashok Leyland during the given period, which implies lower level of profitability of these companies while Mahindra & Mahindra is performing well in this respect compared to other two companies.
- Return on total assets is a pure measure of the efficiency of a company in generating returns from its assets. Return on total assets of Tata Motors and Ashok Leyland turns negative during the study period, which shows poor performance in terms of profitability of the companies.
- Return on equity which measures the returns earned on the common stock holder'sinvestment in the company.Return on total equity of Tata Motors and Ashok Leyland turns negative. This reflects the poor performance of the management in utilization of financial resources.

 The overall performance of Tata Motors and Ashok Leyland regarding profitability is poor, despite the fact that the company's customer base is increasing.

#### 3.1.3. EFFICIENCY ANALYSIS

 The receivable turnover ratio of Tata Motors and Mahindra & Mahindra have increased while in case of Ashok Leyland it fell from 24.71 in 2018 to 8.00 in 2022 indicating that they are not handling credit more efficiently.

#### 3.1.4. LEVERAGE ANALYSIS

- Fixed interest coverage ratio shows that Tata Motors and Ashok Leyland's ability to make contractual interest payments is massively declining while Mahindra & Mahindra has had a slight decrease. This shows that all of them are not in a good position to make payments.
- A debt ratio greater than 1.0 tells that a company has more debt than
  assets. A debt ratio less than 1 indicates that a company has more
  assets than debt. (HAYES, 2021) The debt ratio of two of them
  i.e. Tata motors and Ashok Leyland have increased over the years
  indicating that they have more debt now as compared to Mahindra &
  Mahindra.

#### 3.2. RECOMMENDATIONS

From the above findings we can say that Tata Motors and Ashok Leyland are making losses, or more accurately, decreasing their profitability. To avoid meeting tough financial conditions in the future, they must closely monitor prices, reduce expenditures, and manage their finances. To get rid of this it is very important to increase their sales revenue.

#### 3.3 CONCLUSION

To conclude, although the selected three companies maintain their influence in the industry, the financial performance of the companies is not so good. Except Ashok Leyland the liquidity ratio of other two companies is increasing over time which shows their good performance in liquidity management. But financial leverage of Tata Motors and Ashok Leyland have increased over time which shows that dependence on debt is increasing for those companies, which has two-way effect on company's financial health. It enables growth in earnings per share through generating a return on borrowed money in one hand, on the other, it exposes the company to greater financial risk. The profitability performance of the companies is also not impressive. It is expected that these companies, being such large companies, will recover from losses if their assets are managed well and their debts are used efficiently.

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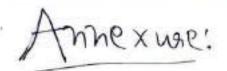
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BALANCE SHEET OF TATA MOTORS (in Rs. Cr.)	MAR 22	MAR 21	MAR 20	MAR 19	MAR 18
	12 mths	12 mths	12 mths	12 miths	12 mths
EQUITIES AND LIABILITIES					
SHAREHOLDER'S FUNDS					
Equity Share Capital	765.88	765.81	719.54	679.22	679.22
TOTAL SHARE CAPITAL	765.88	765.61	719.54	679.22	679.22
Reserves and Surplus	43,788.97	54,480.91	61,491.49	59,500.34	94,748.69
TOTAL RESERVES AND SURPLUS	43,788.97	54,480.91	61,491.49	59,500.34	94,748.69
TOTAL SHAREHOLDERS FUNDS	44,554.85	55,246.72	63,078.63	60,179.56	95,427.91
Minority Interest	4,271.06	1,573.49	813.56	523.06	525.06
NON-CURRENT LIABILITIES		al soft			
Long Term Borrowings	97,759.17	93,112.77	83,315.62	70,817.50	61,199.50
Deferred Tax Liabilities [Net]	1,558,44	1,555.89	1,941,87	1,491.04	6,125.80
Other Long Term Liabilities	18,831.32	20,280.99	17,780.94	16,871.09	13,904.33
Long Term Provisions	12,955.89	13,606.76	14,736.69	11,854.85	10,948.44
TOTAL NON-CURRENT LIABILITIES	131,104.82	128,556,41	117,775.12	101,034.48	92,178.07
CURRENT LIABILITIES					
Short Term Borrowings	41,917.87	21,652.79	16,362.53	20,150.26	16,794.85
Trade Payables	59,970.38	68,179,84	63,626.88	68,513,53	76,939.83
Other Current Lisbilities	38,028.25	55,058.52	50,135.60	46,596.89	41,531.29
Short Term Provisions	10,768.31	12,848.03	10,329.04	10,196.75	7,953.50
TOTAL CURRENT LIABILITIES	150,682.81	157,749.18	140,454.05	145,457.43	143,219.47
TOTAL CAPITAL AND LIABILITIES	330,619.93	343,125.80	322,121.26	307,194.53	331,350.51
ASSETS					
NON-CURRENT ASSETS					
Tangible Assets	87,586.15	86,130.71	84,158.17	72,619.86	73,867.84
Intangible Assets	50,462.13	51,773.18	42,171.91	37,866.74	47,429.57
Capital Work-In-Progress	3,529.04	8,377,14	8,599.56	8,538.17	16,142.94
FIXED ASSETS	148,299.37	158,867.82	161,982.37	142,370.44	161,330.91
Non-Current Investments	6,670.31	5,569.09	5,446.94	6,240.89	5,651.65

Deferred Tax Assets [Net]	3,870 65	4,520.35	5,457.90	5,151.11	4,158.70
Long Term Loans And Advances	843.35	1,204.59	782 78	407.42	495.41
Other Non-Current Assets	23,151.34	25,272.59	26,116.96	28,845.64	23,624.55
TOTAL NON-CURRENT ASSETS	183,442.39	198,238.18	202,534.01	183,763.37	195,377.67
CURRENT ASSETS					
Current Investments	22,709 22	19,051.19	10,861,54	9,529.83	15,161.10
Inventories	35,240 34	38,088.59	37,456.88	39,013.73	42,137.63
Trade Receivables	12,442.12	12,679.06	11,172.69	18,996.17	19,893.30
Cash And Cash Equivalents	40,669.19	45,792.45	33,726.97	32,648.62	34,613.91
Short Term Loans And Advances	1,571.93	1,749.40	935,25	1,268,70	2,279.66
OtherCurrentAssets	34,244.74	30,526.92	25,433,92	21,973.91	21,887.24
TOTAL CURRENT ASSETS	146,977.54	148,887.64	119,587.25	123,431.16	135,972.84
TOTAL ASSETS	330,619.93	343,125,80	322,121.26	307,194.53	331,350.51
OTHER ADDITIONAL INFORNATION					
CONTINGENT LIABILITIES,					
Contingent Liabilities	18,470.45	17,773.75	15,590.75	17,148.64	15,431,46
SONUS DETAILS					
Bonus Equity Share Capital	111 29	111.29	111.29	111.29	111.29
NON-CURRENT INVESTMENTS					
Non-Current Investments Quoted Market Value	1,345.52	499.39	316.46	726.53	36.64
Non-Current Investments Unquoted Book Value	975.40	868.91	711.59	770.98	727.12
CURRENT INVESTMENTS					
CURRENT INVESTMENTS  Current investments Quoted Market Value	685.52	0.00	0.00	0.92	303.26

PROFIT & LOSS ACCOUNT OF TATA MOTORS (in Rs. Cr.)	MAR 22	MAR 21	MAR 20	MAR 19	MAR 1
	12 mths	12 mths	12 mths	12 miles	12 mth
INCOME					
REVENUE FROM OPERATIONS [GROSS]	275,235.23	246,972.17	258,594.36	299,190.59	289,386.2
Less: Excise/Sevice Tax/Other Levies	0.00	0.00	0.00	0.00	790 1
REVENUE FROM OPERATIONS [NET]	276,236.23	246,972.17	253,594.36	299,190.59	268,596.0
TOTAL OPERATING REVENUES	278,453.62	249,794,75	261,067.97	301,938.40	294,619.1
Other Income	3,053.63	2,643.19	2,973.15	2,965.31	888 8
TOTAL REVENUE	281,507.25	252,437.94	264,041.12	304,903,71	295,508.0
EXPENSES					
Cost Of Materials Consumed	160,920.55	141,357.27	152,671.47	181,009.08	171,992,5
Purchase Of Stock-In Trade	18,374.77	12,250.09	12,228.35	13,258.83	15,903.90
Operating And Direct Expenses	9,223.95	5,226.63	4,188.49	4,224.57	3,531.8
Changes in Inventories Of GWIP And Stock In Trade	1,590.49	4,684,16	2,231.19	2,053.28	-2.046.56

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Employee Benefit Expenses	30.808.52	27,648.48	30,438.60	33.243.67	30,300,09
Finance Costs	9,311.86	8,097,17	7.243.33	5,758.60	4,691,79
Depreciation And Amortsation Expenses	24,835,69	23,546.71	21,425.43	23,590.63	21 553 59
Other Expenses	47,212.53	39,189.82	56,826,20	63,144,03	58,998.93
TOTAL EXPENSES	287,881.08	249,151.20	271,749.66	306,623.30	286,328.18
PROFIT/LOSS BEFORE EXCEPTIONAL, EXTRAORDINARY ITEMS AND TAX	4,373.83	3,286.74	-7,708.54	-1,719.59	3,179.85
Exceptional Items	-629.58	-13,761.02	2,871.44	29,651.56	1,975.14
PROFIT/LOSS BEFORE TAX	-7,003.41	-10,474.28	-10,579.98	-31,371.15	11,156.03
TAX EXPENSES CONTINUED OPERATIONS					
Current Tax	2,669.98	1,710.18	1,893.05	2,225.23	3,303.46
Less: MAT Credit Entitlement	0.00	0.00	0.00	0.00	0.00
Deferred Tax	1,561,31	831.68	-1,497.80	4,662.68	1,038,47
Other Direct Taxes	0.00	0.00	0.00	0.00	0.00
TOTAL TAX EXPENSES	4,231.29	2,541.86	395.25	-2,437.45	4,341.83
PROFIT/LOSS AFTER TAX	-11,234.70	-13,016.14	10,975.23	-26,933.70	6,613.10

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#### AND BEFORE EXTRAORDINARY ITEMS

PROFIT/LOSS FROM CONTINUING OPERATIONS	-11,234.70	-13,016.14	-10,975.23	-28,933,70	6,613.10
PROFIT/LOSS FOR THE PERIOD	-11,234.70	-13,016.14	-10,975.23	-28,933.70	6,813.10
Minority Interest	-132,71	-56.29	-95.62	-102.03	-102.45
CONSOLIDATED PROFIT/LOSS AFTER MI AND ASSOCIATES	-11,441.47	-13,451,39	-12,070.85	-28,826.23	8,948.91
OTHER ADDITIONAL INFORMATION					
EARNINGS PER SHARE					
Basic EPS (Rs.)	-30.00	-37.00	-35.00	-85.60	26.00
Diluted EP5 (Rs.)	-30.00	-37.00	-35.00	-85.00	26.00
DIVIDEND AND DIVIDEND PERCENTAGE					
Equity Share Dividend	0.00	0.00	0.00	0.00	0.00
Tax On Dividend	0.00	0.00	0.00	0,00	0.00

BALANCE SHEET OF MAHINDRA AND MAHINDRA (in Rs. Cr.)	MAR 2	MAR 2	MAR 20	MAR 11	MAR 1
	12 mfts	12 mfter	12 mlhs	12 mths	12 mthr
EQUITIES AND LIABILITIES					
SHAREHOLDER'S FUNDS					
Equity Share Capital	556.06	955.15	554.28	543.96	543.13
TOTAL SHARE CAPITAL	654.04	555.15	554.28	543,96	543.13
Reserves and Surplus	46,343,12	40,771.89	39,150.07	39,439.45	36,232.06
TOTAL RESERVES AND SURPLUS	46,343.12	40,771.89	39,150.07	39,439.45	36,232.06
TOTAL SHAREHOLDERS FUNDS	47,122.64	41,581.92	39,969.31	39,983.41	36,775.19
Minority Interest	9,702,62	9,070,31	7,691.74	8,360.57	8,250.47
NON-CURRENT LIABILITIES					
Long Term Borrowings	48,625.06	54,906.56	52,298.05	43,526.17	33.809.18
Deferred Tax Liabilities [Net]	1,786.10	1,494.16	1,511.89	2,171.31	1,587.42
Other Long Term Liabilities	9,090.06	6,362,65	7,142.02	6,506,14	3,853.43
Long Term Provisions	1,497.99	1,600.88	4,384.13	4,100.64	3,785.68
TOTAL NON-CURRENT LIABILITIES	60,999.21	64,364.25	65,336.09	56,304.26	43,035.71
CURRENT LIABILITIES					
Short Term Borrowings	26,042.12	4,645.59	10,217.53	10,541.01	11,325.54
Trade Payables	19,036.55	15,505.79	14,985,35	20,992.17	18,287.34
Other Current Liabilities	10,241.47	30,219.29	27,055.10	25,593.70	15,141.40
Short Term Provisions	968,19	1,074.34	1,751.54	1,616.45	1,395.26
TOTAL CURRENT LIABILITIES	56,288.33	51,446.01	54,009.52	58,743.33	49,149.54
TOTAL CAPITAL AND LIABILITIES	174,112.80	166,462.49	167,006,66	163,391.57	137,210.91
ASSETS					
NON-CURRENT ASSETS					
angible Assets	21,902.26	17,611.65	24,417.18	22,227.17	20,820.49
ntangible Assets	2,775.83	2,463.13	3,759.78	4,681.97	3,201.74
apital Work-in-Progress	3,036.10	4,477.64	2,551.75	2,454.34	1,814.57
IXED ASSETS	31,380.90	27,947.39	35,033.44	31,688,98	28,291.70
on-Current Investments	19,210.55	18,745.84	12,914.78	12,160.88	10,687.54

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1,724.31	1,717.32	1,290 53	1,502.91	841.60
38,649.40	38,525.68	45,945.23	40,515.00	31,414.43
6,459,24	6,083.45	6,264.94	6,064.16	4,759.95
98,964,80	94,324.68	102,961.23	93,985.53	78,134.89
10,849,88	10,031.82	6,295.56	6,107.22	5,350.07
11,595,62	9,615.41	11,111.86	12,200,16	9,335.57
6,373.95	6,007.76	6,928.28	9,290.51	8,489.82
11,117.61	12,851.99	7,910.90	8,734.91	6.547.60
29,242.26	29,119.55	27,963.68	26,622.06	24,725,46
5,968.48	4,511.38	3,835.15	4,451.18	4,627.50
75,148.00	72,137.91	64,045.43	69,406.04	59,076.02
174,112.00	166,462.49	167,006.66	183,391.57	137,210.91
7,015.76	8,934.97	9,130.31	9,426.10	7,284.08
481.41	481.41	481.41	481.41	481.41
46,117.60	34,421,25	17,464.02	24,246.56	21,635.36
3,524,46	3,359.68	3,268.64	3,126,92	3,005.73
3,524,46	3,359.68	3,288.64	3,126.92	3,005.73
3,524,46 9,535,50	3,359.68 7,324.28	3,268.64 5,677.26	3,126.92 3,785.42	3,913.92
	38,849.40 6,459.24 98,964.80 10,649.88 11,595.82 6,373.95 11,117.61 29,242.26 5,968.48 75,148.00 174,112.80	38,849.40 38,525.68 6,459.24 6,083.45 98,964.80 94,324.68 10,849.88 10,031.82 11,595.82 9,615.41 6,373.95 6,007.76 11,117.61 12,851.99 29,242.26 29,119.55 5,968.48 4,511.38 75,148.00 72,137.91 174,112.80 166,462.49 7,015.76 8,934.97	38,849.40 38,525.68 45,845.23 6,459.24 6,083.45 6,264.94 98,964.80 94,324.68 102,961.23 10.849.88 10,031.82 6,295.56 11,595.82 9,615.41 11,111.86 6,373.95 6,007.76 6,928.28 11,117.61 12,851.99 7,910.90 29,242.26 29,119.55 27,963.68 5,968.48 4,511.38 3,635.15 75,148.00 72,137.91 64,045.43 174,112.80 166,462.49 167,006.88	38,849.40 38,525.68 45,945.23 40,515.00 6,459.24 6,083.45 6,264.94 6,064.16 98,964.80 94,324.68 162,961.23 93,986.53 10.849.88 10.031.82 6,295.56 6,107.22 11,595.82 9,615.41 11,111.86 12,200.16 6,373.95 6,007.76 6,928.28 9,290.51 11,117.61 12,851.98 7,910.90 8,734.91 29,242.26 29,119.55 27,963.68 28,622.06 5,968.48 4,511.38 3,835.15 4,451.18 75,148.00 72,137.91 64,045.43 69,406.04 174,112.80 166,462.49 167,006.68 163,391.57 7,015.76 8,934.97 9,130.31 9,426.10

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PROFIT & LOSS ACCOUNT OF MAHINDRA AND MAHINDRA (in Rs. Cr.)	MAR 22	MAR 21	MAR 20	MAR 19	MAR 16
	12 mths	12 mths	12 mths	12 mths	12 mths
NCOME					
REVENUE FROM OPERATIONS (GROSS)	89,353.96	72,678.98	74,304.07	103,015.23	91,941.50
Less: Excise/Sevice Tax/Other Levies	0.00	0.00	0.00	0.00	1,170.82
REVENUE FROM OPERATIONS [NET]	89,353.96	72,678.98	74,304.07	103,016.23	90,770.68
TOTAL OPERATING REVENUES	90,170.57	74,277.78	75,381.93	104,720.68	92,093.95
Other Income	934.51	1,033.11	1,028.69	1,085.61	631.03
TOTAL REVENUE	91,105.08	75,310.89	76,410.62	105,806.29	92,724.98
EXPENSES					
Cost Of Materials Consumed	46,265,48	32,797.56	32,321.80	56,120.20	48,439.86
Purchase Of Stock-In Trade	5,399.37	5,473.64	5,273.50	5,961.90	5,017.43
Operating And Direct Expenses	0.00	0.00	0.00	0.00	0.00
Changes In Inventories Of FGWIP And Stock in Trade	-861.66	135.59	826.62	-1,730.48	83.33
Employee Berefit Expenses	8,386.74	7,813.26	8,214,82	11,563.89	10,004.62
Finance Costs	5,018.05	6,102.22	6,021.15	5,021.35	3,987.09
Depreciation And Amortisation Expenses	3,507.50	3,378,11	3,366.68	3,990,77	3,279.90
Other Expenses	15,452.96	14,541.92	15,871.20	19,052.43	16,820.50
TOTAL EXPENSES	84,013.27	70,081.56	71,578.19	98,526.29	86,134.84
PROFIT/LOSS BEFORE EXCEPTIONAL, EXTRAORDINARY ITEMS AND TAX	7,091.81	5,229.33	4,832.43	7,280.00	6,590,14
Exceptional Items	414.17	-1,158.26	-1,171.28	224.32	2,628.12
PROFIT/LOSS BEFORE TAX	7,505.98	4,071.07	3,661.15	7,504.32	9,218.26
TAX EXPENSES-CONTINUED OPERATIONS					o devenienti
Current Tax	1,868.10	2,014.89	2,314.16	2,350.48	2,563.61
.ess: MAT Credit Entitlement	0.00	0.00	0.00	0.00	0.00
Deferred Tax	240.66	369.06	-338.55	503.53	-195.88
Other Direct Taxes	0.00	0.00	0.00	0.00	0.00
OTAL TAX EXPENSES	2,108.76	1,645.81	1,975.61		

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6,397.22	2,425.26	1,685,54	10000000000000000000000000000000000000	
		1,000.04	4,650.33	6,850.53
8,397.22	235.73	-1,348.28	4,650.33	6,850.53
675,69	300,10	448.04	-701.39	-447.40
8,577.32	1,612.49	127.04	5,315.46	7,510.39
59.00	16.00	-1.00	49.00	69.00
59.00	16.00	-1.00	49.00	69.00
979.17	262.16	1,135.09	937.46	847.97
0.00	0.00	0.00	0.00	0.00
	675.69 6,577.32 59.00 59.00	675.69 300.10 6,577.32 1,612.49 59.00 16.00 59.00 16.00	675.69 300.10 446.04 6,577.32 1,612.49 127.04 59.00 16.00 -1.00 59.00 16.00 -1.00 979.17 262.16 1,135.09	675.69 300.10 446.04 -701.39 6,577.32 1,612.49 127.04 5,315.46 59.00 16.00 -1.00 49.00 59.00 16.00 -1.00 49.00 979.17 262.16 1,135.09 937.46

BALANCE SHEET OF ASHOK LEYLAND (in Rs. Cr.)	MAR 22	MAR 21	MAR 20	MAR 19	MAR 18
	12 mths				
EQUITIES AND LIABILITIES					
SHAREHOLDER'S FUNDS					
Equity Share Capital	293.55	293.55	293.55	293.55	292.71
TOTAL SHARE CAPITAL	293.55	293.55	293.55	293.55	292.71
Reserves and Surplus	6,968.86	7,568.47	7,469.59	8,442.91	7,127.88
TOTAL RESERVES AND SURPLUS	6,968.86	7,568.47	7,469.59	8,442.91	7,127.88
TOTAL SHAREHOLDERS FUNDS	7,303.89	7,862.02	7,788.81	8,745.57	7,420.59
Minority Interest	1,286.27	1,268.28	1,107.08	1,075.07	825.33
NON-CURRENT LIABILITIES					
Long Term Borrowings	15,297.30	15,564.63	13,308.71	13,009.65	10,228.09
Deferred Tax Liabilities [Net]	315.83	386,09	338.57	257.76	298.51
Other Long Term Liabilities	497.60	532.67	560.50	401.13	240.67
Long Term Provisions	283,99	229,38	228.54	316.87	313,32
TOTAL NON-CURRENT LIABILITIES	16,394.72	16,712.77	14,436.32	13,985.41	11,080.59
CURRENT LIABILITIES					
Short Term Borrowings	8,642.05	2,599.73	2,842.68	2,137.75	1,919.20
Frade Payables	7,249.91	5,346.23	2,834.60	5,179.02	5,074.65
Other Current Liabilities	2,191.26	7,698.36	8,401.39	7,389.59	6,584.75
hort Term Provisions	532.68	579.48	715.98	609.50	612.89

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TOTAL CURRENT LIABILITIES	18,615.90	16,223.80	14,794.65	15,315.86	14,191.48
TOTAL CAPITAL AND	43,600.78	42,066.87	38,126.86	39,121.91	33,517.99
ASSETS					
NON-CURRENT ASSETS					
Tangible Assets	5,744.44	6,047,42	5,835.66	5,070.85	5,069.4
Intangible Assets	1,118.31	1,196.03	1,079.71	509.06	418.9
Capital Work-In-Progress	139.38	233.27	442.12	294.63	251.1
FIXED ASSETS	7,102.76	7,578.99	7,489.26	6,257.52	5,927.8
Non-Current Investments	998.49	851.11	777.10	859.12	966.84
Deferred Tax Assets [Net]	27.13	8.91	7.71	10.30	141.70
Long Term Loans And Advances	14,890.73	15,462.72	12,022.12	12,922.32	9,935.6
Other Non-Current Assets	935.59	1,005.51	1,405.62	1,469.61	1,016.5
TOTAL NON-CURRENT ASSETS	24,986.53	26,148.01	22,817.37	22,634.43	19,096.4
CURRENT ASSETS		N. Li			
Current Investments	1,653.63	244.52	183.24	632,76	3,415.7
Inventories	2,540.55	2,495.85	1,536.39	3,063.43	2,207.6
Trade Receivables	3,278.76	3,020.91	1,496.16	2,717.18	1,175.5
Cash And Cash Equivalents	2,099.44	1,778.53	2,235.30	1,777.29	1,230.5
Short Term Loans And Advances	6,818.03	6,258.96	7,888.95	6,553.63	5,117.99
OtherCurrentAssets	2,223.84	2,120.09	1,969.45	1,743.19	1,274.1
TOTAL CURRENT ASSETS	18,614.25	15,918.86	15,309.49	16,487.48	14,421.56

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TOTAL ASSETS	43,600.78	42,066.87	38,126.86	39,121.91	33,517.99
OTHER ADDITIONAL INFORMATION					
CONTINGENT LIABILITIES, COMMITMENTS					
Contingent Liabilities	917.30	864.31	794.82	863.19	638.71
BONUS DETAILS					
Bonus Equity Share Capital	139.26	139.26	139.26	139.26	139.26
NON-CURRENT INVESTMENTS					
Non-Current Investments Quoted Market Value	0.00	0.00	0.00	0.00	0.00
Non-Current Investments Unquoted Book Value	0.00	0.00	750.36	831.64	1,019.29
CURRENT INVESTMENTS					
Current Investments Quoted Market Value	0.00	0.00	0.00	0.00	0.00
Current Investments Unquoted Book Value	1,653.63	244.52	183.24	632.76	3,415.74

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PROFIT & LOSS ACCOUNT OF ASHOK LEYLAND (In Rs. Cr.)	MAR 22	MAR 21	MAR 20	MAR 19	MAR 18
	12 mths				
INCOME					
REVENUE FROM OPERATIONS [GROSS]	26,237.15	19,454,10	21,748.12	32,753.24	29,336.74
Less: Excise/Sevice Tax/Other Levies	0.00	0.00	0.00	0.00	281.52
REVENUE FROM OPERATIONS [NET]	26,237.15	19,454.10	21,748.12	32,753.24	29,065.22
TOTAL OPERATING REVENUES	26,237.15	19,454.10	21,951.27	33,196.84	29,619.57
Other Income	86.81	131.16	107.83	128.06	199.88
TOTAL REVENUE	26,323.96	19,585.26	22,059.10	33,324.90	29,819.45
EXPENSES					
Cost Of Materials Consumed	16,619.60	11,768.86	11,164.38	21,680.55	17,317.71
Purchase Of Stock-In Trade	945.42	807.62	874.38	837.48	750.50
Operating And Direct Expenses	0.00	0.00	0.00	0.00	0.00
Changes In Inventories Of FGWIP And Stock In Trade	48.24	-529.10	1,307.16	-919.42	1,149.86
Employee Benefit Expenses	2,616.76	2,159.43	2,190.27	2,639.85	2,257.48
Finance Costs	1,869.05	1,900.64	1,801.65	1,502.24	1,231.72
Depreciation And Amortisation Expenses	865.96	835.62	749.99	675.56	645.89
Other Expenses	3,241.89	2,784.85	3,181.73	4,048.38	3,895.59
TOTAL EXPENSES	26,206.92	19,727.92	21,269.56	30,464.64	27,248.75
PROFIT/LOSS BEFORE EXCEPTIONAL, EXTRAORDINARY ITEMS AND TAX	117.04	-142.66	789.54	2,860.26	2,570.71

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Exceptional Items	-324.15	76.08	-53.27	0.12	0.39
PROFIT/LOSS BEFORE TAX	-207.11	-86.58	736.27	2,860.38	2,571.10
TAX EXPENSES-CONTINUED OPERATIONS					
Current Tax	102.65	63.09	194.68	525.67	789.28
Less MAT Credit Entitlement	0.00	0.00	0.00	0.00	0.00
Deferred Tax	-16.79	-60.57	84.68	151.39	-38.17
Other Direct Taxes	0.00	0.00	0.00	0.00	0.00
TOTAL TAX EXPENSES	85.86	2.52	279.36	677.06	751.12
PROFIT/LOSS AFTER TAX AND BEFORE EXTRAORDINARY ITEMS	-292.97	-69.10	456.91	2,183.32	1,819.98
PROFIT/LOSS FROM CONTINUING OPERATIONS	-292.97	-69.10	456.91	2,183.32	1,019.98
PROFIT/LOSS FOR THE PERIOD	-292.97	-69.10	456.91	2,183.32	1,807.25
Minority Interest	-73.16	-95.63	-123.13	-115.90	-53.44
CONSOLIDATED PROFIT/LOSS AFTER MI AND ASSOCIATES	-358.61	-165.23	336.67	2,078.70	1,760,38
OTHER ADDITIONAL INFORMATION			000		
EARNINGS PER SHARE					
Basic EPS (Rs.)	-1.00	-1.00	1.00	7.00	6.00
Diluted EPS (Rs.)	-1.00	-1.00	1.00	7.00	6.00
DIVIDEND AND DIVIDEND PERCENTAGE					
Equity Share Dividend	176.13	0.00	1,275.73	859.84	549.48
Tax On Dividend	0.00	0.00	0.00	0.00	0.00

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#### The University of Burdwan



# B.A./B.Sc. (Honours) In Economics w.e.f. 2017-18 under Semester with CBCS

### Structure of Syllabus for BA/B.Sc.Honours in Economics under Semester with CBCS

Students must have to pass in Mathematics/ Business Mathematics or equivalentat +2 Level

SEM	Paper	Paper Description	Course	L-T-P	Credit	Marks
	Code		Type			
I		Introductory Microeconomics	CC-1	5-1-0	6	75
		Statistics-I	CC-2	5-1-0	6	75
		AECC-I ENVS	AECC-1	4-0-0	4	100
		Generic Elec(GE)-I – any discipline other	GE-1	5-1-0	6	75
		than Economics				
II		IntroductoryMacroeconomics	CC-3	5-1-0	6	75
11		Mathematical Economics –I	CC-4	5-1-0	6	75
		AECC-II Communicative English / MIL	AECC-2	2-0-0	2	50
		Generic Elec(GE)-II – any discipline other	GE-2	5-1-0	6	75
		than Economics				
		Y	00.	<b>7.1.0</b>		7.5
III		IntermediateMicroeconomics	CC-5	5-1-0	6	75
		IntermediateMacroeconomics	CC-6	5-1-0	6	75
		MathematicalEconomics –II	CC-7	5-1-0	6	75
		SkillEnhCourse (SEC)-I	SEC-1	2-0-0	2	50
		Generic Elec(GE)-III – any discipline other	GE-3	5-1-0	6	75
		than economics				
IV		Selected Features of Indian Economy	CC-8	5-1-0	6	75
		Statistics-II	CC-9	5-1-0	6	75
		Development Economics	CC-10	5-1-0	6	75
		SkillEnhCourse(SEC)-II	SEC-2	2-0-0	2	50
				0-0-2		
		Generic Elec(GE)–IV – any discipline other	GE-4	5-1-0	6	75
		than economics				

V		International Economics	CC-11	5-1-0	6	75
		Money and Banking	CC-12	5-1-0	6	75
	*	DiscSpElective(DSE)-I	DSE-1	5-1-0	6	75
	*	DSE-II	DSE-2	5-1-0	6	75
VI		Basic Econometrics	CC-13	5-1-0	6	75
		Field Survey& Project Report	CC-14	0-0-6	6	75
	*	DSE-III	DSE-3	5-1-0	6	75
	*	DSE-IV	DSE-4	5-1-0	6	75

#### CC14: Field Survey and Project Report

Full Marks: 75 Credit: 6 Lectures: 30 + Practical: 40

(Project Report: 50 Marks) (Viva-Voce: 25 Marks)

This is a Project Paper where the Students will make a Field Visit to collect Primary information followed by analysis of data and writing a project report with support from the faculty members. Ideally there should be 10 classroom lectures to prepare the students for Field Survey and to train them for Report Writing. Remaining should be Field Visits and Report Writing.

The project report should ideally cover the following areas:

Introduction – Motivations – Literature Review – Objectives – Methodology – Results– Policy Suggestion – Bibliography

#### Project to be done on a small Primary sample of size 30 or more observations.

#### **Proposed Guidelines**

- 1. Each college shall arrange for a Field Visit for collection of data by the students
- 2. Each student will prepare a term paper between 4000-5000 words (excluding charts, diagrams, tables etc.).
- 3. The selection of the topic will be from the subjects covered in the undergraduate economics honours syllabus.
- 4. The term paper will be submitted by the candidates to the respective colleges at least a fortnight before the viva-voce examination which will be held at the respective college centres.
- 5. The board of examiners will consist of one internal and one external examiner (from some other college on a one-on-one basis).
- 6. The marks division for the term paper will be as follows: 50 for the written report and 25 for viva voce.
- 7. The marks of the written paper will be the average given by the internal and external examiners.
- 8. However, the viva-voce will be conducted and the marks awarded by the external examiner only.



#### SURI VIDYASAGAR COLLEGE

(Govt. Sponsored & Constituent college of the University of Burdwan) SURI, BIRBHUM, PIN – 731101, Ph. No. – 03462-255504

Website: surividyasagarcollege.org.in, e-mail:: surividyasagarcollege1942@gmail.com
This Institution is Ragging Free

#### PROJECT COMPLETION CERTIFICATE

This is to certify that the following students have successfully completed their projects of semester VI Economics Honours under the supervision of the faculties of Economics Department as listed below:

SI.No.	Name of the students	Title of the projects	Name of the Supervisor
1	Sreedutta Samanta	A study of micro-enterprises in the district of Murshidabad, west Bengal	Dr. Labanya Pal

Labanya Pal

H.O.D.

Department of Economics Suri Vidyasagar College

Head

Department of Economics Suri Vidyasagar College

#### A Study of Micro-enterprises in the district of Murshidabad, West Bengal

A Field Survey and Project Report (CC14)

Submitted for partial fulfilment for the Bachelor Degree in Economics (Honours), The University of Burdwan

Submitted by

Sreedutta Samanta

Sprachetta Somanta (Signature)

Roll No: 250131500264

Registration No: 202001031224

of (2020-21

Session: 2020-23

Labanya Pal Supervisor

Suri Vidyasagar College

Suri, Birbhum-731101

June, 2023

Date - 06/06/2023

## A Study of Micro-enterprises in the district of Murshidabad, West Bengal

A Field Survey and Project Report (CT Id) Submitted for partial infolment for the Beathelov Degree to Estimates (Florities), The University of Bardones

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Roll No. 2 or Joy Local List

Registration No. Aspertment out

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Labanya Pal Supervisor

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Date - 06/06/2023

Department of Economics
Suri Vidyasagar Colles

#### Acknowledgement

Acknowledgement behind the completion of this project goes to the active contribution of Professor Dr.Labonya Pal, Department of Economics, Suri Vidyasagar College. He has assisted me immensely through out this journey by meticulously reviewing my works and correcting the manuscript rigorously and making all the necessary improvements.

I have also received valuable help and cooperation from the Department of Economics, Suri Vidyasagar College, and my teachers- Professor Dr.Labonya Pal, Professor Ramananda Roy and Professor Dr.Kakoli Adhikari without which, it would be almost impossible to conduct the field visit for the collection of primary data in the Block of Khargram of district of Murshidabad.

I owe my heart felt gratitude to District Technical Expert of Murshidabad Shri Sridhar Samanta for choosing my topic of field project and area of field survey in accordance to the relevant available data and help me profusely in directing the Block Development Service Provider in cooperating with me in conducting the survey.

Finally, I am thankful to my honourable institution Suri Vidyasagar College for making field tour successful.

Laboury PH

Head

Head

Department of Economics

Sun Vidyasagar Covega

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#### A Study of Micro-enterprises in the district of Murshidabad, West Bengal

#### Introduction

Micro, small and Medium Enterprises (MSMEs) are one of the most vibrant and sensitive sectors and act as the catalyst of socio-economic development of the Indian economy. The importance of Micro, Small and Medium Enterprises (MSMEs) is attributable to its ability of employment generation, low capital and technology requirement, use of traditional or inherited skill, use of local resources, mobilization of resources and exportability of products. The advent and development of Micro-entrepreneurship has been the turning point for the Indian economy. They have ushered in a new era of growth in this economy through their multitude of activities. The most prominent of these micro-enterprises, the MSME (Micro, Small and Medium Enterprises) have played key roles in promoting economic growth and development equally at all levels starting from regional to rural to national levels. Now, before we dive into the analysis regarding the growth and development of the MSME, we need to define separately what the Micro, Small and Medium enterprises are. Micro, small and medium enterprises, as per MSMED Act, 2006, are defined based on their investment in plant and machinery (for manufacturing enterprise) and on equipment for enterprises providing or rendering services. The present ceilings on investment for enterprises to be classified as micro, small and medium enterprises are as follows:

Table 1. Classification of MSMEs

Enterprises (Types)	Investment in Plant and Machinery (Manufacturing)	Investment in Equipment (Service)
Micro	Up to 25 lakhs	Up to 10 lakhs
Small	Above Rs 25 lakhs up to Rs 5 crores	Above Rs 10 lakhs up to Rs 2 crores
Medium	Above Rs 5 crore up to Rs 10 crores	Above Rs 2 crore up to Rs 5 crores.

(As per Micro, Small and Medium Enterprises Development Act, 2006)

The MSMEs have contributed to the economic growth and development in the following ways which are enumerated in the following manner:

- Inclusive growth: They promote inclusive growth by providing employment opportunities in rural areas especially to people belonging to the weaker sections of the society.
- Financial Inclusion: Small enterprises and retail businesses in tier-II and tier-III
  cities create opportunities for people to use banking services and products.
- Promote innovation: It provided opportunity for budding entrepreneurs to build creative products boosting business competition and growth.
- Economic growth and development: MSME are boosting economic growth
  and development at regional, national and global levels. With its dexterity and
  dynamism, the sector has shown venerable innovativeness and malleability to survive
  economic shocks, even of the gravest nature.
- Mobilisation of rural savings: MSMEs have mobilised rural savings by placing
  profitable business proposition and attract investment to ensure private participation
  in the process of industrialisation which give away to the multiplier effect in the
  process of wealth creation.
- Job creation and employment: They create large-scale employment opportunities for the rural people and eradicates the poverty of the rural people to some extent.

In addition to the above written benefits of micro-enterprises, they have made innumerable other contributions to the economy which cannot be understated which makes them very central to our economy and the unravelling of their latent potential a key to economic growth and prosperity. In 2011, Dixit and Pandey applied co-integration analysis to examine the relationship between MSME output, exports, employment and the number of SMEs and the total GDP of the country from the period 1973-74 to 2006-07 and found that there is a positive causality between the SME's output and GDP. The MSME sector is an important pillar of the Indian economy by way for creating employment for about 73 million persons through 31 million units, manufacturing more than 6,000 products, contributing about 44% to manufacturing output and about 40% of exports, directly and indirectly. Moreover, the Government of West Bengal states its mission to create additional employment for about 10 million people in next 10 years in the state in the MSME sector and its vision is to create a sustainable eco-system to maximize the utilization of resources and widen the area of operation. Hence, from that angle, the study of the MSME sector is a very futuristic and a very lucrative prospect.

Motivation: After serious and careful consideration of the innovative growth prospects underlying the MSME sector, we are highly motivated to undertake this "A Study of Microenterprises in the district of Murshidabad, West Bengal" to unravel some of its latent growth aspects on the livelihood of that district.

The study is organised as follows. The section 2 discusses a brief literature review. Objectives of the study are presented in section 3. Sources of data is discussed in section 4. Section 5 explains the methodology used in this study. Section 6 presents the analytical results. Conclusion remarks is presented in the final section 7.

Literature review: For the purpose of the present study, some journals, research papers and books were reviewed. Sonia and Kansai Rajeev (2009) studied the effects of globalization on Micro, Small and Medium Enterprises (MSMEs) during pre and post liberalization from 1973-74 to 2008-09. They used four economic parameters namely number of units, production, employment and export and interpreted study results based on Annual Average Growth Rate (AAGR) calculation. AAGR in pre liberalization period (1973-74 to 1989-90) was higher in all selected parameters than that of post liberalization period (1991-92 to 2007-08). They concluded that MSMEs failed to put up an impressive performance in post reform era. Bhavani T.A. (2010) highlights the issue of quality employment generation by the SSIs and negates the short-term attitude of increasing the volume of employment generation compromising with quality. The author argues that employment generation by the SSIs may be high in quantitative term but very low in quality. Technological up gradation would enable the small firms to create quality employment improving remuneration, duration and skill. This structural shift may reduce the rate of employment generation in the short run but would ensure high-income employment generation in the long run. Subrahmanya Bala (2011) has probed the impact of globalization on the export's potentials of the small enterprises. The study shows that share of SSI export in total export has increased in protection period but remain more or less stagnated during the liberalization period. However, the correlation co-efficient in liberalization period is higher than that of protection period suggesting that the relationship between the total export and SSI export has become stronger in liberalization period. This may be due to the drastic change in composition of SSI export items from traditional to non-traditional and growth in its contribution to total export through trading houses, export houses and subcontracting relation with large enterprises. Thus, the current policy of increasing competitiveness through infusion of improved technology, finance, and marketing techniques should be emphasized. Ganguly. S. (2013) also showed the importance

of MSMEs in West Bengal. The MSMEs (basically micro and small enterprises) in West Bengal face very tough situation due to utmost competition in national and international level from large industries due to lack of infrastructure, lower volume of capital, lack of product standardization, lack of access to modern technology etc. Another important problem of MSMEs in West Bengal is the number of unregistered MSMEs is much higher than the registered units. Srinivas (2013) studied the performance of micro, small and medium enterprises, their contribution in India's economic growth, identified the number of enterprises, employment in MSMEs and concluded that MSMEs play a significant role in inclusive growth of Indian economy. Lahiri. R. (2014) analysed the ground reality of MSMEs at Howrah district in West Bengal. He tried to find out the scenario of institutional credit support by the banks and rank the major problems faced by the MSMEs. He explored that the most vital problems of MSMEs at Howrah are poor banking support, obsolete technology, competition, labor problems, infrastructural deficiency, etc. Rangacharya, K. (2014) attempted to analyses the growth trends of SMEs in Karnataka after enactment of MSMED Act 2006, and discussed the investment, employment, production and export performance of the SMEs in Karnataka state. Sathish. A. (2014) showed the trend of MSME in terms of number of units, employment and investment in Goa from 2007-08 to 2013-14. He also briefly discussed the issues related to closure of units.

