

AIMS AND OBJECTIVES OF OUR FIELD STUDY

- To gain a general idea about the forest ecosystem.
- To gather a knowledge regarding the biodiversity of the area.
- To learn about population distribution of various animal species.
- To understand the diverse habit, habitat and behaviour of various animals and their original area of living.
- To gather knowledge about inter relationship between biotic and various abiotic components of the ecosystem.
- Knowledge about threats and determining protection and conservation.
- Discovering our teachers in new ways.
- Relationship and harmony with friends.

THE TEAM

• TEACHERS

- Dr. Debjani Datta (Principal)
- Dr. Partha Pratim Chaudhuri (Head of the Department of Zoology)
- Dr. Papia Das (Assistant Professor, Department of Zoology)

• LAB ATTENDANT

Mr. Tapas Show

• STUDENTS

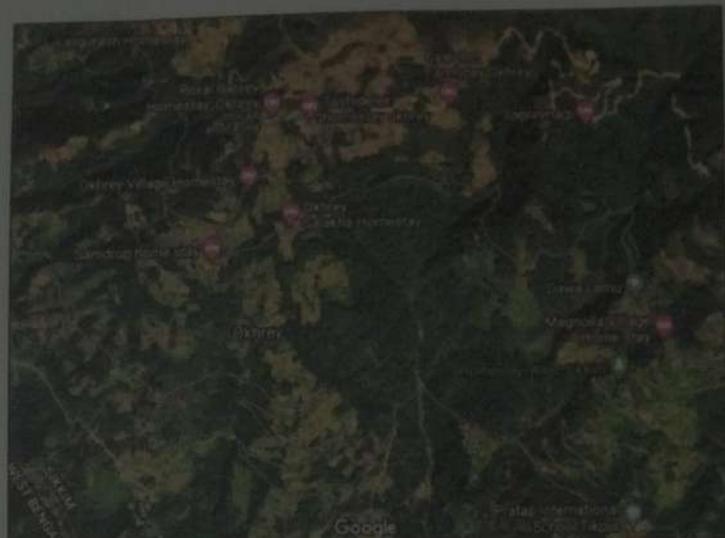
1. Afsana Parveen	6) Prajjal Pal
2. Anannya Mondal	7) Sebika Ghosh
3. Brishty Chakraborty	8) Sidharta Adhikary
4. Nazma Khatun	9) Sk Nadir Rafed
5. Paramita Pramanik	10) Swastika Kumar



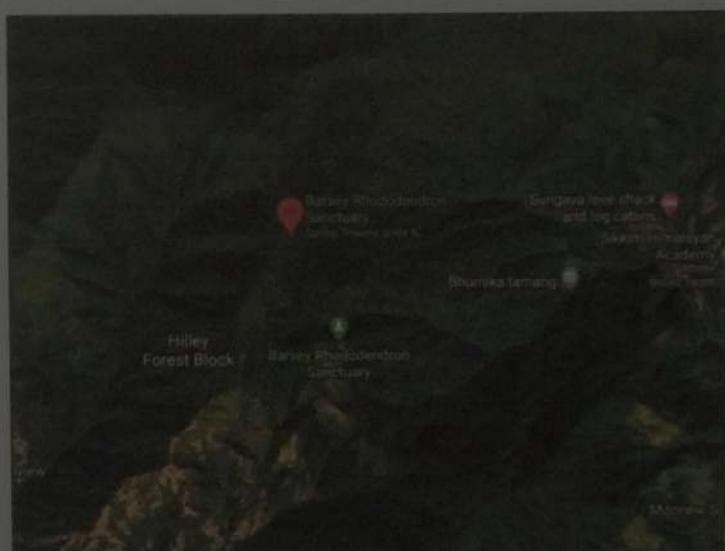
Fig : Group Photo

ITINERARY

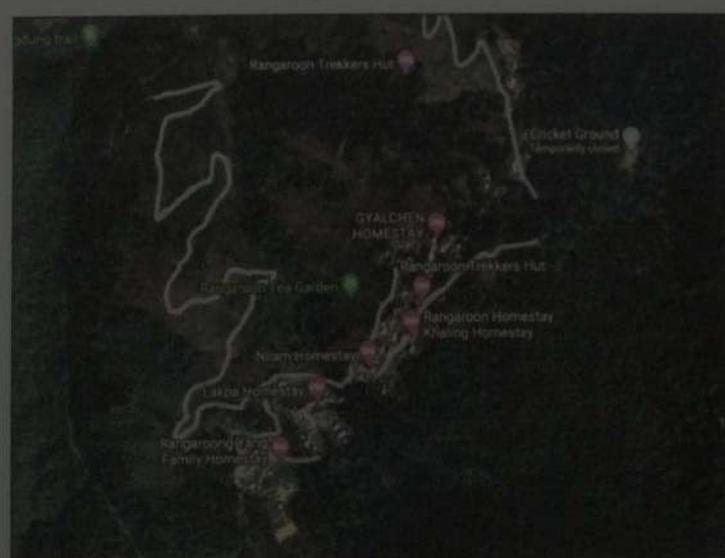
DATE	TIME	PROGRAMME
14th November - 2022	08.35 P.M.	Sealdah to New Siliguri Jn. by 13149 up Kanchan Kanya Exp.
15th November - 2022	8.00 A.M. 9 .00 A.M 2 .30 P.M.	Reached at Siliguri Jn. We started our journey to Okhrey,West Sikkim Reached at Okhrey,West Sikkim
16th November - 2022	6.30 A.M. 8.30 A.M. to 1.30 P.M.	Local Birds Study
17th November - 2022	8.00 A.M. to 10.00 A.M 10.00 A.M.	Local Birds Study Visited Monastery
18th November - 2022	7.30 A.M. to 2.30 P.M.	Visited Varsey Rhododendron Sanctuary
19th November – 2022	7.15 A.M 12.30 P.M. 5.00 P.M to 6.00 P.M.	Way to Rangaroon Reached at Rangaroon Local Study
20th November – 2022	6.00 A.M to 7.30 A.M 8.15 A.M to 10.00 A.M 11.00AM to 3.00 P.M	Local Birds Study Visited Senchal Forest, Rangaroon Local Study
21th November – 2022	10.00 A.M 11.15 A.M 11.30 A.M 3.30 P.M 7.00 P.M 8.20 P.M	Way to Darjeeling Reached at Darjeeling Visited Padmaja Naidu Himalayan Zoological Park Set to Return from Darjeeling Reached at Siliguri Jn. By 13150 UP Kanchan Kanya Exp. Leaves Siliguri Jn.
22th November – 2022	8.45 A.M	Return to Sealdah Station.



Okhrey, West Sikkim



Varsey, West Sikkim



Rangaroon

Fig: Our Study Map

A Brief History Of Sikkim

The history of Sikkim begins with ancient Hindu and Tibetan contacts, followed by the establishment of a kingdom (Chogyal) in the 17th century. Sikkim emerged as a polity in its own right against a backdrop of incursions from Tibet and Bhutan, during which the kingdom enjoyed varying degrees of independence. In the early 18th century, the British Empire sought to establish trade routes with Tibet, leading Sikkim to fall under British suzerainty until independence in 1947. Initially, Sikkim remained an independent monarchy, however in 1975, its subjects voted by plebiscite to become a state of India.

Not much is known about Sikkim ancient history except that the original inhabitants were the Lepcha (or "Rong"), Limbu (Tsong) and Bhutias. Sikkim also finds its mention on many Hindu texts as Indrakil or "Garden of Lord Indra."

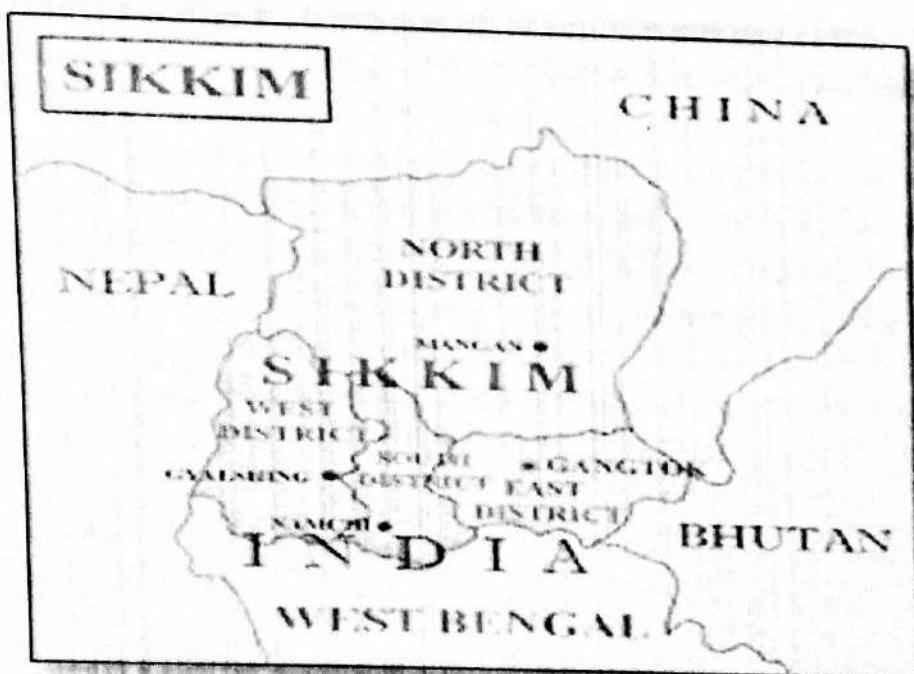


Fig: Map of Sikkim

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TOMORROW

Sikkim is only state in India which is divided into four states like East Sikkim, West Sikkim, North Sikkim and South Sikkim.

