



BAHONA COLLEGE

বাহনা মহাবিদ্যালয়

Affiliated to Dibrugarh University

**Supporting Documents for
NAAC Self Study Report (SSR)
(3rd Cycle)**

Period: 2016-2021

Criterion 2		Key Indicator: 2.3	
Teaching- Learning and Evaluation		Teaching- Learning Process	
Metric Number: 2.3.1	Student centric methods, such as experiential learning, participative learning and problem solving methodologies are used for enhancing learning experiences		

**Prepared and submitted by
Bahona College**





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Metric No:	Heading
2.3.1	Student centric methods, such as experiential learning, participative learning and problem-solving methodologies are used for enhancing learning experiences.

List of Students who Participated in Experiential Learning through Project Work/Field-Work/Internships in Academic Year 2020-21



Internal Quality Assurance Cell

Bahona College

P.O: Bahona, Jorhat- 785101 (Assam)
Affiliated to Dibrugarh University

Email : iqacbahonacollege@gmail.com
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List of students participated in the experiential learning through project work/field work/internship during the year 2020-21.

Program name	Program code	Name of the Course that include experiential learning through project work/field work/internship	Course code	Name of the student studied course on experiential learning through project work/field work/internship
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Prachurzya Dutta
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Mrigen Saikia
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Probhati Pegu
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Kandarpa Gayan
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Pranjit Dutta
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Susmita Saikia
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Rajashree Borah
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Anupam Borah
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Rajdeep Neog
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Kaustav Moni Neog
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Plabita Bora
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Prasujya Kashyap
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Hrisikesh Borah
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Himashri Borah
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Trishna Das
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Trishna Rani Borah
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Bornisha Borah
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Bijoy Krishna Nath
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Dipankar Gogoi
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Mondeep Gogoi
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Porismita Kalita
B.Sc. Chemistry	UG-Chem	Project work	MM-608	Nayan Nilim Ozah
B.Sc. Chemistry	UG-Chem	Project work	MM-608	Abhijit Pachani
B.Sc. Chemistry	UG-Chem	Project work	MM-608	Chandan Jyoti Borah
B.Sc. Chemistry	UG-Chem	Project work	MM-608	Bedanta Bora
B.Sc. Chemistry	UG-Chem	Project work	MM-608	Arindam Borah
B.Sc. Chemistry	UG-Chem	Project work	MM-608	Noni Gopal Nath
B.Sc. Chemistry	UG-Chem	Project work	MM-608	Udai Sankar Mudoi
B.Sc. Chemistry	UG-Chem	Project work	MM-608	Tapash Jyoti Hazarika

(Dr. P.K. Dutta)
Principal,
Bahona College



(Signature)
Coordinator
IQAC
Bahona College, Jorhat
Pin-785101



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B.Sc Chemistry	UG-Chem	Project work	MM-608	Prastuti Saikia
B.Sc Chemistry	UG-Chem	Project work	MM-608	Sirky Gogoi
B.Sc Chemistry	UG-Chem	Project work	MM-608	Priyadarshini Gogoi
B.Sc Chemistry	UG-Chem	Project work	MM-608	Abinash Hazarika
B.Sc Chemistry	UG-Chem	Project work	MM-608	Gitartha Gaurab Das
BA Education	UG-Edn	Field Report	Paper 602	Popy Borah
BA Education	UG-Edn	Field Report	Paper 602	Disha Hazarika
BA Education	UG-Edn	Field Report	Paper 602	Neha Dutta
BA Education	UG-Edn	Field Report	Paper 602	Dirina Saikia
BA Education	UG-Edn	Field Report	Paper 602	Pranjit Saikia
BA Education	UG-Edn	Field Report	Paper 602	Nilav Jyoti Bordoloi
BA Education	UG-Edn	Field Report	Paper 602	Samikhya Nath
BA Education	UG-Edn	Field Report	Paper 602	Pinku Neog
BA Education	UG-Edn	Field Report	Paper 602	Sumki Boruah
BA Education	UG-Edn	Field Report	Paper 602	Shymal Krishan Borah
BA Education	UG-Edn	Field Report	Paper 602	Pranjal Bora
BA Education	UG-Edn	Field Report	Paper 602	Kongkon Jyoti Saikia
BA Education	UG-Edn	Field Report	Paper 602	Siranta Bora
BA Education	UG-Edn	Field Report	Paper 602	Ankita Das
BA Education	UG-Edn	Field Report	Paper 602	Sumitra Das
BA Education	UG-Edn	Field Report	Paper 602	Pankaj Das
BA Education	UG-Edn	Field Report	Paper 602	Madhab Kutum
BA Education	UG-Edn	Field Report	Paper 602	Disanta Dutta
BA Education	UG-Edn	Field Report	Paper 602	Pinky Dutta
BA Education	UG-Edn	Field Report	Paper 602	Prerona Das
BA Education	UG-Edn	Field Report	Paper 602	Monalisha Dutta
BA Education	UG-Edn	Field Report	Paper 602	Trishna Moni Kalita
BA Education	UG-Edn	Field Report	Paper 602	Prandeep Dutta
BA Education	UG-Edn	Field Report	Paper 602	Rupam Baruah
BA Education	UG-Edn	Field Report	Paper 602	Monju Pegu
BA Education	UG-Edn	Field Report	Paper 602	Mayur Dutta
BA Education	UG-Edn	Field Report	Paper 602	Prasanta Borah
BA Education	UG-Edn	Field Report	Paper 602	Gautam Dutta
B.Sc Statistics	UG-Stats	Project work	STSM 604	Faiza Almas Ahmed
B.Sc Statistics	UG-Stats	Project work	STSM 604	Lakhyajit Kalita
B.Sc Statistics	UG-Stats	Project work	STSM 604	Nabajyoti Bora
B.Sc Statistics	UG-Stats	Project work	STSM 604	Debasish Hatibaruah

(Dr. P.K. Dutta)
Principal,
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B.Sc Statistics	UG-Stats	Project work	STSM 604	Alongkrita Goswami
B.Sc Statistics	UG-Stats	Project work	STSM 604	Kamal Gam
B.Sc Statistics	UG-Stats	Project work	STSM 604	Dhananjay Teye
B.Sc Statistics	UG-Stats	Project work	STSM 604	Geetanjali Bora
B.Sc Statistics	UG-Stats	Project work	STSM 604	Pranjal Bora
B.Sc Statistics	UG-Stats	Project work	STSM 604	Sanjib Bhuyan
B.Sc Statistics	UG-Stats	Project work	STSM 604	Omprakash Shah
B.Sc Statistics	UG-Stats	Project work	STSM 604	Udit Gogoi
B.Sc Statistics	UG-Stats	Project work	STSM 604	Pranjal Bora
B.Sc Statistics	UG-Stats	Project work	STSM 604	Pallav Raj Bora
B.Sc Statistics	UG-Stats	Project work	STSM 604	Sankarjyoti Saikia
B.Sc Statistics	UG-Stats	Project work	STSM 604	Uday Pratim Saikia
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Pallabi Bez
		Practical and Project work	ZooMP-605	
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Arpita Hazarika
		Practical and Project work	ZooMP-605	Madhumita Borah
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Rajib Bora
		Practical and Project work	ZooMP-605	Janmoni Teye
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Jitu Nath
		Practical and Project work	ZooMP-605	Abidit Dutta
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Aikyata Sharma
		Practical and Project work	ZooMP-605	Kaustav Moni Gogoi
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Dikshita Bora
		Practical and Project work	ZooMP-605	Swasti Banaspati
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Mahananda Payung
		Practical and Project work	ZooMP-605	Pundarikashya Goswami
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Chirojyoti Pamegam
		Practical and Project work	ZooMP-605	Ananya Thakur
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Bisakha Borah
		Practical and Project work	ZooMP-605	Pujashree Devi
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Priyobrat Tamuli
		Practical and Project work	ZooMP-605	Baspi Gam
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Moni Sankar Borah
		Practical and Project work	ZooMP-605	Binita Kumari Sahu
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Nidarshan Nath
		Practical and Project work	ZooMP-605	Trinayana Sonowal
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Rupjyoti Dutta

(Dr. P.K. Dutta)
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		Practical and Project work	ZooMP-605	Tribeni Shyam Gohain
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Aditya Nath
		Practical and Project work	ZooMP-605	Liza Boruah
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Akangsha Bhuyan
		Practical and Project work	ZooMP-605	Kaustav Moni Nath
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Mrinmoy Borah
		Practical and Project work	ZooMP-506	Akash Borkotoky
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-605	Bhargav Kr. Dutta
		Practical and Project work	ZooMP-506	Mridupawan Das
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-605	Jadumoni Das

(Dr. Pankaj Bora)
Coordinator,
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(Dr. P.K. Dutta)
Principal,
Bahona College



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IQAC report on Students' participation at Field Work and Project Work 2020-21

In the Academic Session 2020-21, total 204 students of Botany, Chemistry, Economics, Education, History, Political Science, Statistics and Zoology department of Bahona College participated in the field work or in project works. Names of students participated in Field Work, Project Works in 2020-21 are mentioned below.

Sl No	Name
1.	Prachurzya Dutta
2.	Mrigen Saikia
3.	Probhati Pegu
4.	Kandarpa Gayan
5.	Pranjit Dutta
6.	Susmita Saikia
7.	Rajashree Borah
8.	Anupam Borah
9.	Rajdeep Neog
10.	Kaustav Moni Neog
11.	Plabita Bora
12.	Prasujya Kashyap
13.	Hrisikesh Borah
14.	Himashri Borah
15.	Trishna Das
16.	Trishna Rani Borah
17.	Bornisha Borah
18.	Bijoy Krishna Nath
19.	Dipankar Gogoi
20.	Mondeep Gogoi
21.	Porismita Kalita
22.	Nayan Nilim Ozah
23.	Abhijit Pachani
24.	Chandan Jyoti Borah
25.	Bedanta Bora
26.	Arindam Borah

27.	Noni Gopal Nath
28.	Udai Sankar Mudoi
29.	Tapash Jyoti Hazarika
30.	Prastuti Saikia
31.	Sinky Gogoi
32.	Priyadarshini Gogoi
33.	Abinash Hazarika
34.	Gitartha Gaurab Das
35.	Meghashri Bhuyan
36.	Puja Saikia
37.	Pallabi Pegu
38.	Popy Borah
39.	Disha Hazarika
40.	Neha Dutta
41.	Dirina Saikia
42.	Pranjit Saikia
43.	Nilav jyoti Bordoloi
44.	Samikhya Nath
45.	Pinku Neog
46.	Sumki Boruah
47.	Shymal Krishan Borah
48.	Pranjal Bora
49.	Kongkon Jyoti Saikia
50.	Simanta Bora
51.	Ankita Das
52.	Sumitra Das
53.	Pankaj Das



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List of Students who Participated in Experiential Learning through Project Work/Field-Work/Internships in Academic Year 2020-21

54.	Madhab Kutum
55.	Disanta Dutta
56.	Pinky Dutta
57.	Prerona Das
58.	Monalisha Dutta
59.	Trishna Moni Kalita
60.	Prandeep Dutta
61.	Rupam Baruah
62.	Monju Pegu
63.	Mayur Dutta
64.	Prasanta Borah
65.	Gautam Dutta
66.	Dipanka Dutta
67.	Himanshu Bora
68.	Jyotishna Dutta
69.	Manalisha Nath
70.	Manash Jyoti Bhuyan
71.	Mayuri Hazarika
72.	Mousumi Deka
73.	Pallabi Bora
74.	Pankaj Das
75.	Pranjal Kalita
76.	Preeti Rekha Gogoi
77.	Rija Bora
78.	Rimpi Neog
79.	Satabdi Hazarika
80.	Shabana Yesmin
81.	Susmita Sarma
82.	Samirranjan Saikia
83.	Shekhar Das
84.	Sourav Dutta
85.	Anindita Saikia
86.	Debajoni Borah
87.	Jaishree Saikia
88.	Joyshree Das
89.	Hamida Yesmin Begum
90.	Hillary Pegu
91.	Indrani Gogoi
92.	Jahnobi Kalita
93.	Juribul Bora
94.	Krishnashree Dolakashria
95.	Minakshi Patir
96.	Nishi Hazarika

97.	Porinita Nath
98.	Pori Kalita
99.	Priyanka Das
100.	Rupanjali Dutta
101.	Sangita Das
102.	Simpdy Deka
103.	Ankur Rajkhowa
104.	Ashish Utpal Dutta
105.	Bidyut Bikash Das
106.	Biki Das
107.	Debabrot Saikia
108.	Debajit Sarmah
109.	Dhiren Saikia
110.	Diganta Khanikor
111.	Dipu Bora
112.	Farhan Mashud
113.	Ghanashyam Gayan
114.	Goutam Saikia
115.	Gyandeep Kumar Neog
116.	Jatindra Yein
117.	Madhuja Nath
118.	Mithilesh Routh
119.	Mrinmoy Borah
120.	Mrinmoy Bordoloi
121.	Nilutpol Das
122.	Pranab Jyoti Gam
123.	Prandeep Baruah
124.	Ananta Nath
125.	Bishnu Das
126.	Dashagrib Boruah
127.	Debang Borah
128.	Hirok Jyoti Borah
129.	Jyotishmoy Saikia
130.	Palash Jyoti Saikia
131.	Prinyanku Dutta
132.	Ritick Borbora
133.	Anamika Bora
134.	Anamika Gogoi
135.	Anushmita Bharali
136.	Anusmita Bordoloi
137.	Chari Hazarika
138.	Debojoni Bora
139.	Dimpi Borah
140.	Dimpi Kalita



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141.	Dipika Saikia
142.	Dipshika Bora
143.	Gitashree Kalita
144.	Liza Nazir
145.	Manashree Borah
146.	Nabanita Saikia
147.	Panchami Bhuyan
148.	Panchurita Dutta
149.	Parli Dutta
150.	Pikumoni Bora
151.	Priyanka Saikia
152.	Priyanki Sarmah
153.	Rupshree Pahadi
154.	Silphisikha Saikia
155.	Faiza Almas Ahmed
156.	Lakhyajit Kalita
157.	Nabajyoti Bora
158.	Debasish Hatibaruah
159.	Alongkrita Goswami
160.	Kamal Gam
161.	Dhananjay Taye
162.	Geetanjali Bora
163.	Pranjal Bora
164.	Sanjib Bhuyan
165.	Omprakash Shah
166.	Udit Gogoi
167.	Pranjal Bora
168.	Pallav Raj Bora
169.	Sankarjyoti Saikia
170.	Uday Pratim Saikia
171.	Pallabi Bez
172.	Arpita Hazarika
173.	Madhumita Borah

174.	Rajib Bora
175.	Janmoni Taye
176.	Jitu Nath
177.	Abidit Dutta
178.	Aikyata Sharma
179.	Kaustav Moni Gogoi
180.	Dikshita Bora
181.	Swasti Banaspati
182.	Mahananda Payung
183.	Pundarikashya Goswami
184.	Chirojyoti Pamegam
185.	Ananya Thakur
186.	Bisakha Borah
187.	Pujashree Devi
188.	Priyobrat Tamuli
189.	Baspi Gam
190.	Moni Sankar Borah
191.	Binita Kumari Sahu
192.	Nidarshan Nath
193.	Trinayana Sonowal
194.	Rupjyoti Dutta
195.	Tribeni Shyam Gohain
196.	Aditya Nath
197.	Liza Boruah
198.	Akangsha Bhuyan
199.	Kaustav Moni Nath
200.	Mrimoy Borah
201.	Akash Borkotoky
202.	Bhargav Kr. Dutta
203.	Mridupawan Das
204.	Jadumoni Das


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Individual Departments of the College with Required Practical Work in the Curriculum are Equipped with Laboratories for Hands-on Learning Oriented towards Problem-solving



Students of Dept of Chemistry Engaged in the Laboratory


(Dr. P.K. Dutta)
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Students of Dept of Zoology engaged in the Laboratory [Page 1]


(Dr. P.K. Dutta)
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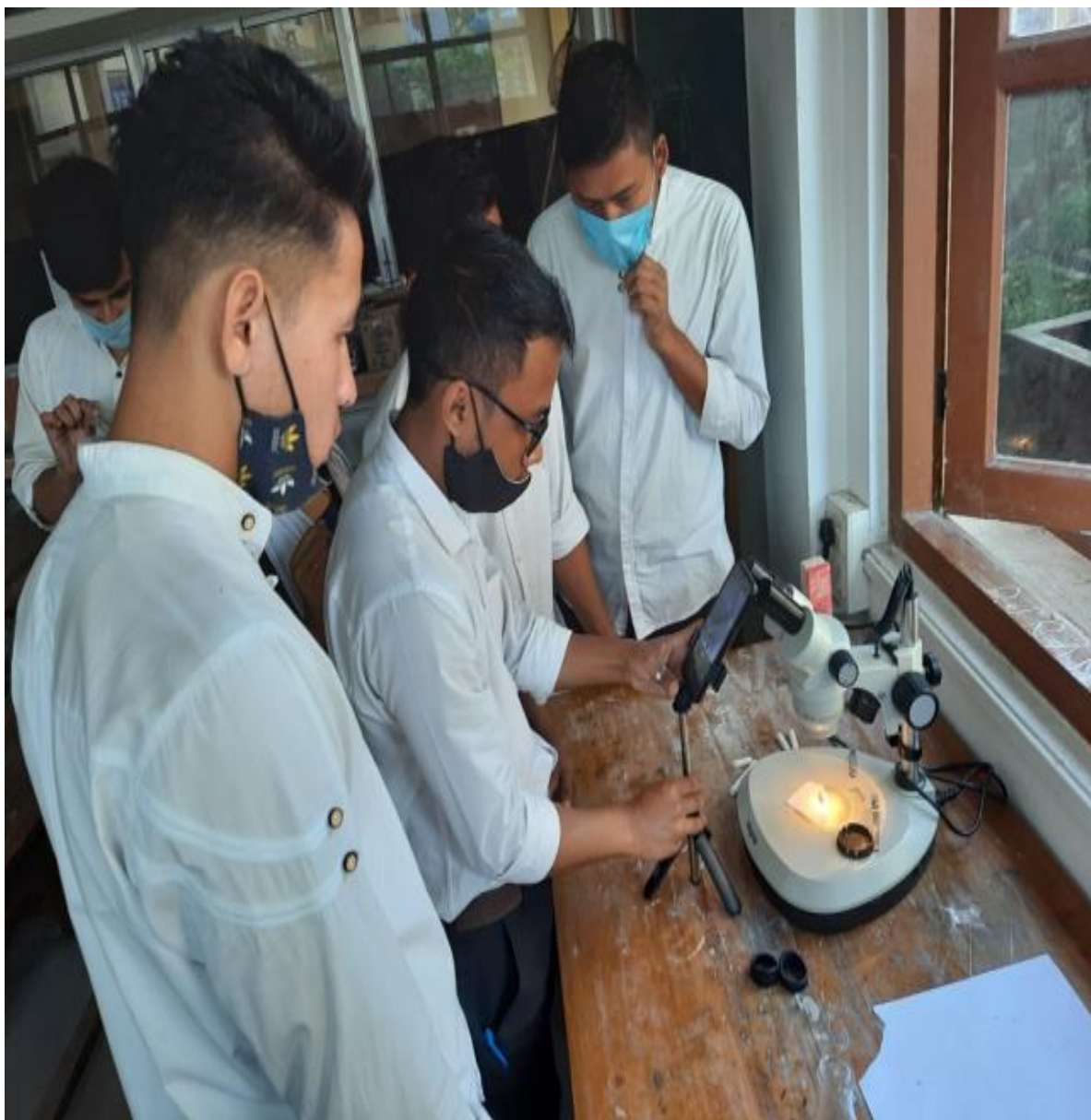


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Students of Dept of Zoology engaged in the Laboratory [Page 2]


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Students of Dept of Zoology engaged in the Laboratory [Page 3]


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Students of Dept of Zoology engaged in the Laboratory [Page 4]


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Students of Dept of Zoology engaged in the Laboratory [Page 5]


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Students of Dept of Zoology engaged in the Laboratory [Page 6]


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Focus on Experiential Hands-on Learning Makes the Learning Process More Enjoyable, Immersive and Participative, while Orienting Them towards Problem-solving based Education



Students working in the Institutional Bio-Tech Hub [Page 1]


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Focus on Experiential Hands-on Learning Makes the Learning Process More Enjoyable, Immersive and Participative, while Orienting Them towards Problem-solving based Education



Students working in the Institutional Bio-Tech Hub [Page 2]

Focus on Experiential Hands-on Learning Makes the Learning Process More Enjoyable,


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Immersive and Participative, while Orienting Them towards Problem-solving based Education



Bahona, Assam, India
R65Q+WXX, Bahona, Assam 785101, India
Lat 26.80967°
Long 94.239905°

Students working in the Institutional Bio-Tech Hub [Page 3]


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Students working in the Institutional Bio-Tech Hub [Page 4]


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Students Involved in Mushroom Culture [Page 1]


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Students Involved in Mushroom Culture [Page 2]


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Students Involved in Mushroom Culture [Page 4]


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Students in a Training Programme of Blood Pressure Measurement [Page 1]


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Students in a Training Programme of Blood Pressure Measurement [Page 2]


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Vol.: 1, Issue: 1, Year: 2019, Month: March

BOLETUS



জ্ঞান-বিজ্ঞান বিদ্যুৎ

News bulletin of UGC-COC Mushroom Culture Program, Botany Department, Bahona College, Jorhat



UGC sponsored COC on Mushroom Culture was initiated from April, 2014 - March, 2019 in the Botany Department, Bahona College at the undergraduate level to ensure that graduates who pass out after completing this course will have knowledge, skill and aptitude for gainful employment in the wage sector in general and self employment in particular. This course was successfully carried out in the Botany Department and necessary teaching and awareness facilities regarding the various techniques of mushroom cultivation was provided theoretically as well as practically by the faculty members.

From the desk of Principal



Dr. Prasanna Dutta,
Principal,
Bahona College,
Jorhat

At the very outset, I would like to thank the members of Botany Department for successfully carrying out this UGC sponsored COC on Mushroom Culture. This course will add on skill to the students which will further enhance their employability. I wish good luck and also expect such type of activities from the Department which will help the students in particular.

From the desk of HOD



Mrs Protiva Borah,
Head,
Department of Botany,
Bahona College,
Jorhat

UGC sponsored COC on Mushroom Culture was initiated from 2014-2019 in the Botany Department with an aim to enhance the skill among the students in the undergraduate level. I hope this program has benefitted the students greatly and it will open up new opportunities for the students in future.

From the desk of Coordinator



Dr. Sangeeta Das,
Assistant Professor,
Department of Botany,
Bahona College, Jorhat

It is my immense pleasure for having this opportunity to disseminate knowledge as well as skill regarding mushroom cultivation techniques among the students as program coordinator. This bulletin 'Boletus' is an effort to showcase the different activities which were carried out throughout these years (2014-2019) under this UGC sponsored Career Oriented Course (COC) on Mushroom Culture.

MUSHROOM FACTS



Hieroglyphics found in Egyptian tombs showed pharaohs considered mushrooms "the plant of immortality".



Truffle mushrooms are one of the most expensive edible mushrooms in the world which cost between \$800 and \$1500 a pound.



The English believed that mushrooms had to be gathered under a full moon to be edible.



A mushroom has almost as much potassium as a small banana.

MUSHROOM MYTHS

- Poisonous mushrooms dissolve after being cooked.
- Mushrooms eaten by cats, dogs, and monkeys are always safe to eat.
- Poisonous mushrooms will lose their poison when cooked with onions.
- Mushrooms having a fuzzy mold are safe to eat.



News bulletin of UGC-COC Mushroom Culture Program, Botany Department, Bahona College, Jorhat

Page 1

Newsletter of UGC-COC Mushroom Culture Programme at the College [Page 1]

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Newsletter of UGC-COC Mushroom Culture Programme at the College [Page 2]

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OUTREACH PROGRAMS CONDUCTED

Sl. No.	Name of the Programs	Duration	No. of Participants	Level of participants
1	Outreach Students' Awareness Program on National Science Day at Kalyani High School, Jorhat	1 day, Feb. 28, 2019	98	School students
2	Outreach Classroom Teaching Program at Charigaon Girl's High School, Jorhat	1 day, May 07, 2018	20	School students

PROGRAMS CONDUCTED

Sl. No.	Name of the Programs	Duration	No. of Participants	Level of participants
1	Hands on Training Program on Biological Databases and Sequence analysis	1 day, March 02, 2019	30	B.Sc. Students
2	Training program on Mushroom Cultivation	2 days, Jan.24 &25, 2019	12	B.Sc. Students
3	Training program on Bioinstrumentation and Mushroom Culture	1 day, April 28, 2018	20	School students
4	Daylong workshop on Bioinformatics	1 day, March 16, 2018	44	B.Sc. Students
5	Hands on students program on oyster mushroom cultivation	2 days, March, 22 &23, 2018	24	B.Sc. Students
6	Workshop on Mushroom Cultivation	2 days, Nov. 27 &28, 2017	67	Teachers and B.Sc. Students
7	Hands on Training Program on Mushroom Cultivation	2 days, Nov.25 &26, 2016	20	B.Sc. Students

News bulletin of UGC-COC Mushroom Culture Program, Botany Department, Bahona College, Jorhat

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Newsletter of UGC-COC Mushroom Culture Programme at the College [Page 3]


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List of students awarded with merit certificates under UGC-COC Mushroom Culture Program

Sl. No.	Name of the student	Grade	Sl. No.	Name of the student	Grade
2014-15			2017-18		
1	KAMALA KANTA TAID	A	1	TRIDIBJYOTI DUTTA	A
2	RUPAK SARMA	A	2	BABLI PATIR	A
3	KHUSBOO BEGUM	B	3	ANUSMITA DUTTA	A
4	HIROK JYOTI DOEY	B	4	JATINDRA NATH	A
5	PAROSH BORA	B	5	PINKU DUTTA	B
6	MUKUT KALITA	A	6	MOHIT KR. SINGH	A
2015-16			7	RUBI NATH	A
1	SANGITA HAZARIKA	A	8	TULAN PAYENG	B
2	BOHNIMAN BORDOLOI	A	9	JUTIKA SAIKIA	A
3	NIMISHA BORUAH	A	10	BISHAKHA HAZARIKA	A
4	RUBI HAZARIKA	A	11	GEETASHREE BORAH	B
5	ANURAG KUSHIK GOSWAMI	A	12	DEEPIKA KALITA	B
6	BOBITA BHUYAN	A	13	ARPITA BORA	B
7	BHRIGUPATI HAZARIKA	A	14	JAHNABI DUTTA	B
8	PORISMITA HAZARIKA	A	15	SUPRIYA SARMAH	A
9	MALLIKA BARUAH	A	16	SUSHMITA HAZARIKA	A
10	SHASHWATI HAZARIKA	B	17	PUJA GOGOI	A
11	PUBALI KONWAR	A	18	AMLAN JYOTI SAIKIA	B
12	JYOTSHNA SAIKIA	B	19	PANKAJ SAIKIA	A
13	KAJAL GUPTA	A	20	PARTHA PROTIM NEOG	A
14	ANKURAN BORAH	A	21	PORISMITA BHARALI	A
15	SUDIPTA KIAMAL DAS	B	22	SHILPIKA DUTTA	A
16	VIBHA DEVI	A	23	ZAKARIA AHMED	B
17	RUNJUN PEGU	A	2018-19		
18	SANGITA BHUYAN	A	1	BIDYUT PHUKON	B
19	MADHURJYA MADHAE MORANG	A	2	DEBASHREE BORUAH	B
2016-17			3	SMRITI SHYAMOLEE BORA	A
1	PARIKSHIT DUTTA	A	4	NAYANIKI DUTTA	A
2	DIPANKAR NATH	A	5	SANGITA BORUAH	B
3	PRIYANSHU JYOTI DUTTA	A	6	ANGELIKA HATIBORUAH	B
4	WASHIMA BEGUM	A	7	PRIYANKA KHANIKAR	B
5	JOYSHREE DUTTA	A	8	ANUSMA BARUAH	B
6	ASHMITA BHUYAN	A	9	SUSHMITA DUTTA	B
7	TRISHNA MONI DAS	A	10	PRINCESS RANI DAS	B
8	SINU BORAH	A	11	BARSHA RANI BORAH	B
9	JAHNABI DAS	A	12	PAPORI BORAH	B
10	SUNITA BHAGAT	A	13	TAPASHI SAIKIA	B
11	SANKARJYOTI BORA	A			
12	AMLAN JYOTI BARUAH	B			
13	JYOTI PRASAD PATIR	B			
14	GAYATRI PEGU	A			
15	PRARTHANA KASHYAP	A			
16	DEBOJANI NATH	A			
17	BEDANTA GOSWAMI	B			
18	ANKITA BARUAH	A			

News bulletin of UGC-COC Mushroom Culture Program, Botany Department, Bahona College, Jorhat

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Newsletter of UGC-COC Mushroom Culture Programme at the College [Page 4]

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**A Teaching-Learning Method Based on Problem-Solving Orient Students towards
Entrepreneurial Activities**



Piyush Bharali, a Student of Dept of Zoology has Started his Own Art-Based Entrepreneurship
[Page 1]


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Piyush Bharali, a Student of Dept of Zoology has Started his Own Art-Based Entrepreneurship
[Page 2]


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A Teaching-Learning Method Based on Problem-Solving Orient Students towards Entrepreneurial Activities



Bhargav Bora, a Student of Dept of Zoology has Started his Own Business of Pets and Exotic Fishes


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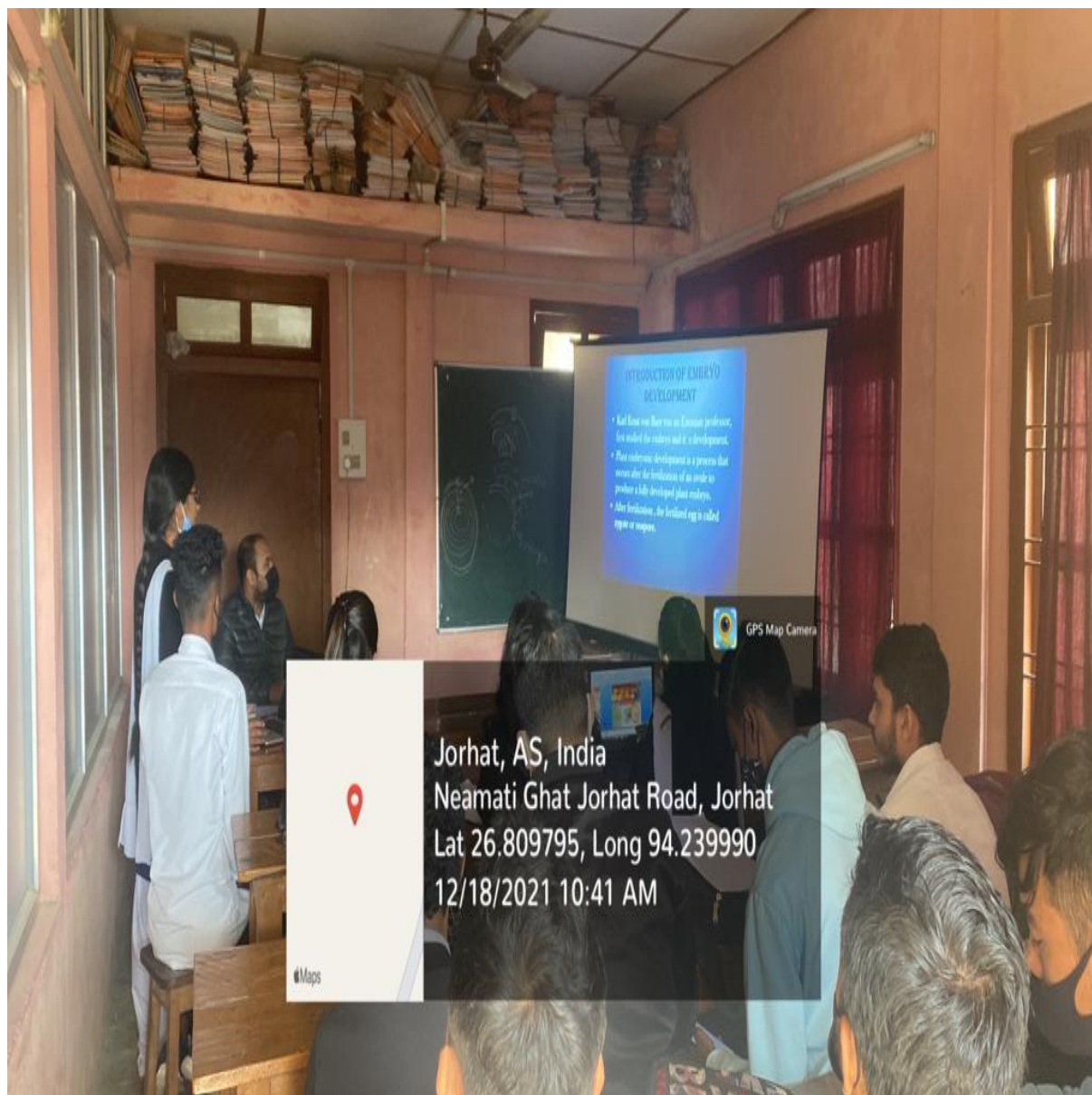


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Seminar for Students Organised by Dept of Botany [Page 1]


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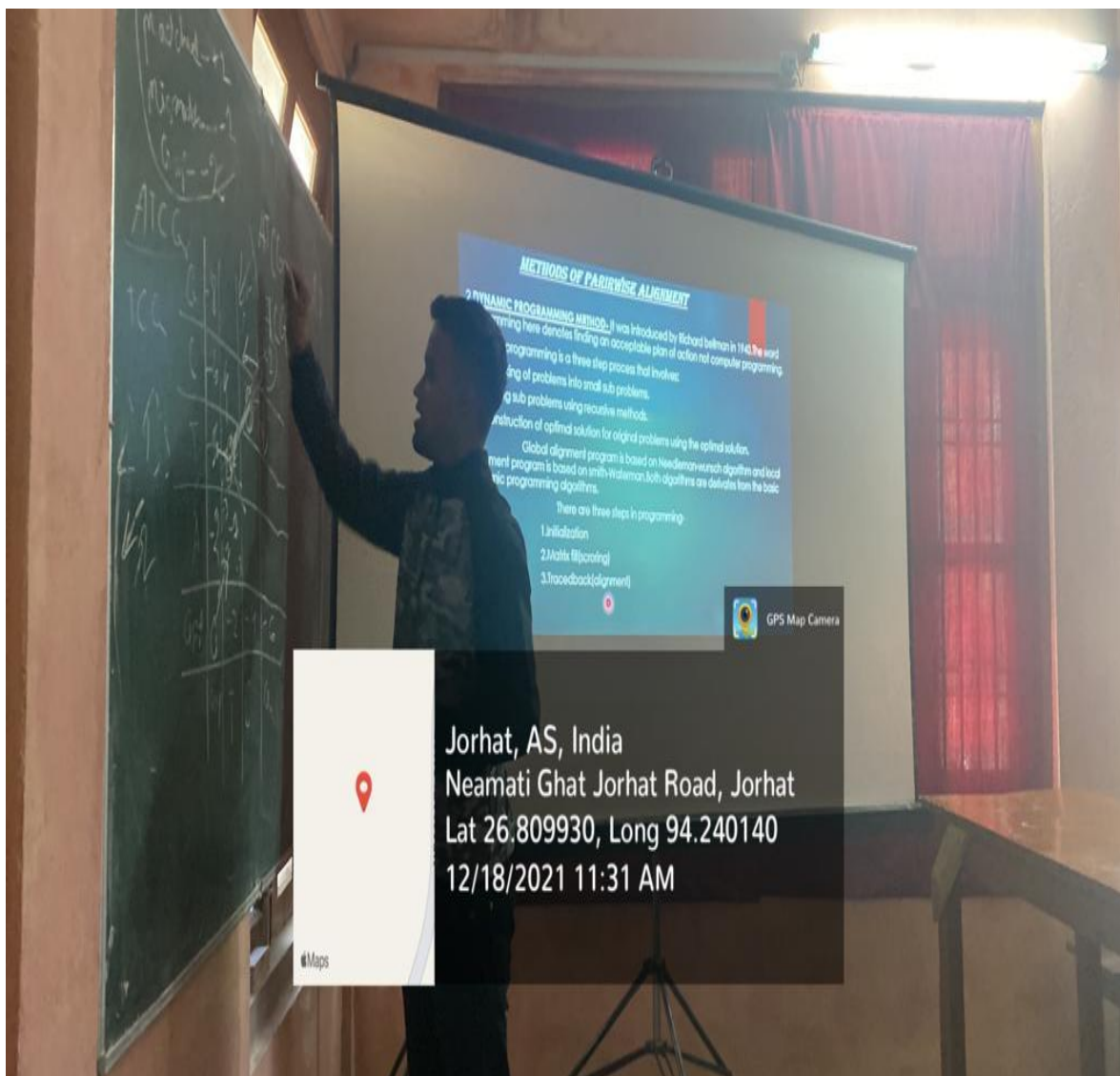



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Seminar for Students Organised by Dept of Botany [Page 2]


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Seminar for Students Organised by Dept of Botany [Page 3]


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Seminar for Students Organised by Dept of Botany [Page 4]


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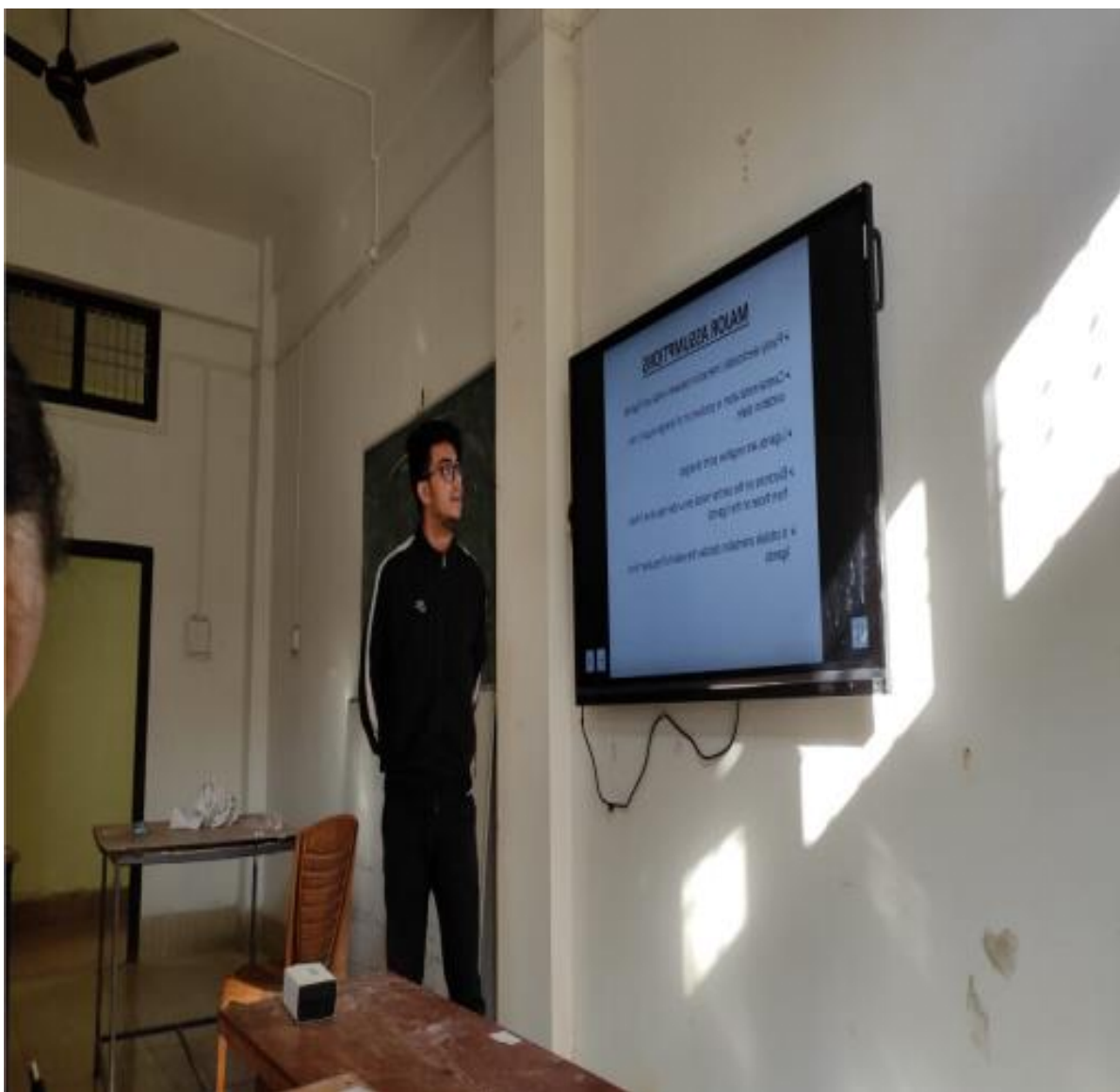


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Seminar for Students Organised by Dept of Chemistry [Page 1]


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Seminar for Students Organised by Dept of Chemistry [Page 2]


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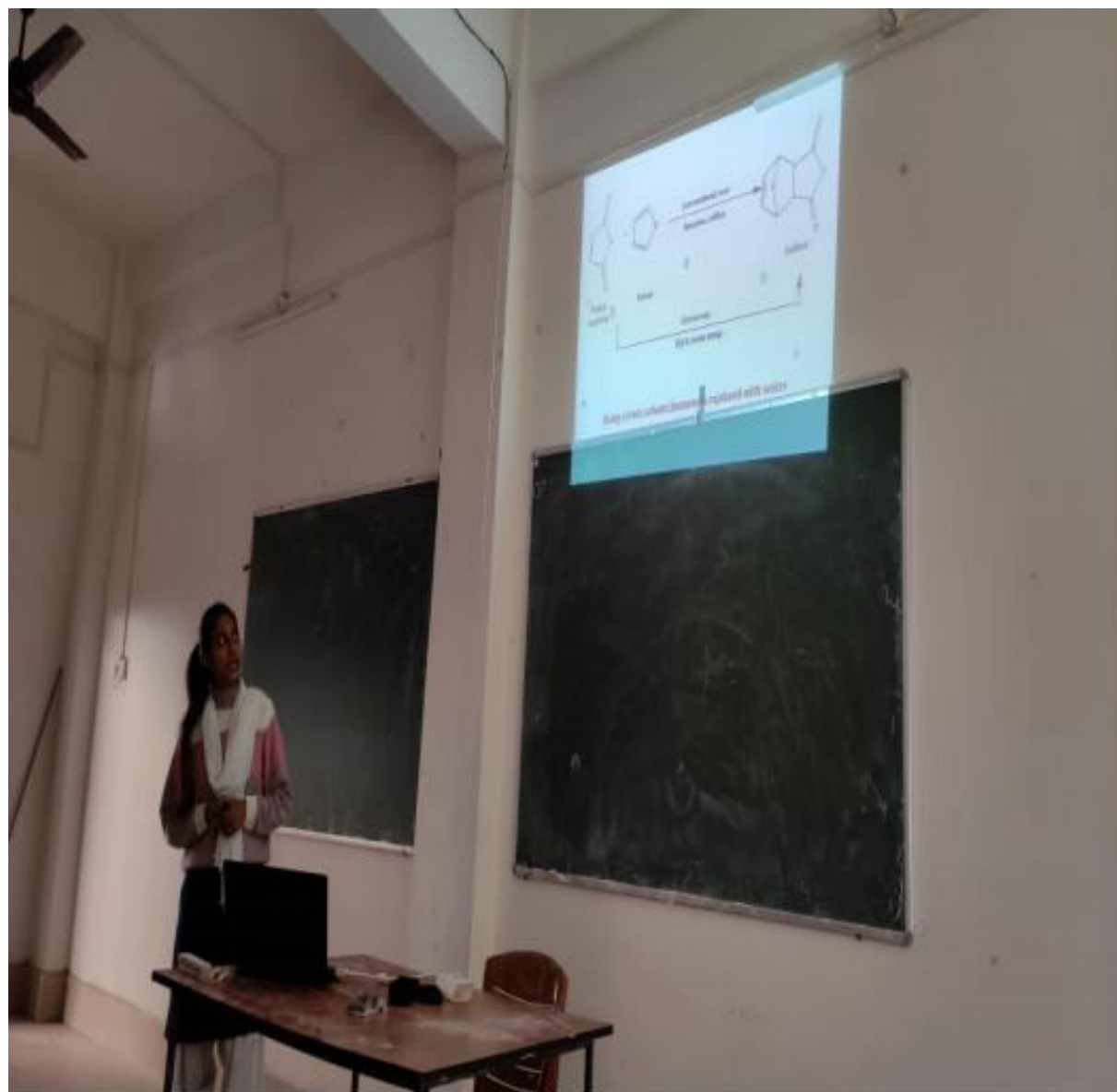


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Seminar for Students Organised by Dept of Chemistry [Page 3]


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Seminar for Students Organised by Dept of Economics [Page 2]


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Seminar for Students Organised by Dept of Economics [Page 3]


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Seminar for Students Organised by Dept of Economics [Page 4]


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Seminar for Students Organised by Dept of Physics [Page 1]


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Seminar for Students Organised by Dept of Physics [Page 2]


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Seminar for Students Organised by Dept of Zoology [Page 1]


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Seminar for Students Organised by Dept of Zoology [Page 2]


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Departmental Museums Allow a More Immersive Learning Experience for both Advanced and Slow Learners



Museum of Dept of History


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Museum of Dept of Zoology [Page 1]


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Museum of Dept of Zoology [Page 2]


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Museum of Dept of Zoology [Page 3]


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Museum of Dept of Zoology [Page 4]


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Museum of Dept of Zoology [Page 5]


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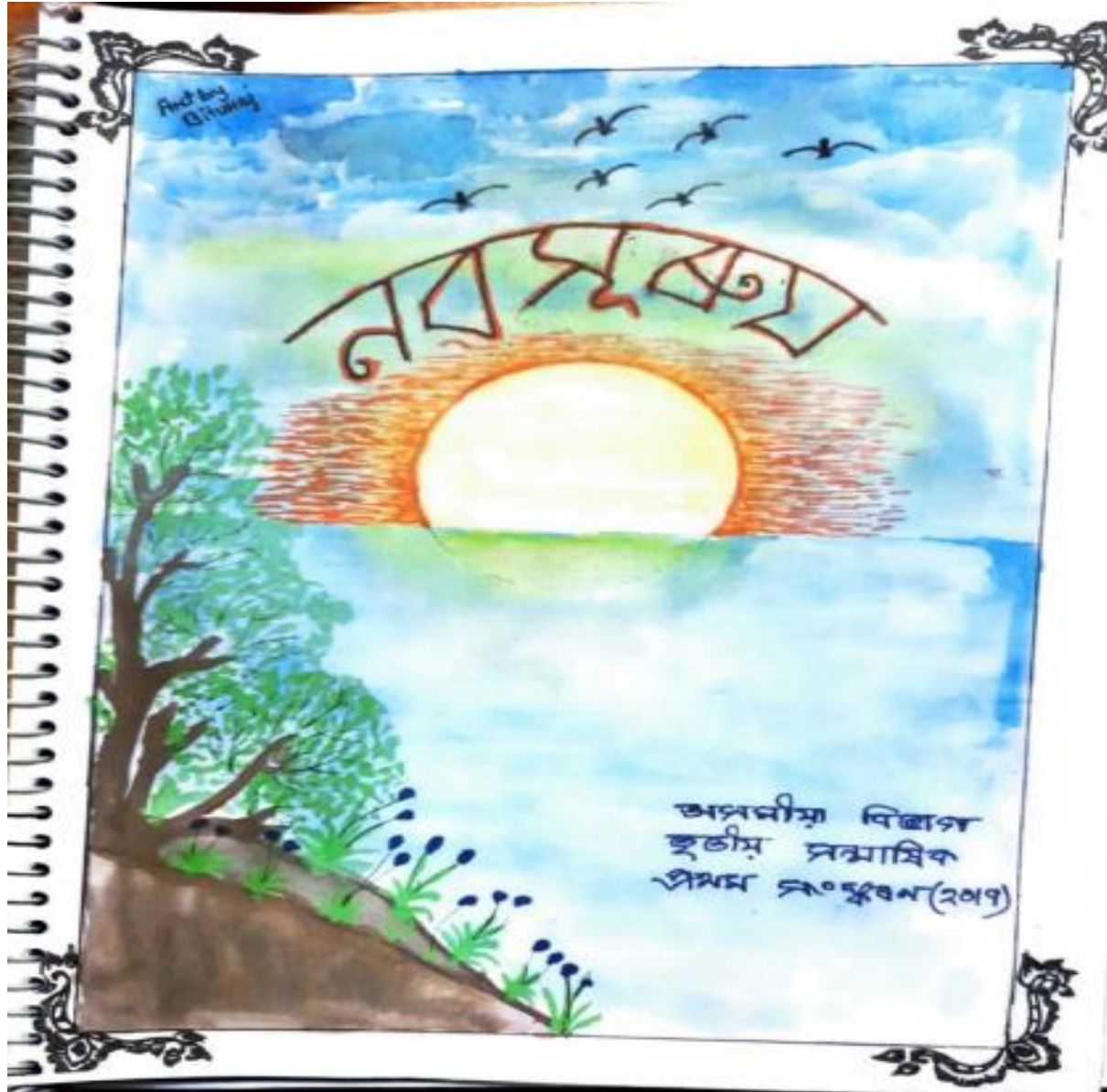



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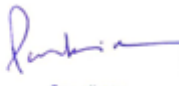
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২/ অঙ্কনঃ মানব	—	কৃষ্ণি দত্ত (৬)
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৯/ অ' প্রেমঃ প্রবন্ধঃ অ	—	তপন শর্কীয় (৩৭)
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১৬/ ইন্দ্রাঃ প্রবন্ধঃ অ	—	মেঘনা গাতি (৪৪)
১৭/ অমলক	—	অজিত বসু (৪৫)
১৮/ অমলকঃ প্রবন্ধঃ অ	—	অজিত বসু (৪৬)