Objective: The objectives of the present study are as follows.

- (i) To study the performance of micro, small and medium enterprises in Murshidabad in terms of their participation in trading, services or the manufacturing sector. We want to find out which sector has the highest participation rate in different economic activities.
- (ii) To know in what extent and magnitude the financial assistance affects the performance of MSMEs. So, we examine whether there exists any sort of correlation between the baseline yearly turnover and the loan amount sanctioned, the loan amount sanctioned and the yearly income and the numbers of workers employed in that enterprise and the yearly income of that enterprise.

Data: We have used cross-sectional data for the year of 2022 for the purpose of our study. Primary data have been collected on 150 micro-enterprises from the district of Murshidabad in West Bengal by employing survey method (using the format of a questionnaire and then asking them). Simple random sampling technique is used to collect the data so that there is no effect of sampling bias. We have synthesized the collected data on specific parameters like baseline yearly turnover, loan amount sanctioned, yearly income and the number of workers employed in those enterprises.

Methodology: For the purpose of this study, we have done some statistical analysis such as simple bar diagrams, pie charts and descriptive statistics of the selected variables to show and represent data. We have also run OLS regression where ever necessary to infer a meaningful relation between of the variables.

#### Analysis of Results:

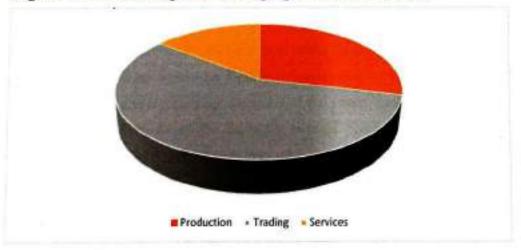
In the different types of microenterprises, trading sector elicits the highest participation rate followed by production sector and the services sector shown in table 2, and in figure 1.

Table 2. Different types of enterprises

Different types of Enterprises				
Production	44			
Trading	87			
Services	22			

Source: Author's own estimation

Figure 1. Microenterprises belonging to different sectors



Source: Author's own estimation

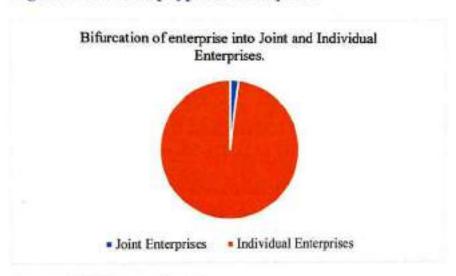
Table 3: Different kinds of Enterprises

Different kinds of Enter	rprises
Joint Enterprises	3
Individual Enterprises	147

Source: Author's own estimation

Next, we have tried to segregate the number of enterprises and demarcate them into either Joint enterprise and Individual enterprise. Joint enterprise is that enterprise which has more than 1 owners and, individual enterprise is that enterprise which has a single owner. We have found that a major portion of those enterprises are individual enterprises with the exception of a few. This result is only natural given that these enterprises are micro-enterprises and is most likely to be handled single-handedly.

Figure 2. Ownership types of Enterprises



Source: Author's own estimation

Now, we have shown the descriptive statistics of the various parameters in table 4. We have observed from the table 4 that the mean yearly income is 1484325.839, the median yearly income is 438000, and the standard deviation of the yearly income is 3384582.617 with the range being 27338500, where the maximum average yearly income is 27375000 and the minimum being 36500.

Table4. Descriptive statistics of income of microenterprises

The baseline average yearly turnover			
Mean	1484325.839		
Median	438000		
Mode	360000		
Standard Deviation	3384582.617		
Range	27338500		
Minimum	36500		
Maximum	27375000		

As it can be observed form Table 5, the mean yearly income of the trading sector is the highest at 1899428.313 followed by the production sector at 957332.5581 and then by the services sector at 927461.9048. Hence, it can be inferred that the trading sector is the most lucrative.

Table 5: Descriptive statistics of income of different sectors

Different types of enterprises	Mean yearly turnover	Standard deviation	Range	Median
Production sector	957332.5581	1544227.291	8963500	396200
Services Sector	927461.9048	1124665.376	4360000	480000
Trading sector	1899428.313	4326428.916	27331200	440200

Now, we want to decipher the impact of loan amount sanctioned on the baseline yearly turnover, and, for that purpose, we consider an OLS sample regression function of the form:

Y= a+bL where Y denotes the baseline yearly turnover and L denotes the loan amount sanctioned. Here, Y is the dependent variable and L is the independent variable.

After running the OLS estimation concerning the baseline yearly turnover and the loan amount sanctioned, we find that the value of "a" is equal to -348632.3896 and the value of b is equal to 56.41480892.

Table 6. Estimated OLS Regression where yearly turnover as regressand and loan amount sanctioned as regressor

Regression Statistics				
Multiple R	0.202898443			
R Square	0.041167778			
Adjusted R Square	0.034689182			
Standard Error	3316053.386			
Observations	150			

	Coefficients	Standard Error	t Stat	P-value
Intercept	- 348632.3896	772467.1357	-0.4513233	0.652417
Loan amount				
sanctioned	56.41480892	22.37973084	2.5207993	0.012769

As it can be seen from the above table 6 that the slope co-efficient between the baseline yearly turnover and the loan amount sanctioned is 56.41480892, or the change in the baseline yearly turnover pertaining to one unit change in loan amount sanctioned is 56.41480892. Hence, the regressor which is loan amount sanctioned has a significant positive impact on the baseline yearly turnover, which can serve as a policy prescription for the government. The regression statistics in table 6 reveal a lot of information regarding the nature of the data. As we observe from the table that the value of R<sup>2</sup> as well as multiple R<sup>2</sup> is so small which implies that the data has a lot of discrepancies or that the disturbance term is huge. This result is rightly corroborated by the fact that the standard error is also huge which means that there is a lot of inherent variability in the data that cannot be explained by the linear influence of the regressor on the regressand or the independent variable on the dependent variable (in this case, the independent variable is the loan amount sanctioned and the dependent variable is baseline yearly turnover.)

Next, we have to inspect whether there is any sort of relation between the loan amount sanctioned and the yearly income of the enterprise. For this, we use similar technique that we used in the case of baseline yearly turnover and the loan amount sanctioned. Here, we use the Ordinary Least Squares (OLS) regression technique and discern the effect that loan amount has had on the yearly income of the enterprise.

Let us consider the OLS Sample regression function of the form:

Y=c+dL; Where Y denotes the yearly income of the enterprise and L denotes the Loan amount sanctioned. Here, the yearly income, Y, represents the regressand or the dependent variable and, L, represents the regressor or the independent variable.

Table 7: Estimated OLS Regression where yearly income as regressand and loan amount sanctioned as regressor

#### SUMMARY OUTPUT

Regression Statistics			
Multiple R	0.21143476		
R Square	0.044704658		
Adjusted R			
Square	0.03820605		
Standard Error	332993.4008		
Observations	149		

	Coefficients	Standard Error	t Stat	P-value
Intercept	-33922.94848	77585.53499	-0.43723	0.662584
40000	5.90231323	2.250380884	2.622806	0.00964

After running the OLS estimation concerning the yearly income and the loan amount sanctioned, we find out that the value of the slope coefficient between the yearly income and the loan amount sanctioned is equal to 5.90, or the average change in Yearly income, Y, pertaining to one unit change in the loan amount sanctioned is equal to 5.90. Thus, it can be inferred that the loan amount sanctioned has a significant positive impact on the yearly income of the enterprise revealing pretty much the same result as in the case of baseline yearly turnover and the loan amount sanctioned. The regression statistics in Table 7 reveal a lot of information regarding the nature of the data. As we observe from the table that the value of R<sup>2</sup> as well as multiple R<sup>2</sup> is so small which implies that the data has a lot of discrepancies or that the disturbance term is huge. This result is rightly corroborated by the fact that the standard error is also huge which means that there is a lot of inherent variability in the data that cannot be explained by the linear influence of the regressor on the regressand or the independent variable on the dependent variable (in this case, the independent variable is the loan amount sanctioned and the dependent variable is yearly income.)

Next, we want to determine the impact of baseline yearly turnover on yearly income which implies whether any sort of change in the baseline yearly turnover causes change in the yearly income. We have used the familiar OLS regression technique to figure out the impact that baseline yearly turnover has on the yearly income.

The Sample regression line for this OLS estimation is of the form:

Y= k+mT where Y is the regressand or the dependent variable and T is the regressor or the independent variable and k &m are the intercept and the slope coefficients respectively.

Table 8: Estimated OLS Regression where yearly income as regressand and baseline yearly turnover as regressor

Regression Statistics		
Multiple R	0.99979018	
R Square	0.999580404	
Adjusted R		
Square	0.99957755	
Standard Error	6978.824321	
Observations	149	

	Coefficients	Standard Error	t Stat	P-value
Intercept	7698.203974	624.6316812	12.32439	2.04E-24
96000	0.100299404	0.000169491	591.7688	3.9E-250

After running the OLS estimation concerning the yearly income and the baseline yearly turnover, we find that the value of slope coefficient "m" or the average change in the yearly income pertaining to change in baseline yearly turnover is 0.1002. Despite the slope coefficient being very small, the baseline yearly turnover has a significant positive impact on the yearly income as portrayed by the large value of the t statistic. Moreover, as we can observe from Table 8, that the value of R2 and adjusted R2 is 0.9996 which is quite large, which implies that there is very little discrepancy in the model or that the disturbance term is quite small. This result is corroborated by the fact that the standard error is quite high which implies that there is a lot of inherent variability in the model which can be explained by the linear influence of the independent variable on the dependent variable. The fact that the baseline yearly turnover and the yearly income has a quite high correlation between them also has the serious implication that majority portion of the baseline yearly turnover is being converted and adding into yearly income. This can only happen only when the cost of production is so low that it is being met with only a minimal amount of turnover which is very reasonable given that majority of the enterprises surveyed here are individual enterprises.

Next, we want to decipher the impact that the number of workers employed in an enterprise has on the yearly income of that enterprise. For this, we use the following Sample regression function of the form:

Y= u+vL where Y denotes the yearly income of the enterprise and L denotes the number of workers employed in the enterprise including the owner; "u" and "v" represents the intercept and the slope coefficient between the yearly income of the enterprise and the number of workers employed in that enterprise.

After running the regression analysis concerning the yearly income and the number of workers employed in that enterprise shown in table 9, we find that the value of "v" is 11766.6 or the average change in the yearly income pertaining to one unit change in the number of workers employed is quite large. However, this result is misleading as the value of the "t" statistic is quite small and not sufficient enough for us to reject the null hypothesis which states that the change in the number of workers employed produces zero impact on the yearly income of the enterprise.

Table 9: Estimated OLS Regression where yearly income as regressand and number of workers as regressor

Regression Statistics		
Multiple R	0.105847416	
R Square	0.011203675	
Adjusted R Square	0.00447717	
Standard Error	338781.9148	
Observations	149	

-	Coefficients	Standard Error	t Stat	P-value
Intercept	130830.8843	34179.03084	3.827811	0.000191
1	11766.57437	9117.26419	1.290582	0.198875

Therefore, we can safely conclude that any change in the number of workers employed does not produce any sort of significant effect on the yearly income of the enterprise which is quite reasonable given that the majority of the enterprises are individual enterprises. So, size of the enterprises does not play any important role in determining the yearly income of that enterprise.

Conclusion: We can draw several deductions from this study that we have decided to undertake. In the present study, I have concentrated on the small-scale enterprises, and how they are benefitted by micro-credit and self-help groups. The aim of my study can be better described as my quest to delve deeper into the latent and immense growth prospect of microenterprises and the MSME sector, which has gradually developed to be the backbone of our economy. Now, based on my study and the results that I have derived, it is clear that there is a significant positive relationship between the loan amount sanctioned by CEF (Community Entrepreneurship Fund) and the baseline yearly turnover and the yearly income of the enterprise, which can serve as an important policy prescription for the West Bengal government. Given that the West Bengal government has already stated that its motive is to develop the prosperity of the MSME sector in the future, it should therefore concentrate in the outlets which can mobilise savings of the economy and provide riskless credit to these micro-enterprises so that they can successfully utilize it and add to the growth of the economy as a whole. There are several such outlets in present operation like OSF (One Stop Facilitation Fund), CEF (Community Entrepreneurship Fund), CIF (Community Investment Fund), EDP (Entrepreneurship Development Programme) which are doing a great job in successfully circumventing all the financial risks and providing loans to these microenterprises. Hence, the aim of the government should be to develop these outlets further or to seek the opening of such newer outlets in the future. Meanwhile, we have also noticed that there is a huge positive correlation between the baseline yearly turnover and the yearly income of that enterprise which means that a major portion of the turnover is actually adding to the yearly income due to the cost of production being quite low. This has serious economic implication because it indicates that the micro-enterprises can be most fruitful when it is run by a single individual rather than by a group of owners. Now, this finding can depress the prospect of these micro-enterprises employing more people to work under them, and thus eradicating disguised employment, but it can inspire other individual to become micro-enterpreneurs, contributing immensely to the economic growth and prosperity of the state.

Moreover, the state of West Bengal is a place where social dualism exists or it is an amalgam of capitalistic economy and rural economy and these sorts of micro-enterprises are the main pillars of strength of the rural economy. Hence, if the rural economy grows and develops hand in hand with the capitalistic economy, it will lead to the manifestation of the latent amazing growth prospects of this state into a reality and, West Bengal being much more prosperous and opulent in the future than it is now and, in this era, where India has successfully entered Rostow's "The Take-off Stage", development and enrichment of West Bengal should be the main motive driving all of us for a better future.

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GIG 25

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#### THE UNIVERSITY OF BURDWAN



# Curriculum and syllabus for 3- yr. B.Sc. General in Plant Protection Under Choice Based Credit System

(CBCS) (w.e.f. Academic Year

2017-2018)

#### **Scheme for Choice Based Credit System in B.Sc. with Plant Protection:**

Semester	Core Course (12)	Ability	Skill enhancement	Discipline specific
		Enhancement	course (SEC) (2)	elective DSE (6)
		compulsory course		
		(AECC) (2)		
	Discipline 1 (Plant			
SEM-I	Protection)	Environmental		
	CC 1A: Pests and Vectors	Studies (ENVS)		
	Discipline 2 (other)			
	CC 2A:			
	Discipline 3 (other)			
	CC 3A:			
	Discipline 1 (Plant			
SEM-II	Protection)	Communicative		
	CC 1B: Pests management	English /MIL		
	Discipline 2 (other)			
	CC 2B:			
	Discipline 3 (other)			
	CC 3B:			
	Discipline 1 (Plant			
SEM-III	Protection)		SEC-1	
	CC 1C: Bionomics, Plant			
	Diseases and their			

	Management Discipline 2 (other) CC 2C: Discipline 3 (other) CC 3C:		
SEM-IV	Discipline 1 (Plant Protection) CC 1D: Plant's defence Mechanism Discipline 2 (other) CC 2D: Discipline 3 (other) CC 3D:	SEC-2	
SEM-V			DSE-1A: (Plant Protection): Integrated Pest Management/ Seed Pathology and Seed Treatment DSE-2A (other) DSE-3A (other)
SEM-VI		SEC-4	DSE – 1B: (Plant Protection): Biotechnology in Plant Protection/ Dissertation DSE - 2B (other) DSE- 3B (other)

#### Semester –VI

#### Discipline specific Electives

(1) Dissertation (Curriculum based local area survey of pest and crop) Credit: 6



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This Institution is Ragging Free

#### PROJECT COMPLETION CERTIFICATE

This is to certify that the following students have successfully completed their dissertation (curriculum based local area survey of pest and crop) of semester VI in Plant Protection under the supervision of the faculties of Plant Protection Department as listed below:

SI.No.	Name of the students	Title of the projects	Name of the Supervisor
1	Bappa Mondal	A survey on potato cultivation, insect pest, bio- control agent and their management in Amritpur, suri, Birbhum	Dr. Tanmoy Mandal
2	Indranii Mal	A survey on rice cultivation, insect pest, bio-control agent and their management at Gobra village, Kendua, Birbhum, West Bengal	Dr. Tanmoy Mandal
3	Sumaiya Nasrin	Survey of local common crop plants, their important diseases and the impact of systemic fungicides on them	Dr. Papia Mandal (Raha)

H.O.D.

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# THE UNIVERSITY OF BURDWAN

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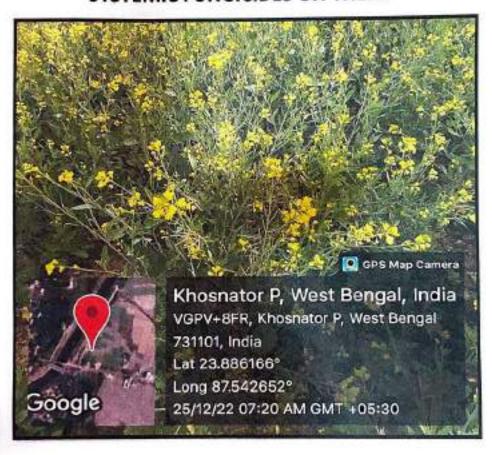
SEMESTER: 6TH SEMESTER

SUBJECT: PLANT PROTECTION

YEAR: 3<sup>RD</sup> YEAR (BIO GENERAL) 2023



## SURVEY OF LOCAL COMMON CROP PLANTS, THEIR IMPORTANT DISEASES AND THE IMPACT OF SYSTEMIC FUNGICIDES ON THEM.





I DEDICATE MY DISSERTATION WORK TO MY PARENTS AND BELOVED TEACHERS.



I, sumaiya nasrin ,declare that this dissertation entitled "survey of local common work crop plants, their important diseases and the impact of systemic fungicides on them " been originally carried out by me under the supervision of **D**r. Papiya Mandal (raha), deperment of plant protection, suri vidyasagar college , 731101. this work has not been submitted else where either in part or entirely copied for the degree or diploma.

Papia Mardel (Rohe) 27-07-23 Sumaiya Kassin 27-06-23

signature of the supervisor

signature of the candidate

#### EXAMINED



27/08/2023 signature of the H.O.D

## ACKNOWLEDGEMENT

It is my great opportunity to express my sincere gratitude appreciation acknowledgement to them who directly and indirectly have helped me to complete my curriculum based dissertation work.

I would first like to thanks of my gratitude to my supervisor, professor Dr. PAPIYA MANDAL (RAHA) for her valuable guidance through out my survey she provided me precious information for choosing the proper title for the dissertation work and directs me to complete my dissertation work successfully.

I would also like to thanks our head of the department professor Dr. TANMAOY MANDAL, whose valuable opinion and methodology make me enriched.

In addition , I would like to thanks MADHUSUDAN BISWAS , the education staff of our department who helped me in this dissertation work .

I would also thank my parent for their wise council and pleasentc ambience .

Finally, I cannot complete this dissertation work without the support of the beloved friends Indranil Mal and Bappa Mondal.

I would like thanks RAMACHANDRA GHOSH for starting our first dissertation work in his crop plants field and he has helped us with various information.

I would also like to thanks SK RASHID ALI and his colleagues for giving us the opportunity to complete dissertation work in their own garden house.

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India is an agricultural country, India's agricultural system depends on nature. Human has inseparable association with plants. Plants not only provide basic necessities of human being viz food, fuel, fiber, fodder, timber but also maintain vital and most crucial role in maintaining ecosystem and environmental balance.

susceptibility of the crop plants to pest and diseases causes damages and enormous issues often causing complete elimination of their plants.

Agriculture is the practice of cultivating plants and life stalks in order to provide facilities to the human being. Primary objective of agricultural project is to introduce modern method of cultivation to generate large scale production and thus providing an opportunity to the unemployment youths of the society to adopt agriculture as a means of earning livelihood and attaining economic empowerment.

For the planning and agricultural project we must follow some procedures proper planning mast be based on the specific and unique field condition; its trends and changes besides this, in aspects of watering, proper irrigation; climate control also be mentioned.

Last but not the least, providing proper nutrients must be applied.

To execute our curriculum based activity we had to go different crop fields such as mustard, paddy, potato, different types of vegetable and noticed small amount of insect pest such as red pumpkin beetle, aphids, caterpillar, etc. and nematode also these insects damaged the crop plants in many ways we noticed huge amount of plant diseases such as Alternaria blight of mustard, leaf roll of potato and chili, late blight of potato, phomopsis blight of brinjal, blight of amarenthus sp., downymildew of brinjal.

we also visited some agricultural farm to gather our knowledge in nature. Besides the different types of pest, a number of local weeds belonging to different families including medicinal plants had been also noticed.



we gained profuse knowledge from the fields farms apart from our class lesson.

Such type of pathogen can be controlled in different manner such as cultural, physical, biological and chemical method as a last resort.

Farmers are using different chemical pesticides including fungicides in an unregulated manner; that's why crop plants are affecting very much simultaneously environment also become polluted. To overcome these type of situation we, students of 6th semerster, are are trying to control the desired the selectivepest through chemical methods.



Cultivation of plants by human being is the core of agriculture, which in turn has played a key role in the history of world civilization. Agriculture includes agronomy for arable crops, horticulture for flowers. And fruits and forest tree for timber plants are multicelluler eukaryotes obtain their energy from sunlight using carbon-di-oxide and chlorophyl they can synthesized their own by the process of photosynthesis. Without plant life on earth could not exist. Directly or indirectly plants are the primary source of food for human and animal. Approx seven thousand different plant species have been used as food by people.

The major staples include cereals such as rice wheat; starchy roots and tubers sudh as potato, cassava; legumes such as peas and beans; vegetable oil such as olive oil provide lipid; while fruit and vegetable contribute vitamin and mineral to diet.

Medicianal plants are a primary sources of organic compounds, both for their medicinal and physiological effects. Modern medicine derived from plants include aspirin, taxol, morphilin, quinine, reserpine etc.

Plants grown as industrial crops are the sourceso of a wide range of products used in manufacturing. Structure resources and fibre from plants are used to construct dwellings and to manufacture clothing thousands of plan species are also cultivated for their beuty and fragnance.

So they are more precious gift of humanity on earth from nature for which we must be gratefull.

Suri and its adjoining areas of Birbhum district, is one of the crop (rice, wheat, mustard, pulses, different types of vegetables)

Yielding region. Soil of the lateritic belt is good enough for growing healthy crops.

Farmers are caltivating crop plants by providing proper nourishment, moisture and sufficient light reaches on their leaves and the temperature remains with in a normal range.

# REVIEW OF LITRETURE



Agriculture plays a vital role in economy as well as it is considered to be the backbone economic system for developing country. For decades, agriculture has been related with the production of important fruit crop. Agricultural largly dependent on a number of factors such as

### SOIL TYPE

Soil containing different types of mineral nutrients (
nitrogen, phosphorus, potassium etc.) which affect
the intensis cultivation of crop plant. in our
Birbhum district mainly lateritic soil are found. Such
type of soils are generally suitable for most of the
dryland crop. It is mainly cultivated with rice, wheat,
mustard, potato etc.

propagated derectly from the seed and it can be shown in the field by broad casting or by mechanical drilling.

Rice, (Oryzae sativa) edible starchy cereal grain and grass plant by which it is producted. the cultivated rice plant is an annual grass plant and grows to about 1.2m (approx.) in height. the leaves are long and flatend and are borned on hollow steam. the panical or inflowrence is made3 up of spikelet bearing flowering that produce the food or grain.

#### SCIENTIFIC CLASSIFICATION

Kingdom: Plantae

Order: Poales

Family: Poaceae

Genus : Oryza

Species: O. sativa

Binomial name: Oryza sativa

POTATO PLANT



vegetatively propagate desired characteristics. Indeed, vegetative reproduction is always used commercially, though the resulting decrease in genetic diversity has made the popular varieties more vulnerable to pests and diseases.

#### SCIENTIFIC CLASSIFICATION

Scientific name: Solanum tuberosum

Kingdom: Plantae

Phylum: Magnoliophyta

Class: Magnoliopsida

Order: Solanales

Family: Solanaceae

Genus: Solanum

Species: tuberosum



# CROP PLANTS AFFECTED BY PHYTO PATHOGENIC MICROORGANISM

#### MUSTARD PLANT

Various important diseases are found in mustard plant Alternaria blight (causal organism Alternaria brassicae), club root of crucifers(causal organism plasmodiphora brassicae).

Among these, Alternaria blight is one of most common and distractive diseases of mustard crop in india (S.J Kolte, 1985) Alternaria blight diseases caused by Alternaria brssicae has been repeated from all the continents of the workd and is one among the important diseases of india.

Mustard causing upto 47% yield losses, average yield losses is the rate of 32% to 87% due to Alternaria blight has been repeated

parts of Asia (Mew & Gonzales, 2002), causing significant grain yield losses in these regions (Sunder et al., 2014). The fungus can also infect a wide range of grasses including switchgrass (Panicum virgatum; Krupinsky et al., 2004) and the American wild rice (Zizania palustris; Johnson & Percich, 1992).

The disease cycle and epidemiology of B. oryzae have been extensively studied on rice (Ou, 1985; Webster & Gunnell, 1992; Barnwal et al., 2013). Conidia and mycelia on seeds and in crop residues are thought to be the most common survival structures and sources of primary inoculum. The fungus infects leaves, panicles, glumes, stems, sheaths and grain hulls. The major damage in rice is due to fungal infections during the seedling stage that weaken plants and consequently reduce grain yield (Ou, 1985; Webster & Gunnell, 1992). Fungicide applications and proper plant nutrition are the major disease management strategies used by growers due to lack of high levels of genetic resistance in current commercial cultivars (Ou, 1985; Webster & Gunnell, 1992; Barnwal et al., 2013).

#### POTATO PLANT.

potato is one of the most important vegetable and fourth most important in India. Various important diseases are found in potato plant, among these potato leaf roll virus (PLRV) is one of the most important damaging viral diseases of potato distributed widely in potato growing areas of different parts of world PLRV is a single strainded positive sence RNA virus which belongs to the genus polerovirus of family Luteoviridae (Mayo et al , 1989).the PLRV is circulative , non propagative virus transmitted exclusively by aphid and is capable of causing severe yield and quality losses in potato (Flanders et al, 1990). Banttary et al. (1993) reported that planting of PLRV infected seed tubers can causes yield loss of

80%.some reports
have stimeted that
the virus causes 20
million tons of potato
production loss globally (Taliansky et al,
2003; Abbas et al,2016).





- to gather knowledge of Birbhum as well as local agricultural field
- to identify the local important food crop in open field amd agricultural farm.
- to know the idea about seasonal crop in our locality.
- To identify the pathogen properly thet cause the diseases of the crop .
- 5. To detect the inefected our locality.
- 6. To know how t cultivate crop plant.
- To know the plant pathogen interaction in relation with environment.
- To know the mechanism of disease development of pathogen.
- To develop the amount measure of plant diseases by chemical method.

# MATERIALS AND METHOD

Under the syllabus of plant protection we, 6<sup>th</sup> semester students opted the dissertation that is curricullam baed local area survey of pest and crop.

To complete the dissertation we surveyed the agricultural field small farm etc.

#### MATERIALS

to conduct this curricullam based dissertation survey we needed some metarials like note book, pencil, magnifying glass, scissors, polythin bag, watch glass, mercuric chloride, sterile water, alchohol pettri plates etc. a systemic fungicide like carbendazine as a chemical control agent; and last but not the least camera with 50 mp along with GPS map camera.

#### METHODS

During this survey, we visited mustard, rice, potato, brijanl, leafy vegetables like amarenthus in the agricultural field.

#### DAY 1

on 16<sup>th</sup> November 2022--- I along with my co-workers Indranil Mal and Bappa Mondal performed our field survey with our teacher Papiya Mandal (raha). This field is located in a village khosnator about 3km from our

seed should be treated with 3 grams of dithane M 45 per kg of seeds .

#### SEED SHOWING

Seeds are sown directly In the field by broadcasting method.seed should germinate in around 7-14 days at a soil temp 18°-20°. mustard cultivation required 125 gm per katha.

#### IRRIGATION

first irrigation should be given at the flowering stage which is obout 30 after showing sowing. The 2<sup>nd</sup> irrigation . should be given at the pod formation stage which is about 30 after showing. The pod formation stage which is about 60-65 days after sowing.

#### WEEDS CONTROL

Metalochlor, pendi methyline are the most affecting harbicides used for controlling grass weeds and solanacidse weeds.

#### DAY 2

On 26<sup>th</sup> November 2022, we visited the same field to notice the mustard plant we were astonished to notice the mustard plant we were astonished to see the growth of musterd plant. Some paints becoming but

#### DISCUSSION

prom our field survey it can be concluded that major crops in suri and its adjoining areas. Very often these crops are being infected with fungi, bacterial pathogensas well as virus. Such type pathogens can be controlled by different types of chemical methods. To kill the the fungi, we use contact as well as systemic fungicides. In case of viral infection, we use in-secticides for killing the insect vectors of the virus. Though I have taken only one fungicides for controlling the disease of vegetable crop of brinjal. But in future, I shall try to solve the problem of other crops such as potato leaf curl, alternaria blight of mustard, late blight of potato in different manner.

I have done curriculum based survey on some common crop plants for about 3-4 months in open agricultural field and farm of Suri and its adjoining areas.

I have mainly surveyed mustard, potato, rice, vegetable field. While conducting this survey, I came to know a lot of information about the characteristic, cultivation, disease of these crop plants. and at the same time I gathered knowledge about the pathogen. I have seen alternaria blight of mustard, potao leaf roll disease and late blight of potato, a divasting disease, phomopsis blight of brinjal can be observed. We have noticed the symptoms of the disease directly and realized how terrible crop disease can be and how they can damage the desired crops.

I did not work with all the crop plants, but I have visited many places with my co-workers and teachers there I also saw crop diseases like rice, wheat, tomato, sugarcane etc, observed the symptoms and learned about the measures taken by the farmers to control diseases. So, as a result of the survey, we have learned as much as we have known apart from our classroom lesson.

#### ENVIRONMENTAL STUDIES

Credits: 4

#### **Course Code: AEECC1**

#### COURSE TITLE: FUNDAMENTALS OF ENVIRONMENTAL STUDIES

Lectures-80

#### **Unit 1: Basic of Environmental Studies**

(06)

Definition, Nature, Scope and Importance; Components of environment: Environmental education

#### **Unit 2: Natural Resources: Renewable & Non-renewable Resources**

**(15)** 

Nature and natural resources their conservation and associated problems:

- Forest resources: Uses, types and importance, Joint Forest Management & Tribal population,
   Deforestation and its effects
- Water resources: Distribution of water on Earth; Use, over exploitation of surface and ground water; Dams: Benefits and problems; Flood and Drought
- Mineral resources: Mineral resources in India; Use and exploitation, Social impacts of mining
- Food resources: World food problems and food insecurities.
- Energy resources: Renewable and Non-renewable energy sources; Use of alternate energy sources Case studies
- Land resources: Land as a resource; Land degradation, landslides, soil erosion, desertification
- Use of resources for sustainable development

#### **Unit 3: Ecology & Ecosystems**

(12)

Concept of ecology, Population ecology, Community ecology

- Concept of an ecosystem, different types of ecosystem
- Food chains, food weds and ecological succession
- Energy flow in the ecosystem and energy flow models

#### **Unit 4: Biodiversity & Conservation**

**(12)** 

- Biodiversity: Levels of biological diversity
- Values of biodiversity
- Hot-Spots of biodiversity, Mega-biodiversity countries
- Threat to biodiversity
- Threatened and endemic species of India
- Conservation of biodiversity (*In- situ* and *Ex-situ*)
- Ecosystem services: Ecological, Economical, Social, Ethical, Aesthetical and Informational values

#### **Unit 5: Environmental Pollution & Management**

**(12)** 

- (a) Nature, Causes, Effects and Control measures of –
- (i) Air pollution
- (ii) Water pollution
- (iii) Soil pollution
- (iv) Noise pollution
- v) Nuclear hazards
- (b) Fireworks Pollution: Definition, Composition/Ingredients, effects, monitoring strategies
- Solid waste management: Causes, effects and disposal methods; Management of biomedical and municipal solid wastes
- Disaster management: Floods, Earthquake, Cyclone and Landslides

#### **Unit 6: Environmental Policies & Practices**

(15)

- Constitutional Provisions for protecting environment- Articles 48(A), 51 A (g)
- Environmental Laws: The Environment (Protection) Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981; The Water (Prevention and Control of Pollution) Act 1974; Forest (Conservation) Act, 1980
- The wildlife Protection Act, 1972
- Climate change, Global warming, ENSO, Acid rain, Ozone layer depletion; Montreal and Kyoto Protocols

#### **Unit 7: Human Communities & Environment**

(08)

- Human population growth; Impacts on environment
- Population explosion Family Welfare Programme
- Environment and human health: Concept of health and disease; Common communicable and Non-communicable diseases; Public awareness
- Environment movements in India: Chipko Movements, Silent Valley Movement, Movements in Karnataka

#### Unit 8: Field Work Report/Project Report/Term paper (based on any one of the following topics and to be evaluated by internal teachers only)

- Environmental assets River/Forest/Grassland/Hill/Mountain *etc*.
- Environmental pollution Urban/Rural/Industrial/Agricultural
- Study of common Plants/Insect /Birds/Wild life *etc*.
- Study of simple ecosystems: Pond/River/Hill slope *etc*.
- Municipal solid waste management and handling.



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#### PROJECT COMPLETION CERTIFICATE

This is to certify that the following students have successfully completed their Environmental Studies Project (ENVS) relating to the paper AECC-1 in the academic Year 2022-23:

Title of the Project: Environmental Pollution

Name of the Supervisor: Papri Mukherjee, SACT( Environmental Science), Suri Vidyasagar College

Sl.No.	Course	Paper	Year	Name of the Student
1	BA/BCOM	AECC-1	2022-23	AAMAN KHAN
2	BA/BCOM	AECC-1	2022-23	ABDUL BARIK
3	BA/BCOM	AECC-1	2022-23	ABDUL KALAM
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77	BA/BCOM	AECC-1	2022-23	ASMA KHATUN	
178	BA/BCOM	AECC-1	2022-23	ASMA KHATUN	
179	BA/BCOM	AECC-1	2022-23	ASMATARA KHATUN	
80	BA/BCOM	AECC-1	2022-23	ASRAFUL HAQUE	
181	BA/BCOM	AECC-1	2022-23	ASRAUL HOQUE	
182	BA/BCOM	AECC-1	2022-23	ASRUPA KHATUN	
183	BA/BCOM	AECC-1	2022-23	ASRUPA KHATUN	
184	BA/BCOM	AECC-1	2022-23	ASTIK HAZRA	
185	BA/BCOM	AECC-1	2022-23	ASTOJIT ROY	
186	BA/BCOM	AECC-1	2022-23	ATANU DUTTA	
187	BA/BCOM	AECC-1	2022-23	ATANU MAHARA	
188	BA/BCOM	AECC-1	2022-23	ATASHI MANDAL	
189	BA/BCOM	AECC-1	2022-23	ATIFA PARVIN	
190	BA/BCOM	AECC-1	2022-23	ATIKUR RAHAMAN MOLLAH	
191	BA/BCOM	AECC-1	2022-23	AVUIT MONDAL	- 1
192	BA/BCOM	AECC-1	2022-23	AYESA JULEKHA	
193	BA/BCOM	AECC-1	2022-23	AYESA KHATUN	
194	BA/BCOM	AECC-1	2022-23	AYESHA KHATUN	
195	BA/BCOM	AECC-1	2022-23	AYESHA KHATUN	- 3
196	BA/BCOM	AECC-1	2022-23	AYESHA KHATUN	
197	BA/BCOM	AECC-1	2022-23	AYESHA KHATUN	
198	BA/BCOM	AECC-1	2022-23	AYESHA KHATUN	
199	BA/BCOM	AECC-1	2022-23	AYESHNUR KHATUN	
200	BA/BCOM	AECC-1	2022-23	AZIZ SHA	- 00
201	BA/BCOM	AECC-1	2022-23	AZIZA KHATUN	
202	BA/BCOM	AECC-1	2022-23	BABLI GARAIN	
203	BA/BCOM	AECC-1	2022-23	BABLU MADDI	
204	BA/BCOM	AECC-1	2022-23	BABUDHAN TUDU	
205	BA/BCOM	AECC-1	2022-23	BABUL BIRBANSHI	
206	BA/BCOM	AECC-1	2022-23	BABUSONA BAGDI	
207	BA/BCOM	AECC-1	2022-23	BABY DAS	
208	BA/BCOM	AECC-1	2022-23	BABY KHATUN	
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211	ва/всом	AECC-1	2022-23	BAISAKHI HANSDA	
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213	BA/BCOM	AECC-1	2022-23	BAISAKHI SADHU	
214	BA/BCOM	AECC-1	2022-23	BAISHAKHI LOHAR	
215	BA/BCOM	AECC-1	2022-23	BAISHAKHI SAHA	
216	BA/BCOM	AECC-1	2022-23	BAKUL DAS	
217	BA/BCOM	AECC-1	2022-23	BALARAM BAURI	





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218	BA/BCOM	AECC-1	2022-23	BALARAM MONDAL
219	BA/BCOM	AECC-1	2022-23	BALIKA BASKI
220	BA/BCOM	AECC-1	2022-23	BANANI BITTAR
221	BA/BCOM	AECC-1	2022-23	BANASHREE DAS
222	BA/BCOM	AECC-1	2022-23	BANDHAN SAHA
223	BA/BCOM	AECC-1	2022-23	BANTI CHAKRABARTY
224	BA/BCOM	AECC-1	2022-23	BAPI DAS
225	BA/BCOM	AECC-1	2022-23	BAPI DAS
226	BA/BCOM	AECC-1	2022-23	BAPI MAJUMDAR
227	BA/BCOM	AECC-1	2022-23	BARISH CHATTORAJ
228	BA/BCOM	AECC-1	2022-23	BARNALI BAGDI
229	BA/BCOM	AECC-1	2022-23	BARNALI DAS
230	BA/BCOM	AECC-1	2022-23	BARNALI PAL
231	BA/BCOM	AECC-1	2022-23	BARSHA BEGUM
232	BA/BCOM	AECC-1	2022-23	BARSHA DALUI
233	BA/BCDM	AECC-1	2022-23	BARSHA DALUI
234	BA/BCOM	AECC-1	2022-23	BARSHA GHOSH
235	BA/BCOM	AECC-1	2022-23	BARSHA GHOSH
236	BA/BCOM	AECC-1	2022-23	BARSHA KAHAR
237	BA/BCOM	AECC-1	2022-23	BARSHA MONDAL
238	BA/BCOM	AECC-1	2022-23	BASANTI HEMBROM
239	BA/BCOM	AECC-1	2022-23	BASANTI MURMU
240	BA/BCOM	AECC-1	2022-23	BEAUTI KHATUN
241	BA/BCOM	AECC-1	2022-23	BEAUTY DAS
242	BA/BCOM	AECC-1	2022-23	BEAUTY DEY
243	BA/BCOM	AECC-1	2022-23	BELI TUDU
244	BA/BCOM	AECC-1	2022-23	BHABANI ANKUR
245	BA/BCOM	AECC-1	2022-23	BHAGIRATH SADHU
246	BA/BCOM	AECC-1	2022-23	BHAJAN DAS
247	BA/BCOM	AECC-1	2022-23	BHASKAR GHOSH
248	BA/BCOM	AECC-1	2022-23	BHASWATI GHOSH
249	BA/BCOM	AECC-1	2022-23	BHIM ANKUR
250	BA/BCOM	AECC-1	2022-23	BHOLANATH ANKURE
251	BA/BCOM	AECC-1	2022-23	BIBEK MONDAL
252	BA/8COM	AECC-1	2022-23	BIDISHA GHOSH
253	BA/BCOM	AECC-1	2022-23	BUAY KAHAR
254	BA/BCOM	AECC-1	2022-23	BUOY MAL
255	BA/BCOM	AECC-1	2022-23	BUOY SHAW
56	BA/BCOM	AECC-1	2022-23	BUOY SOREN
117	BA/BCOM	AECC-1	2022-23	BUOY SUTRADHAR
57	BA/BCOM	AECC-1	2022-23	BIKASH KAPAR
58	BA/BCOM	AECC-1	2022-23	BIKRAM BAGDI
59	-	AECC-1	2022-23	BIKRAM DAS
60	BA/BCOM	AECC-1	2022-23	BIKRAM MAHARA
61	BA/BCOM	AECC-1	2022-23	BIKRAM MAL
62	BA/BCOM BA/BCOM	AECC-1	2022-23	BILTU BAGDI