West Sikkim is the second largest district in the Indian state of Sikkim with an area of 1,166 sq km. West Sikkim lies between 27°-27°55" North latitudes and 88°-88°36" East Longitudes. Average elevation is 2,694 m. Maximum elevation is 7,320 m. Minimum elevation is 298 m. The breathtaking view of Mt. Kanchenjunga along with scared lakes, deep forest of pine, fir with so many known and unknown floras and faunas make it one of the best tourist regions in the Sikkim. The erstwhile capital of the Sikkim beginning in 1642, West Sikkim remains the capital city for almost 50 years until it shifted to Rabdentse. The region was under the ownership of Nepalese for nearly 30 years in the 18th and 19th centuries. It comes under Sikkim after the Anglo-Nepalese war from 1814 to 1816. Spread over 1,166 sq. km., West Sikkim has a sizeable Nepali population owing to their possession for three decades. Also, Nepali is the predominant language, along with the Bhutia, Lepcha, Limbu, etc. Now, Geyzing is the capital of West Sikkim, which is also recognized as Gyalshing. Geyzing is also connected to the West Bengal towns of Darjeeling and Kalimpong via Jorethang. The town enjoys a temperate climate for most of the year and snow sometimes falls in the vicinity. Other important towns include Pelling, Yuksom and Dentam. The district shares its borders with South Sikkim and North Sikkim in the east and north respectively and with the state of West Bengal in the south. It also has an international border with Nepal to its west.

+

Okhrey:

Okhrey is a small village situated in West Sikkim district, India. Okhrey is mostly inhabited by Sherpas. Okhrey comes under Daramdin BAC Block Administrative Center, and is approximately 110 kilometres (68 mi) from the capital Gangtok. The nearest town from Okhrey is Sombaria at a distance of around 15 kilometres (9.3 mi). The main occupation of the people of Okhrey is farming, and they mainly produce potatoes. The temperature of Okhrey can fall to -2 °C (28 °F) in winter, and it has a moderate climate during summer.

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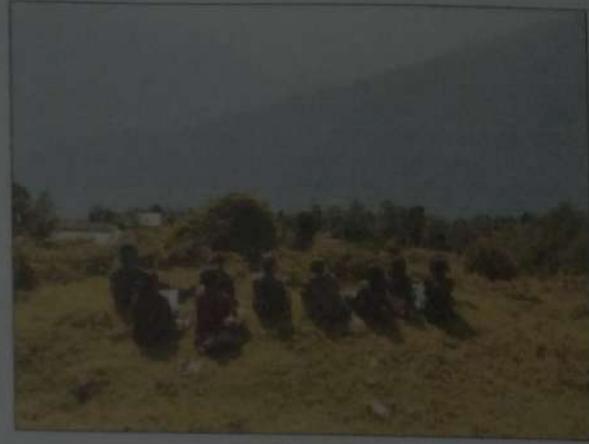
Varsey Rhododendron Sanctuary:

The **Varsey Rhododendron Sanctuary** or Barsey Rhododendron Sanctuary occupies 104 km² in the Singalila Range in western Sikkim. It borders on Nepal to the west, and on the state of West Bengal to the south across the Rambong Khola stream. The Rhododendrons bloom during March and April. The Varsey Sanctuary can be reached from three points, Hille, Dentam and Soreng. The most popular entry is Hille since it is approachable by road and Varsey is only 4 km trek from this point along an undulating path shaded by different species of rhododendron.

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Kolkata - 700 017



A



B

Fig : (A,B) Okhrey, West Sikkim



C



D



E



F EXAMINED
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Fig : (C,D,E,F) Varsey Rhododendron Sanctuary

FAUNAL DIVERSITY

BIRDS

- DATE: 16/11/2022
- DESTINATION: Okhrey, West Sikkim (Zone - I)
- TIME : 6:00am -1:00pm

Table - 1. Birds Diversity Observed in Zone - I :-

SERIAL NO.	COMMON NAME	SCIENTIFIC NAME	NUMBER
1.	Striated Laughingthrush	<i>Grammatoptila striatus</i>	2
2.	Grey Wagtail	<i>Motacilla cinerea</i>	1
3.	Red-billed Leiothrix	<i>Leiothrix lutea</i>	1
4.	Chestnut-tailed Minla	<i>Actinodura strigula</i>	6
5.	Grey Treepie	<i>Dendrocitta formosae</i>	2
6.	Rufous Sibia	<i>Heterophasia capistrata</i>	1
7.	Green-tailed Sunbird	<i>Aethopyga nipalensis</i>	1
8.	Fulvettta	<i>Alcippe poiocephala</i>	1
9.	Chestnut	<i>Lonchura atricapilla</i>	2
10.	Asian Barred Owlet	<i>Glaucidium cuculoides</i>	1
11.	Blue-fronted Redstart	<i>Phoenicurus frontalis</i>	3
12.	Green Backed Tit	<i>Parus monticolus</i>	1
13.	White Browed Fulvettta	<i>Fulvetta vinipectus</i>	1
14.	Golden Breasted Fulvettta	<i>Lioparus chrysotis.</i>	27
15.	Rufous Capped Babbler	<i>Stachyridopsis ruficeps</i>	1
16.	Yellow Billed Magpie	<i>Pica nuttalli</i>	1

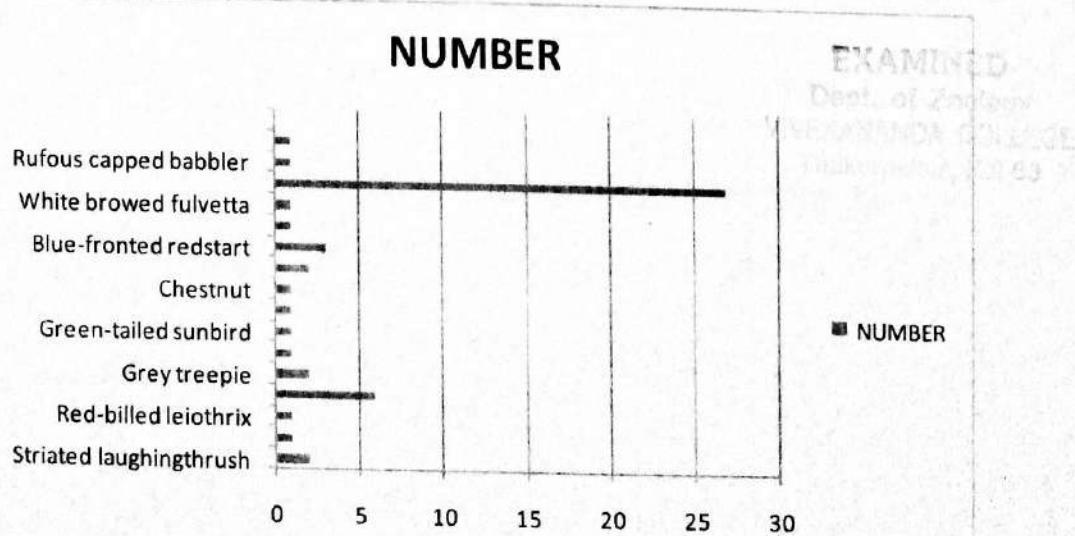


Fig : Graphical Representation of Okhrey, West Sikkim (Zone - I)

- DATE: 17/11/2022
- DESTINATION: Okhrey, West Sikkim (Zone - II)
- TIME: 7:00am- 12:00pm

Table - 2. Birds Diversity Observed in Zone - II :-

SERIAL NO.	COMMON NAME	SCIENTIFIC NAME	NUMBER
1.	Rufous Sibia	<i>Heterophasia capistrata</i>	2
2.	Sikkim Treecreeper	<i>Certhia discolor</i>	1
3.	Striated Laughingthrush	<i>Grammatoptila striatus</i>	2
4.	Red Tailed Minla	<i>Minla ignotincta</i>	1
5.	Chestnut Tailed Minla	<i>Actinodura strigula</i>	1
6.	Velvet Fronted	<i>Sitta frontalis</i>	1
7.	Grey Treepie	<i>Dendrocitta formosae</i>	1