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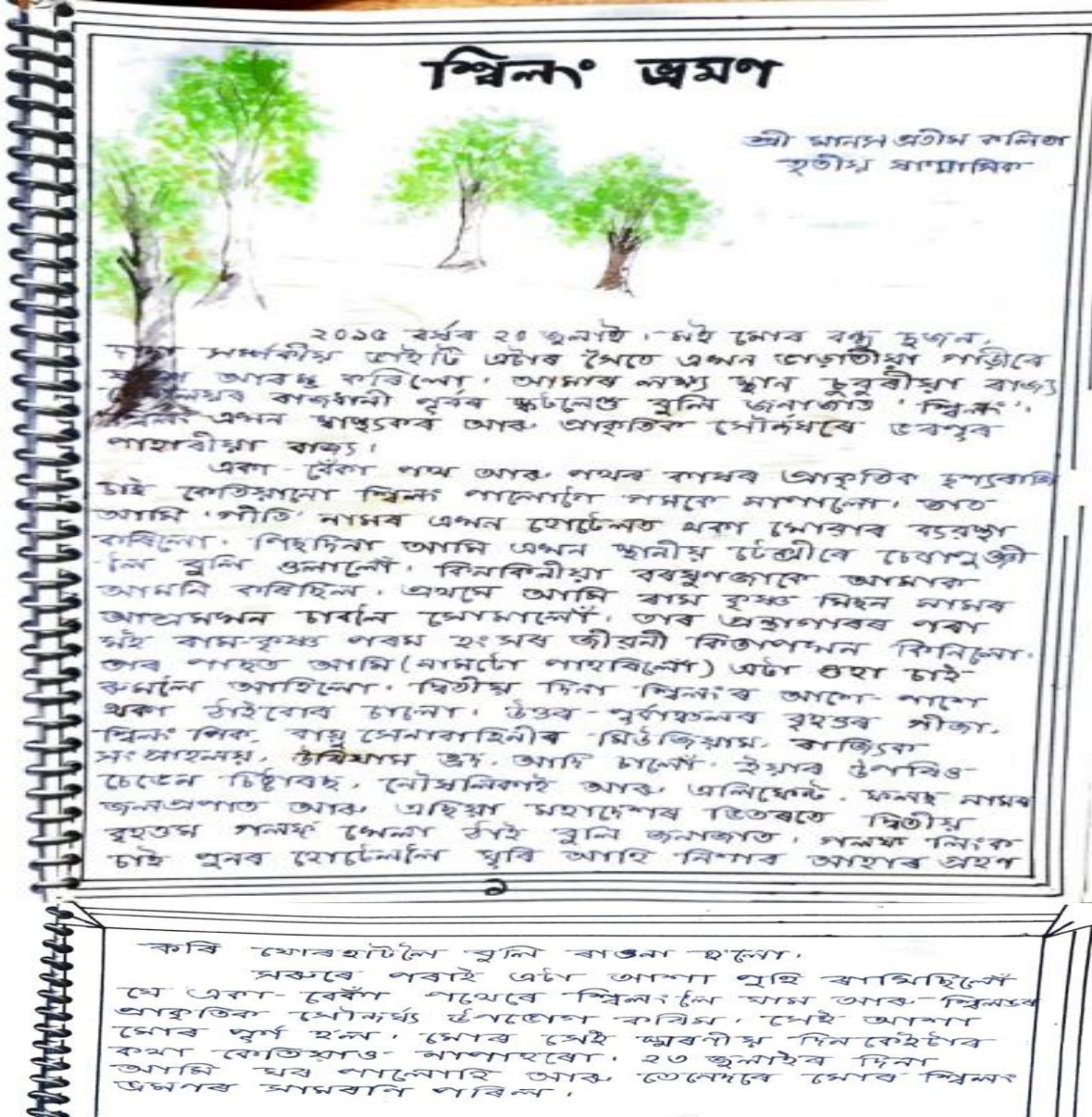


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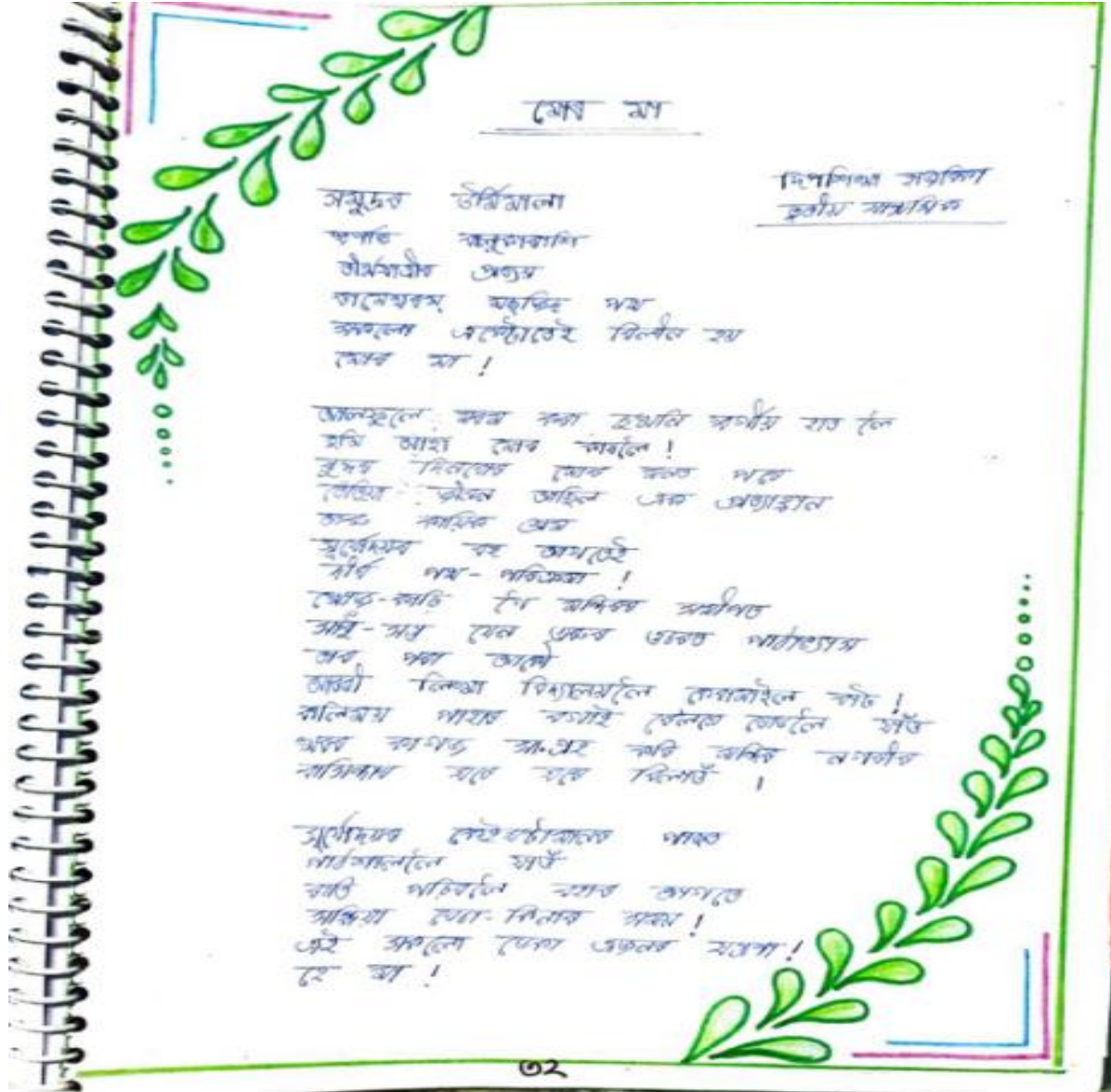


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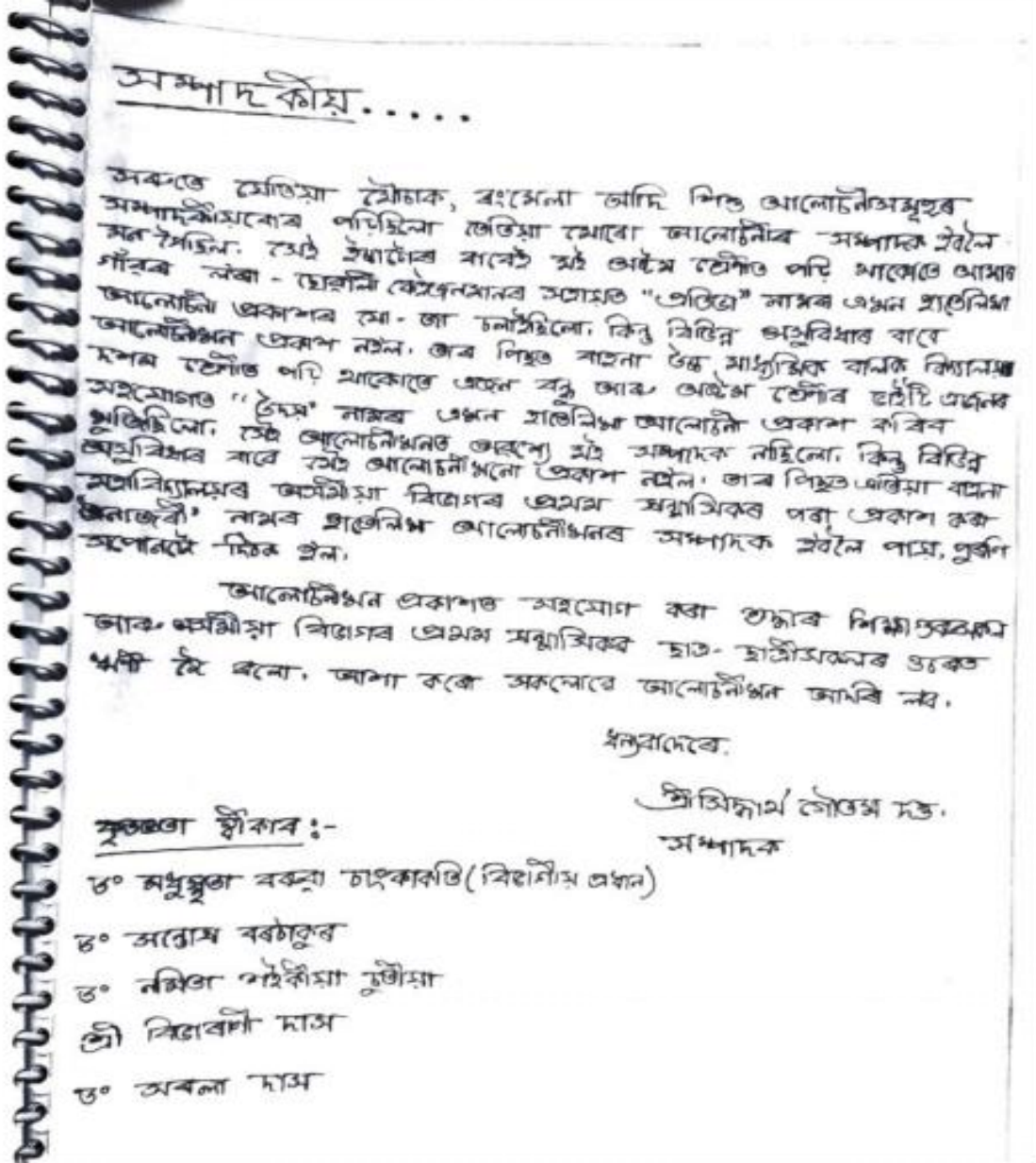


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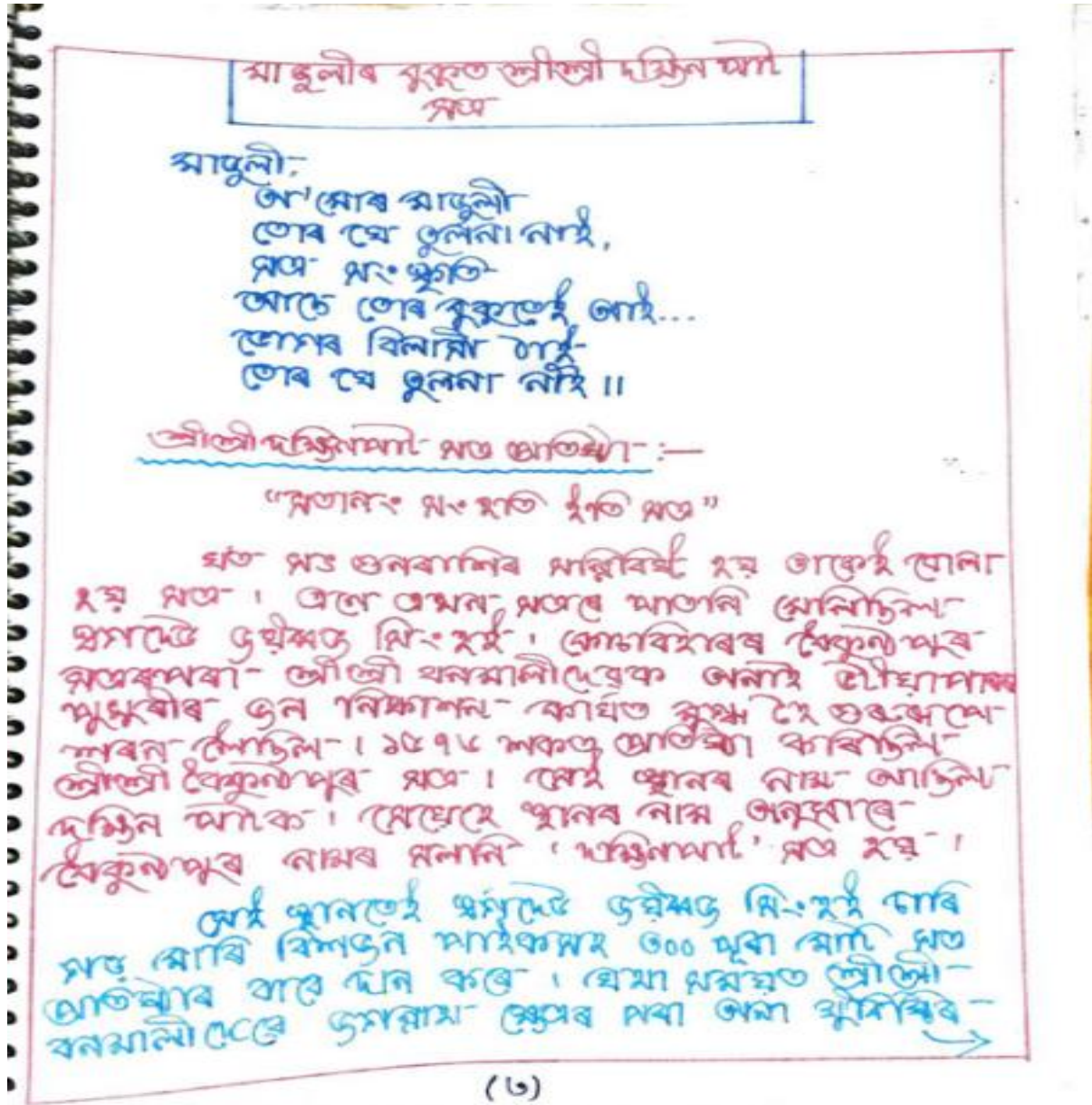


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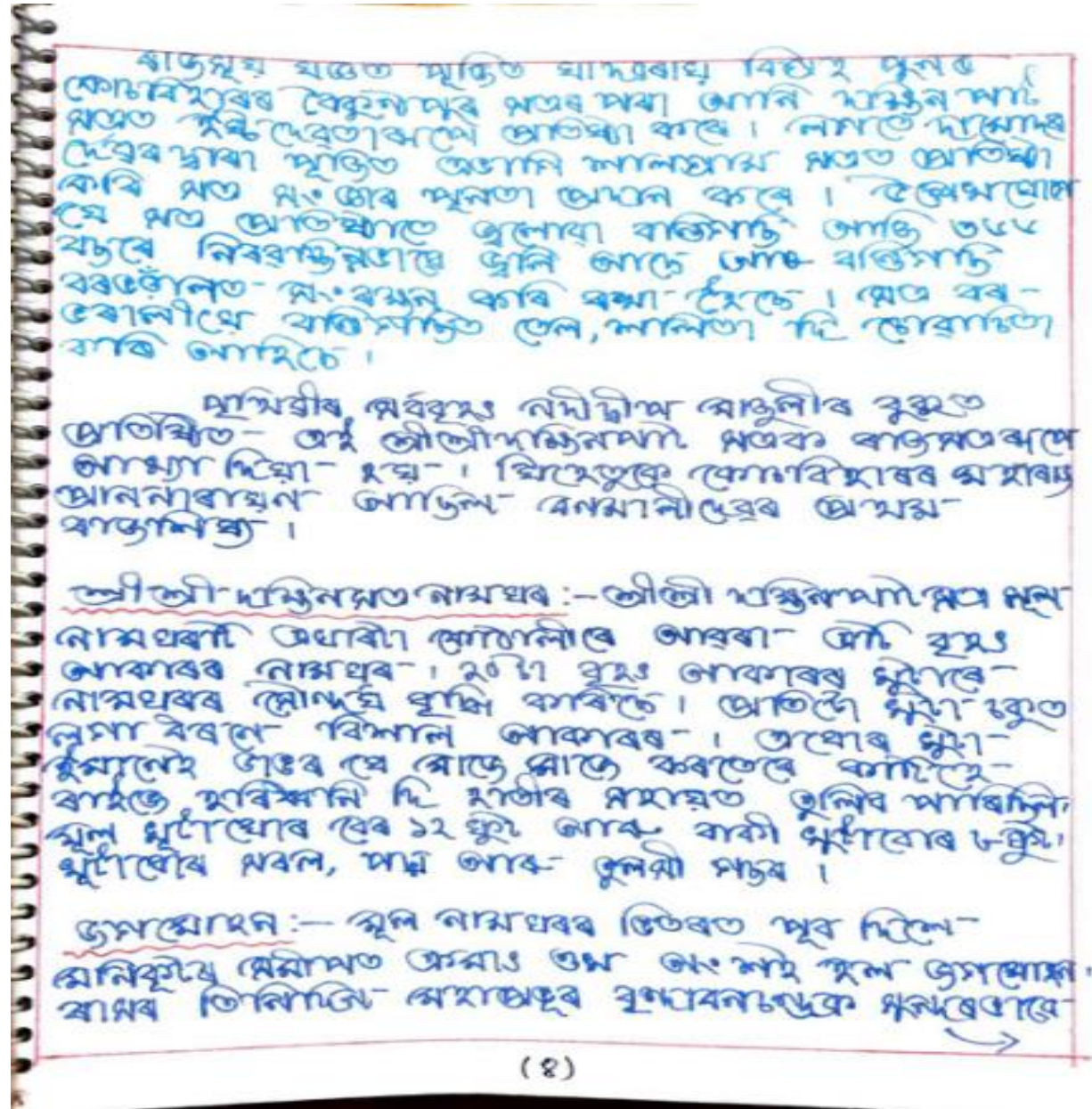


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নিৰ্মিত মণ্ডপত দ্ৰাতিবোৰা কৰি ঘোম-ঘজোদি কৰি পূজা
ওজন কৰা হয় তেঁও জমাজোহল মূৰত।

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মত্ৰ নিম্না দিয়া দৰ্শক কামোৰ তিনিমিটাৰ, যোন-ৰাম
 মণ্ডোৰা বাপুসুখী-বাপুসুখী হাট, ২জীথনী, কুল-
 ধাটী, জোৰাবাৰী, অসমীয়া সঙ্গীত, জোৰাবাৰী সঙ্গীত-
 দেৱেশ্বৰদেৱ-দুই দান বাৰা জয়ৰ ফালি, ৫০০খন
 মণ্ডীমণ্ডীয়া মুখি, কুলমণ্ডীয়া মুখি, দুই
 বিহুৰ জামুৰ-মীয়া সৰুৰ অৰ্থ বৰঙালত
 মন বহুত কাৰি বহা হৈছে।

শ্ৰীজীৱন্তনমোহনৰ ক্ৰীদাৰ ভেদ:-

১/ জামুৰ-:— জামুৰ বাপু মুখি তিনিমিটাৰ
 জামুৰ সৰুৰ জামুৰ মুখি তিনিমিটাৰ বিমুখ
 ২/ জামুৰ জামুৰ জামুৰ- তিনিমিটাৰ
 জামুৰ জামুৰ জামুৰ- কাৰা ২৫।

৩/ জামুৰ বা কামুৰ।

৪/ কুলমী মুখি।

৫/ শ্ৰীজীৱন্তনমোহন মুখি।

৬/ মিল মুখি।

৭/ বিমু।

নাম:- শ্ৰীমতী বৰমা বানী দত্ত।
 শ্ৰেণী:- জামুৰ জামুৰ জামুৰ।
 বোলন:- ৬ ৫৫

(৬)

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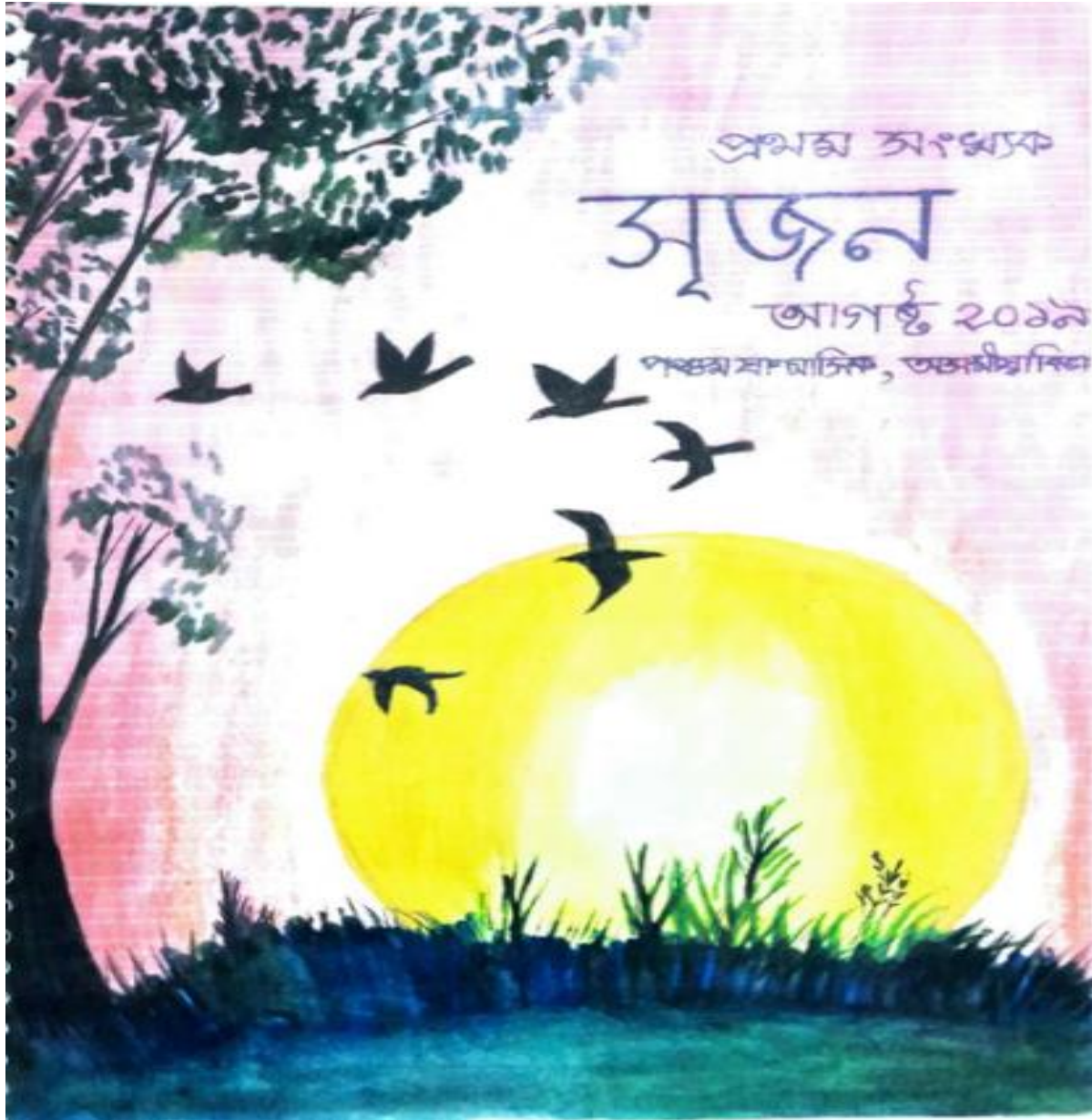


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ক্রমিক নং	কবিতা	লিখোঁজৰ নাম
১	যে নাবী নাম কৰা আত্মব বচিব বিতৰ্কিত	চিনাক্ত দত্ত
২	প্ৰতিব লিখন	পৰিষ্কাৰ শোণিত
৩	জীৱন হুমা	দ্বিতীয় আই.এ.এ.
৪	বৰষা	জিতেন্দ্ৰ নাথ
৫	অন্তৰ লক্ষ্য	চন্দ্ৰমা আই.এ.এ.
৬	জীৱন সৌন্দৰ্য হুমা	বিদ্যা কল্যাণ
৭	বচিব বুকুৰ বৰষা	জ্যোতিকা দত্ত
৮	জীৱন	জ্যোতিকা বৰা
৯	জন্মৰ ওচৰ জিব	জিল্পাশিমা বৰা
১০	এজাক বৰষা	সুনন্দা নেতা
১১	স্বপ্ন	অজিতা হাজৰিকা
১২	নবী হুমা অপেক্ষা	সুনন্দা বৰা
১৩	পৰা, পৰা	নন্দিতা হাজৰিকা

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୧.	* ସିହାରିଲୁମ୍ବର * ୧୮.୨.୯୫. ୧୫. ଅଗସ୍ତ୍ୟ ଶାସନ	ଡିଜିଟାଲିଜେସନ ନାହିଁ .
୨.	ସୁଦ୍ଧ ଉତ୍କଳ ଗାନ୍ଧୀ ପିଣ୍ଡୁ ଗାନ୍ଧୀ	ଅଭିମତାତ୍ମକ ନାହିଁ .
୩.	ଅବଲୋକ	ଡିଜିଟାଲିଜେସନ ନାହିଁ .
୪.	ଅଧ୍ୟାତ୍ମିକ ଲିପି ଗ୍ରନ୍ଥ ବିଶାଳ ଗ୍ରନ୍ଥ ଅଭିମତାତ୍ମକ ଗ୍ରନ୍ଥ	ଡିଜିଟାଲିଜେସନ ନାହିଁ .
୫.	ଅଭିମତାତ୍ମକ ଗ୍ରନ୍ଥଗୁଡ଼ିକ ଗାନ୍ଧୀଜୀ ଗ୍ରନ୍ଥ ଗ୍ରନ୍ଥ ଗାନ୍ଧୀଜୀ	ଅଭିମତାତ୍ମକ ଗ୍ରନ୍ଥଗୁଡ଼ିକ
୬.	ଅଭିମତାତ୍ମକ, ଗାନ୍ଧୀଜୀ ଅଭିମତାତ୍ମକ ଗ୍ରନ୍ଥ ଗ୍ରନ୍ଥ ଗାନ୍ଧୀଜୀ ଗ୍ରନ୍ଥଗୁଡ଼ିକ	ଡିଜିଟାଲିଜେସନ ନାହିଁ .
୭.	ଅଭିମତାତ୍ମକ ଗ୍ରନ୍ଥଗୁଡ଼ିକ ଅଭିମତାତ୍ମକ ଗ୍ରନ୍ଥଗୁଡ଼ିକ ଗ୍ରନ୍ଥ	ଡିଜିଟାଲିଜେସନ ନାହିଁ .
୮.	ଗାନ୍ଧୀଜୀ ଗ୍ରନ୍ଥଗୁଡ଼ିକ ଗାନ୍ଧୀଜୀ ଗ୍ରନ୍ଥଗୁଡ଼ିକ ଗ୍ରନ୍ଥ	ଡିଜିଟାଲିଜେସନ ନାହିଁ .
୯.	ଗାନ୍ଧୀଜୀ ଗ୍ରନ୍ଥଗୁଡ଼ିକ ଗାନ୍ଧୀଜୀ ଗ୍ରନ୍ଥଗୁଡ଼ିକ ଗ୍ରନ୍ଥ	ଡିଜିଟାଲିଜେସନ ନାହିଁ .
୧୦.	ଗାନ୍ଧୀଜୀ ଗ୍ରନ୍ଥଗୁଡ଼ିକ ଗାନ୍ଧୀଜୀ ଗ୍ରନ୍ଥଗୁଡ଼ିକ ଗ୍ରନ୍ଥ	ଡିଜିଟାଲିଜେସନ ନାହିଁ .

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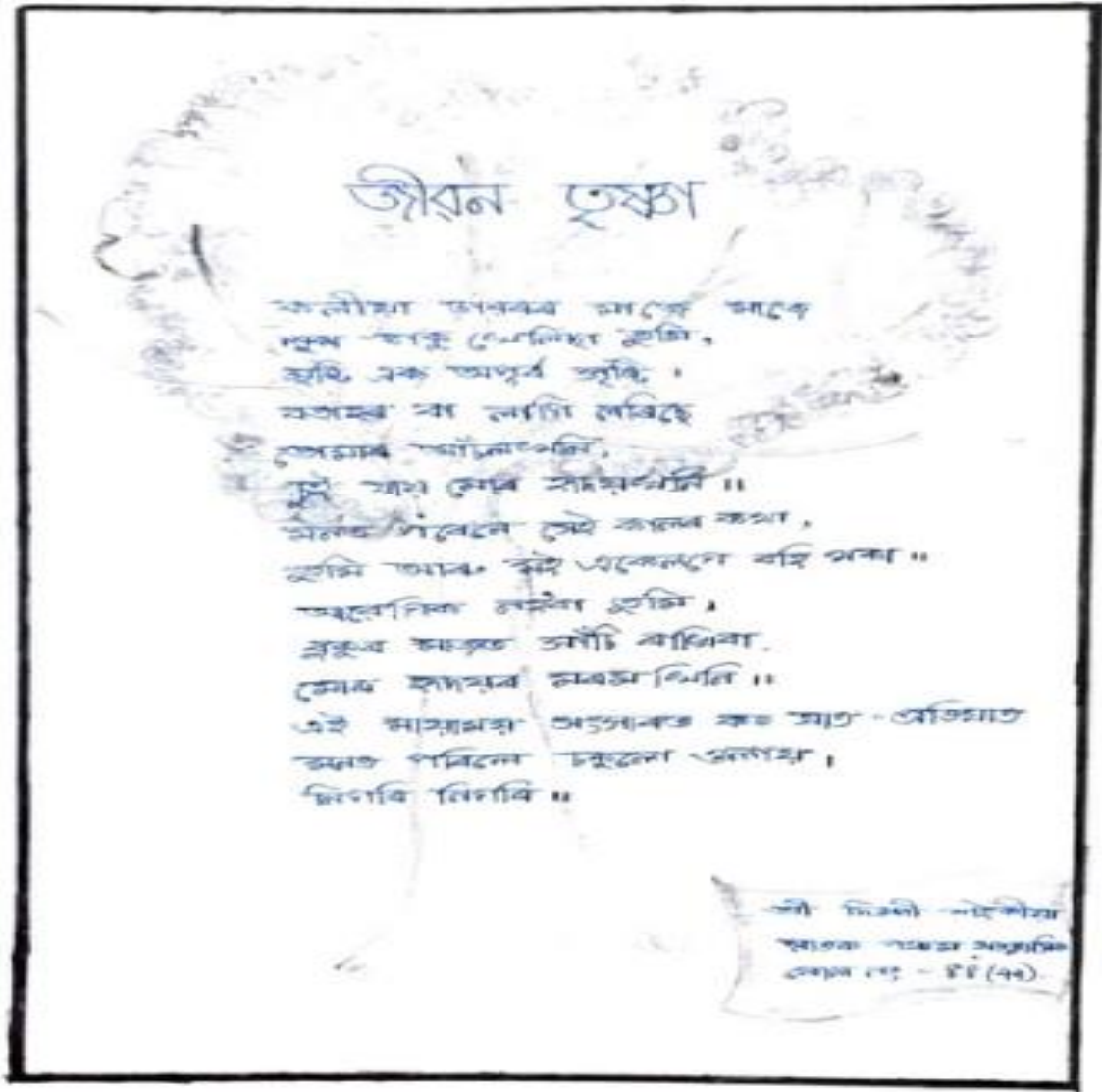


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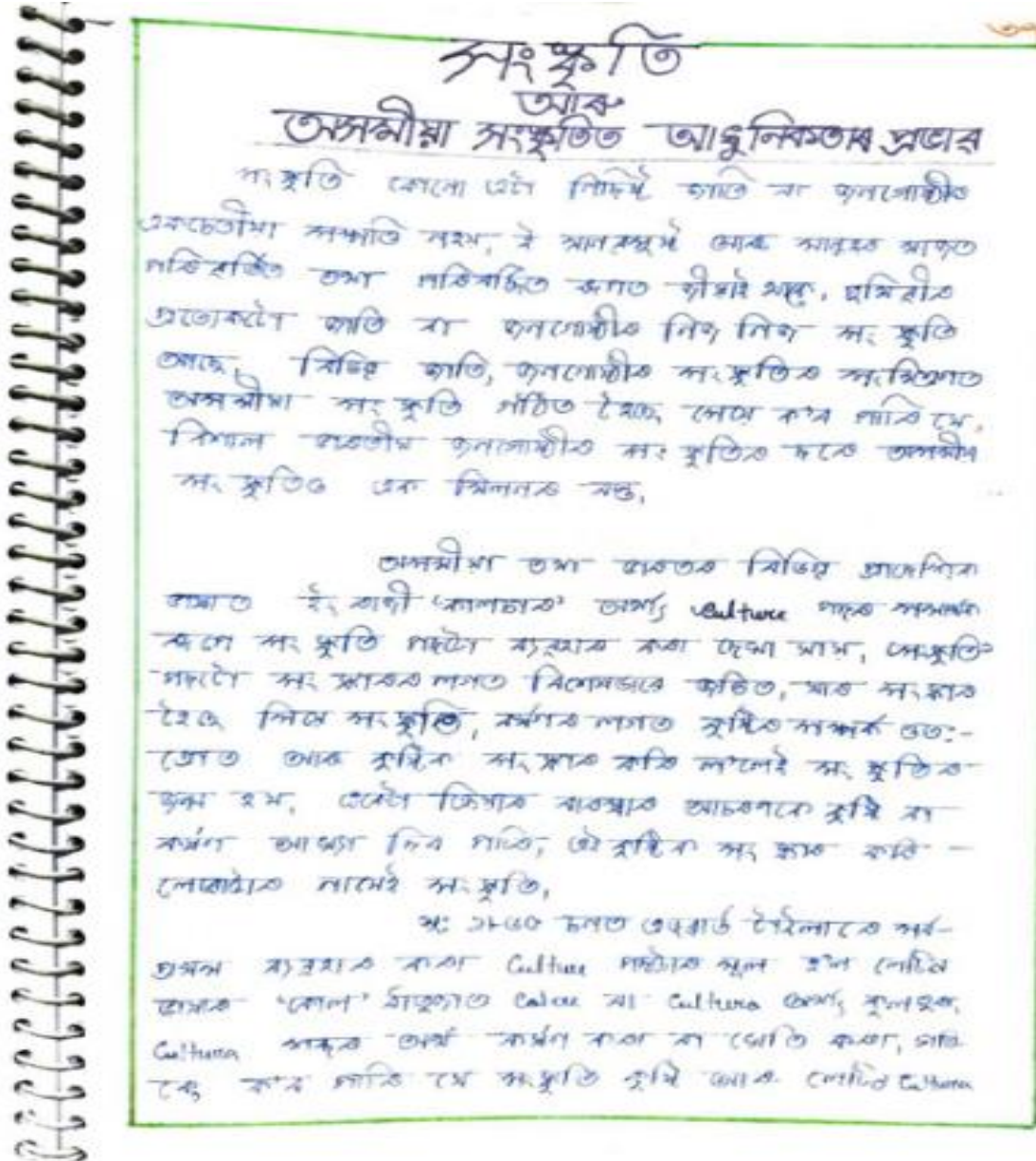
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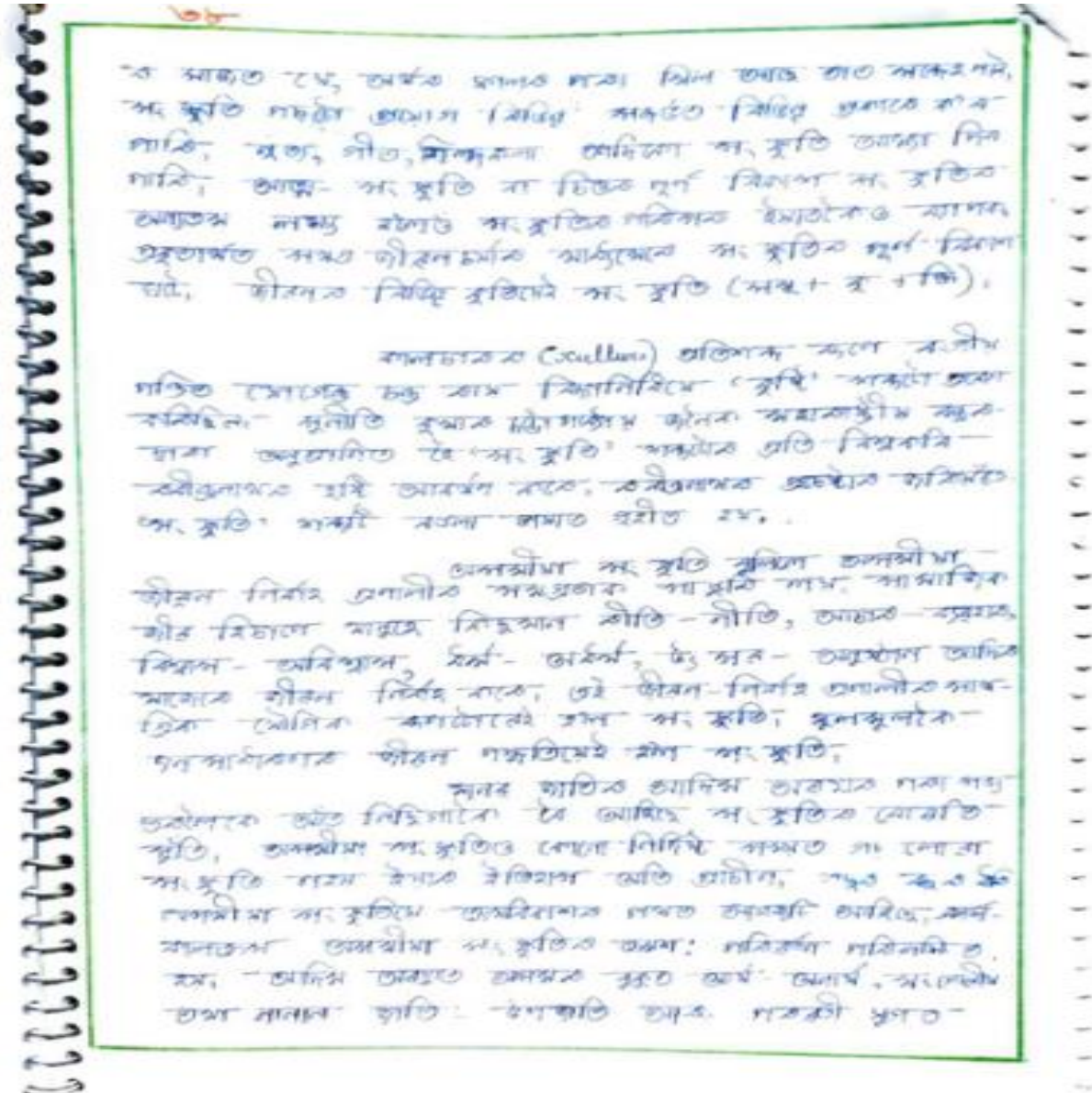


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Wall Magazine of Dept of Chemistry [Page 1]


(Dr. P.K. Dutta)
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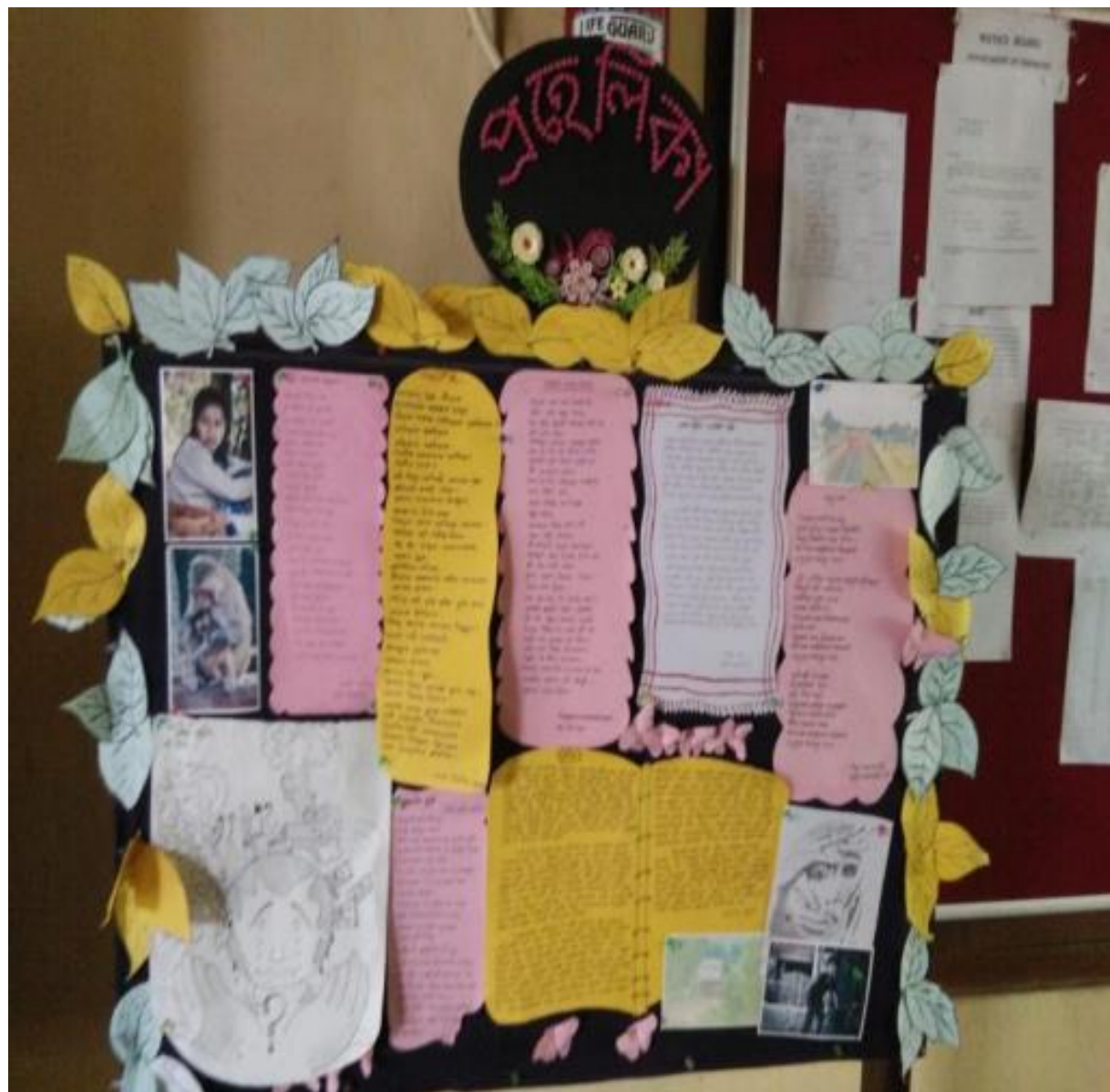


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Wall Magazine of Dept of Chemistry [Page 2]


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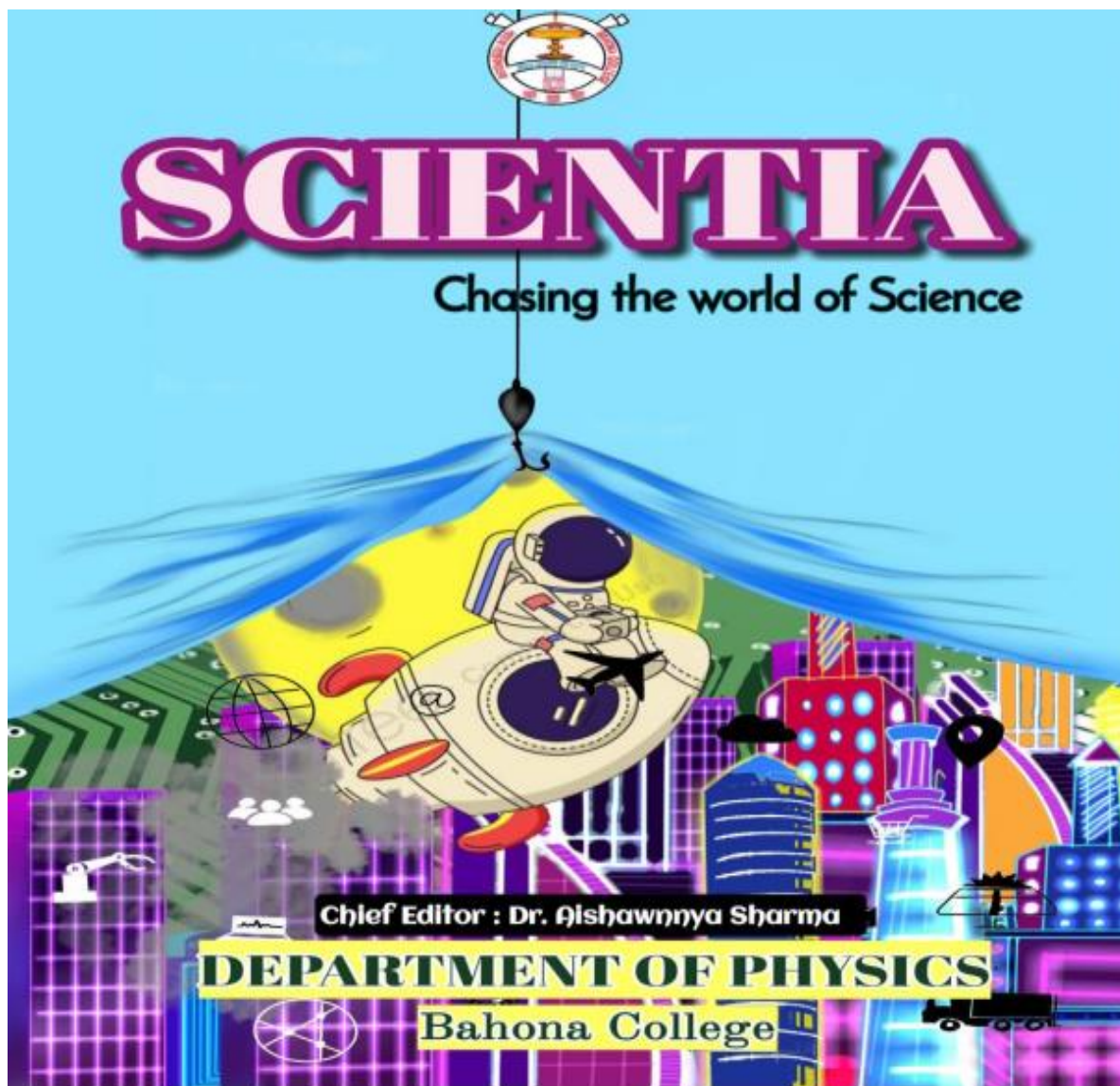



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E-Magazine of Dept of Physics


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Newsletter of Dept of English


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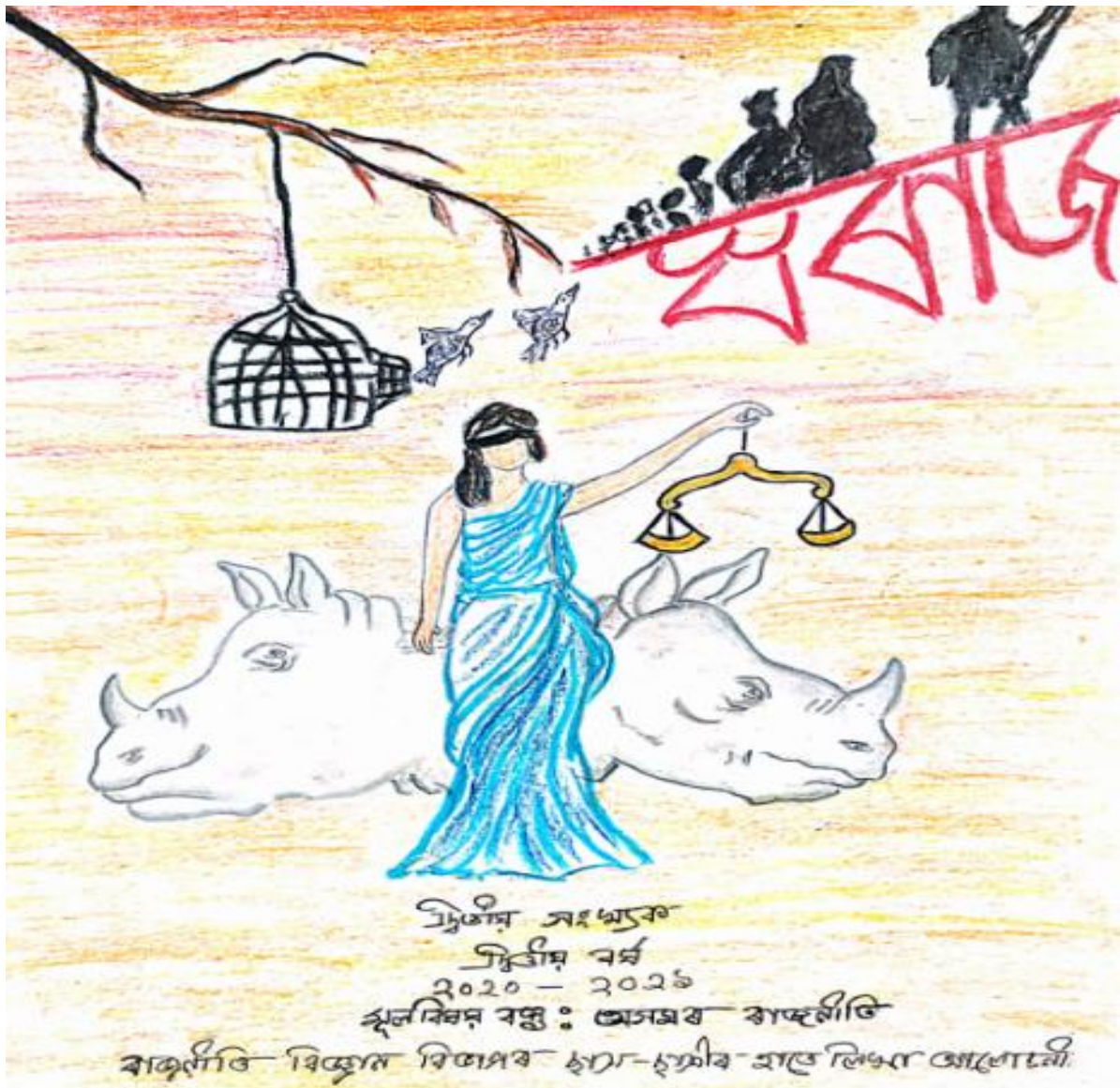



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Hand-Written Magazine of Dept of Political Science [Page 1]


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उत्तर :-

ହୁମା-କାଉଣ୍ଡା ଏ ଶୁକ୍ରାଦିନ ଅର୍ଦ୍ଧସେ ଗଢାତି ଲାଗେ,
ଆଲୋବୀ, ମୁକୁ ଆଦିକ ସାମକ ମଢିଆଳ
ଅର୍ଦ୍ଧନିଶିଞ୍ଜର ଲଗିଲା ଓ ଅବଶିଷ୍ଟ ନିମ୍ନ-ଘେନା
ଆଦି ଓ ଉପାଦେତ ଆଦି, ଏବଂ ଯେଉଁଠି ଗଢା
ନିଲା ଆଲୋବୀ ଆଦିର ଦୁର୍ଗନ୍ଧିତ ଏ
ଓଡ଼ିଆ କଥା ନାହିଁ ।

ଉପରୁ କଥା ନାହିଁ ।
 ସାଧନା ଲକ୍ଷ୍ୟାବଳୀରେ ଅଭ୍ୟାସ ବିଧାନ
 ଶିକ୍ଷକ- ମାତ୍ର ନିଜ ଆଲୋଚନା 'ପ୍ରକାର' ଓ ୨୫-
 ମାତ୍ରା ପ୍ରକାରର ପଞ୍ଚତ ହୁଅନ୍ତି ଜାଣି ଆଲୋଚିତ
 ହେଉ । ଚାହିଁ-ଚାହିଁ ମଧ୍ୟରୁ ଯୋଗ୍ୟ - ଜାଣିଥିବ
 ଶିକ୍ଷକ ଶ୍ରେଣୀର ମାଧ୍ୟମରେ - ଶୁଦ୍ଧିତ
 ଜାଣିବାରେ ଯେଉଁଲୋକର ଦୃଷ୍ଟିରୁ ପଞ୍ଚତ ମାତ୍ରା
 ହେଉ ହୁଅନ୍ତି ଆମା ସେହିଭଳି ।

ଆଧୁନିକ ଶିକ୍ଷା-ନୀତିରୁ ଏହାପାଇଁ ଉପଯୋଗୀ ମିଳୁଥିବା କିଛି ତଥ୍ୟ ଉଲ୍ଲେଖ କରାଯାଉଛି ।

2/52/2020
समय
समय

Hand-Written Magazine of Dept of Political Science [Page 2]

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Message and good wishes.