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4		AECC-1	2022-23	BIPASA GARAI
5	BA/BCOM	AECC-1	2022-23	BIPASHA DUTTA
66	BA/BCOM	AECC-1	2022-23	BIPLAB BAGDI
67	BA/BCOM	AECC-1	2022-23	BIPUL DAS
68	BA/BCOM		2022-23	BISHAL MOLLA
69	BA/BCOM	AECC-1	2022-23	BISHAL RAJAK
70	BA/BCOM	AECC-1	2022-23	BISHAL SARKAR
71	BA/BCOM	AECC-1	2022-23	BISHNU BAGDI
272	BA/BCOM	AECC-1	2022-23	BISHNU CHARAN BAGDI
273	BA/BCOM	AECC-1	The second secon	BISHNU DAS
274	BA/BCOM	AECC-1	2022-23	BISHNU DAS
275	BA/BCOM	AECC-1	2022-23	BISHNU LOHAR
276	BA/BCOM	AECC-1	2022-23	BISHNU ROY
277	BA/BCOM	AECC-1	2022-23	BISHNUPRIYA DAS
278	BA/BCOM	AECC-1	2022-23	BISHNUPRIYA KISKU
279	BA/BCOM	AECC-1	2022-23	BISWAJIT BAGDI
280	BA/BCOM	AECC-1	2022-23	BISWAJIT BALA
281	BA/BCOM	AECC-1	2022-23	BISWAJIT BANERJEE
282	BA/BCOM	AECC-1	2022-23	BISWAJIT DAS
	BA/BCOM	AECC-1	2022-23	BISWAJIT SAHA
283	BA/BCOM	AECC-1	2022-23	BITHI BITTAL
284	BA/BCOM	AECC-1	2022-23	BITTU BAURI
285	BA/BCOM	AECC-1	2022-23	BOBY MURMU
286	BA/BCOM	AECC-1	2022-23	BONASREE MAL
287	BA/BCOM	AECC-1	2022-23	BRAJOGOPAL GHOSH
288	BA/BCOM	AECC-1	2022-23	BRIHASPATI DAS
289	BA/BCOM	AECC-1	2022-23	BRISHTI ACHARYA
290	BA/BCOM	AECC-1	2022-23	BRISHTI MONDAL
291	BA/BCOM	AECC-1	2022-23	BRISHTI SHEE
292	BA/BCOM	AECC-1	2022-23	BRISTI BAHADUR
293	BA/BCOM	AECC-1	2022-23	BRISTI DAS
294	BA/BCOM	AECC-1	2022-23	BRISTI DHIBAR
295	BA/BCOM	AECC-1	2022-23	BRISTI MONDAL
296	BA/BCOM	AECC-1	2022-23	BUBAI DALUI
297	BA/BCOM	AECC-1	2022-23	BUBAI MAL
298	BA/BCOM	AECC-1	2022-23	BUDDHADES BAGDI
299	BA/BCOM	AECC-1	2022-23	BUDDHADEB YADAV
300	BA/BCOM	AECC-1	2022-23	BUDDHADEV DAS
301	BA/BCOM	AECC-1	2022-23	BUDDHADEV KAHAR
302	BA/BCOM	AECC-1	2022-23	BUDI MURMU
303	BA/BCOM	AECC-1	2022-23	CHAINA SAHA
304	BA/BCOM	AECC-1	2022-23	CHAITALI BAGDI CHAITALI SOREN
305	PA/BCOM	AECC-1	2022-23	CHAMPA BAGDI
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10	BA/BCOM	AECC-1	2022-23	CHANDAN DAS
311	BA/BCOM	AECC-1	2022-23	CHANDAN HANSDA
12	BA/BCOM	AECC-1	2022-23	CHANDANA MAHARA
13	BA/BCOM	AECC-1	2022-23	CHANDI CHARAN DAS
14	BA/BCOM	AECC-1	2022-23	CHANDNI KHATUN
315	BA/BCOM	AECC-1	2022-23	CHANDRA BHATTACHARYA
316	BA/BCOM	AECC-1	2022-23	CHANDRA HAZRA
317	BA/BCOM	AECC-1	2022-23	CHANDRABALI DEY
318	BA/BCOM	AECC-1	2022-23	CHANDRABATI KHAIRA
319	BA/BCOM	AECC-1	2022-23	CHANDRANI BAGDI
320	BA/BCOM	AECC-1	2022-23	CHANDRANI CHATTARAJ
321	BA/BCOM	AECC-1	2022-23	CHARLES HEMBRAM
322	BA/BCOM	AECC-1	2022-23	CHHABI MARDI
323	BA/BCOM	AECC-1	2022-23	CHIRANTAN GANGULY
324	BA/BCOM	AECC-1	2022-23	CHITRA GHOSH
325	BA/BCOM	AECC-1	2022-23	CHOTTU NANDI
326	BA/BCOM	AECC-1	2022-23	CHUMKI GHOSH
327	BA/BCOM	AECC-1	2022-23	DASARATH HANSDA
328	BA/BCOM	AECC-1	2022-23	DAYAMOY MONDAL
329	BA/BCOM	AECC-1	2022-23	DAYAMOY SWARNAKAR
330	BA/BCOM	AECC-1	2022-23	DEBABRATA MONDAL
331	BA/BCOM	AECC-1	2022-23	DEBABROTO CHATTERJEE
332	BA/BCOM	AECC-1	2022-23	DEBARATI MUKHERJEE
333	BA/BCOM	AECC-1	2022-23	DEBASISH DAS
334	BA/BCOM	AECC-1	2022-23	DEBASISH GARAIN
335	BA/BCOM	AECC-1	2022-23	DEBASISH GHOSH
336	BA/BCOM	AECC-1	2022-23	DEBASISH GHOSH
337	BA/BCOM	AECC-1	2022-23	DEBASISH SAHA
338	BA/BCOM	AECC-1	2022-23	DEBASISH SINGHA
339	BA/BCOM	AECC-1	2022-23	DEBASRITA GANGULI
340	BA/BCOM	AECC-1	2022-23	DEBIKA ANKUR
341	BA/BCOM	AECC-1	2022-23	DEBIKA GARAIN
342	BA/BCOM	AECC-1	2022-23	DEBIKA MAL
343	BA/BCOM	AECC-1	2022-23	DEBIPRASAD MONDAL
344	BA/BCOM	AECC-1	2022-23	DEBJIT CHATTERJEE
345	BA/BCOM	AECC-1	2022-23	DEBJIT MONDAL
346	BA/BCOM	AECC-1	2022-23	DEBKANTA MONDAL
347	BA/BCOM	AECC-1	2022-23	DEBKANTA MONDAL
348	BA/BCOM	AECC-1	2022-23	DEBLINA SEN
349	BA/BCOM	AECC-1	2022-23	DEBNATH ROY
350	BA/BCOM	AECC-1	2022-23	DEBOBRATA PAL
351	BA/BCOM	AECC-1	2022-23	DEBOJIT BAGDI
352	BA/BCOM	AECC-1	2022-23	DEBOJYOTI DOME
353	BA/BCOM	AECC-1	2022-23	DEBOLINA GHOSH
354	BA/BCOM	AECC-1	2022-23	DEBPARNA MUKHERJEE
355	BA/BCOM	AECC-1	2022-23	DEBRANJAN DAS





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356	BA/BCOM	AECC-1	2022-23	DEEP BAGDI
357	BA/BCOM	AECC-1	2022-23	DEEP JADAB
158	BA/BCOM	AECC-1	2022-23	DEEP PAL
359	BA/BCOM	AECC-1	2022-23	DEEP SUTRADHAR
360	BA/BCOM	AECC-1	2022-23	DEVKANTA MONDAL
361	BA/BCOM	AECC-1	2022-23	DEYA MONDAL
362	BA/BCOM	AECC-1	2022-23	DHANU HANSDA
363	BA/BCDM	AECC-1	2022-23	DHARITRI DAS
364	BA/BCOM	AECC-1	2022-23	DHONMUNI MURMU
365	BA/BCOM	AECC-1	2022-23	DHRITI DAS
366	BA/BCOM	AECC-1	2022-23	DHRUBA CHOWDHURY
367	BA/BCOM	AECC-1	2022-23	DIBAKAR DAS
368	BA/BCOM	AECC-1	2022-23	DIBYENDU GHOSH
369	BA/BCOM	AECC-1	2022-23	DIKSHA SARKAR
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371	BA/BCOM	AECC-1	2022-23	DIPA DAS
372	BA/BCOM	AECC-1	2022-23	DIPA MAHARA
373	BA/BCOM	AECC-1	2022-23	DIPA MONDAL
374	BA/BCOM	AECC-1	2022-23	DIPAK DAS
375	BA/BCOM	AECC-1	2022-23	DIPAK MAL
376	BA/BCOM	AECC-1	2022-23	DIPANKAR BADYAKAR
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379	BA/BCOM	AECC-1	2022-23	DIPIKA HEMBROM
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384	BA/BCOM	AECC-1	2022-23	DISHA MAHARA
385	BA/BCOM	AECC-1	2022-23	DISHA MONDAL
386	BA/BCOM	AECC-1	2022-23	DISHA SHARMA
387	BA/BCOM	AECC-1	2022-23	DOLAN GHOSH
388	BA/BCOM	AECC-1	2022-23	DOLORES HEMBRAM
389	BA/BCOM	AECC-1	2022-23	DOYEL LAHA
390	BA/BCOM	AECC-1	2022-23	DOYEL MONDAL
391	BA/BCOM	AECC-1	2022-23	DURGA MANI MURMU
392	8A/BCOM	AECC-1	2022-23	ESHA PARVIN
393	BA/BCOM	AECC-1	2022-23	ESHAN MONDAL
394	BA/BCOM	AECC-1	2022-23	FAHMIDA KHATUN
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395 396	BA/BCOM	AECC-1	2022-23	FALGUNI MAL
-	BA/BCOM	AECC-1	2022-23	FALGUNI ROY
397	BA/BCOM	AECC-1	2022-23	FALGUNI SAHA
398 399	BA/BCOM	AECC-1	2022-23	FARHA KHATUN
400	BA/BCOM	AECC-1	2022-23	FARHANA PARVEEN
400	BA/BCOM	AECC-1	2022-23	FARJINA NASRIN

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404	BA/BCOM	AECC-1	2022-23	FAYJUNNESHA KHATUN
405	BA/BCOM	AECC-1	2022-23	FERDOUSI KHATUN
406	BA/BCOM	AECC-1	2022-23	FIRDOUS AHAMMED
407	BA/BCOM	AECC-1	2022-23	FIROJA KHATUN
408	BA/BCOM	AECC-1	2022-23	FULMANI TUDU
409	BA/BCOM	AECC-1	2022-23	GANGA MAHALI
410	BA/BCOM	AECC-1	2022-23	GAYETRI DOME
411	BA/BCOM	AECC-1	2022-23	GIASUDDIN MOLLA
412	BA/BCOM	AECC-1	2022-23	GIRIDHARI DAS
413	BA/BCOM	AECC-1	2022-23	GOBINDA DAS
414	BA/BCOM	AECC-1	2022-23	GOBINDA MONDAL
415	BA/BCOM	AECC-1	2022-23	GOBINDA SUTRADHAR
416	BA/BCOM	AECC-1	2022-23	GOLAM MASUD SHA
417	BA/BCOM	AECC-1	2022-23	GOPAL DAS
418	BA/BCOM	AECC-1	2022-23	GOPAL DAS BAIRAGYA
419	BA/BCOM	AECC-1	2022-23	GOPAL MAL
420	BA/BCOM	AECC-1	2022-23	GOPAL PAL
421	BA/BCOM	AECC-1	2022-23	GOPAL SWARNAKAR
422	BA/BCOM	AECC-1	2022-23	GOPIKA BADYAKAR
423	BA/BCOM	AECC-1	2022-23	GOPINATH GHOSH
424	BA/BCOM	AECC-1	2022-23	GOURAB BAGDI
425	BA/BCOM	AECC-1	2022-23	GOURAVMOY GARAI
426	BA/BCOM	AECC-1	2022-23	GRACY SUZANE BISWAS
427	BA/BCOM	AECC-1	2022-23	GULEBSHA KHATUN
428	BA/BCOM	AECC-1	2022-23	HABIBA KHATUN
429	BA/BCOM	AECC-1	2022-23	HABIBA KHATUN
430	BA/BCOM	AECC-1	2022-23	HABIBA KHATUN
431	BA/BCOM	AECC-1	2022-23	HAIMANTI CHAND
432	BA/BCOM	AECC-1	2022-23	HARE KRISHNA GHOSH
433	BA/BCOM	AECC-1	2022-23	HARIPADA DAS
434	BA/BCOM	AECC-1	2022-23	HARSHAJYOTI KARMAKAR
435	BA/BCOM	AECC-1	2022-23	HEMANTA SEN
436	BA/BCOM	AECC-1	2022-23	HEMLATA MARANDI
437	BA/BCOM	AECC-1	2022-23	HIRAN DAS
438	BA/BCOM	AECC-1	2022-23	HOSNEHARA KHATUN
439	BA/BCOM	AECC-1	2022-23	HOSNEHARA KHATUN
440	BA/BCOM	AECC-1	2022-23	HUPNI MARDI
441	BA/BCOM	AECC-1	2022-23	HUSNAHARA KHATUN
442	BA/BCOM	AECC-1	2022-23	HUSNEARA KHATUN
443	BA/BCOM	AECC-1	2022-23	ID MAHAMMAD KHAN
-	BA/BCOM	AECC-1	2022-23	IMON GHOSH
444		AECC-1	2022-23	IMRAN KHAN
445	BA/BCOM	AECC-1	2022-23	INDIRA DHIBAR
446	BA/BCOM	AECC-1	2022-23	INDIRA GARAIN
447	BA/BCOM	WECC-1	2022-23	INDIRA GARAIN





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448	BA/BCOM	AECC-1	2022-23	INDIRA MONDAL
449	BA/BCOM	AECC-1	2022-23	INDRAIT DHIBAR
450	BA/BCOM	AECC-1	2022-23	INDRAJIT KARMAKAR
451	BA/BCOM	AECC-1	2022-23	INDRAJIT SAHA
452	BA/BCOM	AECC-1	2022-23	INDRANATH SAHA
453	ва/всом	AECC-1	2022-23	INDRANI BHANDARI
454	ва/всом	AECC-1	2022-23	INDRANIL MAHARA
455	BA/BCOM	AECC-1	2022-23	INDRANIL ROY
456	BA/BCOM	AECC-1	2022-23	INDRANIL SAHA
457	BA/BCOM	AECC-1	2022-23	INNAHARA KHATUN
458	BA/BCOM	AECC-1	2022-23	INSAN KHAN
459	BA/BCOM	AECC-1	2022-23	IPSITA BHANDARY
460	BA/BCOM	AECC-1	2022-23	IRFAN AYAS MOLLA
461	BA/BCOM	AECC-1	2022-23	IRFAN KHAN
462	BA/BCOM	AECC-1	2022-23	ISA SAHA
463	BA/BCOM	AECC-1	2022-23	ISANUR MOLLA
464	BA/BCOM	AECC-1	2022-23	ISHA DAS
465	BA/BCOM	AECC-1	2022-23	ISHANI DAS
466	BA/BCOM	AECC-1	2022-23	ISITA BANERJEE
467	BA/BCOM	AECC-1	2022-23	ISMAT JAHAN
468	BA/BCOM	AECC-1	2022-23	ISMATARA KHATUN
469	BA/BCOM	AECC-1	2022-23	ISNEHA KHATUN
470	BA/BCOM	AECC-1	2022-23	IYAKUB KHAN
471	BA/BCOM	AECC-1	2022-23	JABA BAGDI
472	BA/BCOM	AECC-1	2022-23	JAGABANDHU DEBNATH
473	BA/BCOM	AECC-1	2022-23	JAHANARA KHATUN
474	BA/BCOM	AECC-1	2022-23	JAHANGIR KOBIR
475	BA/BCOM	AECC-1	2022-23	JAHANGIR MOLLA
476	BA/BCOM	AECC-1	2022-23	JAHARA KHATUN
477	BA/BCOM	AECC-1	2022-23	JAHIR ANSARI
478	BA/BCOM	AECC-1	2022-23	JAHIR HOSSAIN
479	BA/BCOM	AECC-1	2022-23	JAMERUL SK
480	BA/BCOM	AECC-1	2022-23	JAMIUL KHAN
481	BA/BCOM	AECC-1	2022-23	JANNATUNNISHA KHATUN
482	BA/BCOM	AECC-1	2022-23	JASMINA KHATUN
483	BA/BCOM	AECC-1	2022-23	JATIN KONRA
484	BA/BCOM	AECC-1	2022-23	JAYA MONDAL
485	BA/BCOM	AECC-1	2022-23	JAYANTA MONDAL
486	BA/BCOM	AECC-1	2022-23	JAYANTI ANKUR
487	BA/BCOM	AECC-1	2022-23	JAYANTI KUMARI SHAW
488	BA/BCOM	AECC-1	2022-23	JAYANTI MAL
489	BA/BCOM	AECC-1	2022-23	JAYDEB HEMRAM
490	BA/BCOM	AECC-1	2022-23	JEBA RAISA
491	BA/BCOM	AECC-1	2022-23	JEET BAGDI
492	BA/BCOM	AECC-1	2022-23	JEET KUMAR MAL
493	BA/BCOM	AECC-1	2022-23	JEET SAHA

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494	BA/BCOM	AECC-1	2022-23	JHILIK DALUI
495	BA/BCOM	AECC-1	2022-23	JHUMA BAGDI
496	BA/BCOM	AECC-1	2022-23	JHUMPA PAL
497	BA/BCOM	AECC-1	2022-23	JISHU ROY
498	BA/BCOM	AECC-1	2022-23	JIT DAS
499	BA/BCOM	AECC-1	2022-23	JIT GHOSH
500	BA/BCOM	AECC-1	2022-23	JIT MAL
501	BA/BCOM	AECC-1	2022-23	JIT MONDAL
502	BA/BCOM	AECC-1	2022-23	JIT RAHAMAN
503	BA/BCOM	AECC-1	2022-23	JOY BANERJEE
504	BA/BCOM	AECC-1	2022-23	JOYANTA DAS
505	BA/BCOM	AECC-1	2022-23	JOYANTA HEMBRAM
506	BA/BCOM	AECC-1	2022-23	JOYSHREE KAHAR
507	BA/BCOM	AECC-1	2022-23	JOYTI DHAR
508	BA/BCOM	AECC-1	2022-23	JULEKHA KHATUN
509	BA/BCOM	AECC-1	2022-23	JULEKHA KHATUN
510	BA/BCOM	AECC-1	2022-23	JUTHIKA MONDAL
511	BA/BCOM	AECC-1	2022-23	JYOTISHKA DUTTA
512	BA/BCOM	AECC-1	2022-23	KABERI GHOSH
513	BA/BCOM	AECC-1	2022-23	KABERI MAL
514	BA/BCOM	AECC-1	2022-23	KABITA BAGDI
515	BA/BCOM	AECC-1	2022-23	KABITA KHATUN
516	BA/BCOM	AECC-1	2022-23	KABITA MONDAL
517	BA/BCOM	AECC-1	2022-23	KAFI MOULA
518	BA/BCOM	AECC-1	2022-23	KAIFA KHATUN
519	BA/BCOM	AECC-1	2022-23	KAJAL KHATUN
520	The state of the s	AECC-1	2022-23	KALICHARAN MARDI
	BA/BCOM	- 1000000		
521	BA/BCOM	AECC-1	2022-23	KALIDAS TUDU
522	BA/BCOM	75070300101	2022-23	KALPANA KISKU
523	BA/BCOM	AECC-1	2022-23	KALYAN GARAI
524	BA/BCOM	AECC-1	2022-23	KALYAN GHOSH
525	BA/BCOM	AECC-1	2022-23	KALYAN MAHARA
526	BA/BCOM	AECC-1	2022-23	KALYAN PAL
527	BA/BCOM	AECC-1	2022-23	KALYANI GHOSH
528	BA/BCOM	AECC-1	2022-23	KAMALESH RUIDAS
529	BA/BCOM	AECC-1	2022-23	KANCHAN BHANDARI
530	BA/BCOM	AECC-1	2022-23	KANCHAN GHOSH
531	BA/BCOM	AECC-1	2022-23	KANIKA HEMBRAM
532	BA/BCOM	AECC-1	2022-23	KANKANA SAHA
533	BA/BCOM	AECC-1	2022-23	KARISHMA KHATUN
534	BA/BCOM	AECC-1	2022-23	KAZI ABDUL ALIF
535	BA/BCOM	AECC-1	2022-23	KAZI MD ASHIF
536	BA/BCOM	AECC-1	2022-23	KAZI MD ASLAM
537	BA/BCOM	AECC-1	2022-23	KAZI ROHIT
538	BA/BCOM	AECC-1	2022-23	KAZI ZINNATH MURSEDA KHATUN
539	BA/BCOM	AECC-1	2022-23	KESHAB KUMAR SHAW



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#### SURI VIDYASAGAR COLLEGE

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540	BA/BCOM	AECC-1	2022-23	KESHAB MONDAL	
541	BA/BCOM	AECC-1	2022-23	KESHAB MONDAL	
542	BA/BCOM	AECC-1	2022-23	KEYA BHANDARI	
543	BA/BCOM	AECC-1	2022-23	KEYA GHOSH	
544	BA/BCOM	AECC-1	2022-23	KEYA ROY CHOWDHURY	
545	BA/BCOM	AECC-1	2022-23	KHADUA KHATUN	
546	BA/8COM	AECC-1	2022-23	KHADUA KHATUN	
547	BA/BCOM	AECC-1	2022-23	KHAIRUNNESA KHATUN	
548	BA/BCOM	AECC-1	2022-23	KHAIRUNNESA KHATUN	
549	BA/BCOM	AECC-1	2022-23	KHAIRUNNESHA KHATUN	
550	BA/BCOM	AECC-1	2022-23	KHALEDA NASRIN	
551	BA/BCOM	AECC-1	2022-23	KHAUDA KHATUN	
552	BA/BCOM	AECC-1	2022-23	KHALIDA KHATUN	
553	BA/BCOM	AECC-1	2022-23	KHALIDA KHATUN	
554	BA/BCOM	AECC-1	2022-23	KHATEJA KHATUN	-
555	BA/BCOM	AECC-1	2022-23	KHOKAN ANKUR	
556	BA/BCOM	AECC-1	2022-23	KHUKUMONI GHOSH	
557	BA/BCOM	AECC-1	2022-23	KHUSBU KEWAT	
558	BA/BCOM	AECC-1	2022-23	KHUSHI ANKUR	
559	BA/BCOM	AECC-1	2022-23	KOBID KUMAR MONDAL	-
560	BA/BCOM	AECC-1	2022-23	KOHINUR KHATUN	
561	BA/8COM	AECC-1	2022-23	KOUSHIK CHOUDHURY	-
562	BA/BCOM	AECC-1	2022-23	KOUSHIK DUTTA	
563	BA/BCOM	AECC-1	2022-23	KOUSHIK GHOSH	
564	BA/BCOM	AECC-1	2022-23	KOUSHIK MONDAL	-
565	BA/BCOM	AECC-1	2022-23	KOYEL DOME	-
566	BA/BCOM	AECC-1	2022-23	KOYEL KHATUN	
567	BA/BCOM	AECC-1	2022-23	KRISHNA BAGDI	-
568	BA/BCOM	AECC-1	2022-23		-
569	BA/BCOM	AECC-1	2022-23	KRISHNA BAGDI KRISHNA BAGDI	-
570	BA/BCOM	AECC-1	2022-23	KRISHNA DUTTA	-
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571	BA/BCOM		2022-23	KRISHNA GOPAL SAHA	-
572	BA/BCOM	AECC-1	2022-23	KRISHNA KANTA MONDAL	
573	BA/BCOM	AECC-1	2022-23	KRISHNA KONAI	_
574	BA/BCOM	AECC-1	2022-23	KRISHNENDU MONDAL	_
575	BA/BCOM	AECC-1	2022-23	KRISHNENDU SAHA	-
576	BA/BCOM	AECC-1	2022-23	KRISHNENDU SAHA	-
577	BA/BCOM	AECC-1	2022-23	KUDDUS MALLICK	_
578	BA/BCOM	AECC-1	2022-23	KULSUM KHATUN	_
579	BA/BCOM	AECC-1	2022-23	KULSUM KHATUN	_
580	BA/BCOM	AECC-1	2022-23	KULSUMA KHATUN	_
581	BA/BCOM	AECC-1	2022-23	KUMARISH MONDAL	
582	BA/BCOM	AECC-1	2022-23	KUMKUM MAL	
583	BA/BCOM	AECC-1	2022-23	KUMKUM MUKHERJEE	
584	BA/BCOM	AECC-1	2022-23	KUNTAL MONDAL	
585	BA/BCOM	AECC-1	2022-23	KUSUMKALI LOHAR	



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\$6	BA/BCOM	AECC-1	2022-23	LABANI DALUI
8+	BA BCOM	AECC-1	2022-23	LABANYA GHOSH
55	BA BCOM	AECC-1	2022-23	LASONI DESNATH
559	BA/BCOM	AECC-1	2022-23	LAKHI KHATUN
1307	BA/BCOM	AECC-1	2022-23	LAKSHI BAGDI
101	BA/BCOM	AECC-1	2022-23	LAKSHI SOREN
502	BA/BCOM	AECC-1	2022-23	LAKSHMI DAS
593	BA/BCOM	AECC-L	2022-23	LAKSHMI DAS
594	BA/BCOM	AECC-1	2022-23	LAKSHMI RANI BAGDI
595	BA/BCOM	AECC-1	2022-23	LAKSHMI SINGH
596	BA/BCOM	AECC-1	2022-23	LATIKA MURMU
597	BA/BCOM	AECC-1	2022-23	LAXMAN BAGDI
598	BA/BCOM	AECC-1	2022-23	LAXMI DAS
599	BA/BCOM	AECC-1	2022-23	LAXMIKANTA HANSDA
600	BA/BCOM	AECC-1	2022-23	LIPIKA DEY
601	BA/BCOM	AECC-1	2022-23	LIPIKA SAHA
602	BA/BCOM	AECC-1	2022-23	LOKNATH DALUI
603	BA/BCOM	AECC-1	2022-23	LUCKY BHATTACHARYA
604	BA/BCOM	AECC-1	2022-23	LUIS BASKEY
605	BA/BCOM	AECC-1	2022-23	LUSI KHATUN
606	BA/BCOM	AECC-1	2022-23	MADHUMITA CHAKRABORTY
607	BA/BCOM	AECC-1	2022-23	MADHUMITA DAS
608	BA/BCOM	AECC-1	2022-23	MADHUMITA DHIBAR
609	BA/BCOM	AECC-1	2022-23	MAFUJA KHATUN
610	BA/BCOM	AECC-1	2022-23	MAHABUB ALAM MOLLA
611	BA/BCOM	AECC-1	2022-23	MAHADEB HANSDA
612	BA/BCOM	AECC-1	2022-23	MAHAMMAD KAIF
613	BA/BCOM	AECC-1	2022-23	MAHEK CHOWDHURY
614	BA/BCOM	AECC-1	2022-23	MAHIMA KHATUN
615	BA/BCOM	AECC-1	2022-23	MAHMUDUL HASAN
616	BA/BCOM	AECC-1	2022-23	MAHUA MONDAL
617	BA/BCOM	AECC-1	2022-23	MAINUDDIN SK
618	BA/BCOM	AECC-1	2022-23	MAJIBUR SAIKH
619	BA/BCOM	AECC-1	2022-23	MAKHAN DOME
620	BA/BCOM	AECC-1	2022-23	MALAY BAGDI
621	BA/BCOM	AECC-1	2022-23	MALLIKA BAGDI
522	BA/BCOM	AECC-1	2022-23	MALUKA DAS
623	BA/BCOM	AECC-1	2022-23	MALLIKA MAHARA
624	BA/BCOM	AECC-1	2022-23	MAMONI BAGDI
625	BA/BCOM	AECC-1	2022-23	MAMONI MAHARA
626	BA/BCOM	AECC-1	2022-23	MAMPI DAS
527	BA/BCOM	AECC-1	2022-23	MANAS DAS
628	BA/BCOM	AECC-1	2022-23	MANAS DHISAR
629	BA/BCOM	AECC-1	2022-23	MANAS GHOSH
630	BA/BCOM	AECC-1	2022-23	MANAS BAGDI
631	BA/BCOM	AECC-1	2022-23	MANAS DAS

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nti nti	BA/BCOM	AFCC I	2027-74	MANAS MONDAI
.54	BA/BCOM	Att t	3037.73	MANAS PAL
	BA/Breaks	Alte I	2022-24	MANASA HAZRA
175	DA/DCC364	ALC: 1	2022-23	MANDIRA BITTAR
10.	BA/BLOM	ARCC 1	2022.71	MANDIRA GARAL
C	DA DE CHA	ALCC 1	2022-73	MANDRA GHOSH
, MA	BA/BCOM	APCC 1	2022 23	MANDIRA MONDAL
110	DA/BCOM	Alter T	2022.73	MANDIRA PAL
rack.	BA/BCOM	ALC: 1	7077 73	MANUSH PAL
111	BA/BLOM	ALCC L	2022.23	MANGAL HEMBROM
14.7	BIA/BLOM	ALCC 1	7077.21	MANGALA RAKSHIT
14.4	MA/BCOM	ALCC 1	2022-23	MANGALDEEP SAHA
144	MAZIW KIMI	ALC: 1	2022-23	MANIE DAS
14%	BA/W OM	ALC: 1	2022-23	MANIKA MURMU
otes	BA/BCOM	ALCC I	2022-23	MANIBA KHATUN
84.7	BA/BCOM	ALCC 1	2022-23	MANISHA BHANDARI
048	BA/BCOM	ALCC I	2022-23	MANISHA DALUI
144	BA/BCOM	ALCC I	2022 24	MANISHA DAS
tien	BA/BCOM	ALCC 1	2022-23	MANISHA GHOSH
651	BAJBCOM	AFCC 1	2022-23	MANISHA MANDAL
652	BA/BCOM	ALCC 1	2022.73	MANISHA MARANDI
120	BA/BCOM	ALCC 1	2022-23	MANISHA SAHA
054	BA/BCOM	ALCC 1	2022-23	MANIOY BAGDI
655	BA/BCOM	ALCC-1	2022-23	MANIUSHA KHATUN
050	BA/BCOM	ALCC 1	2022-23	MANOJ SADHU
057	BA/BCOM	ALCC-1	2022-23	MANOJIT GHOSH
658	валясом	ALCC 1	2022-23	MANOJIT MAL
659	BA/BCOM	ALCC 1	2022-23	MANOWARA KHATUN
ped	BA/BCOM	ALCC 1	2022-23	MANTU DAS
100	BA/BCOM	ALCC 1	2022-23	MARIAM KHATUN
662	ва/всом	ALCC-1	2022-23	MARIYA KHATUN
603	BA/BCOM	ALCC-1	2022-23	MARSILA HEMRAM
664	BA/BCOM	AECC-1	2022-23	MD ABDUL KADER MIR
665	BA/BCOM	ALCC-1	2022-23	MD ABID HASSAN
000	BA/BCOM	AECC-1	2022-23	MD ABUTAHER
667	BA/BCOM	AECC-1	2022-23	MD ABUTALEB
668	BA/BCOM	AFCC-1	2022-23	MD AINUL ISLAM
669	BA/BCOM	AECC-1	2022-23	MD AKIB
670	BA/BCOM	ALCC-1	2022-23	MD ANAS
671	BA/BCOM	AECC-1	2022-23	MD ANOWAR ANSARI
672	BA/BCOM	AECC-1	2022-23	MD ARIFUL ISLAM ATIK
	BA/BCOM	AECC-1	2022-23	MD ARIU SK
673	BA/BCOM	AECC-1	2022-23	MD ASIF ZAMAN
674	100000000000000000000000000000000000000	AECC-1	2022-23	100000000
675	BA/BCOM	AECC-1	2022-23	MD AZIZ MD AZIZ SK
676	BA/BCOM	-		10005-900000000
677	BA/BCOM	AECC-1	2022-23	MD BILAL

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678	BA/BCOM	AECC-1	2022-23	MD DILSAD
679	BA/BCOM	AECC-1	2022-23	MD FAIZAN ANSARI
680	BA/BCOM	AECC-1	2022-23	MD FARHAD HOSSAIN
681	BA/BCOM	AECC-1	2022-23	MD FIRDOS HOSSAIN
682	BA/BCOM	AECC-1	2022-23	MD HASANUR JAMAN MONDAL
683	BA/BCOM	AECC-1	2022-23	MD HASIBUR RAHMAN
684	BA/BCOM	AECC-1	2022-23	MD IMRAN
685	BA/BCOM	AECC-1	2022-23	MDIMRAN
686	BA/BCOM	AECC-1	2022-23	MD JAHIR KHAN
687	BA/BCOM	AECC-1	2022-23	MD JARDIS HOSSAIN
688	BA/BCOM	AECC-1	2022-23	MDKAIF
689	BA/BCOM	AECC-1	2022-23	MD KAIF
690	BA/BCOM	AECC-1	2022-23	MD KAIFUDDIN
691	BA/BCOM	AECC-1	2022-23	MD MOBIN
692	BA/BCOM	AECC-1	2022-23	MD MURSHID ALAM KHAN
693	BA/BCOM	AECC-1	2022-23	MD MUSTOFA
694	BA/BCOM	AECC-1	2022-23	MD SABIR UDDIN SHAH
695	BA/BCOM	AECC-1	2022-23	MD SAHIL
696	BA/BCOM	AECC-1	2022-23	MD SAHIL ALAM
697	BA/BCOM	AECC-1	2022-23	MD SAIYAD AHAMAD
698	BA/BCOM	AECC-1	2022-23	MD SAID HOSSAIN
699	BA/BCOM	AECC-1	2022-23	MD SAMSER
700	BA/BCOM	AECC-1	2022-23	MD TAIF ALI
701	BA/BCOM	AECC-1	2022-23	MD WAZID
702	BA/BCOM	AECC-1	2022-23	MEGHA PAL
703	BA/BCOM	AECC-1	2022-23	MEGHNATH DALUI
704	BA/BCOM	AECC-1	2022-23	MEHERJEBIN PARVIN
*****	BA/BCOM	AECC-1	2022-23	MEHERUNNISA KHATUN
705	BA/BCOM	AECC-1	2022-23	MEHERUNNISHA KHATUN
706	BA/BCOM	AECC-1	2022-23	MERILA SOREN
707	The state of the s	AECC-1	2022-23	MILAN DAS
708	BA/BCOM	AECC-1	2022-23	MIMMA KHATUN
709	BA/BCOM	AECC-1	2022-23	MINA BEGUM
710	BA/BCOM	AECC-1	2022-23	MINAKSHI DOME
711	BA/BCOM	AECC-1	2022-23	MINATI ANKUR
712	BA/BCOM	AECC-1	2022-23	MINATI BAGDI
713	BA/BCOM	AECC-1	2022-23	MIR ATIKUR RAHAMAN
714	BA/BCOM	AECC-1	2022-23	MIR IKBAL HOSSAIN
715	BA/BCOM	AECC-1	2022-23	MIR LUCKY
716	BA/BCOM		2022-23	MIR MAINUDDIN
717	BA/BCOM	AECC-1	2022-23	MIR MD ASRAFUL
718	BA/BCOM		2022-23	MIR TANBIR HOSSAIN
719	BA/BCOM	AECC-1	2022-23	MIRIA JAMIRUL
720	BA/BCOM	AECC-1	2022-23	MISTI DAS
721	BA/BCOM		2022-23	MISTU KAHAR
722	BA/BCOM	AECC-1	2022-23	MITALI MONDAL



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724	BA/BCOM	AECC-1	2022-23	
725	BA/BCOM	AECC-1	2022-23	MITHUN GHOSH
726	BA/BCOM	AECC-1	2022-23	MOFUA KHATUN
727	5A/BCOM	AECC-1	2022-23	MOHIMA KHATUN
728	BA/BCOM	AECC-1	2022-23	MOJAHEDUL ISLAM
729	BA/BCOM	AECC-1	2022-23	MONASI ROY
730	BA/BCOM	AECC-1	2022-23	MONALISA KHATUN
731	BA/BCOM	AECC-1	2022-23	MONALISA PAITANDY
732	BA/BCOM	AECC-1	2022-23	MONDIRA DOME
733	BA/BCOM	AECC-1	2022-23	MONDIRA GHOSH
734	BA/BCOM	AECC-1	2022-23	MONI MONDAL
735	BA/BCOM	AECC-1	2022-23	MONIKA KHATUN
736	BA/BCOM	AECC-1	2022-23	MONIMALA KHATUN
737	BA/BCOM	AECC-1	2022-23	MONUILA KHATUN
738	BA/BCOM	AECC-1	2022-23	MONOJIT GORAIN
739	BA/BCOM	AECC-1	2022-23	MONOWARA KHATUN
740	BA/BCOM	AECC-1	2022-23	MONSUR KHALIFA
741	BA/BCOM	AECC-1	2022-23	MORINA KHATUN
742	BA/BCOM	AECC-1	2022-23	MOSARAT KHATUN
743	BA/BCOM	AECC-1	2022-23	MOSTAK MOLLICK MOTUAN KHATUN
744	8A/BCOM	AECC-1	2022-23	MOUBANI MONDAL
745	BA/BCOM	AECC-1	2022-23	MOULI MONDAL
746	BA/BCOM	AECC-1	2022-23	MOUMITA BAYEN
747	BA/BCOM	AECC-1	2022-23	MOUMITA BATEN
748	BA/BCOM	AECC-1	2022-23	MOUMITA GARAI
749	BA/BCOM	AECC-1	2022-23	MOUMITA MAL
750	BA/BCOM	AECC-1	2022-23	MOUSUMI BHANDARI
751	BA/BCOM	AECC-1	2022-23	MOUSUMI GHOSH
752	BA/BCOM	AECC-1	2022-23	MOUSUMI PAL
753	BA/BCOM	AECC-1	2022-23	MOUSUMI SEN
754	BA/BCOM	AECC-1	2022-23	The state of the s
755	BA/BCOM	AECC-1	2022-23	MRINAL KANTI GARAIN MRINMAY DAS
756	BA/BCOM	AECC-1	2022-23	MRINMAYE DAS
757	BA/BCOM	AECC-1	2022-23	MRINMOY MAHARA
758	BA/BCOM	AECC-1	2022-23	
759	BA/BCOM	AECC-1	2022-23	MUNMUN DAS
60	BA/BCOM	AECC-1	2022-23	MUNMUN DEY
61	BA/BCOM	AECC-1	2022-23	MUNMUN MAJI
62	BA/BCOM	AECC-1	2022-23	MUSKAN KHATUN
63	BA/BCOM	AECC-1	2022-23	MUSKAN KHATUN
64	BA/BCOM	AECC-1	2022-23	MUSKAN KHATUN
65	BA/BCOM	AECC-1	2022-23	MUSKAN KHATUN
66	BA/BCOM	AECC-1	2022-23	NAAZ PARVIN
67	BA/BCOM	AECC-1		NABAMI SONER
58	BA/BCOM	AECC-1	2022-23	NAHANUR KHATUN
69	BA/BCOM	AECC-1	2022-23	NAJIMUDDIN MIYA

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77	BA/BCOM	AECC-1	8322-23	NAVIR HOSSAM	
1	84/900M	AECC-1	2022-23	NAMITA DAG	
2	8A/8COM	A800-1	2022-23	NAMES SOREN	
1	84/8COM	AECC-1	2022-23	NANON MORA	
4	84/800M	AECC-1	2022-23	NANOTA BANOHU	
5	84/BCOM	AECC-1	2022-23	NANOTA SAOHU	
16	BA/BCOM	AECC-1	2022-23	NARGO CHATUN	
7	BA/BCOM	AECC-1	2021-23	NARGS CHATUN	
78	BA/BCOM	1-003A	2022-23	NARGS SULTANA	
79	BA/BCOM	45CC-1	2022-23	NARGO MATUN	
80	8A/BCOM	AECC-1	2022-23	NAROTTAM DAS	
81	8A/BCOM	AECC-1	2022-23	NASIBA KHATUN	
82	BA/BCOM	AECC-1	2022-23	NASMA CHATUN	
83	BA/BCDM	AECC-1	2022-23	NASRIN KHATUN	
34	8A/8CDM	AECC-1	2022-23	NASRIN KHATUN	
85	BA/BCOM	AECC-1	2022-23	NASAIN CHATUN	
86	8A/BCOM	AECC-1	2022-23	NASRIN KHATUN	
67	SA/SCOM	AECC-1	2022-23	NASRIN PARVEEN	
88	BA/BCOM	AECC-1	2022-23	NASRIN PARVEJ	
89	8A/BCOM	AECC-1	2022-23	NASRIN PARVIN	
90	BA/BCOM	AECC-1	2022-23	NASRIN SULTANA	
91	BA/BCOM	AECC-1	2022-23	NAUSIN PARVEEN	
92	8A/BCOM	AECC-1	2022-23	NAYAN DALUI	
93	BA/BCOM	AECC-1	2022-23	NAZIRA CHATUN	
94	8A/BCOM	AECC-1	2022-23	NAZIRA CHATUN	
95	BA/BCOM	AECC-1	2022-23	NAZMUNNESA KHATUN	
96	BA/BCOM	AECC+1	2022-23	NAZNEENNESHA KHATUN	
797	BA/BCOM	AECC-1	2022-23	NAZRIN PARVEEN	
198	BA/BCOM	AECC-1	2022-23	NEHA BIRBANSHI	
199	BA/BCOM	AECC-1	2022-23	NEHA BITTAR	
800	BA/BCOM	AECC-1	2022-23	NEHA KHATUN	
801	8A/BCOM	AECC-1	2022-23	NIBEDITA DAS	
302	BA/BCOM	AECC-1	2022-23	N/BED/TA GHOSH	
803	BA/BCOM	AECC-1	2022-23	NIBEDITA GHOSH	
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808	BA/BCOM	AECC-1	2022-23	NIKITA DAS	
809	BA/BCOM	AECC-1	2022-23	NIKITA GHOSH	
810	BA/BCOM	AECC-1	2022-23	NILA KAHAR	
811	BA/BCDM	AECC-1	2022-23	NILIMA BAGDI	
812	BA/BCOM	AECC-1	2022-23	NIRMAL DAS	
813	BA/BCOM	AECC-1	2022-23	NISHA KHATUN	
814	BA/BCOM	AECC-1	2022-23	NISHAT ANUUM	
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### SURI VIDYASAGAR COLLEGE