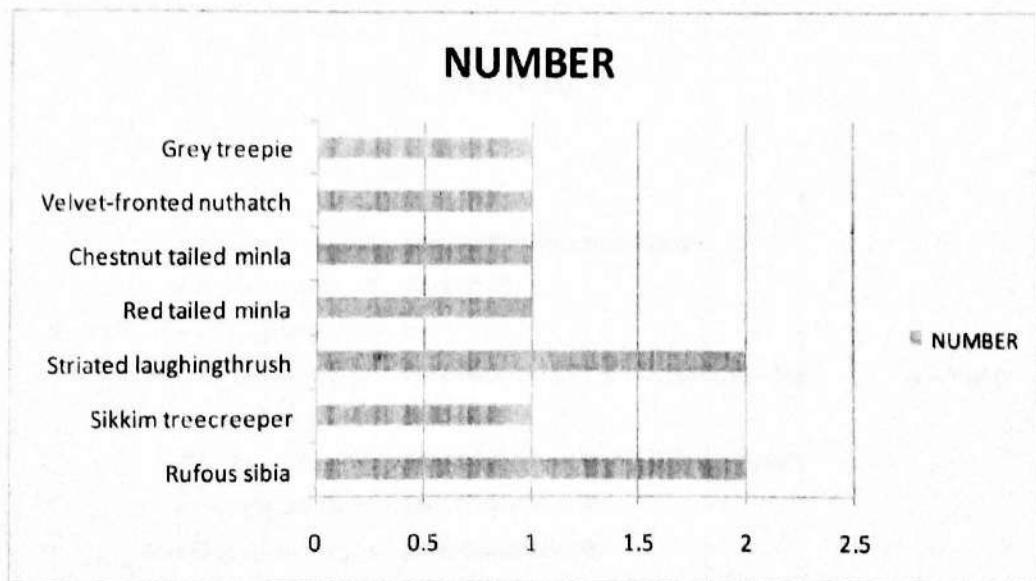


Fig : Graphical Representation of Okhrey, West Sikkim (Zone - II)

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TIRUPUR

➤ DATE: 18/11/2022
 ➤ DESTINATION: Varsey Rhododendron Sanctuary (Zone – III)
 ➤ TIME: 9:00am - 2:00pm

Table - 3. Birds Diversity Observed in Zone - III :-

SERIAL NO.	COMMON NAME	SCIENTIFIC NAME	NUMBER
1.	Common Green Magpie	<i>Cissa chinensis</i>	2
2.	Black-throated Parrotbill	<i>Paradoxornis nipalensis</i>	2
3.	Fire Tailed Myzornis	<i>Myzornis pyrrhura</i>	4
4.	Eurasian Cuckoo	<i>Cuculus canorus</i>	1
5.	Green-crowned Warbler	<i>Seicercus burkii</i>	4
6.	The White-crested Laughingthrush	<i>Garrulax leucolophus</i>	1
7.	Blue-fronted Redstart	<i>Phoenicurus frontalis</i>	1
8.	Speckled Wood Pigeon	<i>Columba hodgsonii</i>	3

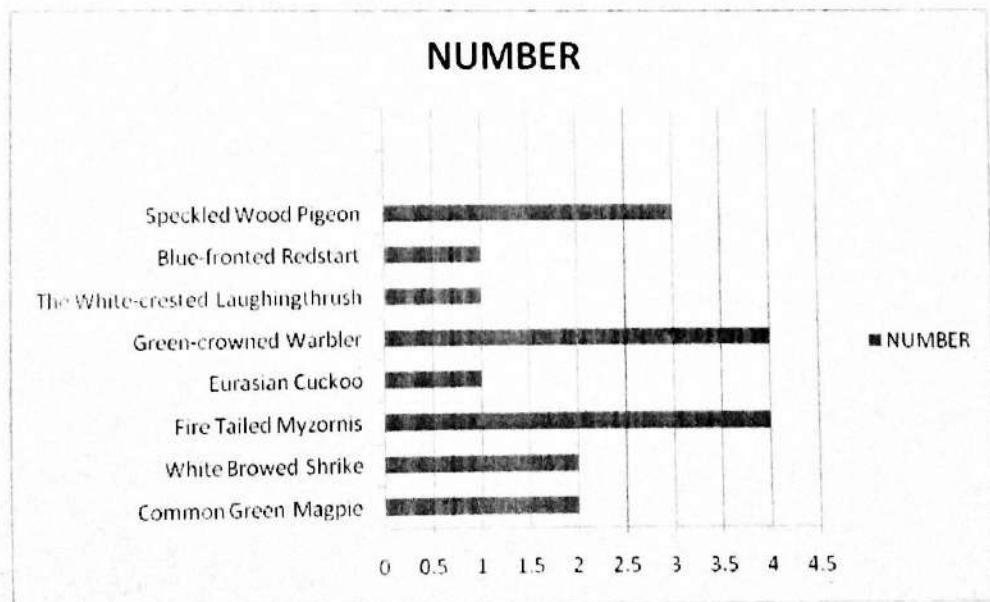


Fig : Graphical Representation of Varsey Rhododendron Sanctuary (Zone – III)

COMPARISON OF THE MAJOR BIRD POPULATION OF THE THREE ZONES

TABLE -4

SERIAL NO.	COMMON NAME	SCIENTIFIC NAME	TOTAL NUMBER
1.	Asian Barred Owlet	<i>Glaucidium cuculoides</i>	1
2.	Blue-fronted Redstart	<i>Phoenicurus frontalis</i>	4
3.	Chestnut	<i>Lonchura atricapilla</i>	2
4.	Chestnut Tailed Minla	<i>Actinodura strigula</i>	7
5.	Common Green Magpie	<i>Cissa chinensis</i>	2
6.	Eurasian Cuckoo	<i>Cuculus canorus</i>	1
7.	Fire Tailed Myzornis	<i>Myzornis pyrrhura</i>	4
8.	Fulvetta	<i>Alcippe poiocephala</i>	1
9.	Golden Breasted Fulvetta	<i>Lioparus chrysotis.</i>	27
10.	Green Backed Tit	<i>Parus monticolus</i>	1
11.	Green-crowned Warbler	<i>Seicercus burkii</i>	4
12.	Green-tailed Sunbird	<i>Aethopyga nipalensis</i>	1
13.	Grey Treepie	<i>Dendrocitta formosae</i>	3
14.	Grey Wagtail	<i>Motacilla cinerea</i>	1
15.	Red Tailed Minla	<i>Minla ignotincta</i>	1
16.	Red-billed Leiothrix	<i>Leiothrix lutea</i>	1
17.	Rufous Capped Babbler	<i>Stachyridopsis ruficeps</i>	1
18.	Rufous Sibia	<i>Heterophasia capistrata</i>	3
19.	Sikkim Treecreeper	<i>Certhia discolor</i>	1
20.	Speckled Wood Pigeon	<i>Columba hodgsonii</i>	3
21.	Striated Laughingthrush	<i>Grammatoptila striatus</i>	2
22.	The White-crested Laughingthrush	<i>Garrulax leucolophus</i>	1
23.	Velvet Fronted	<i>Sitta frontalis</i>	1
24.	White Browed Fulvetta	<i>Fulvetta vinipectus</i>	1
25.	Black-throated Parrotbill	<i>Paradoxornis nipalensis</i>	2
26.	Yellow Billed Magpie	<i>Pica nuttalli</i>	1



Fig : Asian Barred Owlet



Fig : Green-tailed Sunbird



Fig : Chestnut Tailed Minla



Fig : Black-throated Parrotbill

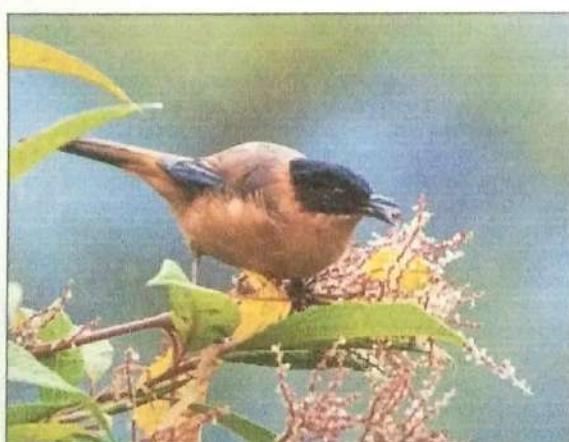
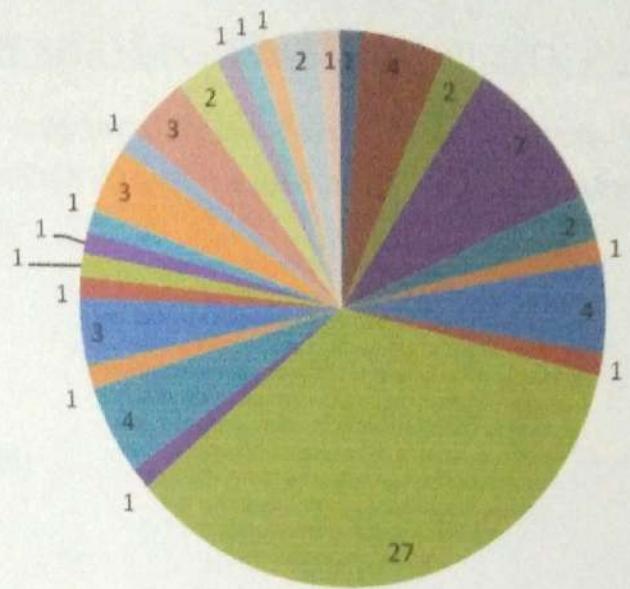


Fig : Rufous Sibia



Fig : Green-tailed Sunbird (Male)



- Asian Barred Owlet
- Chestnut
- Common Green Magpie
- Fire Tailed Myzornis
- Golden Breasted Fulvetta
- Green-crowned Warbler
- Grey Treepie
- Red Tailed Minla
- Rufous Capped Babbler
- Sikkim Treecreeper
- Striated Laughingthrush
- Velvet Fronted
- Black-throated Parrotbill
- Blue-fronted Redstart
- Chestnut Tailed Minla
- Eurasian Cuckoo
- Fulvetta
- Green Backed Tit
- Green-tailed Sunbird
- Grey Wagtail
- Red-billed Leiothrix
- Rufous Sibia
- Speckled Wood Pigeon
- The White-crested Laughingthrush
- White Browed Fulvetta
- Yellow Billed Magpie

Fig : Graphical Representation Of The Major Bird Population Of The Three Zones

Remark –

On comparing the major bird population of the three zones of our field study, it was found that Golden Breasted Fulvetta population was much more in number compared to that of the others. So apparently we can say that it seems to be the dominant species. But as the duration of the field study was for a short span of time, so we can't conclude that it is the dominant species of that zone.