It is my pleasure to learn that Bahona College Political Science Department is going to publish Annual Department Magazine "SWARAJ". I hope the magazine will help to enthuse the young generation to acquire bright career in life.

I wish success of the magazine & offer my best wishes to all concerned related to publication of the magazine.

Date.

09/12/2020

President
Bahona College
Students Union.

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‘স্বৰাজ্য’ নৈপথ্যত-
 স্মৃণ্য উদ্যোক্তা : ড° অমলকুমাৰ দত্ত (অধ্যাপক)
 উদ্যোক্তা : শ্ৰী যুগ্ম অধ্যাপক শিল্পী (অবস্ৰী অধ্যাপক-
 বাৰ্জনীতি-বিজ্ঞান, বিজ্ঞান)
 শ্ৰী যুগ্ম বক্তৃতা নেতা
 ড° অমলকুমাৰ
 ড° গণকজ বৰা
 সম্বাদকৰণ : দলপ্ৰিয় বৰুৱা
 দেৱাঙ্গনা বৰা
 সহঃ সম্বাদকৰণ : উজ্জী বৰা
 পঞ্চমী হুতা
 সহঃ অধ্যাপক : বাৰ্জনীতি বিজ্ঞান বিজ্ঞানৰ সন্মত
 ছাত্ৰ-ছাত্ৰী
 তত্ত্বনিধান : গীতাঞ্জলী বৰা, জুয়েলী হাজৰীকা, বিদ্যা
 বিকাশ দাস, অমলিকা বৰা, বিষ্ণু
 দাস, নৱনীতা কলিতা
 অধ্যক্ষ : হুগুণ হাজৰীকা
 প্ৰসংগক : বাৰ্জনীতি বিজ্ঞান বিজ্ঞান, বাহনা
 মহাবিদ্যালয়
 প্ৰকাশ কাল : ২০২০
 দ্বিতীয় বছৰ, দ্বিতীয় সংখ্যা

Hand-Written Magazine of Dept of Political Science [Page 4]

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ଅନୁକ୍ରମନିଷା

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Bahona College

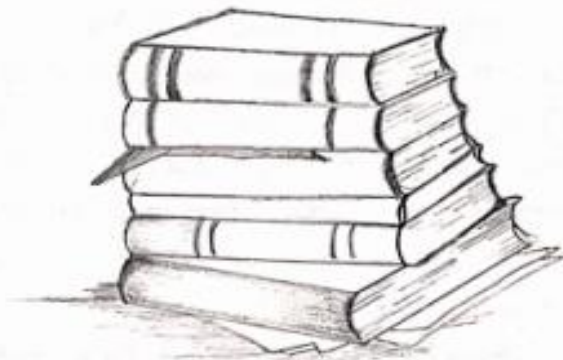



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সম্পাদকীয় একলম

সাহিত্য- বিভিন্ন উপাদান সম্বন্ধে- তেওঁ "হাতে
লিখা" আলোচনীৰ এক পুৰ্বদৃষ্টি আদৰ্শ আছে। আলো-
চনী সম্বন্ধে প্ৰথমতঃ হাতে লিখি চপোৱা হৈছিল।
এগৰাকী সাহিত্যিকৰ সাহিত্য কৰ্মৰাজি- সমীৰণতে প্ৰথম
অধ্যায়ত আলোচনী, স্থলভাষা, প্ৰতিব- প্ৰতিক্ৰিয়া আদিত-
বিশ্লেষণ ঘটে। বিশ্বৰ বহুতো জ্ঞাতনামা সাহিত্যিকো
সাহিত্যৰ পৰামৰ্শত এনেদৰে- কঠিন- পেন্সিছিল। দুইটা-
হাতে- আৰু এজন ব্যক্তিৰ- কলা- হৈছে- হাতেলিখা-
আলোচনীখনৰ- গঢ়াৰ প্ৰথম আদৰ্শ হ'ব লাগিব-
সুন্দৰ হাতে লিখা।

সকলো- ব্যক্তিয়ে- এটা অধ্যয়নৰ- অন্তৰ্ভুক্ত-
পৰা- গঢ় লৈ উঠে। হৈছে- লিখা- গঢ়া কৰি- পৰা-
হাত- হাতী গৰাকীৰ- বৈজ্ঞানিক- আনন্দিক- বিশ্লেষণ পোৱাত
হাতেলিখা- আলোচনীয়ে সহায় কৰে। বৰ্তমান সময়
আলোচনী-সম্বন্ধে- আধুনিক- ডিজিটেল সেৱা বা ডি.টি.
পি. আদিৰ সহায়ত- প্ৰস্তুত- কৰি- গৈছে। কিন্তু
হাতেলিখা- আলোচনীৰ- দ্বাৰা- হাত- হাতী সকলে এনে-
দৰে- আনন্দিকভাৱে- প্ৰস্তুত- কৰি- গৈছে- হাত- হাতীৰ
প্ৰতিভা- বহিঃ- প্ৰকাশ- আৰু- বৈজ্ঞানিক- দিশৰ উৎকৰ্ষ
সাধনৰ- উত্তৰণ- যাৰ বাবে আমি গ্ৰে- হাতেলিখা-
আলোচনীখন প্ৰস্তুত কৰি- উলিয়াওঁ।

আমি বৈজ্ঞানিক- বিশ্লেষণৰ হাত- হাতী সকলে
হাতৰ বাৰ "দ্বিভাষী"ৰ- দ্বিতীয়- অধ্যয়ন- প্ৰস্তুত কৰি

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অসীম জোৰত বিপ্লৱী সৰ্গ

অতিশোৰ্ষক দাবানলে জ্বলিছে সাদৰ
কা- পৃথকৰ তেজ নাই মোৰ
কুৰাঙ্গত অসীম জোৰ ।
আম মাথ মাথক
নাই সৰগৰ তেজ
অসীম জোৰত বিপ্লৱী সৰ্গ !



একোটা দুৰ্গা জেজেৰে
দেখ বাঙালী হ'ল
বিপ্লৱী আজি কাৰাগাৰত
গমতকৈ গৰ্ব হ'ল,
আহ আহ মূৰ তেজ
ৰাজপক্ষত নামিবৰ হ'ল
বিস্মৃ-জ্যোতিৰ সন্মোহনৰ দেশ
বপাতলৈ গ'ল ।

অসীমৰ বৰা-
পঞ্চম যুগ্মাধিকা

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অসমৰ-ৰাজনীতিঃ মোৰ এক দীৰ্ঘা-

ৰাজনীতি- হৈছে ব্যক্তি আৰু-ৰাষ্ট্ৰ-ৰাজ্য-সম্বন্ধ। ৰাজনীতি- হৈছে ব্যক্তি বা- ব্যক্তি সমষ্টিৰ-আৰু-ৰাষ্ট্ৰ বা-ৰাষ্ট্ৰ সমষ্টিৰ-ৰাজ্য-অন্তৰ্গত বা-পৰোন্তৰ সম্বন্ধ।

এখন নিৰ্দ্ধাৰিত-আৰু-হু-ৰাজনীতিয়ে দেশ-ৰ-ঐতিহ্য-অৰিহণা-খোলাহু। পুৰণি অসম-ৰাজনীতিলৈ নতুন-কৰিলে নিৰ্বাচন, সভা-ও-ন্যায়-পৰায়ণতা আৰু-হু-নীতিহীনতা-অতিশূণ্ড হৈছিল। কিন্তু বৰ্তমান অসম-ৰাজনীতি মোল অ্যকিত অৱস্থা-প্ৰাপ্ত। অত্যা-লুণ্ঠন, প্ৰভাৱ-ও-প্ৰত্যাঘাৰ, “বাইজৰ বাবে, বাইজৰ দ্বাৰা, বাইজৰ চৰকাৰ” মোলা-কমাখাৰ প্ৰায় বিলুপ্তপ্ৰায়। কিয়নো-বৰ্তমান-ৰাজনৈতিক ব্যৱস্থাত বাইজৰ-কোনো-দুৱাৰ নোহোৱা-হৈ-পৰিছে। তাৰ বিপৰীতে ৰাজনীতি-কেন্দ্ৰীভূত হৈ-পৰিছে স্থিতিস্থাপক কেইজনমান নোকৰ-হাত-। বাইজৰ-হাতত কেৱল ভোটদানৰ অধিকাৰ-হৈ-আছে; হুই-ভোটদানো-বিবেকহীন। আৱেগৰ দ্বাৰা-পৰিচালিত হৈ কোনো-বিচাৰ নকৰাকৈ নিজ-মৌখিক-কতক হুৰল কৰি-বৰ্তমান বাইজে-ভোট দূৰ কৰা-দেখা-হৈছে।

যদিও ভাৰতবৰ্ষক এখন অফল জনতান্ত্ৰিক-দেশ-বুলি কোৱা-হয়, তথাপিও কিন্তু আমি আমাৰ-জন-তান্ত্ৰিক-ব্যৱস্থাক-অফল বুলি ক’ব নোৱাৰো। কিয়নো-যি এখন দেশত জনসংঘৰগুই-স্বাধীনতা-বলি হুই-নগা-হয়, হুই-দেশত-কেতিয়াও অফল

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ମାତୃତ୍ବ, ସାହସିକତା ଓ ସ୍ୱାଧୀନତା
ଉନ୍ନୟନ

জাতি, ঐশ্বর্য, বর্ণ, ভাষা, অঃ স্ফুৰ্তি, ঐতিহ্য .
 ভিত্তিত- আনুহৰ- আশ্ৰেণ গা টেল উঠে . নিজে ভাষা-
 অঃ স্ফুৰ্তি- , ঐতিহ্য- প্রতি আনুহ- অদায় বৰ- অঃ বেদন-
 সীল . ভাষাত- দৰে এখন বহুত্ববাদী অশ্রাজ্ঞ মকা-
 চন্দ্রপত অঃ কীৰ্ণ আবেগ- উৎকীৰ্ত- হৈ অশ্রাজ্ঞিক ল্যঙ্গ,
 অশ্রজ্ঞা, ভাষ্যবোধ- প্রতিষ্ঠা কৰিব পাৰিলেহে দেশ-
 স্মৃতি আৰু- প্ৰগতি নিশ্চিত হ'ব . দেশৰ অঃ বিধানে
 ইয়াৰ- প্ৰস্তাৱনাতে এই- বিঘ্নযুগ জোৰ দি মানবিসকলক
 অতৰ্ক কৰি দিছা . কিন্তু, বহুদলীয় স্বীকৃতি থকা- অঃ সন্দীপ
 সাজন ব্যৱস্থা- ক্ৰমশঃ- বাজ্জৈতিক দলসমূহে অশ্রজ্ঞা-
 ভাষ্যনৰ বাবে জাতি- ঐশ্বৰ্য, জাতি- পাৰ- ভিত্তিত যি নিফুৰে
 মানব আশ্ৰেণিক- বাজ্জৈতিক কৰা দেশ- খায়া আৰ পাৰা-
 অঃ কীৰ্ণ- ক'ব পাৰি যে এনে ভাট্টে কেন্দ্ৰীক- নিৰ্বাচন-
 সমূহে বাবে বাবে অঃ বিধানেৰে আশ্ৰাত কৰ্মৰপাত কৰি-
 আহিছে . একক অঃ অঃ বিধানেৰে- লাভ কৰি অশ্রজ্ঞা-
 কৰ্মৰপাত কৰাৰ স্বাৰ্থত প্ৰাক নিৰ্বাচন বা- নিৰ্বাচনোত্তৰ
 অঃ স্ফুৰ্ত বাজ্জৈতিক- দলসমূহৰ আশ্ৰিত যি নেত্ৰেতা, অ-
 অঃ সন্দীপ স্মৃতিশোণিতা- ; বুদ্ধাৱজি , বেচা- - স্মিলা- স্মিলিলে
 টেলছে ই- ভাষ্যজীয়া বহুত্ববাদী অশ্রাজ্ঞানক- ভাষ্যবোধ-
 ওলাওবীৰে- বহুতকৈ দুৰ্বৰ একতাৰ- বাজ্জৈতিক-
 'দ্বিগু-বিদ্বিগু কৰি দিবলৈ ধৰিছে . অঃ স্মিলা অঃ স্মিলা
 অঃ বিধানিক- নীতি- আদৰ্শ আৰু- জনগণক- মুক্তাৱজাৰে
 ওলাওব- কৰি ভাষ্যজীয়া স্মিলাক- দুৰ্বল কৰি উলিছে .



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Departmental Magazines/Newsletters Allow Students to Express Themselves and Work in Groups in a Participative, Collaborative Manner



Wall-Magazine of Dept of Statistics


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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Students of Dept of Chemistry Preparing their Wall Magazine


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Students of Dept of Zoology Preparing their Wall Magazine


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চিত্র: চৰিত্ৰ অধ্যয়নৰ বাবে 'নমুনা'

Field-Based Study Conducted by Students of Dept of Economics


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Long 93.406437°
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Field-Based Study Conducted for Students by from Dept of History


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Field-Based Study Conducted for Students by from Dept of Political Science [Page 1]


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Field-Based Study Conducted for Students by from Dept of Political Science [Page 2]


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Birding trip to Jhanjimukh - Kokilamukh IBA site. Jan, 2020

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At Hoolongapar Gibbon Wildlife Sanctuary, Jorhat. Feb, 2019

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Students visiting Hoolongapar Gibbon Wildlife Sanctuary, Jorhat. 2018

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B.Sc. Students during a Bird Census Project, Sarala Wetland, Nimati Ghat, Jorhat

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B.Sc. 6th Semester students and Teachers during a trip to Central Muga Eri Research and Training Institute, Gol, Lahdoigarh Jorhat Feb. 2019.

Field-Based Study Conducted for Students by from Dept of Zoology


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**At Central Muga Eri Research and Training Institute , Lahdoigarh,
Under Central Silk Board, Gol**

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Educational Tours are Useful Avenues for Students to Learn in an Immersive, Experiential and Participative Manner.

REPORT ON THE BAHONA COLLEGE EXCURSION TO DELHI, AGRA, JAIPUR UNDERTAKEN
FROM 13.12.2017 TO 21.12.2017

SUBMITTED BY:
SHANTANA SAIKIA
TEACHER-IN-CHARGE
DEPARTMENT OF ENGLISH
BAHONA COLLEGE

Altogether 42 members, including the teacher in charge and a junior teacher, Ms Shrutidhara Saikia of the Department of English, went on this educational tour to the national capital city of Delhi, Agra and Jaipur.

The students consisted of a good mix from both the Arts and the Science stream from the Degree classes. (List enclosed)

The idea behind this excursion was to acquaint the students with the historical, social and cultural milieu and diversity of the country. Further, as the students were basically from rural pockets of the small city of Jorhat in Assam and also majority being from economically straitened backgrounds, the excursion was undertaken with the intention of exposing them to the mainstream and acquainting them with opportunities that they might further explore. Therefore, visits to the IIT, JNU and Delhi University were kept on the agenda.

The excursion began with a overnight journey by train from Jorhat to Guwahati on 13.12.2018 where the group was to board the North East Express early next morning. However, a twelve hour delay in the train schedule upset the itinerary and the plan to visit the universities had to be dropped.

Delhi: 16.12.2018. Having arrived late, the students were given a tour of Connaught place and given a ride in the metro on the first day. The highlight being the students being made to get their tickets themselves and ask for general directions with a view to improve their communication skills both in Hindi and English. While the accompanying teachers kept a general eye on the group, the students were encouraged to take their own and their group's responsibilities. Small groups with group leaders were formed and time and place set for them to meet. Post dinner, it was made mandatory for the groups to share their experiences.

17.12.2017: It was agreed with the tour operator that a bus would be kept in the service of the group on all days, there being no male teacher with the group. Accordingly, the group went to Agra on the morning of 17.12.2017 by a Volvo accompanied also by the tour operator and his assistant, two very responsible and energetic young men. The drive through the expressway was an excitement in itself for the students as was the Breakfast at a dhaba set in a lush yellow-green field.

The visit to Agra began with a tour of the Agra Fort. A tourist guide was engaged who told the students of the chequered history of the Mughals. The view from the window to Tajmahal and the tale of Emperor Shah Jahan's arraignment silenced the chirpy youngsters.

The much anticipated visit to the Tajmahal became trying as the group had to wait in the queue for nearly three hours to get inside. However, once inside, everybody was transported to another world. There was much photo clicking and everybody had to be literally dragged out! And the road journey to Jaipur commenced.

Report of Excursion Conducted in 2017 [Page 1]


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The arrival at Jaipur was late and post dinner everybody retired for the night.

18.12.2017

The next leg began with a tour of the Amber Fort where a guide was engaged to explain the Rajput history to the students. The students were enraptured by the recounted valour of the Rajput history and the magnificence of the fort. Much more than the stipulated time was spent at the fort and the students were taken to see the Jaimahal after that. Camel rides, shopping for baubles and posing in traditional clothes kept the students happy and they were allowed to indulge in these activities and communicate with the local people. Post lunch, a general tour of the pink city was given by bus. More sight-seeing had to be cancelled as winter nights were foggy and the group had to return to Delhi. Arrival in Delhi was late, post-midnight and the next morning the students were allowed to rest till late.

19.12.2018-20.12.2018

Local tour of Delhi began with visiting the Qutub Minar, India Gate, Rajghat, Rashtrapati Bhavan and the Lotus Temple. As some of the students were showing signs of fatigue, the pace was slowed and more rest was given. The 20th was kept for shopping at collective request and the students with their group leaders and teachers went to the Sarojini Nagar Market to shop for friends and family.

21.12.2017

The group had an early train to catch to Guwahati and had to leave the hotel at 2AM on the morning of the 21st only to be informed of a 17-hour delay. Finally, after a delay of 27 hours an exhausted group reached Guwahati on the 23rd and left for Jorhat the same night.

SUMMING UP:

The students showed exemplary resilience, good conduct, responsibility and smartness. There was no untoward incident and they bore with the discomforts and the unfamiliar-to-their-palate food with equanimity. They took each other's responsibility and on the tiring journey back on a very slow and dirty train, were solicitous of the accompanying teachers' comfort. It is also worth mentioning that on the way back from Jaipur to Delhi the boys took turns to sit near the bus driver on the floor to keep him company and awake! We have been informed that some of them have maintained contact still with the driver, the hotel staff and the tour operators extending them invitations to visit which is a natural part of the Assamese culture. The same spirit was noticed on the train as they took up lower berths on the sides putting the girls in the middle.

A spirit of bonhomie developed among all the students across streams and semesters as they sang and danced together to the accompaniment of the karaoke that they had carried with them. Many students in their reports have expressed their resolve to study harder and go to Delhi for higher studies. Thus, this trip has definitely been an enriching experience for the students and the teachers alike.

Counter Sign

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REPORT ON BAHONA COLLEGE EXCURSION, 2018, TO RAJASTHAN (From 05/12/18 to 12/12/18)

Submitted by: Ajit Kumar Borah,
Teacher –in-Charge,
Department of English
Bahona College.

Bahona College, Jorhat, has been imparting quality higher education to a large number of undergraduate students both in Arts and Science since its inception nearly six decades ago. Since travelling is an integral part of education, the college authority arranges study tours, field studies, awareness camps and excursions for the greater interests of the students from time to time. Earlier, the expenses were exclusively borne by the participating members. Fortunately, the government of Assam has been gracious enough to grant a substantial amount for annual excursions by college students for the last few years, our college too readily grabbed the opportunity and organized such excursions annually. Excursion for the year 2018 was to be led to Rajasthan as instructed and the same was scheduled to take place during winter vacation cum semester break. A group of 22 students (boys & girls), from both Arts and Science stream with three Teachers-in-charge undertook the journey by train on 05/12/2018. It came to a successful end on 12/12/2018 with a rewarding series of experiences for the students and the teachers alike. The following is a brief report on the itinerary and rich experiences garnered from the excursion.

The excursion began with a happy anecdote as 5th December was coincidentally the birthday of one of the Teachers-in –charge in the group. As all were on board the Abadh Assam Express at Mariani Station, all the members of the group wished her a very happy birthday and a happy journey. The teacher entertained all with a very melodious song. Almost all the members of the group joined her and the students started singing and dancing providing much entertainment to all present. The teacher offered dinner to all which was relished with thankfulness by all. Thus, the journey to Delhi from Mariani railway station became a memorable event for most

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of the group members for whom it was the first train journey and first experience of going out of their home state.

The teachers kept an eye on the movement of the students while allowing them to mix up and communicate with other co-passengers, preferably in Hindi and English with the intention to help improve their communication skills. The students readily complied with the instructions and the enjoyed each and every moment of the journey. They shared berths, talks and personal belongings quite happily and accepted even inconvenience to make room for their fellow group members and other passengers. The group was accompanied by a young travel guide from Guwahati who had been engaged for making the whole excursion enjoyable. Nothing unpleasant or inconvenient happened to the team and it reached New Delhi hale and hearty on 07/12/18. We headed towards a hotel arranged by our travel guide who worked for the D.S. Excursions. The accommodation and the food were quite satisfactory and all enjoyed sound sleep after a sumptuous dinner.

Early in the morning of 8th December the team boarded a luxury bus driven by a handsome Punjabi driver who seemed to be quite expert in his profession. As the bus headed towards Jaipur, the students started singing and dancing and sharing experiences with each other. On the way, the team had breakfast and lunch. We visited Tajmahal at Agra, one of the best monuments of the world, enroute Jaipur. Then we headed towards our destination- Jaipur. Accommodation in a Jaipur hotel had been arranged beforehand by the tour operator. All seemed to be happy on reaching Jaipur though it was pretty late due to heavy traffic on the way. All enjoyed mutton curry over dinner and had a good night's sleep as the next days were to witness history, culture and society of Rajasthan, one of the most colourful states of India.

On 9th December we set out early in the morning and headed towards Amber Fort, one of the most attractive and popular places of historical importance in North India. Students were explained in details the importance of these historical monuments and rich cultural heritage of Rajasthan. The group were amazed to know many things of Indian history and noted down the important pieces of information written on plaques. They were also taken to Neer mahal, the Jantar-Mantar, to the busy market areas of the pink city, to the Birla Temple and to a replica of rural Rajasthan- Chokki Dhani. All members participated in the

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Report of Excursion Conducted in 2018 [Page 2]

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Excursion Report 2020 Excursion to Digha & Kolkata

A team of young energetic students of Bahona College, led by Assistant Professor of English Mr. Ajit Kr. Borah and Assistant Professor of Mathematics, Dr. Manashjyoti Borah, set out on an Excursion to Digha & Kolkata on 4th March 2020. The team boarded a bus that took reached the Mariani Railway station on time to catch the Kolkata bound Kamrup Express.

The Team reached Howrah station in the wee hours of 6th March. They got fresh in the station, took breakfast and boarded the Digha Super Express. The students enjoyed this trip very much. All were excited to have a look at the Digha sea beach as for all of them it was the maiden trip to a sea beach. The team reached Digha railway station and moved to a pre-booked sea facing lodge near the beach. In the afternoon, all went out to the sea beach, studied the life style of the small vendors selling eateries and hand-made crafts. Some of the students collected few specimens of sea weeds and stones.

Next day, i.e. 7th March, the team moved to Mandarmani sea beach, some 80 K. M away from Digha. Most of the students eagerly observed the potentiality of rural sea side or river side tourism projects and innovative livelihood ways like fish farming and homestays in rural areas. The students enjoyed their time in riding speed boats and playing on the sea beach. Almost all of them collected specimen of sea life and memorabilia from the sea side stalls. In the evening they moved back to Digha Railway station and boarded the train to Howrah station. They stayed in a hotel in Kolkata and took rest for the night.

On 8th March, the team set out early in the morning to Alipore Zoological Park. All the students were excited and happy to see as wide range of flora and fauna the vast park offered to the visitors in the heart of the city. They talked to a few officials of the park and came to know much about its history, present management system and the way of treating the animals in captivity.

Then the students were taken to Kolkata science city which was a kind of wonderland for them. What they enjoyed most was the animation programme like the evolution of the homo-sapiens, time machine and the well managed museum showing the landmarks in scientific innovation and inventions.

Then the students were taken to Victoria Memorial where they excitedly witnessed the pieces of Indian history laden the colonial regime of the British. They could witness the historical marvels in the museum and felt the worth of the priceless socio-political and cultural heritage of the country. Then the team moved towards the hotel and took rest for the night.

On 9th March, the team checked out off their lodge and moved towards Birla Science City which offered them a scope to learn about many landmark events in scientific research and development. They were taken to have a glimpse of the famous Eden Garden stadium at


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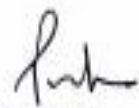
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salt Lake. Then the team moved to the Dakshineswar Temple, one of the serene and beautiful places to visit in Kolkata. In the evening the team moved towards Howrah station and boarded the Marianin Bound Kamrup Express. The team reached Mariani in the morning of 11th March, 2020. Everyone was safe and sound in spite of the rising cases of covid-19 infection in the Country. All the members of the team reached home happily with loads of happy memories of the excursion, 2020.


Principal
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Report prepared by,
Mr. Ajit Kr. Borah
Assistant Professor, English
Teacher – in-charge for Excursion, 2020.
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Report of Excursion Conducted in 2020 [Page 2]


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A Project-work/Fieldwork Based Learning Provides Useful Avenues for Students to Learn in an Immersive, Experiential and Participative Manner

গবেষণা পত্ৰ
জাহ্নবা বঙ্গবন্ধৱৰ এক বিদ্ভূত
অধ্যয়ন
শ্ৰী প্ৰকল্পটো অন্তৰ্ভুক্ত কৰোঁতামহুৱা
১. দ্বিপদীয়া হাজৰীয়া
২. বীজা জামুলী
৩. প্ৰনাগী বৰা
৪. জনিন্দীয়া পাতিৰ
৫. পলি অৰ্হকায়া
তৃতীয় স্বাপ্নামিকা
অসমীয়া বিভাগ,
২০২১

Project Report by Students of Dept of Assamese [Page 1]


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সূচীপত্র

- ১.০০ আমৰঙাৰি-
- ২.০০ অৰ্ণিমলৰ উদ্দেশ্য
- ৩.০০ অৰ্ণিমলৰ সমল
- ৪.০০ বিহুত অৰ্ণিমল
- ৫.০০ আমৰঙাৰি
- ৬.০০ প্ৰসাংগ পুথি

Project Report by Students of Dept of Assamese [Page 2]


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1.00

छात्रवृत्ति :

"প্ৰগতি" মিত্ৰিত্ব ঠাইত ভাৰতীয় জাতি জেতা হ'ব।
 দেশপ্ৰেমক জটীয়া নৃত্যৰূপত আগবঢ়াই জাতিবিজ্ঞানী
 প্ৰদৰ্শন মঞ্চ কৰিছে। প্ৰতিষ্ঠিত ভাৰতীয় জাতি
 আছে। প্ৰদৰ্শনৰ প্ৰতিষ্ঠিত পৰ্ব জাতিপ্ৰদৰ্শন দিহা
 কিছুমান জাতিৰ পৰিচয়ৰ দ্বাৰা জাতি কিছুমান
 জাতি চিহ্নিতৰ বাবে জাতি পৰিচয়। প্ৰতিষ্ঠিত
 প্ৰদৰ্শনৰ জাতি জাতি জাতি প্ৰদৰ্শনৰ জাতি
 জাতিৰ নৃত্যৰূপত ভাৰতীয় জাতিপ্ৰদৰ্শন
 কৰিব পৰা নাই, সেয়ে পৰ্ব জাতিপ্ৰদৰ্শন
 নৃত্যৰূপত আগবঢ়াই জাতিবিজ্ঞানীসকলে
 জাতিৰ পৰা মঞ্চ কৰি আগবঢ়াই। বহু-চিত্ৰ-
 চিত্ৰৰ মূলত বৰ্ণনাকৰণ কিছুমান অজস্ৰ
 টিক কৰা দ্বাৰা মণ্ডিত প্ৰদৰ্শনৰ বৰ্ণনাকৰণ
 প্ৰতিষ্ঠিত বিজ্ঞানপ্ৰদৰ্শন পুৰি জেতাৰি। জাতি
 প্ৰদৰ্শনৰ জ্যোতিষিক অৱস্থান অনুসৰি জাতি
 পৰ্ব জাতিৰ পৰা জেতা জেতা জাতিপ্ৰদৰ্শন জাতি-
 প্ৰদৰ্শন কৰিবলৈ মঞ্চ কৰা দ্বাৰা। প্ৰদৰ্শনৰ
 বৰ্ণনাকৰণ জাতিপ্ৰদৰ্শন নৃত্যৰূপত আগবঢ়াই
 জাতিপ্ৰদৰ্শন পৰ্ব জাতিপ্ৰদৰ্শন পৰ্ব জাতিপ্ৰদৰ্শন
 দ্বাৰা। পৰ্ব জিহ্ন জাতিপ্ৰদৰ্শন জাতিপ্ৰদৰ্শন
 জ্যোতিষিক দিহাৰ পৰা, জ্যোতিষিক পৰিচয়
 জাতি জ্যোতিষিক জাতিপ্ৰদৰ্শন দিহাৰ পৰা
 জিহ্ন কৰি-পৰিচয়কৰণ কৰিবলৈ মঞ্চ

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4.00 चिह्नित व्ययसूचन :

ମିଛରେ ଘୋଷାପିଲାଙ୍କ ଚକ୍ଷୁଷ୍ଟିମ୍ବକ ଘୋଷଣାଲିକ ନିଶବ-
 ମବା, ଚକ୍ଷୁଷ୍ଟିମ୍ବକ ମାସିଗାଲବ ନିଶବ ମବା ତାହା
 ଚକ୍ଷୁଷ୍ଟିମ୍ବକ ତାହାକୃଷ୍ଟିବ ନିଶବ ମବା ଘୋଷୀ ବିଚାରନ
 ବସି ମାସିଗାଲବୁକ୍ତ କସିପିଟିନ ଥକ୍ତ ବସା ଘୋଷ
 ମାସିଗାଲବୁକ୍ତ ଘୋଷାବ ଘୋଷୀବିଚାରନ ବସା
 ମାସିଗାଲବୁକ୍ତ ଘୋଷାବ ବସୀବସନ ଘୋଷି ଘୋଷାବ ଘୋଷ

ভাৰত
যত্ন
দেয়া
পদ্ধতি
কৰিছে
কিহে
—

- ① আকর্ষণমূলক বা অণতকর্ষণমূলক
- ② ঐতিহাসিক বা ক° সামুদায়িক
- ③ ভৌগোলিক অর্থনৈতিক আকর্ষণ —

① ଅହାମେଶୀୟ - ବିଚ୍ଛିନ୍ନ - ଅହିମ୍ସା - ହସା,
ଅହିମ୍ସା - ହସା, ଆହମେଶ୍ଵର - ହସା ଅହିମ୍ସା,
 ② ମେଶୀୟ - ବିଚ୍ଛିନ୍ନ - ଚୀନ ହସା, ହସା ହସା

ଓପେନେଇ ତିନିଠିଶକରବ ବିଦାକରବ ହିତବତ ଅବୃତ୍ତି
 -ସୁରକ ଭାବ ଅଂଶିହାସିକ ବର୍ଗାକିରବେ ବିଜ୍ଞାନ
 ନନ୍ଦାତ ସୁନିକ ଦେଖିବି ବା ଶୁଦ୍ଧ । ତାନନାତେ
 ଓପେନେଇ ଭାବୁନ ଅନୁଗାବି ବା ବିଦାକରବ
 ବିଜ୍ଞାନନନ୍ଦାତ ସୁନି ବା ନନ୍ଦା । ଭାବ ଅଂଶ ବର୍ଗାକିରବ
 ଓପେନେଇ ସୁନି ଦାସାବିଜ୍ଞାନୀ ନକଲ ଓପେନେ
 ବର୍ଗାକି ।

তিমিভবিধ-
 ভাষা-
 কথ-
 —

Project Report by Students of Dept of Assamese [Page 4]

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কথা দিচ্ছে।

ଏକମାତ୍ର - 'ହାମାବ' ଦେଖିବାବିହୀନ ବା ଅଜ୍ଞାନ
- କେନ୍ଦ୍ର 'ହାମାବ' ବର୍ଣ୍ଣିକର ବୁଲି-କୋର ଇନ୍ଦ୍ର,

2.00

অবিস্মরণ - বিনোদনঃ

জোমা বদীকিবনৰ এক বিদ্বত ভাৰ্য্যমুন' গৰ্ভ বিষয়
 চো ভাৰ্য্যমুনৰ উদ্দেশ্য ইল আনি গৰ্ভ জোমা
 বদীকিবন গজিয়াৰ বিষয়ে পুংখানুপুংখহায়ে
 জোত হোৱা ভাক জানকো গৰ্ভ বিষয়ে অৱগত
 কৰোৱা । গৰ্ভ বদীকিবনৰ বিষয়ে ভাৰ্য্যমুনৰ
 এক বিশেষ-ওৰুফুগুন কাৰণ ইল ই জোমা
 পাঠ্যপুথিত-অনুগত । এতেদৰে জোমোচনা
 কৰি ভাৰ্য্যমুন কৰিলে-জোমাৰ-বিশেষহায়ে
 লাভ হোৱা পাৰিতৰিকত ইয় ।

3. 60

अभिप्रेत- समय :

[illegible]

Project Report by Students of Dept of Assamese [Page 5]

(Dr. P.K. Dutta)
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[illegible]

Project Report by Students of Dept of Assamese [Page 6]

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DEPARTMENTAL SEMINAR ON
"CRYSTAL FIELD SPLITTING IN
OCTAHEDRAL COMPLEX"

PRESENTED BY-
NAME:- DHRUBAJYOTI SAIKIA
B.Sc. 5th SEMESTER, 2021
ROLL NO: 25
DEPARTMENT OF CHEMISTRY
BAHONA COLLEGE,
DATE: 27/11/2021

Seminar Paper by Student of Dept of Chemistry


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
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**AN INTRODUCTION TO DISCONNECTION APPROACH
THROUGH IMAGINARY BOND CLEAVAGE**

PRESENTED BY
-SOURABH BORAH
BSC 5TH SEMESTER
ROLL NO -24
BAHONA COLLEGE,
JORHAT
YEAR-2021

27/11/2021

-1

Seminar Paper by Student of Dept of Chemistry


(Dr. P.K. Dutta)
Principal,
Bahona College




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Bahona College

Electroanalytical methods:

p^H metric titrations, potentiometric titrations,
conductometric titrations

Department of Chemistry

Prodip Borah.

Roll no : 01.

B.Sc. 5th sem.

Year : 2021-22

Date : 27/11/2021

Seminar Paper by Student of Dept of Chemistry


(Dr. P.K. Dutta)
Principal,
Bahona College




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Bahona College

Electroanalytical methods:

p^H metric titrations, potentiometric titrations,
conductometric titrations

Department of Chemistry

Prodip Borah.

Roll no : 01.

B.Sc. 5th sem.

Year : 2021-22

Date : 27/11/2021

Seminar Paper by Student of Dept of Chemistry


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প্রকল্প প্রতিবেদন

বাহনা মহাবিদ্যালয়ৰ ছাত্র-ছাত্রীসকলৰ
অর্থনৈতিক প্রেক্ষাপট



তত্ত্বাবধায়ক : ড° বফিক আহমেদ

প্রস্তুতকর্তা :

শ্রী বন্দনা ভূঞা

শ্রী বাজশ্রী দত্ত

শ্রী দেবানীষ দত্ত


Principal
Bahona College

পঞ্চম বার্ষিক, অর্থবিজ্ঞান বিভাগ


বাহনা মহাবিদ্যালয়, ২০১৮ চন।


HoD, Department of Economics
Bahona College, Jorhat

Project Report by Student of Dept of Economics


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Coordinator
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প্রকল্প প্রতিবেদন

উজনি অসমৰ পর্যটন উদ্যোগৰ
সমস্যা আৰু সম্ভাৱনা



তত্ত্বাবধায়ক : ড° ৰফিক আহমেদ

প্রস্তুতকৰ্তা : শ্রীমতী হিমাত্ৰী গগৈ

ষষ্ঠ শাস্ত্রাংগিক, অর্থবিজ্ঞান বিভাগ
বাহনা মহাবিদ্যালয়, ২০১৭ চন।


Principal
Bahona College


HOD, Department of Economics
Bahona College, Jorhat

Project Report by Student of Dept of Economics


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প্রকল্প প্রতিবেদন

নৈপৰীয়া অঞ্চল আৰু নগৰ উপকণ্ঠ অঞ্চলৰ
মাজৰ জীৱন নিৰ্বাহৰ মানৱ পৰ্থক্য



তত্ত্বাবধায়ক : ড° ৰফিক আহমেদ

[Signature]
Principal
Bahona College

প্রস্তুতকৰ্তা :
শ্রী মেঘাশ্রী ভূঞা
শ্রী পূজা শইকীয়া
শ্রী পল্লৱী পেগু

[Signature]
HOD, Department of Economics
Bahona College, Jorhat

চতুৰ্থ ষান্মাষিক, অৰ্থবিজ্ঞান বিভাগ
বাহনা মহাবিদ্যালয়, ২০১৭ চন।

Project Report by Student of Dept of Economics

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বুম খেতিৰ ওপৰত এটি আলোকপাত
ইয়াৰ অবহনক্ষমতাৰ প্ৰসংগসহ



তত্ত্বাবধায়ক : বীমা ৰাভা

প্ৰস্তুতকৰ্তা :
প্ৰিয়দৰ্শন বৰুৱা
প্ৰিয়ংকা বৰা
মনীষা গোস্বামী
সংকল্পিতা বৰা


Principal
Bahona College

পঞ্চম ব্ৰাহ্মাৰ্ষিক, অৰ্থবিজ্ঞান বিভাগ
বাহনা মহাবিদ্যালয়, ২০১৭ চন।


HoD, Department of Economics
Bahona College, Jorhat

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প্রকল্প প্রতিবেদন

বাহনা মহাবিদ্যালয়ৰ ছাত্ৰ-ছাত্ৰীৰ
মোবাইল ফোন ব্যৱহাৰৰ ধৰণ



তত্ত্বাবধায়ক : ড° ৰফিক আহমেদ

প্রস্তুতকৰ্তা :

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শ্ৰী দিপশিখা ভূঞা
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Principal
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প্রকল্প প্রতিবেদন

নৈপৰীয়া অঞ্চল আৰু নগৰ উপকণ্ঠ অঞ্চলৰ
মাজৰ খাদ্য সুৰক্ষাৰ পৰ্য্যক্য



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প্রস্তুতকৰ্তা :
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শ্রী বাজেশ গোহাঁই
শ্রী সক্ষজিৎ বৰা
শ্রী বিক্রম দাস

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অসমৰ গ্ৰাম্য পৰ্যটনৰ বিকাশ



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শ্ৰী পৰিণিতা বৰা
শ্ৰী স্বত্বপূৰ্ণা দত্ত
শ্ৰী পিয়ংকা কলিতা


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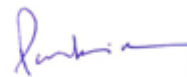
ষষ্ঠ যাদ্ৰাযিক, অথবিক্ৰাণ বিভাগ
বাহনা মহাবিদ্যালয়, ২০১৮ চন।


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**PREPARATION OF CHEMICALLY DEPOSITED
NANOCRYSTALLINE CdS THIN FILMS AND
ITS OPTICAL PROPERTIES**

Project Report

Submitted By

**Mitra Handique
Hirok Jyoti Borah
Arponjit Buragohain
Manas Saikia
Anupam Goswami**

**B.Sc 6th Semester, 2018
Physics Department, Bahona College**

*19.6.18
H.O.D.*

Project Report by Student of Dept of Physics


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John Mazumder 604 Project Report



Bahona College
Department of Statistics
Project Paper Code – 604

The dissertation on
“Fitting of Regression Line and Calculation of
Multiple Correlation Coefficient”

Prepared By:
John Mazumder
Roll No.: 12220052
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Supervised by:
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**A STUDY ON SEX DISTINCTION IN CASE OF
EMPLOYMENT IN NOPOMUA GAON OF
JORHAT DISTRICT**



Prepared By
Sri Monoj Borah
B.Sc. 6th Sem.

Department of Statistics
Bahona College
2017

Project Report by Student of Dept of Statistics


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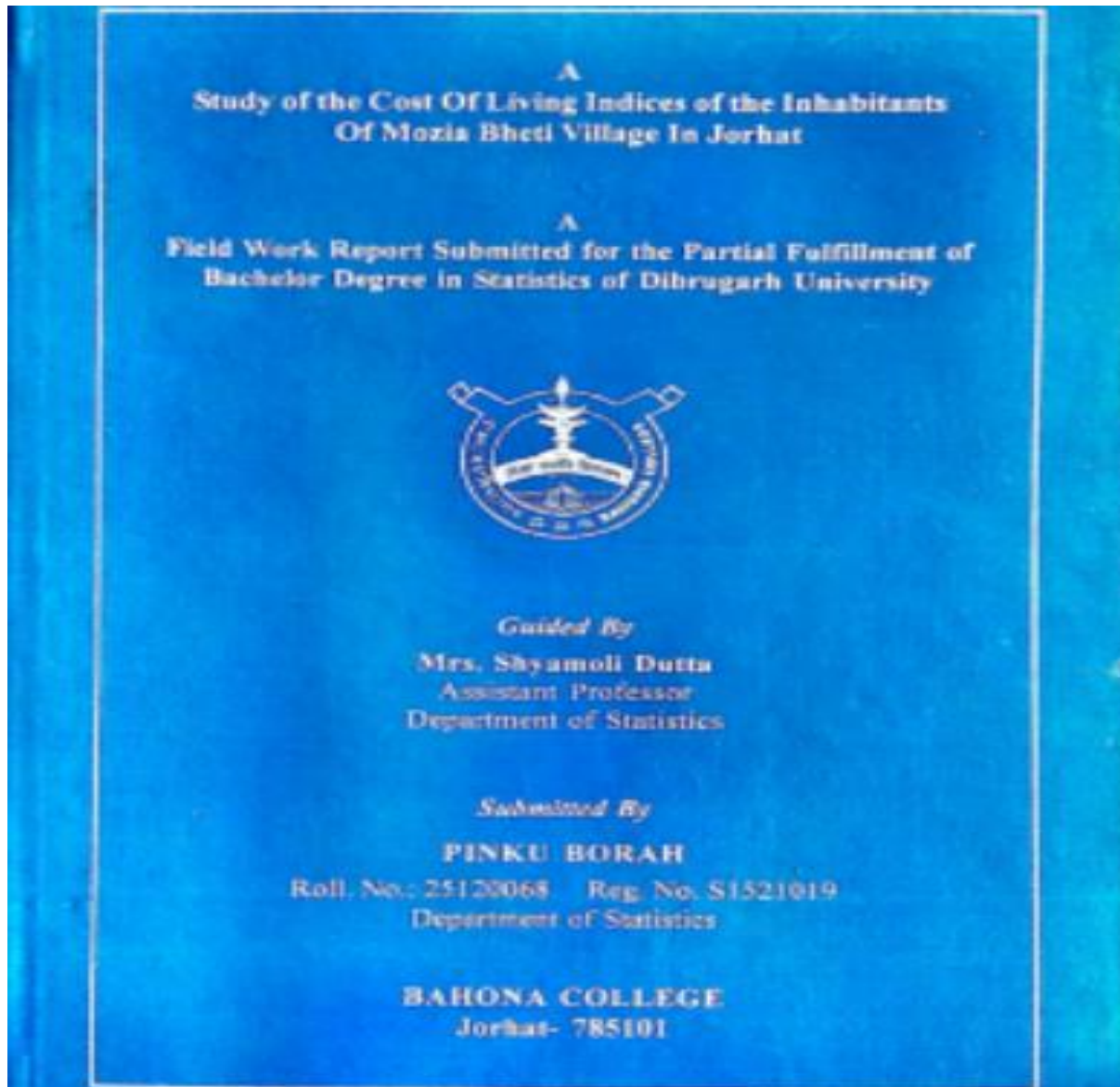



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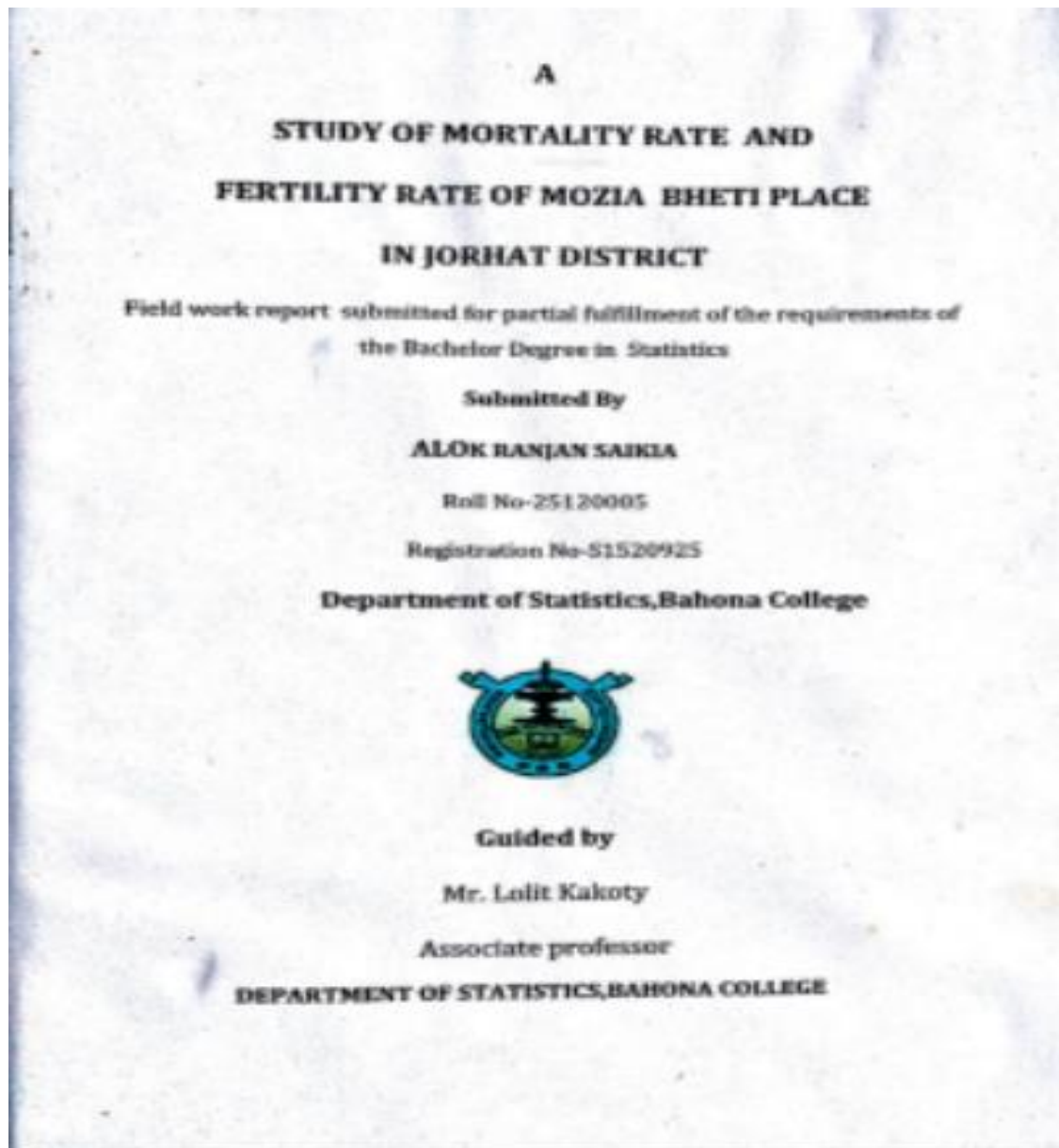



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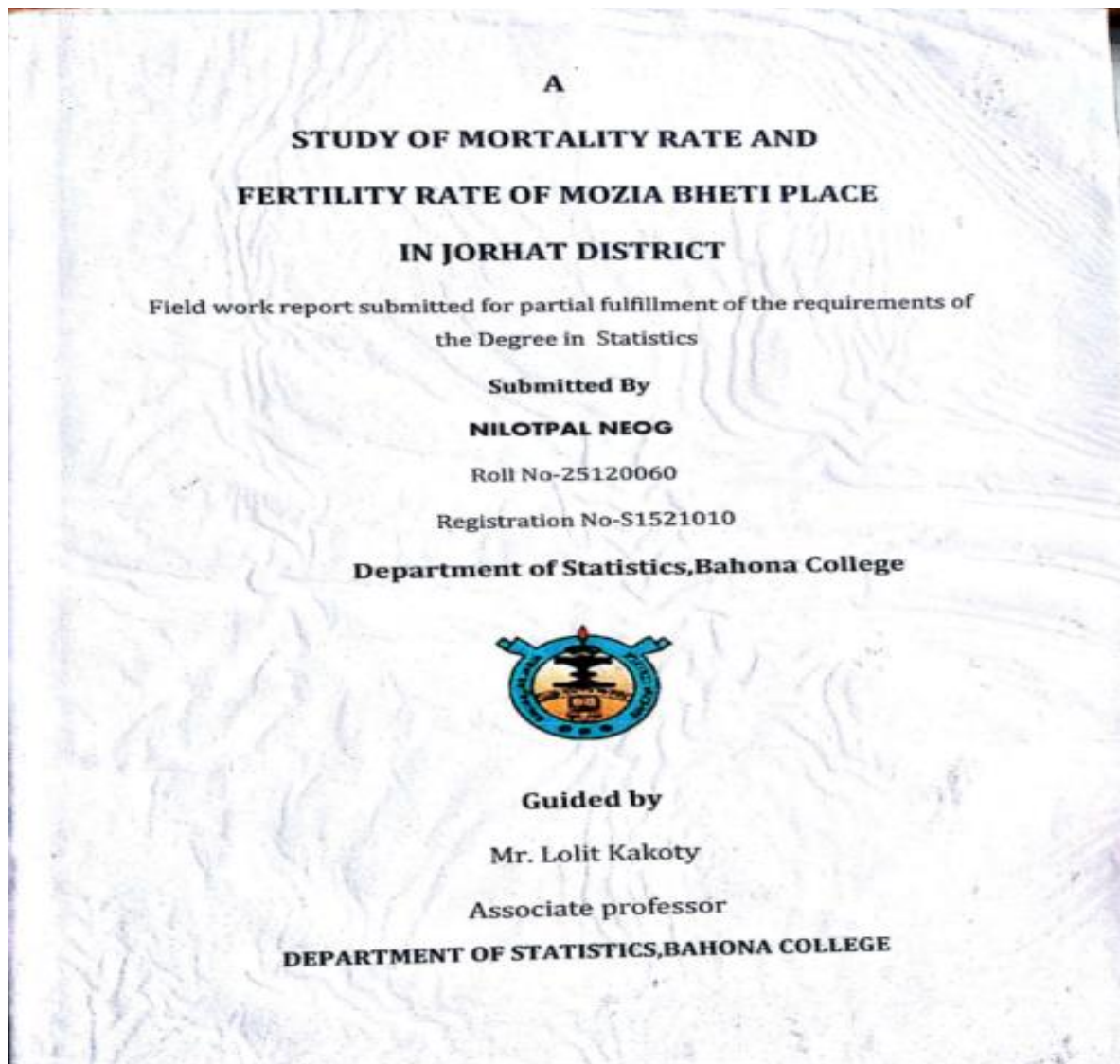



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A

**Study of the Cost Of Living Indices of the Inhabitants
of Mozla Bheti Village In Jorhat**

A

**Field Work Report Submitted for the Partial Fulfillment of Bachelor Degree in Statistics of
Dibrugarh University**



Guided By

Mrs. Shyamoli Dutta

Assistant Professor

Department of Statistics

Submitted By

JOSEPH PATIR

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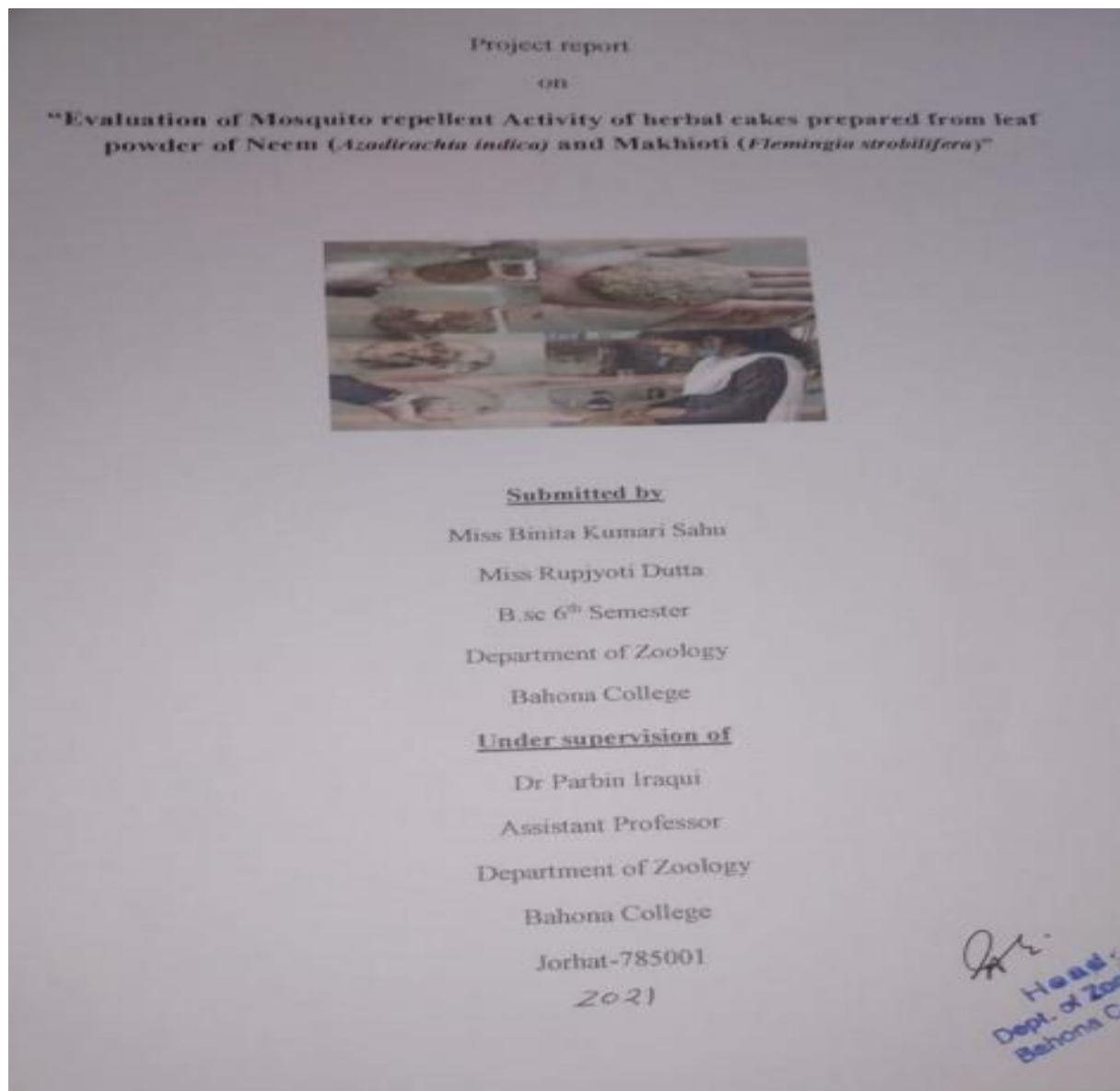



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CERTIFICATE

This is to certify that Miss Binita Kumari Sahu and Miss Rupjyoti Dutta, B.Sc. 6th Semester students of Dept. of Zoology, Bahona College have carried out the research project entitled "*Evaluation of Mosquito repellent activity of herbal cake prepared from leaf powder of Neem (Azadirachta indica) and Makhioti (Flemingia strobilifera)*" under my guidance and supervision. This project work was assigned to them as project work under the banner of **Environment and Climate Cell** of Bahona College.