(Govt. Sponsored & Constituent college of the University of Burdwan) SURI, BIRBHUM, PIN – 731101, Ph. No. – 03462-255504

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816	BA/BCOM	AECC-1	2022-23	NOMITA DAS
817	BA/BCOM	AECC-1	2022-23	NUPUR MAL
818	BA/BCOM	AECC-1	2022-23	NUPUR MONDAL
819	BA/BCOM	AECC-1	2022-23	NURALAM SK
820	BA/BCOM	AECC-1	2022-23	NURBANU KHATUN
821	BA/BCOM	AECC-1	2022-23	NURJAHAN KHATUN
822	BA/BCOM	AECC-1	2022-23	OSMAN GANI MUNSHI
823	BA/BCOM	AECC-1	2022-23	OSMAN GONI
824	BA/BCOM	AECC-1	2022-23	OYAHIDA KHATUN
825	BA/BCOM	AECC-1	2022-23	PADMA DAS
826	BA/BCOM	AECC-1	2022-23	PALLABI BAGDI
827	BA/BCOM	AFCC-1	2022-23	PALLABI MAHARA
828	BA/BCOM	AECC-1	2022-23	PALLABI MAL
829	BA/BCOM	AECC-1	2022-23	PALLABI PAL
830	BA/BCOM	AECC-1	2022-23	PAMELA DAS
831	BA/BCOM	AECC-1	2022-23	PAMPA ANKUR
832	BA/BCOM	AECC-1	2022-23	PANCHAMI BAGDI
833	BA/BCOM	AECC-1	2022-23	PANKAJ DAS
834	BA/BCOM	AECC-1	2022-23	PANKOJ DISTRI
835	BA/BCOM	AECC-1	2022-23	PAPIA MONDAL
836	BA/BCOM	AECC-1	2022-23	PAPIYA BAGDI
837	BA/BCOM	AECC-1	2022-23	PAPIYA SAHA
838	BA/BCOM	AECC-1	2022-23	PAPU BAGDI
839	BA/BCOM	AECC-1	2022-23	PARBATI HEMBRAM
840	BA/BCOM	AECC-1	2022-23	PARESHNATH MURMU
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841 842	BA/BCOM BA/BCOM	AECC-1	2022-23	PARNA ACHARYYA
843	BA/BCOM	AECC-1	2022-23	PARSWATI CHATTERIEE
33.0	BA/BCOM	AECC-1	2022-23	PARTHA DOM
844		AECC-1	2022-23	PARTHA MAL
845	BA/BCOM		2022-23	PARTHA MONDAL
846	BA/BCOM	AECC-1	2022-23	PARTHA SAHA
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848	BA/BCOM	AECC-1	2022-23	Light Control of the
849	BA/BCOM	AECC-1	2022-23	PARUL KHATUN
850	BA/BCOM	AECC-1	2022-23	PARVIN KHATUN
851	BA/BCOM	AECC-1	2022-23	PARVIN SULTANA
852	BA/BCOM	AECC-1	2022-23	PATHIK GHOSH
853	BA/BCOM	AECC-1	2022-23	PATHIK KUMAR MONDAL
854	BA/BCOM	AECC-1	2022-23	PATIT DOME
855	BA/BCOM	AECC-1	2022-23	PATIT PABAN ANKUR
856	BA/BCOM	AECC-1	2022-23	PAYAL SINGHA
857	BA/BCOM	AECC-1	2022-23	PAYEL DALUI
858	BA/BCOM	AECC-1	2022-23	PAYEL DAS
359	BA/BCOM	AECC-1	2022-23	PAYEL DAS
860	BA/BCOM	AECC-1	2022-23	PAYEL DAS
B61	BA/BCOM	AECC-1	2022-23	PAYEL DAS



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862	BA/BCOM	AECC-1	2022-23	PAYEL KHATUN
863	BA/BCOM	AECC-1	2022-23	PAYEL MONDAL
864	BA/BCOM	AECC-1	2022-23	PUUS DAS
865	BA/BCOM	AECC-1	2022-23	PINKI DAS
866	BA/BCOM	AECC-1	2022-23	PINKI DOME
867	BA/BCOM	AECC-1	2022-23	PINKI GARAI
868	BA/BCOM	AECC-1	2022-23	PINKI MALAKAR
869	BA/BCOM	AECC-1	2022-23	PINKI ORANG
870	BA/BCOM	AECC-1		
871	BA/BCOM	100000000000000000000000000000000000000	2022-23	PINTU SAHA
872		AECC-1	2022-23	PIU BAGDI
873	BA/BCOM	AECC-1	2022-23	PIU DALUI
874	BA/BCOM	AECC-1	2022-23	PIU KAHAR
	BA/BCOM	AECC-1	2022-23	PIU MAL
875	BA/BCOM	AECC-1	2022-23	PIU PAL
876	BA/BCOM	AECC-1	2022-23	PIU SAHA
877	BA/BCOM	AECC-1	2022-23	PIYA KHATUN
878	BA/BCOM	AECC-1	2022-23	PIYALI CHATTERJEE
879	BA/BCOM	AECC-1	2022-23	PIYALI MALLARAJ
880	BA/BCOM	AECC-1	2022-23	POULOMI DAS
881	BA/BCOM	AECC-1	2022-23	PRABHAS GHOSH
882	BA/BCOM	AECC-1	2022-23	PRADEEP BAGDI
883	BA/BCOM	AECC-1	2022-23	PRADIP BAGDI
884	BA/BCOM	AECC-1	2022-23	PRADIP KUMAR GANGULY
885	BA/BCOM	AECC-1	2022-23	PRADYUT PAL
885	BA/BCOM	AECC-1	2022-23	PRAHALAD GHOSH
887	BA/BCOM	AECC-1	2022-23	PRAKASH GUIN
888	BA/BCOM	AECC-1	2022-23	PRAKASH SUTRADHAR
889	BA/BCOM	AECC-1	2022-23	PRAKRITI CHATTERJEE
890	BA/BCOM	AECC-1	2022-23	PRALOY MONDAL
891	BA/BCOM	AECC-1	2022-23	PRAMILA BAGDI
892	BA/BCOM	AECC-1	2022-23	PRANAB MURMU
893	BA/BCOM	AECC-1	2022-23	PRANGOPAL BAGDI
894	BA/BCOM	AECC-1	2022-23	PRASENJIT BAGDI
895	BA/BCOM	AECC-1	2022-23	PRASHANTA MURMU
895	BA/BCOM	AECC-1	2022-23	PRATAP KIRTANIA
897	BA/BCOM	AECC-1	2022-23	PREETY HANSDA
898	BA/BCOM	AECC-1	2022-23	PREM MODAK
899	BA/BCOM	AECC-1	2022-23	PREM PAL
900	BA/BCOM	AECC-1	2022-23	PRITAM BHATTACHARYA
901	BA/BCOM	AECC-1	2022-23	PRITAM DEY
902	BA/BCOM	AECC-1	2022-23	PRITAM KARMAKAR
903	BA/BCOM	AECC-1	2022-23	PRITAM KUMAR DOME
904	BA/BCOM	AECC-1	2022-23	PRITAM PAL
905	BA/BCOM	AECC-1	2022-23	PRITHA MONDAL
906	BA/BCOM	AECC-1	2022-23	PRITI BAGDI
907	BA/BCOM	AECC-1	2022-23	PRITI DAS

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909	BA/BCOM	AFCC 1	2022-23	PRITI KAHAR
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911	BA/BCOM	AECC-1	2022-23	PRITI SHARMA
912	BA/BCOM	AECC-1	2022 23	PRITY MONDAL
913	BA/BCOM	AECC 1	2022-23	PRIYA BAGDI
914	BA/BCOM	AECC-1	2022 23	PRIYA DAS
915	BA/BCOM	AECC-1	2022-21	PRIVA GARAL
916	BA/BCOM	AECC-1	2022.23	PRIYA KHATUN
917	BA/BCOM	AECC-1	2022-23	PRIYA MONDAL
918	BA/BCOM	AECC-1	2022-23	PRIYA PAL
919	BA/BCOM	AECC-1	2022-23	PRIVA PAL
920	BA/BCOM	AECC-1	2022-23	PRIYA PAL
921	BA/BCOM	AECC-1	2022-23	PRIYAGOPAL DAS
922	BA/BCOM	AECC-1	2022-23	PRIYANKA DALUI
923	BA/BCOM	AECC-1	2022-23	PRIYANKA DALUI
924	BA/BCOM	AECC-1	2022-23	PRIYANKA DAS
925	BA/BCOM	AECC-1	2022-23	PRIYANKA DHIBAR
926	BA/BCOM	AECC-1	2022-23	PRIYANKA GHOSH
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929	BA/BCOM	AECC-1	2022-23	PROTIMA DAS
930	BA/BCOM	AECC-1	2022-23	PROTYASHA BISWAS
931	BA/BCOM	AECC-1	2022-23	PUJA BHANDARI
932	BA/BCOM	AECC-1	2022-23	PUJA DAS
933	BA/BCOM	AECC-1	2022-23	PUJA DAS BAIRAGYA
934	BA/BCOM	AECC-1	2022-23	PUJA GHOSH
935	BA/BCOM	AECC-1	2022-23	PUJA GHOSH
936	BA/BCOM	AECC-1	2022-23	PUJA HANSDA
937	BA/BCOM	AECC-1	2022-23	PUJA HAZRA
938	BA/BCOM	AECC-1	2022-23	PUJA MAHARA
	BA/BCOM	AECC-1	2022-23	PUJA MAHARA
939	BA/BCOM	AECC-1	2022-23	PUJA MONDAL
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941	BA/BCOM	AECC-1	2022-23	PUJA MURMU
942	BA/BCOM	AECC-1	2022-23	PUJA PAL
943	BA/BCOM	AECC-1	2022-23	PUJA RAMDAS
944	BA/BCOM	AECC-1	2022-23	PUJA SAHA PUNAM ANKUR
945	BA/BCOM	AECC-1	2022-23	PUNKA TUDU
946	BA/BCOM	AECC-1	2022-23	
947	BA/BCOM	AECC-1	2022-23	PURBASHA DAS PURNA CHANDRA DAS
948	BA/BCOM	AECC-1	2022-23	Control of the Contro
949	BA/BCOM	AECC-1	2022-23	PURNIMA BAGDI
950	BA/BCOM	AECC-1	2022-23	PURNIMA DAS
951	BA/BCOM	AECC-1	2022-23	PURNIMA MIRDHA PURNIMA SWARNAKAR
952	BA/BCOM	AECC-1	2022-23	PORTINIA SVENINGOS







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955	BA/BCOM	AECC-1	2022-23	RABINA BAGDI
956	BA/BCOM	AECC-1	2022-23	RABINDRANATH DAS
957	BA/BCOM	AECC-1	2022-23	RABIYA KHATUN
958	ва/всом	AECC-1	2022-23	RACHANA DOME
959	BA/BCOM	AECC-1	2022-23	RACHANA MAL
960	BA/BCOM	AECC-1	2022-23	RACHAYITA HAZRA
961	BA/BCOM	AECC-1	2022-23	RADHAKRISHNA DAS
962	BA/BCOM	AECC-1	2022-23	RADHARANI MONDAL
963	BA/BCOM	AECC-1	2022-23	RAFIYA KHATUN
964	BA/BCOM	AECC-1	2022-23	RAGHUNATH BAGDI
965	BA/BCOM	AECC-1	2022-23	RAHAMAN KHAN
966	BA/BCOM	AECC-1	2022-23	RAHILA KHATUN
967	BA/BCOM	AECC-1	2022-23	RAHIMA KHATUN
968	BA/BCOM	AECC-1	2022-23	RAHIMA KHATUN
969	ва/всом	AECC-1	2022-23	RAHIT KAZI
970	ва/всом	AECC-1	2022-23	RAHUL BAGDI
971	BA/BCOM	AECC-1	2022-23	RAHUL BAGDI
972	ВА/ВСОМ	AECC-1	2022-23	RAHUL BAGDI
973	BA/BCOM	AECC-1	2022-23	RAHUL BAURI
974	BA/BCOM	AECC-1	2022-23	RAHUL DAS
975	BA/BCOM	AECC-1	2022-23	RAHUL HANSDA
976	BA/BCOM	AECC-1	2022-23	RAHUL MAHARA
977	BA/BCOM	AECC-1	2022-23	RAHUL MAHARA
978	BA/BCOM	AECC-1	2022-23	RAHUL MIRDHA
979	BA/BCOM	AECC-1	2022-23	RAHUL SAHA
980	BA/BCOM	AECC-1	2022-23	RAHUL SOE
981	BA/BCOM	AECC-1	2022-23	RAHUL TUDU
982	BA/BCOM	AECC-1	2022-23	RAIHAN AHAMMED KHAN
983	BA/BCOM	AECC-1	2022-23	RAIHAN KHAN
984	BA/BCOM	AECC-1	2022-23	RAIMA SEN
985	BA/BCOM	AECC-1	2022-23	RAJ BAGDI
986	BA/BCOM	AECC-1	2022-23	RAJ BEDE
987	BA/BCOM	AECC-1	2022-23	RAJAT HALDER
988	BA/BCOM	AECC-1	2022-23	RAJAT MAL
989	BA/BCOM	AECC-1	2022-23	RAJEN KISKU
990	BA/BCOM	AECC-1	2022-23	RAJESH MAHARA
991	BA/BCOM	AECC-1	2022-23	RAJESH MAL
	BA/BCOM	AECC-1	2022-23	RAJESH SOREN
992		AECC-1	2022-23	RAJESH TUDU
993	BA/BCOM	AECC-1	2022-23	RAJESWARI DAS
994	BA/BCOM	AECC-1	2022-23	RAJIB CHOWDHURY
95	BA/BCOM	10.000000000000000000000000000000000000	2022-23	RAJIB DAS
96	BA/BCOM	AECC-1	2022-23	RAJIB DAS
97	BA/BCOM	AECC-1	2022-23	The first of the same of the s
198	BA/BCOM	AECC-1	2022-23	RAJIB GHOSH RAJIB MANDAL





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1000	BA/BCOM	AECC-1	2022 23	RAJIBUL ISLAM
1001	BA/BCOM	AECC-1	2022 23	RAJINA KHATUN ALAM
002	BA/BCOM	AECC-1	2022 23	RAJIYA SULTANA
003	BA/BCOM	AECC-1	2022 23	RAJKISORE MURMU
1004	BA/BCOM	AECC-1	2022-23	RAJKUMAR MONDAL
1005	BA/BCOM	AECC-1	2022-23	RAJU BAGDI
1006	BA/BCOM	AECC-1	2022-23	RAJU HEMRAM
1007	BA/BCOM	AECC-1	2022-23	RAJU MAL
1008	BA/BCOM	AECC-1	2022-23	RAKESH BAGDI
1009	BA/BCOM	AECC-1	2022-23	RAKESH DAS
1010	BA/BCOM	AECC-1	2022-23	RAKESH GHARUI
1011	BA/BCOM	AECC-1	2022-23	RAKESH MAL
1012	BA/BCOM	AECC-1	2022-23	RAKESH MANNA
1013	BA/BCOM	AECC-1	2022-23	RAKESH SK
1014	BA/BCOM	AECC-1	2022-23	RAKHI ANKUR
1015	BA/BCOM	AECC-1	2022-23	RAKHI GHOSH
1016	BA/BCOM	AECC-1	2022-23	RAKHI MAL
1017	BA/BCOM	AECC-1	2022-23	RAKHI MONDAL
1018	BA/BCOM	AECC-1	2022-23	RAMAN DAS
1019	BA/BCOM	AECC-1	2022-23	RAMEN BAGDI
1020	BA/BCOM	AECC-1	2022-23	RAMKRISHNA SOREN
1021	BA/BCOM	AECC-1	2022-23	RANA NANDI
1022	BA/BCOM	AECC-1	2022-23	RANADIP MAL
1023	BA/BCOM	AECC-1	2022-23	RANAK DAS
1024	BA/BCOM	AECC-1	2022-23	RANI KAHAR
1025	BA/BCOM	AECC-1	2022-23	RANI MONDAL
1026	BA/BCOM	AECC-1	2022-23	RANIT DALUI
1027	BA/BCOM	AECC-1	2022-23	RANJIT MAHARA
1028	BA/BCOM	AECC-1	2022-23	RANJIT SARKAR
1029	BA/BCOM	AECC-1	2022-23	RASLAL MARDI
1030	BA/BCOM	AECC-1	2022-23	RATNA MONDAL
1031	BA/BCOM	AECC-1	2022-23	REJINA KHATUN
1032	BA/BCOM	AECC-1	2022-23	REJINA KHATUN
1033	BA/BCOM	AECC-1	2022-23	REKHA BAGDI
1034	BA/BCOM	AECC-1	2022-23	RESHAM KHATUN
1035	BA/BCOM	AECC-1	2022-23	RESHMINA KHATUN
1036	BA/BCOM	AECC-1	2022-23	RIAJUL HAQUE
1037	BA/BCOM	AECC-1	2022-23	RIASTULLAH KHAN
1038	BA/BCOM	AECC-1	2022-23	RUAN ANKUR
1039	BA/BCOM	AECC-1	2022-23	RUIYA PARVEEN
1040	BA/BCOM	AECC-1	2022-23	RUU MONDAL
1041	BA/BCOM	AECC-1	2022-23	RUUYONA NASRIN
1042	BA/BCOM	AECC-1	2022-23	RIKTA PAL
1043	BA/BCOM	AECC-1	2022-23	RIMA DAS
1044	BA/BCOM	AECC-1	2022-23	RIMA MONDAL
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046	BA/BCOM	AECC-1	2022-23	RIMA MONDAL
047	BA/BCOM	AECC-1	2022-23	RIMI MANDAL
048	BA/BCOM	AECC-1	2022-23	RIMPA BHANDARY
049	BA/BCOM	AECC-1	2022-23	RIMPA DAS
050	BA/BCOM	AECC-1	2022-23	RIMPA HAZRA
051	BA/BCOM	AECC-1	2022-23	RIMPA PAL
1052	BA/BCOM	AECC-1	2022-23	RINA BAGDI
1053	BA/BCOM	AECC-1	2022-23	RINA DAS
	- Company of the Comp	AECC-1	2022-23	RINKI KHATUN
1054	BA/BCOM	AECC-1	2022-23	RINKI KHATUN
1055	BA/BCOM	AECC-1	2022-23	RINKI KHATUN
1056	BA/BCOM	AECC-1	2022-23	RINKU MAHARA
1057	BA/BCOM		2022-23	RINU SAHA
1058	BA/BCOM	AECC-1	2022-23	RIPAN MAL
1059	BA/BCOM	AECC-1		RISA KHATUN
1060	BA/BCOM	AECC-1	2022-23	RITIKA BAGDI
1061	BA/BCOM	AECC-1	2022-23	RITTIK SOHEL MOMIN
1062	BA/BCOM	AECC-1	2022-23	RIYA DAS
1063	BA/BCOM	AECC-1	2022-23	RIYA DAS
1064	BA/BCOM	AECC-1	2022-23	RIYA DAS
1065	BA/BCOM	AECC-1	2022-23	RIYA GARAI
1066	BA/BCOM	AECC-1	2022-23	RIYA GARAI
1067	BA/BCOM	AECC-1	2022-23	RIYA GHOSH
1068	BA/BCOM	AECC-1	2022-23	RIYA GHOSH
1069	BA/BCOM	AECC-1	2022-23	RIYA HEMBRAM
1070	BA/BCOM	AECC-1	2022-23	RIYA KUNUI
1071	BA/BCOM	AECC-1	1 100 000 0000	RIYA PAL
1072	BA/BCOM	AECC-1	2022-23	RIYA SAHA
1073	BA/BCOM	AECC-1	2022-23	RIYA SARKAR
1074	BA/BCOM	AECC-1	2022-23	RIYASAD SK
1075	BA/BCOM	AECC-1	2022-23	RIZIA SULTANA
1076	BA/BCOM	AECC-1	2022-23	ROHIT BISWAS
1077	BA/BCOM	AECC-1	2022-23	ROHIT DAS
1078	BA/BCOM	AECC-1	2022-23	ROHIT DHIBAR
1079	8A/BCOM	AECC-1	2022-23	ROHIT DOME
1080	BA/BCOM	AECC-1	2022-23	ROHIT MAHARA
1081		AECC-1	2022-23	ROHIT MAL
1082	The second secon	AECC-1	2022-23	ROHIT MOLUK
1083		AECC-1	2022-23	ROHIT MONDAL
1084		AECC-1	2022-23	ROHIT PAL
1085	- Inches	AECC-1	2022-23	ROJA KHATUN
1086		AECC-1	2022-23	ROJMINA KHATUN
1087	- Incase	AECC-1	2022-23	ROKEYA KHATUN
1088	a s Incots	AECC-1	2022-23	ROKEYA KHATUN
1089	0.0000000000000000000000000000000000000	AECC-1	2022-23	ROKEYA KHATUN
109	41.000044	AECC-1	2022-23	ROKSUNA KHATUN

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1092	BA/BCOM	AECC-1	2022-23	ROMI MONDAL
1093	BA/BCOM	AECC-1	2022-23	ROMUA SULTANA
1094	BA/BCOM	AECC-1	2022-23	RONIT DUTTA
1095	BA/BCOM	AECC-1	2022-23	RONIT GHOSH
1096	BA/BCOM	AECC-1	2022-23	ROSHNI KHATUN
1097	BA/BCOM	AECC-1	2022-23	ROUSHNI FARZANA
1098	BA/BCOM	AECC-1	2022-23	ROZINA KHATUN
1099	BA/BCOM	AECC-1	2022-23	RUBAI HEMRAM
1100	BA/BCOM	AECC-1	2022-23	RUDRA JIT DAS
1101	BA/BCOM	AECC-1	2022-23	RUKSANA KHATUN
1102	BA/BCOM	AECC-1	2022-23	RUKSAR KHATUN
1103	BA/BCOM	AECC-1	2022-23	RUKSAR KHATUN
1104	BA/BCOM	AECC-1	2022-23	RUKSAR KHATUN
1105	BA/BCOM	AECC-1	2022-23	RUKSONA KAHTUN
1106	BA/BCOM	AECC-1	2022-23	RUMA BAGDI
1107	BA/BCOM	AECC-1	2022-23	RUMI MURMU
1108	BA/BCOM	AECC-1	2022-23	RUMKI GARAIN
1109	BA/BCOM	AECC-1	2022-23	RUNA KHATUN
1110	BA/BCOM	AECC-1	2022-23	RUNA LAILA KHATUN
1111	BA/BCOM	AECC-1	2022-23	RUP KUMAR DAS
1112	BA/BCOM	AECC-1	2022-23	RUPA DAS
1113	BA/BCOM	AECC-1	2022-23	RUPA KHATUN
1114	BA/BCOM	AECC-1	2022-23	RUPALI DAS
1115	BA/BCOM	AECC-1	2022-23	RUPNATH RAJAK
1116	BA/BCOM	AECC-1	2022-23	RUPSA CHOWDHURY
1117	BA/BCOM	AECC-1	2022-23	RUPSA SALUI
1118	BA/BCOM	AECC-1	2022-23	RUPSAN KHAN
1119	BA/BCOM	AECC-1	2022-23	RUPSHA SAMANTA
1120	BA/BCOM	AECC-1	2022-23	SABANA KHATUN
1121	BA/BCOM	AECC-1	2022-23	SABILA KHATUN
1122	BA/BCOM	AECC-1	2022-23	SABINA PARVIN
1123	BA/BCOM	AECC-1	2022-23	SABITRI SAHA
1124	BA/BCOM	AECC-1	2022-23	SABNAM PARVIN
1125	BA/BCOM	AECC-1	2022-23	SABYASACHI DAS
1126	BA/BCOM	AECC-1	2022-23	SADIA KHATUN
1127	BA/BCOM	AECC-1	2022-23	SADIKA KHATUN
1128	BA/BCOM	AECC-1	2022-23	SAGAR BIRBANSHI
129	BA/BCOM	AECC-1	2022-23	SAGAR DAS
130	BA/BCOM	AECC-1	2022-23	SAGAR KAIBARTYA
131	BA/BCOM	AECC-1	2022-23	SAGAR MONDAL
132	BA/BCOM	AECC-1	2022-23	SAGARIKA SAHA
133	BA/BCOM	AECC-1	2022-23	SAGIRA SULTANA
134	BA/BCOM	AECC-1	2022-23	SAHADEB BAGDI
135	BA/BCOM	AECC-1	2022-23	SAHADEB GARAIN
		AECC-1	2022-23	SAHAJAHAN KHAN
136	BA/BCOM BA/BCOM	AECC-1	2022-23	SAHANA KHATUN





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V-V	sa Incota	AECC-1	2022-23	SAMRAT DAS
184	BA/BCOM		2022-23	SAMRAT DOME
185	BA/BCOM	AECC-1	2022-23	SAMSUNNEHAR KHATUN
186	BA/BCOM	AECC-1		SANATAN DAS
187	BA/BCOM	AECC-1	2022-23	SANCHALI MAJUMDER
188	BA/BCOM	AECC-1	2022-23	SANCHITA BISRA
1189	BA/BCOM	AECC-1	2022-23	SANCHITA HANSDA
1190	BA/BCDM	AECC-1	2022-23	- Control of the Cont
1191	BA/BCOM	AECC-1	2022-23	SANCHITA SAHA
1192	BA/BCOM	AECC-1	2022-23	SANCHITA SEN
1193	BA/BCOM	AECC-1	2022-23	SANDIP BAGDI
1194	BA/BCOM	AECC-1	2022-23	SANDIP DAS
1195	BA/BCOM	AECC-1	2022-23	SANDIP DOME
1196	BA/BCOM	AECC-1	2022-23	SANDIP GARAI
1197	BA/BCOM	AECC-1	2022-23	SANDIP GHOSH
1198	BA/BCOM	AECC-1	2022-23	SANDIP HANSDA
1199	BA/BCOM	AECC-1	2022-23	SANDIP SOW
1200	BA/BCOM	AECC-1	2022-23	SANGITA BAGDI
1201	BA/BCOM	AECC-1	2022-23	SANGITA BASKI
1202	BA/BCOM	AECC-1	2022-23	SANGITA BISWAS
1203	BA/BCOM	AECC-1	2022-23	SANGITA MONDAL
1204	BA/BCOM	AECC-1	2022-23	SANGITA SAHA
1205	BA/BCOM	AECC-1	2022-23	SANGITA SUTRADHAR
1206	BA/BCOM	AECC-1	2022-23	SANIA KHATUN
1207	BA/BCOM	AECC-1	2022-23	SANIYA KHATUN
1208	BA/BCOM	AECC-1	2022-23	SANIYA YASMIN
1209	BA/BCOM	AECC-1	2022-23	SANJAY MAHARA
1210	BA/BCOM	AECC-1	2022-23	SANJIB HANSDA
1211	BA/BCOM	AECC-1	2022-23	SANJIDA KHATUN
1212	BA/BCOM	AECC-1	2022-23	SANJIT MURMU
1213	BA/BCOM	AECC-1	2022-23	SANJOY DALUI
1214	BA/BCOM	AECC-1	2022-23	SANNYASHI MAHARA
1215	BA/BCOM	AECC-1	2022-23	SANTANA DAS
1216	BA/BCOM	AECC-1	2022-23	SANTANA TUDU
1217	BA/BCOM	AECC-1	2022-23	SANTOSH PRASAD
1218	BA/BCOM	AECC-1	2022-23	SANTOSHI BAGDI
1219	BA/BCOM	AECC-1	2022-23	SANTU SWARNAKAR
1220	BA/BCOM	AECC-1	2022-23	SAPNA MAHARA
1221	BA/BCOM	AECC-1	2022-23	SAPTAMI DAS
1222	BA/BCOM	AECC-1	2022-23	SARADAMONI MAHALI
1223	BA/BCOM	AECC-1	2022-23	SARASWATI CHOWDHURY
1224	BA/BCOM	AECC-1	2022-23	SARASWATI LOHAR
1225	BA/BCOM	AECC-1	2022-23	SARASWATI MAL
1226	BA/BCOM	AECC-1	2022-23	SARATHI KARMAKAR
1227	BA/BCOM	AECC-1	2022-23	SARFARAJ KHAN
1228	BA/BCOM	AECC-1	2022-23	SARIFA KHATUN
1229	BA/BCOM	AECC-1	2022-23	SARJINA KHATUN

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Website surrentransparentlege orgon comail surrentransparentlege 1942 at gmail.com

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1230	BA/BCOM	MECC 1	2022 23	
1731	BA/BCDM	MECC 1	2022 23	SARARISTHA DAS
1737	BA/BCOM	AECC 1	2022 23	SASANKA KISKI)
1233	BA/BCOM	AFCC 1		SATADIEA NONDAL
1234	BA/BCOM	AECC 1	2027-71	SATASHREE BHANDARI
1735	BA/BCOM	AECC 1	5051.51	SATHI BAGOI
1136	BA/BCOM	AFCC 1	2027.23	SATH DAS
1227	BA BCOM	AECC 1	2022 23	(ATHI GARA)
1238	BA/BCOM	AECC 1	2022 23	SATH GARAI
1239	BA/BCOM	AECC 1	2027 21	SATH GHOSH
1240	BA/BCOM	AFCC 1	2077 71	SATHI GHOSH
1241	BA/BCOM	AECC 1	2027.71	SATHI MONOAL
1242	8A/BCDM	AFCC 1	7027 21	SATHI MONDAL
1243	BA/BCOM	AECC 1	2022.21	SATHI SOW MONDAL
1244	8A/8COM	AECC 1	2072 23	SATI GARAIN
1245	54/BCOM	AECC 1	2022 23	SATYA GOPAL BANDOPADHYAY
1246	BA/BCOM	ARCC 1	2022-23	SATYAJIT BAURI
1247	BA/BCOM	AECC 1	2022-23	SATYAJIT KAHAR
1248	BA/BCOM	AECC-1	2027-23	SATYAJITA KAJBARTTA
1249	BA/BCOM	AECC 1	2022 23	SATYAM MAL
1250	BA/BCOM	AECC 1	2022 23	SAYAN BAGO!
1251	BA/BCOM	AECC-1	2022-23	SAYAN BANERJEE
1252	BA/BCOM	AECC 1	2022-23	SAYAN CHATTERJEE
1253	BA/BCOM	AECC 1	2022-23	SAYAN DUTTA
1254	BA/BCOM	AECC-1	2022-23	SAYAN KHAN
1255	BA/BCOM	AECC 1	2022-23	SAYAN SADHU
1256	8A/8COM	ALCC 1	2022-23	SAYAN SADHU
1257	BA/BCOM	AECC 1	2022-23	SAYANTAN MUKHERJEE
1258	BA/BCOM	AECC-1	2022 23	SAYANTANI SARKAR
1259	BA/BCOM	AECC-1	2022-23	SAYANTI PANDA
1260	BA/BCOM	AECC 1	2022-23	SAYANTIKA MUKHERJEE
1261	BA/BCOM	AECC 1	2072-23	SAYANTINI CHANDRA
1262	8A/8COM	AECC 1	2022 23	SEBASTIAN BASKI
1263	BA/BCOM	AECC 1	2022-23	SEHEJUL KHAN
1264	8A/8COM	AFCC-1	2022-23	SEKH SAIDULISLAM
1265	BA/BCOM	AECC 1	2022-23	SHABANA ASRAFEE
1266	8A/BCGM	AECC-1	2022-23	SHABANA MIRJA
1267	8A/BCOM	AECC-1	2027 23	SHAHEEN ABSAR
268	BA/BCOM	AFCC 1	2022-23	SHAHIN YEASMIN
1269	BA/BCOM	AECC-1	2022-23	SHAHIFB ALAM
270	BA/BCOM	AFCC-1	2022 23	SHAMBHULAL MADDI
271	BA/BCOM	AECC-1	2022-23	SHAMPA DAS
272	BA/BCOM	AECC-1	2022-23	SHAMPA LOHAR
273	8A/BCOM	AFCC-1		SHANKU KAHAR
274	8A/8COM	AFCC 1	2022:23	SHARMISTHA SARKAR
275	BA/BCOM	AECC-1	2022-28	SHAYANTANI PAL
		PEAR.	2022-21	SHAYOREE RAKSHIT

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1276	BA/BCOM	AECC-1	2022-23	SHEHNAZ PARVIN
1277	BA/BCOM	AECC-1	2022-23	SHIB SANKAR DAS
1278	BA/BCOM	AECC-1	2022-23	SHIBAM DAS
1279	BA/BCOM	AECC-1	2022-23	SHIBANDRA MARANDI
1280	BA/BCOM	AECC-1	2022-23	SHIBANI DAS
1281	BA/BCOM	AECC-1	2022-23	SHIBANI HAZRA
1282	BA/BCOM	AECC-1	2022-23	SHIBU DAS
1283	BA/BCOM	AECC-1	2022-23	SHIFA NAAZ
1284	BA/BCOM	AECC-1	2022-23	SHILA ANKUR
1285	BA/BCOM	AECC-1	2022-23	SHILPA GHOSH
00115		AECC-1	2022-23	SHILPA GOSWAMI
1286	BA/BCOM	AECC-1	2022-23	SHILPA KHATUN
1287	BA/BCOM		2022-23	SHILPA MURMU
1288	BA/BCOM BA/BCOM	AECC-1	2022-23	SHILPI DAS
1289	BA/BCOM BA/BCOM	AECC-1	2022-23	SHILPI KHATUN
1290	BA/BCOM BA/BCOM	AECC-1	2022-23	SHILPI SAHA
1291	BA/BCOM BA/BCOM	AECC-1	2022-23	SHIULI BAGDI
1292	BA/BCOM		2022-23	SHIULI BAYEN
1293	BA/BCOM	AECC-1	2022-23	SHIULI DAS
1294	BA/BCOM BA/BCOM	AECC-1	2022-23	SHIULI DOME
1295	BA/BCOM	AECC-1	2022-23	SHIULI KAHAR
1296	BA/BCOM	AECC-1	2022-23	SHIULI PAL
1297	BA/BCOM	AECC-1	2022-23	SHOHEB AKHTAR
1298	BA/BCOM		2022-23	SHRABANI BAGDI
1299	BA/BCOM	AECC-1	2022-23	SHRABANI BAURI
1300	BA/BCOM	AECC-1	2022-23	SHRABANI MAL
1301	BA/BCOM	AECC-1	2022-23	SHRABANTA MAL
1302	BA/BCOM	AECC-1	2022-23	SHREEMA GARAI
1303	BA/BCOM	-	2022-23	SHREYA CHOUDHURY
1304	BA/BCOM	AECC-1	2022-23	SHREYA DAS
1305	BA/BCOM	AECC-1	2022-23	SHREYA DEY
1306	BA/BCOM	AECC-1	2022-23	SHREYA DUTTA
1307	BA/BCOM	AECC-1	2022-23	SHREYA MAL
1308	BA/BCOM	AECC-1	2022-23	SHREYA MONDAL
1309	BA/BCOM	AECC-1	2022-23	SHUBHAM DAS
1310	BA/BCOM	AECC-1		SHUBHANKAR BHATTACHARYA
1311	BA/BCOM	AECC-1	2022-23	SHUBHENDU GHOSH
1312	BA/BCOM	AECC-1	2022-23	SHUKLA DAS
1313	BA/BCOM	AECC-1	2022-23	200 (200 (200 (200 (200 (200 (200 (200
1314	BA/BCOM	AECC-1	2022-23	SHUVANKAR SADHU
1315	BA/BCOM	AECC-1	2022-23	SHUVO DAS
1316	BA/BCOM	AECC-1	2022-23	SHYAMAL GARAIN
1317	BA/BCOM	AECC-1	2022-23	SHYAMALI GHOSH
1318	BA/BCOM	AECC-1	2022-23	SIDDHARTHA SHANKAR MONDAI
1319	BA/BCOM	AECC-1	2022-23	SIDDIQUE ROWSAN GULZAR
1320	BA/BCOM	AECC-1	2022-23	SIKHA ORANG
1321	BA/BCOM	AECC-1	2022-23	SILA BAGDI



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	BA/BCOM	AECC-1	2022-23	SIMA MAHARA
1322	BA/BCOM	AECC-1	2022-23	SIMA MURMU
1323	BA/BCOM	AECC-1	2022-23	The state of the s
1324	BA/BCOM	AECC-1	2022-23	SIMA SOREN
1325	BA/BCOM	AECC-1	2022-23	SIMRAN KHATUN
1326	BA/BCOM	AECC-1	2022-23	SIPRA MAHARA
1327	BA/BCOM	AECC-1	2022-23	SIRDHARTHA RUIDAS
1328	BA/BCOM	AECC-1	2022-23	SITALA DAS
1329	BA/BCOM	AECC-1	2022-23	SITANATH PAURIYA
1330	BA/BCOM	AECC-1	2022-23	SIULI SARKAR
1331	BA/BCOM	AECC-1	2022-23	SIYA DOME
1332	BA/BCOM	AECC-1	2022-23	SIYA KHATUN
1333	BA/BCOM	AECC-1	2022-23	SK ABBASUDDIN
1334	BA/BCOM	AECC-1	2022-23	SK ABBASUDDIN
1335	BA/BCOM	AECC-1	2022-23	SK ABU BAKKAR
1336	BA/BCOM	AECC-1	2022-23	SK AFTAB
1338	BA/BCOM	AECC-1	2022-23	SK AIMAN ASIF
1339	BA/BCOM	AECC-1	2022-23	SK AJIJUL HAQUE
1340	BA/BCOM	AECC-1	2022-23	SK AJMUL
1341	BA/BCOM	AECC-1	2022-23	SK AJRUL
1342	BA/BCOM	AECC-1	2022-23	SK ALAMGIR
1343	BA/BCOM	AECC-1	2022-23	SK ALAMGIR RANA
1344	BA/BCOM	AECC-1	2022-23	SK ALIF
1345	BA/BCOM	AECC-1	2022-23	SK ALLARAKHA
1346	BA/BCOM	AECC-1	2022-23	SK AMINUL HASSAN
1347	BA/BCOM	AECC-1	2022-23	SK AMIR
1348	BA/BCOM	AECC-1	2022-23	SK ANISUR
1349	BA/BCOM	AECC-1	2022-23	SK ARIF
1350	BA/BCOM	AECC-1	2022-23	SK ARIF
1351	BA/BCOM	AECC-1	2022-23	SK ARMAN
1352	BA/BCOM	AECC-1	2022-23	SK ARMAN HOSSAIN
1353	BA/BCOM	AECC-1	2022-23	SK ASADUL ISLAM
1354	BA/8COM	AECC-1	2022-23	SK ASHARUL
1355	BA/BCOM	AECC-1	2022-23	SK ASHIK HOSSAIN
1356	BA/BCOM	AECC-1	2022-23	SK ASHMATULLA
1357	BA/BCOM	AECC-1	2022-23	SK ASLAM
1358	BA/BCOM	AECC-1	2022-23	SK ASRAF
1359	BA/BCOM	AECC-1	2022-23	SK ASRAF
1360	BA/BCOM	AECC-1	2022-23	SK AZIM
1361	BA/BCOM	AECC-1	2022-23	SK BADSHA
1362	BA/BCOM	AECC-1	2022-23	SK FIRDOUS
1363	BA/BCOM	AECC-1	2022-23	SK FIROJ
1364	BA/BCOM	AECC-1	2022-23	SK FULCHAND
1365	BA/BCOM	AECC-1	2022-23	SK GIASUDDIN
1366	BA/BCOM	AECC-1	2022-23	SK GIYASUDDIN
1367	BA/BCOM	AECC-1	2022-23	SK HABIBUR RAHAMAN



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## SURI VIDYASAGAR COLLEGE

(Govt. Sponsored & Constituent college of the University of Burdwan) SURL BIRBHUM, PIN 731101, Ph. No. - 03462-255504