Diversity Analysis:

CALCULATION OF SHANON – WIENER DIVERSITY INDEX ON BIRDS

Most popular measure of species diversity is Shannon- Wiener index, based on information theory which describe a system contain more information when it has many possible states.

FORMULATION:

$$H = -\sum P_i(\ln P_i)$$

Where,

H= the Shannon – Wiener diversity index.

P_i= fraction of the entire population made up of species i, estimated using (n_i/N)

\sum = sum from species 1 to species S.

ln = denotes the natural logarithm.

TO CALCULATE THE INDEX:

1. Calculate pi using divide the numbers of individuals of species 1 found in sample by the total number of individuals of all species.
2. Multiply the fraction by its natural log {P_i (ln P_i)}.
3. Repeat this for all of the different species. The last species is "S".
4. Sum all the - {P_i (ln P_i)} produce to get the value of H.

RANGE OF SHANNON WIENER INDEX:

Usually between 1.5 and 3.5.

The main advantage of this index is that the rare species of one individual contributes some value to the Shannon index, so if an area has many rare species, their contributions would accumulate.

ZONE SYSTEM	NUMBERS OF BIRDS SPECIES	Pi	In Pi	Pi ln Pi
OKHREY (Zone- I)	52	0.658	-0.418	-0.275
OKHREY (Zone- II)	9	0.113	-2.180	-0.246
VARSEY	18	0.227	-1.48	-0.335
TOTAL	79			

CALCULATION:

$$\begin{aligned}
 H &= -\sum Pi(\ln Pi) \\
 &= - \{(-0.275)+(-0.246)+(-0.335)\} \\
 &= - \{(-0.275-0.246-0.335)\} \\
 &= - \{-0.856\} \\
 &= 0.856
 \end{aligned}$$

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Remark – The value of Shannon diversity index for real communities are after found to fall between 1.5 and 3.5 . Hence the value (0.856) obtained in this study clearly indicates that the diversity is not quite high in the study area.

A Brief History Of Rangaroon

Rangaroon is a tea garden and an adjacent village not far from Darjeeling town. This village is situated at a distance of 16 km from Darjeeling in West Bengal. The estate lies near the boundary of **Senchal Wildlife Sanctuary** at an altitude of 6100 ft above sea level. Rangaroon means turning of a great river; the river **Rungdong** takes a turn at the valley of this tea garden. It produces some of the world's finest quality tea and is home to the famous Rangaroon Tea which had won the hearts of British colonists. The view of Mt. Kanchenjunga and other snow capped peaks from Rangaroon is truly awe inspiring. Rangaroon also offers its visitors a spectacular view of the Tiger Hill, Observatory Hill and the Darjeeling town. With a small population and a tea-growing area of around 90 hectares, it is a popular destination among tourists. It's an ideal place for Nature Lovers as well as Bird Watchers.

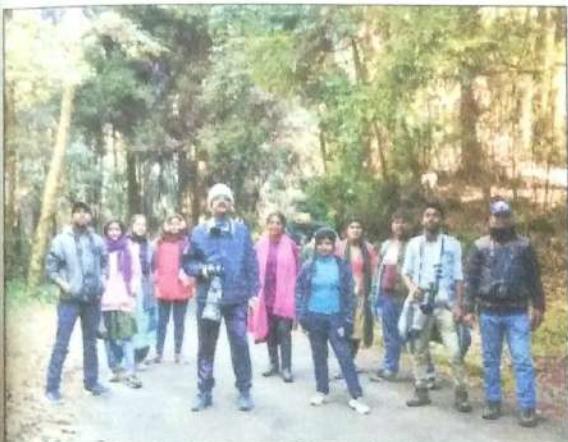
Rangaroon can be considered as heart of the **Senchal wildlife Sanctuary**. It is one of the oldest wildlife sanctuaries of India and covers an area of 38.6 km² (14.9 sq mi). The elevation ranges from 1,500 to 2,600 m (4,900 to 8,500 ft).It provides habitat for barking deer, wild boar, Himalayan black bear, Indian leopard, jungle cat, rhesus monkey, Assam macaque, Himalayan flying squirrel. The sanctuary is also rich in bird life. The two Senchal lakes supply drinking water to the town of Darjeeling.



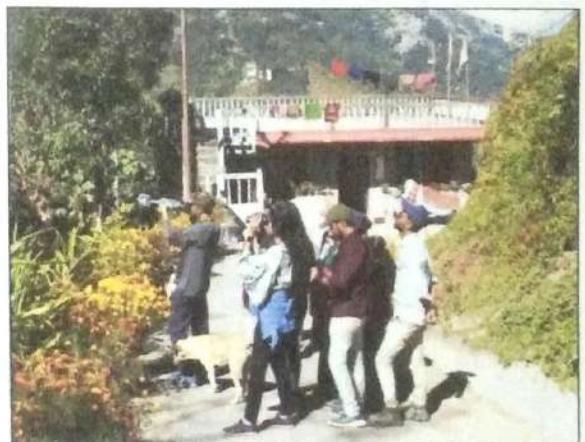
A



B

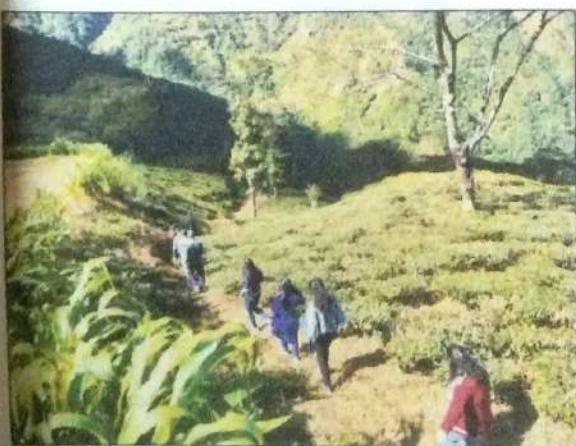


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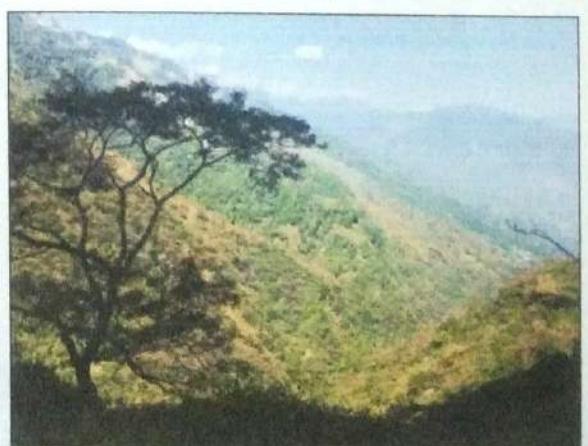


D

Fig : (A,B,C,D) Senchal Forest, Rangaroon EXAMINED
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E



F

Fig : (E,F) Rangaroon Tea Garden

FAUNAL DIVERSITY

■ BIRDS

- DATE: 20/11/2022
- DESTINATION: Rangaroon (Zone - IV)
- TIME : 6:00am - 3:00pm

Table - 5. Birds Diversity Observed in Zone - IV :-

SERIAL NO.	COMMON NAME	SCIENTIFIC NAME	NUMBER
1.	Green Backed Tit	<i>Parus monticolus</i>	2
2.	Blue Whistling Thrush	<i>Myophonus caeruleus</i>	4
3.	Himalayan Bulbul	<i>Pycnonotus leucogenys</i>	1
4.	Green Tailed Sunbird	<i>Aethopyga nipalensis</i>	2
5.	Grey Tea Pie	<i>Dendrocitta formosae</i>	4
6.	Chest Nuthatch	<i>Sitta europaea</i>	1
7.	Kalij Pheasant	<i>Lophura leucomelanos</i>	4