This is also stated that the research work is original and not copied from other sources.

Parbin Iraqui

Dr. Gayatri Agni Borah
HOD, Department of Zoology

Dr. Parbin Iraqui
Supervisor,
Asst. Professor, Dept. of
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ACKNOWLEDGEMENT

At first, we would like to express our gratitude to Dr. Gayatri Agni Borah (Head of the Dept.) for allowing us to conduct the project work. I would like to express my special thanks to our teacher Dr. Parbin Iraqui for her guidance and supervision to carry out and complete this project work. I am really thankful to them. Secondly, I would like to thank our parents and friends who helped us a lot in finalizing this project within the limited time frame.

Binita Kumari Sahu

Rupjyoti Dutta

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- INTRODUCTION
- AIMS AND OBJECTIVES
- HYPOTHESIS OF THE STUDY
- MATERIALS AND METHODS
- RESULT
- CONCLUSION
- REFERENCE

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ABSTRACT

Mosquitoes transmit serious human diseases causing millions of deaths every year. They are the vectors of diseases like dengue, Malaria, Filariasis, Encephalitis, Chikungunya etc. In India the most common disease causing mosquito species are *Aedes aegypti*, *Anopheles stephensi* and *Culex quinquefasciatus*. So from protect us from mosquito bites chemical mosquito repellent coils have been used by people for a long time. But the mosquito repellent coils which are available in the market give harmful effects on our health. It is also not good for our environment. So to combat these problems an alternative way to get rid of mosquitoes is very much needed. Plants are the source of many bioactive components and these components make them antibacterial, antifungal, larvicidal as well as mosquito repellent. So in his study we had selected Neem and makhiti plant leaves to prepare herbal mosquito repellent cakes and compared their activity with market available mosquito repellent coils. The leaves of these two plants have been used traditionally to repel insect as well as mosquitoes. Neem oil is used to kill harmful insects. In this study we had found that these herbally prepared mosquito repellent cakes gave better results than the chemical mosquito repellent coils. These herbal cakes are also eco-friendly as well as not injurious to our health.

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INTRODUCTION

Controlling mosquitoes is of utmost importance in the present day scenario with rising number of mosquito borne diseases [1]. The mosquitoes take a lead role in carrier of parasites like protozoa, virus, fungus, etc. They can cause some serious diseases like Dengue, Hepatitis-B, etc. which may cause death. Chickengunya causes fever and joint pain which can be severe and lasting for many days [2]. The risk of developing a serious disease is most dangerous outcome of mosquito bite. Mosquito borne diseases became a burning health problem in developing countries.

An alarming increase in the range of mosquitoes is mainly due to deforestation, industrialized farming and stagnant water [3]. There are 100 of mosquito species around the world but they all have two things common-they can all spread serious diseases and they all need water to breed in. Thus, special products like mosquito repellents for combating mosquitoes are required. There are various technologies and tools for the control of vector borne diseases, but still this problem is not solved yet [4]. One of the methods available for the control of mosquito borne diseases is the use of chemical insecticides but a main drawback in it is that they are non-selective and could be harmful to human and other non target organisms also. Market available chemical mosquito repellent coils which are used to repel mosquitoes gave adverse effects on our health as well as on the environment. The emission of formaldehyde from one burning coil can be as high as that released from fifty one burning Cigarettes [5]. This is because of the chemical found in mosquito coils. Making a mosquito coil out of natural ingredients may remove this problem.

Due to the harmful effects of chemical pesticides, insecticides and mosquito repellent coils an alternate method for vector control is essentially preferred and that is undoubtedly the biological control [6]. Plants have evolved a variety of secondary compounds, which are bioactive [7,8]. Due to presence of these compounds plants show activities like antibacterial, antifungal, antimalarials, larvicidal and mosquito repellent [9,10]. Plant extracts with insecticidal properties are used in the form of biological eco-friendly pesticides. So far more than five thousand plants have been searched for biopesticides [12,13]. The parts of plants like leaves, seed can be used to prepare mosquito repellent cakes which are not effective against mosquitoes but also eco-friendly [14].

Keeping all things in mind we had selected this project work of preparing mosquito repellent cakes from plant leaves. Mosquito repellent cakes made up of plant leaves can be used to repel mosquitoes. They will not be injurious to health as well as to the environment. In this study to traditionally used plants Neem and Makhoti were used to prepare mosquito repellent cakes and compared their repellent activity with market available mosquito repellent coil.

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AIM AND OBJECTIVES

The objectives of the study are listed below---

1. Preparation of herbal mosquito repellent cakes from the leaf power of Makhioti plant (*Flemingia strobilifera*) and Neem (*Azadirachta indica*).
2. Comparison of mosquito repellent activity of herbal cake prepared from leaf powder of Neem with market available chemical mosquito repellent coil.
3. Comparison of mosquito repellent activity of herbal cake prepared from leaf powder of Makhioti with market available chemical mosquito repellent coil.
4. Comparison of mosquito repellent activity of herbal cake prepared from leaf powder of Makhioti and Neem with market available chemical mosquito repellent coil.

HYPOTHESIS OF THE STUDY

If Neem and Makhioti leaves are extracted its natural component for making the mosquito repellent cake. We will observe its activity by applying the fog of mosquito repellent cake against mosquitoes. If it is effective against mosquitoes it will repel mosquitoes away and long time exposure may kill mosquitoes also. Then we can say the cakes prepared herbally have mosquito repellent activity.

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Methodology [11]

1. After collection of leaves we washed those leaves with the help of clean water and kept for dry under shade.
2. After 15 days, the dry leaves were grinded by mixer grinder, then it stored in a air tight container.
3. On 18 December, we collected the coconut fibre, extract of wood, candle and Maida flour. These material are important to prepared herbal mosquito repellent cakes.
4. After the collection of all materials, we take 4gm of each neem and makhiati leaves extract, 2gm of wood extract, 1gm of coconut fibre, 4gm of melted candle and 30mL Maida. Then all these materials are mixed well and added hot water with these materials.
5. After mixing properly, the mixture of leaf powder with other substances kept under sun for drying .
6. After drying cakes were kept in air tight containers for further use.
7. On 26th of December 2020, we had started our experiment.
8. For this experiment , we took three containers, in one container we had put some burning pieces of herbal cake prepared from makhioti leaves, in one container we had put burning pieces of herbal cake prepared from neem and in one container chemical mosquito repellent coil (Maxo) was added. We had waited few minutes to let them create fog.
Then 20 mosquitoes were added to the both containers.
9. This way we had done repeated the experiment for three times and we had counted the senseless and dead mosquitoes in every 5 minutes in each container.

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MATERIAL AND METHODS

To start our experiment we had to collect selected plant leaves first. We had started to collect the plant leaves of project from two different areas. The details of the collection of leaves are given below:

Makhiati:

Area: Dakshinpat puroni satra gaon,

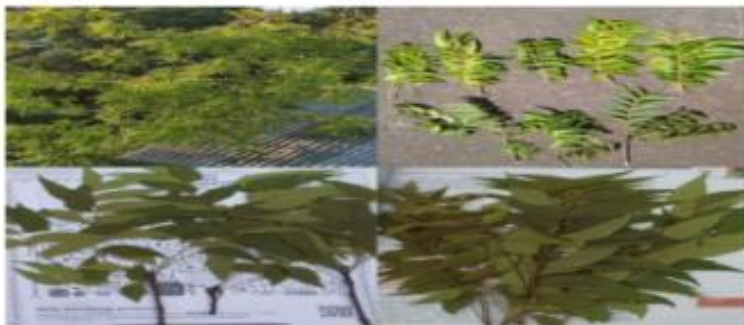
Majuli Date: 21.09.2020

Time: 4 PM (Taking picture of leaves) Time: 4.04 PM (Taking picture of plant)

Neem:

Area: Rajamaidam new colony, Jorhat Date: 20.09.2020

Time: 11.15 AM (Taking picture of leaves) Time: 11.16 AM (Taking picture of plant)



Photographs of Neem and Makhioti plant leaves

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RESULT AND DISCUSSION

In this experiment the mosquito repellent activity of herbally prepared cakes was compared with the activity of market available mosquito repellent coil. Their activity measured on the basis of mosquitoes that became senseless and mosquitoes became after exposed to the fog that arise from burnt cakes and chemical coils.

From the experiment it was found that the herbally prepared mosquito repellent cakes are more efficient than the market available mosquito coil. These herbal cakes are also eco-friendly as well as not harmful for our health. The experiment was examined comparatively. We compared our herbal cakes with market available mosquito repellent coil and found that herbal cakes are more effective on mosquitoes than the chemical coils.

From the above observations, we find that among the three cakes, the cake made from Neem (*Azadirachta indica*) leaves and Makhioti is more effective than the chemical based products available in markets. This cake is able to make the mosquitoes unconscious in 10 minutes after consumption and sacked to the brink of death after 15 minutes.

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Table 1: Comparison of effectiveness of herbal cake prepared from leaf powder of Neem with Maxo Coil by counting senseless and dead mosquitoes.

Neem Leaf Cake				Chemical Substance (Maxo coil)			
Time	Total no. of mosquitoes	Senseless Mosquitoes count	Dead Mosquitoes count	Time	Total no. of mosquitoes	Senseless Mosquitoes count	Dead Mosquitoes count
5 min	20	0	0	5 min	20	0	0
10 min		1	0	10 min		0	0
15 min		2	0	15 min		3	0
20 min		2	0	20 min		5	2
25 min		4	3	25 min		6	2
30 min		2	2	30 min		3	1
35 min		4	5	35 min		3	5
40 min		4	6	40 min		0	7
45 min		4	7	45 min		0	3
50 min		0	8	50 min		0	3

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Table 2: Comparison of effectiveness of herbal cake prepared from leaf powder of Makhioti with Maxo Coil by counting senseless and dead mosquitoes

Makhioti Leaf Cake				Chemical mosquito repellent (Maxo coil)			
Time	Total no. of mosquitoes	Senseless Mosquitoes count	Dead Mosquitoes count	Time	Total no. of mosquitoes	Senseless Mosquitoes count	Dead Mosquitoes count
5 min	20	0	0	5 min	20	0	0
10 min		1	0	10 min		0	0
15 min		1	0	15 min		0	0
20 min		4	0	20 min		4	2
25 min		4	0	25 min		6	2
30 min		1	0	30 min		3	1
35 min		3	2	35 min		3	2

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40 min	3	3	40 min	0	3
45 min	5	3	45 min	0	3
50 min	4	2	50 min		4
55 min	2	4	55 min		5
60 min	0	5	60 min		5
65 min	0	8	65 min		5

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Makhroti + Neem Leaf Cake				Chemical mosquito repellent (Maxo coil)			
Time	Total no. of mosquitoes	Senseless Mosquitoes count	Dead Mosquitoes count	Time	Total no. of mosquitoes	Senseless Mosquitoes count	Dead Mosquitoes count
5 min	20	0	0	5 min	20	0	0
10 min		2	0	10 min		0	0
15 min		2	2	15 min		3	0
20 min		3	1	20 min		5	2
25 min		6	2	25 min		6	2
30 min		6	5	30 min		3	1
35 min		1	7	35 min		3	5
40 min		0	3	40 min		0	7
45 min				45 min		0	3

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CONCLUSION

Since the use of synthetic chemicals to control mosquitoes raises several concerns related to environment and human health. An alternative of it is to use natural products that possess good efficacy and are environmentally friendly. Among those chemicals essential leaves from plants belonging to several species have been helpful in repellent properties as a valuable resource. Neem (*Azadirachta indica*) and Makhroti (*Flemingia strobilifera*) leaves are the essential whose repellent activities have been demonstrated also smell nice. There are hundreds of ways to repel the mosquitoes naturally and all are cheap and simple to make and with a little inventiveness we will soon compile our own list of homemade natural remedies.

PHOTOGRAPHS



Preparation herbal mosquito repellent cakes from the leaf powder of Neem and Makhroti

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PROJECT REPORT ON
FEEDING HABIT OF CERTAIN LOCAL
FISHES THROUGH RLG VALUE



SUBMITTED BY

SANGITA BORUAH

B.Sc 6th sem , ZOOLOGY (Major)

Roll no – 17020142

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*Examined
31/10/2020*

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CERTIFICATE

This is to certify that Miss Sangita Boruah bearing Rollno 17020142 of B.Sc 6thsem of Zoology Department, Bahona College Jorhat, affiliated to 'Dibrugarh University' has completed this research project entitled "FEEDING HABIT OF CERTAIN LOCAL FISHES THROUGH RLG VALUE", herself under my guidance and supervision. This is an original research work and not submitted elsewhere for any degree or award. This report has been submitted in partial fulfillment of the B.Sc 6thsem practical paper 605 requirement of Dibrugarh University.

Dr. Gayatri Agni Borah
Department of Zoology
Bahona College
Assam

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CERTIFICATE

This is to certify that Sangita Boruah (17020142), Pratim Das (17020087) and Kettrina Patik (17020125), students of B.Sc. 6th semester Zoology Department of Bahona College have carried out the project work "Feeding Habit of Certain of Local Fishes Through RLG Value". Under my guidance and supervision of Department of Zoology of Bahona College. This project is a part of UG Zoology Major syllabus of Dibrugarh University 6th semester and the instructions has been followed by this research activity.

It is also stated that the research work is original and not directly copied from other sources. Further, it was not submitted anywhere else for any degree or award. Any part of the report left without citation is purely unintentional and the credit remains to the original author(s).

The level of participation of each student in the project work:

High	Medium	Low	Equal
------	--------	-----	-------

B. Bakalial
(Dr. Bikramaditya Bakalial)

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ACKNOWLEDGEMENT

In the accomplishment of my project report on "*FEEDING HABIT OF CERTAIN LOCAL FISHES THROUGH RLG VALUE*" successfully, many people have owned upon me their blessings and the heart pledged support.

At the very honest I am happy to acknowledge the teachers of Zoology Department for providing us the facilities in successful completion of the project report. I would like to pay sincere thank to Dr. P. Dutta (principal name) for financial support and permission.

I extended my heartfelt gratitude to Dr. Gayatri Agni Bora, HOD of the department for the arrangements and who also help me during the journey of my survey.

I express my deep sense of gratitude to our respected Dr. Bikramaditya Bakalial, assistant professor of the department whose suggestions, instructions and constant encouragement throughout the tenure of this investigation has served as the major contributor towards the completion of this project. I also thank him for sharing some of the photographs.

I am also thankful to my team members for field data record as well as report preparation.

Sangita Boruah.
(full signature of student)

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Date-

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INTRODUCTION

Every organism on earth requires energy for growth, reproduction and other metabolic activities. These life sustainable processes take place utilizing food energy. Hence, food is considered as the most essential component for the growth of all living organisms.

The growth of a fish is influenced by the quality and quantity of food materials available and consumed. Fishes like any other organisms depends on the energy received from its food to perform its biological processes. Any variation in quality and quantity of food materials will affect the growth rate of the fish. Food consumption is the major factor controlling fish production. Information on the natural food of fish is important in understanding its nutritional requirements, its interaction with other organisms and its potential use for aquaculture (Royce, 1987).

Studies on food and feeding habit of fishes have importance on fishery biology (Sarkar and Deepak, 2009). Studies associated to feeding of fishes in their natural environments are of major importance for the management of their fishery and also for the environment (Al-Kahem et al., 1988, 1990). Understanding of food and feeding habit provides information on the aquatic ecosystem, fish health, trophic relations of fishes and other aquatic organisms.

Food availability is a factors which strongly influence fish community biomass. Woodward & Hildrew (2002) stated that the food web model is an effective tool for describing trophic relationships among organisms. Grouping organisms by trophic level (i.e., producer, herbivore, predator) loosely characterizes their relative position within a food web, but this categorical approach does not account for complex trophic interactions such as omnivory (Kling et al. 1992).

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The underwater observation of feeding habit of fish is easy. But there are some indirect methods through which the feeding nature can be understood. Analysis of Relative Length of Gut (RLG) is one of such approach which together with other observations helps to determine the feeding guild of a fish. The herbivore fishes possess very long alimentary canal whereas carnivorous fish have short gut length. The larger the value the more herbivory and value close to 1 indicate omnivory whereas value towards zero indicate pure carnivory.

In this project work, we tried to find out the feeding habit of different locally available fish species by using the RLG value method.

CONTENT

- INTRODUCTION
- MATERIALS AND METHODS
- PHOTOGRAPHS
- RESULT AND DISCUSSION
- CONCLUSION
- REFERENCES



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MATERIALS AND METHODS

Collection of Fish:

Fresh fishes were collected from weekly market of Bahona College area, Jorhat during Pre Covid Pandemic Lockdown period. The fishes are brought to the market from pond, wetlands, ditches of nearby area. Occasionally, harvested fishes are supplied from Majuli also.

The study was carried out from August 2019 to October 2019.

RLG measurement.

The length of the gut was measured and the relative length of the gut was estimated (RLG) for the different length groups by the method of AlHussaini (1949).

$$\text{RLG} = \text{Length of the alimentary canal} / \text{Total length of the body}$$

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RESULTS & DISCUSSION

The relative gut length of 22 native fish species were studied and the species specific values are given in Table 1. The comparative data are also shown in Fig 1.

Table 1: Fish species and their RLG value

	Species studied	Gut Length (Avg.)	Total Length (Avg.)	RLG Value
1	<i>Ailia coila</i>	10.7	8.23	0.77
2	<i>Amblypheryngodon mola</i>	6.3	19.1	3.02
3	<i>Anabas testudineus</i>	8.9	12.6	1.51
4	<i>Channa gachua</i>	9.6	3.4	0.35
5	<i>Channa punctatus</i>	10.1	4.5	0.44
6	<i>Esomus danricus</i>	5.3	12.66	2.39
7	<i>Glossogobius giuris</i>	9.6	3.93	0.41
8	<i>Heteropneustes fossilis</i>	15.7	20.7	1.31
9	<i>Labeo bata</i>	8.02	58.7	7.32
10	<i>Labeo boga</i>	11.2	54.9	4.73
11	<i>Lepidocethalichthys guntea</i>	8.1	6.5	0.8
12	<i>Macrognathus aral</i>	11.4	9.91	0.87
13	<i>Macrognathus punctatus</i>	14.1	9.8	0.68
14	<i>Mystus tengara</i>	6.94	3.74	0.54
15	<i>Neotropius atherinoides</i>	7.1	3.9	0.54
16	<i>Notopterus notopterus</i>	9.9	6.5	0.64
17	<i>Nundus nundus</i>	9.1	13.7	1.5
18	<i>Ompok bimaculatus</i>	12.2	6.58	0.54
19	<i>Puntius sophore</i>	9.6	17.1	1.74
20	<i>Puntius ticto</i>	7.2	15.26	2.12
21	<i>Salmostoma bacaila</i>	8.8	15.5	1.7
22	<i>Trichogaster fasciata</i>	7.9	67.9	8.6

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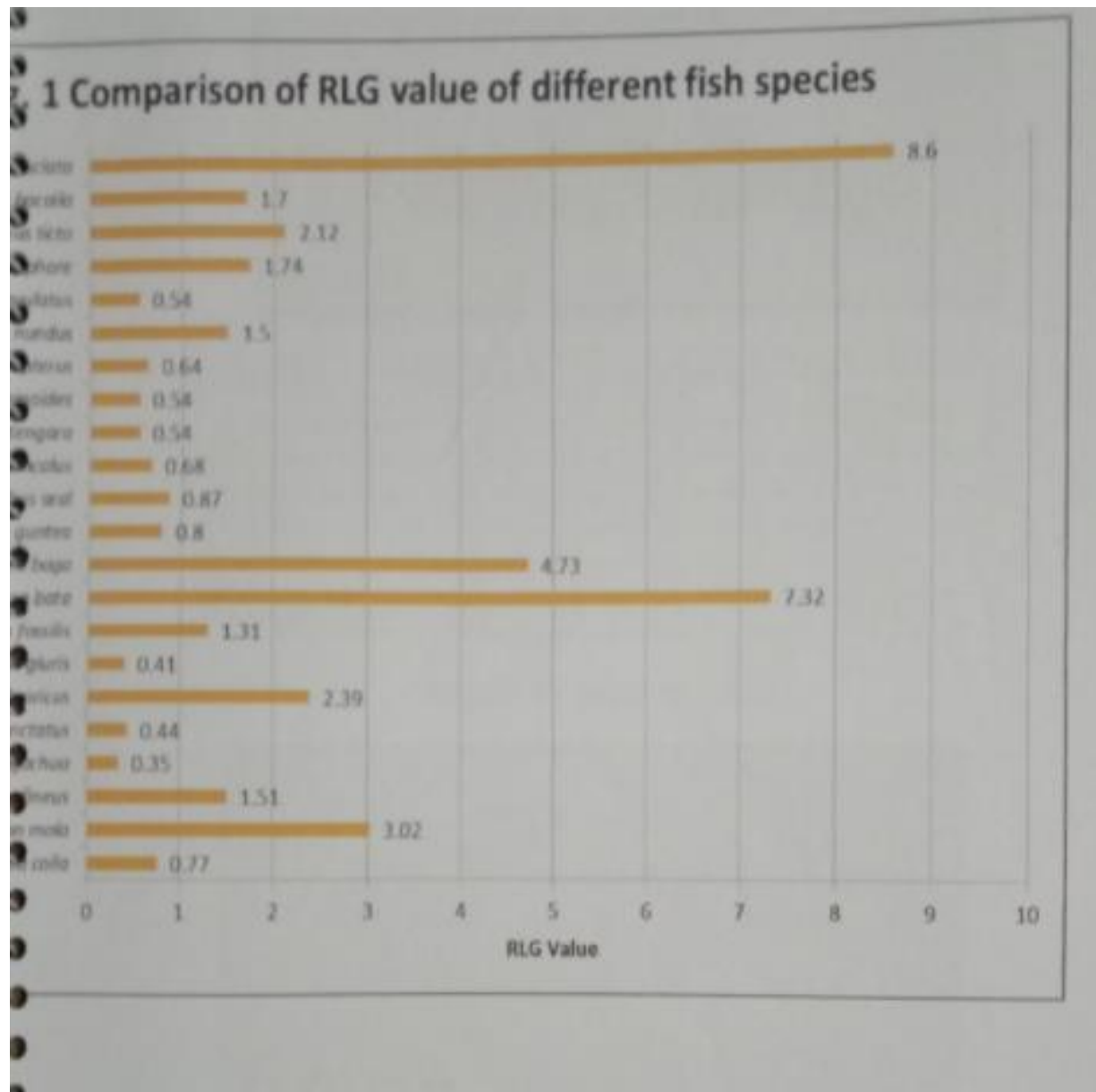

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Singora (*Mystus tengara*)



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	8.9	4.8	0.54
Sp 2	7.7	4.3	0.56
Sp 3	6.1	3.2	0.53
Sp 4	6.8	3.7	0.55
Sp 5	5.2	2.7	0.52
Average	6.9	3.7	0.54

Gedgedi (*Nundus nundus*)



Specimen (Locality)	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	9.5	14.5	1.53
Sp 2	7.2	10.4	1.45
Sp 3	11.2	17.6	1.58
Sp 4	6.9	9.7	1.42
Sp 5	10.4	16.2	1.56
Average	9.04	13.7	1.50

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Chengeli (*Channa gachua*)



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	10.5	4	0.39
Sp 2	8.3	2.7	0.32
Sp 3	9.6	3.3	0.34
Sp4	10.2	3.8	0.37
Sp 5	9.4	3.2	0.33
Average	9.6	3.4	0.35

Kanduli (*Notopterus notopterus*)



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	11.1	10	0.9
Sp 2	9.8	5.9	0.6
Sp 3	10.5	8.4	0.8
Sp4	8.7	3.5	0.4
Sp 5	9.4	4.7	0.5
Average	9.9	6.5	0.64

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Puthi (*Puntius sophore*)



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	10	20.7	2.07
Sp 2	9.8	19.6	2.01
Sp 3	10.7	22.4	2.09
Sp4	8.5	10.1	1.18
Sp 5	9.2	12.7	1.39
Average	9.6	17.1	1.74

Goroi (*Channa punctatus*)



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	10.2	4.5	0.45
Sp 2	9.5	3.9	0.42
Sp 3	11.5	5.7	0.49
Sp4	8.9	3.7	0.41
Sp 5	10.6	4.7	0.44
Average	10.1	4.5	0.44

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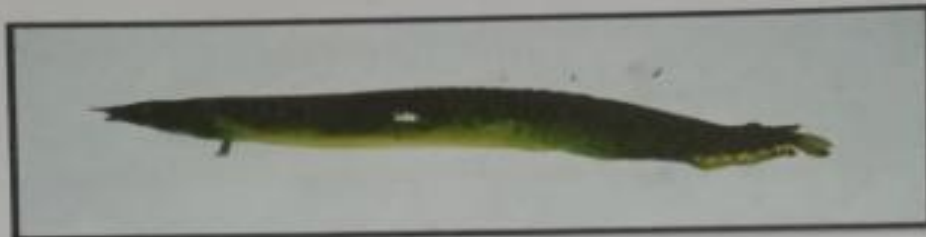
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Tura (*Macrognathus punctatus*)



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	15	12	0.8
Sp 2	13	7.8	0.6
Sp 3	14.6	10.2	0.7
Sp4	15.8	14.3	0.9
Sp 5	12.2	4.9	0.4
Avarage	14.1	9.8	0.68

Bheseli (*Trichogaster fasciata*)



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	8	70	8.8
Sp 2	8.7	79.2	9.1
Sp 3	7.5	62.3	8.3
Sp4	9.2	87.4	9.5
Sp 5	7.9	67.9	8.6

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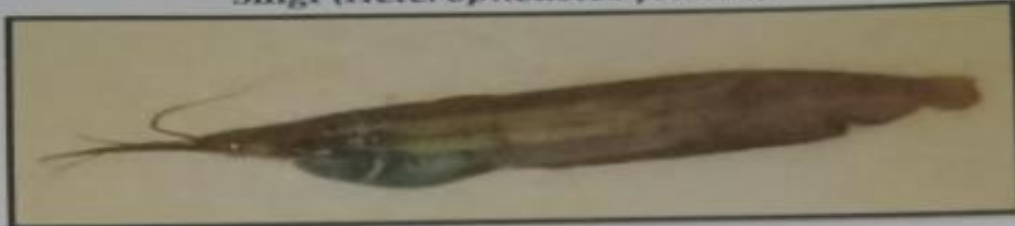
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Singi (*Heteropneustes fossilis*)



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	16.8	22.7	1.35
Sp 2	15.2	19.9	1.31
Sp 3	16.2	21.5	1.33
Sp 4	14.9	19.1	1.28
Sp 5	15.5	20.4	1.32
Average	15.7	20.7	1.31

Borduwa *Neotropius atherinoides*



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	6.7	3.5	0.53
Sp 2	7.5	4.5	0.59
Sp 3	6.2	2.9	0.48
Sp 4	8.3	5.1	0.62
Sp 5	6.9	3.5	0.51
Average	7.1	3.9	0.54

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Botia *Lepidocephaleichthys guntea*



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	7.9	6.2	0.78
Sp 2	7.2	5.2	0.73
Sp 3	8.5	7.1	0.83
Sp4	7.7	6.2	0.81
Sp 5	9.1	8.1	0.89
Average	8.1	6.5	0.80

Selkona (*Salmophasia*)



Specimen (Locality)	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	8	8	1
Sp 2	8.8	13.2	1.5
Sp 3	10	30	3
Sp4	9.2	17.4	1.9
Sp 5	8.3	9.1	1.1
Average	8.8	15.5	1.7

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Kawoi *Anabas testudineus*



Specimen (Locality)	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	8.8	12.5	1.42
Sp 2	8.1	11.1	1.38
Sp 3	9.3	13.2	1.41
Sp4	8.6	11.9	1.39
Sp 5	9.9	14.5	1.47
Average	8.9	12.6	1.41

Mowa *Amblypheryngodon mola*



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	6.2	18.5	2.98
Sp 2	6.7	20.8	3.11
Sp 3	5.5	15.7	2.87
Sp4	5.9	17.4	2.95
Sp 5	7.2	23.1	3.22
Average	6.3	19.1	3.02

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Labeo boga



Specimen (Locality)	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	11.4	54.2	4.75
Sp 2	10.2	45.9	4.50
Sp 3	11.9	58.5	4.92
Sp4	11.6	56.3	4.86
Sp 5	10.8	49.8	4.62
Average	11.2	54.9	4.73

Labeo bata



Specimen (Locality)	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	8.2	60	7.31
Sp 2	8.5	62.5	7.36
Sp 3	7.8	56.8	7.28
Sp4	6.9	50.2	7.27
Sp 5	8.7	64.3	7.39
Average	8.02	58.76	7.32

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Understanding the feeding habit of fish species is of great importance in understanding their ecological interaction (Alberto *et al.*, 2003). The alimentary canal of fishes is well adapted and modified in accordance with their nature of diet and mode of feeding habits. The structure of alimentary canal and external morphology are influenced greatly by ecology of the food and feeding regimes (Thomas, 1962; Sinha, 1968). The variation in position, shape and size of mouth can be correlated to the dietary habits of fishes. The feeding behavior is a species characteristic formed during its life history (Nikolsky, 1963).

According to Fukusho, (1969) The length of intestine in fish depends up on its feeding habits. Modification of the intestine (short, moderate, long or coiled) is an indication of its feeding habit- carnivores, omnivores or herbivores.

The length of fish intestine is clearly related to the trophic status of the species, being in the order, carnivores < omnivores < herbivores < detritivores (Fryer and Iles 1972). Junger *et al.* (1989) stated that short intestine indicates a tendency towards carnivory. Carnivore fishes normally have short and more or less straight intestine because the meat gets digested more easily, whereas in herbivore fishes, the intestine is long and coiled as the cellulose containing food items take more time for digestion (Pandey and Shukla, 2005; Serajuddin and Ali, 2005). According to Nikolsky (1963), gut length less than 100% of body length indicates carnivory while more than 100% indicates herbivory and an intermediate value indicates omnivorous mode of feeding (Das and Nath, 1965). According to Jobling (1995), the ratio of the intestinal length to body length is usually less than unity in carnivores species. In omnivores, the ratio may increase to around 2-3, and the ratio is even higher in herbivores and those fish species which consumes diet with a high roughage content. Relative gut lengths may range from 0.5 to 2.4

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for carnivores, 0.8 to 4 for omnivores and 2 to 21 for herbivores (Al-Hussaini, 1949, Kapoor *et al.* 1975).

In the present study the RLG value for *Channa gachua*, *Glossogobius giuris*, *Channa punctatus*, *Mystus tengara*, *Neotropius atherinoides*, *Ompok bimaculatus*, *Notopterus notopterus*, *Macragnathus punctatus*, *Ailia coila*, *Lepidocethalichthys guntea* and *Macragnathus arai* were found in between 0.35-0.87 indicating their carnivory nature.

On the other hand, the RLG value (range 1.31-3.02) for *Heteropneustes fossilis*, *Nundus nundus*, *Anabas testudineus*, *Salmostoma bacaila*, *Puntius sophore*, *Puntius ticto*, *Exomus danricus*, and *Amblypheryngodon mola* showed that they are omnivore in feeding habits.

The remaining three species *Labeo boga*, *Labeo bata*, *Trichogaster fasciata* are herbivorous and their RLG values were 4.73, 7.32, and 8.6 respectively.

CONCLUSION

In the present study, we reported the feeding habit of 22 species based on their Relative Length of Gut (RLG) value. Information on the food and feeding habit of many native species are still incomplete and proper study including other biological and physiological condition should be undertaken.

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প্ৰস্তুতকৰ্তা :

শ্ৰীমতী পৰিস্মীতা বেজবৰা

স্নাতক প্ৰথম বাৰ্ষিক

বোল নং - ১৬৩

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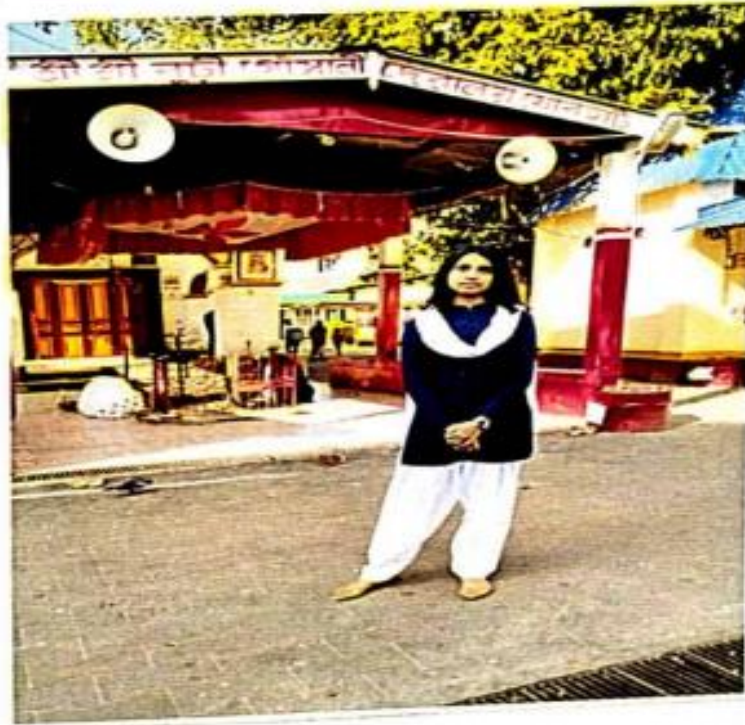

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যোৰহাটৰ বুঢ়ী গোসাঁনী দেৱালয়



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অসমত বিভিন্ন চৰ্ম্মীয় ঐতিহ্যৰে ভৰপূৰ হৈ আছে।
ই ঐতিহ্য ব্যক্তিগত চৰ্ম্মীয় অনুষ্ঠান অমূহে যোগে যোগে উচ্চ গুণ
বিহীন আকৰ্ষিত কৰি আহিছে। তেনে এক চৰ্ম্মীয় ক্ষেত্ৰ বিষয়ে
ই একমুখী জড়িয়তে পাঠকক অৱগত কৰাই এই একমুখী মূল
উদ্দেশ্য।

অসমৰ পাঠকসকলক অৱগত কৰি গোট হৈছে ক্ষেত্ৰ ভিত্তিক
চৰ্ম্মীয়, গতিকে অসমত বিভিন্ন চৰ্ম্মীয় ক্ষেত্ৰ ভিত্তিক যোগসাজী
যিটো গাঁওগাঁও সন্মিলনক ক্ষেত্ৰ ভিত্তিক অৱশ্যসন্মিলন হিচাপে নিৰ্ধাৰণ
কৰিছে, গতিকে এই সন্মিলনৰ মূলৰ ব্যৱস্থা বিষয়ে পাঠকক জ্ঞাত
কৰাৰে হৈছে ক্ষেত্ৰ ভিত্তিক অৱশ্যসন্মিলনৰ মূল উদ্দেশ্য।

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মোহনগাঁও বুদ্ধি পোজোনি দেৱালয় ভাঙি কুলক অপচয় চিন্তায় আলোচনা
কৰাৰ পাছত এই দেৱালয় গুলক অ-স্বত্বপৰ চৰকাৰ চৰকাৰী আৰু কি চৰকাৰ
আঁচনী নৈদে চাক বিপ্লৱমণ কৰি চালে দেখা যায় যে দেৱালয় স্থল
অন্ধুৱ পুজাৰী অকলে আৰু আনুষ্ঠানিক ওখল কৰ্মীৰে বিশেষ গ্ৰাণ্টৰে কলত
অক্লিৱিট হৈ আদ, গটকে আৰু অন্ধুৱ ভাঙি পুনে জোঁদে আলোচনা কৰি
চৰকাৰী গুৰি অ-পুৱ কৰি বিশেষ ভাৱে অ-স্বত্বপৰ কৰি স্বৰূপ টেট। এই
জোঁত অন্ধুৱ চৰকাৰ কি চৰকাৰ পদাৰ্থপ নৈদে জোঁত অন্ধুৱা চিঙা কৰি
লগা কৰা, গটকে এই পৰিচ জোঁত অন্ধুৱা কৰি স্বৰূপ টেট।

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Age Specific Distribution of Population in Bahona Area



Guide : Reema Rabha

Prepared by :

**Pallabi Saikia
Shamima Yasmin
Dipsikha Bora
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**Principal
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**TDC Third Semester
Department of Economics
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Year : 2016**


**HoD, Department of Economics
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- ❖ Introduction
- ❖ Objective
- ❖ Methodology
- ❖ Result and Discussion
- ❖ Conclusion
- ❖ Reference
- ❖ Acknowledgement

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INTRODUCTION:-

In developing country, the economic development is also depending upon their age structure of population. Classification of people according to age is called age structure. Age structure of a population refers to the number of people in different age groups. It is important to study age structure of population to relate and study the work efficiency, social status, education, occupational patterns of the people. A larger size of the population in the age group of 15-60 years indicates the chances of having a large work force in the country. If the percentage of working population of a country is higher, then it can be stated that the country is in favourable stage of economic development. It is not favourable, if the number of children in the population, that is, the dependency ratio is higher. Similarly, a growing population in the age group 60 plus indicates greater expenditure on the care of the aged and it is somehow burden to the government. The more is the population of age group less than 15 and more than 60, the less is economic efficiency in the country particularly in primary sector dependent country like India.

Therefore, the types of age structure have a direct influence on the future of a nation. Since both sides, old

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RESULT AND DISCUSSION...

From the following table, it is seen that the above objectives are fulfilled.

Area Indicator	Parameter	Social groups			
		Gen	OBC	MUS	SC
HH expenditure	Average	2746.67	1715.48	2231.59	1148.89
	CV	65.57	50.35	52.10	31.05
Male & female both	Average	37.45	35.38	37.78	28.90
	CV	14.59	15.27	18.98	16.84
Male age	Average	43.62	42.43	37.87	28.95
	CV	32.34	22.10	22.36	26.50
Female age	Average	37.52	32.70	40.81	29.78
	CV	22.80	26.63	21.12	20.81
life expectancy	Average age	78.07	83.60	76.53	74.07
	% death in total	100	100	100	100
Life expectancy Male	Average age	78.38	85.33	77.50	69.44
	% death in total	53.33	80	53.33	60
Life expectancy Female	Average age	77.71	76.67	75.43	81
	% death in total	46.67	20	46.67	40

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দৈনন্দিন জীৱনত বিজ্ঞাপনৰ ভূমিকা
- যোৰহাট জিলাত এক ক্ষেত্ৰভিত্তিক অধ্যয়ন



তত্ত্বাবধায়ক : ড° বফিক আহমেদ

প্ৰস্তুতকৰ্তা :
মেঘাশ্ৰী ভূঞা
পূজা শইকীয়া
পল্লবী পেঙ


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ষষ্ঠ বার্ষিক, অর্থবিজ্ঞান বিভাগ
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পাতনি :- বিজ্ঞাপনে মানৱ জীৱনত বিভিন্ন ক্ষেত্ৰত জ্ঞান আহৰণ কৰাত সহায় কৰে।

মানৱ জীৱনৰ বিকাশৰ প্ৰণালী শুদ্ধ হৈ উঠিলে, তেওঁলোকে কি ক্ষমতা বা বাল্যে, তেওঁলোকে কি কামোৰ বা জোতা পিন্ধিব লাগে বা বাল্যে ইত্যাদি জ্ঞানত সহায় কৰে।

কিছুমান সামাজিকভাৱে সচেতন হৈ, বিজ্ঞাপনসমূহে মানৱক কেনেদৰে প্ৰভাৱিত কৰিব পাৰিব পাৰে, তেওঁলোকে বহুদূৰৈলৈ বৰ্তমান জীৱন-বিহীন কৰি বঢ়ি আছে। তেওঁলোকে বিজ্ঞাপনসমূহে বাস্তৱিক আচল প্ৰতিফলিত কৰিব পাৰে।

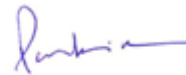
বৰ্তমান সমস্যা বিজ্ঞাপন আমাৰ জীৱনত প্ৰতি ক্ষেত্ৰত সন্নিৱিষ্ট হৈ আছে। এই বিজ্ঞাপনসমূহে বিভিন্ন সামাজিক চৰিত্ৰৰ বিজ্ঞাপন সমূহ প্ৰদৰ্শন কৰিছে। যেনে- বেটিং, ছফ্টৱেৰ ব্যৱহাৰ, অন-লাইন বিজ্ঞাপন ইত্যাদি। বিভিন্ন সামাজিক ক্ষেত্ৰত বিজ্ঞাপনৰ প্ৰভাৱত তেওঁলোকে উৎসাহিত হৈছে। আমাৰ সমস্যা হৈছে কৰাৰ বাবে মানৱক আকৰ্ষণ কৰাৰ। বিজ্ঞাপন সমূহে কেৱল আকৰ্ষণ কৰাৰ আহিলা নহয় বৰঞ্চ বিজ্ঞাপনৰ দ্বাৰা প্ৰচাৰিত তথ্য কমেই নহয়।

কিছুমান বিজ্ঞাপনৰ দ্বাৰা জীৱনত বেয়া প্ৰভাৱ পৰাও দেখা যায়। যেনে- কিছু বিজ্ঞাপনে মানৱ জীৱনত বৰ্ণ, মনোভাৱ ইত্যাদি ক্ষেত্ৰত প্ৰতি প্ৰভাৱিত কৰিছে। ইয়াৰ ফলত আমাৰ কিছু ক্ষেত্ৰত বিজ্ঞাপনে মানৱৰ জীৱনত প্ৰভাৱ পৰাও দেখা যায়। যেনে- বেটিং, ছফ্টৱেৰ ব্যৱহাৰ, অন-লাইন বিজ্ঞাপন ইত্যাদি। বিভিন্ন সামাজিক ক্ষেত্ৰত বিজ্ঞাপনৰ প্ৰভাৱত তেওঁলোকে উৎসাহিত হৈছে। আমাৰ সমস্যা হৈছে কৰাৰ বাবে মানৱক আকৰ্ষণ কৰাৰ। বিজ্ঞাপন সমূহে কেৱল আকৰ্ষণ কৰাৰ আহিলা নহয় বৰঞ্চ বিজ্ঞাপনৰ দ্বাৰা প্ৰচাৰিত তথ্য কমেই নহয়।

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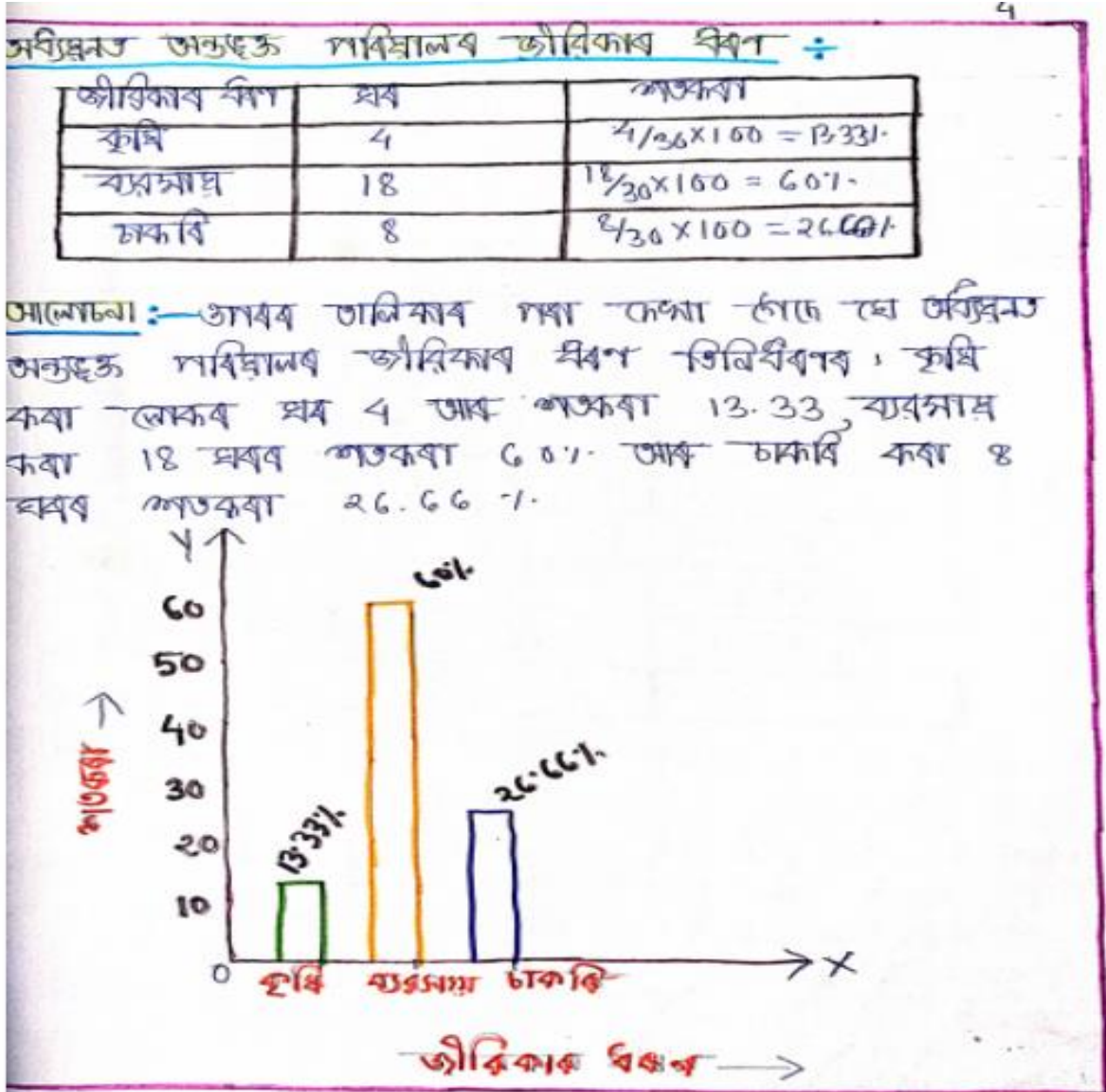


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অসমৰ গোলাঘাট জিলাৰ প্ৰসংগত চাহ বাগানৰ
মহিলা কৰ্মীসকলৰ জীৱন নিৰ্বাহৰ
এক ক্ষেত্ৰভিত্তিক অধ্যয়ন



তহাবধায়ক : বীমা বাভা

প্ৰস্তুতকৰ্তা : স্বতুপৰ্ণা দত্ত
বন্দী নাথ
সূৰজ পাটিৰ


Principal
Bahona College

পঞ্চম বান্ধাযিক, অৰ্থবিজ্ঞান বিভাগ
বাহনা মহাবিদ্যালয়, ২০১৭ চন।


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আমতনি

চাহ উদ্যোগ আমাৰ বৃহৎ হাতৰ নিৰ্দেশা-স্বীকৃতি
উদ্যোগ। ভাৰতবৰ্ষৰ উত্তৰত চাহ উৎপাদনৰ হেতু
আমাৰ ক্ষমতা আছে। আমাৰ আৰ্থনীতিত চাহ উদ্যোগ
অতি গুৰুত্বপূৰ্ণ স্থান দখল কৰি আছে। আমাৰ
ভাৰতবৰ্ষৰ মুঠ চাহ উৎপাদন ৬৪% আৰু উত্তৰ
পূৰ্বাঞ্চলত চাহ উৎপাদনৰ হেতু আমাৰ ৯৯%
বসতিগত জনসংখ্যা আছে। আমাৰ উৎপাদিত ৭৫%
চাহ বসতিগত জনসংখ্যা হয়। আমাৰ উৎপাদিত চাহ
মজিদ্ধা বা আমাৰ চাহ উৎপাদন বুলি জনে জনে কয়
নহয়। আমাৰ চাহ-গাৰত যিদৰে কোটি কোটি টকা ব্যয়
কৰি আমাৰ জীৱনত তেনে পোতা হয়; কিন্তু সেইদৰে
আমাৰ উৎপাদিত চাহৰ বসতিগত জনসংখ্যা
আমাৰ চাহ-গাৰত কতি আশংকা হয়। আমাৰ
বৃহৎ আৰু উত্তৰ আমাৰ চাহৰ কেন্দ্ৰস্থি বুলি
আমাৰ লগত আহিছিল।