		4.44.		BOTTOM CONTROL
1368	BA/BCOM	AECC-1	2022-23	SK HABIBUR RAHAMAN
1369	BA/BCOM	AECC-1	2022-23	SK HAPIZ
1370	BA/BCOM	AECC-1	2022-23	SK HASAN
1371	BA/BCOM	AECC-1	2022-23	SK HASANUR
1372	BA/BCOM	AECC-1	2022-23	SK HASANUR
1373	BA/BCOM	AECC-1	2022-23	SK HASANUR JAMAN
1374	BA/BCOM	AECC-1	2022-23	SK HASARUL
1375	BA/BCOM	AECC-1	2022-23	SK HASIBUL
1376	BA/BCOM	AECC-1	2022-23	SK HOSANUR JAMAN
1377	BA/BCOM	AECC-1	2022-23	SK HUJAYFA
1378	BA/BCOM	AECC-1	2022-23	SK IKBAL HOSSAIN
1379	BA/BCOM	AECC-1	2022-23	SKIMRAN
1380	BA/BCOM	AECC-1	2022-23	SK IMRAN
1381	BA/BCOM	AECC-1	2022-23	SKIMRAN
1382	BA/BCOM	AECC-1	2022-23	SK IMTIAJ UDDIN
1383	BA/BCOM	AECC-1	2022-23	SK INJAMAM
1384	BA/BCOM	AECC-1	2022-23	SK INJAMAMUL HOQUE
1385	BA/BCOM	AECC-1		SK INJAMUL HAQUE
1386	8A/BCOM	17.50	2022-23	Average production and the second
1387	BA/BCOM	AECC-1	2022-23	SK IRFAN
1388	BA/BCOM		2022-23	SK IRFAN HABIB
3,122	BA/BCOM	AECC-1	2022-23	SK ISMAIL
1389	100000000000000000000000000000000000000	AECC-1	2022-23	SK ISMAIL
1390	BA/BCOM	AECC-1	2022-23	SK JYOTI
1391	BA/BCOM	AECC-1	2022-23	SK KAIF
1392	BA/BCOM	AECC-1	2022-23	SK KAIF
1393	BA/BCOM	AECC-1	2022-23	SK MAFIJUDDIN
1394	BA/BCOM	AECC-1	2022-23	SK MAFUZ ALAM
1395	BA/BCOM	AECC-1	2022-23	SK MAHACHAND
1396	BA/BCOM	AECC-1	2022-23	SK MANARUL
1397	BA/BCOM	AECC-1	2022-23	SK MANOYAR HOSSAIN
1398	BA/BCOM	AECC-1	2022-23	SK MASUD HASAN
1399	BA/BCOM	AECC-1	2022-23	SK MEHEMUD
1400	BA/BCOM	AECC-1	2022-23	SK MINTAUL
1401	BA/BCOM	AECC-1	2022-23	SK MOHIUDDIN
1402	BA/BCOM	AECC-1	2022-23	SK MOHIUDDIN
1403	BA/BCOM	AECC-1	2022-23	SK MOZADDED
1404	BA/BCOM	AECC-1	2022-23	SK MUSA
1405	BA/BCOM	AECC-1	2022-23	SK MUSIUR RAHAMAN
1406	BA/BCOM	AECC-1	2022-23	SK NAJIBUDDIN
1407	BA/BCOM	AECC-1	2022-23	SK NASIMUDDIN
1408	BA/BCOM	AECC-1	2022-23	SK NASRUL
1409	BA/BCOM	AECC-1	2022-23	SK NASRUL ISLAM
1410	BA/BCOM	AECC-1	2022-23	SK NAYEEM HOSSAIN
1411	BA/BCOM	AECC-1	2022-23	SK NAZIBUL
1412	BA/BCOM	AECC-1	2022-23	SK NESIBUL
1413	BA/BCOM	AECC-1	2022-23	SK NOSIBUDDIN





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		This	Institution is Rag	iging Free
1414	BA/BCOM	AECC-1	2022-23	SK NUR ALAM
1415	BA/BCOM	AECC-1	2022-23	SK DHIJAMAL
1416	BA/BCOM	AECC-1	2022-23	SK OLIUL
1417	BA/BCOM	AECC-1	2022-23	SK RABIUL ISLAM
1418	BA/BCOM	AECC-1	2022-23	SK RAFIKUL
1419	BA/BCOM	AECC-1	2022-23	SK RAHAMAN
1420	BA/BCOM	AECC-1	2022-23	SK RAHAMATULLA MOLLA
1421	BA/BCOM	AECC-1	2022-23	SK RAHUL
1422	BA/BCOM	AECC-1	2022-23	SK RAJESH
1423	BA/BCOM	AECC-1	2022-23	SK RAJESH
1424	BA/BCOM	AECC-1	2022-23	SK RAJIBUL
1425	BA/BCOM	AECC-1	2022-23	SK RAJIBUL
1426	8A/BCOM	AECC-1	2022-23	SK RAJU
1427	8A/BCOM	AECC-1	2022-23	SK RANA
1428	8A/BCOM	AECC-1	2022-23	SK RIYAZUDDIN
1429	BA/BCOM	AECC-1	2022-23	SK RIYAZUDDIN
1430	BA/BCOM	AECC-1	2022-23	SK ROBIUL
1431	BA/BCOM	AECC-1	2022-23	SK SABIR MAHAMMAD
1432	BA/BCOM	AECC-1	2022-23	SK SAHIDUL
1433	BA/BCOM	AECC-1	2022-23	SK SAHIL
1434	BA/BCOM	AECC-1	2022-23	SK SAIFULLAH
1435	BA/BCOM	AECC-1	2022-23	SK SALMAN
1436	BA/BCOM	AECC-1	2022-23	SK SAMAUN
1437	BA/BCOM	AECC-1	2022-23	SK SAMIM
1438	BA/BCOM	AECC-1	2022-23	SK SAMIM
1439	BA/BCOM	AECC-1	2022-23	SK SAMIM AKTAR
1440	BA/BCOM	AECC-1	2022-23	SK SAMIM EKTAR
1441	BA/BCOM	AECC-1	2022-23	SK SAMIR
1442	BA/BCOM	AECC-1	2022-23	SK SAMIUL
1443	BA/BCOM	AECC-1	2022-23	SK SAMSUDDIN
1444	BA/BCOM	AECC-1	2022-23	SK SAMSUL HOSSAIN
1445	BA/BCOM	AECC-1	2022-23	SK SARIF
1446	BA/BCOM	AECC-1	2022-23	SK SELIM
1447	BA/BCOM	AECC-1	2022-23	SK SHER ALI
1448	BA/BCOM	AECC-1	2022-23	SK SOHEL
1449	BA/BCOM	AECC-1	2022-23	SK SOYEB
1450	BA/BCOM	AECC-1	2022-23	SK SUJOL
1451	BA/BCOM	AECC-1	2022-23	SK SULTAN
1452	BA/BCOM	AECC-1	2022-23	SK SUYEL
1453	BA/BCOM	AECC-1	2022-23	SK USHAUL HOSSAIN
1454	BA/BCOM	AECC-1	2022-23	SK WASIM AKTAR
1455	BA/BCOM	AECC-1	2022-23	SK YEASIN
1456	BA/BCOM	AECC-1	2022-23	SK ZIYABUL
1457	BA/BCOM	AECC-1	2022-23	SKTAHASIN ALI
1458	BA/BCOM	AECC-1	2022-23	SMRITIKA DAS
1459	BA/BCOM	AECC-1	2022-23	SNEHA ACHARJEE





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		2 51457 61	restriction to truck	and there
1460	BA/BCOM	AECC-1	2022-23	SNEHA CHATTERJEE
1461	BA/BCOM	AECC-1	2022-23	SNEHA DAS
462	BA/BCOM	AECC-1	2022-23	SNEHA DAS
463	BA/BCOM	AECC-1	2022-23	SNEHA SHARMA
1464	BA/BCOM	AECC-1	2022-23	SNEHUNGSU DAS
1465	BA/BCOM	AECC-1	2022-23	SNIKDHYA SHAW
466	BA/BCOM	AECC-1	2022-23	SOHA ROY
1467	BA/BCOM	AECC-1	2022-23	SOHAN KARMAKAR
1468	BA/BCOM	AECC-1	2022-23	SOHEL HOSSAIN
1469	BA/BCOM	AECC-1	2022-23	SOHEL KHAN
1470	BA/BCOM	AECC-1	2022-23	SOKHI DAS
1471	BA/BCOM	AECC-1	2022-23	SOMA DAS
1472	8A/BCOM	AECC-1	2022-23	SOMA MONDAL
1473	BA/BCOM	AECC-1	2022-23	SOMASHREE PAL
1474	BA/BCOM	AECC-1	2022-23	SOMENATH DAS
1475	BA/BCOM	AECC-1	2022-23	SOMENATH RUJ
1476	BA/BCOM	AECC-1	2022-23	SOMENATH SHAW
1477	BA/BCOM	AECC-1	2022-23	SOMNATH CHAKRABORTY
1478	BA/BCOM	AECC-1	2022-23	SOMNATH DAS
1479	BA/BCOM	AECC-1	2022-23	SOMNATH DAS
1480	BA/BCOM	AECC-1	2022-23	SOMNATH GHOSH
1481	BA/BCOM	AECC-1	2022-23	SOMNATH GHOSH
1482	BA/BCOM	AECC-1	2022-23	SOMNATH SOREN
1483	BA/BCOM	AECC-1	101100000000000000000000000000000000000	SONALI BAGDI
1484	BA/BCOM	AECC-1	2022-23	SONALI BAGDI
-	BA/BCOM		0801070000	SONALI BAYEN
1485		AECC-1	2022-23	SONALI KISKU
1486	BA/BCOM	AECC-1	2022-23	SONALI LOHAR
1487	BA/BCOM	1000000	2022-23	723170701700
1488	BA/BCOM	AECC-1	2022-23	SONALI MALO
1489	BA/BCOM	AECC-1	2022-23	SONALI MONDAL
1490	BA/BCOM	AECC-1	2022-23	SONALI MONDAL
1491	BA/BCOM	AECC-1	2022-23	SONALI TANTI
1492	BA/BCOM	AECC-1	2022-23	SONAMONI MURMU
1493	BA/BCOM	AECC-1	2022-23	SONAMUNI MARDI
1494	BA/BCOM	AECC-1	2022-23	SONIYA DAS
1495	BA/BCOM	AECC-1	2022-23	SOUBHIK MUKHERJEE
1496	BA/BCOM	AECC-1	2022-23	SOUGATA MONDAL
1497	BA/BCOM	AECC-1	2022-23	SOUJIT MAHARA
1498	BA/BCOM	AECC-1	2022-23	SOUKAT GHOSH
1499	BA/BCOM	AECC-1	2022-23	SOUMAJIT DAS BISWAS
1500	BA/BCOM	AECC-1	2022-23	SOUMASHRI DAS
1501	BA/BCOM	AECC-1	2022-23	SOUMEN BASKI
1502	BA/BCOM	AECC-1	2022-23	SOUMEN DHIBAR
1503	BA/BCOM	AECC-1	2022-23	SOUMEN GARAI
1504	BA/BCOM	AECC-1	2022-23	SOUMEN GHOSH
1505	BA/BCOM	AECC-1	2022-23	SOUMEN MAHANTO





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1506	BA/BCOM	AECC-1	2022-23	SOUMEN MAHARA
1507	BA/BCOM	AECC-1	2022-23	SOUMI DAS
1508	BA/BCOM	AECC+1	2022-23	SOUMIK SAHA
1509	ва/всом	AECC-1	2022-23	SOUMILI BHATTACHARYA
1510	BA/BCOM	AECC-1	2022-23	SOUMYAJIT SU
1511	BA/BCOM	AECC-1	2022-23	SOUPTIK OJHA
1512	BA/BCOM	AECC-1	2022-23	SOURAV BAGDI
1513	BA/BCOM	AECC-1	2022-23	SOURAY DOME
1514	BA/BCOM	AECC-1	2022-23	SOURAV GHOSH
1515	BA/BCOM	AECC-1	2022-23	SOURAV KUMAR SAHA
1516	BA/BCOM	AECC-1	2022-23	SOURAV MAL
1517	BA/BCOM	AECC-1	2022-23	SOURAV MUDI
1518	BA/BCOM	AECC-1	2022-23	SOURAV PATAR
1519	BA/BCOM	AECC-1	2022-23	SOURAV ROY
1520	BA/BCOM	AECC-1	2022-23	SOURESH DAS
1521	BA/BCOM	AECC-1	2022-23	SOUVIK ADHIKARI
1522	BA/BCOM	AECC-1	2022-23	SOUVIK BAGDI
1523	BA/BCOM	AECC-1	2022-23	SOUVIK DAS
1524	BA/BCOM	AECC-1	2022-23	SOYED AHIDUL ISLAM
1525	BA/BCOM	AECC-1	2022-23	SRABANI DOME
1526	BA/BCOM	AECC-1	2022-23	SRABONI HEMBRAM
1527	BA/BCOM	AECC-1	2022-23	SRUAN DAS
1528	BA/BCOM	AECC-1	2022-23	SRIKRISHNA MAHANTA
1529	BA/BCOM	AECC-1	2022-23	SRITAMA DEY
1530	BA/BCOM	AECC-1	2022-23	SRUTIPARNA DAS
1531	BA/BCOM	AECC-1	2022-23	SUBARNA SENGUPTA
1532	BA/BCOM	AECC-1	2022-23	SUBHA GHOSH
1533	BA/BCOM	AECC-1	2022-23	SUBHADEEP DAS
1534	BA/BCOM	AECC-1	2022-23	SUBHADIP MAL
1535	BA/BCOM	AECC-1	2022-23	SUBHADIP MONDAL
1536	BA/BCOM	AECC-1	2022-23	SUBHADRA DAS
1537	BA/BCOM	AECC-1	2022-23	SUBHADRA MONDAL
1538	BA/BCOM	AECC-1	2022-23	SUBHAJIT DAS
1539	BA/BCOM	AECC-1	2022-23	SUBHAJIT DAS BAYEN
1540	BA/BCOM	AECC-1	2022-23	SUBHAJIT MONDAL
1541	BA/BCOM	AECC-1	2022-23	SUBHAJIT SADHU
1542	BA/BCOM	AECC-1	2022-23	SUBHAM DAS
1543	BA/BCOM	AECC-1	2022-23	SUBHAM KUMAR DAS
1544	BA/BCOM	AECC-1	2022-23	SUBHAS BADYAKAR
1545	BA/BCOM	AECC-1	2022-23	SUBHO KAHAR
1546	BA/BCOM	AECC-1	2022-23	SUBHOJIT ADHIKARY
1547	BA/BCOM	AECC-1	2022-23	SUBIR DAS
1548	BA/BCOM	AECC-1	2022-23	SUBRATA DAS
1549	BA/BCOM	AECC-1	2022-23	SUBRATA DOME
1550	BA/BCOM	AECC-1	2022-23	SUBRATA MONDAL
1551	BA/BCOM	AECC-1	2022-23	SUBRATA SAHA





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		No. of the last of		B. T. T.
1552	BA/BCOM	AECC-1	2022-23	SUCHANDRA MURMU
1553	BA/BCOM	AECC-1	2022-23	SUCHARITA SINGHA
1554	BA/BCOM	AECC-1	2022-23	SUCHARITA SINGHA
1555	BA/BCOM	AECC-1	2022-23	SUCHITRA DAS
1556	BA/BCOM	AECC-1	2022-23	SUDESHNA CHOWDHURY
1557	BA/BCOM	AECC-1	2022-23	SUDESHNA SAHA
1558	BA/BCOM	AECC-1	2022-23	SUDIP BAGDI
1559	BA/BCOM	AECC-1	2022-23	SUDIP MAJUMDAR
1560	BA/BCOM	AECC-1	2022-23	SUDIP MARDI
1561	BA/BCOM	AECC-1	2022-23	SUDIP MONDAL
1562	BA/BCOM	AECC-1	2022-23	SUDIP MONDAL
1563	BA/BCOM	AECC-1	2022-23	SUDIP MURMU
1564	BA/BCOM	AECC-1	2022-23	SUDIPA MONDAL
1565	BA/BCOM	AECC-1	2022-23	SUFIYA KHATUN
1566	BA/BCOM	AECC-1	2022-23	SUHANA KHATUN
1567	BA/BCOM	AECC-1	2022-23	SUHANA PARVEEN
1568	BA/BCOM	AECC-1	2022-23	SUJATA BADYAKAR
1569	BA/BCOM	AECC-1	2022-23	SUJATA BADYAKAR
1570	BA/BCOM	AECC-1	2022-23	SUJATA KONRA
1571	BA/BCOM	AECC-1	2022-23	SUJAY BAGDI
1572	BA/BCOM	AECC-1	2022-23	SUJIT BHANDARI
1573	BA/BCOM	AECC-1	2022-23	SUIT DAS
1574	BA/BCOM	AECC-1	2022-23	SUJOY BADYAKAR
1575	BA/BCOM	AECC-1	2022-23	SUJOY BAGDI
1576	BA/BCOM	AECC-1	2022-23	SUJOY CHOWDHURY
1577	BA/BCOM	AECC-1	2022-23	SUJOY MONDAL
1578	BA/BCOM	AECC-1	2022-23	SUKANYA MUKHERJEE
1579	BA/BCOM	AECC-1	2022-23	SUKDEB DOME
1580	BA/BCOM	AECC-1	2022-23	SUKHAMOY GARAIN
1581	BA/BCOM	AECC-1	2022-23	SUKHEN KAHAR
1582	BA/BCOM	AECC-1	2022-23	SUKUMAR DAS
1583	BA/BCOM	AECC-1	2022-23	SULAGNA SAHA
1584	BA/BCOM	AECC-1	2022-23	SULATA ANKURE
1585	BA/BCOM	AECC-1	2022-23	SULATA MAL
1586	BA/BCOM	AECC-1	2022-23	SULEKHA BAGDI
1587	BA/BCOM	AECC-1	2022-23	SULEKHA GHOSH
1588	BA/BCOM	AECC-1	2022-23	SULTANA YASMIN
1589	BA/BCOM	AECC-1	2022-23	SUMAYA KHATUN
1590	BA/BCOM	AECC-1	2022-23	SUMAN SAHA
1591	BA/BCOM	AECC-1	2022-23	SUMAN BAGDI
1592	BA/BCOM	AECC-1	2022-23	SUMAN BAGDI
1593	BA/BCOM	AECC-1	2022-23	SUMAN DAS
1594	BA/BCOM	AECC-1	2022-23	SUMAN DAS
1595	BA/BCOM	AECC-1	2022-23	SUMAN GHOSH
1595	BA/BCOM	AECC-1	2022-23	SUMAN GHOSH
1597	BA/BCOM	AECC-1	2022-23	SUMAN HALDER





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		1 868 41	Estriction is really	ing rett
1598	BA/BCOM	AECC-1	2022-23	SUMAN HAZRA
1599	BA/BCOM	AECC-1	2022-23	SUMAN KAHAR
1600	BA/BCOM	AECC-1	2022-23	SUMAN KORA
1601	BA/BCOM	AECC-1	2022-23	SUMAN MARDI
1602	BA/BCOM	AECC-1	2022-23	SUMAN MUDIKORA
1603	BA/BCOM	AECC-1	2022-23	SUMANA BAGDI
1604	BA/BCOM	AECC-1	2022-23	SUMANA BAGDI
1605	BA/BCOM	AECC-1	2022-23	SUMANA GHOSH
1606	BA/BCOM	AECC-1	2022-23	SUMANA SHEEL
1607	BA/BCOM	AECC-1	2022-23	SUMANTA SOREN
1608	BA/BCOM	AECC-1	2022-23	SUMIT MONDAL
1609	BA/BCOM	AECC-1	2022-23	SUMIT SADHU
1610	BA/BCOM	AECC-1	2022-23	SUMIT SHAW
1611	BA/BCOM	AECC-1	2022-23	SUMITA BAGDI
1612	BA/BCOM	AECC-1	2022-23	SUMITA DAS
1613	BA/BCOM	AECC-1	2022-23	SUMITA DAS
1614	BA/BCOM	AECC-1	2022-23	SUMITA MURMU
1615	BA/BCOM	AECC-1	2022-23	SUMITRA MAL
1615	BA/BCOM	AECC-1	2022-23	SUMITRA SOREN
1617	BA/BCOM	AECC-1	2022-23	SUNAMI KHATUN
1618	BA/BCOM	AECC-1	2022-23	SUNANDU DAS
1619	BA/BCOM	AECC-1	2022-23	SUNDAR DAS
1620	BA/BCOM	AECC-1	2022-23	SUNIL HEMRAM
1621	BA/BCOM	AECC-1	2022-23	SUNITA BAGDI
1622	BA/BCOM	AECC-1	2022-23	SUPRABHA MONDAL
1623	BA/BCOM	AECC-1	2022-23	SUPRATICK MURMU
1624	BA/BCOM	AECC-1	2022-23	SUPRAVA BAGDI
1625	BA/BCOM	AECC-1	2022-23	SUPRAVA SUR
1626	BA/BCOM	AECC-1	2022-23	SUPREETI GANGULY
1627	BA/BCOM	AECC-1	2022-23	SUPRIYA DAS
1628	BA/BCOM	AECC-1	2022-23	SUPRIYA MONDAL
1629	BA/BCOM	AECC-1	2022-23	SUPRIYA SARKAR
1630	BA/BCOM	AECC-1	2022-23	SUPRIYO DAS
1631	BA/BCOM	AECC-1	2022-23	SURAJ ALI MOLLA
120000000000000000000000000000000000000	BA/BCOM	AECC-1	2022-23	SURAJ DAS
1632	BA/BCOM	AECC-1	2022-23	SURAJ KHAN
1633	BA/BCOM	AECC-1	2022-23	SURAJIT BAGDI
1634	BA/BCOM	AECC-1	2022-23	SURAJIT DAS
-	BA/BCOM	AECC-1	2022-23	SURAJIT DOME
1636		AECC-1	2022-23	SURAJIT GOSWAMI
1637	BA/BCOM BA/BCOM	AECC-1	2022-23	SURAJIT HALDER
1638	BA/BCOM	AECC-1	2022-23	SURAJIT MAL
1639	BA/BCOM BA/BCOM	AECC-1	2022-23	SURESH BAGDI
1640	BA/BCOM	AECC-1	2022-23	SURIYA KHATUN
1641	BA/BCOM BA/BCOM	AECC-1	2022-23	SUROJIT BALL
1642 1643	BA/BCOM	AECC-1	2022-23	SURUMONI MARANDI





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			Contract to the contract to th	
1644	BA/BCOM	AECC-1	2022-23	SURYADEV DALUI
1645	BA/BCOM	AECC-1	2022-23	SURYAKANTA GHOSH
1646	BA/BCOM	AECC-1	2022-23	SUSHAMA KHATUN
1647	BA/BCOM	AECC-1	2022-23	SUSHIL DAS
1648	BA/BCOM	AECC-1	2022-23	SUSILA MURMU
1649	BA/BCOM	AECC-1	2022-23	SUSMITA ANKUR
1650	BA/BCOM	AECC-1	2022-23	SUSMITA BISHNU
1651	BA/BCOM	AECC-1	2022-23	SUSMITA CHOWDHURY
1652	BA/BCOM	AECC-1	2022-23	SUSMITA DAS
1653	BA/BCOM	AECC-1	2022-23	SUSMITA KUNDU
1654	BA/BCOM	AECC-1	2022-23	SUSMITA MAL
1655	BA/BCOM	AECC-1	2022-23	SUSMITA MONDAL
1656	BA/BCOM	AECC-1	2022-23	SUSMITA ROY
1657	BA/BCOM	AECC-1	2022-23	SUTAPA GHORUI
1658	BA/BCOM	AECC-1	2022-23	SUTAPA GHOSH
1659	BA/BCOM	AECC-1	2022-23	SUTAPA RUJ
1660	BA/BCOM	AECC-1	2022-23	SUTAPA SUR
1661	BA/BCOM	AECC-1	2022-23	SUVAJIT MANDAL
1662	BA/BCOM	AECC-1	2022-23	SWAGNIK MONDAL
1663	BA/BCOM	AECC-1	2022-23	SWAPNA MURMU
1664	BA/BCOM	AECC-1	2022-23	SWAPNENDU DAS
1665	BA/BCOM	AECC-1	2022-23	SWATHI DAN
1666	BA/BCOM	AECC-1	2022-23	TAHAMINA KHATUN
1667	BA/BCOM	AECC-1	2022-23	TAHERA KHATUN
1668	BA/BCOM	AECC-1	2022-23	TAHID KHAN
1669	BA/BCOM	AECC-1	2022-23	TAJKURA KHATUN
1670	BA/BCOM	AECC-1	2022-23	TAMANNA PARVIN
1671	BA/BCOM	AECC-1	2022-23	TANIA MAHARA
1672	BA/BCOM	AECC-1	2022-23	TANIA SHOW
1673	BA/BCOM	AECC-1	2022-23	TANIA SULTANA
1674	BA/BCOM	AECC-1	2022-23	TANIA SULTANA
1675	BA/BCOM	AECC-1	2022-23	TANIA SULTANA
1676	BA/BCOM	AECC-1	2022-23	TANIMA KHIRHAR
1677	BA/BCOM	AECC-1	2022-23	TANIMA KORA
1678	BA/BCOM	AECC-1	2022-23	TANIYA PARVIN
1679	BA/BCOM	AECC-1	2022-23	TANJIMUL HOQUE
1680	BA/BCOM	AECC-1	2022-23	TANUJA KHATUN
1681	BA/BCOM	AECC-1	2022-23	TANUSHREE BAURI
1682	BA/BCOM	AECC-1	2022-23	TANUSHREE PAL
1683	BA/BCOM	AECC-1	2022-23	TANUSHRI PAL
1684	BA/BCOM	AECC-1	2022-23	TAPAS DAS
1685	BA/BCOM	AECC-1	2022-23	TAPAS HANSDA
1686	BA/BCOM	AECC-1	2022-23	TAPASI TUDU
1687	BA/BCOM	AECC-1	2022-23	TASKIYA PARVIN
1688	BA/BCOM	AECC-1	2022-23	TASUMA KHATUN
	BA/BCOM	AECC-1	2022-23	TASUMA KHATUN





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	1		2022-23	TASLIMA KHATUN	
1690	BA/BCOM	AECC-1	2022-23	TASNIM PARVIN	
1691	BA/BCOM	AECC-1		THAKURDAS DAS	
1692	BA/BCOM	AECC-1	2022-23	THAKURDAS MONDAL	
1693	BA/BCOM	AECC-1	2022-23	TINA DAS	
1694	BA/BCOM	AECC-1	2022-23	TINA KHATUN	
1695	BA/BCOM	AECC-1	2022-23	TINA MONDAL	
1696	BA/BCOM	AECC-1	2022-23		
1697	BA/BCOM	AECC-1	2022-23	TINA SAHA	
1698	BA/BCOM	AECC-1	2022-23	TISHA DAS	
1699	BA/BCOM	AECC-1	2022-23	TITHI BAGDI	
1700	BA/BCOM	AECC-1	2022-23	TITHI GANGULI	-
1701	BA/BCOM	AECC-1	2022-23	TITHI GHOSH	$\neg$
1702	BA/BCOM	AECC-1	2022-23	TITHI MONDAL	-
1703	BA/BCOM	AECC-1	2022-23	TITLI BAGDI	-
1704	BA/BCOM	AECC-1	2022-23	TONIMA MONDAL	-
1705	BA/BCOM	AECC-1	2022-23	TOSIBA KHATUN	-
1706	BA/BCOM	AECC-1	2022-23	TOUFIK RAHAMAN	-
1707	BA/BCOM	AECC-1	2022-23	TRIPTI MONDAL	-
1708	BA/BCOM	AECC-1	2022-23	TRISHA DUTTA	_
1709	BA/BCOM	AECC-1	2022-23	TRISHA GHOSH	
1710	ва/всом	AECC-1	2022-23	TRISHA HAZRA	_
1711	BA/BCOM	AECC-1	2022-23	TRISHA KHATUN	_
1712	BA/BCOM	AECC-1	2022-23	TUMPA BAYEN	
1713	BA/BCOM	AECC-1	2022-23	TUMPA KHATUN	
1714	BA/BCOM	AECC-1	2022-23	TUPMA BAGDI	
1715	BA/BCOM	AECC-1	2022-23	TUPU GHOSH	
1716	BA/BCOM	AECC-1	2022-23	TUSHAR CHAKRABORTY	
1717	BA/BCOM	AECC-1	2022-23	TUSI MONDAL	
1718	BA/BCOM	AECC-1	2022-23	UMA MONDAL	
1719	BA/BCOM	AECC-1	2022-23	UMA PAL	
1720	BA/BCOM	AECC-1	2022-23	UMME KULSUM	
1721	BA/BCOM	AECC-1	2022-23	UMME KULSUM	
1722	BA/BCOM	AECC-1	2022-23	URMILA KAHAR	
1723	BA/BCOM	AECC-1	2022-23	URMILA MARDI	
1724	BA/BCOM	AECC-1	2022-23	URMILA SAHANI	
1725	BA/BCOM	AECC-1	2022-23	USHA DHIBAR	
1726	BA/BCOM	AECC-1	2022-23	USHA HEMBROM	
1727	BA/BCOM	AECC-1	2022-23	VIVEKANANDA SINGHA	
1728	BA/BCOM	AECC-1	2022-23	WAHIDA KHATUN	
	BA/BCOM	AECC-1	2022-23	WALIUL HOQUE	
1729	BA/BCOM	AECC-1	2022-23	WASIM RAJA	
1730	BA/BCOM	AECC-1	2022-23	WRIK BAITHA	
1731	BA/BCOM	AECC-1	2022-23	YANDRILA MAZUMDER	
1732	- Automatical Control	AECC-1	2022-23	YASIN KHAN	
1733	BA/BCOM	AECC-1	2022-23	YASIN MIRDHYA	
1734 1735	BA/BCOM BA/BCOM	AECC-1	2022-23	YASMINA KHATUN	





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1736	BA/BCOM	AECC-1	2022-23	YEARUNNESHA KHATUN	
1737	BA/BCOM	AECC-1	2022-23	YEASMINA KHATUN	
1738	BA/BCOM	AECC-1	2022-23	YEASMINA KHATUN	
1739	BA/BCOM	AECC-1	2022-23	YESMEEN KHATUN	
1740	BA/BCOM	AECC-1	2022-23	YESMINA KHATUN	
1741	BA/BCOM	AECC-1	2022-23	YUEB ALAM MIDHYA	
1742	BA/BCOM	AECC-1	2022-23	ZAHIMA KHATUN	
1743	BA/BCOM	AECC-1	2022-23	ZAMIMA SULTANA	
1744	BA/BCOM	AECC-1	2022-23	ZUNED AKHTER MOLLA	

Report Mukhonje

Project Coordinator AECC-1 Suri Vidyasagar College



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#### PROJECT COMPLETION CERTIFICATE

This is to certify that the following students have successfully completed their Environmental Studies Project (ENVS) relating to the paper AECC-1 in the academic Year 2022-23:

Title of the Project: 1. Study of five common plants 2. Study of five insects

Name of the Supervisors: 1. Dr. Tanmoy Mandal, Department of Plant Protection

2. Dr. Anirban Paul, Department of Botany, Suri Vidyasagar College

SI.No.	Course	Paper	Year	Name of the Student
	BSC	AECC-1	2022-23	ABDUL ASIF
1	BSC	AECC-1	2022-23	ADITI GARAI
2	BSC	AECC-1	2022-23	AFJAL HOSSAIN
3	BSC	AECC-1	2022-23	AFNAN KHATUN
4	BSC	AECC-1	2022-23	AGASTA DAS
6	BSC	AECC-1	2022-23	AGNIBHA PAL
	BSC	AECC-1	2022-23	AKASH MIR
7	BSC	AECC-1	2022-23	ANIRBAN MANDAL
8	BSC	AECC-1	2022-23	ANISHA DAS
9	BSC	AECC-1	2022-23	ANITESH CHATTOPADHYAY
10	BSC	AECC-1	2022-23	ANIAN DAS
11	BSC	AECC-1	2022-23	ANKIT SIL
12	BSC	AECC-1	2022-23	ANUBHAB MARDI
13	BSC	AECC-1	2022-23	ANUP GARAI
14	BSC	AECC-1	2022-23	ANUTRI SEN
15		AECC-1	2022-23	ARANAYA MONDAL
16	BSC	AECC-1	2022-23	ARUIT CHATTARAI
17	BSC	AECC-1	2022-23	ARUIT PAITANDI
18	BSC	AECC-1	2022-23	ARITRA PANDIT
19	BSC	AECC-1	2022-23	ARKA GARAIN
20	BSC	AECC-1	2022-23	ARNAB MISHRA
21	BSC	AECC-1	2022-23	ARPAN GHOSH
22	BSC	AECC-1	2022-23	ARPIT BANERJEE
23	BSC	AECC-1	2022-23	ARPITA GARAIN
24	BSC	AECC-1	2022-23	ARPITA RAKSHIT
25	BSC	AECC-1	2022-23	ARPITA RAKSHIT
26	BSC	AECC-1	2022-23	ATANU CHOWDHURY
27	BSC	AECC-1	2022-23	BABAI SAHA
28	BSC	AECC-1	2022-23	BAIJUNNESA BEGAM
29	BSC	AECC-1	2022-23	BAISHAKHI SINHA
30	BSC		2022-23	BARSHA MONDA
31	BSC	AECC-1	2022-23	BIDISHA MONDAL
32	BSC	AECC-1	2022-23	BUOYA SAHA
33	BSC	AECC-1		-17



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4	BSC	AECC-1	2022-23	BISWAJIT DAS
5	BSC	AECC-1	2022-23	BISWAJIT SAHA
-	BSC	AECC-1	2022-23	CHANDRADEB MONDAL
16	BSC	AECC-1	2022-23	CHANDRIMA BOSE
37	BSC	AECC-1	2022-23	CHHABI KHATUN
18	BSC	AECC-1	2022-23	CHITRA MONDAL
39	BSC	AECC-1	2022-23	DEBABRATA HEMBRAM
10		AECC-1	2022-23	DEBASISH BHATTACHARIEE
11	BSC	AECC-1	2022-23	DEBASISH GARAI
12	BSC	AECC-1	2022-23	DEBJYOTI DAS
14	BSC	AECC-1	2022-23	DEBOJYOTI DUTTA
45	BSC	AECC-1	2022-23	DHRITI ROY
11.	BSC	AECC-1	2022-23	DIBYENDU DAS
46 47	BSC	AECC-1	2022-23	DIP NARAYAN SINGHA
48	BSC	AECC-1	2022-23	DIP SADHU
19	BSC	AECC-1	2022-23	DIPANWITA MONDAL
50	BSC	AECC-1	2022-23	FIRDOUS KHATUN
51	BSC	AECC-1	2022-23	HAIMANTI GHOSH
52	BSC	AECC-1	2022-23	HARSHA BAURI
53	BSC	AECC-1	2022-23	INAMUR RAHAMAN
54	BSC	AECC-1	2022-23	ISHANI SINGHA
55	BSC	AECC-1	2022-23	JAHIRUL ISLAM MALLICK
56	BSC	AECC-1	2022-23	JANMEJOY GHOSH
57	BSC	AECC-1	2022-23	JAVED AKTAR SEKH
58	BSC	AECC-1	2022-23	JIT BAUL
-	BSC	AECC-1	2022-23	JOY KONAI
59	BSC	AECC-1	2022-23	JUI CHOWDHURY
60	BSC	AECC-1	2022-23	JYOTI KARMAKAR
61	BSC	AECC-1	2022-23	KALYAN DHIBAR
52	BSC	AECC-1	2022-23	KAZI MAZHARUL ISLAM
63	BSC	AECC-1	2022-23	KAZI ASIF IQBAL
64	BSC	AECC-1	2022-23	KEKA LAHA / Y
65	BSC	AECC-1	2022-23	KIRAN RAJAK
66	BSC	AECC-1	2022-23	KRISHNA PANDIT
67	BSC	AECC-1	2022-23	MANIKA GARAIN
68		AECC-1	2022-23	MD ARIF MOLLA
69	BSC	AECC-1	2022-23	MD MASIUR RAHAMAN
70	BSC	AECC-1	2022-23	MD MEHEFUZ ANAM
71	BSC	AECC-1	2022-23	MD NASIFUDDIN
72	BSC	AECC-1	2022-23	MD RAFYUDDIN SHAH
73	BSC	AECC-1	2022-23	MD RASIDUL ISLAM
74	BSC	AECC-1	2022-23	MD SOHEL AMIN
75	BSC	AECC-1	2022-23	MEHENAJ KHATUN
76	BSC	AECC-1	2022-23	MISHU DE
77	BSC	AECC-1	2022-23	MOFIJUL HAQUE
78	BSC	AECC-1	2022-23	MOJAHIDUCALAM

BSC

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00	BSC	This Institutio	2022-23	MONOJ KUMAR DAS
80	BSC	AECC-1	2022-23	MOUSUMI NANDI
1	BSC	AECC-1	2022-23	MUNMUN MONDAL
2	BSC	AECC-1	2022-23	NASRIN SULTANA
3	BSC	AECC-1	2022-23	NASRIN SULTANA
34	BSC	AECC-1	2022-23	NAYAN GARAIN
85	BSC	AECC-1	2022-23	NAZMUNNISHA KHATUN
86	BSC	AECC-1	2022-23	OLI AHAMMED
37	BSC	AECC-1	2022-23	OSMAN GANI
88	BSC	AECC-1	2022-23	PAPRI DEVNATH
89	BSC	AECC-1	2022-23	PARTHIB DAS
90	BSC	AECC-1	2022-23	PARVEJ MUSARAF
91	BSC	AECC-1	2022-23	PAYEL CHOWDHURY
92		AECC-1	2022-23	PAYEL CHOWDHURY
93	BSC BSC	AECC-1	2022-23	PAYEL DAS
94	BSC	AECC-1	2022-23	PAYEL GHOSH
95 96	BSC	AECC-1	2022-23	PIYALI SEN
97	BSC	AECC-1	2022-23	PRADIP DAS
10100	BSC	AECC-1	2022-23	PRAKASH GOPE
98	BSC	AECC-1	2022-23	PRAKASH MONDAL
99	BSC	AECC-1	2022-23	PRATIK MONDAL
100	BSC	AECC-1	2022-23	PREETI SAHA
101	BSC	AECC-1	2022-23	PRIYANKA GARAI
102	BSC	AECC-1	2022-23	PROMILA MONDAL
	BSC	AECC-1	2022-23	RABIA KHATUN
104	BSC	AECC-1	2022-23	RABILAL BESRA
105	BSC	AECC-1	2022-23	RABISANKAR SUTRADHAR
106	BSC	AECC-1	2022-23	RANAJIT MONDAL
107	BSC	AECC-1	2022-23	RATAN MONDAL RIKTA BHAKTA
108	BSC	AECC-1	2022-23	RIKTA BHAKTA RIMI RUJ
109	BSC	AECC-1	2022-23	RATAN MONDAL RIKTA BHAKTA RIMI RUJ
110	BSC	AECC-1	2022-23	RINKI DAS
111	BSC	AECC-1	2022-23	RITAVASH GHOSH
112	BSC	AECC-1	2022-23	RUSHDA ALAM
113	BSC	AECC-1	2022-23	SAFIUR RAHAMAN
114	BSC	AECC-1	2022-23	SAIKAT DAS
115	BSC	AECC-1	2022-23	SALAUDDIN MONDAL
116	BSC	AECC-1	2022-23	SAMANITA CHATTERJEE
117	BSC	AECC-1	2022-23	SAMIM KHAN
118	8SC	AECC-1	2022-23	SAMIRAN SAHA
119	BSC BSC	AECC-1	2022-23	SANDIP MONDAL
120	BSC	AECC-1	2022-23	SANDIP PAL
121		AECC-1	2022-23	SANKO MONDAL
122	BSC	AECC-1	2022-23	SANTANU MONDA
123	BSC BSC	AECC-1	2022-23	
124	BSC	AECC-1	2022-23	SAYAN KUNDU