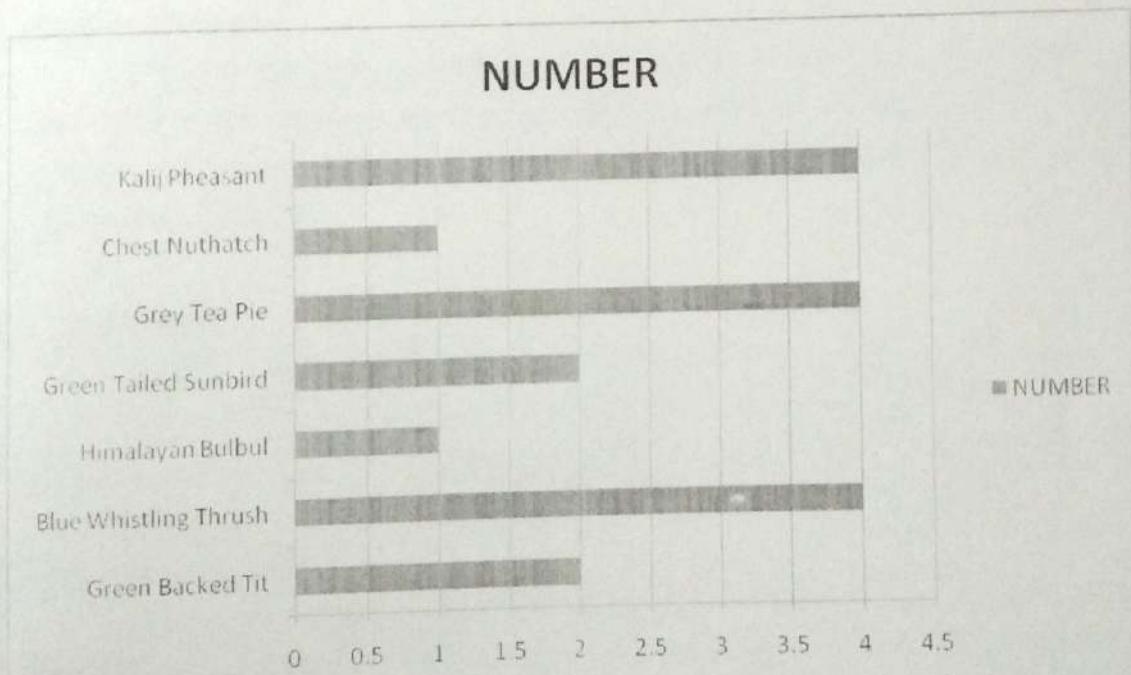


Fig : Graphical Representation of Rangaroon (Zone - IV)

THREATS

The Biodiversity of Sikkim faces a number of threats due to biotic as well as abiotic factors. The Sikkim Biodiversity Action Plan 2003 deliberated upon these issues and identified a number of threats which need be addressed under the present situation, in order to conserve the state's biodiversity. The current and anticipated threats are summarized below:

1. Soil erosion:

Sikkim being a hill State with and unstable soil conditions often suffers from soil erosion due to biotic factors as well as natural factors. This is compounded by the very high rainfall, span over a large part of the year. The main causes of such erosion and landslides, which also destroy biodiversity of the area, are unplanned roads, hydro-electric projects and other development.

2. Deforestation:

Despite the high percentage of the forest of the State, deforestation and loss of habitats emerge as constant threats, which are mainly due to need of forest resources by the urban and semi urban population, development projects and power projects.

3. Air pollution:

Due to rapid expansion of domestic tourism, a large number of vehicles move every day consuming tons and tons of fossil fuel and causing air pollution as well as noise pollution, which in long term can affect fauna and their propagation, especially along fringe of protected areas and reserve forests.

4. Poaching of animals:

Evidences suggest involvement of some local people as well as visitors from other parts of the country many a times engaged in poaching of animals (red panda, deer).

5. Unplanned tourism:

Inappropriate planning and limited implementations have gone into regulating their movement, mode of transport, life style including generation of garbage, construction for the accommodation, road development or environment friendly responsible behaviour, etc.

Visit At:-

PADMAJA NAIDU

HIMALAYAN

ZOOLOGICAL PARK

EXAMINED
Date of issue
Place of issue

➤ TOUR DESCRIPTION :

- **Date** - 21.11.22
- **Time** - 11.30A.M
- **Weather Condition** - Humidity – 45%

• TEACHERS

- Dr. Debjani Datta (Principal)
- Dr. Partha Pratim Chaudhuri (Head of the Department of Zoology)
- Dr. Papia Das (Assistant Professor, Department of Zoology)

• LAB ATTENDANT

Mr. Tapas Show

• STUDENTS

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4) Nazma Khatun	9) Sk Nadir Rafed
5) Paramita Pramanik	10) Swastika Kumar



Fig : Group Photo

> INTRODUCTION :

- **Definition of Zoological Garden:**

The Zoological Garden is the institute where mainly wild animals (exotic and endemic) are restricted within enclosures, bred, displayed to public and also used for education and scientific study. The abbreviation 'zoo' was first used for London Zoological garden which opened for scientific study 1828. Nowadays the importances of Zoological Garden are gradually increasing not only for displaying the wild animals for amusement and entertainment of the visitors. The Zoological Garden or parks provide recreation and amusement of general people of the society, create awareness among common people regarding the ecological importance of wild life animals and provide opportunities for public and prove awareness about endangered species

- **Importance of Zoological Garden:**

- ✓ It is an example of **ex-situ conservation**.

Ex situ conservation is a technique of conservation of biological diversity outside its natural habitats. Its concept was developed earlier before its official adoption under the Convention on Biological Diversity signed in 1992 in Rio de Janeiro. Ex-situ conservation includes a variety of activities, from managing captive populations, education and raising awareness, supporting research initiatives and collaborating with in situ efforts. It is used as valuable tools in studying and conserving biological resources for different purposes through different techniques such as zoos, captive breeding, aquarium, botanical gardens, and gene banks.

The ever increasing threats to natural ecosystems has caused several habitats and thereby species to become severely threatened with extinction. Faced with this extinction crisis the ex-situ conservation of threatened species is an alternative that has relevance in the present context. Zoos today function not only as venues for exhibition of animals and education of the visiting public but also as centers of conservation and research.

- ✓ Zoological garden acts as **captive breeding centre**.

Captive Breeding programs are departments within zoos, rescues, sanctuaries and so on in which animals are kept in enclosures and are bred to produce future generations of their species. The main aim of captive breeding programme is to help conserve animals that are endangered or threatened in the wild so that a species doesn't become extinct. **Captive breeding** is the process of capturing, breeding, raising and sometimes reintroducing a wild species (threatened and endangered) in a controlled environment outside their natural habitats under the care of wildlife biologists and other experts.

Captive breeding at **Padmaja Naidu Zoological Park** has raised the inventory of several animals, many of which are not found even in the wild in the country. The increase in the population of **zebras** and **giraffes** through captive breeding is an achievement in itself because both these species aren't found in the wild anywhere in India. Alipore Zoological Garden has achieved success in captive breeding programmes of **marmoset**, **barking deer** are also successfully undergoing in The Padmaja Naidun. zoological park Recently captive breeding programme of Royal Bengal Tiger has been initiated since 2014 to increase the number of the big cats at the Zoological Gardens.

✓ **Zoo as research centre:**

Zoological Garden give scientists the opportunity to study species that are difficult to observe in their natural habitat. Captive animals in zoological garden provide sample research opportunities in field like genetics and veterinary medicine.⁷

Padmaja Naidu Himalayan Zoological Park:

The Zoological Garden of darjeeling established in 1958. It has 67.89 acres At present, Zoological Garden, darjeeling has 162 nos. Mammals, 744 nos. Birds and 86 nos. Reptiles. It is home to some of the captivebreeding projects involving the Manipur brow-antlered deer, Blackbuck, Bengal Florican etc.

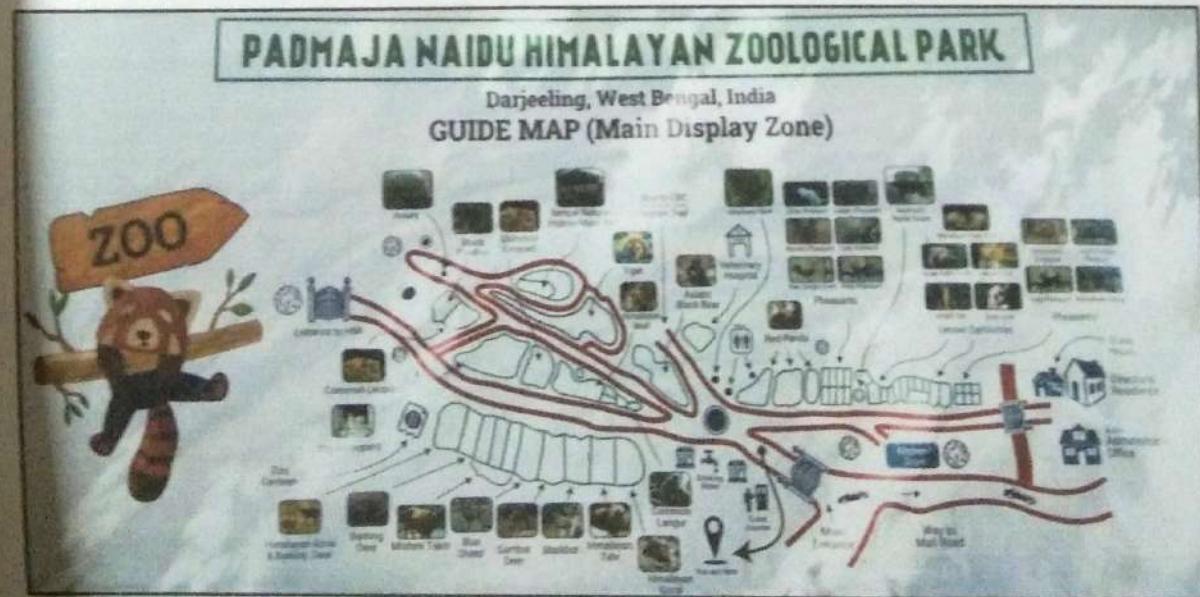


Fig : Map of Padmaja Naidu Himalayan Zoological Park

➤ Awareness Programmes Organised By Padmaja Naidu Zoological Park:

- Since 2017 Alipore Zoo is organizing **Zoo Festival** as public awareness programme to create love for animals among general public and students. In this festival, t-shirt competition, quiz and extempore competition on wild life were organized where students from different schools and colleges participate.
- Padmaja Naidu Zoological Park participates in animal exchange programme. As a part of exchange programme Mouse Deer, Asiatic Lion, Jaguar were taken to Padmaja naidu Zoo from Nehru Zoological Park, Hyderabad and Eastern Grey Kangaroo from Kanazawa Zoological Park, Yokohamaha, Japan. Thus, Alipore zoological garden has a great role in the conservation of wild animals from India and abroad and it is continuously contributing in public awareness, education and research for sustainable conservation of wildlife fauna.
- Alipore Zoological Garden, Kolkata has launched a scheme of "**adoption**" of zoo animals. Public, either institutions or individuals are invited for adopting animals of the zoo. One of the main objectives of the zoo management is to create awareness and love for the wild life among the general public. Creating a sense of participation and attachment to the zoo animals create bonding and a sense of involvement. Adoption of zoo animals is very popular in international zoos and several Indian zoos have started this practice. Besides bonding this also provide a source of revenue for better zoo management and for better up keep of animals.

➤ Objectives And Importance Of Visit To Padmaja Naidu Zoological Park

- Provide opportunity to observe different animals of the world both India and abroad under one roof.
- One can get an idea about ex-situ conservation and captive breeding.
- Get opportunities to observe animals including some endangered and exotic animals up close.
- Get an idea about the ecology, behavior and morphology of different animals. So to gain knowledge on behavior and morphology of different animals, the process of their ex-situ conservation and finally to see some of the endangered animals that are difficult to observe in their natural habitat.

➤ MODE OF STUDY

During our visit to Padmaja Naidu Zoological Park , we conducted a three hours observation sessions to study behavior of different animals in captive condition. We were divided into three groups each consisting of seven individuals and observed activity of each animal for thirty minutes. We keenly observed the behavioral and the morphological characters of the animal. We also took note on their food habits, their mode of living, their health, their breeding pattern. Besides we also observed many different species from different parts of sections viz, birds, reptiles and mammals and noted their distribution, feeding habit etc..

➤ OBSERVATION

❖ BIRD GALLERY:

We observed different varieties of aquatic and terrestrial birds many of which are exotic. Among them eight birds were selected for their detailed behavioral study.

1. Common Name : Silver Pheasant

Scientific Name : *Lophura nycthemera*

Morphological features:

- i. This is a relatively large pheasant of order Galliformes and the family Phasianidae.
- ii. Body length 125cm. and weight 500-2500 gms.
- iii. Male has a long black crest, a black chin and throat, with white a glossy bluish black belly.
- iv. Their tail can be quite long with the central feathers.
- v. Most noticeable feature is bright red face.

Distribution: South-western China, eastern Burma, southern Vietnam, Thailand Cambodia

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2. Common Name : Roseate Cockatoo

Scientific Name : *Eolophus roseicapillus*

Morphological features:

- i. It is also known as rose-breasted cockatoo, galah cockatoo, roseate cockatoo. Pink and grey are the most common and widespread cockatoo.
- ii. Body-lenth 35cm. and weight- 270-350g.
- iii. It is endemic on the mainland and was introduced to Tasmania, where it found in pink and grey colour.

Distribution: It found In all Australan states, and are only absent from the dnest areas. Adelaide, Perth and Melbourne are common to abundant in open habitats.

3. Common Name : Himalayan Monal

Scientific Name : *Lophophorus impejanus*

Morphological features:

- i. Himalayan monal belongs to the genus and *Lophophorus* family pheasant.
- ii. Body-lenth 70cm. and weight- 1800-2300g.
- iii. Male has multi coloured climate, while female has full colour.
- iv. Borabor features in male include a long, metallic green crest, coppery green feathers on the back.
- v. The female has prominent white patch on the throat and white spot on tail.

Distribution: In north western, central and eastern Himalaya.

4. Common Name : Temminck's Tragopan

Scientific Name : *Tragopan temminckii*

Morphological features:

- i. It is one of the most beautiful in all the pheasant.
- ii. Body-length 64cm. and weight- 1600g.
- iii. The male are large bright crimson coloured with round black-bordered pearl-grey spots or oceli on under parts.
- iv. Male is distinguished by large spots and bright orange neck.

Distribution: Northeast India through Mayanmar to north east Vietnam to central China.

5. Common Name : Hill Myna

Scientific Name : *Gracula religiosa*

Morphological features:

- i. This is a stocky jet-black myna with bright orange-yellow patches of naked skin and fleshy wattles on the side of its head and nape.
- ii. The bill and strong legs are bright yellow, and there are yellow Wattles on the nape and under the eye.
- iii. Sexes are similar; juveniles have a duller bill..
- iv. Its large, white wing patches are obvious in flight, but mostly covered when the bird is sitting

Distribution: South Asia and Southeast Asia.



Fig : Silver Pheasant



Fig : Roseate Cockatoo



Fig : Himalayan Monal



Fig : Temminck's Tragopan

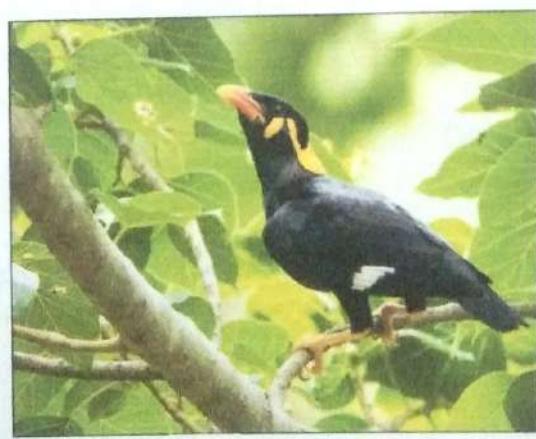


Fig : Hill Myna

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MAMMALIAN GALLERY:

1. Common Name : Common Leopard

Scientific Name : *Panthera pardus*

Morphological features:

- i. The Common Leopard is a member of the Felidae family.
- ii. Body length is 7ft. & weight 68kg
- iii. Gestation period: 87-94 days.
- iv. Life Span : 18-20 years.
- v. Conservation Status : "Endangered" to "Critically Endangered" to "Threatened" depending on the geographic region (IUCN) Schedule I(WPA).

Distribution: The common Leopard has an extremely broad distribution across Africa and South and Southeast Asia.

2. Common Name : Royal Bengal Tiger

Scientific Name : *Panthera tigris tigris*

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Morphological features:

- i. Body length is 110-120 inch (male); 94-104 inch (female).
- ii. Weight is 221.2kg (male); 139.7kg (female).
- iii. Diet: Chital, samber, gaur, barasingha, water buffalo, nilgai, hog, deer, gray langur, hares and peafowl.
- iv. Life span: 10 to 15 years (wild); 16 to 20 years (captivity)
- v. Gestation period 104 to 106 days
- vi. Conservation Status : Present IUCN status- Endangered (IUCN) Schedule I(WPA)

Distribution: The Bengal tiger is found primarily in India with smaller populations in Bangladesh, Nepal, Bhutan, China and Myanmar.

3. Common Name : Himalayan Tahr
Scientific Name : *Hemitragus jemlahicus*

Morphological features:

- i. The Himalayan Tahr is diurnal and lives in small groups of 2-20 individuals, excluding older solitary males. Males are larger than females.
- ii. The hair on head and face is short. The body is covered with tangled masses of coarse, flowing hair.
- iii. Body Length 90 -140 cm and weight is 36 to 90kg.
- iv. Sexual maturity - 2 to 3 yrs.
- v. Gestation Period - 7 months.
- vi. Diet: Eat almost any vegetation they can find, from grass herbs to the leaves of shrubs and trees.
- vii. Conservation Status: Near Threatened (IUCN) Schedule I (WPA).

Distribution: Its native habitat is in the rugged wooden hills and mountain slopes of the Himalaya from Central Asia in Northern Kashmir to China.

4. Common Name : Jungle Cat

Scientific Name : *Felis chaus*

Morphological features:

- i. With its long legs and comparatively short tail the Jungle cat has a very distinctive appearance.
- ii. Its pale green eyes give it a coldly cruel expression. The colour of its fur varies from sandy grey to yellowish grey.
- iii. Body length: 50-94 cms and weight is 4-16kgs.
- iv. Gestation Period: 63-68 days
- v. They mainly feed on small mammals, birds, reptiles, amphibians, fish, domestic poultry.
- vi. Conservation Status : Least Concern (IUCN) Schedule II (WPA).