চাহহেতি আমাৰ কিয়া ভাৰতবৰ্ষত নতুন। ইতিমধ্যে
লোকসকলেই ইয়াৰ আমাৰ দেশত প্ৰৱৰ্তন কৰে। ইয়াৰ
জীৱনত চাহৰ বুলি কোৱা হয় যদিও আমাৰ ইতিমধ্যে
ইয়াৰ আমাৰ ইতিমধ্যে। ভাৰতবৰ্ষৰ উত্তৰত আমাৰ বসতিগত
জনসংখ্যা চাহৰ চাহৰ আৱিষ্কাৰ কৰে। এই জনসংখ্যা
আমাৰ চাহৰ আমাৰ দেশত চাহৰ চাহৰ চাহৰ
চাহৰ বুলি গণ্য কৰা হয়। বৰ্তমান আমাৰ চাহৰ
জীৱনত আমাৰ ৩২.১১ হাজাৰ হেক্টৰ আৰু আমাৰ
মুঠ চাহৰ উৎপাদন ৬১৬ নিম্বুত কিলোগ্ৰাম।

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আমৰাৰ গাঁৱ উদ্যোগ আধাৰত হাইলিট কৰ্মী সকলৰ আঁহ
তালিকা :

দেখা দিয়া গাঁৱ উদ্যোগত হাইলিট কৰ্মী সকলৰ আঁহ
পুৰুষাৰ্থকৈ আঁহক । তলত এয়াৰ তালিকাৰ দ্বাৰা ইয়াৰ
দেখুওৱা হৈছে —

আমৰাৰ হাইলিট কৰ্মী সকলৰ আঁহ

বৰ্ষ	দৈনিক গাঁৱ উদ্যোগত হাইলিট কৰ্মী সকলৰ আঁহ			
	পুৰুষ	হাইলিট	মিষ্ট আঁহ	মুঠ
১	২	৩	৪	৫
১৯৯৮	২৮৮২৮৭	২৮০০৩৮	৩৭৩৯৯	৫৮৮৭৯৮
১৯৯৯	২৯২৩২৩	২৮৮৭৯৮	৩৭৯০৮	৫৯৮৯৯৮
২০০০	২৯৩৮৮৮	২৭০৮৯৯	৩৮৯৮৮	৫০২৮৮৮
উপৰত ২০০০	৫৭০২৮৭	৫৯৩৮৭৯	৮৮২৮৭	১২০০৮৮

তালিকাৰ দ্বাৰা দেখা গৈছে যে আমাৰ গাঁৱ পুৰুষ
আঁহ হাইলিটৰ আঁহ আধাৰত ইয়াৰ , তলত পুৰুষাৰ্থকৈ
হাইলিটৰ আঁহ গাঁৱ উদ্যোগত আঁহক ।

তালিকাৰ মিষ্ট আঁহ আধাৰত দেখুওৱা হৈছে ।
মিষ্ট আঁহ আধাৰত গাঁৱ আধাৰত , পুৰুষাৰ্থকৈ
আঁহ দিয়া , তলত দিয়া কৰ্মী ইয়াৰ কৰ্মীৰ
ই হৈছে ।

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বংদৈ অঞ্চলত বাজহুৰা বিতৰণ ব্যৱস্থা
- এক ক্ষেত্ৰভিত্তিক অধ্যয়ন



তত্ত্বাবধায়ক : বীমা বাভা

প্ৰস্তুতকৰ্তা :
প্ৰিয়ংকা বৰা
সংকল্পিতা বৰা
নবজ্যোতি শইকীয়া


Principal
Bahona College

তৃতীয় বাৰ্ষিক, অৰ্থবিজ্ঞান বিভাগ
বাহনা মহাবিদ্যালয়, ২০১৬ চন।


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A Project-work/Fieldwork Based Learning Provides Useful Avenues for Students to Learn in an Immersive, Experiential and Participative Manner

Introduction

ভেতৰত সাজুৱা বিচৰন ব্যৱস্থা বিশ্বস্ত ডিভেচন সৰ্ব্বমুখী ক্ষমতাৰী প্ৰাদ্য বিচৰন ব্যৱস্থা। এই ব্যৱস্থা ভেতৰ ক্ষমতাৰ প্ৰায়ক মন্ত্ৰালয়, প্ৰাদ্য ভাষা-সাজুৱা বিচৰনৰ দ্বাৰা প্ৰতিষ্ঠা দিছিল। ১৯৭৩ চনত ভাৰতীয়া মুম্বাইত ভাৰতীয় কৰ্মী এই ব্যৱস্থা আৰম্ভণিৰ কালত বিলাতীকৈ ছাৰুণ শাৰিক্যৰ ২০ জনক ইয়াৰ সমুখীন পৰিচালনা হয়। কৰ্মজীৱীৰ ক্ষমতাৰ জৰিয়তে ই দুখীয়া লোকসকলকৈ অভ্যন্তৰীণ প্ৰাদ্য ভাষা বিচৰন কৰে। এই ব্যৱস্থাত বিচৰন কৰা ভাষাসমূহ হ'ল গুৱাহাটী, চাৰ্ভী, বোকা, কুৰাণি আদি।

ভেতৰত প্ৰাদ্য মন্ত্ৰালয়ে সাজুৱা বিচৰন ব্যৱস্থা প্ৰতিষ্ঠাপন কৰে। কুৰাণীৰ ভাষা-কৰ্মজীৱীৰ ক্ষমতাৰ সমুখীনত এই বিচৰনৰ প্ৰায়কসমূহ প্ৰতিষ্ঠাপিত হয়। ইয়াৰ প্ৰাদ্য মুম্বাইৰ ক্ষমতাৰী ব্যৱস্থাপনা বিলাতী-ভাষা কৰে।

সাজুৱা বিচৰন ব্যৱস্থাই এটি দুখীয়াসকলক প্ৰতিষ্ঠাপন কৰি প্ৰায়ক সমুখীন প্ৰায়ক প্ৰায়ক। ভেতৰত এটি দুখীয়াসকলক প্ৰায়ক প্ৰায়কৰ স্তৰ বিচৰন কৰাত সমুখীনপ্ৰায়ক সমুখীন হ'ল লগত দিছে। ভেতৰত বিচৰন ব্যৱস্থাই প্ৰাদ্য সমুখীন প্ৰায়ক

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[illegible]

Commodity	APL	BPL	AAV
Wheat (Per kg.)	7.50	13.60	7.00
Rice (Per kg.)	8.60	5.20	13.00
Sugar (Per kg.)	non entitled	12.50	13.60
Kerosene oil (Lit)	9.08	9.08	9.08

ଅର୍ଥସ୍ଥାନ ଲକ୍ଷଣ:-

স্বাধীনতা বিচলন ব্যতীতই সুবিধা জাতিতে সমানে
উন্নয়ন কঠিনে নাই সেয়া নতীয়া কঠিনে হাফা

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Items	Total amount of consumption	Total PDS	Average consumption
Rice	1275	486	38.11%
Sugar	171	565	33.05%
Kerosene oil	135.5	121	89.29%
Atta	169	9	5.33%

[illegible]

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আলোচনাৰ বিষয়

বাহনা মহাবিদ্যালয়ৰ ছাত্র- ছাত্রী সকলৰ অর্থনৈতিক প্রেক্ষাপট
(বাহনা মহাবিদ্যালয়ৰ এক ক্ষেত্র ভিত্তিক অধ্যয়ন)



তত্ত্বাবধায়ক-

ড° বফিক আহমেদ
অর্থনীতি বিভাগ

প্রস্তুতকর্তা -

শ্রী বন্দনা ভূঞা
শ্রী বাজশ্রী দত্ত
শ্রী দেবশীষ দত্ত

পঞ্চম বার্ষিক, অর্থনীতি বিভাগ
বাহনা মহাবিদ্যালয়, ২০১৮ ।

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পাঠ্য :-

উচ্চ শিক্ষা লাভত বিভিন্ন কক্ষকে অলংকৃত পেলোহ ।
ভাৰ হিতকৃত প্ৰদৰ্শন কক্ষকলৈ ইলি অৰ্থনৈতিক
কক্ষক । অৰ্থনৈতিক কক্ষক সুলি কঙতে পৰিচালন বিনাক্ষ
অৰ্থনৈতিক অৱস্থাক বুজোৱা হয় । কক্ষক ঠেৰ শিক্ষা
লাভ কৰিবলৈ ইয়াতে বিভিন্ন দিশত প্ৰভাৱ উদ্ভূত
হয় । পাঠ্যক্ৰমৰ পক্ষ অৱস্থাক কৰি সম্ভাৱতঃ প্ৰভাৱ,
প্ৰেক্ষণিক ইত্যাদি ইত্যাদি । সেয়েহে বিভিন্ন অৱস্থান
অৱস্থান পৰিচালনা প্ৰদৰ্শন পাঠ্যক্ৰম যি কোনো এক
অৱস্থান অৰ্থনৈতিক অৱস্থান সেই অৱস্থান ঠেৰ শিক্ষা
হাৰলৈ নিৰ্দেশন কৰে । এনে এক উদ্দেশ্য অৱস্থান
কক্ষক বাহনা মহাবিদ্যালয়ৰ দ্বাৰা-দ্বাৰীৰ অৱস্থান
সকলৰ অৰ্থনৈতিক অৱস্থান ওপৰত অনুৰূপত
কৰিবলৈ ইয়াত অৱস্থান পৰিচালনা প্ৰদৰ্শন কৰা
হৈছে । ইয়াত অৱস্থান পৰিচালনা কক্ষক
অৱস্থান অৱস্থান অৰ্থনৈতিক অৱস্থান সন্মত
কক্ষক কৰা হৈছে । ইয়াত অৱস্থান পৰিচালনা
পৰিচালনা ইলি বাহনা মহাবিদ্যালয়ৰ দ্বাৰা-দ্বাৰী-
সকলৰ অৰ্থনৈতিক অৱস্থান সন্মত কক্ষক লাভ
কৰা অৱস্থান ইয়াত অৱস্থান ঠেৰ শিক্ষা সন্মত
কক্ষক পৰিচালনা কৰি পোৱা ।

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উদ্দেশ্য :-

- * বাহনা মহাবিদ্যালয়ৰ ছাত্ৰ-ছাত্ৰীসকলৰ অৰ্থনৈতিক অৱস্থা সম্পৰ্কে বুজ লোৱা
- * দৰিয়াৰ পাৰ্শ্বত শিক্ষা ব্যৱস্থা অৱস্থানৰ তথ্যপৰীক্ষা।
- * অৰ্থনৈতিক অৱস্থাৰ লগত ঋণ শিক্ষাৰ সম্পৰ্ক কি ভাৱে পৰিলক্ষিত কৰি চোৱা।

অধ্যয়ন পদ্ধতি :- বাহনা মহাবিদ্যালয়ৰ ছাত্ৰ-ছাত্ৰীসকলৰ অৰ্থনৈতিক অৱস্থা সম্পৰ্কে এক কামান্বিতা চলোৱা হয়। এই কামান্বিতাত শাহুজিৰা আদিত্য পদ্ধতিৰে ওচৰলৈ ছাত্ৰ-ছাত্ৰী নিৰ্বাচন কৰি তথ্য সংগ্ৰহ কৰা হয়। পূৰ্ব অঞ্চলত এখন অঞ্চল তালিকাৰ বিকিত নিৰ্বাচন ছাত্ৰ-ছাত্ৰী সকলৰ পৰা তথ্য সংগ্ৰহ কৰা হয় আৰু ইয়াৰ সন্নিবিষ্ট তথ্য "মাইক্ৰফাৰ্মট এপ্লিকেশ্যন অৱেয়াৰ" জৰিয়তে বিশ্লেষণ কৰা হয়। এই বিশ্লেষণত "জাতকৰ্মৰ গড়" নিৰ্ধাৰণ ইত্যাদি দৰে ফল পানীয়া-গিয়াৰ পদ্ধতি অনুসৰি কৰি ফলসমূহ সন্নিবিষ্ট কৰা হয়।

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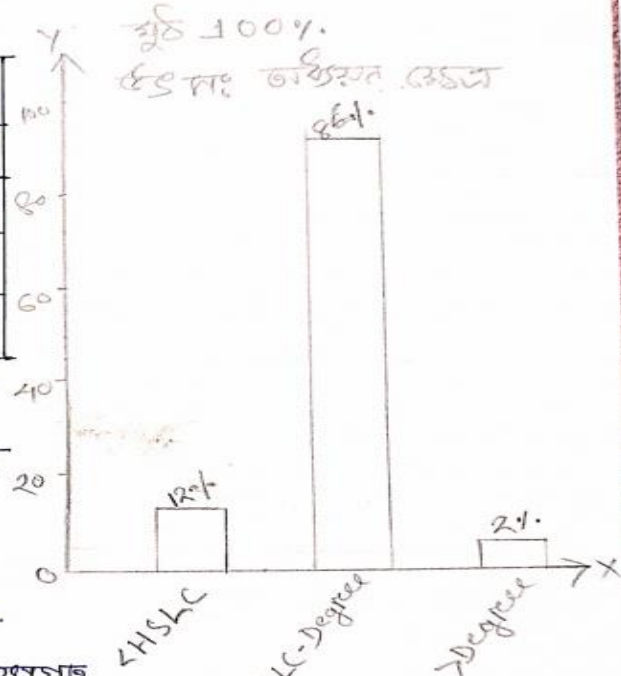
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তলোচনোৰ অধীনৰ শিতান সমূহ →

A) অৰ্থনৈতিক অন্তৰ্ভুক্তি হাৰ-হাৰী সফলতাৰ সৰ্বাধীনতা বিৱৰ্তন :-
তালিকা ২:- অৰ্থনৈতিক অন্তৰ্ভুক্তি হাৰী আৰু হাৰীসকলৰ -
 পৰিস্থিতিৰ সূচকীয় শিতানসমূহ অৰ্থনৈতিক ক্ষমতা হাৰ -

Level of HH Edu.	%
< HSLC	12.00
HSLC-Degree	86.00
> Degree	2.00
Total	100.00



ওপৰৰ তালিকাৰ-
 পৰ্যায় দেখা গৈছে যে সফলতা
 অৰ্থনৈতিক অন্তৰ্ভুক্তি হাৰী-হাৰী-
 সফলতাৰ H.S.L.C তলৰ শি
 শিতানসমূহ অৰ্থনৈতিক ক্ষমতা
 সূচকীয় ক্ষমতা হাৰ হৈছে
 12%। H.S.L.C-Degree শিতানসমূহ
 সফলতাৰ সূচকীয় ক্ষমতা হাৰ হৈছে 86%।
 >Degree-ৰ ওপৰৰ শিতানসমূহ অৰ্থনৈতিক
 ক্ষমতা হাৰ হৈছে 2%।

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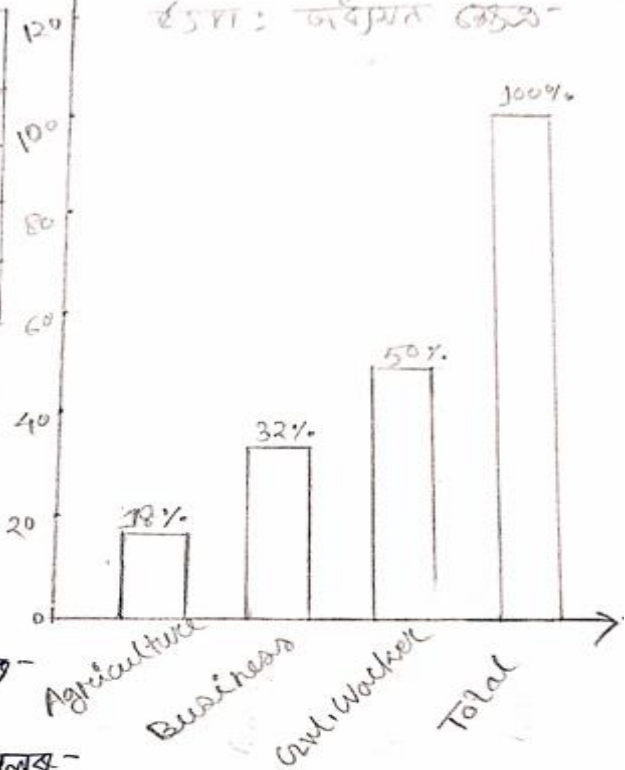
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তালিকা ২ঃ- অসমত অৰ্জিত হোৱা-দামীসকলৰ পৰিয়াল
বিলাকৰ- মূল জীৱিকাৰ ধৰণৰ প্ৰত্যেকৰ হাৰ -

Main Occupation	%
Agriculture	18.00
Business	32.00
Govt. Worker	50.00
Total	100.00

মুঠ : 100%.

ইয়াত : অৰ্জিত হোৱা-



ওপৰত তালিকাৰ
পৰা দেখা গৈছে যে
জমি অৰ্জিতৰ বাবে বাদি
সেৱা বাহনা মহাবিদ্যালয়ৰ
ছাত্র-ছাত্রী ৫০ জন - দাতা -
দামীৰ পৰিয়ালবিলাকৰ -
জিৱিত ১৪ অৰ্জিতৰ পৰিয়ালৰ -
মূল জীৱিকা হৈছে : কৃষি
বৃষ্টি ১ ৩২ অৰ্জিতৰ পৰিয়ালৰ -
মূল জীৱিকা হৈছে ব্যৱসায় আৰু বাকী ৫০ অৰ্জিতৰ
হৈছে চাকৰি চাকৰিয়াল ।

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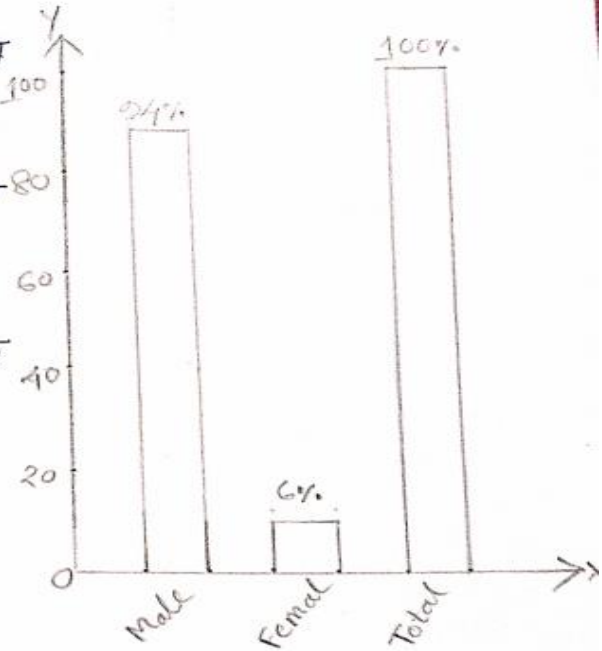
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তালিকা ৩ :- অর্থায়নৰ অন্তৰ্ভুক্ত ছাত্র-ছাত্রীসকলৰ শৈক্ষিক
বিলম্বৰ মূল্য ত্রিবিধৰ তথ্যিত থকা মন্তব্যৰ প্ৰত্যেক
হাৰ —

Person	%
Male	94.00
Female	6.00
Total	100.00

আলোচনা :- ওপৰৰ তালিকাৰ
পৰা দেখা গৈছে যে
আমি অর্থায়নৰ বাবে ছাত্র
লৈয়াৰ বাহনা মহাবিদ্যালয়ৰ
৫০ জন-ছাত্র ছাত্রীৰ
শিক্ষিক বিলম্বৰ তথ্যিত
১৫ ৰ মূল্য ত্রিবিধৰ তথ্যিত
থকা প্ৰত্যেকৰ প্ৰত্যেক
হাৰ হৈছে ৯৪% আৰু
ছাত্রীৰ প্ৰত্যেক হৈছে
৬% ।



মুঠ 100%
কেন : অর্থায়নৰ বাবে

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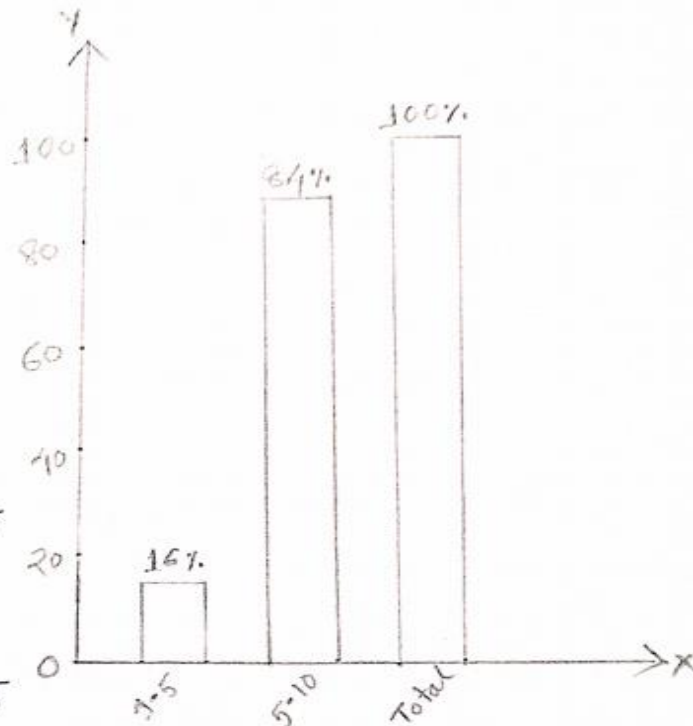
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তালিকা ১:- তথ্যসংগ্রহ অন্তর্ভুক্ত ছাত্র - ছাত্রী সংখ্যকৰ
পৰিচালন বিনামূল্যে মূল জীৱিকাত গড়ে দিওঁ
অন্তৰ্ভুক্ত সময় (ঘণ্টা)ৰ শতাংশ হাৰ -

Time (hours)	%
1 to 5	16.00
5 to 10	84.00
Total	100.00



মাল্যমোঃ- ওপৰত
তালিকাৰ পৰা দেখা
গৈছে যে মূল জীৱিকাত
দিওঁ 1-5 ঘণ্টা সময়
অন্তৰ্ভুক্ত কৰাৰ শতাংশ
হাৰ হৈছে 16%. অন্য
5-10 ঘণ্টা সময়
কৰাৰ শতাংশ হাৰ হৈছে
84%।

মুঠ 100%
উপস্থাপন কৰা

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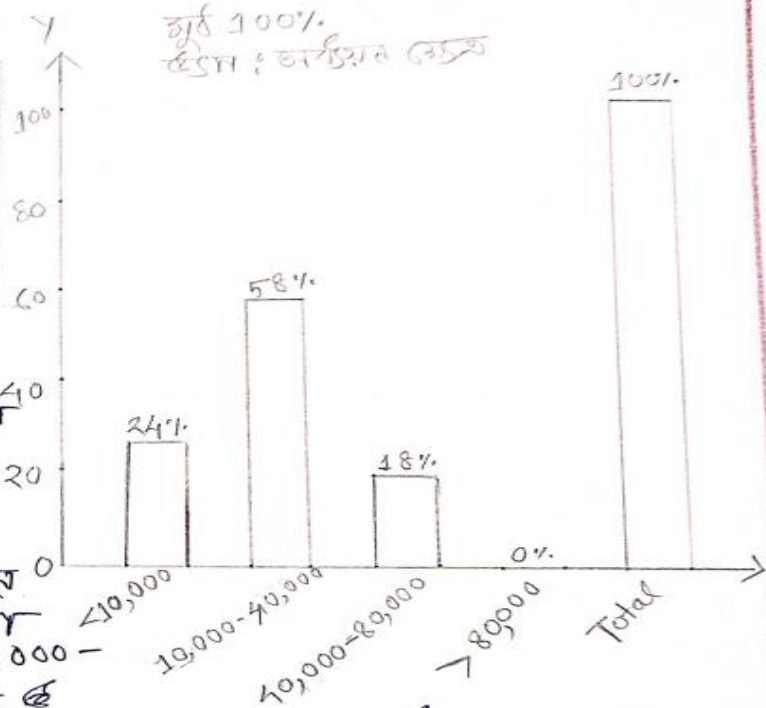
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তালিকা ৫:— অধ্যয়ন অন্তর্ভুক্ত ছাত্র-ছাত্রীসকলৰ পৰিয়াল
বিল্যকৰ মূল জীৱিকাৰ পৰা হোৱা মাহিলী উপাৰ্জনৰ
মাত্ৰতা হ'ল —

Income	%
<10,000	24.00
10,000-40,000	58.00
40,000-80,000	18.00
>80,000	0.00
Total	100.00



তালিকা ৬:— ওপৰৰ
তালিকাৰ পৰা দেখা
গৈছে যে পৰিয়াল
বিল্যকৰ 10,000
তলত মূল জীৱিকাৰ
পৰা মাহিলী উপাৰ্জন
হোৱা অমুখৰ মাত্ৰতা
হ'ল হৈছে 24%। 10,000-
40,000 টকা মাহিলী
উপাৰ্জন হোৱা অমুখৰ মাত্ৰতা হ'ল হৈছে 58%।
40-80 হাজাৰ টকা উপাৰ্জন হোৱা অমুখৰ মাত্ৰতা
হ'ল হৈছে 18%। অমুখ 80 হাজাৰৰ ওপৰত
মাহিলী উপাৰ্জন হোৱা অমুখৰ মাত্ৰতা হ'ল হৈছে 0%।
সুতৰাৰ পৰা দেখা গৈছে যে অমুখবিল্যক পৰিয়ালেই
হৈছে মৰ্যবাহী পৰিয়াল।

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তালিকা ৬ঃ— অর্থহীন অধ্যয়ন ছাত্র-ছাত্রীসকলৰ
পৰিচালনাবিলাকৰ পেশাৰা কৃষিকৰ্মৰ বিষয়ে
হাৰ —

Others Occupation	%
Agriculture	40.00
Business	8.00
Total	48.00

মুঠ 100%
উদাহৰণঃ অধ্যয়ন
কেন্দ্র

তালিকা ৭ঃ— জাতি অধ্যয়ন কৰি দেখিবলৈ পাইছে
মৈ জাতি বান্ধিলোহা হওক-জাত ছাত্র-ছাত্রীৰ
পৰিচালন বিলাকৰ জিহ্বা মাত ২৭ টা পৰিচালন
হৈ অৰ্থাৎ ৭৪% হৈ পেশাৰা কৃষিকৰ্মৰ লগত
জড়িত। ইয়াত পেশাৰা কৃষিকৰ্মৰ ক্ষেত্ৰত
পৰিচালনৰ মতকথা হাৰ হৈছে ৭০% অৰ্থাৎ
৪৭% হৈছে ব্যৱসায়ৰ লগত জড়িত।

তালিকা ৮ঃ— অর্থহীন অধ্যয়ন ছাত্র-ছাত্রীসকলৰ
পৰিচালনাবিলাকৰ পেশাৰা কৃষিকৰ্মত জড়িত
মহান্যৰ মতকথা হাৰ —

Person	%
Male	30.00
Femal	30.00
Total	60.00

উদাহৰণঃ অধ্যয়ন কেন্দ্র

তালিকা ৯ঃ— জাতি অধ্যয়ন কৰি দেখিবলৈ পাইছে
মৈ পৰিচালনাবিলাকৰ পেশাৰা কৃষিকৰ্মত জড়িত
থকা মহান্যৰ মতকথা হাৰ সমাৰ। অৰ্থাৎ পেশাৰা
কৃষিকৰ্মত জড়িত পুৰুষৰ মতকথা হাৰ হৈছে ৩০%
অৰ্থাৎ মহিলাৰ মতকথা হাৰ হৈছে ৩০%।

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তালিকা ৪ :- অর্থায়নৰ অন্তৰ্ভুক্ত দায়-দায়ীমতলৰ পৰিস্থাল
বিলম্বিত উপকৰণৰ জীৱিকাৰ দিল্লী অঞ্চলৰ কৰা সময়
অভ্যাসৰ হাৰ —

Time (hours)	%
1-2	38.00
3-4	10.00
Total	48.00

মুঠ ১০০%
উপায়: অধ্যয়নৰ ক্ষেত্ৰ

অনুলোচনা :- ওপৰৰ তালিকাৰ পৰা দেখা গৈছে যে
উপকৰণৰ জীৱিকাৰ দিল্লী ১-২ ঘণ্টা সময় অঞ্চল
কৰা পৰিস্থালৰ অভ্যাসৰ হাৰ হৈছে ৩৮%। অঞ্চল
৩-৪ ঘণ্টা সময় অঞ্চল কৰা পৰিস্থালৰ অভ্যাসৰ
হাৰ হৈছে ১০%। উপকৰণৰ জীৱিকাৰ দিল্লী অঞ্চল কৰা
সময়ৰ মুঠ অভ্যাসৰ হাৰ হৈছে ৪৮%।

তালিকা ৫ :- অর্থায়নৰ অন্তৰ্ভুক্ত দায়-দায়ীমতলৰ পৰিস্থাল
বিলম্বিত উপকৰণৰ জীৱিকাৰ পৰা হোৱা মাহিলী উপকৰণৰ
অভ্যাসৰ হাৰ —

Income	%
< 1,000	8.00
1,000 - 2,500	28.00
2,500 - 5,000	12.00
Total	48.00

মুঠ ১০০%
উপায়: অধ্যয়নৰ ক্ষেত্ৰ

অনুলোচনা :- ওপৰৰ তালিকাৰ পৰা দেখা গৈছে যে
পৰিস্থালবিলম্বিত ১,০০০ তলত উপকৰণৰ জীৱিকাৰ পৰা
মাহিলী উপকৰণৰ অভ্যাসৰ হাৰ হৈছে ৮%। ১,০০০-২,৫০০
ৰৈ মাহিলী উপকৰণৰ অভ্যাসৰ হাৰ হৈছে ২৮%
অঞ্চল ২,৫০০-৫,০০০ ৰৈ মাহিলী উপকৰণৰ অভ্যাসৰ
হাৰ হৈছে ১২%।

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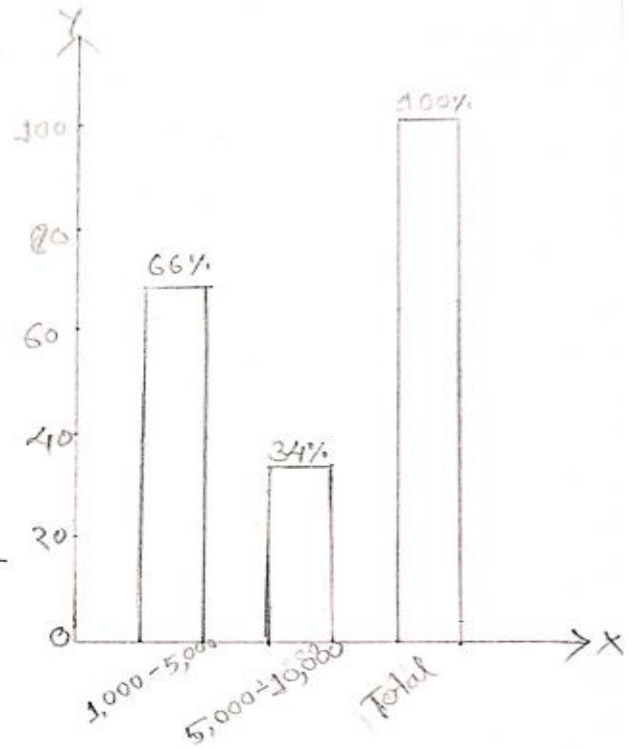
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তালিকা 10 :- অর্থায়নৰ অন্তৰ্ভুক্ত দায়-দায়ী পৰ্যায়ৰ
পৰিসংখ্যক লৈকে লৈকে ইয়াতলৈ প্ৰায়োগিক, শিক্ষা
অনুষ্ঠানৰ ক্ষেত্ৰত কৰা ব্যয়ৰ প্ৰত্যেক প্ৰকাৰৰ দায় —

1) প্ৰায়োগিক ক্ষেত্ৰত ব্যয়

Expenditure	%
1,000 - 5,000	66.00
5,000 - 10,000	34.00
Total	100.00

তালিকা 10 :- অর্থায়নৰ
পৰিসংখ্যক লৈকে ইয়াতলৈ
পৰিসংখ্যক বিলাকৰ- ভিতৰত
অন্তৰ্ভুক্ত প্ৰায়োগিক
ক্ষেত্ৰত 1,000 - 5,000 টকা
ব্যয় কৰে 66% লৈকে
অনুষ্ঠান 5,000 - 10,000 টকা
প্ৰায়োগিক ক্ষেত্ৰত ব্যয়
কৰে 34% লৈকে।



মুঠ 100%
কৈ : অর্থায়নৰ ক্ষেত্ৰত

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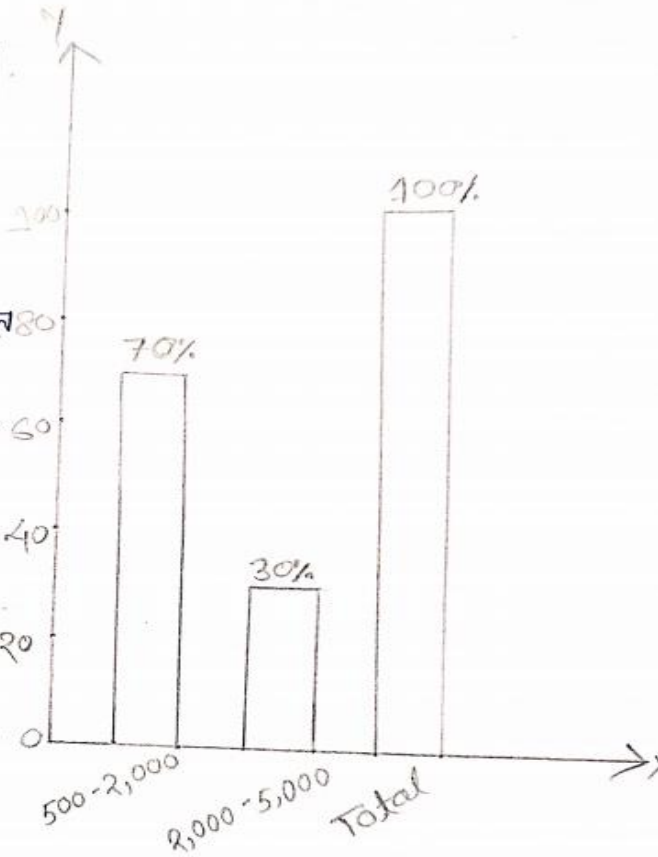
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(ii) শিক্ষা ক্ষেত্রে ব্যয়

Expenditure	%
500-2,000	70.00
2,000-5,000	30.00
Total	100.00

অনুলোচনা :- আমি অধ্যয়ন
কর্তি দেখিবলৈ পাঠিয়ে
যে ছাত্রীরা শিক্ষা ক্ষেত্রে
৫০০ টাকার ওপর ২,০০০
টাকা ব্যয় করে ৭০%
পরিসরে অর্থ ব্যয়
৩০% পরিসরে শিক্ষা
ক্ষেত্রে অর্থ ৩,০০০
টাকার ওপর ৫,০০০ টাকা
পর্যন্ত ব্যয় করে।



মুঠ ১০০%
উপঃ অধ্যয়ন ক্ষেত্রে

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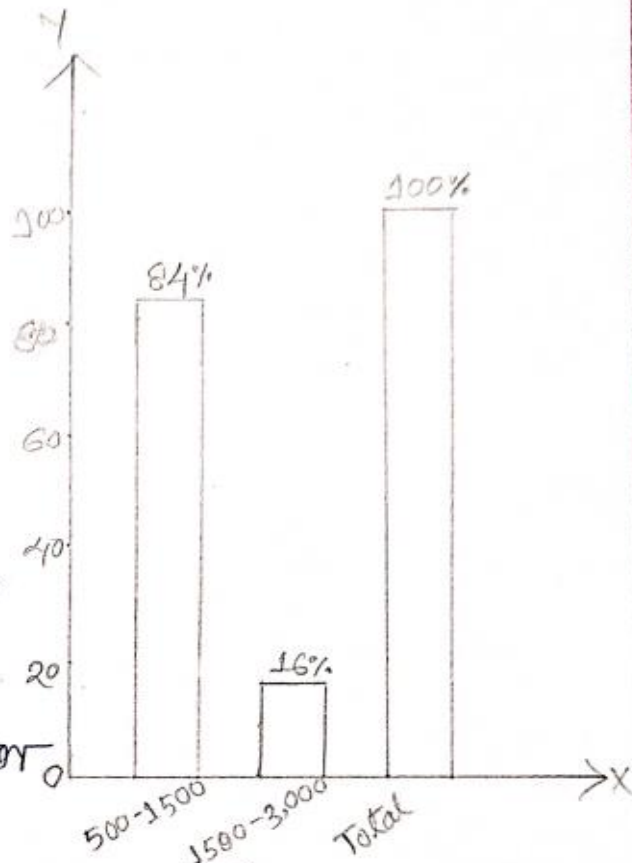


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iii) ব্যয় ক্ষেত্রে ব্যয় :

Expenditure	%
500-1,500	84.00
1,500 - 3,000	16.00
Total	100.00

অনোন্মোদন :- তালিকাৰ
পৰা দেখা গৈছে যে
সৰ্বমুঠ ৪৪% ব্যয়
ক্ষেত্ৰত ৫০০ টকাৰ পৰা ১,৫০০
টকা ব্যয় কৰে। বাকী
১৬% ক্ষেত্ৰত ১,৫০০ টকা
পৰা ৩,০০০ টকা পৰ্যন্ত ব্যয়
কৰে।



মুঠ ১০০%

উৎস : অধ্যয়ন ক্ষেত্ৰ

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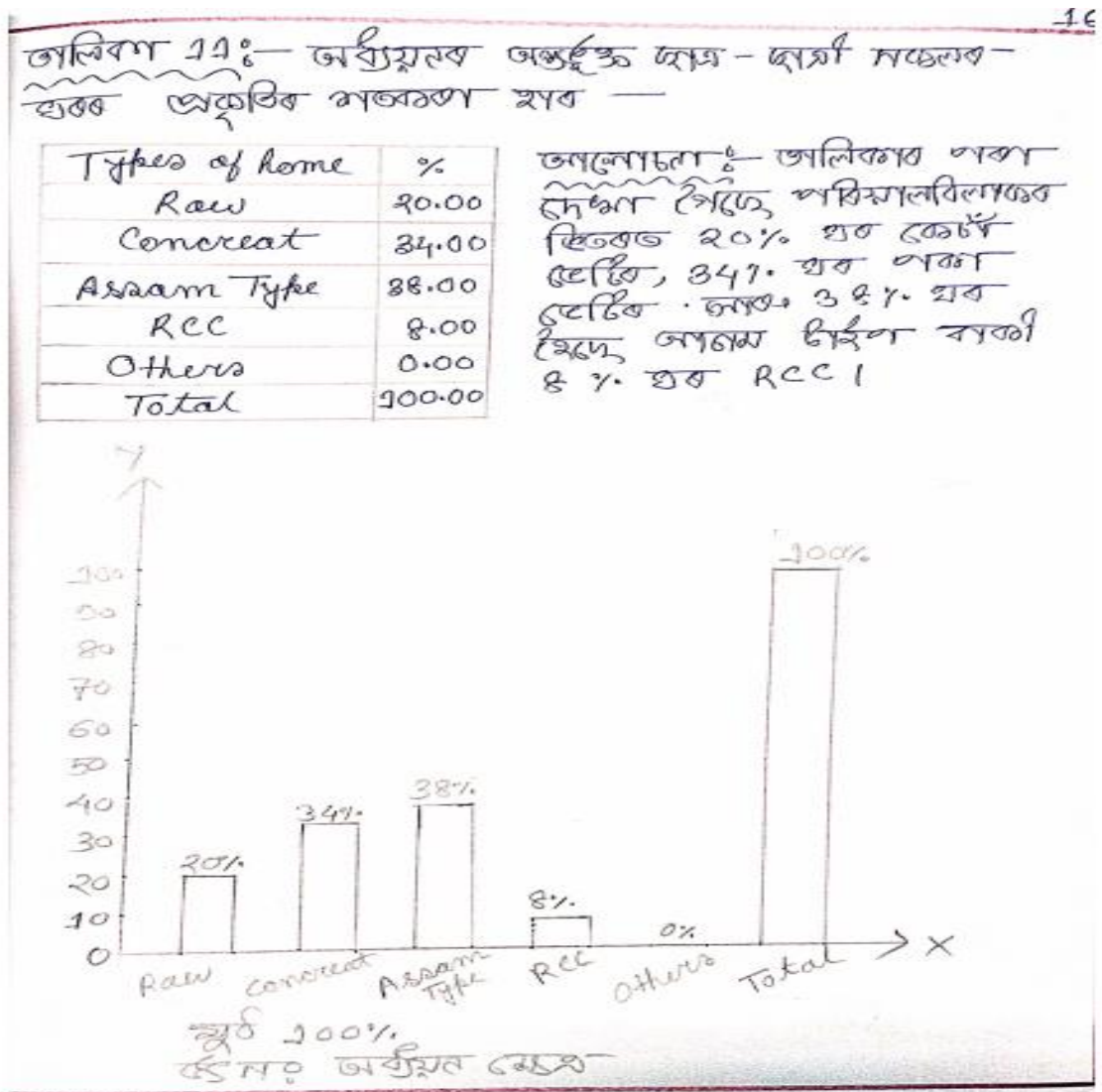


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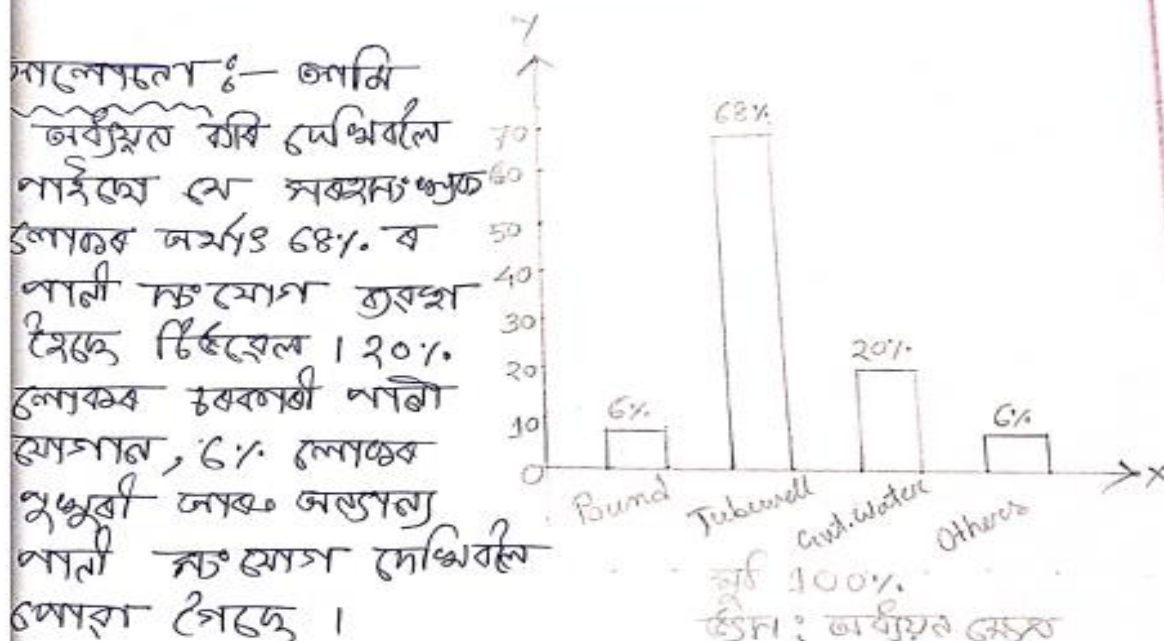


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Water Connectivity %	
Pound	6.00
Tubewell	68.00
Cunt. Water	20.00
Others	6.00
Total	100.00



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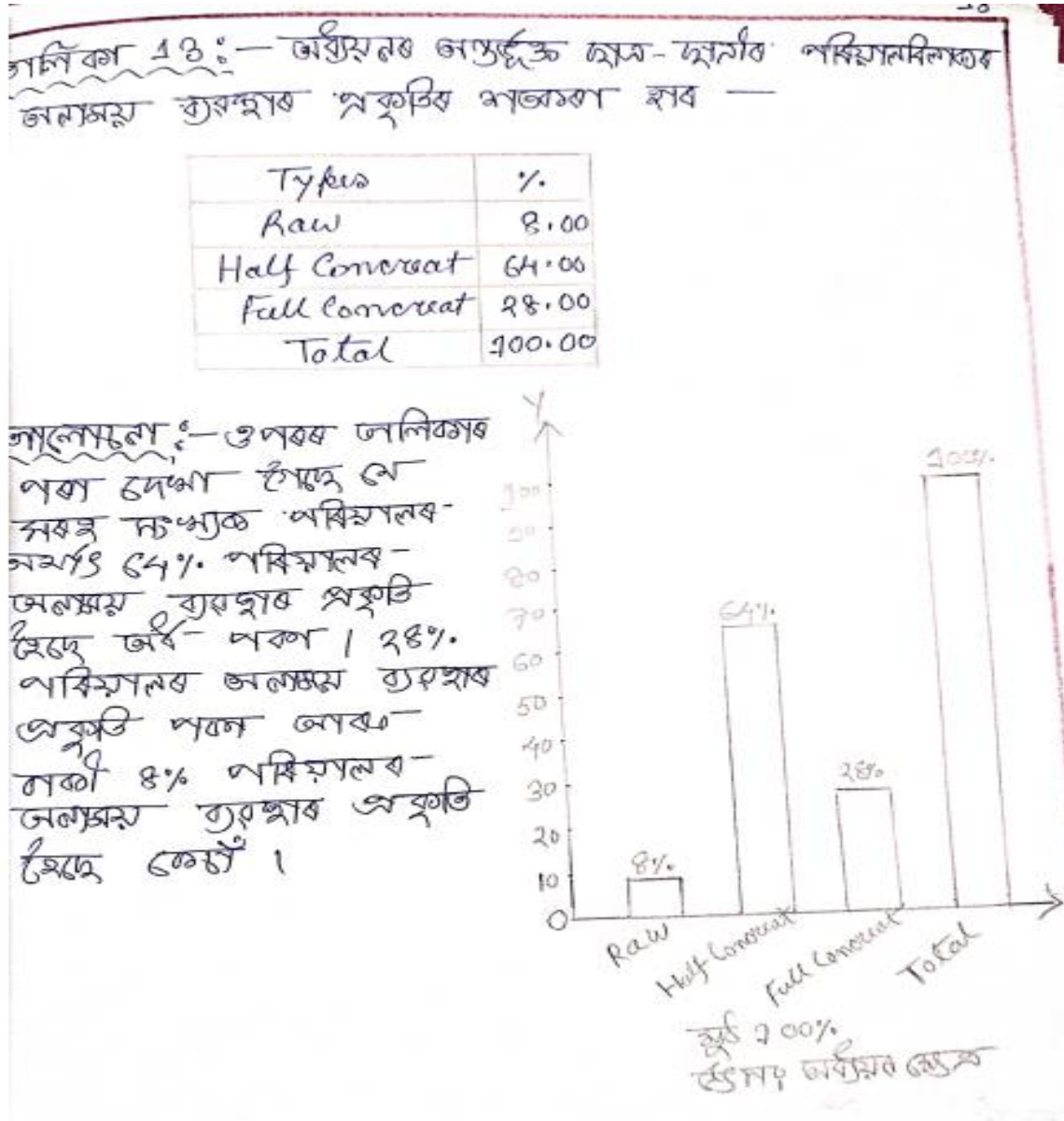


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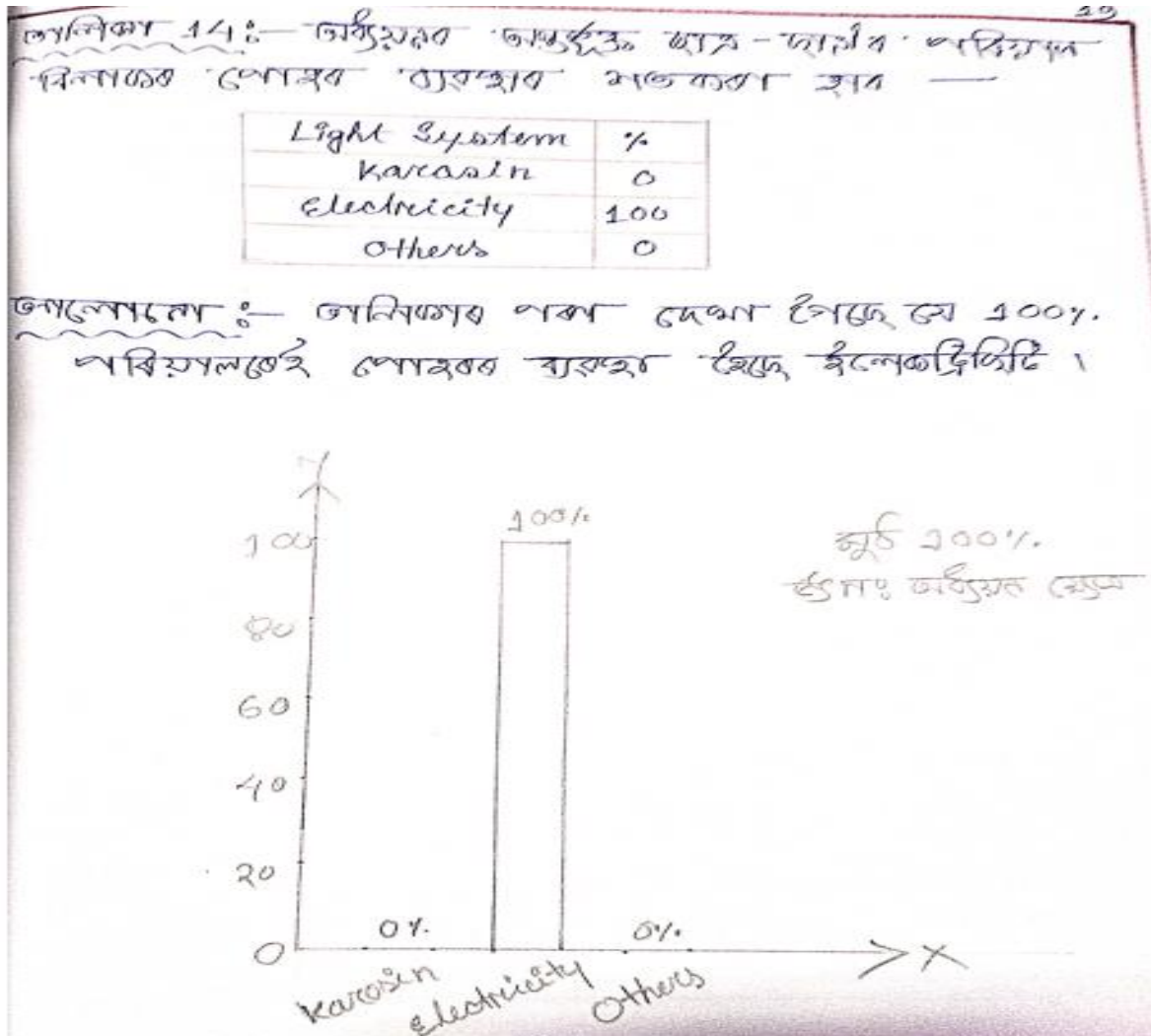