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126	BSC	AECC-1	2022-23	SAZIA NAZ KHAN
127	BSC	AECC-1	2022-23	SHANKAR MONDAL
128	BSC	AECC-1	2022-23	SHRABANI DAS
129	BSC	AECC-1	2022-23	SHREYA BANERJEE
130	BSC	AECC-1	2022-23	SHUBHAM DAS
131	BSC	AECC-1	2022-23	SHUVAJIT MONDAL
132	BSC	AECC-1	2022-23	SHUVANKAR DAS
133	BSC	AECC-1	2022-23	SK ABDUS SATTAR
134	BSC	AECC-1	2022-23	SK ANISUR RAHAMAN
135	BSC	AECC-1	2022-23	SK ANJAR ALI
136	BSC	AECC-1	2022-23	SK ASRAFUL HAQUE
137	BSC	AECC-1	2022-23	SK HABIB
138	BSC	AECC-1	2022-23	SK HAFIZUL HAQUE
139	BSC	AECC-1	2022-23	SK MASUD
140	BSC	AECC-1	2022-23	SK MOINUDDIN
141	BSC	AECC-1	2022-23	SK MUFAJUDDIN MONDAL
142	BSC	AECC-1	2022-23	SK NAYAN
143	BSC	AECC-1	2022-23	SNEHA BISWAS
144	BSC	AECC-1	2022-23	SOHAN BAG
145	BSC	AECC-1	2022-23	SOUMI KUNDU
146	BSC	AECC-1	2022-23	SOUMIK KUNDU
147	BSC	AECC-1	2022-23	SOUMYADIP BISWAS
148	BSC	AECC-1	2022-23	SOUMYAIT SALUI
149	BSC	AECC-1	2022-23	SOURAV MONDAL
7	BSC	AECC-1	2022-23	SOURAV MONDAL
150	BSC	AECC-1	2022-23	SOUVIK BAGDI
151	BSC	AECC-1	2022-23	SOUVIK CHOWDHURY
152	BSC	AECC-1	2022-23	SOUVIK DEY
153	BSC	AECC-1	2022-23	SOUVIK MUKHERJEE
154	BSC	AECC-1	2022-23	SOUVIK SINGHA SRABONI SARKAR
155	BSC	AECC-1	2022-23	SRABONI SARKAR
156	And the Control of th	AECC-1	2022-23	SUBHAJIT TUDU
157	BSC	AECC-1	2022-23	SUBHAM SEN
158	BSC	AECC-1	2022-23	SUBHENDU GHOSH 153
159	BSC	AECC-1	2022-23	SUBRATA DALUE
160	BSC	AECC-1	2022-23	SUDIP MONDAL
161	BSC	AECC-1	2022-23	SUDIPTO GHOSH
162	BSC	AECC-1	2022-23	SUFINA KHATUN
163	BSC		2022-23	SUHANA PARVEEN Q
164	BSC	AECC-1	2022-23	SUMAN GARAIN
165	BSC	AECC-1	2022-23	SUMAN MONDAL A 8
166	BSC	AECC-1	2022-23	SUMAN ROOJ
167	BSC	AECC-1	2022-23	SUMAN SAHA
168	BSC	AECC-1	2022-23	SUPRIYO MONDAL
169	BSC	AECC-1	2022-23	SURAJIT DHIBAR
170	BSC	AECC-1	2022-23	SUVALIT CHAKRABORTS
171	BSC	AECC-1	2022-23	120101



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172	BSC	AECC-1	2022-23	SYED IRFAN AHAMMED
173	BSC	AECC-1	2022-23	TABBASUM YASMIN
174	BSC	AECC-1	2022-23	TANMAY PRASAD YADAV
175	BSC	AECC-1	2022-23	TASNEEM FATEMA
176	BSC	AECC-1	2022-23	TINA MONDAL
177	BSC	AECC-1	2022-23	TISTA MONDAL
178	BSC	AECC-1	2022-23	UMA PRASANNA GHOSH
179	BSC	AECC-1	2022-23	UMME KULSUM KHATUN
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Head polaring

Project Coordinators
AECC-1
Suri Vidyasagar College

Department Suri Vidyasagar Commis Suri, Birbhum, W.B. SALVIDYASGAR COLLEGE



#### THE UNIVERSITY OF BURDWAN

ASSIGNMENT SEMESTER - 1st

NAME :- SK SAMIR

ROLL NO :- 22010411

SUBJECT :- ENVIRONMENT STUDIES

SEASON :- 2022 - 2023

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# SURI VIDYASAGAR COLLEGE

SESSIONS: 2022-2025

### THE UNIVERSITY OF BURDWAN

ASSIGNMENT : ENVIRONMENT STUDIES

STUDENT NAME: MD. KAIF

ROLL NO: 22040088

SUBJECT: ENVIRONMENT STUDIES

CODE : AECC1

SEMESTER: 1

) वर्षित्वा हिस्सी कारक पील । वर्तानिका हिस्तिक करानेवारी एए कु देश व - सिवहात्ताम्य हो अवधार्माम् तिक ३ द्वीवक त्रीकातम् । जित्रकार्यक वर्षवर्वर्वः या सीवड्याः वर्षावर्वाः वर्षावः अर्थाः आवतः कातः Grea वर्षवृत्वा क्रम्स बहुन । न्रिक्का ध्यात् भावताः इसन १म क्षित्रायान एक व्यवनायानिक २०० देनिक लेकिनायेन १४० व्याद्वादित देखिमाल व्यादान्य मा द्वीवकारत है विकास उपत्य दिवस प्रभव दिसा गरिए यह गिरिक लाईकिराक अल्ला, -िकाल मिल्ला प्राणिश बुर्ज सीवलवर्गमा स्थापडहर्ता रहोडावान लासिका लिलाई डेड्रमानक ल्यानिकारित क्यानेती जिलाहित प्राथनंत्रम भवन त्यात्विवते अवद्वात्यात्म भवाव त्यात्वात्रम् कृतिहारिक बीसराय कलाव स्थितिय सेस्स्येच व्याज नेया भ्यारे एसरि एसस्य व विकल ह क्राबाद्यां ल्या इडिस्ट र्राज्य दुर्घत क्रिय क्रिय विश्ववीत बीपति ५६ ध्याचेर्रेष्ट्र नेत्रस्ति उत्ता क्रेक्ट्रिस खारीपति ट्रायुड तिहित भाषा छात्र 2) वर्षिट्य क्षित अपन हमार कार्यक विस्त निर्म हमार हिन्द र हिन्त । -> व्यापन है वर्षा हमार कार्यक वर्षा वर्षा क्षित हिन्द र हिन्त । द्धान नुभी कामन देश त्या वर्षेत्र वर्षित काम देश प्राप्त भीप World health Organnisation (all of 1/10)

ाणिम्बन्द निर्मार्थित सहार्य भारत मानेस द अव क्षिक्रांत अभिनेक्ट निर्मात्मः वार्थः देशव वाला । निर्मात्मे अप्राप्ति क्रेम विमान । स्प्रिके त्रिक । निर्मात्म अप्रिक्त अप्रितः न्यांम विमान त्रिकिति अपिन रामास उ -कार्य उपर ७५% प्रे (क्युक्रिक्) स्थितिक स्थापन नुबाद्धि कर्रेक्सा ज्यादास उ I SUPPLY BOAR undural THAT A → 3505/10 -उत्तिक्शकुर<sup>६</sup> गार्वे पुरास्त्र -STUMBERS KJ क्षित व्यक्त -579 WG7795 ११र्राष्ट्राकाका

वरिस्ताम क्षेत्रका क्षेत्रका कार्य इंगि येला ÷ व्युग्निव्यम्, अलक्षित्रं, क्ष्मिव्यम्, व्याप्तिक्षम् । न्त्रप्रभी : क्षिप्रमान उत्तरसकीला जिल्हाकार्वी कार्य यदास एक्सायब कार्य वीद्राप्तासक इस अवड आरिसीब कार्यविभिक्त स्मातिकिक उत्तरसम्बद्धारम् एक निहाससम्बद्ध वपूत्र , जादक वायु दूधन वहने । कालक्ष्य न क (त्राष्ट्रक) (याणकी वार्षिकण्य १८१ शादक नेसर्टेश्च वीण । एकर्राहर वेतवं दुनसम्बद्धिय डिप्स स्टिस देश (त्रुन वंतरत्रेश्चिक इनकेश्च वार्षित वी धरीत्रसमित कार्षित त्रिला क्षित क्षित क्षित

व्यक्षित्र क्षेत्रम् -वर्षिक्षं उपनेप्तर्से केर्नु बर्ग हारा उन्तर हीनी है। अध्या — (i) जादुक्कुभूष्ये (ii) ardalew serge - माध्य क्रिके क्षांत्र (i) न्हीतान्त्र ज्यानानि त्याहास्तरः - विकास क्षेत्र के ने क्षेत्र विकास क्षेत्र वरिंग स्वर्धि क्षेपेंब न्यला वाटाकि स्थित वक्त प्रैयम होता। -अक्ष्माद्वीरहर कार्यम उन्हे ज्वस्ताहर , महाद्वा ह्या ज्वाहर्य --अक्ष्माद्वीरहर कार्यम उन्हे ज्वस्ताहर , महाद्वा ह्या ज्वाहर्य -- राह्में अधिर या श्रायकिं क्यों त्यल्यों अक्ट्रिक । (1) - श्वादर कान्द्रासकं एम्प्रेट क्रिकेट. सिर्वायुक्त माध्यकां व्यक्ताव्येन क्ष्मित्र क्षायान्य माध्य विकास ३ काल्व क्या। प्रमाप - काव्य क्ष्माकार्क्त - कत्य प्राप्त नुकास कार्वाया एकाल स्थाया न्यत्य स्थाया न्याया क्षान का अटिनिष्ट मिका क्षिण अटिनिष्ट बंदुल -60(a 1

व्यक्तिक कान्यन ii) enterbilitudes conserve: हार्क्ष कार्य कार्य हैं। हैं के के अपने कार्य क्षित्र के स्टिक कार्य । कार्य वास्त्र के स्टिक्ट कार्य । कार्य वास्त्र के स्टिक्ट कार्य कार्य के स्टिक्ट कार्य के स्टिक के स्टिक्ट कार्य के स्टिक कार्य कार्य कार्य के स्टिक कार्य अंश में हिंदा कड़ि किंग अति हैं उठे पाण्डिक अस्टिक भिव्यक्तं (अहा अप्टर । (अश्रप्र -म-विभवादम माराष्ट्री अविश्वासि शिक्षमाति कार्य सार त्यक्षेत्रे नामात्र व्यक्षित्र (वटा दिला क्षित काउँग्थानिय पुत्रियात क्षित्र है। हिंगीक । क्षित्र व क्षिकार महारहम्यी मह निकारित होते। १८० १९८० अधिकारित हेन्स् प्राप्त । असि विश्वास्ति । महोत्रक के जिल्ला के जिल्ला के तिया निर्म के कि जिल्ला के तिया निर्म के तिया महामान होता ११व विद्वाल प्रवास होता रिवास महामान होता है। (बार उत्पास प्रवास होता रिवास स्ति । स्वार्थ क्षेत्र भित्र महिल्ली क्षेत्र क्षेत्र

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ल्यालक्षीत लाएक । प्रमाह उद्या ग्रिक्षी १ कं तेला सुरीप ३ काशुप उत्याक्षि कीलक उक्षाच्छे क्यालक चल्ल्युर्वाच्छे आयावित्यक सुवाश्यास खाकं जा करंते इतिसास अति क्यालक चल्ल्युर्वाच्छे आयावित्याल्याल सुवाश्यास खाकं जा करंते इतिसास अति पा । युक्षि व त्याला क्याला खाक्रिय अतिसासी प्रमाशितिसामिश्य काश्य (CEC) लाहाल अन्याला क्यालाला अत्यास शासिस क्याला काश्यास स्थाला स्थाला स्थाला स्थाला स्थाला स्थाला स्थाला स्थाला अत्यास अत्यास शासिस स्थाला अत्यास स्थाला स्थाला

कारिकां एक शुक्राशिकं अक्षाकं लाक्षिशिक विद्यमार्थे। कामार्थिक ३ दिस कुक्षिमार्थि कुक्षिण मार्थित कुक्षिण कार्येश क्षाण्य क्षिण क्षाण्य क्षाण क्षाण्य क्षाण्य क्षाण्य क्षाण्य क्षाण्य क्षाण्य क्षाण्य क्षाण क्षाण क्षाण्य क्षाण क

\* न्यानिकारमध्याति अवितः अधिपक्षक क्षेत्रक क्षेत्रक प्राप्त क्षेत्रक प्राप्त क्षेत्रक प्राप्त क्षेत्रक प्राप्त क्षेत्रक विकास सार्वाताः व स्थाता कार्याति श्रीतिक्व वर्त्वाता कार्याते। स्प्रिया १९११ स्पुरिय क्ष्मित १९८४ के हुं साम प्रति । के द्वाल क्ष्मित GET केंद्रा शलाए-0 क्रिक्कारिक समाति प्रथमि महिला निविद्य कार्यावाय रायहरी तीरी, वैक्षा राष्ट्रा, निर्म अवस्ति कार्याय क्षांना प्रमुख क्याला कारिकार कार्यात कार्या क्रिक के । @ -ळलळावदारा वर्जा . -कार्यका के प्रधा दहाकि विद्यो व विश्व अवस्त उत्परित के के कर्ण. उज्यों हिर क्षेत्रर्थ, ए०म च्यादिश क्ष्यादी अवस्टि क्रामिकाल भिक्छ १९१म च्याम कृतिया २३म । नेड्डम्प्राल कर्म: -२4० ११ क्या नेड्डम्प्रालं व्यक्ष्यंत्रा तत्तक स्थिए प्रमुख्य कुर्दिशं सर्मे । फ्रान्सम् हत्स्रस्मीय नुमिह रहेपाक्ष क्रियं है हिरांगड़ी क्रियाक भेतार क्षां गेरि के जिल ने किया है। कार्य कार्या कार्या कार्या काञ्चलक वीक्षडें के के मिटी हिंदी के का का के कि -अभक्ष्य देवानीम

# SURI VIDYASAGAR COLLEGE



### INTERNAL ASSIGNMENT

SEMESTER:- 1ST

MORNING SECTION

SUB: ENVIRONMENTAL SCIENCE

SUBJECT CODE :-

B.A.GENERAL

NAME :- RAJ BAGDI

COLLEGE ROLL NO :- 22041697

STUDENT ID :- 3122200073

MOBILE NO :- 8617068130

DATE :-

2022-2023

1. जीनप्रिय अप्रीति - जार्वति । जार्वति - जार्वति । जीनप्रता नार्विक व्यापितः । जिल्ला । जीनप्रता व्यापितः । क्षित्रीय यान्त : प्रवर स्मारमान्य कार्य अर्थ करें आहार मान्य कार्य कार E-SEL COLO LOLDIO COLO DE COLO DE SASTE DE LA SASTETA and 41 1010 5114 23. We extra short all 12.6 काराकार क्यारक या द्वीवन सिव्दर्भ द्वारा देशायां । विदे व्हर्भान जार्य अस्ति क्यान व्यक्तीक शास्त्र व्यक्ति व्य मारिए ग्रांक त्यान व्याच्या व्याच्या व्याच्या घर व्याच्या घर याच - ते व्याच्या स्ति गढ़ अल अधिय अशिय किंद दुवेटा कार्ये की म्रिश्टिगाएक। 5" त्मावादेव अधिवस्त्र नार्वे सस्तिति त्रात्मात्मिक प्रतिस्थित रजाद्व. प्रमुख वात-राजाक देवपुरिष्ट- जे वारी जावादिक स्पूर्व कर कर देव दिल वारी के व्यक्ति कार्वित आशाबिक निर्विकाल राष्ट्रि साम के वा कारति । त्ये नारा निके न्या किया नारिया । एड दिन्या है न्या कार्य कार्य कार्य कर कामा मार्काल कार्याच्या कार आहता । त्याच स्पूर्ण अहित्या स्थाए-3. SINDON SOUTH COOK BENINEYS SUM DON ELL TOURS DIOSENDE 1. 38th ( ) 20th ( ) निश्व कार्य आरम्ब्रिक ट्यानायेक ट. कार्यक्ट्य हार्याट क्यामिटक क्कां अर्थ । जु. सेत. क्रिनां येक वर्षायक वर्षाय आमयिक व्याप अमीत्र दशक वर्षायक वर्षण किए (इधवार्य व्याप वर्षण सेत न्य काद्यायाकी त्याक गार्जियाय कार्य गार्थ गार्थ क्याद्याष्ट्रक द्यां कुर कर् styred such to support - 26. 26. 26. Sign suffer 200 व्याद म्पारम महनीति द्रम्पायक द उत्पाष्ट न्यादला। DJ. 3144RD Alpr. 254L Logge 218TED GOLDEMOR STATUS while soul is - regre actual wayor ally and I

4. BEERE GLES DAT TOTAL COULT STAB WYY SUMMON A BACKOLLI DE BYLOGONING TO SAN DE BOYNE BY SURVEYOR मीदियाला. वास्ति किया स्थातिक कुन्न कुन्न . अर्था . अर्था कुने क्या । अर्था कुने क्या न्या त्यावम् कर्ट ठाउट विद्यं अद्य अद्य अद्य कार्व त्याव खादक खादक खादक व्यावस्थ केश्वर करते । किये अधीर्मितपरे क्या किये महाया कामाहा व्यापि। कारत-CEC, टिमालि ' शहरित्राह्म व्यक्तित क्रेक्सि शहरित्रहिलाम ROLLING CRA TILD DICH CRECHASED EARLY CALTER LY - उन्ति कर्त कि किय करवेर क्यान क्यान उरके क्या कार्य कार्य - 03 IL ald Party & - allog and allog shows Eyo Dering Cash Filled By Lary-Do. Sout Earlide - engl I'm ale was with else. - प्रसामातिक-१९७८ शतप्रतापि १६१८ इन्हिंगिक अभिष्या आदक्ष काता अन्त निक्ति कर्त अष्टप्रियमिक क्याहित न्यान करते आ आहे. १ क्षेत्र श्रीत आपकार्व हार - व्यवश्रेष त्याता हत्यां वातम् अस्त आरा स्वालक व्यक्ति सामा विषय कार्य । याग्र विक् उर्द एउ व्यक्ति STEEL SNUTS LEVEL STURE STURE STURE LEVEN. ZOS ENTES ONGO xd 1 20 20/26 64-26 8114 2:9-75-4/20 SL -418-10 QUOMBAOJA यथा गु. खार्ट्या के हिंदी कार्ल आक्रिक्य दर्गाक्षक ए निहस्मा वाहीता वृद्धि अपने हा अहराबत हर्मानुकार वा द्यांपि स्पायक वाष्ट्राम नीत्यं क्या क्या का अहिए आसी काला निर्धान लाकाते वाह्याम्बर्ध काएम स्थित श्रिक रमें त्याना कार्य दिन न्द्रीय त्याड वा दिल्लि हिल्ल अड्य क्या वा पय । व्यक्तिकिक किटित बेगावि अर ज्यालाइक अश्विमित कराव । any - presistud intoler oblight

न्यायत त्यातम् एववं असितिवायं जाताव E355 मायव न्यान्मीव कुण्डे कहारे all Race किश्विमाल मा कि में में मारा मारावाद्या अगिर्य अपुर द्वास कार्यकार्य किल्ला , बार्स अवश्वीय रिपिक्याहिनाह Gran Coult Bolly (SPM) न्याना क्या है। हार्य राजा निस्त स्थित क्यापुष-(स्वाप्त नाराही रही एक- नक्षाफ वाक दिए(८०) some raid rulu hig टियादिन स्टिनि सर्वाप अधिमन्द्र अधिमान show only रहेमा, ज्वामातीव रहिमा रिके अनार्य কার্য - জাইword उत्तर कार उत्तर क पद्मत्व रेनिए , एड दिन्या क्यार रेजादिः व्यति डिकम्हर. <u>ब्रियम्याला</u> अदिम गाउद्यालक प्रकासन प्राक्त मिथि অন্ত্রীয়ত মপ্তত মাদ্যমার-ভার nathraya shilos 311/42 सिए। , ज्यास्ट, जापका देखार । 200 अनवादी (जंब tyles suntilga. Ourse austrus. मायक न्याक्तावित्यक विराध (१७८५) म्हिप किश्विकार अधिक ज्याना रिंग्स किश्र त्रियाती प्रधान कारिक कार्य Brog. Phyr, Colla onthy har ldow. arto-vario WIGHT MOLE WINDLE उद्गारमात्रक दल कवार र >. अहिला लाखितक तथड कावा कर्त वा परं प्रति प्रति न्यान करीक , सम्प्रेस ए प्रमा कारीव देशक कादाव राज्ये रम्द्रा राष्ट्रा राष्ट्रा CO. NOW RELOW ZULLE ZAL YOU ZOO ZIPL CHICA COLLABORNICAD sucer sugar con course from solver on my sot रकार्याकारकर म्यान न्यानाकारकर कार्य रिकुं त्या अहिता म्याप्त न्यात्मिके अयुक्ति व्यपने क्यो-न्यामाल द्वालक कार्याक स्मिन अपि उत्ता ।

Page-6 आर्थ रिवायक अविकार । सिन्यय रे -वाक्षार्वाक केष्ट्र-वेपकतालया -> STATING COSTES अमें द्वियातः जादत्तर् न्यूपत तिप्यत उत्ताजा ब्राइंड प्राचार्म 75335 and ordered তম তার্য জ व्यक्ष > mfaldo > 3 MOUTE BLPLINE B जामार्थ्य देश्यापत অভেন্ডরামুত अधिकार उपात्ती कट ठाउडमा देव > orbodo salerar 220219 ত্ৰৰ লছতি -> - व्यक्ति वावडमार्ज्य session englar ारकोष्ट्र वर्षक उद्धीकः भाष्मप्रवर् নমন্ত্ৰতে ক্যাপ্তমত व्यक्ति करिक ল কার্য্যপানতি appropriate ask क्यी मीते ज्या कर でんて かれていし (i) कि यह क्याक्षकिसाधा त्राक क्रिंडिंट इक्यानि क्रिंडिंट क्या कि व्यक्ति क्रिंडिंट योग त्रिय द्रवेर द्रापुट कार्यहापा द्रायाता क्षितात. कार्यवाद्रिक व्यंति क्रातिवारी 18.8.2012 अधारात कार्य अस्ताक कार्य विश्वास्था में कार्यान्य (ii) 1 किलेंड-सक्त (iii) 1080-311/ अर्थे क्षेत्र प्रिय प्रिक्ट क्षेत्र प्राप्त क्षेत्र क्षेत्र क्षेत्र क्षेत्र क्षेत्र क्षेत्र and care com 3631. (1) - and who with young all all also see out of all see of the also can (1) क्षिट क्षित की अवदेश अड स्थार प्राथम अप कि काम मेरिक आर कार कारी क्लाउमर

(1)-प्रमा जावापा उत्पार का निर्मा का उपारणक रामानाम दिन्दि तथा।

अध्यात्र मिक अपमा वाद्य मयात . उत्तर रें वय त्यात । > त्यार्य क्ष्य ज्ञार मायहोम्स कार्य अपि अपि अपिक्ष , वेशियतेष्य ज्ञा त्यिक

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Page-8 (!!) क्लामिंध क्षी शुक्रमर्गत्व हुदेम उद्ध क्रवाद अद्धाव JEST वार्थ व्यक्तमार विशासिक , मार्थ , रिकेर्त , कर वाकत्तु, काराक्ष्रीय न्या सिक्सियर खालादी नारमप्रिक राम्प्रातर, तलव राजि, क्राह्म राजिक व्यवस्ता, क्राकित्वम् राजित्वम יהופינית יורות שולרולף שייני אהווייות FUST 1 7 195 - 921 Km - 30C (Pb) race off Honon किंकु उत्तालतकारी धारे, कीरिताकाक जाएं पिए , २०० - २० वाकत, कारित-NAN उर्धिकाः 'नाद्वाका ज्वर अक्षाणात्। एक निकायरागियाति क्या (HA) दिस्कान , सामा केर निकार, अक्षारत अपि-कार्कराधा (क्रिज्यकार्व मायके बस्पे) *ভ্যার্ডা*রিচ कड राष्ट्रिक्स । कितियः यस्ते । श्रीद्याभ्यकाः विवृद्धि। (As) न्तरे पावटरेतळात , न्याचा , जायाविवर, इत्यक्ष्यकार्का भारतिक कार्यकार्यात्र, क्षित्रकार्यात्र कार्यक्ष्मास Ta Turyo auril Dougla grand (Cd) P34.0. 1 পাৰ্মন্ত ৷ यक्ति, विद्वीते, प्रक्रीप खालात रिकिट के किल्स कार्यरातिक वसी हिएक-TUST क्रिक्ति जार नामकाय ज्वा राष्ट्रिकाना (2A) 1 open क्रिकार्टिसम्मर , स्टिख्रिश २००६ हो। स्ट्रिट्रेन क्षिरेय कार्यहरा माठे वट्टी.) THIO मेल्कारी (मिरिश्कार्थान ) उर्द (eu) oftamore 1 more GRED LENGT SUBSURIES SEED Rich Coll : 5160 - 215 Wildiampur केषिक कार्याध्यक कार्यिम श्रीकामा (Co) भेटरा राज्यकत प्रकृति। निकामत जारीहै। क्रिमाध्याम विद्वित किंगल कार्करायक असी ठवर -कार्याक व्याचनाक त्याकारियाक (KINMIN) त्युमिति स्टब्ट कार्यः वेशक् 1 count from (cr)

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व्यक्तिक माळान ) statalosio and ERY anter al S' MOSO mid En (20 1 20 My 12 4 160 6 उखड़: कारी मित्र एक अरुका ;- दिन्त कराका के कर्यी गांती कर्ण त द्यार अपित क्या क्युक्यखाक क्या क अत्वाकर : - वाटि अस्ति कांत्र कांत्र काठ द्यारी कार्टी का का का के कार दिला दे का अन्तिक अन्तिक अन्ति। -गार्नेहित्य वं न्यावेष !- -यार्नेटिम(यवं न्यावेष व्यक्त्या िम्दे - नार्ये हित्र अंदार्क् के क्रिअपेश्विक देस त्रकाशत कात्र कां कावं । क्या ; (क) आंधारक -रावंत ए अमें के मुह्द - य - के खिल के प्रावंत ! (क) आके कार्य सम्बंह (Newsong conses); कि स्मिरे अतः विस्मित्र क्रिय वार्षे रियात व उत्यतं (२०) करायकां कामकामार्ट (२०) क्याव खाता तेम्बर (0) त्रवड कार्य आकार (Has) STSTER.

किल्य किल्ल क्षेत्र के के कार किल किल किल किल कार्यक में क्या क्या किया है कार्य में कार्य में कार्य में कारी साराम् कार्य खिला थिए प्राप्त किक खित हार -1920 मिर्डाह्य विशेष्ट कार कार्य कार इत्रथ-व्य दि। स्म्येसकराव-वक्ते स्त्यास्य पुणे अद् " के किए कामा" अधिवास ( अत्या अति आवट" , त्या ; हित्त कार्का अवस्थ अवस्थ नार्वे : देखा ; हित खिदा: कथा एक अग्रह है। अप से प्रवृद्ध सराख्ये दे वाउगाविक व्यापान क्रवेशक। 5) व्याय व वाज्याव देखा:-वाथावद्यार प्रका प्रवंशाव कार कि एक दिवस है का का के का का कर का कल्पाक्रकं भ्रमुखल्या का द्वार का द्वार क्षेत्रक क्रिके करत्री क्षेत्रके कर्तकर अस्तिक स्वर्ध कर क्षेत्रकार अ अन्या करा काया के देवाय अपि कर (कार्य) कर्ता दिस्ते कार्यका अत्यक के असी उत्त कारण वाहि ार्टाष्ट्र स्टार्ट क्या अध्यक क्षेत्रके विभक्त 3) ट्रायक्ष्यार्ज व्यक्तिक (sinons) भावतिक्ष्य (bacteria), Embroarge (Protozoa) Esta fo Contraction of a series who will are the - Carerà औषि बादे। अदे क्षणाण न्यारी विकार प्रदान करण त्राम्याय कार्याक्रम खिला द्राहेश क्याहिन द्राह्म के शक् contracted as a f Hepatitis A and E). escusi (enolona), 28 aususia (B) 1004

5) टावाम्य ६ - कर्तस्याव 'आकावं आवात कुवर्यात सावित वसर्द्ध स्थात कार्येश प्यात्य प्रावायत (fouch time) -त्यरं अस्तु अते। खाकाक क्यार्ट्स्ट खीत यादि क्रम्य कारम्य क्रायामान क्रम्य क्रम्य -वार्येदिक्त -त्यार्ड । 3) - Elegab & - 21 Stain o - 21 B ander papal Comin saw gares Etypord (great stown)-तं अस्ति। जन्न- अपकार अस्टिस्ट 249 Elyoraco 3ugato (simon) -2001 कित्य-वार्व-वात्रीतिवायं कायोतक खेताय-वार्व कराश्माद्धं न्याका क्षेत्रीक्यात क्यूनि (Augui) @ -ermersanes (non i wester) -ode -24 2603 (a) - 21 da 31 de 22 - 021 é 431 25 ( Un trobogo gais on Andificial couses): (1) <u>कथ्यावेताखा</u> (<u>किय</u> - कट्याया देवाया - कात (405) अर्थे क अरास (अस्त कटित -वादेश (बाह्या। निया कार्या के दिया है का है जा के कार्य कारण विस्त करते काराक्ष्यकं (MH2) 'त्याद्राक्षित्वा काव्य (CFes), Cartisa (CIL), - Ercarca (Mills (HC) अड्रक मिलाकी काराम (त्रिक

सिर्देश क्या के क्या के क्या का का का का का का की -32 3001 - 03-001 (Suspended Particulate matters) Jano Afon 3 for it is a store with a second of the Color HIKE -वार्वे क श्रिक वार्वे। (5) - केशन- अठका भित्रका कायान: मेश ना स्थाना के र्जास अत्यक्ति का नाव वा नाव का नाव का नाव का नाव . अखित काश्य सामित अधिक काश्वा का वा वा का का का का का as 314 Last Land is signed on a that व्यवक्षा करते। क्रायाक कावाक न्यावस् वास्वासीयहर न्टरम् क्रिक क्रिक एक - देव के क्रिक क्रिक क्रिक वारे देत्र - कार्य के खिट्टर के स्मूर्य कार कार्य कार्य कुट्टे ने माकार एमायार प्रायत सामा देवार देखा है। खिताय कार्या अधात कर्या क्या हिल्ला प्रथमित वाल्य कुरिक स्थिति - कार्या कार्य क न्यार्थ से मार्थ ना कि (3) तथाव्याय के स्टाप्त : से स्टिया के ने प्रधाव काता toring a celebraigh didio asser sances - यादी कातं न्यातं , प्रकेश , प्रकार के प्रक के प्रकार वास्त्र क्यायात्य कार्यात्य कार्य सार्वायात्य, त्यावम् काटमास्मार्क्त आव्यावन्त्रेव अवस्य विश्वेष उत्त कार्नेर्यात । क्रावल एवर्डिंग मार अखित की किएंड अयत प्र करेंग्या क्राक्षाया करतं। त्वा त्वात्व न्यात्य श्वासावीक 1 ATE GREE ESTERS

May consider S. Elle De conse of the gas:-उत्तका ! - ज्याक केमच जार्मे (मणं अत्रव्यवां व्यव्यिक अविविव्हि कार का मार्गिक कार्य के में में कावार का का का किये , किये का का का का का का त ज्याय के कुछा का का का का का की छों का के बादिक करा के दिसल न्याल । वापरेटा - काल नापीति वं उत्तर अरहाता या की 2000 Lastas assur Sas assur as 24 ERY SOB. 2010 E BU TO 20104;-V अध्य-व्याह्माथा! - - यथ - अथाह्याया हे प्रथा Laces 2000 20000 i 20000 1 color 1 Cary 2 रामका काम काम वामा कामान कामि कु आयत्वं त्याक काम्यात्वं कामकी पर 3) - तथा - काक ; - विकास - 15 के बार्ड के कार्ड निक प्राथम रक्षाक जिल्ला अवस्त अवस्त विस्त्र क्रिक व्यक्तिक क्रिक कर देश नाम दिवर व्यवकार काल क्षा का कार का का का का का का का किया है कि

के नायवान्त्र :- किन, जान, द्वाक, लक्न नीकारि न्यायताकात्य के क्रिकि का का का का । वायवक्षिक कुल ए न्यात समाय है कार्योत्र न्या है जात कार्ये उत्तार विक क्रिक क्रिक प्राय निकार की अस्ति 2416 अपयो क क्या के का के का के का के का के का कि का कि कि कामार ने का निक न्या के का कर ने ना किया में सम्मे वाक काकराट्या अवस्य काक मार्थ मिर्थ कारा निकारक का विक्षितं का कार कार्यकार करते या कार दिवान B32 14 210 asses as Cal 2) याण तामका त्यायात्र !- क्यान्ट । क्यारम् या - किर्वात क्षम -सार साथ तावराया octo सा ल मित्य कर्ता। नाताता क्ष्यं क्षावता कर अवस्त Der कार के कार्य के कार कार कार के कार के उनके कार प्रकार देवार हे का निक्र का निकार के कार का कार मंद्राक ए क्रांत हैं है के के के कार्यात्रका :- कार्यात्रका अवा आकार हामा Espert rece asserber or years washed अध्यक्ति कार्यकात्य कार्यक न्याये सिर् भीत एकरे माळ छातात हा कार देवन द्राप

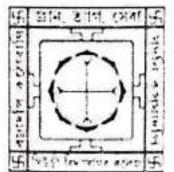
3) कत्यत्रिम कारहा वा । अव्यक्तितां कारहा भी G02. gas. करसमितां अत्यहां - करायं आक्र मादि काव्यकित - ट्राम्मिक क्रिक क्रिक क्रिया श्चित्क करायनं त्यात - य अल्डिकां न्यानीय व क्रिक कर कर का का कर करता के किए उपातु माथीक विधात करवाद्य करवादा कार्यक - क्याप्रकं क्याक्रक क्या क्या क्या कि वाका करप्रदेखन कथा ज्या निर्देशक्रिक किराया कार्यहर्मा कार्य इन्ति - त्युपां दुवेश स्थाति । क्यापादा। स्तुद्धाली इनाक्ता स्तितिक। क्रायि नान्द्रां स्था हरे ह्यां 3 monto (e.s. south-wick, 1976) on E Ecology and the audity of our Environments अन्त वालात्य ता ट्यायास्य विकार स्टिएक हरिएं कावत्रक अवने प्रकृतिक अव्यक्तित्र । आर्वेतिक्र अतिकार्वे कार्यात्र अवस्तित्र कार्यात्र orangular origa Courses of wosters Pollution) !-क्य देतिए वं कर्रा वेष के यह अधिक प्राथ दुवेता हम्सान द्याल, किल, निर्माता, उत्ति अस्पुत्तर कि किर का कर अहम का उन्हर का अंदे कि कि कराम कार्यक व क्रिकार क कर्मक क्रिकार सितं करण देवथ अपूर्णा क्या देव देकार वाथ देविया सार्वास्त्र क्यालाष्य ता है। न्छ।

ameter a asuma sold 300; Derigo comoson (Effects of water Pallution) अध्यक्षित कार्य कार्य कार्य के extermence separado ato a variables danste 1) बार्ड वास्त्र क्रिया क्रिया है वार है। seei agaid saverie metais sue posses Fares Lales 37eg - 501 द्यार्वाडा कर्मान्यक स्वावकृत्य अत्र कार्यात्मिक क्रियात के कार्यात्राक्य के - व्यक्तिका कार्य के (Calionalelixis): an successor - all anemons. दार्जकारिक अधिक अविका अविका अविका कारमान कि का किल्ला किला का का कारमा की क्रिक्टिकार क्रिक्टाता 3) End - End & ERRY 8 ज्याद्यां का कार्य जिन्छ। क्रकेष्ट अविश्विष्ट अव्यक्ति शिक्त Leave our aland resa regard and अधिक । एक ए क्या न्या हिंदी । त्या क्या भागा है कार दिया करता कार कार के स्वास कर कार है। Lisedos sido Gesel warrente supo alo ans reservenció mas 2 à Carel Averios उत्ता - व्यत्न : करात्रा द्वार दे हे क्या स्थात है खाळाडं कराट्या -विद्यां टाय असी बर्दा।

The Strasge - all of Black foot disease) also अरबर मित्र क दाया कता का का माना मुद्धि माना के Every ayeary and Deven ayea alles कर्ति अविशिवाक अविकण्डते। कल्याम्यावश् क्या (minamala disease) - 427 0241 3) - महत्रकाक क्रिया कार क्रिया के क्रिया क्षात्राहा द काम लार्थियाक्ताहा द्व मिका वर्ण अत्या मिर्थ अन्ति। क्रमेश अधिति के कार्युट के कार्य नार्वा याक त्राह दिस्त क प्रमाण " कार्यिक न्याहित व्या reseasing exerce Laco Lais a sylogenon of the telle till lang enter amany Elbert 2002) क्या है। के के कार्याका के क्या का अमेटि । कार्या न्त्राकाक काणत कायात द्वासक कामक कामक 3 cares exco or engly renor carey stall क्षा क्षेत्रकाक अर्केश 4) expersamens LANG 318/ PRISTENS द्राश्चर कार्य कार्य कार्य कार्य कार्य कार्य क्याकत कराया कर्षा वर १ के यह काराय काराय Drs ( Pate o Enes of Delle on Este se Este sur 2) anuto Las! 1 2000 i 200 करणा क्यान ए हैं स्ट्रिक न्या क्या क्या क्या क्या क्या sall cacers. French ( twons) more खिल कारक क्ष्मिन उस क्षित कारा स्थित करा voyà Lacai and averal acutas

(cilardia sis) as abran A) कायक काल हमन ( क्रायमक कार्या कि आं के प्राध्ता क्रिक्स क्रिक क्रिक्ट के मैंबर अर्थे। द्राण्यातं या दिव्यात्र । केप्रिय तेत जावां कार के अध्वापालय स्पान के कि असीका क्षेत्र कुळाण्यका है। कार्टर प्रत्येय किए कांब्रि अन्त्रिया अध्यक क्यांब्र भारेत क्षेत्र व्यक्ति। क्राया भारतीय में में स्वीतिक अधिता व्य ह्मार प्रायम् कार्यक कार्य के न्या कार्य द्धित अस्तृ के क्षेत्र कर्षे। ह) स्थानेकटा काराज्यः ्यात्रे स्थानेकटा काराण ्टाक नाम नाम नाता कारा कर्म नाम नाम ने उत्हित रती। अवंतत्त्र अत्यत्ति अवति हैका करा देशक विश्व कार करा करा करा करा करा

दियावा अक्टा करमाठं कात्रक क्रिक्ट स्थाक ( biologicaldiversity) and are





### INTERNAL ASSIGNMENT

B. A. (GENERAL) MORNING SECTION

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❖ REG NO:- 3122200408

\* SUBJECT:- Envoyonmental Studies

· COURSE / PAPER: - B.A General

\* PAPERNAME/TITLE: - Envisionmental Pollution

❖ SEMESTER:- 1

◆ DATE:- 11.11.22

京都の 金いる なる なる नेवार उरायुक्तवव्य हा है। जाना प्राप्त संक्षित्र संक्षित्र निर्माणित हा नामाणित अवस्थाति । जाना प्राप्त स्थानित । जाना प्राप्त स अगव নারত শ্রেমান্তত ক্রাইন প্রবেশ সাম্রে, কার্মন লেই— অক্সাইত, প্রভানার লাল - ভার্মাইত ইত্যানি, বতার্ম স্থানি, বানি বানি বানিক করি। ্মেন্ত্র - কাব্যানার ভর্ক বিশ্বার্থ বিচার ব্রক্তার রাজ্য চিথাতর করা ত্যান্ত্র-কাব্র রাক্ত্যান্ত্র, কাবন চাই - ভার্ত্যান্ত, গ্লামকার্ত্তর - অক্সার্থত ইত্যান চুর্লক্ষমণ্ড বিবাচ নমার্থ যা বাজান্ত্রণ লাখে মিলৈ বাজাস্থক नारतिकार कीले कता जिल्हा जात्राक राष्ट्र मुखन राला"। वामुमक्षरान्त्र भर्षेत्र जिल्लाका कार्यात्रका प्रधान आह्रा ए हात् माउंडिक दक्ष अध्याना कार्यक्षात्रक क्षांक क्ष ज्ञान एकाराम रहा ए त्या ক্রিয়ার তার চার্ডার) কর্মত হয়।

তারিক কর্ম - ব্রেয়ার প্রার্থিক ব্রেয়ার প্রত্রের ক্রিয়ার কর্মত করি। তার ক্রিয়ার ক্রিয়ার প্রত্রের ক্রিয়ার কর্মত করি। তার ক্রিয়ার ক্রয়ার ক্রিয়ার ক্রেয়ার ক্রিয়ার ক্রেয়ার ক্রিয়ার ক্রিয र्गक कला 一部: জীয়াত কাৰ্যুত্ৰ প্ৰাৰ্থ কাৰে হয় তথ্য তালে ৰায়ু হয়ৰ প্ৰা मार्का व्यक्ति रे अन्य श्रीर काम एक -12x123673 124 WHO IN SMALL CAMPO (MHO) AT THE STEP STORES STORES STORES कर्ष कार्याक कर् नारेहात की : को प्राप्ति राज प्राप्ति कार अर्थाकान मा निक्र पर या ग्रहा वाजा जिल्ला के प्रता वाजा कर काला जिल्ला कर काला 1日初海1人 काटिक चाल: - याम उद्यापान अस्टर् लोकार्थ प्राप्त जिसांकर । जुलास (४ जिय मानायक प्राचित्र निवान अस्त्रात्म कालक यात याताल TANK (A) E- COURT व्याप्त्र त्युक किल रेजिए