Distribution: The Jungle Cat has established itself over a wide territory ranging from north Africa through south-western Asia to India, Ceylon, Burma and Indo-China.

5. Common Name : Grey Langur

Scientific Name : *Seminopithecus entellus*

Morphological features:

- i. Langurs are long-limbed, long tailed and largely gray, with a black face and ears living in medium to large groups usually with one dominant male.
- ii. Body Length: 75cm (male), 65cm (female). Body weight: 18kg (male), 12kg (female).
- iii. The breeding season is April to May and Young per birth is 1.
- iv. Gestation Period: 190-210days.
- v. Usually they eat leaves, flowers, fruits and roots.
- vi. Conservation status: Least Concern (IUCN) Schedule II (WPA).

Distribution: Practically distributed in the whole of India, from the himalayas to Cape Comorin except the western deserts, and Ceylon.

6. Common Name : Himalayan Wolf

Scientific Name : *Canis lupus himalayensis*

Morphological features:

- i. The Himalayan wolf has been suggested by several Indian biologists for recognition as a critically endangered species , distinct from *Canis lupus*.
- ii. Its size, large skull, and teeth distinguish the wolf from the rest of the family.
- iii. Gestation Period: 61 -63days.
- iv. Life span is 12 to 15 years. They feed primarily on medium to large sized ungulates.
- v. Conservation Status: Schedule I (WPA).

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Distribution: Their population is found only the upper Trans-Himalayan region of India across the two northern most states Himachal Pradesh and Jammu & Kashmir with only about 350 individuals in the wild.



Fig : Common Leopard



Fig : Royal Bengal Tiger



Fig : Himalayan Tahr



Fig : Jungle Cat



Fig : Himalayan Wolf

CONCLUSION

The field study gives us an opportunity to observe the animals in their natural abode. The morphology, anatomy, behaviour, food, feeding habits of animal whatever we study in our text books in the confined class rooms cannot provide us always the perfect picture required to have a complete knowledge on the subject. When we are exposed to the nature's laboratory during the field work and interact with creatures living in diverse habitat, our knowledge seems to be complete. Fields study also helps in generating love to nature in our mind which will definite be helpful in conservation of our precious diversity.

The different places we visited were full of wonderful variety of birds & we learnt to appreciate them. The places were enriched in floral & faunal diversity. It gave us the chance of observing the wonders of nature from close quarters. It was a great experience to observe the things that we had learnt in books to come to life in front of our eyes.

Altogether the tour in **Okhrey, Varsey, Rangaroon and Padmaja Naidu Himalayan Zoological Park** was a great one. We enjoyed every second of it. It made us to do so many things in such a short time & so enjoyable that we pray this type of tours should be held more frequently so that we can learn more & help us to invent the true nature around us away from our books.

Examined

Dad
11/1/2023

UNIVERSITY OF CALCUTTA

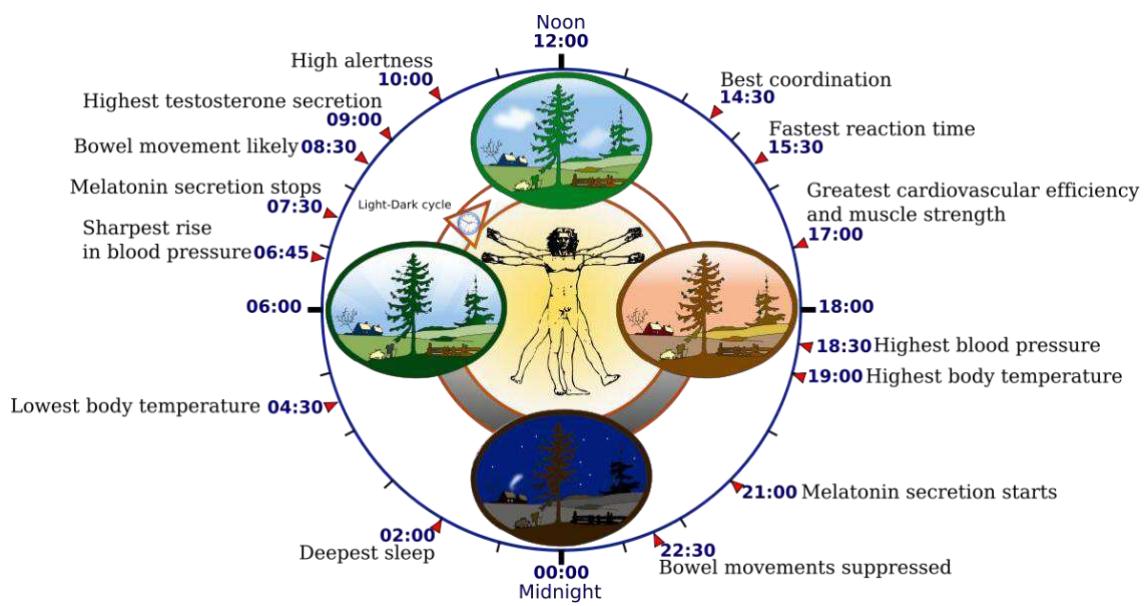
SEMESTER VI HONOURS PRACTICAL EXAMINATION

(UNDER CBCS)

2023

DSE(B)-6-1 PRACTICAL (ZOOA)

A PROJECT ON STUDY OF CIRCADIAN FUNCTIONS IN HUMANS (Daily eating, Sleep and Temperature patterns)



Roll No. - 203561-11-0004

Registration No. - 561-1211-0357-20

INTRODUCTION

RHYTHMICITY

Rhythmicity is a wonderful phenomenon of nature. Various kinds of rhythms are evident in the biological world - day-night cycle, seasonal cycle, moon cycle, tide cycle etc. Organisms also exhibit rhythmicity in behavioural activities called **Biological rhythms** or **Biorhythms**. Biological rhythms are regulated by biological clock.

'**Biological clocks**' are internal timing mechanisms that involve both self sustaining physiological pacemakers and environmental cyclic synchronizers (zeitgebers).

WHAT IS CIRCADIAN RHYTHM?

It is a type of biological rhythm. This term was first coined by the American ethologist, Franz Halberg in 1959. The source of the word Circadian is from two Latin words "Circa" meaning "about" and "dian" meaning "a day". The circadian rhythm is an internal process that naturally regulates our biological processes within a 24-hour time frame. In a simple term, this implies that for an example, everyone's routinised eating time has a great impact on the way our body process the food digestion. Similarly, sleeping pattern of a person also has a great impact on the way of functioning our brain as well as organs of human body. Circadian Rhythm is basically a biological clock that is built in our brain throughout the functionality of everyone's day and night processes, as per the 24-hour clock. Circadian rhythm is also called the biological/circadian clock and refers to behavioral, physiological, and molecular changes with a cycle length of approximately 24 hour. The circadian clock can be divided into 2 parts: the central clock, residing in the supra-chiasmatic nucleus (SCN) of the hypothalamus, which receives light cues, and the peripheral clocks residing in various tissues throughout the body. The peripheral clocks play an integral and unique role in each of their respective tissues, driving the circadian expression of specific genes involved in a variety of physiological functions

HUMAN CIRCADIAN RHYTHM

The circadian rhythm of human body is a self - control system to regulate our eating habits, activities and body functionally, like getting hungry and food digested, passing urine and maintaining blood pressure, sleeping and awakening process, and body temperature. Thus, our food, eating style and time, life disciplinary process, lights (day and night) we see and our body experience, and other day to day lifestyle components are the crucial factors that shape up everyone's circadian rhythm. As circadian rhythm is unique and vary for every individual, the sociological, cultural, political, economic, technological and environmental aspects do also influence the

biological function, mind, brain, thinking and feelings of human. Disruption of a circadian rhythm can become a main source for the severity of possible diseases within human body.

HOW HUMAN REGULATE THE CIRCADIAN RHYTHM

Human body becomes active from awakening at a time and goes through a frame of 24 hours in a day. During this period, our body experiences diverse emotional, behavioural and biological nature (like sleeping, resting, hungry, thirsty, urine passing, etc.) When a human body has a pattern of such experiences for a period of continuous duration, the body gets synchronised to the experience and that can possibly become transformed into our 24-hour routine.

Humans show a periodicity of 24 hours in case of various physiological activities such as hormone levels in blood, blood pressure, EEG, ECG and other activities such as rest cycle, body temperature etc. The circadian rhythms are regulated by small nuclei in the middle of the brain called the supra chiasmatic nuclei (SCN). The secretion of various hormones from different endocrine glands show a rhythmic pattern. The most important gland exhibiting this rhythmic pattern is pineal gland. Serotonin hormone, the secretion of this gland, is highest in noon and lowest at midnight, whereas melatonin hormone is highest at night and it stops in the early hours of morning.