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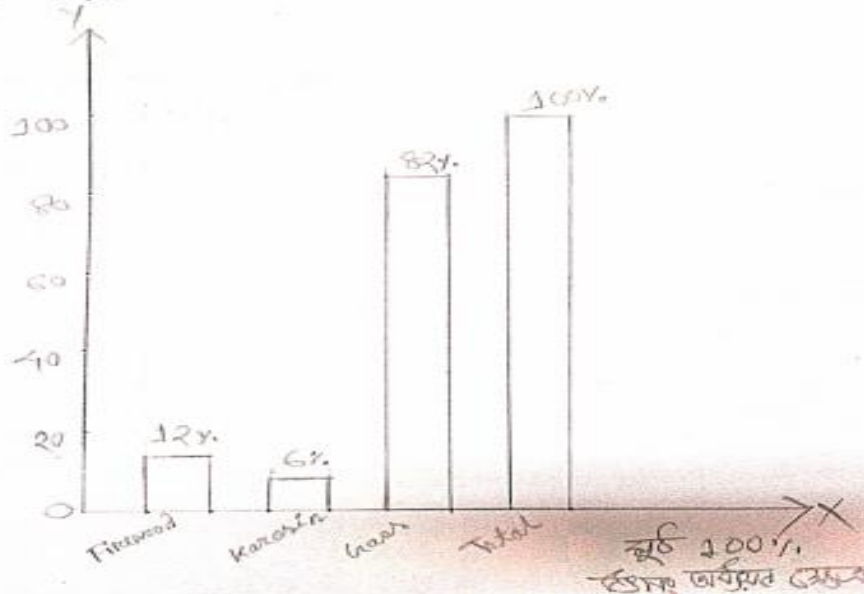
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তালিকা 15 :- অৰ্থহীন তত্ত্ব অনুসন্ধান - বাহনা মহাবিদ্যালয়
পৰিচালক - ইন্সটিটিউট ব্যৱস্থাৰ ক্ষেত্ৰত

Provision of fuel	%
Fire Wood	12.00
Kerosin	6.00
Glass	82.00

তালিকা :- তালিকা অনুসন্ধান কৰি দেখিবলৈ পাইছে যে
৪২% লোকেই ইন্ধন ব্যৱস্থা স্থাপন কৰিবলৈ পৰৱৰ্তী
কৰ্ম মণ্ডল বৰ্তমান সময়ত ৫% লোকে ইন্ধন ব্যৱস্থা
কৰি ৩% লোকে ইন্ধন ব্যৱস্থা কৰা দেখিবলৈ
পোৱা গৈছে।



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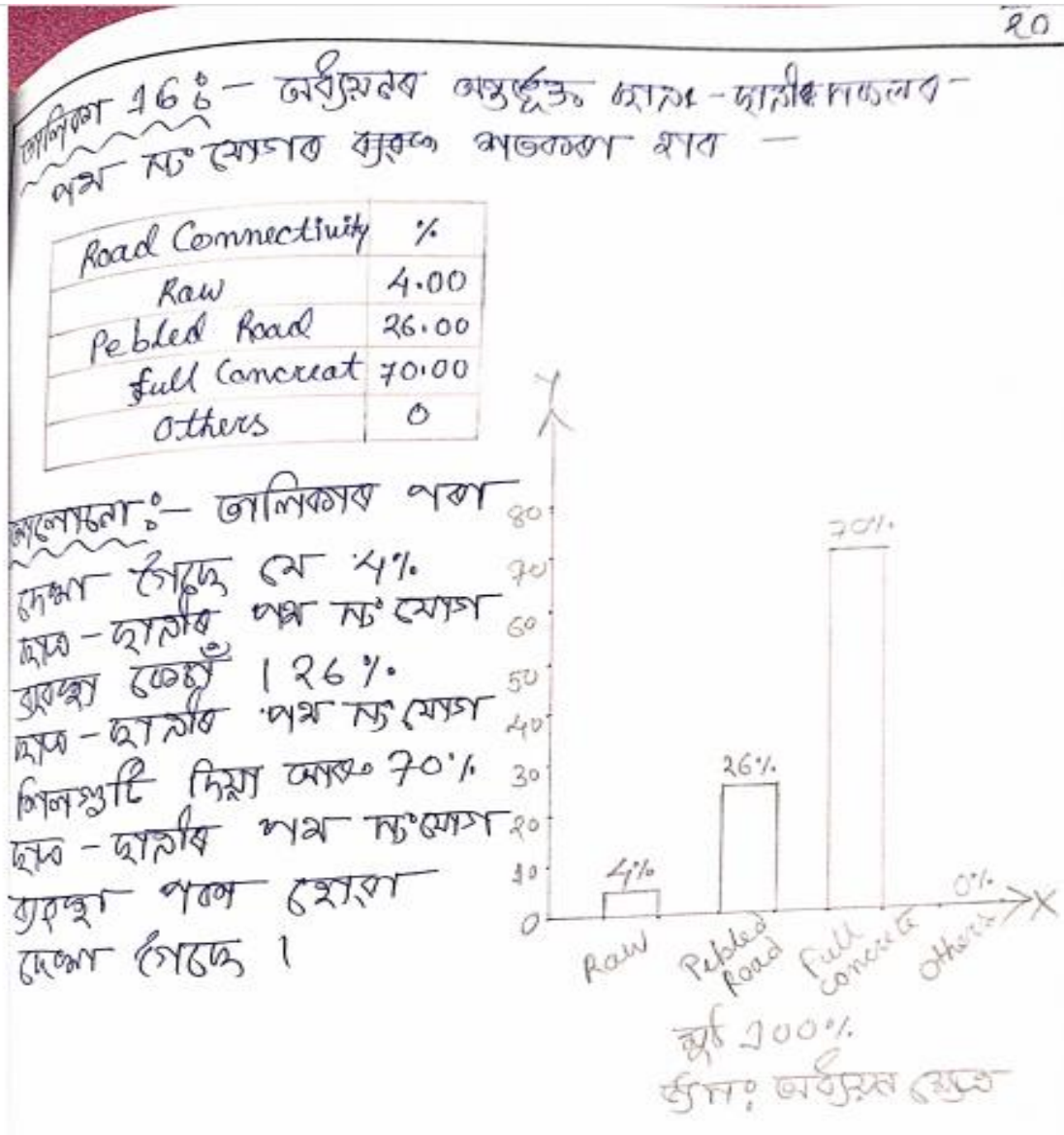


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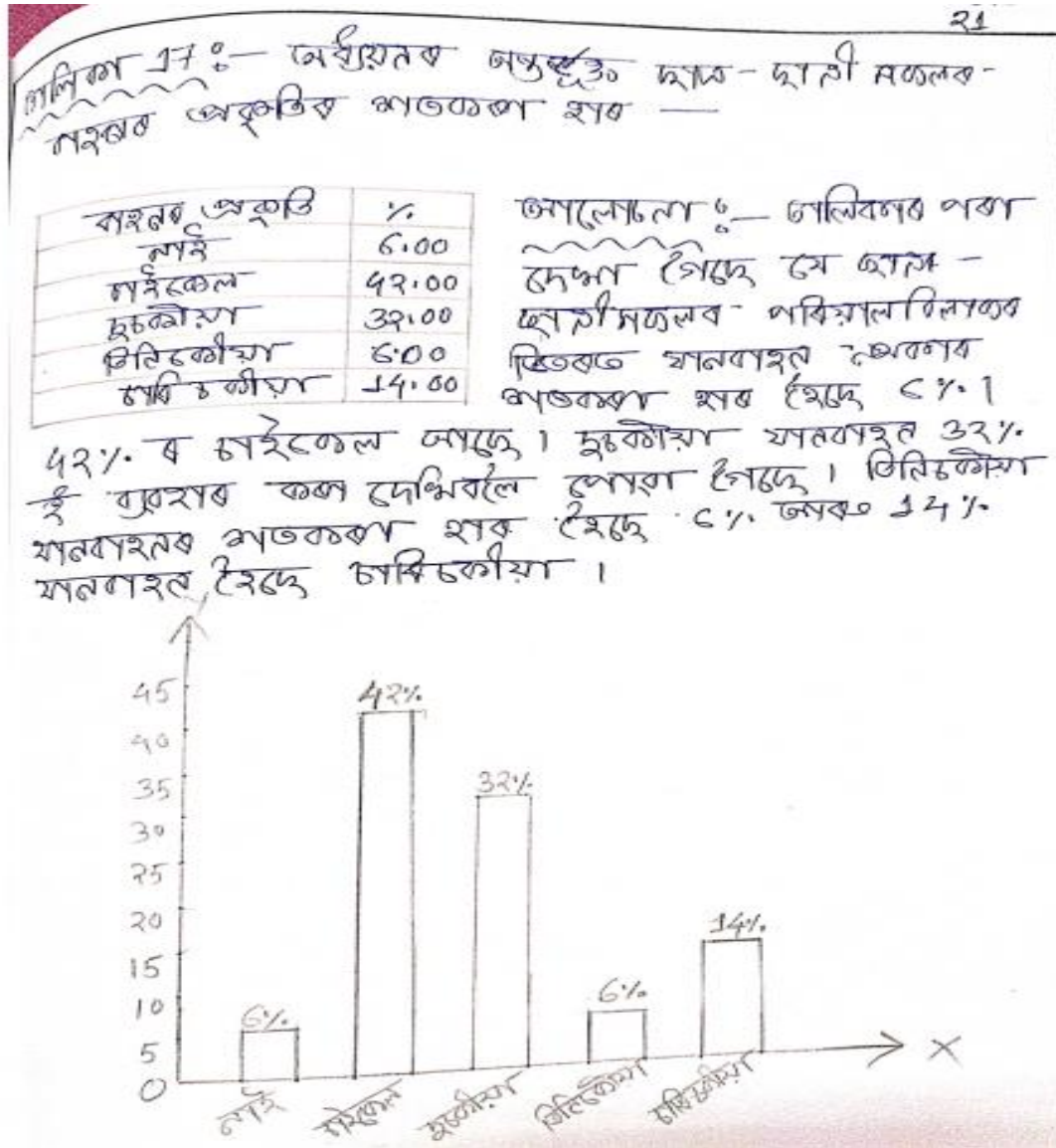


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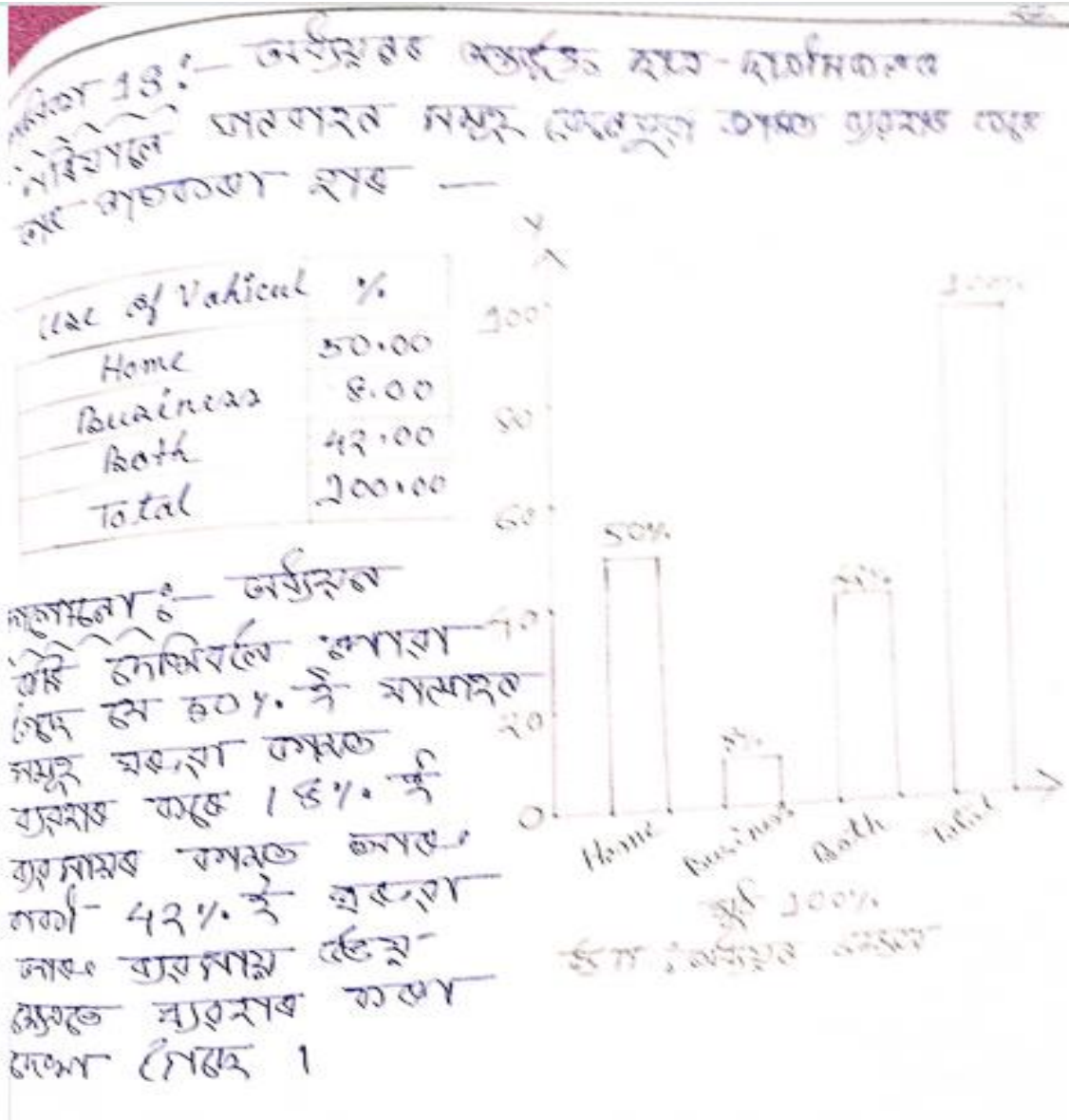


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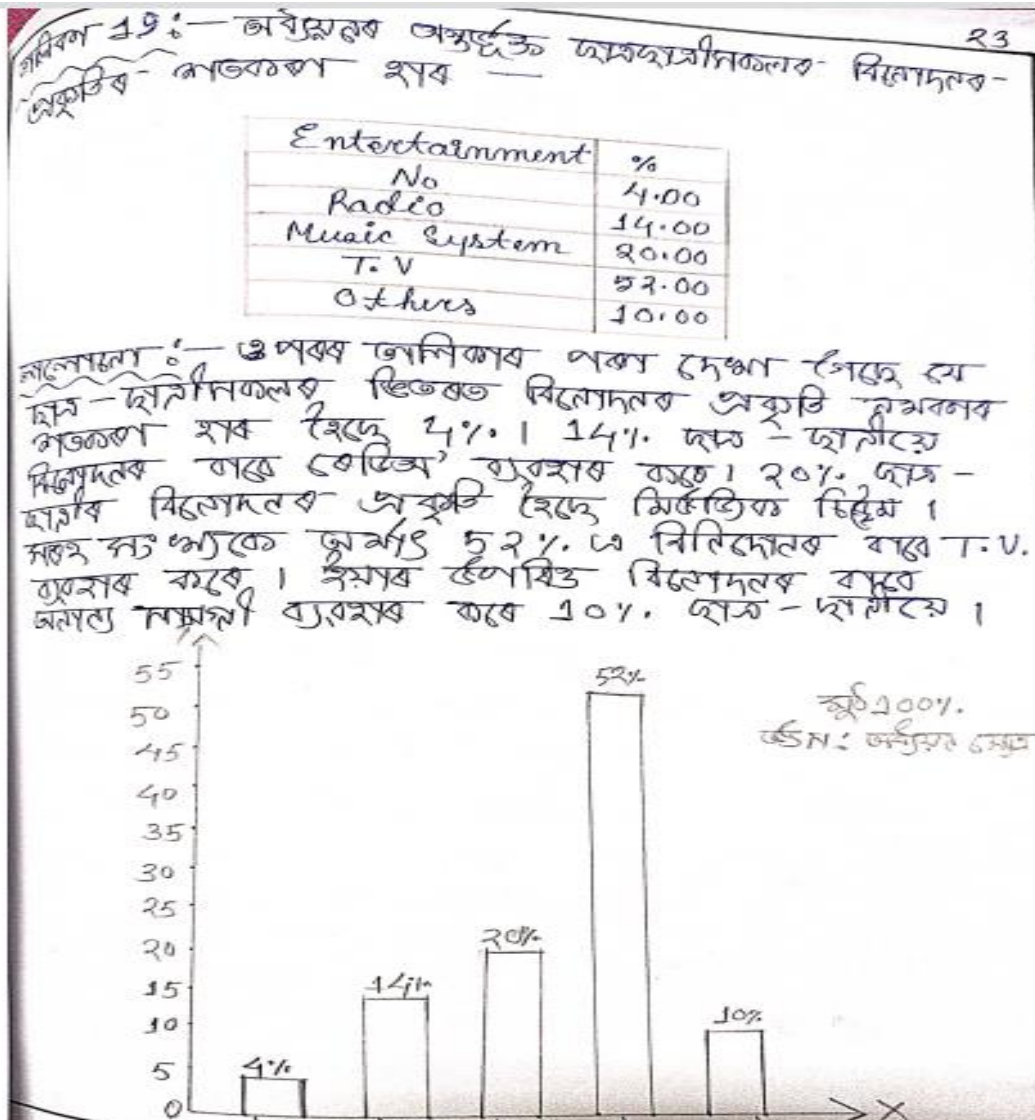


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বাহনা মহাবিদ্যালয়ৰ ছাত্র-ছাত্রীৰ অর্থনৈতিক পরিস্থিতি
ওপৰত যি অধ্যয়ন চলোৱা হৈছিল তথ্য পতা আৱিষ্কাৰ
নিম্নলিখিত উপলব্ধি হৈছে। সেইবোৰ হৈছে —
১) অর্থনৈতিক অৱস্থা দেখিবলৈ পাইছে যে ছাত্র-ছাত্রীৰ
পৰিচালনা ১২% অধিকৰিয়ে H.S.L.C পাছ কৰা
লগী। H.S.L.C - Degree পাছ কৰা মুঠৰ অৱস্থা
হৈছে ৪৫%। Degree ওপৰত শিক্ষাগত
অৱস্থা থকা মুঠৰ অৱস্থা হৈছে ২%।
২) মহাবিদ্যালয়ৰ ছাত্র-ছাত্রীৰ পৰিচালনাবিলাকৰ স্কুল
কীৰ্ত্তিগত পুৰস্কাৰ অৰ্জন অথবা দেখা গৈছে
অৰ্থাৎ ৩৫% পুৰস্কাৰ স্কুল কীৰ্ত্তিগত অৰ্জন হৈ আছে।
কিন্তু অর্থনৈতিক অৱস্থা দেখিবলৈ পাইছে যে পুৰস্কাৰ
উল্লেখ তেনেই কম সংখ্যক অৰ্থাৎ ৫% মানহলে
স্কুল কীৰ্ত্তিগত অৰ্জন আছে।
৩) অর্থনৈতিক অৱস্থা দেখিবলৈ পাইছে যে মহাবিদ্যালয়ৰ
আয়বিলোত ছাত্র-ছাত্রী অৰ্জন পৰিচালনা
৪) অধ্যয়নৰ পতা দেখা গৈছে যে মহাবিদ্যালয়ৰ
ছাত্র-ছাত্রীসকলৰ পৰিচালনাবিলাকে প্ৰেমাৱেশৰ
ফ্ৰেণ্ড অফিচ - ৫ হাজাৰৰ পতা ১০ হাজাৰ টকা
অৰ্জন কৰা দেখিবলৈ পোৱা গৈছে। কিন্তু
শিক্ষা ফ্ৰেণ্ড অফিচ - ২-৫ হাজাৰ টকাৰে
কম দেখা গৈছে।

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১) বাহনা মহাবিদ্যালয়ৰ দ্বাৰা - জাৰ্মী বজাৰ - পৰিষ্কাৰ
বিলাকৰ প্ৰতিভা নগৰ জোৰহাৰে পানী সঞ্চয়ণ
আৰু (হিউ) দৰাওলা। কিন্তু দেখাযোৱা হৈছে সঞ্চয়ণ
পানী জোৰহাৰে ব্যৱহাৰ জোৰহাৰে সঞ্চয়ণ
যথেষ্ট ক্ষতি হয়। সেয়েহে দ্বাৰা - দহিৰা পৰিষ্কাৰ
কৰিলাকে কিন্তু পানী সঞ্চয়ণৰ ক্ষেত্ৰত সুন্দৰ
দিয়া হৈছে।

২) জাৰ্মী জৰ্জৰতৰ পৰা দেখিবলৈ গাইছো যে
বাহনা মহাবিদ্যালয়ৰ দ্বাৰা - জাৰ্মী বজাৰ - পৰিষ্কাৰবিলাকৰ
প্ৰতিভা 100% পৰিষ্কাৰৰে জোৰহাৰে ব্যৱহাৰ
হৈছে ইলেকট্ৰিফিকেশ্বন।

৩) জৰ্জৰতৰ পৰা দেখা গৈছে যে নগৰ
জোৰহাৰে ইলেকট্ৰিফিকেশ্বনৰ বাবে গাৱঁ জোৰহাৰে
জোৰহাৰে যদিও বৰ্তমান নগৰ জোৰহাৰে ইলেকট্ৰিফিকেশ্বন
পৰি জোৰহাৰে জোৰহাৰে ব্যৱহাৰ জোৰহাৰে
জোৰহাৰে গৈছে।

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সমস্যাঃ—

এখন দেশৰ অৰ্থনৈতিক কাৰকৰ লগত ইচ্ছা শিক্ষাৰ এক জড়প্ৰান্ত নহয়। অৰ্থনৈতিক কাৰকৰ সুলি কালে দাবীৰূপে প্ৰতিদানৰ অৰ্থনৈতিক অৱস্থাৰ বুজা যায়। বিভিন্ন অৰ্থনৈতিক অৱস্থাৰ প্ৰেক্ষাপট পাইছে যে দেশৰ এক অৱস্থাৰ অৰ্থনৈতিক অৱস্থাই সেই অৱস্থাৰ ইচ্ছা শিক্ষাৰ হাৰকৈ নিৰ্ভৰশীল কৰে। দেশৰ অৰ্থনৈতিক অৱস্থা বৈকল্যৰ ইলোহে ইচ্ছা শিক্ষা লাভ কৰিব পৰা যায়। অৱস্থাৰ কাৰকত কৰিলে পালে ইচ্ছা শিক্ষা লাভ কৰিলেই অৰ্থনৈতিক অৱস্থা বৈকল্যৰ হয়। দেশৰ ইচ্ছা শিক্ষা লাভ কৰাৰ মানত বহুতো লোকে কৰি চাৰুপৰ লাভ কৰে। মনোবৃত্তি অৰ্থনৈতিক অৱস্থা সুলি হোৱাৰ পৰা মুক্তি হয়।

এই অৰ্থনৈতিক পৰা পাই এটা কৰ্মৰ কাৰিকৰী হৈছে যে দেশৰ দাবীৰূপে ইচ্ছা শিক্ষা লাভৰ পৰি অৱস্থাৰ হয় অৱস্থাৰ অৱস্থাকৰ্মৰূপে ইচ্ছা শিক্ষা লাভ কৰিব লাগে। দেশৰ ইচ্ছা শিক্ষা লাভ কৰি ভৱিষ্যতে দেশ-দাবীৰূপে দেশৰ অৰ্থনৈতিক অৱস্থা বৈকল্যৰ কৰ্মত নহয়কৈ ইব

প্ৰস্তাৱ সমলঃ—

১. ৮° অৱস্থাত অৰ্থনৈতিক কাৰকৰ প্ৰেক্ষাপটে ইচ্ছাৰ অৰ্থনৈতিক, ক্ষমতাৰ মূল্য
২. ইচ্ছাৰূপে দেশৰ ইচ্ছাৰূপে হয়।

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**A Field Report
on
Hoollongapar Gibbon Sanctuary**



Submitted to -

Department of Zoology
Bahona College

Submitted by -

Name — Centwin Gogoi
Class — B.Sc 1st Semester
Roll No — 119
Session — 2021-22

Head,
Dept. of Zoology
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CERTIFICATE

I hereby recommended that the field study report in Hoolongapar Gibbon Wild life sanctuary , Mariani , carried out under the supervision of our teacher to the accepted as full filling the requirement of the syllabus of B.Sc. 1st semester , Zoology(major) under Dibrugarh University . The report in my opinion is worthy for its approval guidance teacher.

ACKNOWLEDGEMENT

At the point of completion of our field study report I would like to pay my sincere thanks to our honourable teachers DR. Bikaramaditya Bakalial , DR. Parbin Iraqui ,DR. Rupjyoti Saikia and DR. Swarupa Bhattacharjee who accompanied us on this field study and for providing us valuable guidance and constructive criticism throughout the course if completion of our report . Finally I would like to thank my friends for their help to fulfil this field study report successfully.

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INTRODUCTION

The Hoollongapar Gibbon Sanctuary, formerly known as the Gibbon Wildlife Sanctuary or Hoollongapar Reserve Forest is an isolated protected area of evergreen forest located in Assam, India. The sanctuary was officially constituted and renamed in 1997. Set aside initially in 1881, its forests used to extend to the foothills of the Patkai mountain range.

Since then, the forest has been fragmented and surrounded by tea gardens and small villages. In the early 1900s, artificial regeneration was used to develop a well-stocked forest, resulting in the site's rich biodiversity. The Hoollongapar Gibbon Sanctuary contains India's only gibbons the hoolock gibbons, and Northeastern India's only nocturnal primate-the Bengal slow loris.

The upper canopy of the forest is dominated by the Hollong tree (*Dipterocarpus macrocarpus*), while the Nahar (*Mesua ferrea*) dominates the middle canopy. The lower canopy consists of evergreen shrubs and herbs.. The habitat is threatened by illegal logging, encroachment of human settlements, and habitat fragmentation.

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HISTORY

The Hoollongapar Gibbon Sanctuary derives from a patch of forest once part of the Hollongapar Reserve Forest in the civil district of Jarhat in Assam, India. Set aside as a Reserve Forest" (RF) on 27 August 1881, it was named after its dominant trees species, Hoollong or Dipterocarpus macrocwpus. At the time, it was considered an "integral part" of the foothill forests of the Patkai mountain range. Although the sanctuary is currently completely surrounded by tea gardens and a few small villages, it Used to connect to a large forest tract that ran to the state of Nagaland. The protected area started with 206 ha (0.80 sq mi) and then shrank in 1896 as sections were de-reserved. As tea gardens began to emerge between 1880 and 1920, and villages were established during the 1960s to rehabilitate people from Majuli and adjoining areas who had lost their lands to floods, the forest became fragmented and the reserve became isolated From the foothills.

Historically, sporadic evergreen trees covered the area along with Bojalbamboos (Pseudodactyum sp). In1924,artificial regeneration was introduced in an attempt to develop well-stocked, even-aged forest. These plantations Subsequently created a forest stocked with a rich variety of flora and fauna (biodiversity). During the 1900s, forest areas were added to the reserve, eventually

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totaling 2,098.62 ha (8.1sq mi) by 1997. However, the sanctuary remains fragmented into five distinct segment. On 30 July 1997, in notification no. FRS 37/97/31, the Sanctuary was constituted under the civil district of Jorhat and named it the "Gibbon Wildlife Sanctuary" after the only apes found in India : the hoolock gibbons (genus Hoolock). It is the only sanctuary India named after a gibbon due to its distinction for containing the densest gibbon populations in Assam. On 25 May 2004, the Assam Government renamed it as the Hoollongapar Gibbon Sanctuary" through notification no. FRP 37/97/20.



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FAUNA

The sanctuary has a very rich biodiversity and is home to the only apes in India, the western hoolock gibbon (Hoolock hoolock), as well as the only nocturnal primate found in the northeast Indian states, the Bengal slow lori (Nycticebus bengalensis). Other primates include the stump-tailed macaque (Macaca arctoides), northern pig-tailed macaque (Macaca leonina), eastern Assamese macaque (Macaca assamensis), rhesus macaque (Macaca mulatta), and capped langur (Trachypithecus pileatus). Also found at the sanctuary are Indian elephants, tigers (Panthera tigris), leopards (Panthera pardus), jungle cats (Felis chaus), wild boar (Sus scrofa), three types of civet, four types of squirrel, and several other types of mammal. At least 219 species of bird and several types of snake are known to live in the park.

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FLORA

The upper canopy consists mostly of *Dipterocarpus macrocarpus* rising 12 to 30 m (39 to 98 ft) and having straight trunks. Other species found in the top canopy include *Sam* (*Artocarpus chaplasts*), *Amari* (*Anoorawalichi*), *Sop as* (*Mcheliai* spp), *Bhelu* (*Tetramels mudiflora*), *Udal* (*Sterculia villosa*) and *Hingori* (*Castanopsis* spp), *Nahar* (*Mesua forrea*) dominates the middle canopy with its spreading crown, casting fairly heavy shade over a wide area. Other species that make up the middle canopy include *Bandordima* (*Dysoxylum procerum*), *Dhuna* (*Conarimresi uiferur*), *Bhomora* (*Terminalia bellerica*), *FulGomari* (*Gmelina* sp.), *Bonbogri* (*Pterospermum lanceafolium*), *Morhal* (*Vatica lanceafolia*), *Selleng* (*Sapium baccatum*), *Sassi* (*Aqualaria golacha*), and *Otenga* (*Dillenia indica*).

A variety of evergreen shrubs and herbs make up the lower canopy and ground layers. The most common of these are *Dolu bamboo* (*Teinostachyum dullooa*) *Bojal bamboo* (*Pseudostachyum polymorphum*), *Jengu* (*Calamus erectus*), *Jati bet* (*Calamus* spp), *Tora* (*Alpinia allughas*), *Kaupat* (*Phrynium imbricatum*), and *Sorat* (*Laportea cremulata*). *Bamboo* spp, and *Houka bet* (*Calamus* spp).

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CONSERVATION

The isolation of the park by numerous tea garden creates a geographic barrier for migrating animals. The growing populations of tea garden workers also threatens the habitat since many people rely on the forest for firewood, traditional medicine and food. Large quantities of leaves and grass are collected from the forest to feed cattle. During the rainy season, herbicides and pesticides from the tea garden wash through the sanctuary.

The tea garden are also used by elephant as a migration route to Nagaland, making them vulnerable to frequent poaching. Railway lines further divide the park, standing a single group of gibbon in the smaller fragment, illegal logging and encroachment by local people employed by the tea gardens degraded the habitat quality.

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CENSUS REPORT

According to a census conducted in 2010 by the Jorhat forest department, they recorded :

- 25 Bengal Slow Loris
- 41 Assamese Rhesus Macaques
- 33 Golden Langurs
- 75 Pig – Tailed Macaques
- 154 Capped Langurs
- 174 Stump tailed Macaques
- 95 Hoolock Gibbons

BIBLIOGRAPHY

The data of this field study report have been collected from the following source :

1. From office of Hollongapar Gibbon sanctuary.
2. Flora and Fauna from Wikipedia encyclopedia.
3. Various reference books.

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PHOTOGRAPH:-



way between Gibbon

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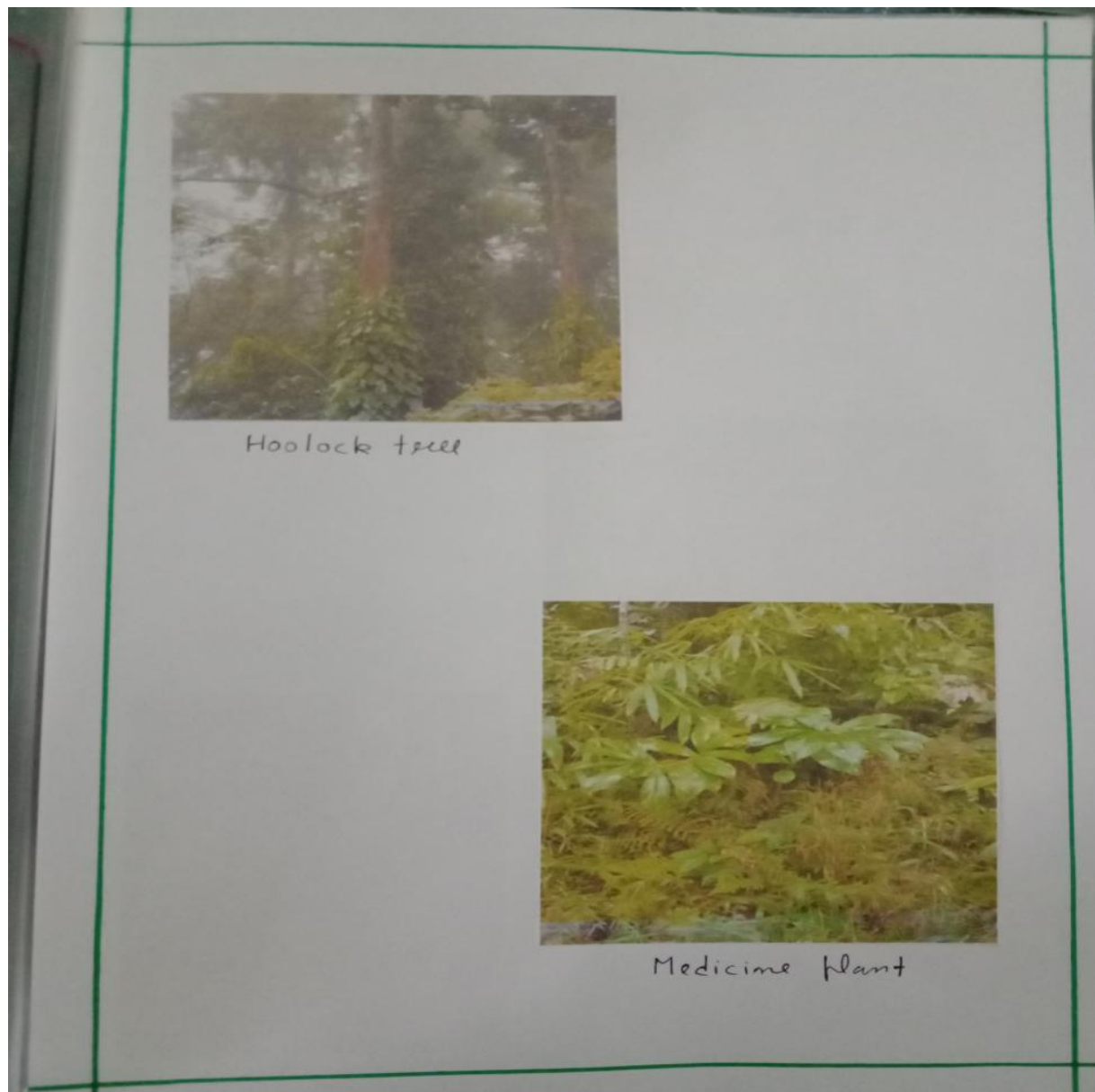



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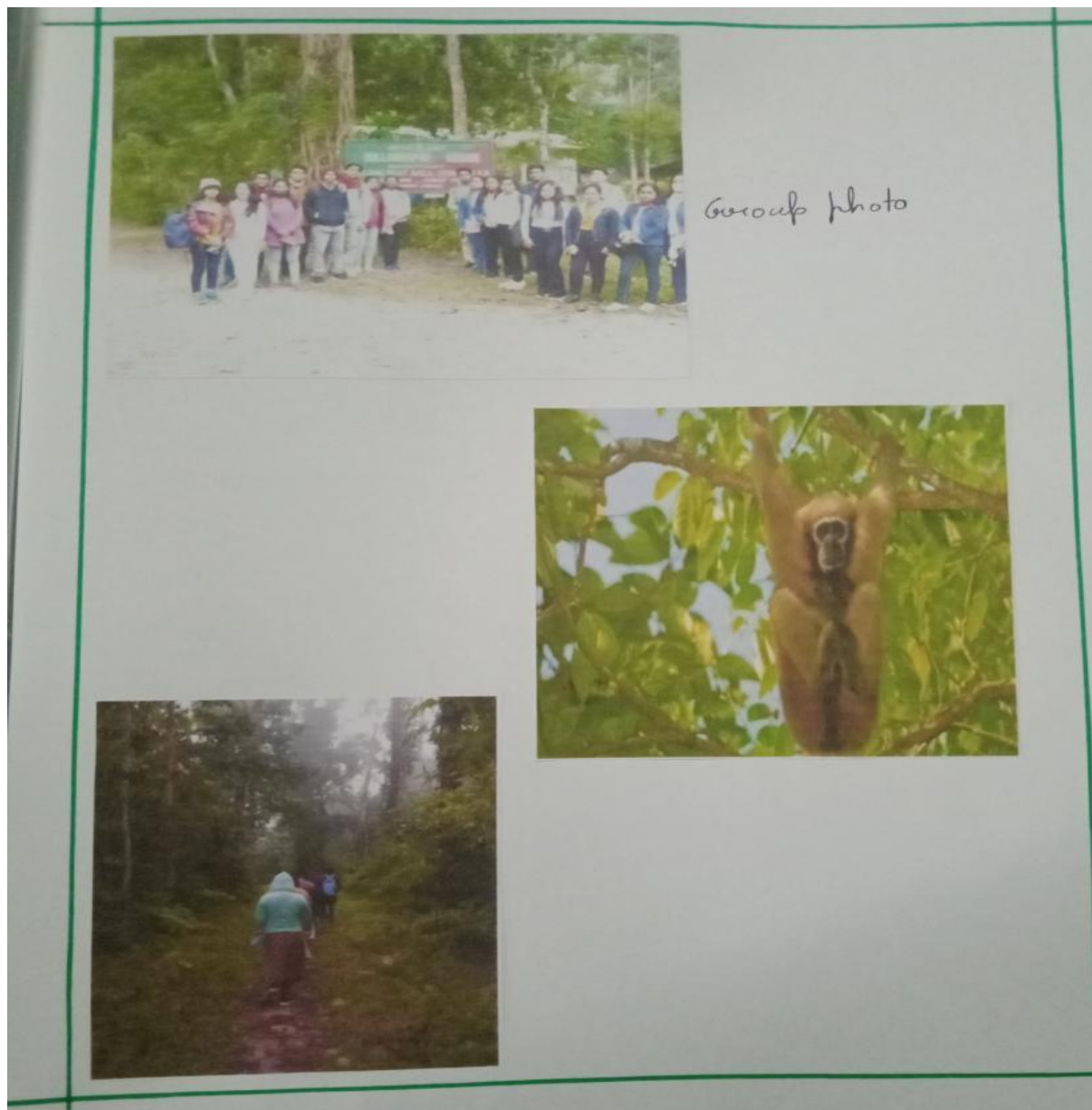



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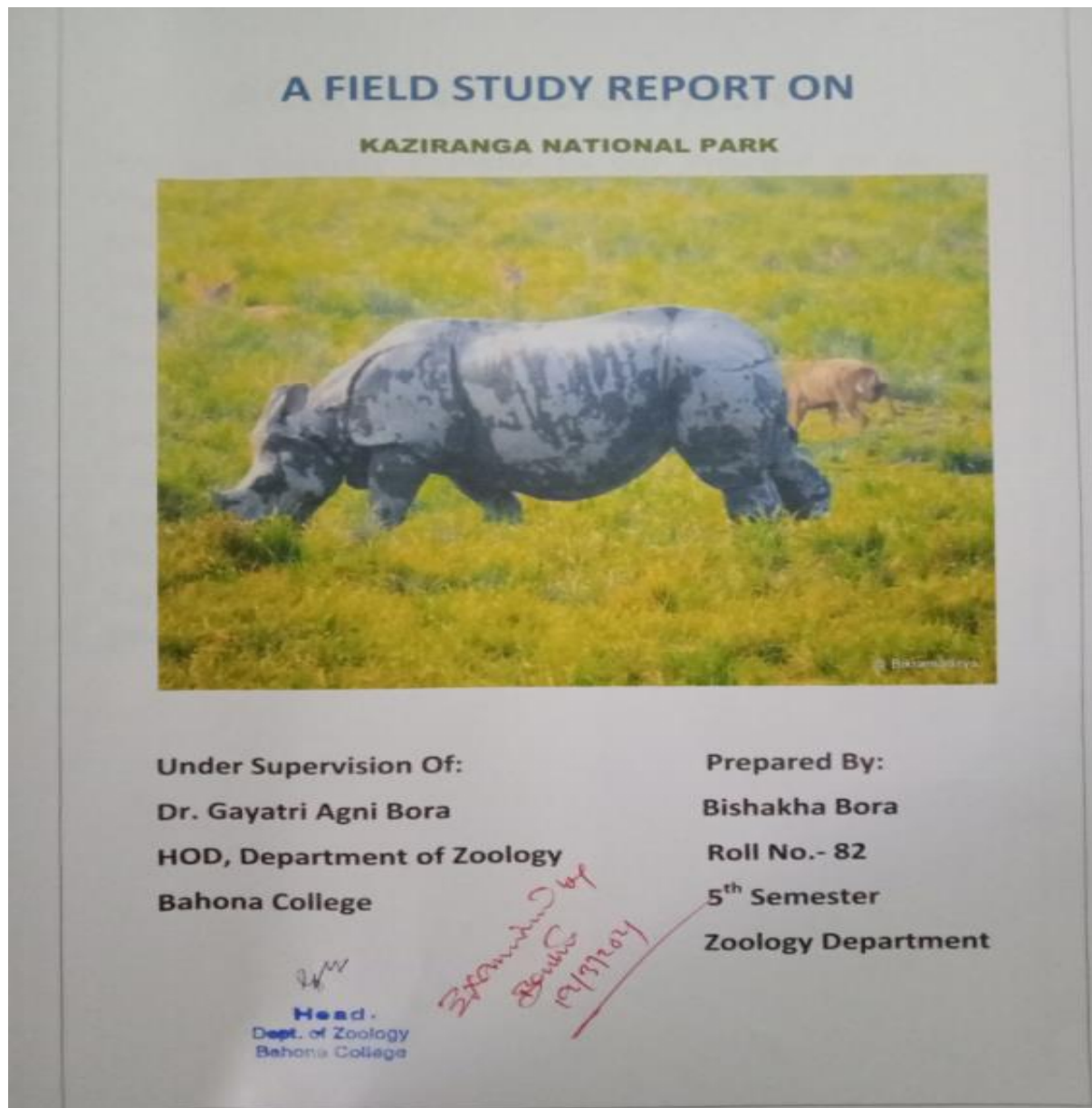



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ACKNOWLEDGEMENT

We are sincerely thankful to our Principal sir Dr. Prasanna Kumar Dutta Sir for financial support and permission and also thanks to our Head of The Department Dr. Gayatri Agni Bora ma'am for arrangement. Thanks to our faculty Dr. Bikramaditya Bakalial Sir, Dr. Rupjyoti Saikia ma'am and Dr. Parbin Iraqi ma'am for support and guidance. Thanks to our team members for field data record as well as for report preparation. Thankful to the Park authority for granting student concession, jeep safari drivers for their active guidance. At last thanks to crew of Bus who safely picked up and dropped the team across the journey.

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CERTIFICATE

This is to certify that Miss Bishakha Bora, student of B.Sc. 5th semester bearing roll no. ৪২ has taken part in the field study trip to Kaziranga National Park under guidance and supervision of the faculties of Department of Zoology, Bahona College and has also submitted a report for the same.

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Bahona College

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DESCRIPTION ABOUT THE JOURNEY

A visit to Kaziranga National Park was made on 7th January, 2021 by the students of 5th semester of zoology department of Bahona College at about 6.30 am. Proper arrangements were made by our department to make the journey pleasant one. The visit was a one day visit; we reached Bokakhat at about 7.45 am. After being refreshed there, we resumed our journey and reached Kaziranga at about 9.30 am. First we visited Kaziranga Orchid Park situated in the Kohora range. The place is a huge site for different flora. From there we resumed our journey to our final destination, i.e., Kaziranga National Park. We reached there at about 11.40 am and after completing the official documentation, we went to have our lunch since the jeep safari time was from 1 pm. So after having our lunch we came back and divided into 6 groups. We took 7 jeep, each group consist of 6 members took each jeep. At about 1 pm, our visiting time started in the National Park. After completing the jeep safari we returned from the sanctuary at about 5 pm. The total safari time inside the park was almost two hours.

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1. INTRODUCTION

Kaziranga National Park, which hosts two-thirds of the World's great one horned rhinoceros, is a world heritage site. It is solitary among the foremost national parks in the earth and also famous as the pleasure of the North East India. Situated in the intense geographical place, the park presents a massive range of natural beauty. Kaziranga National Park is located fairly in the Golaghat and Nagaon regions of Assam in India. It is the oldest park in Assam covering an area of 430 sq kms along the river Brahmaputra on the North and the Karbi Anglong hills on the South. Edged by fertile tea bushes, Kaziranga National Park offers a splendid scenic sight. The park is also recognized as an Important Bird Area making it not only an ideal wildlife sighting destination in India but a birdwatcher's paradise as well.

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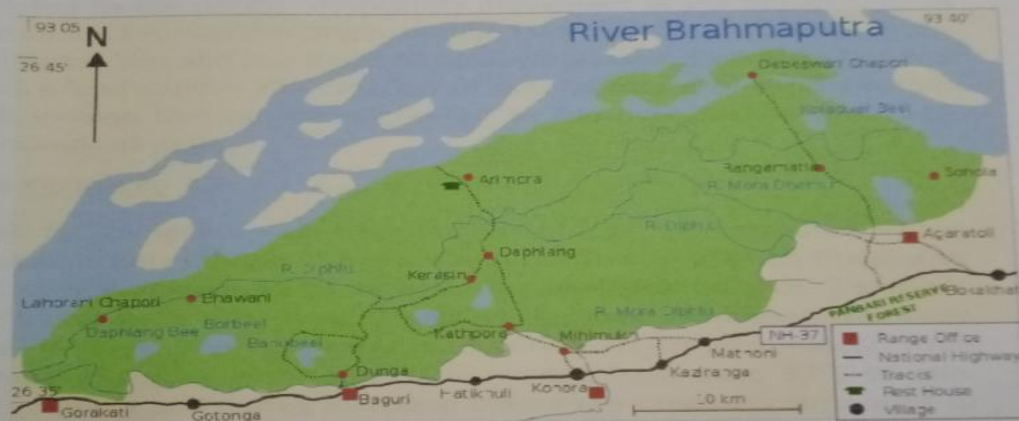
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STUDY AREA

2.1 LOCATION

It is situated on the Southern bank of the Brahmaputra River at the foot of the Mikir-Karbi Anglong Hills about 8 km from Bokakhat and 220 km east of Guwahati, the Assam state capital. It is situated between latitude $26^{\circ}30' N$ and $26^{\circ}45' N$ and longitudes $93^{\circ}08' E$ and $93^{\circ}36' E$.



2.2 History

- 1908: Declared as a Reserve Forest.
- 1916: Declared as Game Sanctuary.
- 1938: Opened for visitors.
- 1950: Designated as Wildlife Sanctuary.
- 1974: Declaration as National Park.
- 1985: Inscribed as World Heritage Site by UNESCO-IUCN.

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2.3 GEOGRAPHY & GEOLOGY

Located between the two districts of Assam – the Koliabar subdivision of Nagaon district and the Bokakhat subdivision of Golaghat district on the edge of the Eastern Himalaya biodiversity hotspots, Kaziranga National Park covers an area of about 378.22 sq. km in which 51.14 km² has been lost to erosion by the Brahmaputra.

Assam is in the easternmost projection of the Indian Plate according to the Plate Tectonics. It is believed that due to the force exerted by the north eastwardly movement of the Indian plate at the time of Himalayan origin, a huge fault was created between the Rajmahal hills and the Karbi Meghalaya plateau. Kaziranga National Park's landscape is the creation of natural forces of slit deposition and erosion that has been effected by the river Brahmaputra over hundreds of years.

2.4 CLIMATE

Due to its location in the middle of the Brahmaputra valley, Kaziranga gets around 250 cm of rain per year. It is often flooded by the river Brahmaputra to maintain the biological balance. 3 seasons are being experienced every year by the park – Summer, Monsoon and Winter. The summer is experienced approximately from February to May with temperature range from max. 37°C to min. 7°C. The hot and humid monsoon covers the sanctuary from June to September with rainfall of 2,220 mm. The winter extends from November to February with temperature range from max. 25°C to min. 5°C.

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3. MATERIALS AND METHODS

This field study report is prepared by using observation method. The primary data were collected during jeep safari in the Kaziranga National Park. Some secondary data were also collected as it is not possible to perform survey of the whole sanctuary in a day.

For field observation of different animals in their natural habitat, few monocular and binocular were used; digital camera and mobile camera were also employed to record different habitat types and other data in the field. Some guidebooks were also used for identification of the animals.

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4. OBSERVATION

4.1 VEGETATION PATTERN

The varied vegetation at the Kaziranga National Park creates the ideal habitat for a number of wild animals and birds and specially the one horned rhino.

Four types of vegetation are found in the sanctuary –

- Tropical wet evergreen forest
- Tropical deciduous forest
- Grasslands
- Swamp areas (beel)

The tropical deciduous forest vegetation are home to different animals of Kaziranga. The evergreen forest vegetation are home to a large variety of wildlife such as deer, wild boar and different species of water birds. The swampy areas inside the park, located near the River Brahmaputra are natural habitats for different species of reptiles and birds. The western area of the national park has grasslands. Tall grasses like sugarcane, elephant grass and spear grass are found in the western grassland zones.

4.2 FAUNAL DIVERSITY PATTERN

Being one of the famous world heritage sites, Kaziranga helps in protecting some of the globally threatened and near endangered species of animals and birds. Kaziranga, home to the world's largest remaining populations of Indian one horned Rhinos, Eastern Barasingha and wild water buffalo, Elephant and Tiger, also offers one of the most cosmopolitan outdoor activities called birding.