्यारेन्येक राज्नीयार्थ्य गर्मे रेवन त्रामे यापू र्घालवं उत्रे विकेश मानव जारे कावन राष्ट्रण एका स्मीन (पाल) प्रात्न जावर्जन, क्ष्ममाल, लारो, हायाव हिल्लामवे प्रत्न वायू प्राप्त 241 क्रिक्ट काम के कार्य हैं कि व्यक्तिया के कि व्यक्ति व्यक्तिया कि कि अग्राडमाएर कल निर्माट आलाका हार - अग्राहिए, कार्म आलाअग्राहरे, प्राप्टिशालिय सालकाहर भोग खर्गक रामेंच सामि सामि होना है। क्षेत्र हेल हेल हेल हेल हैं से स्वाप्त स्वाप्त हेल हैं सिंह स्वाप्त स्वाप्त स्वाप्त स्वाप्त स्वाप्त स्वाप्त स्व कैखान्छ प्राप्त रूल (य यास र्यात र्यात रंग ता गर्म है।क वर्ष । 3 मा मायाक व रेक्टियां : के निर्मेश यथा कि स्वाप्त र कि वा गायम जिलामां हेल्ला बल बार्मेक ही मूठ करों। वहालेर अंक जिलामां हैल्याते नार्वे रेंसन यहार्थ । Q को अप्रतास कं खिलांचाः के आयाशित प्रतिसंचय या टेस्प्रयाण कार्व (य मोस द्विंतं वि हा बार्वे के द्वि। यामें मेम्रावर खेलार या राजाताल लम्मिक व्यालास्या : के व्यानमार रामे मनिलं भएर वानक्त्रं जयादम् समादम् ययव यावस व वार्षेत्रं क्षाव्याप्त करा व्यव वार रम्बावंच कारा याते रियन वर्ता। सुल्यामंच क्षतात्रंग, लास्तर्य, जायात्री जालावित पर्व देशीम कहरव मिल्लि हमंदान करी देमक अधारम् नुरुषयै इतं तके बाते देमच एएमं। आवेशिकावे लायात कार्य देवन तथा लावाने हमा तथा । आर्थे तह याते देख्य खिला व अव्यक्तिकात खिलात तुरसेत अवं। नुम्सि याते र्मेम्बरं जिल्ला व्यात्वाम्य क्रा इ व्या-@ युश्हिरित युवरं यात्रे नैसाबरं खाहारः हो त्यावायात् तार विस्थितं नार्टिहालन जमारेष, राह्यालन आल्याहिए खाउन, उतान रेजान यामें हैं मह खेल त्याक अवता अवता अवता करते। (त्यापन के रचनामंत्र हार लामाइह ह स्थानंबंद त्याहरू हार अपने स्था र्र यक्तिकालकं अकाज्यमान्य व्यक्तिकालक आमेर्साय सेत्रीता राष्ट्रा वास्त्रक नियम रेक्सा यादिक आकार वास्त्रमा विस्तृ मन स्मि रेस 

भू राम्मान जिसके वाराम्बर राज्याकार्य एका राज्याल वर्ग निर्माक्याणाक लिए दिस्टी, कार्बात्र, सामा देलीय डिडिम्एव लिए छीटे सीचे रमं ठीका व शेवें अपि अपि प्रियाम्य द्याय थेए रमं तक श्रीम के सालकाव व्यक्ताह, राहितालय मानाह्य हिलाए याम दूसकेमें लिंग (भुक्ताव अस्मित् अस्ति क्षानंत्र हेत्या अस्ति अस्ति स्थान्त्र स्थान्त्र स्थान्त्र स्थान्त्र स्थान्त्र स्थान्त्र त्यान क्रिक्ट क्रिक्ट क्षेत्र वास मिन्स्य क्रिक्टाक्ट सर्भेंड व्यहात वासे ति भावतिक क्रिक्टिस क्षेत्र वासे मैत्रालंड क्रिक्टाक्ट सर्भेड व्यहात वासे भारंत्राप भारंत्रीयव्यात देति थाते विका भारति आसी सालित सामे हिम्म आवितार सामित सामे सामित सामे सामित सामे साम हमन (य अप्रक खिलार महिला कार्य (महिला रेख-के कार्ष्य शिंचावणाक प्रथम यामें मिकार्ज असम्मित्रे त्यावल कार्याव सर्वित्र उक्तास्य । इक्ष्यायनितं जाग्राक्षेत्रं सर्वतार क्ष्यं यात । किल स्रीयकृते क्रम्र होता होता होता होता न क्रम् ज्याचा आरो। के ट्यांचेप ए धंह लिएक त्यांचाहित्व व्यक्तियाक वार्गे हेमचि शित्रवे लंग कवकामालक दिया श्रीस्माला हि खरार वा स्थास होते हों। राष्ट्राप्त, थाल श्रीत्रचालाने स्थाउँ रियोरिस ध्यामाने द्वापान टियोन के त्राचकार त्यार व्यक्ताहरू थाशक कार्ते रेमकाट्ट व्यक्ताव अस्थितिको ने महिमासन राज्याहर नामक यामें रेसपाट ट्रांमंत्रमें स्वासनार का क्रिकेश नियु क्यायम रेक्सा (वास्त्र वास्त्र प्रसाद । Fidure Polint 2) तिलाय प्रमित्यां अक्षत्र यापक वार्येहेमध्ये भाषत्र कि विषय मिल्लिए क्षेत्राव क्ष न्यां क्यान्ति एम् क्यानारं वित्रकेत क्याना उत्पान (व्यानं क्याने ह) यामेल प्रहालालायर नुबालय अकाज्ययान्य आर्थित रहित स्थान नुवान संसर्कि कालां उत्यार (कंक क्रेन्स्ट व्ह याता खनान माण्या क्रिस्ट्र) श्रीमक्ष्यक्ष्यक विति व्यक्षाने उत्ते विशेषेत सावित श्रावित स्थित अस्ति । वित अउप मर्छ। क्षाम् क्षाम्यास प्रमान क्षाम् । करावर (अटस्ट आम् व्यामामामामाम क्षाम्य क्षाम्यास क्षाम्य क्ष अधि यत्वा द्वाम (साम द्रम त्रम्य (समा राम ) वित्र काल क्षेत्र कार्याम एक महिनाका व कार्याम वाक रंगानाम कार्य क्षित्र कार्याम एक महिनाका व कार्याम वाक रंगानाम कार्य क्षित्र कार्याम (साम द्रम विका क्ष्रां कार्याम कार्य कार्याम कार्य प्रतिवा द्वाम (साम द्रम विका कार्याम कार्याम कार्याम कार्याम कार्याम

© के ज्याप जापाल खर वर्ते वर विवार नुविधारेश कार्त्र मिक्ट्राम नुवादे एन्या जैतिवेट कार्या माल्यावनकार (WHI-(1): ⇒ त्राचात्रित जाताके (यार खेनव तार्चित जागां तर जानक कालाके जाकार पारक खेनव आनोक क्रिके जातिक नक्षके आने के मानेक र्किट प्रथान समाप्रे सेस्ट मी। र्रें में खान क्यांत शिंदिर से मिंदिर तो ताक. रेस्प अर्थ ताद । अन्यास्त्रे भागास अभीतं तर्द्ध हिर्जिक प्रति क्षिरियो क्षरियो क्षिरियो क्षरियो क्षिरियो क्षिरिय क् जाकत किस्टिं क्रियम र रेक्ट्र रहेबारन क्ष्मण द्वार स्टिं मेठन क्षि को क्याने कार्य थेड़ि को तक, प्रावादं व्यक्षिक ही है Mi Fidure Polint आप्टबर्जे अशाया ग्रेस रांग वातं त्या. मेर त देश क्रायम्बर्ग नार्विश् शीया ⊕: इं ह्यायारं न्यायम् व्यक्त वार्येत्यव थ्यारं अर्थेर रागीत्येत हाम वंग अप उन्याम (अंच अधव (ग्रामा) के: इ अमेरि व्यारम्भिके प्रारम्भ हाम्म दिन कर्य म्डबाक्सानायक कार्यान ज्यानिए ह्याल मेंग्रेशका, हनामाक्ष्म यहात्राण, मर्गनाट रेन्जीय लाज राए कर्ण चकार खाना एक काम्या स्तान उत्तरहोत्त क बित्य बाग्यिक क्रिक्स तेष शत्व व्यवसायक त्याम क्रिक्स विषय क्रिक्स का व्यवस्त्र महत्व ता त्यांक्स मा न्यांकर व नियम वारह कर वार्तिकाल हार्म आते। कामण रामालाह के विद्यालय कालों के विश्व के विश्व के विश्व के विश्व का में स्थान का स्था का स्थान का स सहस्र विवासिक उम्र । ट्राइस - व्योष्टि स्थलमा व्यान व्यान व्यानमा ने स्थल काल श्राह्मात (लाक्यां ठक) कार्य धायाक्यांक्य, उत्तवमाद - वह श्राह्मांक हे त्रक दिल्ल कास्त्र कार्यक माया राष्ट्रिय काला लाग्याम राहिताकार काल्याकार अग्रे देशायह मां। D: अ अलगारि दुवरं यार्गे रेमावरं जवार : अ और रेमव अलगारि दुवरं ्टब्री दुकार्तेत उच्चात्रके व्यक्त रेटिए थारो। ( ): के वास वागत्यार मुख्ये गार्ड में में मार में मार के वार मार में में में मार में में मार में में मार में में कार्र मेम्बराया प्रसामित क्रिया अवार मालिए एक्स न्यां उद्यानित व्याहारे कारणात्व राष्ट्रियातिय स्पर्वाग्रहारे विकर विका क्ष्याम्बासार त अयावतीर जिल्ल (जाए) त्यावकात्र- वार्ष- वनक्षेत्रिक एम्ब्र्ट हस्त्रक व केल्यारे थांचा वक व्रथम 5 त्र त्र . रावेशावं श्राह्मात्र रत्ने। त्यावा हत्य काल के निव्योगक क्रीकालाई ( कामका), खाद्रम, क्रीकाता नेपाय प्रावण), प्रकाल मार्डे प्राप्त हैं।

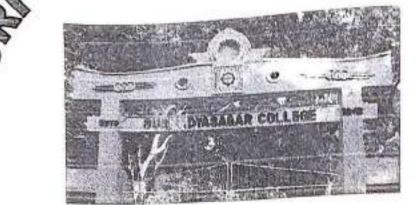
क्षर्य याम माल हा दाल कार्या छात्राका वामा निमाल काला एक याचार्वाचक ए नजर द्याचा प्रति व्यक्तित रां त्वरी व्यक्ति व सिं वाणा त अर्जिताच उत्यानिक एक (यत त्यानाथ सीवन सेवया स्थाप प्राप्त हामाता वर्षाता वर्षाता वर्षाता स्थापाता स्य भेट रेम्ब कार्य: में सिंदर तथर प्राप्त प्राप्त । सारप्रायं के में मास स्थान सम्म स्थान हासते सम्म तमात सामन सामन सामात स्थान सामन स्थान स्थान सम्माति । तन स्थान सामित स्थान स्थान स्थान सामित स्थान स्था व्यक्त यस व्यक्त इसिए यस ममयत यसि मिर्ट व्यक्त स्था है अधिक प्राप्त अधिक स्वास्त क्ष्मिक स्वास्त क्ष्मिक स्वास्त्र क्ष्मिक क्ष्मिक क्ष्मिक क्ष्मिक क्ष्मिक क्ष्मिक क्ष P:=> पर्वाचित्र हिन ब्राज्यायम → ज्ञात्रम ७ ज्ञातांत्र वर्णा वराम ७ हानाना हिन्द ज्यार्किका, बाल ज्वाद्वाल । 2): => ज्योगव नायामाम क्र नार्राहित्यम क्रमम्बल, प्रतिवृत्यने खेपाह के: ⇒ (बाध स्प्रार्थे के बार्व ग्राष्ट्र(द्रावर्गे) ब्राद्धवारे आवासहु अतितः 4): =) दिन एमक क्षेत्र कार्रनामक वालकार्विद्ध, वर्ष्टीकवार्व खद्राह । हैं डे लाया चरात है आंतर प्राप्ता के प्राप्ता के का का कि जा कि जा कि का कि रे हिं क्या क्रिया व्यवका कि उत्त वा जंगल ज्या के प्र वा जंगल जिंग । व्यक्ति क्या क्रिया क्या कि उत्त वा जंगल ज्या क्या जंगल जिंग । के कार्या रेसक क्रि एक क्रिक्टार दिए कि अंधा लाज (प्रहार्य है। मुद्र यान -क्योंमिलां स्थाप सार्व मिलां भारत त्यांका उदा यहा । प्रमाण नावकार यहाम हेस्स कालक अवसाव तमा का जाना वासामा का कार महिन प्रविधान न्यक्ष्माल व्यक्षेत्र आहा गार्क हार्यम त खायां उत्र अधार द्वास्त्र व्यक्षिम् कालक सामक्षातक देशक काल मार्गिक कर के व्यक्ति अस देशक । (वह नामकाला) त वर्षमुखांचे उत्तर । त्या है मिल यह (त्याका क्रिकां) व्यामान्तर्गे एउड्डिम्पीतं व्यक्ति है। में है एक कलारोंके वर्षण्यां प्रमुखे यावाजे (त्यम एक्ट्रिका) बार्ष्यायां क्यान्त्रं भावक्षातिते हैं। त्या स्थाक (राष रवामं। व्यरिता याक दिया में स्था त्यांने लाकिय नियम् क्षित्र प्राप्त क्षेत्र होता है। नियम क्षेत्र क राज्याक वर्षेत्र केला है। हिंदी अस्ति स्थान इस्त्र इस - स्थानमान ख्राजिक कर्ने प्रति विद्यान स्थान स् हारि कालव जात्य (अमासि दर्ग मा यक्षक देशिक खान असे वसार में उत्तर कर कर कार्य कर कार्य के उत्तर के कार्य कर अस त्यास्ट रम हायल (त्रिके क्रिक्रियः 🖹 यहने स्थात (यदि। वियोग यात्रे भारति क्रिक्रीपर कालम जाता अन्यासिय तम्ब नवस्त्र अक्षय नाता निर्वाचे यहम तिर्व भीतम् तन्त जलाव ज्याप (वारा निक्राकृष्ट रम, (प्रमन - (जनपाश द्वाप्ता) र्पिता, (जलाव दुत्याक्तियं सम्में इकिका कार्य याराज (ताद्य यार्याल (तक्ष सिका त लाग्रोव कराया काता क्षिताक देशक्ते हापण (एम में-अव्हें युद्ध व्यवतं तार क्लान्स्यं द्याः अपन्यायास स्टीड (ब्लेट (ताकाद्यावे क्यान्स्यं द्या अपन्य सीण भूला एमए व्यापि कहा १में, मा बाद होते दमांक वालह आता नेमाक रहा क्षित्रकारण राखि कर्म प्राप्त क्षित्र का राज्य क्षित्रकारण प्राप्त का स्थापना राख्य का स्थापना क (मान्य) अध्यक भ्राविभाष्टि या कर्वह स्वायाने का प्रधानित (ताला) एलपार् माल अपन्धन हाह । माला, निह्म आव क्रिकेस कालपाना हिल (मिल्यामार , वर्षेष्ठ , वाहार के कि प्रकार है कामा क्रिक्स क्षेत्र के कि प्रकार के कि एक लाक ब्रिंड आक्रांस वायांत्रक असन् स्था नामि अधिव नामांत्रक उपाद्याहर स्ट्रिंग व्यक्ति का प्रमाद काला वाक्रक क्या द्या । व्यक्ति प्रमाय स्ट्रिंग व्यक्ति वाक्रक प्रमाद विवास प्रमाद स्ट्राणक स्वास्थालक रिमन मार्गम भारत क्यान्त्रम् हाल्डाकार्द्व, देवकप्राक्तरे, देवक लक्ष्म, कार्यत्तरे, क्यानिक टाटा खिक्क हती है। है। एमट समस्याय सेंग्रिंट करते। इस सार पत्र समाय ने मान स्पानिक स्पेश्वर के क्षेत्र करता की कार्य के स्पाता हो। इस सार प्रमाय के मान स्पात स्पाद स्पाद करा के स्पेश स्पेश स्पेश स्पेश का स्पार के बागुत रीमनः हाथावृद्धि एकप व आक्षेत्रमावक खिरार (वर्ज ग्रीप स्थित धार्यातं हेमध्यं खुराप युरमा त्या रश्या प्रधीद (कार्य म्याहण्याक्वं कार्यः) हाथातं रमार्थे ह्या है। है जिस्से के के कि निवास के विस्ता के विस याते तक स्था 3 स्थितं स्थात वसीतित राज्यो हैं स्थाते। त्यात्र क्ष्याः स्वर् के द्वां के क्ष्यां क्ष्यं क्ष्य र्माल कार्या हुन हो यह हो यह स्थान स्थान स्थान स्थान स्थान हो। हात काल निक्राय लागाड :=> कर्मना हात है। व विक्रमे तारी है। आब दा अस्म यालाम बराक । इति ने वाही वाही वाही का मारा मारा है। किस

क्षित कालं काल सेथी क्यांते कार्यक क्रमें कार्यक ट्रासीय अपन त याँ है। राक्त रातं प्रमा या वार्षास्य यथाभित अव यथ ने बर्ट हतां यकां के त्राम करहे त्रक. युक्त युव केंजिंद स्थित समस्तां र्यम् कर्दे। स्ल रेम्पारं क्षिमका: अलग भावपाक विद्यात कर्व : रेम या रेमप अवन यादायं दुवरे दुधिवातायो ज्ञाय किला त्या कार्य हर्वाक त्या. व्याक्तवर्थः लियाक कार्य, तम्हें आल्य दर्गात मुद्दा प्रकार । उन्हें क्या किया किया मा स्थान त्याका काल और नात क्यामंत्र (कासित हुन्याम का उठा का नाम स्वता है। जह कार्या है। जह राज्यक्रांत्रक यह प्रेड्राच तक स्थानिक एका देवा क्ष मान्य के मान के हमान क्षेत्राच क्याहर करहे हैं उस देखव हमाने अंत्राच क्या द्वितासका जवार क्यातं । त्या होत्यं महर्षात् महत्वत् करतं। स्थात्रात्रातः उक्त रम द्वा प्रवक्ता वामायामा या जाना अधिय दाता मुख्यल जातान करा (भार ज्ञात्म कार्या च्या द्वार होया होएता, रत्र) च्या इंद्रिय होत् मुद्रेश इंद्रिया है। एउट्ट ज्ञातर मुम्बः अकार्य क्यान्त यारक को दाक्षक जर्भ प्राप्त व्यक्ति ज्ञातर व्याम्याम काम्परित थ्रार्थिमा कि द्वाक करित। कई रियाद्र के यद हार स्वांशाव प्रांत वितंत या यमक्षित । हार्यात कामहत्व वार्यात व्यक्ति (प्रवास दसे विव व्यक्ति भाषत केर्कोरक खेलावह अव : हि है त्रव ध्यवति खेलावह वरते त्रके सावरे उत्ता भ्रम भ्रमार्थ (रमाहिरिहिक्क भ्राव्य व्यष्ट्रहाउँ काइव १ (७ व्यात । प्रवत নানায় জলের পিচাকিবুসা তক্ত। ইন্দ্রিত কল স্বাধ্য কলেকত্ব মাতা প্রক্রোমক (बाधिक महासारा दात वावि। कल्प में निरंदेश हो जल रल अर्लावम पायक कार्न जकार कार् निवसूर त्यामञ्जालक द्वाविक कर्त । सावाव कल गिरावे वर ५०० मिलंगका नलहार्वा कम रहमा यहिला आया ए यह छ छ । यह महात अहार उनाकृति स्पर्वासवं सहिते प्रवादमें हथं(यवं तेतकी स्थापे केंग्रा केंग्राव प्राप्ते ! अम्मार् रेमवः । नकर नर्थे रेग छक र्क्स्ट साम भागिता विवाल कार्येष्याम्या क्रंग इट्टांट । कार्वित्र भाग प्रमा प्रमा हिम्ह भूम । वार ज्याक्षण्याच व्या त्य भाव भाव किया विकास वास्त वहीं येत्री (काल (मम । वर्ष्ट्रवाव) देवकृत्य वर्ष्ट्रामिकियो एक गर्रव शाहा दिश्लीम कर्त्रकार्युक्त रुप्रख जक्तत काश । आर्षिक का के मार्थ है। जा है जा है जा है। जा ह्या दुष्पुत्तरीतं तक कल्पकं सता लक्षेत्रता दिष्य व्यक्षि अक्षेत्र र्वातर कार विकास कार्य कार्य कार्य केरे निकास कार्य है निकास कार्य कार्य

ज्यार जीतियम व्यवसारं ५००९ थालंब त्याम यामा वाम र प्रांत्रमा भारति आप्रांत राहित वाद्रव्य कर्षा । बक्साल, रवस्वाता 1.5 रिक्सिमां ह्याल राष्ट्रमं न्यान अस त्या त्या त्या त्या त्या व्यापाय राम्यात अस्त हैं से उक्कार आपन स्थानिक स्थानि अप देमच अध्येष बाहर्ता : अ प्रवृद्ध पुत्रकं बाहरां कवं सप्तिय उक्ती वृश्वम जीवज्ञात जीवज्ञातक २ एवं जार्य । र्मिका लामन नित्रमं क्रिक्मा, निक्नि जामनन तक क्यार सीन निक् अव्यामक ह्युक्ति मा यस देसच क्योब्स राह्मात कर्ष है है क्यार महारह रुत्ती हार हराय विधः शेवहारं मात्र तक्ष्य वेषश्वरातं क्षेत्र क्षेत्र व्यवनात विश्वात्रक अवात यत्र तक्षा देश उद्यां राष्ट्र । अभें स्पर्वेशमप रेक्ने सब्दे सिंद रक्षांडे (श्रें जिनास न्यून क्रिकेंप रक्षी हाथ) व्या केशव मार्गिय संध्य प्रवासका द्वारा स्था त्याक प्राप्त कार्य कार्यास्त इत्म के क्षा है। त्याक क्षा प्राप्त नाये करा अस स्था वस स्था का स्था के स्था ब्याद्ध राह्याचे क्याद केला ३ व्याद्ध हाता कालायांक द्र अपका क्याद के कि व्याक्षायां वे प्रधात वोवहात स्वाद्य विवास क्त्रेंश्य द्रमालवर्गे शहा द्रमाहें निक्स समान क्षिमें कर्रा आये। जा हिरावर मुमन जठन एनाकांत्र विमालः प्राजन करा त्याव्यादेश जाता मेक्ट्र काष्ट्रकादि सात संग्रह आतं।

DAIN 22

SAL VIIDYASAGAR COLLING



THE UNIVERSITY OF BURDWAN

NAME: SK. FIRDOUS

SEMISTER: IST YEAR.

SUBJECT: ENVIRONMENTAL STUDIES

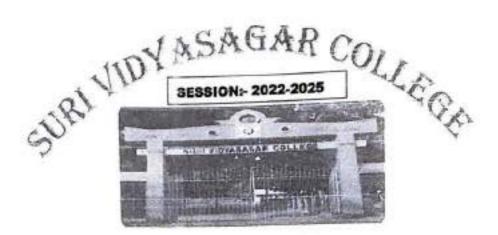
COURSE:-

COLLEGE ROLL: 220419613

**UNIVERSITY NO:-**

REGISTRATION NO: 3122209192

SESSION:- 2022-2023



THE UNIVERSITY OF BURDWAN

**ASSIGNMENT: - ENVIRONMENT STUDIES** 

ROLL NO: - 22041965

SUBJECT: - ENVIRONMENT STUDIES (AECC1)

SEMESTER: - 1

মান্ত্রেছার থাক দর্শন কাজে বলে ১

ও শহর্মদেও ক্রমেন্ড ও ক্রমেন্ড করেনে এই দ্যোপকে ক্রমেন্ট্রার রজে।

্যাত্র ক্রিক । ব্যানিধ্যু রিমান () – মাধান ব্যানিধ্যু স্থানিধ্যু জ্বি ব্যান্ত্রীর ব্যান্ত্রীর ব্যান্ত্রীর ব্যান্ত্রীর ব্যান্ত্রীর ব্যান্ত্রীর ব্যান্ত্রী

্রি বিষ নেজ পন্ন বান্দমণশেও শুডিন মন্দ ক্রাক্রান্ত — সহীশ্র কার্ফনেও ক্রেন্ড প্রেক্তর ক্রাক্রি

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্মেনে দৃহস্তমন কলে তাকে ম্যোম দিমক বলে। ব্রিটির্গন চনো ক্রিমির বিষ্টারাক কলে ব্রেটির্গনিক কর্মার নৈমে হিটিল স্থ্যান দিমক – স্কিমিয়ার ক্রিমের্ডিস্টালির পর্য রামেন্ট্র্যান্থর

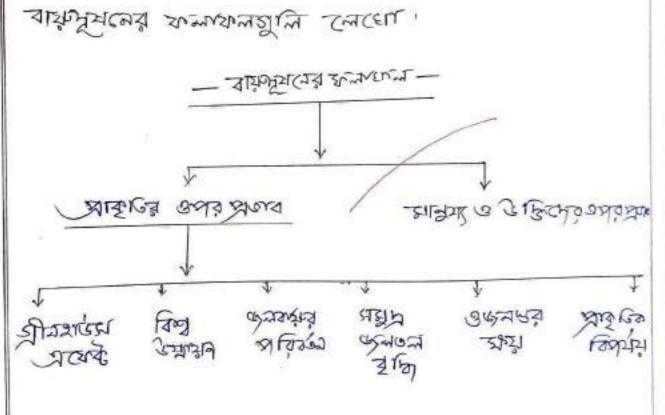
> न्दरकाम ऋस् स्थरमञ्जूह । (त्राप्तप - २०३ ) HF20A क्राह्मास्यक्ष सत्स्र कर्त्वे स्थितं स्थितं

5) यारेप्टर्मात्मं क्यारंग डे

ত্র হার্মির হিন্দুর চারহুরে হরের হার্মের তি ক্রিক্রির ক্রিন্টাছ ব

— প্লোকৃতিক কারন —		কৃতিক কারন —	
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र्यानकम् अक्षित्रं कार्यकृष् १०९७ उत्तर केर्य जाक हिस्स वृज्यि होय-अलि क्रस्ट व्यक्रि, होय-अलि क्रस्ट हिराजिखं क्रस्ट	



जीनअपरिम अटम्बे - कार्ये अक्रप्यं , चिलान , नर्यर्नु প্রাক্তারণ প্রশাস প্রমাণ প্রমাণ ক্রমজ্বর কর্ম কর্ম ক্রান্ত্র त्यकाट त्रें रे- ठीमुख स्पर्क याध येरहाएं कांध्व की खास्ति त्येषा त्येश द्वारंत राधि राधि राधि है। यो व्यक्त संग्रह क्षेत्र ५-विस <u>त्य</u>ाकिश्रम · ५- विम त्याक विष्येत रात्र स्वित अर्गनेत्राद्धः द्वाहिष्यद्य -त्याहिष्यः व्याहिष्यः क्राह्मः का ख्रियात aun ाग्न र- क्षेत्र सोश्याचे - यरम्या तत्त्रं लका (अप्य नाड़ा , यें काट्य की शाधुं का घारारेग्र, 12,5 प्राधिकार्ध ज्ञाक ग्र त्येवत स्पर्धिवस्य केचर त्याच्या रखने बर्यात प्रारंभिक अस्य दे हैं है । रिपर्वा कर्य व्यक्ति कर् उक जात्य यां कल लाशुक वार्यसक्त राज हाम उदी जाभी हैं- व्यक्ति आवार समा होता है। यह उत्मेल लाउंड र्वाये स्थाप जारका

সমৈত্রি।
সমর্ক ন্রিক ব্রেছন্টের সমান হিদ্রেও। ল্রীক্রিছন্টের মাশ্রিমন্থার
হিদ্রেও। সৃত্র মান্দ্রমান্ত্র আর্ব্রক্তের প্রেয় হুস প্রস্তুত্তের
রিন্দ্রী থ সমান মেনেতে। তার মানে স্থান্তর মান্তরক্ত্রা
করি। প্রসালার আর্ব্রক্ত্রা করি মান্দর্শ সমান্তরক ক্রিমুন্সান
ব্যক্ত নামান্তর্ম রামান্তরক্ত্রা ব্যক্তির সমান্তরক ব্যক্তির

এক্ষাম্ট্রের করের মাধ্যেক প্রক্রান্তর ক্রিক্রির বিদ্বা — ফ্রির ক্রির্মিন্তর নির্মের ক্রিক্রির নির্মের ক্রেক্রিকর ক্রের্মিন্তর ক্রেক্রিকর ক্রেন্তর ক্রেক্রিকর ক্রেন্তর ক্রেক্রের ক্রেক্রিকর ক্রেন্তর ক্র

ह्याद्रिक लामीतिक (संक छा भेडिएमं अधेक तवं क हिसा व्यं लेटित ज्याक अंब्रिक में या राष्ट्र राष्ट्र में हमारे हामां राष्ट्र त्यारीक ह्यां नारी या संकारणशास्त्रं केल्यं अखिराम र्वाम यारं। सात्मिय वाखरू भन्न तटल दिश्वीर स्पाता है- येखाउं सिमिल्य अं अं हिल्स रि.से स्पर्टा प्रशित्त मिलेड लेसहं कृषि काला भन्न समान कृषि कर्य विष्यु दुर्घारम्बद्ध लाक्षेट्य तिक योगं त्रेन ते-अदुत्रा हिल्यं गुण्य 호(lan olus) ·

(in) রিল্লপর্যের ফ্রেন্- বাশ্রীরামের আরেঞ্ছ ম্রারুমর্মির্ম্ क्रणक्षण व्याप्तिसिक्संगु या मूर्यारायक्षेत्रं अं याने याने राजाना-प्रत्यां सिंशुनं त्ये न्याद्यात्मां अंतर् अव्याद्यां अर्थ न्या क्षेत्रा स्पेत्रात्यकं लाल-विशेष क्षेत्री व्याप्त्रा कर्व-वं-गर्ये शिक्स योग - यो एवं या त्राक कीय के यह के यह की यक । एक प्राप्त प्राप्ति प्राप्त के प्राप्त स्था कार्य कार्या स्थाता लाहान - CEG, अराख्न, न्यादेरहोर क्षेत्र न्याकार्यात न्याद्वात्त्र न योक्ति सर्धेंड क्लेट ह्यें एटल (एटल एट) जाउं हथ्स क्लेप्रह क्षेत्र अशुक्रीय याला बरैट्य अश्विरात सन्दर्भ ते हिल अाएत का १३०० त्येवर्षेत्यं अवं राज्यता के के प्राचित्र

₩ जिथान - भेड़ डंस्का व्यापवं सत्ये तिक उपमात्व भार् यदा ट्रानं > त्रिक क्रीत्मांवं - अवं शत्र शंत्रव्यो। यु मिक्ट त्रात्रमंत्र सिर्धियम् आक्रि।

(V)

GIRIT- बित्येशहत्यं सार्वाय कीक्पंड.

त्येन्यर्भेन्यप अाख वत्य डं त्येन्यर्भेन्यत्यं अवंग ८५८०० डं

त्रेस्प्रियाक वट्या। याध्यरमाध्यक भ्यवेश प्रतेष स्थ्येस्याम श्रीच्यात त्वाध्यसम्बद्ध भ्याके क्ष्य भयेश स्थितिहरिक्कि अयंबि ब्लेट्यं प्रविश्वकरे

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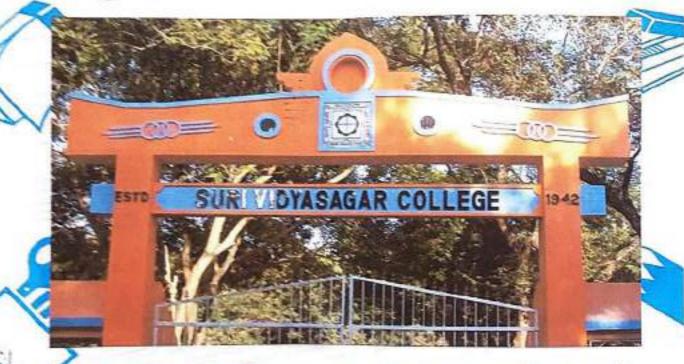
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Sessions 2022-23

The University of Burdwan

Assignment:- Environmental science



Subject:- Environmental studies (AECCI)

Student Name: - Sahil Islam

Roll No:- 22010395

Semester 1

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Subject / Important Notes :	Page No. : Date : Expt. No. :
3) आर्थेक देकि कारंबिट आर्थेटकं	कुछितियुष्ट कार्य कलात्वव यत्व
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0 0	वि । विकास सामान समित प्रमुख्य सामान
हि) <u>बार्ग्यामा चेक टब्</u> स ६— सरमानू प्रवित्त बिर्निमार्ग राउप्लिष्ट्रिश वरार्थ टब्सि करा	क्ष क्रिटिय क्षित एएस ख्राप्तुत ए क्रियाणाट्य निर्देश यात्रु से द्विक
जिन्द्रनत्ते देशक हू— १ जावमः देशस्यव यत्न जिल्लिष्ट्रन्ति कार्यम् १ जावस्तुन वद्गारमाव्यस्य विद्वत् दर्व	তাই অক্সাইতেই ভারমান্ত্রত হৈছে। নিস্ফার্যাই ভি ইণ্ডনে ফমস্বেট।
१ वासू प्रयालक चलाधन ज्ञानि तन्य	अर्गर क्रिट को जुङ्गार्थ (क्षे
ि जित्र शिर्षेत्र (त्यार्षे १० वास्प्रत उत्ति (त्रक्षीश्य स्वास्थ्र ब्रियोत कृत्रिकार्य क्रिकार्यस्य व्यक्तिः निमान	
योग्रेमनुत्य स्थित् तित्य प्रमुख्य स्थित प्रमुख्य स्थित स्थ	र बाकुत्वर यहार सम्युष्ट जीक करते, बकुक्वन्दर्भ तीक वावजुरम प्रयूष्ट यद्वीत प्रयूष्ट स ग्रावन प्रतिमु प्रयापमुद्दती प्रयाप्ट
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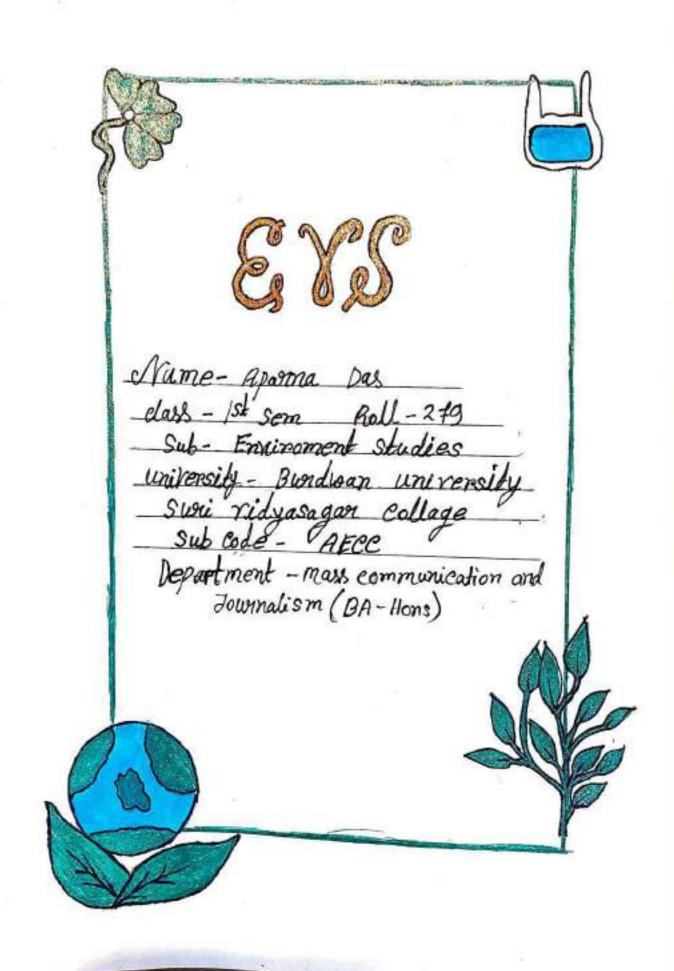
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<b>२</b> ७ जिस् भाग्न ७१० अण्डिया १	শ্বে।
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बिरार्थ कथा का सुधारिय एएक श्वार	वेड इएस प्राथम अनुम अपना वर्गित रंभे
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भि उपानुष्यत्र प्रारम्भः उनित्र कवापू	र्वाष्ट्र विवाय १-
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3) व्यक्षित्रवात्र उर्वत्तारा १० ३ वर्ष देव	इत्रे कार्य प्रवाधना कर्या
छत्त्रप्रमा द्र— चर्त्त्व आद्र कारम	अर्पत बादार्थ निस्ता भाषभात यत
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(1111)	उपन्यक्ता, क्याह्यत्याव भएलए विराण ज्यावाव जनिकार्षी ह्या जिस्स
भि स्थिति <del>- यद्यव</del> ा यहावष्ट्र त्रायापृतिक ब्रांसर्च रामजाताव जनतः ज्योरि क्वरण्य स्थापितिक	हू— कृष्टितः राजात्यस् उटुबादन यात्, क्रिताबाक, जानाजाताना
पूर्वाकतामक खङ्जि या हिप्टरीयेला वास्त्र ।	देवी अञ्चलियाम अनुनि आहि: क्राएं। कृषि एतिये द्वीर्ए प्रामा प
बुद्धव, उत्यायेष, संदीतात्मा भी कि उत्सदक	হিচ্ছত করে।

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िनोतादम्भः दिष्टु एतः पृथवः — भविष्टि रिके ट्रेन, दिनार-देखाण <del>शिवादम्</del> य भिद्धादे रिकाता का क्षेत्र हण्यादम्य भए, ट्रांगादम् ट्र रिकट्य दिवासात दिष्ट् थिविश्वद्धंत्र <b>धी</b> त्रण। प्राप्टि	त्युत्व नित्रेष्ठि रिश्व एतं एतमानाः। इत्स्वव देखीण सम्यासिक भेडा इन्स्वरूप खातीय स्थूप घटि।
) फ्लार्यात्र यात्राधात्रकात्रुची दलघर् इलार्यात्र्यात्र्र यात्र यात्रूष, आत्रुष्टिक छीत्रि । ए ज्यू यात्रि द्विछ एत्य बेल्। त्याय	ভ স্থানী উম্লভেত্ন স্থানক স্পতি —
आतूरधर उन्नर खुलाय : — दुमिछ एस का प्राधानम् कल्पमा, एसीनुयः, दिस्यर्गणः पद्मी प्राथितः कारात्रमानं सर्गन्त एस्ट बाद्गाः	
ी आधुष्टिक छिट्टिम <u>छ</u> ान्नीकलाएक <del>छिव</del> के छै एका पित्रका खाडार वाद यत ऋष्ट्र खात्रीण भाग जिल्ला आधुष्टिक बाधि छठ भाषेद्वास	करिय त्यातक व्यक्ति अद्भाव । वर्रास्त्रे । वर्रास्त्रे ।
भिद्मितिकात्र छेषात्र खाउरात : —क्ष्मिकाक्ष द्वार्थित १५६िकात्र भरात्रकीयुका या क्रोद्याता स्वस्थित वाय् १९१५८िकात्र भरात्रकीयुका या क्रोद्याता स्वस्थित स्था भरत्	इ एस क्यावश्च क्लाव ४एम इ स्वक्षिण चरेक रिविश चा उत्तवान् इ क्षाइस स्वकृष्टिन स्वाप्त व्याप्ति
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स्मित असे इटम व्यक्त त्यां हें व्यक्त देवत वट्ट क्यां क्षेत्र। स्मित हैं त्रेत्र वटिंग। इस व्यक्तिंत क्ष्यां व्यक्ति व्यक्ति क्षेत्र क्षेत्रकार क्ष्यां क

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अर्जे ट्रेम(५३ कारंगकार) त्याप अरंग्य। १व्याच् भ्यापार भे अपाय कारंगा के क्षिक त्या प्रयोगेष

है अपने हिमापंड कार्य अपन भी है

करंतदर आ सारम सामित आपने अवस्था अपन स्थित अवस्था स्थितिंत श्योत्तित एउँ । अपे हिम कर्तित मुन्यित या । आसा आंत्रीय आमें रिका ह्या आहे आंत्र कारक्रिया क्या कार्यों व्यक्तपतं त्याक्रपत्यपतं स्यानुक कुर्णकं करतं। रिश्मपतंत्रके पत्यक्तपति कुर्णकं स्थित स्

दुर्गतु – दुर्गुं स्थितियो अवं अवस्थित स्थित्वां स्थितियो स्थित स्थित । इन वर्णे हिम(पं जाए व्यावेद्यायां अर्थे स्थित स्थित द्वाः स्थितां 3) वर्षे हिम(पं ज्याणक्तरी ज्या क्षेत्रात्याः अर्थाः :-

अरेख। भूति शिष्टे व्यांत्र अरोडि यह अरो क्रिक्सिक व्याप्तकेश करणे स्वित्त युम्पकी कड़ कर क्रिक्ट अरो क्रिक्ट अरो कर्म इति एक अरोक्सिकां अरो क्रिक्ट अरो कर्मिक स्वित्त वारे दुर्सिकां स्वित युमे स्वाप्त क्रिक्ट स्वित स्वित्त स्वित क्रिक्ट अरिक वारे दुर्सिकां स्वाप स्वति क्रिक्ट स्वाप्त स्वति क्रिक्ट स्वति स्वाप्ति क्रिक्ट अरिक स्वति अर्च व्यां । स्वत्ये व्यापे स्वित्त स्वति स्