Following are the faunal diversity found in Kaziranga National Park—

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4.2.1 MAMMALS

The Kaziranga National Park supports more than 35 species of mammals of which 15 belong to Schedule I of Wildlife Act 1972. It harbours the world's largest population of Indian Rhinoceros and many more species. Here is the list of mammals found in the sanctuary –

ENGLISH NAME	SCIENTIFIC NAME
INDIAN RHINOCEROS	<i>Rhinoceros unicornis</i>
ASIATIC WILD BUFFALO	<i>Bubulas bubalis</i>
ROYAL BENGAL TIGER	<i>Panthera tigris</i>
CAPPED LANGUR	<i>Presbytis pileatus</i>
HOOLOCK GIBBON	<i>Hylobates hoolock</i>
LEOPARD	<i>Panthera pardus</i>
INDIAN ELEPHANT	<i>Elephus maximus</i>
SLOTH BEAR	<i>Melursus ursinus</i>
GANGETIC DOLPHIN	<i>Platanista gangetica</i>
OTTER	<i>Lutra lutra</i>
WILD BOAR	<i>Sus scrofa</i>
GAUR	<i>Bos gaurus</i>
SAMBAR	<i>Cervus unicolor</i>
SWAMP DEER	<i>Cervus duvauceli</i>
HOG DEER	<i>Axis porcinus</i>
COMMON LANGUR	<i>Presbytis entellus</i>
INDIAN PORCUPINE	<i>Hystrix indica</i>
LARGE INDIAN CIVET	<i>Viverra zibetha</i>
SMALL INDIAN CIVET	<i>Viverricula indica</i>
COMMON MONGOOSE	<i>Herpestes edwardsi</i>
JACKAL	<i>Canis aureus</i>

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4.2.2 BIRDS

Numerous water bodies constitute rich reservoir of food and thousands of migratory birds visit the park seasonally during winter from as far as Siberia. A total of 478 species has been recorded (M. Barua and P. Sharma, 1999) including 25 globally threatened species and 21 near threatened species. The bird species found in the park are listed as follows –

ENGLISH NAME	SCIENTIFIC NAME
Swamp Francolin	<i>Francolinus gularis</i>
Lesser White fronted Goose	<i>Anser erythropus</i>
Ferruginous Pochard	<i>Aythya nyroca</i>
Baer's Pochard	<i>A. baeri</i>
Blyth's Kingfisher	<i>Alcedo Hercules</i>
Pale capped Pigeon	<i>Columba punicea</i>
Bengal Florican	<i>Houbaropsis bengalensis</i>
Nordmann's Greenshank	<i>Tringa guttifer</i>
Greater spotted Eagle	<i>Aquila clanga</i>
Imperial Eagle	<i>A. heliaca</i>
Palla's Fish Eagle	<i>Haliaeetus leucoryphus</i>
Dalmatian Pelican	<i>P. crispus</i>
Spot billed Pelican	<i>Pelecanus philippensis</i>
Greater Adjutant	<i>Leptoptilos dubius</i>
Lesser Adjutant	<i>L. javanicus</i>
Rufous vented Prinia	<i>Prinia burnesii</i>
Bristled Grassbird	<i>Chaetornis striatus</i>
Mah Babbler	<i>Pellorneum palustre</i>
Jerdon's Babbler	<i>Chrysomma altirostre</i>
Black breasted Parrotbill	<i>Paradoxornis flavirostris</i>
White bellied Heron	<i>Ardea insignis</i>
Finn's Weaver	<i>Ploceus megarhynchus</i>
Black bellied Tern	<i>Sterna acuticauda</i>

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4.2.3 REPTILES

About 42 species of reptiles have been reported from the Kaziranga National Park. Two of the largest snakes in the world as well as the longest venomous snake in the world inhabit the park. Kaziranga is also home to the endangered gharial and about 15 species of turtles, including the endemic Assam roofed turtle and a regional lizard species too. Here is the list of reptiles found in the park –

ENGLISH NAME	SCIENTIFIC NAME
BLACK KRAIT	<i>Bungarus niger</i>
COMMON KRAIT	<i>Bungarus caeruleus</i>
BANDED KRAIT	<i>Bungarus fasciatus</i>
BENGAL COBRA	<i>Naja kaouthia</i>
KING COBRA	<i>Ophiophagus hannah</i>
INDIAN COBRA	<i>Naja naja</i>
ROCK PYTHON	<i>Python molurus</i>
RETICULATED PYTHON	<i>Python reticulatus</i>
RUSSEL'S VIPER	<i>Vipera russellii</i>
PIT VIPER	<i>Trimeresurus spp.</i>
RAT SNAKE	<i>Ptyas mucosus</i>
GHARIAL	<i>Gavialis gangeticus</i>
ASSAM ROOFED TURTLE	<i>Kachuga sylhetensis</i>
INDIAN ROOFED TURTLE	<i>Kachuga tecta</i>
INDIAN TENT TURTLE	<i>Kachuga tentoria</i>
INDIAN EYED TURTLE	<i>Morenia petersi</i>
GANGETIC SOFTSHELL TURTLE	<i>Aspideretes gangeticus</i>
INDIAN BLACK TURTLE	<i>Melanochelys trijuga</i>
BROWN ROOFED TURTLE	<i>Kachuga smithii</i>
BROWN HILL TORTOISE	<i>Manouria emys</i>
COMMON INDIAN SKINK	<i>Mabuya carinata</i>
TUCKTO GECKO	<i>Gecko gecko</i>

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TICTICKY HOUSE GECKO	<i>Hemidactylus frenatus</i>
COMMON BENGAL MONITOR	<i>Varanus bengalensis</i>
INDIAN WATER MONITOR	<i>Varanus salvator</i>
ASSAM GARDEN LIZARD	<i>Calotes maria</i>
DOTTED GARDEN SKINK	<i>Lygosoma punctata</i>

4.2.4 AMPHIBIA

The amphibians residing in the sanctuary are listed below –

ENGLISH NAME	SCIENTIFIC NAME
PYGMY TREE FROG	<i>Chiromantis simus</i>
POINTED NOSE FROG	<i>Clinotarsus alticola</i>
COMMON ASIAN TOAD	<i>Duttaphrynus melanostictus</i>
INDIAN SKIPPER FROG	<i>Euphlyctis cyanophlyctis</i>
INDIAN CRICKET FROG	<i>Fejervarya limnocharis</i>
PIERREI'S CRICKET FROG	<i>Zakerana pierrei</i>
JERDON'S BULL FROG	<i>Hoplobatrachus crassus</i>

4.2.5 FISH

The Kaziranga National Park is home to a wide variety of aquatic life including about 42 species of freshwater fish. Here is the list of the fishes found in the park –

ASSAMESE NAME	SCIENTIFIC NAME
BAHU	<i>Catla catla</i>
CHANDA	<i>Chanda nama</i>
CHENG	<i>Channa amphibia</i>
CHENGELI	<i>Channa orientalis</i>
SAL	<i>Channa marulius</i>
KOKILA	<i>Xenentodon cancila</i>
GARUA	<i>Bagarius bagarius</i>

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ROHU	<i>Labeo rohita</i>
KUCHIA	<i>Amphipnous cuchia</i>
BANHHPUTHI	<i>Amblypharyngodon mola</i>
GOROI	<i>Channa punctata</i>
GONGATUP	<i>Tetraodon cutcutia</i>

4.2.6 INVERTEBRATE FAUNA

Kaziranga National Park is also home to a large number of invertebrate animal diversity which includes butterflies (*Papilio paris*, *Papilio castor*, *Parides aidoneus* etc.), many spiders, ants, various molluscans (*Pila globosa* etc.), Indian earthworm, locust, mosquitoes, various worms (like silkworm, tongue worm etc.), millipedes, dragon fly, beetles etc.

4.3 FLORAL DIVERSITY

The floristic composition of the Kaziranga National Park comprises of following forest types and biomes –

- Eastern Wet alluvial grasslands
- Assam Alluvial plains Semi-evergreen forests
- Tropical moist mixed deciduous forests
- Eastern Dillenia Swamp forests
- Wetlands
- Sandy “chars”

The percent coverage by vegetation is – Moist mixed deciduous forest 29.13%, Grass land 51.91%, Water logged/Beels 6.62%, Swampy/Marshy area 5.21% and Sand 7.12%.

Some of the common species of flora found in the park are elephant grass, sugarcane, spear grass, common reed, kumbhi, Indian gooseberry, *Talauma hodgsonii*, *Duabanga grandiflora*, *Aphania rubra* and *Leea indica*. There are also many different aquatic flora in the lakes and ponds, and along the river shores.

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5. DISCUSSION

5.1 FAUNA

The Kaziranga National Park is very rich in faunal diversity. Varieties of common as well as unique animals are found here. The diverse habitat type such as dense forest, fragmented vegetation, lowland grassland, aquatic bodies support different animals for their food and shelter. The altitudinal slope, pleasant climate, enough rainfall maintain the rich fauna.

5.2 FLORA

The park is quite rich in floral diversity too. The geology and soil parameters of the Himalayan foothill region are favourable for the growth and development of many evergreen, deciduous and epiphytic plants. Heavy rainfall during the monsoon and the Brahmaputra River maintain a good content of humidity in the soil and air of the national park.

5.3 ECOTOURISM

Kaziranga National Park is a tourist destination and conservation area particularly notable as a refuge for the endangered Indian one-horned rhinoceros, hosting the largest population of wild one horned rhinoceros in the world. Central govt. has included Kaziranga in eco-tourism circuit of the integrated Development Tourism Circuit Scheme. The park contains significant stock of other large and small animals too. It also has the highest density of tiger in the world. It is also recognised as an important bird area for conservation of avifaunal species.

The means of travel inside the park is on the back of trained elephants with mahout guides or in jeep or 4WD vehicles. The park has three tourist routes under three ranges – Kohora, Bagori and Agaratoli. These roads are open for tourists from November to mid May and remains closed during monsoon. For spotting wildlife with better view, some observation towers are also situated at Sohola,

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Mihimukh, Kathpara, Foliamari and Harmoti. Wildlife watching, including birding is the main activity inside the park.

Tourist can make entry to the Central, Eastern and Western zone of the park after paying a requisite entry fee to the park authority. Private sector investment in this tourist spot helps in changing the state tourism scenario. There are so many hotels and restaurant near Kohora and Bagori range of Kaziranga National Park, where tourist able to find best places to stay.

5.4 THREATS

At present Kaziranga National Park is facing so many problems. Some of these are discussed below.

FLOOD: Kaziranga National Park is situated in the bank of mighty Brahmaputra. The entire area is has been formed by silt deposition carried by different river systems flowing through it. Each year with increase in the water level of Brahmaputra River, the water level in the various water bodies and stream also raise .As the southern boundary of the national highway is at a height, animals often move to take shelter there during floods. This also invites poachers.

POACHING: The Park has continuously in the headlines in past few years, especially with poaching accounting for the loss of 27 rhinos in 2013.

POLLUTION: The petroleum refinery (Numaligarh Refinery Limited) is situated closely to the eastern range of the park. Water pollution due to run from NRL pose a hazard to the ecology of the region .The use of insecticides by the tea garden always get leached to the rivers and pollute the park lands and wetlands.

HABITAT LOSS: Brahmaputra River erodes large area along the northern boundary of Kaziranga, which reduces the total

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6. CONCLUSION

Kaziranga for the last few years has been a successful wildlife conservation site for the world's famous Indian one horned rhinoceros and many more rare and threatened faunal diversity. Being one of the famous World Heritage Site, the sanctuary hosts two thirds of the world's great one horned rhinoceros. Providing home to many wildlife including the fascinating migratory birds from as far as Siberia, the National Park has been the theme of several books, songs and documentaries too. Thus, visiting this National Park is indeed a great experience.

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To make this field study report, secondary data have been collected from following sources –

1. www.wikipedia.org
2. India Biodiversity Portal
3. Indian Mammals: A Field Guide by Vivek Menon
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Lesser Adjutant



Ruddy Shelduck



Bar Headed Goose



Goose



Ibis



Cinnamon Teal

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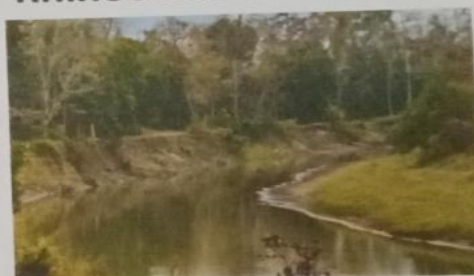
Tortoise



Rhinoceros with baby



Jeep Safari



Water body



Eagle



Red Wattled Lapwing

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Indian Roller



Asian Openbill Stork



Group visiting the National Park

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Visits to Higher Educational Institutions of Repute Acquaint Students with the Career Options Available to Them, as well as with Methods of Teaching-learning Practiced Elsewhere in an Immersive, Experiential Manner.

A FIELD REPORT ON THE EDUCATIONAL TOUR TO TEZPUR UNIVERSITY

***SUBMITTED BY
STUDENTS OF B.SC 6TH SEMESTER
BAHONA COLLAGE
YEAR 2017***

Report of Visit to Tezpur University by students of Dept of Chemistry [Page 1]


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ACKNOWLEDGMENT

We take immense pleasure in thanking our honorable principal DR. P.K. DUTTA for having permitted to carry out of this tour. We want to express our deep sense of gratitude to all the teachers of CHEMISTRY DEPARTMENT for guidance and valuable advice. We the students of CHEMISTRY DEPARTMENT of BAHONA COLLEGE along with our teachers went to TEZPUR UNIVERSITY as an Educational Tour as well as for a picnic on 24/01/2017. Here is a descriptive report on our tour to TEZPUR UNIVERSITY

Report of Visit to Tezpur University by students of Dept of Chemistry [Page 2]


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HISTORY OF TEZPUR UNIVERSITY

The establishment of Tezpur University is considered to be one of the outcomes of the Assam Accord along with the of Assam University and Indian Institute of Technology Guwahati.

Tezpur University was established, by an Act of Parliament, in 1994. Then the prime minister of India, P. V. Narasimha Rao, chaired the opening of the university.

Initially, the university operated from the premises of the Darrang College, in Tezpur. For a while it also operated from the Tezpur Law College premises. Land was acquired at Napaam, a suburb of Tezpur, about 15 kilometers east, of 242 acres (0.98 square kilometers), and the premises shifted.

Kalaguru Bishnuprasad Rava (Rabha) donated an ancestral estate of 2500 bigha of land received from the British government in favour of the peasants. The present-day Tezpur University stands on the land donated by him. Recently the university acquired an additional plot of land.

DETAILS ON TEZPUR UNIVERSITY

Campus

The university campus is at Napaam about 15 km east of Tezpur, the headquarters of the Sonitpur district of Assam. Napaam is a rural area surrounded by peoples of diverse caste, religion and language. The Napaam campus is in a plot of an area of 262 acres (1.06 km²) of land. The campus is bounded by pucca walls. Napaam is linked by a PWD road from the National Highway No. 37A at almost the midpoint between Kalia-Bhomora bridge and Misson Chariali. Tezpur is linked by road and rail with the rest of the state and the country. There is a tri-weekly flight between Kolkata and Tezpur.

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There are provisions for visitors to stay in the university guest house. Students may choose to stay in any of the men's or women's hostels. The university is primarily a residential university.^[6] The university has five men's hostels (listed in order of construction):

- ***Charaideo Men's Hostel: Named after the burial land of Ahom kings in Sivasagar, Assam.***
- ***Nilachal Men's Hostel: Named after the Nilachal Hill in Guwahati***
- ***Kanchenjunga Men's Hostel: Named after Kangchenjunga, the third highest mountain in the world (after Mount Everest and K2).***
- ***Patkai Men's Hostel: Named after the Patkai-Bum, the Khasi-Jaintia-Garo and the Lushai hills mountain range in the eastern Himalayas.***
- ***Saraighat C. V. Raman Men's Hostel: Named after the Saraighat Bridge at Guwahati and the famous Indian physicist and Nobel laureate Sir C. V. Raman.***

There are seven women's hostels:

- ***Bordoichilla Women's hostel: Named after the seasonal storm that occurs in Assam every spring, before and after the festival of Bihu.***
- ***Dhansiri Women's hostel***
- ***Pragjyotika Women's Hostel***
- ***Suwansiri Women's hostel***
- ***Kopili Women's Hostel***
- ***New Women's Hostel***
- ***Pobitara Madam Curie Women's Hostel: Named after the Pobitara Wildlife Sanctuary and the physicist Marie Curie.***

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There is also a married-scholars hostel, which is at present serving as a makeshift accommodation for newly recruited faculty of the university.

Communications

Auto Rickshaws, the chief mode of public transport in and around Tezpur, run between Tezpur University and Tezpur city. There is an ASTC bus utility between the university and the ASTC bus stand located at the heart of Tezpur city. ASTC and private buses run daily between Tezpur and some other major places like Guwahati (ISBT, Lokhra), North Lakhimpur, Dibrugarh, Tinsukia etc. 20-seater cabs ply between Tezpur and Paltan Bazaar, Guwahati. The nearest railway station is Dekargaon Railway Station which offers a link between Tezpur and the other parts of Assam. Travellers can also opt for flying to and from Tezpur where the nearest airport - Tezpur Airport provides air link with Kolkata and Silchar.^[7] For other destinations, the nearest airport is the Lokapriya Gopinath Bordoloi International Airport at Guwahati.

Education

The university has four schools of studies which is divided into 21 departments and additional centers and cells.

- School of Sciences
- School of Humanities & Social Sciences
- School of Management Sciences
- School of Engineering

Schools and departments

The School of Science is divided into five departments, which provides postgraduate degrees in Science and carry on research in science and mathematics.

- Department of Chemical Sciences


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- Department of Mathematical Sciences
- Department of Molecular Biology and Biotechnology
- Department of Physics
- Department of Environmental Science

This School of Humanities & Social Sciences provides education as well as diploma, undergraduate, postgraduate, and research programmes related to arts and social sciences in following departments:

- Department of English and Foreign Languages
- Department of Cultural Studies
- Department of Mass Communication and Journalism
- Department of Sociology
- Department of Hindi
- Department of Education
- Department of Social Work



Department of Business Administration, Tezpur University

The School of Management Sciences provides education as well as diploma, undergraduate, postgraduate, and research programs related to business management in the following departments:

- Department of Business Administration
- Department of Commerce
- Centre for Disaster Management
-



Department of Computer Science and Engineering

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The School of Engineering offers courses in engineering and technology. The offering masters and B.Tech programmes in the various disciplines. Admission to the B.Tech programs is on the basis of JEE (Main). Besides B.Tech and M.Tech programs, School of Engineering, the university provides Ph.D programs in specialized fields.

- Department of Computer Science & Engineering
- Department of Electronics and Communication Engineering
- Department of Mechanical Engineering
- Department of Food Engineering and Technology
- Department of Civil Engineering
- Department of Energy

Special centres and cells

- Centre for Assamese Studies (CAS)
- Centre for Endangered Languages (CFEL)
- Centre for Inclusive Development (CID)
- Centre for Innovation Incubation and Entrepreneurship (CIIE)
- Teaching and Learning Centre (TLC)
- Centre for Women Studies (CWS)

Cells

- Research & Development (R & D) Cell
- Intellectual Property Rights (IPR) Cell
- DBT Nodal Centre
- ONGC Centre for Petroleum Biotechnology (CPBT)
- Bioinformatics Infrastructure Facility (BIF)
- Institutional Biotech Hub
- Internal Quality Assurance Cell (IQAC)

Rankings

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University rankings	
General – International	
QS (Asia) (2018) ^[9]	247
Times (World) (2018) ^[10]	601-80
General – India	
NIRF (Overall) (2017) ^[11]	48
NIRF (Universities) (2017) ^[12]	30

Tezpur University was ranked 601-800 in the world by the Times Higher Education World University Rankings of 2018. The QS World University Rankings ranked it 247 in Asia in 2018. In India it was ranked 48 overall by the National Institutional Ranking Framework of 2017 and 30 among universities.

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DEPARTMENT OF CHEMICAL SCIENCE



Department of Chemical Sciences is one of the most active department of prestigious Best Visitor's Award winning educational institute, Tezpur University. Decorated by well-trained and extremely motivated faculty as well as bright students, the department constantly strives to maintain a culture of excellence in research and uphold the highest standards in chemical education. The Department of Chemical Sciences was started in the year 1997, when it offered M. Sc. course in Polymer Science. From July 2006 the Department has been offering M. Sc. program in Applied Chemistry with specialization in Catalysis, Medicinal Chemistry and Polymer Chemistry. The Department consists of 15 research laboratories, 3 M. Tech. laboratories and 5 M.Sc. laboratories. This Department is supported by DST-FIST and UGC-SAP (DRS-II) level.

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Faculty members are actively engaged in high quality research in chemical sciences as well as interdisciplinary topics. There are several international collaborative projects are going on apart from many national collaborative projects. Few faculty members are also running consultancy projects. External funds are received from DST, UGC, CSIR, DBT, DAE, AICTE etc.

They are well placed across the globe and have contributed significantly in their respective domain.

Central Library



Central Library is the focal point of all user community of Tezpur University. The Library caters to the educational and research needs of the academic community and its resources are consulted by scholars from all over the country. Central Library has been started functioning since 1994. At present, the library holds about 78,318+ books, 10000+ e-journals and 8380 back volumes of journals (as on 15 February 2018). Apart from the online journals and database provided by e-ShodhSindhu consortium and DeLCON consortium, the library

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also holds more than 2550 CDs scattering to different thought contents. Library users can access book database, theses database, journal database, e-journals and other e-resources from any terminal within the University campus. Central Library remains open throughout the year

OUR JOURNEY

The day after, it was waiting for. Planning for week long was going to turn into execution. A group of our so called "senior most students" of our department were the organizers of the picnic cum educational tour to TEZPUR UNIVERSITY. We had so many duties that had to be done for our tour, Managing the tour bus, shopping the food items, the utensils, and so on.

All the preparations were done. The bus was house packed with all the students of our department. At last bus stopped on the GANESH GHAT, our teachers asked us to visit AGNIGAR which is near to the GANESH GHAT . After taking our meal we went to the destinations i.e., the TEZPUR UNIVERSITY which is the most important part of the tour . The senior staffs in the job shown us the CHEMICAL SCIENCE DEPT along with the apparatus they use and explained to us the various mechanisms which is related to the apparatus .Then we visit the central library of the university. We were much lucky to get such a good opportunity to get that valuable knowledge from the senior people.

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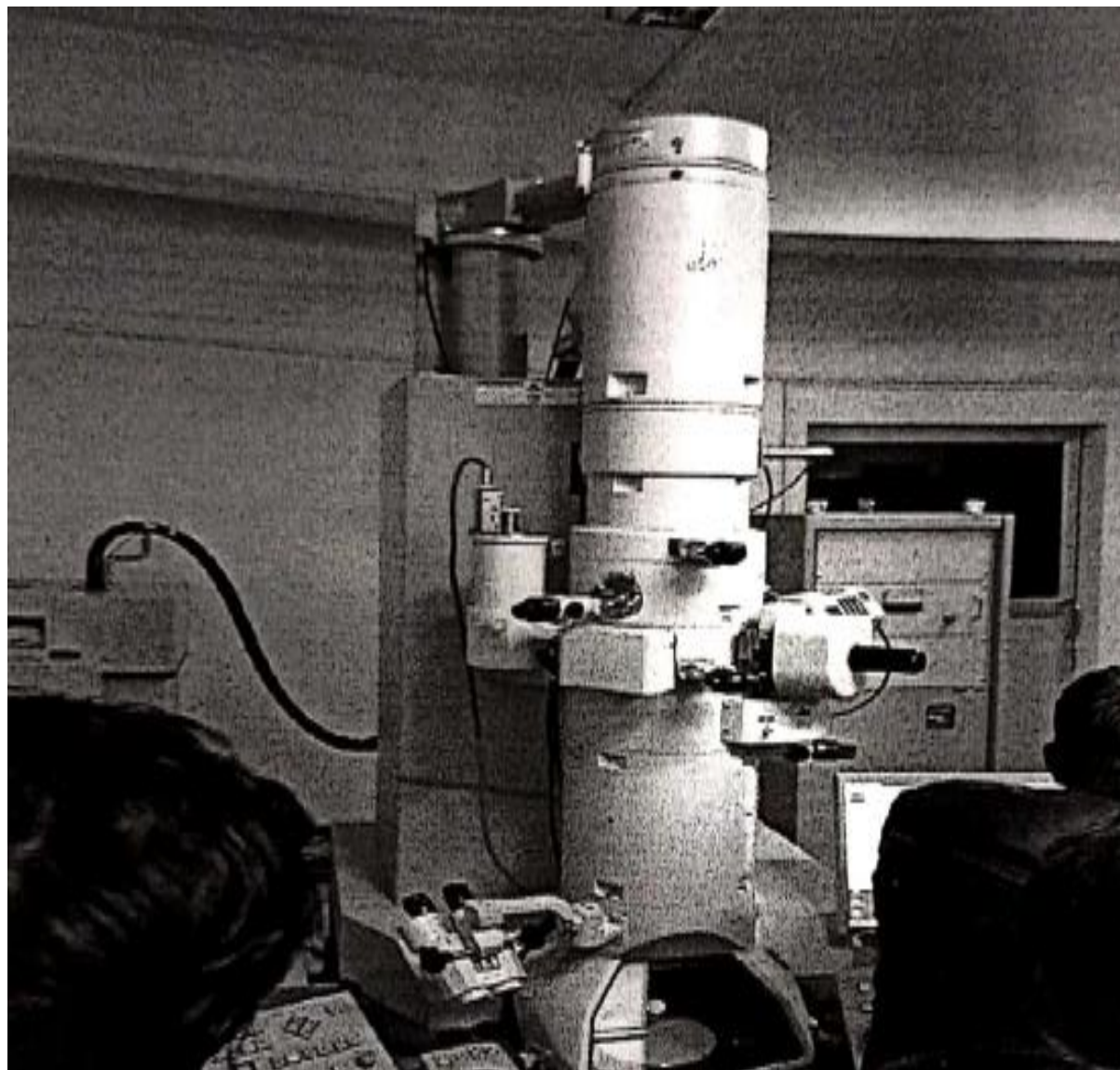



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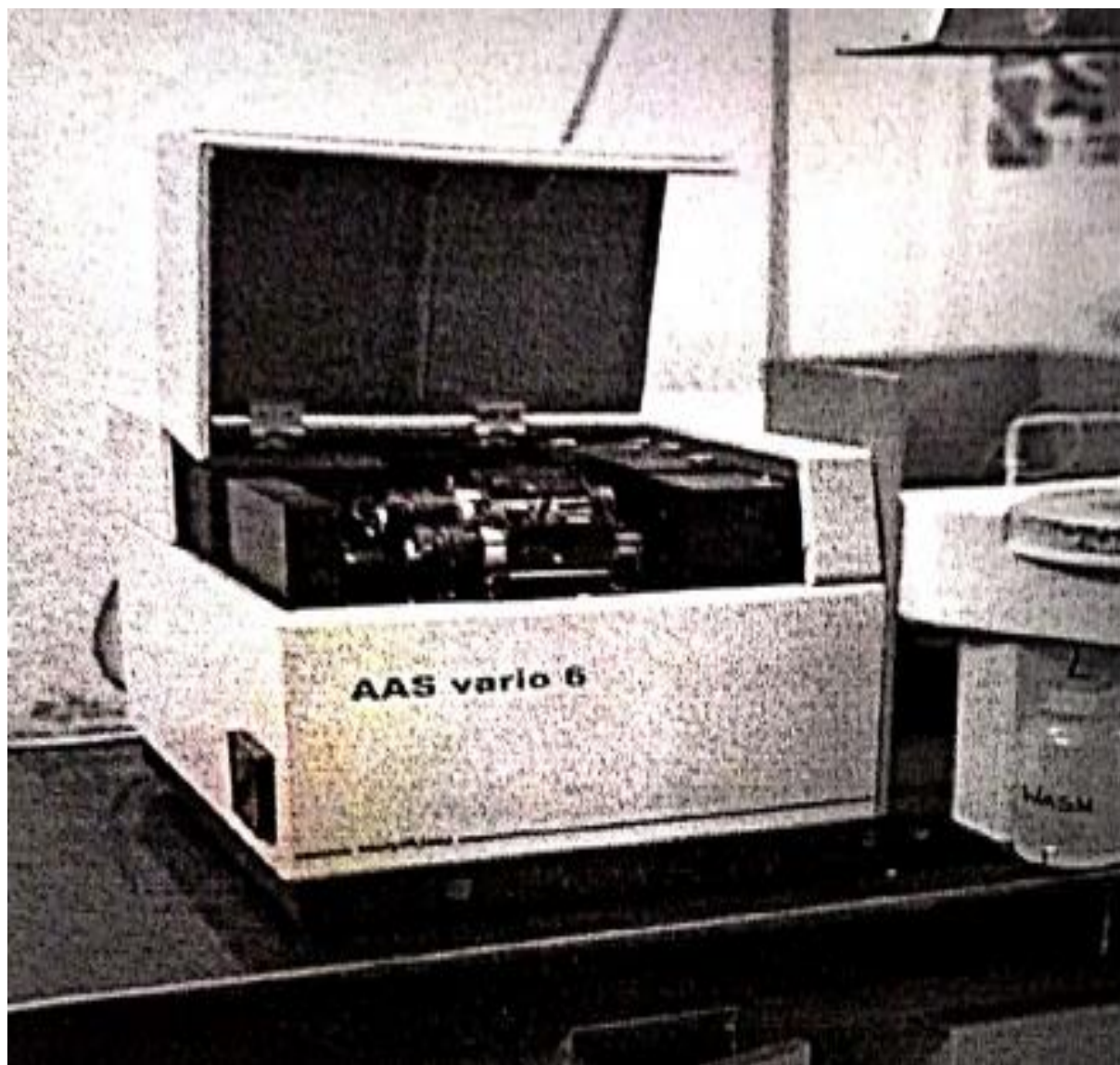



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**A FIELD REPORT ON THE
EDUCATIONAL TO GELEKI OIL FIELD,
SIVASAGAR**

Submitted by

Students of

BSc. 6th semester

BAHONA COLLEGE, JORHAT

Year 2016


Head
Department of Chemistry
Bahona College, Bahona

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ACKNOWLEDGMENT

We take immense pleasure in thanking our honourable principal **DR. P.K. DUTTA** for having permitted to carry out of this field work.

We want express our deep sense of gratitude to all the teachers of **CHEMISTRY DEPARTMENT** for guidance and valuable advice.

We the students of **CHEMISTRY DEPARTMENT** of **BAHONA COLLEGE** along with our teachers went to **GELEKI OIL FIELD** as an Educational Tour as well as for a picnic on 28/01/2016 .Here is a descriptive report on **GELEKI OIL FIELD** .

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HISTORY OF THE OIL INDUSTRY:

The discovery of petroleum in British North East India (NE) began with the onset of amateur geological exploration of the region since the 1820s. Like tea plantations, exploration of petroleum also attracted international capital. Since the last quarter of the 19th century, with the arrival of global technology, the region's petroleum fields became part of a larger global petroleum economy, and, gradually, commercial exploration of petroleum became a reality. It was a time when geologists had not yet succeeded in shaping an understanding of the science of oil and its commercial possibilities. Over the next century, the Assam oilfields played a key role in the British imperial economy. After decolonisation, these oilfields not only turned out to be the subject of intense competition in the regional economy, but also became centrally identified with questions of community rights. Immediately after independence, the Indian state encountered political opposition to its stake on oil from Assam. This happened at a time when the share of natural resources between the province and centre was still not well-defined. Such opposition continued until a later period, when an economic blockade, with the aim of restricting oil flows outwards from Assam, was successfully imposed as part of the assertion of regional politics. This also became a counter in the political negotiations between the Indian state and its federal province. As in the US, China and Iran, oil seeped out of the soil in India as well; British travelers in Assam reported such pools from 1825 onwards. Once fractionation technology was proved in the US, industrial refining of oil became feasible. Assam Railways & Trading Company Limited was registered in London in 1881 to exploit Assam's natural resources. It struck oil in exploitable volume near Digboi in 1889; at that point it transferred its oil interests to a separate company Assam Oil Company. AOC built a refinery in Digboi in 1901. AOC was taken over in 1917 by Burmah Oil Company, which later became Burmah Shell and then Shell. Expanded and modernized a number of times, the Digboi refinery continues to function till today. Today, Digboi boasts two energy wonders of the world—a hundred-year-old oil field that is still operational and the world's oldest operating oil refinery, which produces in excess of its capacity. Digboi Well No. 1 is preserved as a monument to the oil pioneers and their endeavours. Some important year and events in Assam related to oil industry are mentioned below:

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1866: Hydrocarbon exploration began in India when Mr. Goodenough of the Calcutta-based McKillop Stewart Co. drilled a well near Jaypore in Upper Assam and struck oil. He, however, failed to establish satisfactory production.

1867: H. B. Medicott of the Geological Survey of India (GSI) first started oil exploration in India in the Makum area of Assam. The most astounding Indian oil history was made on 26 March by Mr. Goodenough when he struck oil at 35.97 metres at Makum (with a total production of 1135.62 litres). It was Asia's first mechanically drilled well. Before this discovery, three wells had been drilled in Jaypore which encountered some gas but little oil.

1889-1893: The first taste of commercial success came when a well was struck at Digboi in 1889 by the Assam Railways & Trading Company (AR&T). AR&T subsequently acquired a 77.7 square kilometre petroleum-rights concession in the Makum area of Assam, and by 1893 had drilled 10 wells at Digboi producing 757.08 litres/day.

1917: The oil production in Assam, mainly from Digboi, at 43 bopd in 1901, trebled to 120 bopd in 1902. It further increased to 247 bopd in 1911, 435 bopd in 1917 and 5,500 to 7,000 bopd during the war years (i.e. the first half of the 1940s).

1953: Attock Oil Company AOC discovered oil in Nahorkatiya (Upper Assam) in 1953, the first oil discovery after independence.

1956: AOC discovered the Moran oil field (Southwest of Nahorkatiya, Upper Assam), the first deepest drilled well in Asia. The Oil and Natural Gas Division (within the Geological Survey of India) became the Oil and Natural Gas Commission (ONGC).

1964: ONGC discovered oil in Lakwa (Southwest of Moran, Upper Assam).

1968: ONGC discovered an oil field in Geleki in Assam.

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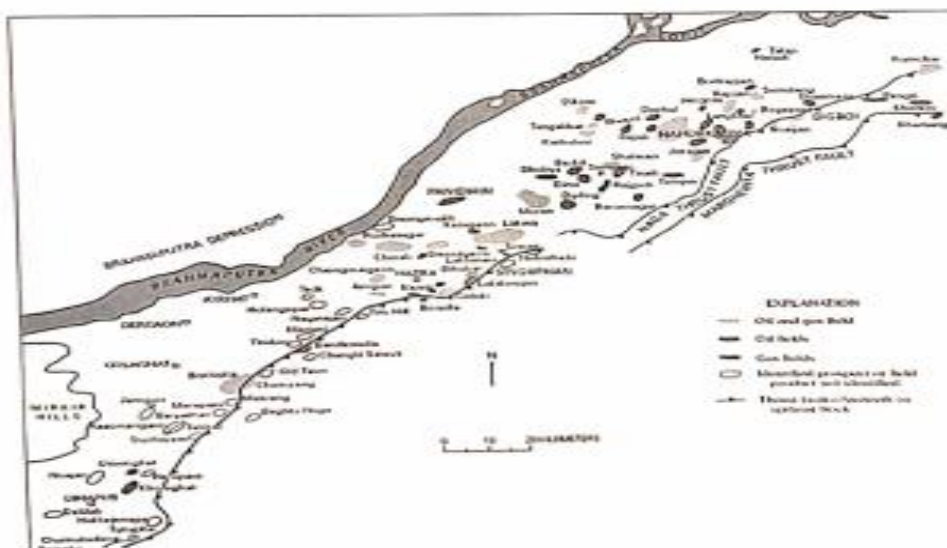
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GELEKI OIL FIELD:

Sivasagar District of Assam houses several Mining Lease (ML) areas for oil and gas exploration. The present request for Environmental Clearance pertains to drilling of eight (8) exploratory wells falling in 5 ML areas viz. Charali ML, Geleki ML, SE Geleki ML, Mekeypore-Santak-Nazira ML and Lakwa ML areas.


Charali Mining Lease (ML) is one of the important oil producing fields of ONGC situated in Sivasagar District of Assam. The area of this lease is 51.63 square kilometers. This ML area forms the part of North Assam shelf. A 20 years ML was obtained with effect from 20.03.1999 (Ref: MOPNG, Govt. of India, Letter No. O-12012/94/2002-ONG/D-IV, dated 29 th April-2002) and is valid upto 19.03.2019. Charali ML is highly prospective where oil and gas have been discovered and produced from a large stratigraphic column ranging from Barail Group to Girujan Formation. However there are areas within the ML which still have untapped hydrocarbons. These locations are proposed for exploiting these pools. In view of the above it is proposed to grant the environmental clearance at the earliest so that the drilling commitments as well post drilling evaluations could be carried out.



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Fig: Location of Geleki Oil Field with other identified prospects in Assam Geological Province.

Geleki and its satellite fields Mekeypore, Santak & Nazira are some of the important oil producing fields of ONGC situated in Sivasagar District of Assam. These areas form the part of North Assam shelf and had been producing hydrocarbons for more than three decades from Barails and Tipams. ONGC has received Mining Lease of these areas from MOPNG, Govt of India for exploring and producing hydrocarbons. The Mining Lease (ML) areas with their respective validity are - 1. Geleki ML (Area: 27.94 sq km, with effect from 16.08.1990 to 15.08.2030), 2. SE Geleki ML (Area: 20.5 sq.km, with effect from 30.01.2006 to 29.01.2026) and 3. Mekeypore-Santak-Nazira ML (Area: 77.0 sq km, with effect from 30.01.2006 to 29.01.2026). Reservoirs in different stratigraphic levels starting from various sand units of Barail Group (BMS, BCS sands) to sands within Tipam Group (TS-6, TS-5, TS-4, TS-3, TS-2 & TS-1) have been charged in different part of the MLs depending on favorable entrapment conditions. Shales/Claystones of within these formations and clays in Girujan & Namsang have acted as cap rock facies. Geleki ML is highly prospective where oil and gas have been discovered and produced from a large stratigraphic column ranging from Pre- Barails to Girujan Formation. However, there are areas within the ML which still have untapped hydrocarbons. These locations are proposed for these exploiting these pools.

Lakwa Mining Lease (ML) contains important oil producing fields of ONGC situated in Sivasagar District of Assam. The area of this lease is 172.49 square kilometers. This ML area forms the part of North Assam shelf and has been producing hydrocarbons for more than three decades from Barails and Tipams. A 20 years ML has been obtained with effect from 29.09.2008 and is valid upto 28.09.2028. So far, 681 numbers of wells (including exploratory and development wells) have been drilled in this mining lease with depths ranging from 2259m to as deep as 5113m. Lakwa Mining Lease is highly prospective where oil and gas have been discovered and produced from a large stratigraphic column ranging from Tura to Girujan Formation. However there are areas within the ML which still have untapped hydrocarbons. These locations are proposed for these exploiting these pools.

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DRILLING FLUID:

Drilling fluid -mud - is usually a mixture of water, clay, weighing material and a few chemicals. Sometimes oil may be used instead of water, or oil added to the water to give the mud certain desirable properties. Drilling fluid is used to raise the cuttings made by the bit and lift them to the surface for disposal. But equally important, it also provides a means of keeping underground pressures in check. The heavier or denser the mud, is the more pressure it exerts. So weighing materials - barite - are added to the mud to make it exert as much pressure as needed to contain formation pressures. The equipment in the circulating system consists of a large number of items. The mud pump takes in mud from the mud pits and sends it out a discharge line to a standpipe. The standpipe is a steel pipe mounted vertically on one leg of the mast or derrick. The mud is pumped up the standpipe and into a flexible, very strong, reinforced rubber hose called the rotary hose or kelly hose. The rotary hose is connected to the swivel. The mud enters the swivel the swivel goes down the kelly, drill pipe and drill collars and exist at the bit. It then does a sharp U-turn and heads back up the hole in the annulus. The annulus is the space between the outside of the drill string and wall of the hole. Finally the mud leaves the hole through a steel pipe called the mud return line and falls over a vibrating, screen like device called the shale shaker. Agitators installed on the mud pits help maintain a uniform mixture of liquids and solids in the mud. If any fine silt or sand is being drilled, then devices called desilters or desanders may be added. Another auxiliary in the mud system is a device called degasser.

Functions of Drilling Fluids

In the early days of rotary drilling, the primary function of drilling fluids was to bring the cuttings from the bottom of the hole to the surface. Today it is recognized the drilling fluid has at least ten important functions:

A- Assists in making hole by:

1. Removal of cuttings
2. Cooling and lubrication of bit and drill string
3. Power transmission to bit nozzles or turbines

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B. Assists in hole preservation by:

4. Support of bore hole wall
5. Containment of formation fluids

C-It also:

6. Supports the weight of pipe and casing
7. Serves as a medium for formation logging

D-It must not:

8. Corrode bit, drill string and casing and surface facilities
9. Impair productivity of producing horizon
10. Pollute the environment.

Types of Drilling Fluids:

Many types of drilling fluids are used in industry. Major categories include air, water- and oil base fluids. Each has many subcategories based on purpose, additives, or clay states.

Water Based Muds:

Water based mud's consist of four basic phases;

- Water
- Active colloidal solids
- Inert solids
- Chemicals

Water is the continuous phase of any water-based mud. Primary function of the continuous phase is to provide the initial viscosity which can be modified to obtain any desirable rheological properties. The second function of the continuous phase is to suspend the reactive colloidal solids, such as bentonite, inert solids, such as barite. Water also acts as a medium for transferring the surface available hydraulic horsepower to the bit on the bottom of the hole. Water is also a solution medium for all conditioning chemicals which are added to the drilling fluid. In water

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based mud's, clay is added to increase density, viscosity, gel strength and yield point, and to decrease fluid loss. Clays used in water based drilling fluids are mainly in three groups:

- Montmorillonites (bentonite)
- Kaolinites
- Illites

Chemicals used in water based mud's can be grouped according to their functions as:

- Thinners
- Dispersants
- Deflocculants

Oil Based Muds

Oil based mud's has been defined as a system the continuous or external phase of which is any suitable oil. At the present time, there are two mud systems the external phase of which is oil, i.e., true oil mud's and invert emulsion mud's. True oil mud systems consist of the following components:

- Suitable oil
- Asphalt
- Water
- Emulsifiers
- Surfactants
- Calcium hydroxide
- Weighting materials
- Other chemical additives

Among all of these, only oil and asphalt are necessary for the proper functioning of oil mud's. The others are only used for the purpose of enhancing and stabilizing rheological properties and plastering characteristics.

Different types of oils have been used as the continuous phase in oil mud's. The following commonly available oils have gained widespread acceptance:

- Lease crude oil

Refined oils



Visits to Relevant Industries Acquaint Students with Hands-on Knowledge about the Discipline they are Enrolled in, in an Immersive, Experiential Manner.

Our journey:

The day after, it was waiting for. Planning for week long was going to turn into execution. A group of our so called "senior most students" of our department were the organizers of the picnic cum educational tour to Geleki. We had so many duties that had to be done for our tour. Managing the tour bus, shopping the food items, the utensils, and so on.

All the preparations were done. The bus was house packed with all the students of our department.

At last bus stopped at the destination. Our teachers asked us to visit oil fields which were much important in the tour. As we travelled down the road, we saw various spots where fumes were glowing like the superior sun. Those were oil fields. We went to the destinations and the senior staffs in the job explained to us the various mechanisms going on in the huge mechanisms in the field. We were much lucky to get such a good opportunity to get that valuable knowledge from the senior people.



Report of Visit to Geleki Oil Fields by students of Dept of Chemistry [Page 10]


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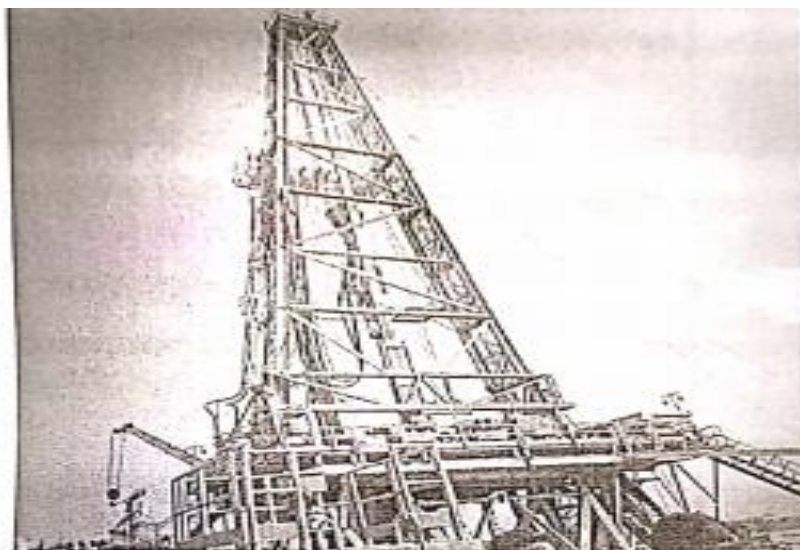


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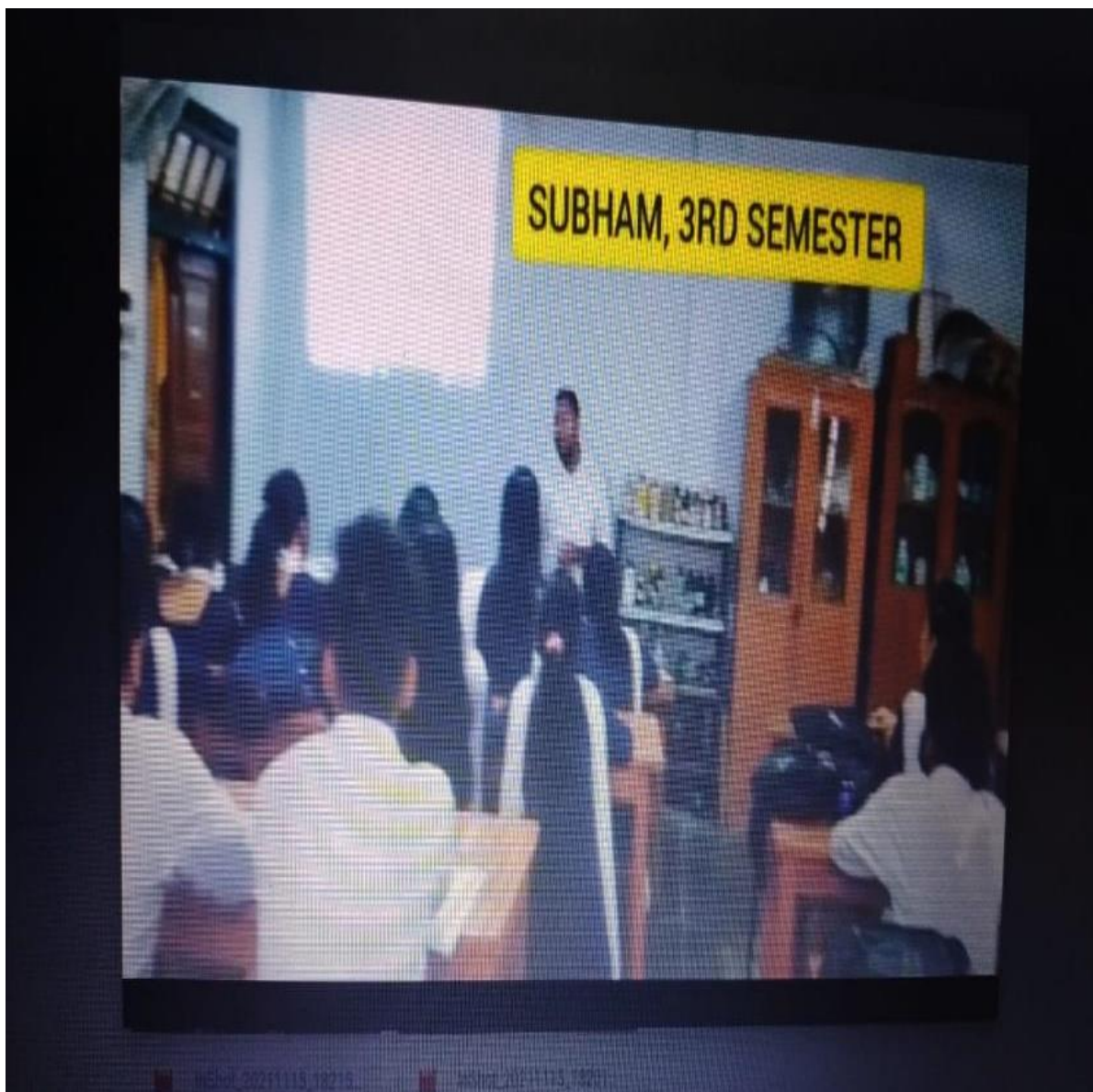



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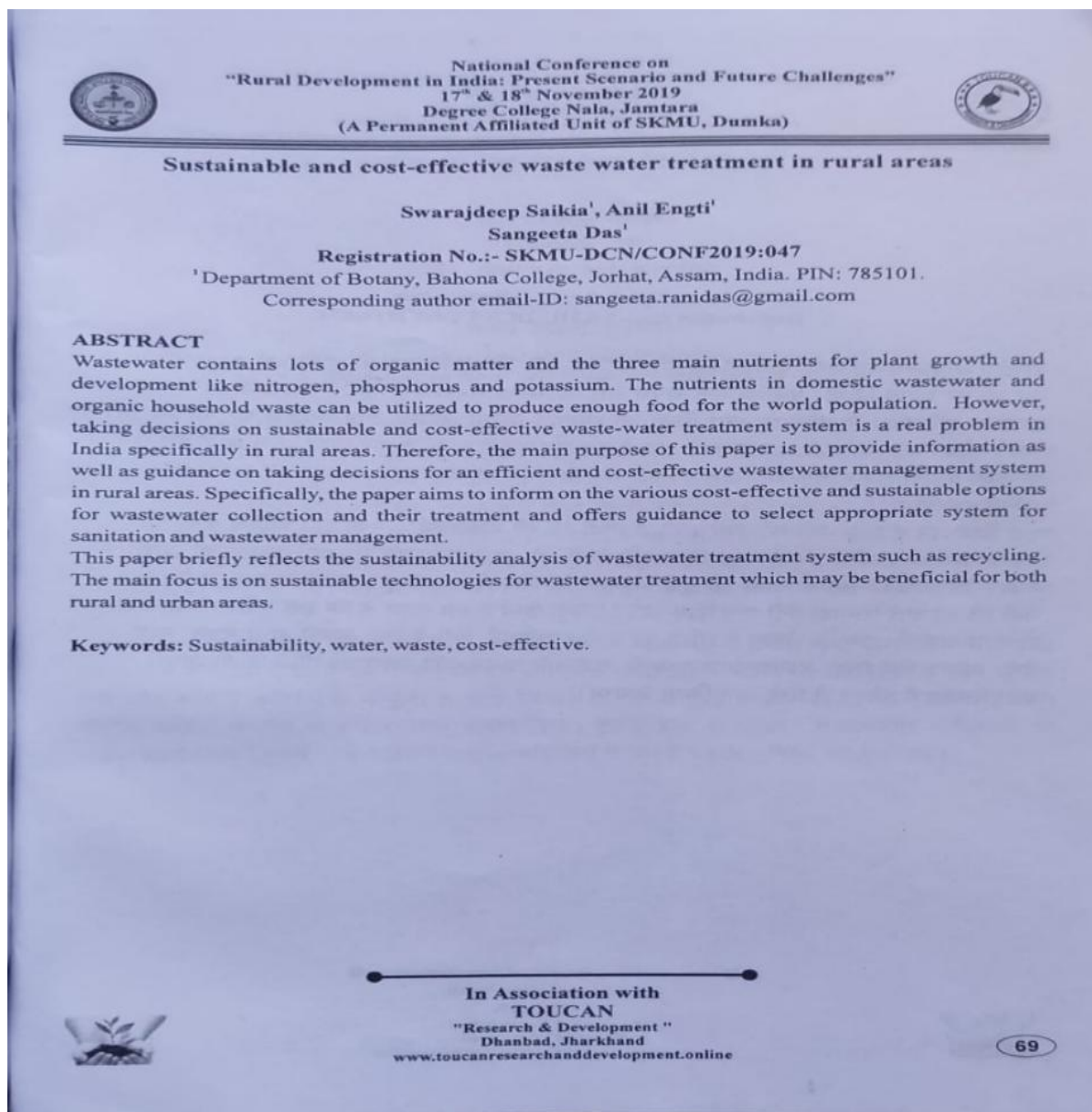


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SYNTHESIS OF SOME POTENT INTERMEDIATES FOR HETEROCYCLES

(Winter Research Program: Dec' 2016 –Jan'2017)

Submitted by,

Chayanika Dutta

B.Sc. 6th sem, Bahona College,

Jorhat, Assam



Carried out under the Supervision of

Dr. Pranjal Gogoi

Scientist, Applied Organic Chemistry Group

Chemical Science and Technology Division

CSIR-North East Institute of Science & Technology

Jorhat-785006, Assam

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Declaration

I, Ms. Chayanika Dutta, winter trainee, Chemical Science and Technology Division, CSIR-North East Institute of Science and Technology, Jorhat-785006, Assam, declare that this report entitled **"SYNTHESIS OF SOME POTENT INTERMEDIATES FOR HETEROCYCLES"** is the result of my winter project. The duration of this project is Dec' 2016- Jan' 2017. I have carried out my project work under the guidance of **Dr. Pranjal Gogoi**, scientist, Applied Organic Chemistry Group, Chemical Science and Technology Division, CSIR-North East Institute of Science and Technology. I have fulfilled all the requirements for this winter project.

Chayanika Dutta
Chayanika Dutta.

CERTIFICATE TO WHOM IT MAY CONCERN

It is to certify that Chayanika Dutta, a student of BAHONA COLLEGE, JORHAT of B.Sc. 6th semester has completed a project report on **"SYNTHESIS OF SOME POTENT INTERMEDIATES FOR HETEROCYCLES"** under my guidance and supervision. She has fulfilled the requirement laid down in the project report.

Pranjal Gogoi
(Dr. Pranjal Gogoi)

Scientist, Applied Organic Chemistry Group
Chemical Science and Technology Division
CSIR-NEIST, JORHAT

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(Dr. P.K. Dutta)
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ACKNOWLEDGEMENT

The preparation and completion of this report is not an individual effort. This gives me immense pleasure to express my sense of gratitude to **Dr. Pranjal Gogoi**, outstanding scientist, Applied organic Chemistry Division, CSIR-NEIST for his individual guidance, suggestions and encouragement throughout my whole project. I express my deepest sense of gratitude for giving me his valuable time and support.

I express my gratefulness to Dr. D. Ramaiah, Director, CSIR-NEIST, Jorhat, for allowing me and providing with the laboratory facilities to carry out my winter project work.

I also acknowledge the help and support rendered by head of the Applied Organic Chemistry Group, Chemical Science and Technology Division, CSIR-NEIST, Dr. P.J. Bhuya and the entire scientific staff for their constant encouragement.

The project would not have been possible for me without the help and support of Limi ba, Kashmiri ba, Aswini da, Avilash da and Kumud da. I have been very fortunate to be around very pleasing and helpful people who were always there to help me in any kind and make me feel comfortable in a completely new environment.

Last but not the least, I would take the opportunity to thank my parents for their innumerable support through everything I do.

Chayanika Dutta.

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2. General remarks
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5. The reaction scheme
6. Experimental procedure
7. Vilsmeier-Haack reaction
8. Some of the synthetic applications of chlorovinyl aldehyde
9. Results and Discussion
10. Conclusion
11. Acknowledgement

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ABBREVIATIONS USED

1. DCM : dichloromethane
2. DMF : dimethylformamide
3. Et : ethyl
4. g : gram
5. h : hour
6. TLC : Thin layer chromatography
7. Me : methyl
8. Min : minute
9. mg : miligram
10. mol : mole
11. IR : infrared
12. NMR : nuclear magnetic resonance
13. R_f : Retension Factor
14. Hz : Hertz
15. MHz : Mega Hertz
16. $^{\circ}\text{C}$: Degree centigrade

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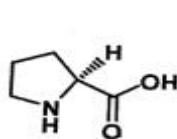

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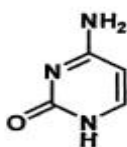
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GENERAL INTRODUCTION

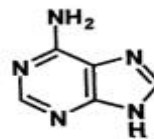
The main focus of this project is the synthesis of β -chloro- α,β -unsaturated aldehyde as intermediate which could be used as a synthon for various heterocycles. Most of the biologically active compounds are comprised of heterocycles, many of which are employed in regular chemical practice. The heterocyclic compounds are widely distributed in nature and play a vital role in the metabolism of all living cells. Some of these are natural products; for example, antibiotics such as penicillin, cephalosporin; alkaloids such as quinine, morphine and reserpine etc.



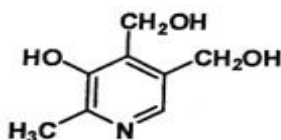
Proline



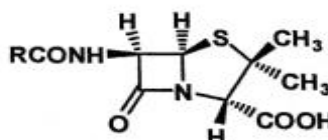
Cytosine



Adenine



Vit B₆



Penicillin

Fig 1: Structures of some biologically important molecules containing heterocyclic ring

In addition, synthetic heterocyclic compounds are also found in various drugs and they exhibit various activities such as anticancer agents, hypnotics, modifiers, veterinary products, agrochemicals etc.

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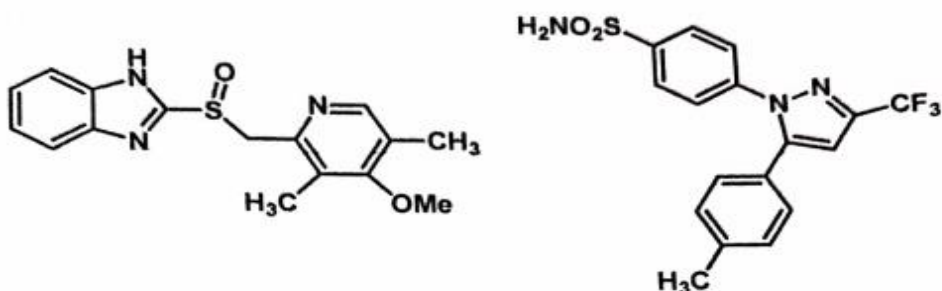

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Omeprazole(antiulcurative)

Celecoxib(antiarthritic)

Fig 2: examples of some drugs containing heterocyclic ring

The β -halo aldehydes are very interesting compounds, which could be transformed to various fused heterocycles by using the reactivity of halide for nucleophilic substitution in combination with the various possibility of transformation of aldehyde functionality. Some examples of β -chloro- α, β - unsaturated aldehyde are shown in Fig 3.

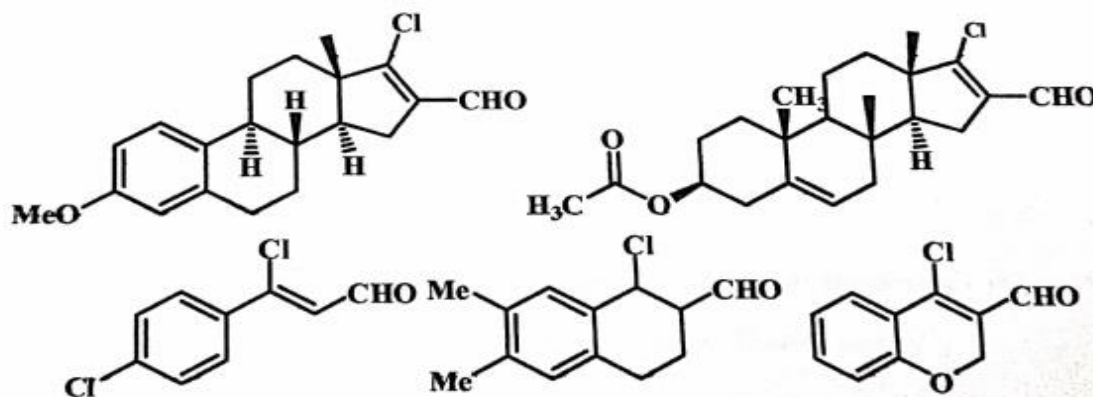


Fig 3: Examples of some β -chloro- α, β - unsaturated aldehydes

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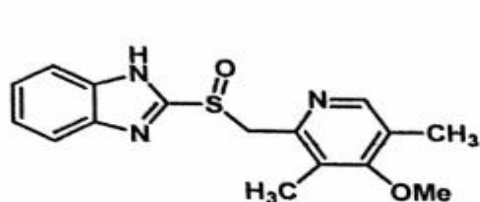

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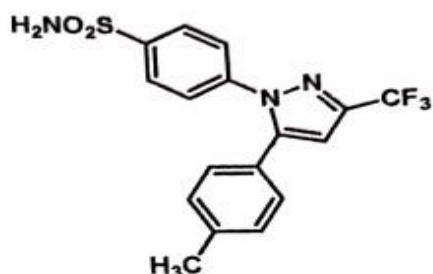

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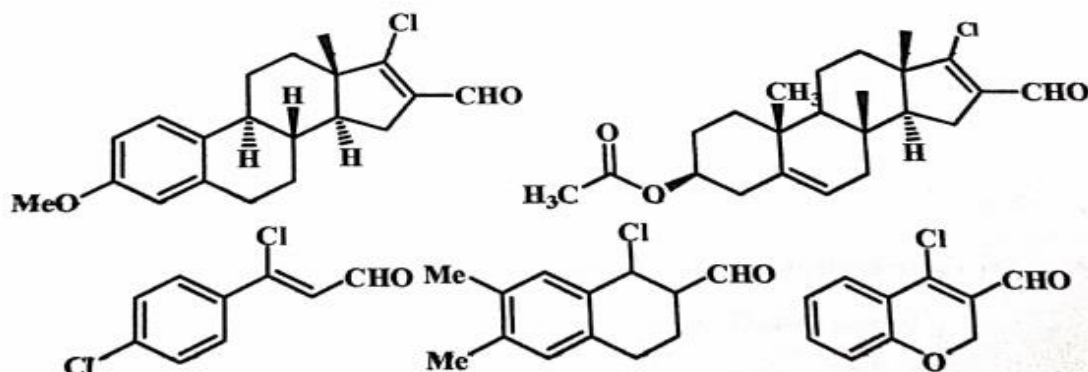


Fig 3: Examples of some β -chloro- α , β - unsaturated aldehydes

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β -Chloro- α,β -unsaturated aldehyde (chloroformyl): The β -chloro- α,β -unsaturated aldehyde (chloroformyl) has been explored as synthetic synthon for different heterocycles as shown in fig 4. They have been used for the synthesis of various heterocycles such as pyridine, pyrimidines, thiophene, furan, coumarin etc.

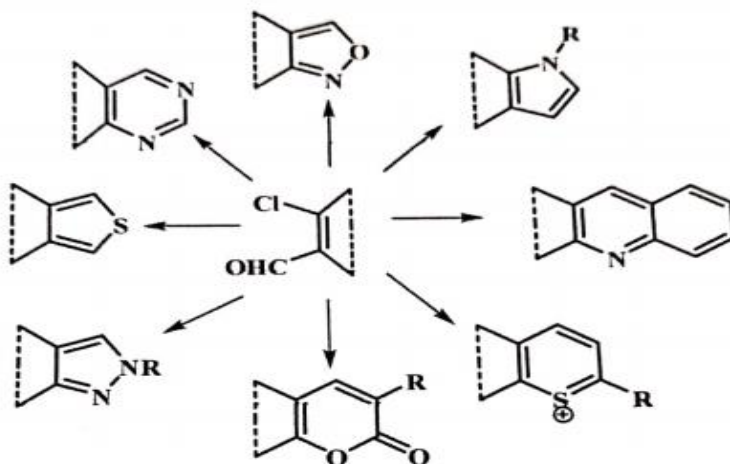
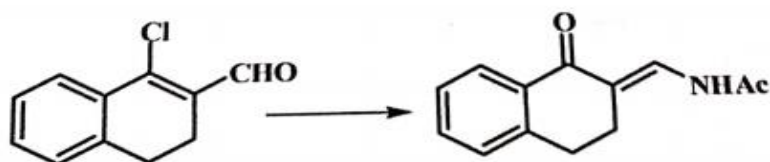


Fig 4: Some synthetic applications of β -chloro- α,β -unsaturated aldehyde

SOME SYNTHETIC APPLICATIONS OF CHLOROVINYL ALDEHYDE:

1. **Synthesis of β -ketoenamide:** 1-Chloro-3,4-dihydronaphthalene-2-carboxaldehyde can be used as starting material for the synthesis of ketoenamide.



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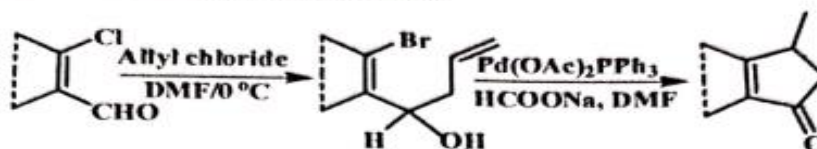



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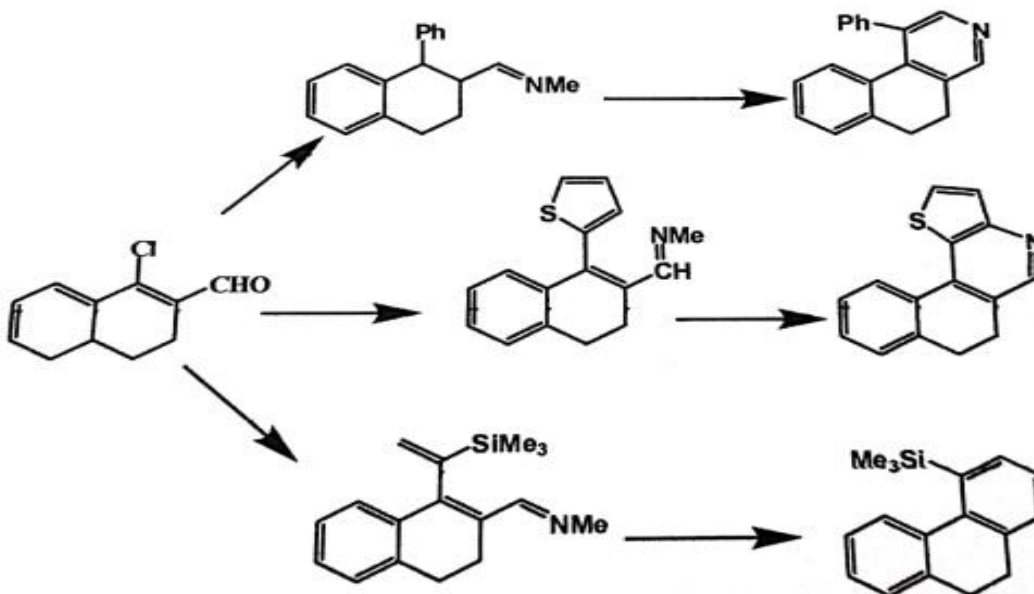


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2. Synthesis of cyclopentanone containing fused rings: Fused carbocycles can be synthesized from chlorovinyl aldehyde.



3. Synthesis of 5,6-dihydrobenz isoquinoline: Using 1-chloro-3,4-dihydronaphthalene-2-carboxyaldehyde as starting materials, 5,6-dihydrobenz isoquinolines can be synthesized.



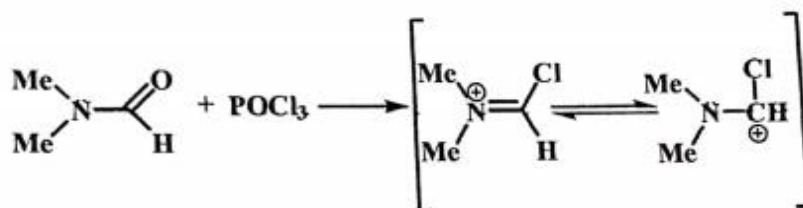
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VILSMEIER-HAACK REACTION

The Vilsmeier- Haack reaction (also called the Vilsmeier reaction) is the chemical reaction of a substituted amide with phosphorous oxychloride and an electron-rich arene to produce an aryl aldehyde or ketone. In 1927, Vilsmeier and Haack discovered that N,N-dimethylformamide formylated aniline derivative in presence of phosphorous trichloride. The classical Vilsmeier Haack reaction involves electrophilic substitution of a suitable carbon nucleophile with a chloromethyleneiminium salt. Chloromethyleneiminium salt is prepared by treating DMF with POCl_3 , at a low temperature.



Vilsmeier reaction is one of the most widely used reactions especially for formylation of various organic substrates in organic chemistry. It plays an important role in the conversion of organic compounds into its corresponding chlorovinyl aldehydes.

Due to the importance of chlorovinyl aldehydes in synthesis of various organic compounds, it is important to synthesize these compounds. Therefore, I have synthesized some chlorovinyl aldehydes using various acetophenones as starting materials.

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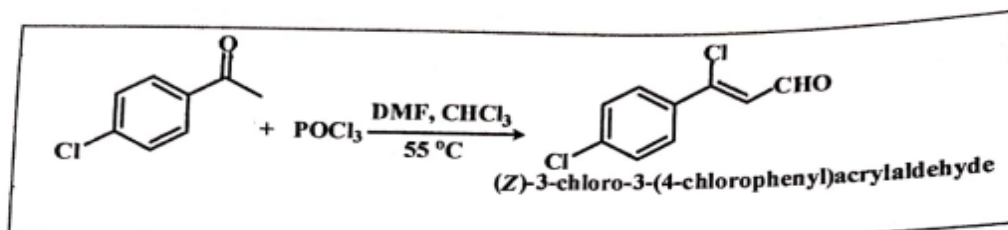
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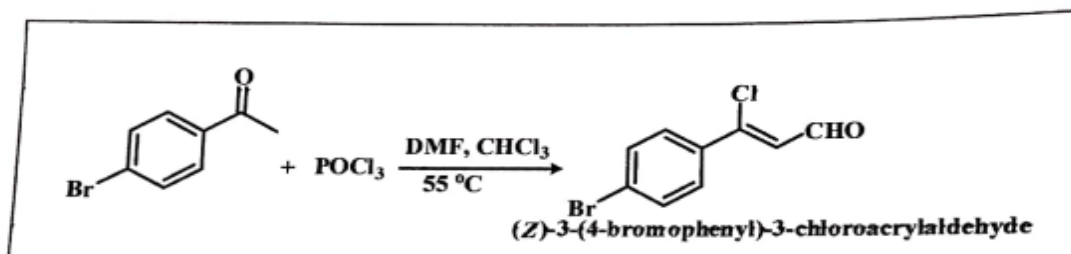
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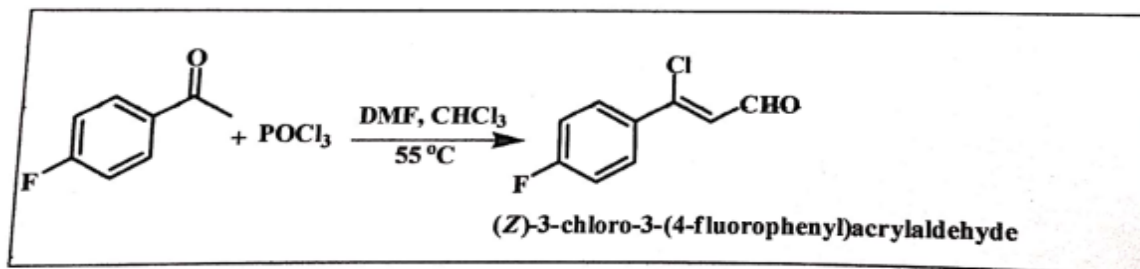
Scheme 1: Preparation of (Z)-3-chloro-3-(4-chlorophenyl)acrylaldehyde from 4'-chloroacetophenone.



Scheme 2: Preparation of (Z)-3-(4-bromophenyl)-3-chloroacrylaldehyde from 4'-bromoacetophenone.



Scheme 3: Preparation of (Z)-3-chloro-3-(4-fluorophenyl)acrylaldehyde from 4'-Fluoroacetophenone.



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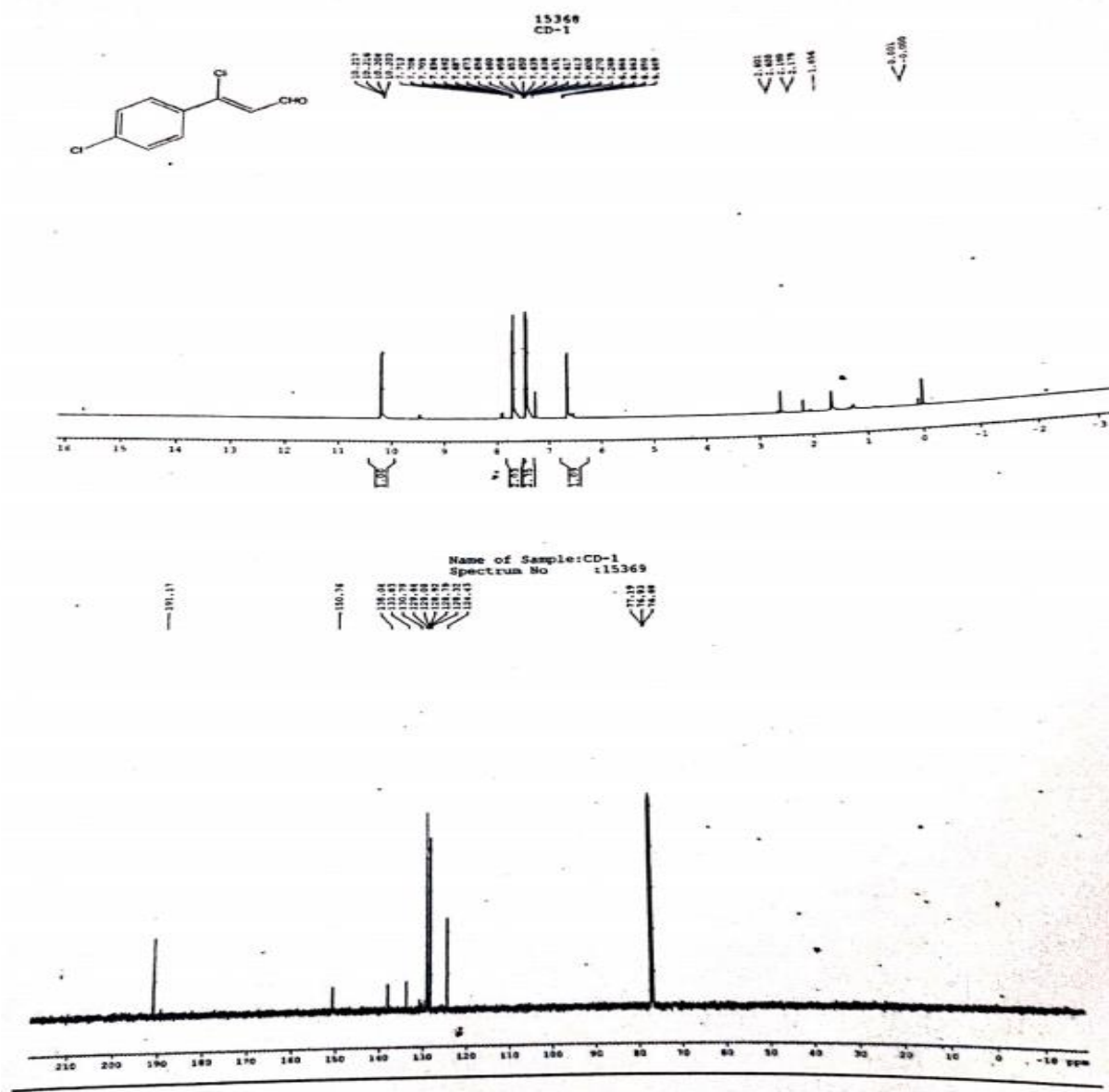

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General procedure for the preparation of β -chloro- α,β -unsaturated aldehyde:

A solution N, N-dimethylformamide (0.7 ml, 10 mmol) in anhydrous chloroform (15 ml) was cooled in ice bath. Phosphorous oxychloride (0.46 ml, 5 mmol) was added drop-wise over a period of 10 minutes. The resulting white suspension was warmed to room temperature and stirred for another 30 minutes. A solution of acetophenone (0.13 ml, 1 mmol) in chloroform (15 ml) was added drop-wise and the reaction mixture was refluxed for three hours. The reaction mixture was then poured into ice water. NaHCO_3 was carefully added to neutralize the acids and the mixture was extracted with chloroform (three times). The organic part was then washed with cold water followed by dried over sodium sulphate. The crude was purified using column chromatography [silica gel (60-120 mesh)]

CONCLUSION

We have synthesized some β -chloro- α,β -unsaturated aldehydes using various substituted acetophenones. All the products were isolated with satisfactory yields and characterised by ^1H and ^{13}C NMR. The synthesized β -chloro- α,β -unsaturated aldehydes could be used as intermediates for the synthesis of various heterocyclic compounds.

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Project Title:

**To study the major nutrients content in
three different types of Organic Manures**

Raktim Dutta
Department of Chemistry
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Acknowledgement

The project work at Tocklai Tea Research Institute was a great privilege and opportunity for me to learn many things regarding activities of a Chemistry Lab. I would like to offer my heartiest thanks to Dr. A K Barooah, Director, Tocklai Tea Research Institute, for giving permission to work in this institute and liberty to access various facilities in the laboratory.

I also express my gratitude to Dr. Raktim Pal, Senior Scientist and In-charge, Analytical Service Department, for his valuable suggestions, encouragement and support during the course of the project.

It is a great pleasure to offer my gratitude and express my deep appreciation and indebtedness to my supervisor Mr. P.K Dutta, Sr. Technical Officer, Analytical Service Department, Tocklai Tea Research Institute, Jorhat, for his valuable guidance. It was a wonderful experience for me to work under his supervision. His necessary suggestions and advices during preparation of the project are duly acknowledged.

At last but not the least, I would like to express my sincere gratitude to the faculty members of Chemistry Department, Bahoma College, especially Head of the Department Dr. Parinita Borah, for recommending me for this summer research training at Tocklai Tea Research Institute.

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Ref.: TOK/X17/12/4

August 3, 2017

TO WHOM IT MAY CONCERN

This is to certify that **Sri Raktim Dutta**, who is pursuing B. Sc., Chemistry, (5th Sem), from Bahoma College, Jorhat, has successfully completed his Training Programme on the topic of **"To study the major nutrients content in three different types of organic manures"** under the supervision of Mr. P.K. Dutta, Sr. Technical Officer and Dr. R. Pal, Sr. Scientist & Incharge, of the Department of Analytical Service of this institute for the period of June - July, 2017.

He was found to be sincere, hardworking, technically sound and result oriented. He worked well as a part of the team during the period.

We wish him success in future.


Administrative Controller

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Abstract

A study was undertaken to determine the major nutrient contents (N, P, K) in three different organic manures viz. Vermicompost, Decomposed cattle manure and a commercial Organic manure sample collected from different sources. The samples were analysed by standard methods and test results were compared for their nutrient contents. Amongst the three organic manures analysed Vermicompost was found to be rich in terms of nutrient contents followed by Decomposed cattle manure.

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Introduction

Manures may be defined as materials which are organic in origin, bulky and concentrated in nature and capable of supplying plant nutrients and improving soil physical environment having no definite chemical composition produced from animal, plant and other organic wastes and by products.

Organic manures are included well rotten farm yard manure (FYM), compost, vermicompost, green manures etc. Generally farm yard manures and composts are the decomposed products of agricultural by-products (animals and crops). Whereas green manures may be defined as materials which are un-decomposed green plant tissues susceptible to decomposition in the soil after incorporation.

The objective of organic cultivation is to have an ecologically sustainable plantation, aimed at the conservation of ecology and natural habit without polluting soil, air and water. So, Organic farming is a method of crop and livestock production that involves much more than choosing not to use pesticides, fertilizers, genetically modified organisms, antibiotics and growth hormones.

Organic manures are of different types i.e. mainly **bulky** and **concentrated** in nature

Bulky organic manures generally contain fewer amounts of plant nutrients as compared to concentrated organic manures. The concentrated organic manures are mainly derived from raw materials of animal or plant origin.

The amount of nutrients content varies with the nature and kind of manures. No definite composition of NPK and other micro-nutrients can be given. However, all oil cakes either edible or non-edible contains differential amount of N, P and K etc.

Concentrated organic manure may be defined as a material of organic origin derived from raw materials of animal or plant, without bulky in nature having no definite composition of plant nutrients.

Some most common such organic manures are oil cakes "edible to cattle (e.g. mustard oil cake, groundnut oil cake, till oil cake etc.) and non-edible to cattle (e.g. neem oil cake, mahua oil cakes etc.); blood-meal, fish manure, bone meal etc.

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Materials and Methods

(A) DETERMINATION OF MOISTURE CONTENT IN ORGANIC MANURE

(a) Equipments and Apparatus:

1. Balance
2. Hot air oven
3. Porcelain crucible

(b) Procedure:

5g of the fresh organic manure sample (in replicate) was accurately weighed in previously weighed clean, dry porcelain crucibles. The crucibles were placed in a hot air oven at 105°C for overnight, and then transferred to a desiccator for cooling. The dry weight of the samples was taken to a constant mass. The loss in mass is the moisture content.

(c) Calculation:

The moisture content was calculated by using the following formula:

$$\% \text{ Moisture content (on fresh weight basis)} = \frac{W_2 - W_3}{W_2 - W_1} \times 100$$

Where, W1 is the weight of the empty basin

W2 is the weight of the fresh sample with basin

W3 is the weight of the sample with basin after drying

(B) DETERMINATION ORGANIC MATTER IN ORGANIC MANURE

(a) Equipments and Apparatus:

1. Balance
2. Hot air oven
3. Porcelain crucible

(b) Procedure:

5g of well mixed fresh organic manure sample (in replicate) was weighed in a previously clean dry silica crucible. The crucible was placed in a muffle furnace at 550°C for four hours. The crucible was removed from the furnace when temperature goes down below 200°C and allowed to cool in a desiccator and weighed to constant mass. The residue represents the ash and loss in mass represents the moisture and organic matter.

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(c) Calculation:

The organic matter content was calculated by using the following formula:

$$\% \text{ Organic matter content} = 100 - M - Z$$

Where, M is the moisture content in the sample and
Z is the total ash content

(C) DETERMINATION OF pH:

(a) Equipments and Apparatus:

1. Weighing balance
2. pH meter (Fig-1)



Fig-1: pH meter

3. Horizontal rotary shaker
4. Conical flask (capacity-100ml)
5. Beaker (capacity-100ml)
6. Measuring cylinder (capacity-50ml)

(b) Principle: pH is a measure of hydrogen ion concentration in a solution. Mathematically it is the negative logarithm of hydrogen ion concentration.

$$\text{pH} = -\log[\text{H}^+]$$

A pH meter is used to measure the hydrogen ion activity in aqueous solutions, indicating its acidity or alkalinity express as pH. The pH meter measures the difference in electrical potential developed between a glass electrode and a reference electrode (calomel electrode). The difference in electrical potential relates to the pH of the solution.

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(c) Procedure:

20 g of test sample (air dried and sieved) is taken into a 100ml conical flask and added 50 ml of distilled water of pH 7.00 with a measuring cylinder. The content was shaking on a horizontal rotary shaker for 30 minutes. The suspension was transferred into a beaker and immersed the combine electrode into the suspension. The pH of the samples was measured in the digital pH meter after calibrating the same with standard buffer solution of pH 7.00 and 4.00.

(D) DETERMINATION OF CARBON IN TEST SAMPLE:

(a) Reagents and Apparatus:

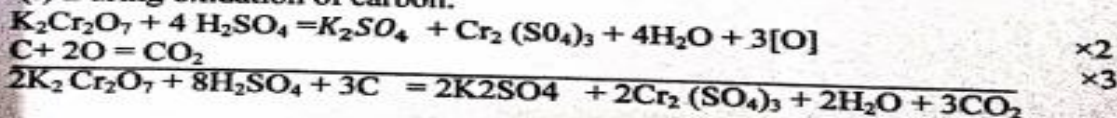
1. Weighing balance
2. Conical flask (500ml capacity)
3. Volumetric flask (capacity-1000ml)
4. Burette (capacity-50ml)
5. Pipette (capacity-10ml)
6. 1N Potassium dichromate solution
7. Concentrated sulphuric acid (98%)
8. Distilled water
9. Solid sodium fluoride
10. Diphenylamine
11. 0.5N Ammonium ferrous sulphate solution

(b) Principle:

The sample is treated with a known excess volume of standard $K_2Cr_2O_7$ solution in presence of concentrated H_2SO_4 . The $K_2Cr_2O_7$ reacts with the H_2SO_4 to produce nascent oxygen which oxidizes carbon to CO_2 . The heat of dilution of the acid facilitates the reaction. The excess unused $K_2Cr_2O_7$ is titrated back against a standard solution of ferrous ammonium sulphate in presence of orthophosphoric acid and NaF using diphenylamine indicator. At the end point of titration the colour changes through blue to green. The NaF flocculates the sample particles in suspension and orthophosphoric acid sharpens the colour change at end point.

(c) Reaction:

(i) During oxidation of carbon:



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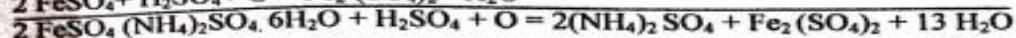
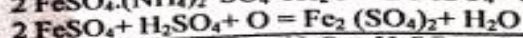
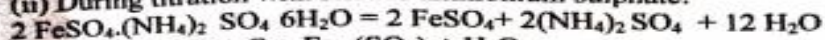
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(ii) During titration with ferrous ammonium sulphate:



(d) Procedure:

0.50g of test sample is taken into a 500ml conical flask and added 10ml of 1N Potassium dichromate solution. Then 20ml of sulphuric acid is added to the above mixture and mixed the content gently for one minute. Then the content is allowed to stand for 20-30 minutes for complete the reaction and then the mixture is cooled down to the room temperature. Then 170ml of water is added to the mixture. Then 0.2g of sodium fluoride and 10ml of orthophosphoric acid is added to the content and shaken gently. Finally 30 drops of diphenylamine indicator is added to the content and titrated against 0.5N Ammonium ferrous sulphate solution taken into a burette.

(e) Calculation:

$$\% \text{ Carbon} = \frac{(B - S) \times 3.869}{S \times w}$$

Where, B is the volume (in ml) of 0.5N Ammonium ferrous sulphate solution consumed in titration with blank determination

S is the volume (in ml) of 0.5N Ammonium ferrous sulphate solution consumed in titration with sample determination

W is the sample taken for test in gram

(E) NITROGEN IN ORGANIC MANURE

(a) Equipments, Apparatus and Reagents :

1. Weighing Balance
2. Kjeldahl digestion unit
3. Kjeldahl distillation unit.
4. Burette and pipette
5. Conc. Sulphuric acid salicylic acid mixture
6. Catalyst mixture (Potassium sulphate & Copper sulphate in 10:1 ratio)
7. Sodium hydroxide solution 45%
8. Hydrochloric acid or Sulphuric acid 0.1N
9. Boric acid 4%
10. Mixed indicator solution
11. Glass bead

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(b) Procedure:

(i) Digestion: 0.20g of air dried and ground organic manure sample is taken in 100ml digestion tube. To it added 4g of catalyst mixture and then added 10ml of Conc. Sulphuric acid with rotating the flask to ensure complete contact of the acid with the sample. The mixture is shaken for some time after adding a few glass bid to avoid bumping and then placed in Kjeltac block digestion unit by raising the temperature from 250°C to 400°C in 15min and finally kept at 400°C for 45min. Then the content is allowed to cool. The digested mixture is transferred to a 300ml Kjeldahl flask quantitatively and diluted accordingly.

(ii) Distillation: 25ml of 4% boric acid solution is pipette out in a receiver flask and added 5 drops of mixed indicator solution. The flask is connected to the distillation apparatus so that the end of the delivery tube is dipped into the boric acid solution. Then the Kjeldahl flask containing the digested material is connected to the distillation apparatus and added about 50ml of 45% Sodium hydroxide solution it in such a way that it runs downs to the bottom of the flask without mixing. The mixture is heated for boiling and continued distillation steadily till about 150ml of the distilled have been collected.

(iii) Titration: The distillate is titrated against 0.1N HCl or H₂SO₄ till the blue color just disappears and tends to turn pink. A blank was done without adding the substance under analysis and titrated in the same way.

(c) Calculation:

$$\% \text{ Total N} = \frac{(T - B) \times S \times 0.014 \times 100}{W}$$

Where, T is the volume of standard acid used in the titration of sample determination

B is the volume of standard acid used in the titration of blank determination

S is the strength of the standard acid used in the titration

W is the weight of the sample in gram taken for the test

(F) PHOSPHOROUS AND POTTASIAM IN ORGANIC MANURE

(a) Apparatus and reagents:

1. Weighing Balance
2. Colorimeter
3. Flame photometer
4. Volumetric flask (Capacity-250ml & 50ml)
5. Whatman No 42 filter paper
6. Reference standard of Phosphorous and Potassium
7. Concentrated nitric acid

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8. Perchloric acid
9. Ammonium molybdate
10. Concentrated hydrochloric acid
11. Stannous chloride

(b) Digestion:

0.50g of air dried and sieved test sample was taken in a conical flask and added gently 30ml of Conc. Nitric acid and 5ml Perchloric acid and boiled the mixture on a hot plate until dense white fumes ceases to form. The mixture is cooled and transferred the digested material to a 250ml volumetric flask, diluted with distilled water and made the volume up to the mark. Then mixed well and filtered using Whatman No.42 filter paper. The filtrate is used for the determination of phosphorous and potassium.

(c) Determination of Phosphorous:

(i) Principle:

The determination of phosphorous is based on Lambert and Beer's law using a colorimeter or a spectrometer.

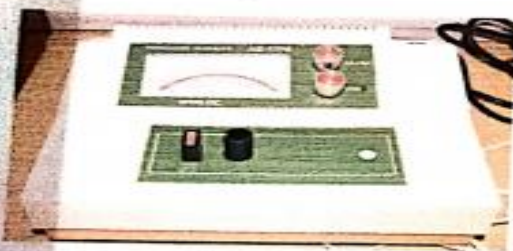


Fig-2(a): A ERBA colorimeter

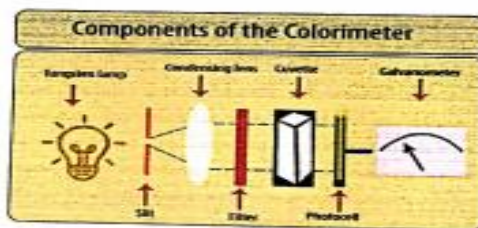


Fig-2(b): Component of a colorimeter

When light falls upon a homogeneous medium a portion of the incident light is reflected, a portion is absorbed within the medium, and the remainder is transmitted. If the intensity of the incident light is expressed by I_0 , that of the absorbed light I_a , that of the transmitted light by I_t and that of the reflected light by I_r , then:

$$I_0 = I_a + I_t + I_r$$

As per Lambert law, when monochromatic light passes through a transparent medium, intensity of the emitted light decreases exponentially as the thickness of the absorbing medium increases, arithmetically express by

$$I = I_0 e^{-kx} \text{ ----- (i)}$$

Where, k is the constant for the wavelength and absorbing medium used,

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I is the light intensity after it passes through the medium, and
 x is the thickness of the absorbing medium.
As per Beer law, the intensity of a beam of light decreases exponentially as the concentration of the absorbing substance increases, now replacing the constant k of Lambert law by its equivalent ϵc for solution, we can sum up the two laws into a single equation as,

$$I = I_0 10^{-\epsilon c x} \text{ ----- (ii)}$$

Where c is the concentration of the solute in moles/litre and ϵ is a constant characteristic of the solute but independent of its concentration in solution. This constant is known as molecular absorption coefficient.
Equation (ii) may be put in the form:

$$\log I_0 / I = \epsilon c x \text{ ----- (iv)}$$

The quantity $\log I_0 / I$ is called **optical density D**, or **absorbance A** or **extinction E**.

Experimental measurements are usually made in terms of **transmittance (T)**, which is defined as:

$$T = I / I_0$$

where I is the light intensity after it passes through the sample and I_0 is the initial light intensity. The relation between absorbance A and transmittance T is:

$$A = \log 1/T = \log (I_0 / I)$$

(ii) Procedure:

1ml of filtrate as prepared in F (b) is transferred to a 50ml of volumetric flask then 10ml of ammonium molybdate solution is added to it. Little amount of water is added to the above content and then 1ml of stannous chloride is added to it. The volume is made up to 50ml mark by adding distilled water and then the content is shaken well to complete the formation of blue colour. Then the intensity of colour develop is measured in a previously calibrated colorimeter to find the concentration of phosphorous in the test samples

(iii) Calculation:

The concentration of phosphorous in the sample extract is obtained by comparing its absorbance/Transmittance reading with the standard curve. The result are expressed as % of P_2O_5

$$\% \text{Phosphorous (as } P_2O_5) = \frac{SR \times V_1 \times V_3 \times 2.29}{W \times V_2 \times 10000}$$

Where, SR is the sample reading from standard curve as P (mg/kg)

V_1 is the original volume of the extractant (in ml)

V_2 is the volume of extractant taken for the test (in ml)

V_3 is the final volume of the extractant (in ml), and

W is the weight of the test sample taken (in gram)

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(d) Determination of Potassium:

(i) Principle: The determination of Potassium is based on flame emission spectroscopy by using a flame photometer.



Fig-3a: A Corning Flame Photometer

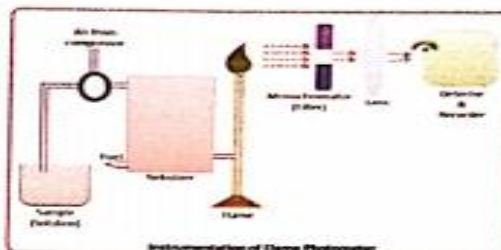


Fig-3b: Schematic diagram of a Flame photometer

The absorption and emission of radiant energy by atoms provide strong analytic determination, qualitatively and quantitatively. In flame emission spectroscopy, the concentration of the analyte present in sample is proportional to the intensity of the emitted radiation.

Let us consider a simplified energy level, where E_0 represent the ground state in which the electrons of an atom are at their lowest energy level and E_1, E_2, E_3 etc represent higher energy levels.

Transitions between two quantized energy levels, say from E_0 to E_1 , correspond to the absorption of radiant energy, and the amount of the energy absorbed (ΔE) is measured by Borh's equation

$$\Delta E = E_1 - E_0 = h\nu$$
, Where h = plank's constant and ν = frequency of radiation

Clearly, the transition from E_0 to E_1 corresponds to the emission of radiation of frequency ν .

The intensity of the light emitted could be described by the Scheibe-Lomakin equation:

$$I = k \times c^n$$

Where:

I = Intensity of emitted light

C = the concentration of the element

k = constant of proportionality

$n \sim 1$ (at the linear part of the calibration curve)

Then,

$$I = k \times c$$

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That is the intensity of emitted light is directly related to the concentration of the sample.

(ii) Procedure:

The filtrate as obtained in F(b) is subjected to flame photometer for determination of potassium after calibrating the same with standard Potassium solution.

(iii) Calculation:

The concentration of potassium in sample extract is obtained by comparing the flame photometer reading with the standard curve. The results are express as % K_2O

$$\% \text{Potassium (as } K_2O) = \frac{SR \times V_1 \times V_3 \times 1.2}{W \times V_2 \times 10000}$$

Where, SR is the sample reading from standard curve as K (mg/kg)

V_1 is the original volume of the extractant (in ml)

V_2 is the volume of extractant taken for the test (in ml)

V_3 is the final volume of the extractant (in ml), and

W is the weight of the test sample taken (in gram)

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Result and discussion

The tests results are given in table-1:

Table-1

Sample identity	Moisture content* (%)	Organic matter content* (%)	pH (1:2.5)	Total nutrient content % (w/w)**				C N Ratio
				Nitrogen as N	Phosphorous as P_2O_5	Potassium as K_2O	Organic carbon	
(1) Vermi compost	66.74	13.55	6.73	1.04	2.34	1.69	17.19	16.5:1
(2) Decomposed cattle manure	49.47	10.43	6.77	0.81	0.20	0.19	10.07	12.4:1
(3) Commercial Organic manure	3.35	58.82	7.44	0.11	0.08	0.05	0.13	1.2:1

*On fresh weight basis; ** on air dry weight basis

The pH of the samples (1) Vermicompost and (2) Decomposed cattle manure are found to be slightly acidic in nature, whereas the sample (3) Commercial organic manure is found to be alkaline in nature (Fig-4).

The organic matter content is found to be very high in Commercial organic manure sample; however it is moderate in case of Vermicompost & Decomposed cattle manure (Fig-5).

The organic carbon level is found to be high in Vermicompost and Decomposed cattle manure samples, however it is very poor in Commercial organic manure sample (Fig-5).

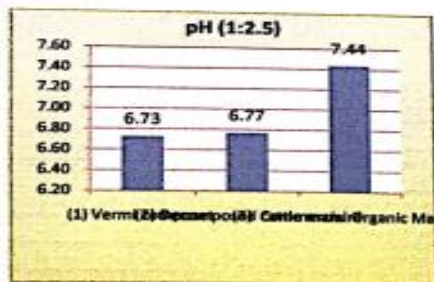


Fig-4

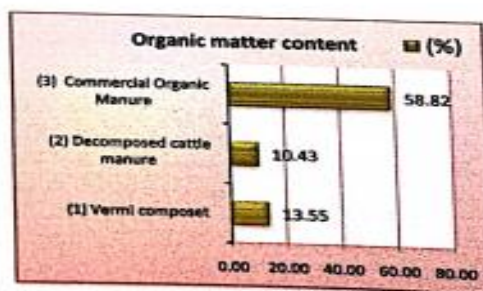


Fig-5



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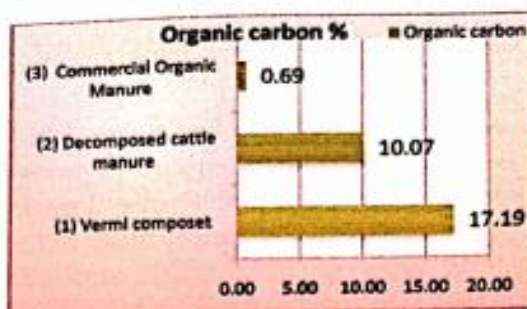


Fig-6

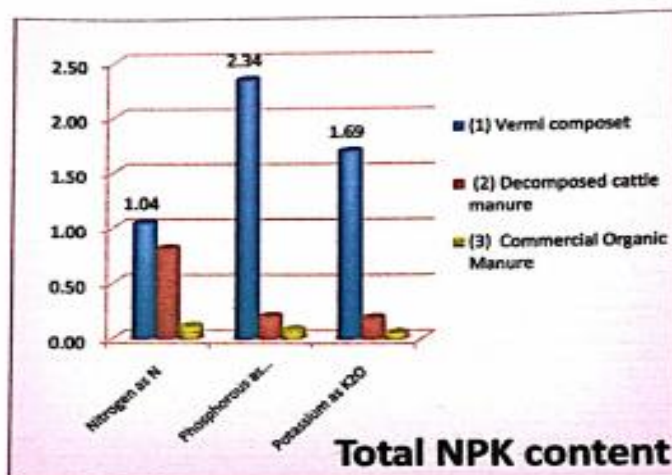


Fig-7

The sum total of NPK content is highest in Vermicompost sample followed by Decomposed cattle manure, while Commercial organic manure sample contains very poor NPK (Fig-7).

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Summery and conclusion

From the test results it is observed that the 'Vermicompost' sample under test contains highest amount of major nutrients (5.1% NPK) amongst the three manure samples analysed, which has satisfied the tolerance limit of Organic fertilizer (which is, the sum total of nitrogen, phosphorus and potassium nutrients shall not be less than 2.5% in case of Vermicompost) as per "Biofertilizers and Organic Fertilizers in Fertilizer (Control) Order, 1985". However the quality of organic manure produced is dependent upon the inputs and method employed.

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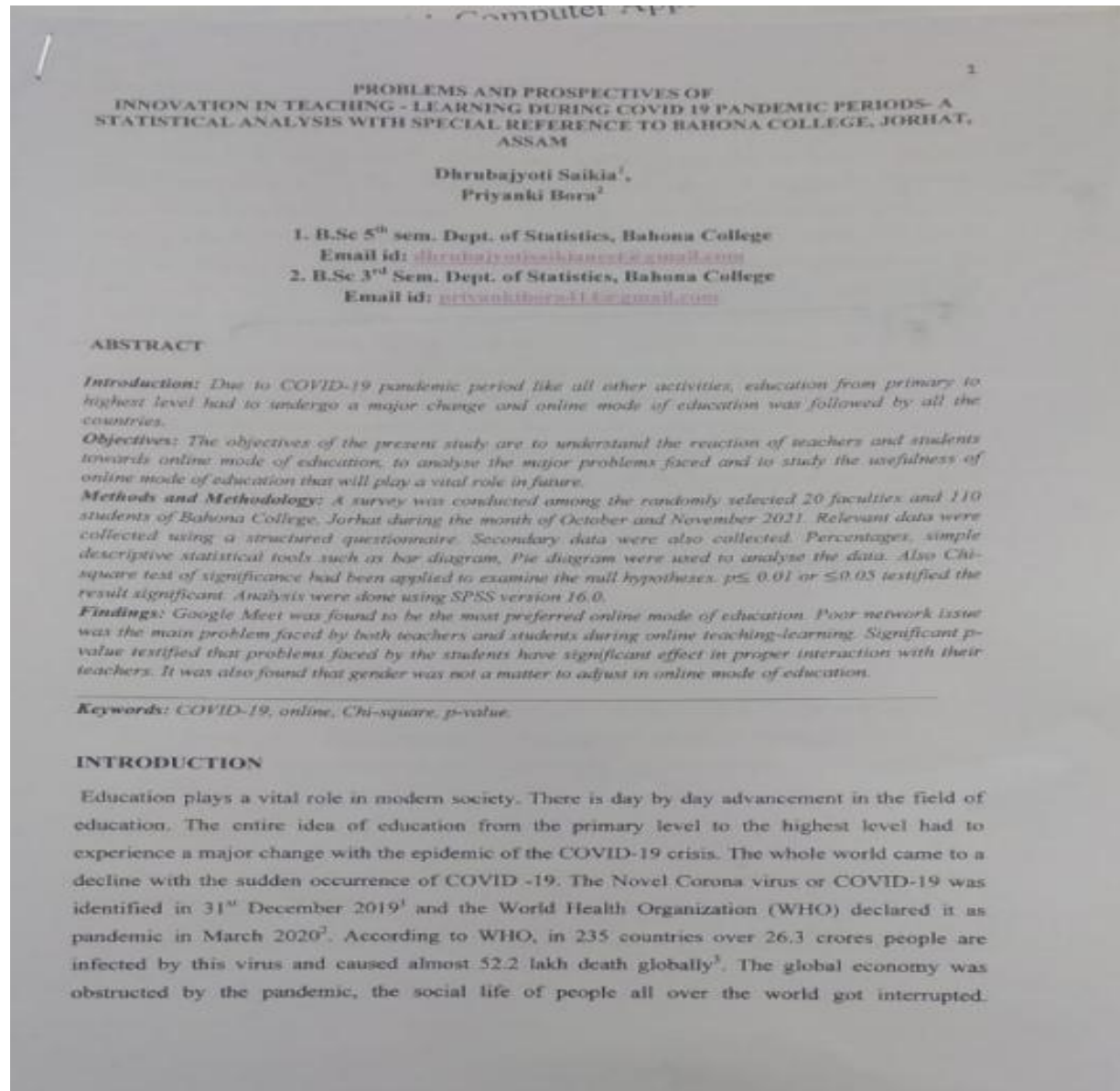


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International Labour Organization estimated that almost 2.7 billion workers will get affected by this pandemic⁴. Over 40 million people lost their jobs in India itself due to COVID-19⁵.

With the spread of COVID-19, educational institutions all over the world were closed down. The only way to stop the spread of this deadly virus was to maintain social distancing. India went under complete lockdown from 25th of March⁶. All sorts of educational institutions, offices, shops, transports and communication facilities were closed. It was thought that children were more likely to be affected by the virus. Thus almost all the educational institutions moved towards online mode of delivering education to the students in different parts of the world. In a country like India where classroom teaching is followed everywhere, the transformation to online mode of teaching was harsh. But this was the only alternative. The closure of educational institutions all over the world put the future of the young students at stake. To deal with this problem online mode of education was followed by all the countries. This was not new for technologically developed European countries. But in India students faced a lot of trouble as they suddenly faced a situation which was unusual. Even the teachers had a harsh time to deal with this alteration. Network connectivity was one of the major problems faced by the teachers as well as students. Keeping these points of view, this paper is a humble attempt to understand the impact of online education on the students of Bahona College, Jorhat. Thus this study will help in understanding the problems and concerns of the students during online learning and will provide new way to cope with these problems.

OBJECTIVES

The objectives of this study are-

- To understand the reaction of teachers and students to the online mode of education
- To analyse the major problems of online education among the students
- To study the usefulness of online mode of education that will play an important role in future.

HYPOTHESES

H₀₁: The problems faced by the students are not obstructive in smooth interaction with teachers during online mode of education.

H₀₂: There is no association between the genders in adjusting with the new mode of online learning.

Papers Presented by Students from Dept of Statistics [Page 2]


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Students of Dept of Zoology Raising Awareness about Conservation of Avian Species [Page 1]


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UG students distributing Torch Light to Forest Guard.
Gibbon Sanctuary, Feb 2019

Students of Dept of Zoology Distributing Torch Lights among Forest Guards


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Students of the College Raising Awareness about Sanitation and Drinking Water


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Outdoor Classes are Conducted during Winter to break the Monotony and for a Rejuvenating Experience



Dept of History [Page 1]


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