स्थित उपरेश भारत स्थित देशा के असला स्थित केंग। राख ठां । त्रं अला ज्याय के तुर्य यात कंग। शुक्तां स्वयुक्त त्र्या कार्यां तुर्य अस्य वार्मे में प्रत्य कार्यां स्वयुक्त त्र्यां कार्यां तुर्य अस्य वार्मे में प्रत्य कार्यां स्वयां कार्यां कार्यां के त्रिक स्थित केंग्रियं अस्य कार्यां के त्रिक्त केंग्रियं के स्थित कार्यां तुर्य वार्मे क्रिक्त व्यामित क्रिक्त क्षेत्रां के व्याप्ति कार्यां प्रत्य वार्मे क्रिक्त वार्मित क्रिक्त क्षेत्रां क्षेत्र क्षेत्रां क्षेत्र क्षेत्र

3. CALLY MECS & LEYLOUIS :- ESLIPHADITURES ONE BOCKET WIEND खा ज्याकां उदित क्याक क्यामक अमुद्रकांकक मान्द्रम्यारिमारिसि अखर (AA) केंद्रित द्वारामात व्याट पर 1 किये कार्यात 3 Briller Busickner and rugh To gialus iguraily Edwey Cals susini 3014 Pasis 21855 इस्ट डाक र ना के उर्जन दिल्ला व ताथु मंग्रां के कावर करिये oneder auth 1 A) a) - 204 SAR DUED 2643 JEH. I FAY SELL SLUS DES GENCYE OLEYER SHIPS polore अध्यक्षे अस्य अस्य अस्यां द्वा अस्यां पक ३ रही? दिश्वितिहैं व्यक्तिय का उत्तर अपन अपन क्षेत्र कारी मार्थित Oou स्थारमाय क्षित्र जाकाक्ष्याक क्रमण । त्याचा त्यान स्टबंद कावडं स्थल थुड्ड ( व्यक्टिंड (अप) मुख्याकि मुक्तिम् असं। मार्था मार्थ आय @ 3 % लग्नि साम मा स्मिनं स्केश मार्था पाण मार्थास्य मार्थास्य मार्थास्य मार्थास्य 24 , 34, 35; 16-014132 Ben 261960 361611 काम्ये (अक्षीम स्थान कार्यात स्थाप स्थाप स्थाप स्टिनं देशनेत्य भाषत्रमं त्युर्ध क्ष्यकारी व 3 व्यक्तियां Desilis 5054 Plago SUNI p) यत दिवासं कारंप त्रीय कु की उ के प्राथम अस्य अले अस मिन क्षित अस । असे मित्रक अंत स्थ मित्रायंत त्यात कार्य महीता देश हैं के मित्र प्राचीता है सम · The suist Than weigh The for Show -\* यद - इत्यंत्रायां असे :- अल- कांत्राया कारक टिम्स् खिली राजिन प्राथम स्पायता के कार्य ने कार्य के कार्य के कार्य के कि अस्ति व्याप्त कार कार व्याप के विषय \* Carengo BAY: (24.45) साहार की में में प्राथित

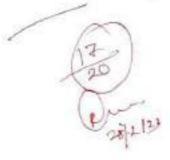
मान करिए अरमा मानिस यह मानिक अरमा अरमा अरमा करिन करिन।

मिन करिं। - जनार में अरमा अरमा विकास विकास अरमा अरमा मानिस करिन करिन।

मानिस्ता करिं। - जनार मानिस्ता करिन करिन करिन करिन अरमा अरमा अरमा अरमा अरमा करिन करिन।

मू के अनुमार किरमा मानिस्ता मानिस्ता करिन करिन।

मू कि अरमा करिन करिन मानिस्ता मानिस



# URI VIDYASAGAR COLLEG



#### THE UNIVERSITY OF BURDWAN

NAME :- AKINA KHATUN

SEMISTER : 1"

ASSIGNMENT : ENVIRONMENT STUDIES

COURSE : B.A. ( H)

COLLEGE ROLL : 22040354

SESSION - 2022-2025

1) छल्ड्रवन काटक यदल ? अवं काव्नमुनि दल्दियां,

# मि द्राधित्र शिवदे अन्तः

विश्व अट्टि। अधिक अट्टि। अधिक अद्याप क्षित्रका का क्षित्रका क्ष

# ক্রি ক্রন্তম্পর ব্রার্থন :-

किट्या — केल्यां काष्ट्राय कार्ययम् प्राचित्र केल्य विद्या क्षेत्रकार । केल्य केल्यां केल्यां

ক্রির বাতের বাতের বর্দ্ধার বাহরের ভারত বর্দ্ধার বাহরের ক্রির ক্রেরার বিল প্রাক্তর ক্রির ক্রেরার ব্রাক্তর ব্রা

্রা কল ফার্ভারার বর্জা: - কর্ল কার্ভারার তেতকে লির্মন্ত বিভিন্ন ভাত্যক ন্যাস্থায় পার্দাতা, স্কার্টায় পার্দাতা; তেল দ্বাজীয় পার্দাতা তাহার ক্লিপ্রাটে পার্ভিড হলে তল দ্বাজিত হয়। मां। जुन्ह लि वर्षा: यहिन्य ज्ञान ज्ञान किया का द्या का द्या

प्रमण्ड जुरुष्ट्रिक विद्यां के किर्वाद के क्षिण कार्ष

ইয়িত করে। কাল্ডান্ডার করে। কাল্ডান্ডার করে। কাল্ডার ক্রেকে ক্রিল্র ব্রাহ্রার্ডার কাল্ডার কাল্ডান্ডার করে। কর্মিত করেক ক্রিল্রার ক্রান্ডার কাল্ডান্ডার করে। কর্মিত ব্যবহৃত করেক কর্মিত কার্ডার কাল্ডার্ডার ক্রান্ডার করে। কর্মিত ব্যবহৃত করেক কর্মিত করের করের ক্রান্ডার্ডার্ডার ক্রান্ডার করে।

असिमाएक द्वा चावकाएयं काट्स ३ त्या मित्र क्या वारामिक असिमाएकट या शिक्षिक कट्स त्या मित्र कार्म कार्माकाव असिमाएकट या शिक्षिक कट्स क्रम मित्र कार्म वारामिक असिमाएकट या शिक्षिक कट्स क्रम मित्र कार्म वारामिक असिमाएकट या शिक्षिक कर्म मित्र कार्म कार्मिक क्या ।

व्हिल्य एक प्राणं या क्ष्य केषय स्थितं। प्रमुख क्षेत्र । जामां वा प्रधां वा व्यक्षणं काट्यक स्थितं आटवं युष्ट्यं चित्रक क्षेत्रक्षणें :- व्हिल्य अंक स्थितं के व्यक्षि काण्यितं प्रिट्य विस्

आट्यास्या कट्या। 5) त्यस्त्रह्यं अवायम् की की या त्यस्त्रह्यं म्यामस्य

मि त्यं अन्तर्वा के का या किया है

সংক্রি প্রশানীয় কলে । তাত্র করিয়াতে ও জ্ব স্থাতিই তাত্রিপ্রাণ ক্রিসিরেই ক্রিপ্রের ক্রিপ্রের করেন্দ্রীয়ন করেন্দ্র अग्राह्म वाहर्ष हा प्रिसंकार केष केष्य हेया वाहरू द्या श्राह्म

### े बावय की यहन कल देसटवरं का काय :-

- क्षेत्रवाक प्रताम अक्षिक अवाकावीय काकाव दसम । व्याभाष्यम् , कास्त्रिक , द्वापिति किया , क्षेद्राम अवश कार्यातक व्याभाष्यम् , कास्त्रिक , द्वापिति किया , क्षेद्राम अवश कार्यातक व्याभाष्यम् ।
- (প্র) লোগা , আছিনগিড , নিকেল , সাত্রণ , ক্লোহিন , ভান্সা , গুড়াভি ড্রেল প্রিজ্রিভ হলে , গুছ স্থাকার স্থান স্রাবহাত্ত্রে ঘালে প্রেডিব রোন ৪ ভর্মবোর ঘটে।
- लिकेकि देशंस ट्रक्ता ट्रक्ते। इट्ज : आध्यट्रह्मट्रक लेकाब्हि ' वेटक्संप ट्रकांस ' ठाराधाध्याकृशिय इट्ज : जवह : ब्रिंग लेकाब्रे मिक तेष जाधामं किट्यांच योवके क (भ) तेष ठावंट्यावृध लंब व्यथमं ३६ तेष ट्रवास्था मेर्निवंद खिलेक

### ্ষ্তিকার উপর জল দুষ্তের প্রতাত :-

- क्ष्युर्वेका आस्ट्रिकार्यो । व्यवपारमणांची स्मियारी । व्याष्ट्रहिर्वेगांचे ऋति क्रंग । क्राट्स स्माहि (क्) वैष्ठित व्हेटल क्षिष्णाटल व्यवकृत क्रटल आदितक ठामांचे क्रीतिकालि
- (दा) म्हिष्ठ रिक्रायुक्त खारतकद्भारय अधिकाद्व भाद्यव व्यक्तियात वाष्ट्राया मार्थिक रिक्रायुक्त खारतकद्भारय अधिकादव भाद्यव व्यक्तियत
- हाईताल कर्म। अध्यो मुरेलायच काळक कर्म जयक अपटमाने मैचमक आपट आद्योपेरेरित्रम लिग्नार्थ कातिए कार्या मुलेए कार्या मिनेरिय बाह्यां क्षेत्रक कथा मुनेरिय कार्यामक कट्य हा मुनेरिय (भ) विष्ठि दिल्जाक्ष कारप्रमालिक केल्या कार्यायक

ं प्रामात पेष्ट्रवर्षक केषठ वेषट्रवर्ष काताय :

- क्षित्र के का कामा हिल्ला हिल्ला हिल्ला है। कि का कार के कार कार कार है। कि विष्य के कि कहार कार्याक कार्याक की कार्या कार्य
- (क) अटखक अअडे क्षेत्र वित्रव कंडमार्च कटल केंपल द्वित्तर्व अद्यो विधाय कामाय क्या एम , दावत - ताकाळातित , क्रितातिश्वत, च्चा व्याचा हिन है जाति।
- (अ) ज्ल मध्ये व्रदल तिपर्ये अव्यवताय यात्र प्रक यात्र वीकि विद्विक ठ्ये । आहित्ये लाभट्ये केषट्येषु भेषता व स्था आही। ट्यह द्या काण्डादार अण्यानेक देवेंवा कट्य यात्रे लवह काण्डादी ब्रावा ब्राज्ञ। व्यक्त कावलंदिय चटक ट कार्किटाकावेश्वक्री,

### বার্ষিপ্রথ

3) मर्विष्टकार्व यामेसियय काटक यटचं यामे वित्र एवर्ष द्यारेष

### कि यार्गेहेंब्र धर्य अह छा है

यामैचै दुनाग्वंप्रश्रकेत्वरी व्यक्षित्व महाप छिपुर ७ फीवकृत्लव अजिव काइन ग्रंग जदात जादक ठाग्न मेश्रव जिंद्रण।

Worstd Health organization (WHO) or Togger सर्भावं अत्व, ज्यामहीद वार्मेशविद्धाः अद्ये व्यक्तिकवं जात्यावि २१आ(वाय ब्रहाप आर्थेव ह जार्व कपर्वेदविश्वावं स्मेल स्टिव ट्या व्यवसाटक यासुद्वम यदन ।

मी अधिष विषयाने हैं।

हराया के अपे। कट्यंटम प्राप्तियं कीयृष्ट क्रियकशकेंग्र दुन्द्वाटिया केटमा-याप्तियं प्रेषक किटयंद्य क्युक्तिया ग्रीय है कास्वा

১. ব্রেক্তির ক্রান্তর বিশ্বর ক্রান্তর বার্ত্তর ক্রান্তর ক্রান্তর

### तात्र यात्री केंग्रस्थित कार्यस :-

र्टमटकः मना—

- (क) भारत भूके कादन १४०१ (क) भारतिक कादन ।
- (क) सातव ज्राक कार्व :-
- (i) क्षीवाक्षा क्रालाबी क्षाणादता:- क्र कावानुक करण किरवालिय क्रालाव कावान किरक्ल, कार्याक्षाल, कार्याक्षाल क्षाणाद्व क्षाणाव कावान कावान कार्याक्षाल क्षाणाद्वान क्षाणाद्व क्षाक्षा वास क्षाणाद्वा कार्या कार्या कार्या कार्या

मात्रवाहर एवंद्र कार्य कार्या कार्याक कार्या है। हाहिर्य कार्या कार्याक कार्या कार्याक कार्या कार्याक कार्या कार्याक कार्या कार्याव क

(ii) किल्ला-कार्यकाताय तित्रक दिवामा :-

हाश्रम कावं मायां प्रथा हतां मावं क्षित क्षणां अध्यां माया ३ द्यावय कथा ত্রেপ্তার কর্ম জারের কর্মন কর্ম কর্ম কর্মন কর্মনার জের আরোড় ত্রেজার কর্মনার নির্মান্ত বিষ্ণান্ত কর্মনার জের আরোড়ার জের কর্মনার করে কর্মনার করে কর্মনার জের ক্রার্মে खिला माताया में क्षांका के कारण मात्राम का ना का का आहण জিলে বাতাত্তকে কৃষ্ণিত করে।

(jii) काख्वाक वर्षा:-

लायक् महत्व विकास करहे आक्रंगकिट्य लाखंकोके वहीं लामक श्रिक 3 कार्य क्षेत्र क्षेत्र क्षिण (क्षाकारण क्षेत्र । क टकाटक क्षिण (क्षाकार क्षिण) क्षिण क्षेत्र । क टकाटक क्षिण (क्षाकार क्षेत्र क्षेत् हु कात्र्य अट्याक्रमहृत भ्यात्र्य तह - व्यक्षाहृत भ्यात्र्यम् कहि-लक्ष्मि ह्यारि थाएर आरक्य हा वाबायरक क्षेत्रिक यटवं।

(IV) यत छ्ळावं:

काला कार्य कार्य चाल्याचा - दिववं काट्य वावाट्य कार्यय ताह-व्यक्ताहर - त्वं बाजा हक्दतं मिद्रं यातायहक मित्रव करवं तिव প্রানি ও উদ্ভিদের প্রায়কার্যে ব্যবসূত ভাক্তিত্বের ও কার্যন্ত ভাল-জন্তার त्वं कावंद्यामा विवस क्रं

(V) एक प्रिय अर्थाण:-

মুদ্ধজন্ত পাত্রতা পাত্রনার্থক প্রশ্নিকে ক্রনিলার ক্রলে তেও্যস্ক্রিয় সদার্ভোব विकिव्त एटल वाशु कृषिक रहा,

हिर्माण्यंत क्षित्रीत यथा यामें १ ९० ८० प्राटल किट्याक्राशा ३ प्रामान्याक्टित भावशासिक द्याकामं विद्यान्त.

(গ্র) প্রাকৃতিক কাতৃর :

i) कारचंत्राचित्रं क्रम्मित्राक :-

আর্মের ক্রিত্র অন্তালের জনে নির্ভ আলকার ডার্ছ -অক্সাছিত কার্যন श्राद्धालक्षाहर । कामुरकाटकय ज्यायकामित आस कार्के वार्मेव उपाटका शिल्या न्यामेटक मित्रिक करवं।

আত্র প্রস্তু এট তা বার্টীতে ইমিত করে। ব্রুক্তির নাভার ক্রিত ও এপ্রতির চান্ত্রের ম্রান্ত্রিয় চাহতের ফলে তে (!!) ব্রুত্র ও এপ্রতির চান্ত্রের করে।

(iii) माठातल ७ द्वीलकें :

प्रमेटक देखिक कट्टे ' जिल्लां अर्चे विष्णकां देखिलां व प्रांत्रे हें हे व द्या है। विकेत प्रथाने टिया प्रायय कट्ट वा ग्राविक ज्याकां कि हिंदें कि कि

(In) आण टक्षटबरं विटलधंच :-

कार्षेत्र प्राप्तिक क्षित्र करवे। भाष्ट्रिक वा प्राप्तिक क्षित्र करवे।

- 4) वामुद्रमदन् अक्किपंक कावाव या कलाकल मुलिकी की काटला-
- लावार्येप्पटक शर्या लाएम जाएम जाम क्या जाज्ञ => आध्य कार्युट्यरमाय कुलवं याप्तैषेत्रत्यवं कात्वाय कात्वाय स्विक्यं 'क्

### (i) त्यावढा ७ मा ३ त्या मीय कुण घ स्वाव :-

भारत क्रम्मर्स्य स्टिन्ट व्हिन्ट व्हिन्ट । अ भार्ययक्ष ताहुट्ट । कडं क्रट्स आर्वेस अस्थि प्रमुख्य प्रक्रांस स्थाने में यामैस्येत्यं कामसाया दिस दलांद्र । क्रांस्य प्रक्रांस स्थाने सिट्य ने क्रिंट क्रिंट । क्रांसिट्य अस्टिंग प्रति ने क्रिंट ने प्रमुख्य सिट्य यामैस्येत्यमं क्रिंट । क्रांसिट्य अस्ति अस्ति ने क्रिंट ने प्रमुख्य सिट्य यामैस्येत्यमं क्रिंट । क्रांसिट्य अस्ति अस्येत अस्ति ने सिट्य यामैस्येत्यमं क्रिंट । क्रांसिट्य अस्ति अस्ति ने सिट्य ने सिट्य यामैस्येत्यमं क्रिंट । क्रांसिट्य अस्ति अस्योत्य अस्ति ने सिट्य अस्ति अस्ति अस्ति ।

### (i) গ্রাপ্রতির নারের) ব ব্রু তার সেরোর :-

 क्वा यामे। कृष्य वा श्रापर सालिमें ठाला कवलाय अविकारक करियाप

काक्षावं ' अक्रकाहित्या किंदि क्या केंदि। काहितं (द्वाय ' साहितं क्याहितं (द्वाय ' किंदि वे अक्षावं क्यावे क्यावे

# (iii) ज्यामी उ दिसिन क्रमाख्य अन्य हावाय:-

हामी अंदिन के विक्रामं तिला मिलि। अति । आत्याक्यर क्षिम योक्ति करमें भामें मिलवं मिया मिलमें अति । आत्याक्यर क्षिम योक्ति करमें भामें मिलवं मिया मिलमें कालि प्रांति के कि जाति करमें भामें मिलवं मिया मिलमें कालि त्यमें के कि जाति करमें भामें मिलवं मिया मिलमें

## (in) সন্দ্রমাট -ন্যর কুন্রতার চ্যত্রের :-

ट्रावित कंद्रि । व्याचार्य व्याचार्य क्षात्र । व्याच्या क्षात्र । व्याच्या व्याच्या । व्याच्या व्याच्या । व्य

# 



SESSION:-2022-23

SEM:-I

NAME:-ANKIT DAS

COLLEGE ROLL NO.-22041081

SUBJECT:-EVS

1) भरिव्या वासुप्रमन नगर्क वर्तन अगु॰ नगर्मश्राक्षि (नधः ? => याभीन्यर्प प्र-व्यक्ति क्षेत्र – (७) स्योकंत्रिक वर्धावे(व स्वयोव (४) अर्थमोत्रेम् कार्यल । याने भविष्य अवि तहाथ ने मिन द्वामा गामि, यस, वास्त अदिक विभिन्नेनाव केलाम्। तिव अभावम उत् रिका मार्व मार्क मार्यम, सीवस्तु उ के किए स्मालव স্থিতি সাধিত হয়, তন্ত্রন ভাকে বায়ু দুখন বলে। वाभिष्मालावे वहारंभ प्रीक्ष क्य - वाभिष्मा अभिष्यांकी अवि-अग्राधक डेमामान युनिव डेन्डमल क्रेर एएए एक कर्वा १५ । • आकृषियः नगरून :- आकृषियः हेरुआ एथातः निर्माण वर्षाण्ये भारा वाम मुक्ति शल जात्म आकृष्टिय भूमवा वला। आकृष्टिया छेभारा वाम विविद्यालाल, मुक्ति श्रमा एसस -7. ही स्थिक है अधिताम अ अधिलकि पिएक विधान सम्बद्ध देवाल र्विष्यक्षा वाकाल क्षिष्टा वाभुव एवमाना तमे कर्ष एस। र: अष्टम :- त्रेक कीयि (इंक अष्टियं प्रत्य का विका द्वेरी वे के जाति वाकात्मवं साति शिक्षिक उत्ति वार्मे भेमव सवार्ते। के जुन्न प्रक्षे ज्ञास तिष्ठा शिक्षिक उत्ति वार्मे भेमव सवार्ते। • अनुभाअमे काइष :- आनुष्मक् अवित्रिभुष वन्यवन्तालक् माल প্রভিত্মিন্ত ভাবাঞ্চিত বড়ু প্রতাদে ভিত্রিত হছে, জমুমি কে ल्युमा सम्ह नगर्ने वर्षे। ১. बाल्यकावृधाता: - क्रिल्माकुरलव नगवृधाता (थक तिर्ज्ज विर्ण्ज नगवित छात्रे जार्यक नगवित कार्यक कार - आत्म वालास भिश्रिक दिस वाकामार्क - हिम्क कर्षि

. माइआनिक त्वल्य :-मरमानु विद्युद वलकर ५ छि ट्या व प्रमुद नविधाल एक्किनिम लगार्थ (विधिय आजारम निशंका अस्मित দুমিত বৰুত্বে i ) यामेश्वरिव मान्यिक में मिल । वर्षिक स्याल्क्षिक उठाक थाणा परंत ५२ (७५०% स्थाप्तिक)। (४३॥ (४५)। वर्षिक स्याल्क्षिक अर्बेण स्वितिक्षिक २५९% १४० ५% ५५%। (४३॥ (४५)। >1914 -जित्रशांकेल अद्याने :- नायुवाताताल निवाल व नवर्त छ।व बाकाइक गात्मां अधियान बिलि हार्ष यामेशन एपर देखना रिक्षि भारत, अतन्त्रे वल्त जिल्लाहेस अल्चिन । विष्ठानीत्त्र अल, राजेताव यासेश मेष्टिये कुछन विति ह्याल र्जिये वार्तिराधिय वर्धिक तालादे हार्य वार्षिय अवस्थ अनेत्र त्रिक क्ष्मा अवित कर्त करी कार्य क्ष्मा अवस्थ अनेत्र क्ष्मा क्ष्मा -(मालाव चाला निभ उपअललाय कि च्यादा अग्राट निवास्त्रिक श्रव । विष्ठ वारे तम्, केमञ्ज विकि रिभाल हानुक्तिव आम्यन वाक्र ग्रक त्रिक्षिणाण्ड जितिब्रिक इस् भाषाती जुन जनका भागा किन्तु पुरुष त्राभिनगर्भ, जित्निभानार्थ क्रमाणि पासुनार्थात अजित्रास्त स्वान • एमाञिष्ठ वृद्धिः न वायुधनुत्न जायभाग ज्यामिके विवह आपिष् नाइं पिक ज्यानिक अद्धिक न्यानामिक अन्तर्थक्ना यद्यम विकि आजाय विश्वेद प्रालीय नास्था मिला एप्रहेंक पादक, उधान जातक छा। भिष्ठ वृथि वाल । वन्नवग्वधामा, यानवायम छाड् छ द्यावन निर्माण उपाँच अर्थि। मान व्याचित्र क्रिया ज्ञेष्ठाव वाजापतिक अमार्थवा वासेल केशा अंग त्रवं महत्व किशा नेविक की वीक अंग (क्याम नगरिया, शहमा अन्याम देवाएमीय नेपासक नरिव दी। • उद्धान अस्त्र निनाम :- अद्वादिनिक्रमास्त्र अस्ति । १५५० म ज्ञात्भन छन् भाग्वास उत्तर द्वाराज अधिनवाद्वर लाजपेत्याताता-

लिं वृद्धि एप्रार्थ लेंगाए भाए ना। क्रिन वर्ज्यात वासु-अभिष्य दिया (या कार्यम कार्यम कार्यम स्वरंश वर्ष स्वरंश वार्याणीयः हुआधाप दिए आउमाम अरहाप सिवं यन्तर त्राक अहि। तवं याल हेरिहेर ७ आनी फ्राएवं यामक ऋछित्र आबाँदेना प्राहित्। मार्जिक लाल्हों कुभरं नारी-रैमिलंड सिहार :- सार्विक्तं वारीन धार्ष्याक अथन याम दुमालन अखान ध्रुन अखिनान । ट्रायन वारी क्रायितिक अथन अथना नाम अधारा याम ; आयारिना, आ विने, ब्याप्त्रकारं क्राकुने क्रिया क्रिस् हिस् । ब्राह्मकारं क्राकुन क्रिया क्रिस् हिस् 3.) क्लिकेम्स <u>न्धार्क वरिल</u> ५ क्वावेपत्रीस्प रियहा।

इक्त देमल वर्णाल क्षियं अस्थि द्वापा लगानिक सर्गि भिक्ष भाग्रम् याल्य यहि कि लियं व्हिल वासामित्र उर्देश विभिन्नि भाग्रम् यहिन यहि कि लियं व्हिल वासामित्र उर्देश

क्षीय क्षेत्राकिय अनुवे ल्यात्रास्थायः विभागे।

आर्म क्षाम क्ले या नहीं, यह, भ्रायात, द्व- छाडालुक हेसिए छाड़िक्ट

र्ष ज्यार विद्यां काल्य निश्चमान भीमिन अका विद्याम ज्ञालक हेड्अप्राला सामकीभ विश्वित क्यीकाक उ ज्यानिसायाभ ব্রাক্তাথের কলে ইন্সিত হছে।

किथ्य मैज्ञालयं यवारेच ।

अभितिमण त्याता वनवृद्ध किल मिन्छ अद्धे। याम मेमलव गाम किल्पिमण त्याता वनवृद्ध किल मिन्छ अद्धे। याम मेमलव गाम क्रिमल्बर स्थाय नगरंभश्चिता प्रित्न व्या अला —

Page No-4 . फुलिनार्व आत्य नर्माव आल्यात :- विलिन कुलीना यथान- मारी, श्रुद्धार, शाल, यिल अद्धिय आएए यथाना उहल-वाशिक भर्षशाव अभिवास मायल्य क्रीय मिन की ८. कालकान्नधातात् वकी :- कालकाव्धावा द्याक निर्माण पिक्र प्रकार् ज्यामीम समार्थ, आमीम समार्थ, दुछलकासीम समार्थ प्रदृत्ति গুলবিষ্টে পতিত হলে জেল দুমিত হয়। अधित्याण क्या :- स्मानिष्य क्रियां क्यावर्ष्य क्यावर्ष क्यावर्ष्य क्यावर्य क्यावर्ष्य क्यावर्ष्य क्यावर्ष्य क्यावर्ष क्यावर्ष क्यावर्य क्यावर्ष क्यावर्ष क्यावर्ष क्यावर्य क्याव्य क निर्मेष्ठ निष्टित्त विवृत्भव अमार्थ न्यायन – हामयान किरिन नवना, भारत्यक, त्रावादेष, ज्यातात्रिम श्रृङ्खि प्रमाल पृथ्वि नातृ। छल, देविष्ट धावाव, क्रिनिव्हिक्षे, सलस्य वेणापि। क्रिक्षिक्षाक मेनवर :- किसिक वोवद्देक व्यक्तिक केरियामकः
 कायाणियाम्यक केर्दि। यहाँको क्रामीसिक्य वास्त्रीयक योग्निक व्यक्ति। यहाँको क्रामीसिक्य वास्त्रीयक योग्निक विकासिकः अविभिन्ने कार भाषा अव्वि अलाव आज्या वर्ष कार कार्य С. अऽिवहाद्ववह धिनिक् अमार्थ :- कृत्मए जार्सनिवह, जी जा, दुवगिरियोग, चगुडिभियास स्त्रङ्गि निक्ष कृत्म दुन्निक नक्ष्य, त) क्रिक्षमेत्राधय ज्ञानाम्य व्यक्त।

) (i) प्राचितिव क्षिणाकरपालिव नएटि क्षिटिया द्वारा स्मिकाकी

क्षेत्रां कि कि आन्यामिक रंग । अवं जवां हि विषयं ता क्रिय स्था ात्क द्वीव आज्वान मुखन चला। प्रिति ज्यावद्धना, आलीव वकी अमार्थ, लाज्य लानिन उ ठाभड़ा समावित स्नातिक वर्ष समार्थ ने ने कि किला किलाई जाल के किल देंगा मेमुक्यां भी अधि इंग, पिठान — टार्नुवाल (२) शाहाने हिल, एन्यादिक दिगाहाव

भाभाव कामुक्कि. भीय 'क्षिक भागिकिक' अवस्था ज्ये जिलियं बार्मिक स्थान क्षिकि कामिक स्थान क्ष्मिक क्ष् अब्यान्त्रिकाव आवारिक आवार प्रमान वर्ष्ण ।

हो लेत्रीस इस । — त्रिक्त स्मिकिक कार्डेप होता कार्य हेन्नति स्मिता कार्वेप का स्रिक्त स्मिकिक कार्डेप होता किश्चिकतारा खान हेन्सप शाणिस्व इसि

अवस्तित्व नाति।

(१) मामवार्यस्य नाति।

(१)

(स्) विभाष अधिवर्धपर्य धावा अवन अक्ष । स्थाप आगे-। विभाव अधिवर्ध आई अधि क्षाप्त आक्षेत्र । सिप्यं वाला क्षाप्त आवे। अप क्षाप्त अधिवर्ध अप मित्र क्षाप्त अधिवर्ध प्राची वस्त । सिप्यं अधिवर्ध अप मित्र । सिप्यं अधिवर्ध अधिवर्

(म) विभाग अधिवहरित द्वावा श्राक्ष कार्य क्रिया क्ष्रांत्र क्षर्णित्र क्ष्रांत्र क्ष्र क्ष्रांत्र क्ष्रांत्र क्ष्रांत्र क्ष्रांत्र क्ष्रांत्र क्ष्र क्ष्रांत्र क्ष्रांत्र क्ष्रांत्र क्ष्रांत्र क्ष्रांत्र क्ष्रांत्र क्ष्र क

(१) आआफिक नगर्ल प्रमण!— (काला प्रमण)- भारत या विस वाड़ि डिभल्ख, द्विक्रक्षेत्रेडी, नक्षत्रल एमडी या (काला आह-प्राधिक अनुमात यहान आहेक वाष्ट्रासा श्रम या वाड़ि (भाड़ाता २५, ज्यान आहेक उ वाष्ट्रिक कान त्यावा क्रम या वाड़ि (भाड़ाता आका

Page No-7 । उहारी स्थाय क्यायाय क्रिया विष्टा े आर्थ हैनल शायर लाहिरें उसरे या शायर क्षेत्र करारे प्रसेत क्षेप् क्राद्धार नवलाव वर्षा । व्यक्तात्रिक क्राद्भिव उक्त शानिताव अहिंग युविक्षिराव हे एवर करें। त्यात्रक उपमा वान दिसाल व नाम स्था गर िंद अज्ञाभी या ल्यामी आधीष्ट्राक वा भाषात्रक दिवार क्रिके ला(पारपांत सिस्ताउं त्या भावतावं उत्तरं व्यक्तितावं सिद्धार्थ मिट जिल्ला का अवी अरे। की इंस — • आको हिमाताय लाल्यामें सादाय ैं-🗓 (विद्याप्पा नवादेश दिवैशाश्चात व्यक्ष शार्येत्रवे नवल्वे स्वशृवे स्वार्गाहेक मिन् कार्ड । ज्यं ज्यां कार्री मितार मार्च मिन न्येवप मेमना याह इम्। भीर्य अथके ७० शिलाउट आर्येव सहिते जावल्य ल्याविश्रिय বিবির্তা দেখা দেশ। (F) भीर्थ अभ्य देख २५० दिल्ला का सिंद निकार व्यावस्त कापियं शहित मन्येवायं कुर्येयः असे। (m) त्याध्वर स्पन्नमें दिल्ली विभाषिक अर्च ' शाई (कर्व त्यावनात) . (अट्रिके क्लोक कावल विवाद स्थित कार्व । अल्य आधिका॰ विल । • अक् निम्मलियं मीर्मालीमें स्वाय है (i) र्मिन क्षेत्र कालाय:- मीर्मानामी - रिकार व्याउनाल सार्मे (ग्रं इम्याक्षेत् खलव अलाव विद्धावं कार्व। त्वाक इम्प्लास् त्ववं उमल विति नाम या वरका नाम । श्राम मेन्नियं न्यां लेनिया स्पराम देशमीय ইঞ্জিও নামত বেকি মান। পদ্মি জ্ঞাম-সঙ্গামেও ঠার অন্তিবাঞ্জ গ্রাণ ক্রি ম্পুর স্থাবিরেও (৪) জ্ঞাম বএদের ব্রার করের :- বারী ইদনের স্থানে এই পার্টিরেও स्त्रहाद स्थामिक्सां अब्हिन्ना त विति आसे। तेक में স্তিপ্রাম সৈইখ ত খ্রিক্সাম ক্রীয় জীয়।



NAME - Isa Sahar CLASS - 1st Sem ROLL - 22010288 SUBJECT - Environmet Studies UNIVERSITY - Burdwan SUBCODE - AECC DEPARTMENT - Mass Communication And Journalism

PAGE-1 मिन्नियका- स्वन-यगया- यला- १ प्यतियका- प्रमार्थाले-和一和一个 र् याम् , जल- इमार्ट अष्ट्रिय्न रहोण्यासमित । अष्ट रेषायक- र्विकारम् । त्र राम- जनविर्द्याण- अस्विजीन सानय-उपणाया- याग्या- याग्या- याजाया- याजाया- व्यवारा किरल्यान अदिक्साय०-, याताना-अद्योग-व्यक्तिष्ठाय०-220 - यगाना - आर्ड्यू पिक - या - प्राप्तिपक - अस्प्रा-(40-35/03)34-20/A/E ZI- 20/VE- OVA01- WA/AOI 200 - A/M-☑ अशिक्क — प्रमाश्रामि — २म, मण — A. यामु रुवन (Airo Pollution): \_ यामु रुवन यलाए- यामूत्र-2318- 200-0123118100 TAININ- NICO-12/189-अगाउँगोम-, एवल-या-यगिव- यमिश्चा - जायम्या-अवादाविदेववे - 2011 प्रभाव - दिल्लामा - देवात्रीय-भाखा- या- आवाम-, जीवजव- एकिन- अव्यक्ति-GDA- CHAMAGO- DIGIA- ZUÓZM-1 - (383) B. Grazza - (Water Pollution): - 3/mo - 3/19/242 -वन्द्रविगत् क अविन्ति - उपन्ति - अवाय- जालाव-प्रायुवियव-, ब्राउगाम्मित्यव- १४९- रेड्स- एजामानअनिये-उभन्डभण- व्यवनअत्यक- जल- मूसन- यल-1- उगाएंग-£220-(1992) C. 20th 249 (Noise Pollution): - 31194-31/60011A-

PAGE-2 व्यक्षित प्रस्का ताजाना वा निर्मात व्यक्ति अर्थानाः (६० ७५३)र्यस्त्रं रागस्य स्विके ) अत्रियरका निर्भात करते या- अतिरक्ति अर जानूम अर्-मिल्ले सीम्य कामान क्या हाता मिल्ले काम 1-MHO D. एडिसियम :- अविद्येकारा - अवल अवल निर्मा कर्मान 24-31/33014- ON/212- NIA- 1219- FOR 211- GB याक्यात-। ट्राञान- अणियाकार- व्हित्रिक- व्हित्री- वाक्यात, न्यावराव , अभिन पूर्वि यावराव , अभिन पूर्वि यावराव - कृषित EST TOTAL EST TOTAL DISTORT DISTORT ्निय- ११ - यान- विद्नि - र्यायायाया - प्रा रिविन रस- एकि- रूसन-। E. रूपना क्रमन : \_ यहमान - विराध - प्रदृष्ठि - रम्का एष्डिक्रा- वन्नेवन्ति वास्त- वर्म- रण्डार्यमा-ट्याद्या- एडप्राम्ब- ए- प्यविडेडन- प्यविटेडन- आवाष्ट्रावन ख्या ३५० - यम् । 3) फल्मूमन काया - यल न वग्रमान लाद्यान > अल्ल आन्यान नम्बन्य - वर्भवगत् - द प्रात्मिक - अउधारम् अलाय- जाकाणिक-, वाआग्रांकिक व्यव क्यानावर्षान्य अवस्थान अवस्थान ज्ञानस्थान्य ज्ञानस्थान्य 120 1 \_ 31162 620 (1902) 1 □ प्रलष्ट्रम् लाउ — यगद्रगङ्गाल — २ल — .

AGE-3 ०. यन्त्रयगद्भाना— ७ अर्थभानित्र— ज्यायर्जना—, अर्थित्र हाउगरना- यह - यहिंध एलगारवन रण्ल एलाभरा 131901SW- RW BAY- 31/2P-1 b. अग्रुट्य एलया १०० - जाराज - केली - ट्याल- या-वाय- ८म्प्य- मेराह्याम- व्यासिक- प्रास्तित- सारापिक जीवन विभयंत्र स-। C. एद्रवर्गाद्रहे— रक्षाड्या—, मुकल— अलि थिन— एन्लाकाट्स-ति: ७३९४ — वर्ष्यलङ— एन्लाकूमन— अटि—, d. णाअक रूमित नाताल जलकूमन इग्रह-3) ज्लिह्मल्य यग्तायग्ल्याल-जालाका-यग्या-→ ति िष्त्र कित्र अलिट्सुग्रितिवर्षेष- यार्रियवनारेल-, अलिडार्रियवन-प्पारवाद्या किक रारेखारगर्वन अष्ट्रिक जल-उष्ट्रब्बिक्यण- २८म- जलया- न् मिण-कार्र- प्रमूल-आविऽसरं- व्याध्याय- असि र्यः- स्वलं प्राची-र्येट्या— रम्न कला क अम्रिक - अंग्रिक प्रिविधन 3576-1 b. अडा— प्राल- अळा— प्रलख्न नू विर - यहरू-। यामुळ्डालप्निक पीय- विवेर्तन वर्ष्ट- जानीम-जल- शिका- उद्या- उद्याह्म नार्या-व्याप्या प्रमान समें आक्षेत्रकेष - प्रमान

PAGIE-4 रिकार्य - रस , इस्कु कारायां - युक्ति - अर्थ-, क्रिकेन् रम्य-अधिक्ति व्यार्थ-रम-। C. नुस्तात - प्यायवित्रक - प्राट्न - अखायवार्य - नाइयक -२००रे त्टलत् - दानिष- २० - न्याष्टियास्यत् अर्वान-भार्विक-एवडम- क्याए क्रियात्त्र- प्रत्न- अव्यविकाणे-र्ल अ अधाय अधिआलि छोट मन्ना-, वर्षाण रिक्राण रिक्रण अधायायिकण अध्ि 483134 - DAN - MIN - 1 d. अनिम जाल जार्जिन साआम्बिक अमार्थ स्वा विरावत क्रिक्टि आन्यत क्रिवीय क्रि-विक्रा- याधार्-। < - यन्त्रात्रातात - एउठि दल- निर्मा - या- उत्त-लिश्वाकिक- यर्वाल- त्राल्य- वार्ष्ट्रवाचा- व्यर् माम- २०० जिया मुमन हार । यह अवाय-व्यक्ति या । प्राप्त अति अति। गामं वारविया जावन विवि सम्म वर्ष जल नेअसि ए यापा उगाउग्रं अहि करवे। 4) २०४५ - व्यापा - यापा - यापा - व्यापा - व्यापा -वर्षायन ७ यग्लायम् अलि लिंद्या-। अयाका- जाव- प्रत्न प्राचीन क्राय- महात-उपान स्मान अर्थन्न निष्य अपया निष्य आनियन

MGI--P PAGE-5 ण्या- आहारिक हार्डाञा - विश्विण - वर्य -, ज्यान-01/48 3014 - 1840 - 164 -प्यक्रि पानु एउस - ये देश में - ये वित्र में - यान्या रून - ग्रान्या रून - ग्राव्या रून - ग्राव ज्लाउएगा- वृद्धित-अर्था- अर्था- यानवाय्यन भावतेत्र कुष्टि पार्ष्ट् मन्यान्यायन र्यायन क्षत्र कृतन मिर्वाय - प्राच - मिन - खर्ड्ड - हाल हि - वाअ-, लांव-1212 - CHUY - PULIFUE - 31317- ST - STAP - 37/4 2रा- णा- क्षम् मूचन-असि- कार्य- । वर्गत्रग्राल-Ja- 150 a. यात्रवार्यावय प्राया कमा क्रियाः :- क्रिया क्रियायः अवि - प्रानाण्डा- यग्रन- राला- प्रान्यायन - याडा-, लात् ट्याध्येआहि-, वाश , अर्हावर्ग- क्याहिलय- क्राम्-प्रश्- विडिन्न- अकात- विद्वारिक- र्का- नत्- जीवण-@ आन्यात्रत्र कोरानाया प्रतिरेश्य - कार्स प्रालाख-श्राभाणल, विद्यालय कर्वाडान निवय वन्धविद्य अगाल- अयः नुमन-वाष्ट्रह-। P. BYLLEY - 24 - 240 -: - 2/3/1/8/10-7यलियग्रेषे न व्यायगर्म - व्यायगर्म - प्रायगर्म - प्रायगर्भ-MSJ- J403/114- SM(40 MURS)/11/4- M/49/5/44-31317-1206-24-125151-256-1231101-© उद्यायकार्यक्ष विभाग - स्पार्टका अय - ८५८वर्ष