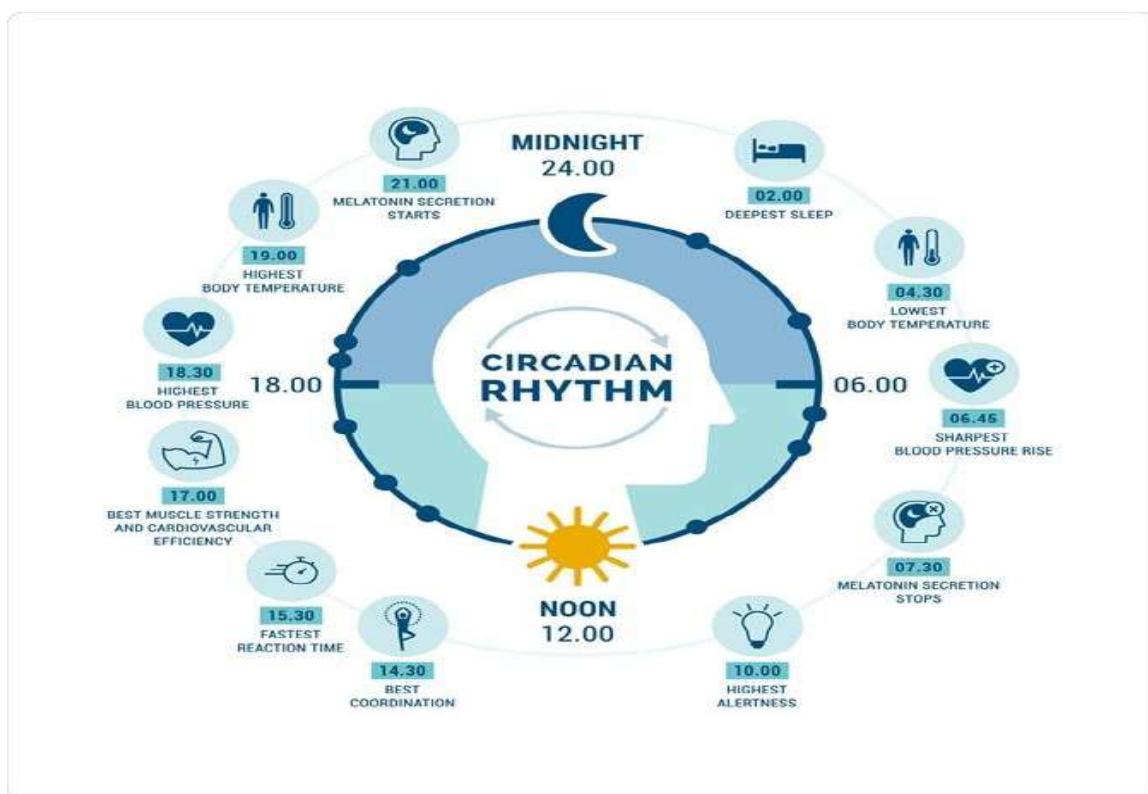


Fig: HUMAN BIOLOGICAL CLOCK

STUDY OF BODY TEMPERATURE FOR 24 HOURS

INTRODUCTION

Body temperature is regarded as the “basic variable” of circadian rhythm and is used as a circadian rhythm marker. Normal human body-temperature is the typical temperature range found in humans. The circadian component in body temperature is under the control of the supra chiasmatic nuclei (SCN) and is also modulated by exogenous influences such as postural changes, physical activity, ambient temperature, meals and sleep. Human body temperature has a circadian rhythm with a 0.8-1°C oscillation between a diurnal maximum and a nocturnal minimum.

Types of Body Temperature:

- i) **Core temperature:** Temperature of deep tissues of the body.
- ii) **Surface temperature:** Temperature of the outer most surface of the body.

MATERIALS REQUIRED:

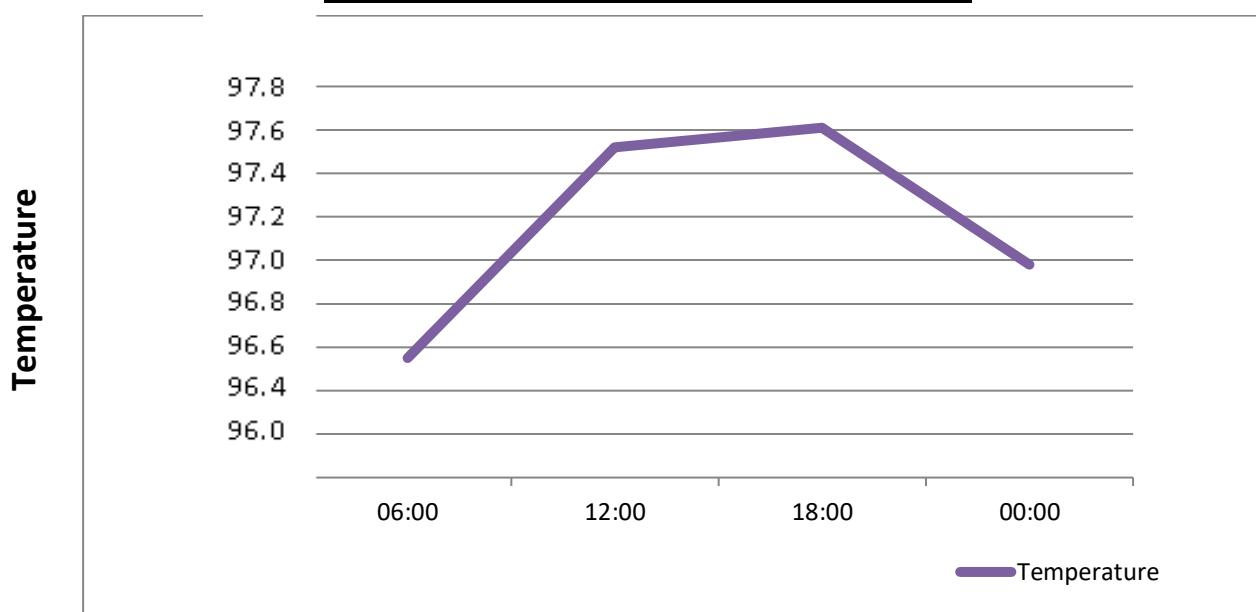
- i) Thermometer
- ii) Clock
- iii) Pen
- iv) Notebook

PROCEDURE:

- Surface body temperature is measured at 6am, 12noon, 6pm and 12 midnight using a Thermometer.
- Thermometer is placed under the arm, with the tip gently pressed against the center of the armpit.
- Put the arm down, close against the body so the thermometer stayed in place.
- It took about a minute to take its reading.
- And then the thermometer is removed from the armpit and read the temperature.
- Record the temperature for 14 consecutive days and make a graph.

OBSERVATION:

DAY	6AM	12PM	6PM	12AM
1	96°F	97.9°F	97°F	96.5°F
2	96.8°F	98.1°F	97.1°F	97.8°F
3	96.6°F	97.6°F	98.2°F	97.2°F
4	96.2°F	96.8°F	97.5°F	96.7°F
5	96.1°F	97.3°F	98°F	97.4°F
6	97°F	97.8°F	98°F	97.4°F
7	96.4°F	97.7°F	97.6°F	96.8°F
8	96.8°F	97.5°F	97.4°F	96.5°F
9	96.3°F	97.6°F	97.8°F	97.2°F
10	96.8°F	97.3°F	97.7°F	96.8°F
11	96.5°F	97.4°F	97.5°F	96.6°F
12	97°F	97.7°F	97.6°F	97°F
13	96.9°F	96.9°F	97.4°F	96.7°F
14	96.3°F	97.8°F	97.8°F	97.2°F

Pattern of human body temperature

RESULTS : The body temperature is low at 6am morning that is 96.5°F, increased 12 noon that is 97.5°F, remains constant still the evening with a very little fluctuations. From the evening temperature falls off and becomes least at midnight that is 96.9°F.

COMMENTS : The body temperature data shows circadian rhythmicity corresponding to the dark and light condition. The result can be interpreted as the effect of circadian rhythmicity of Melatonin. Melatonin is a hormone, which is affected by darkness and light. This important hormone is produced by the pineal gland in the brain, retina, lens, and the gastrointestinal system. Melatonin decreases at day time and as a result temperature rises. Light inhibits melatonin synthesis as the activity of NAT (N-acetyltransferase) and HIOMT (Hydroxyindole-O-methyltransferase) is less at day light. Also the melatonin is low, cortisol level in human is high so perhaps, the rhythmicity of the melatonin regulates the rhythmicity of the body temperature through cortisol concentration. Cortisol is one of the hormones produced by the adrenal cortex. In night, during darkness melatonin reaches pick at midnight, reducing body temperature by reducing cortisol.

STUDY OF SLEEP - WAKE CYCLE

INTRODUCTION :

Circadian rhythm cycles become active every day with a regularity between sleepiness and alertness that is known as the sleep-wake cycle.

Sleep-wake cycle refers to our 24 hour daily sleep pattern which consists of approximately 16 hours of daytime wakefulness and 8 hours of night-time sleep. The complex process of the sleep-wake cycle is controlled by the body's circadian rhythm and sleep homeostasis (the amount of accumulated sleep need that builds during time spent awake).

Every cell in the body contains its own biological clock, which is synchronized by the suprachiasmatic nucleus (SCN), located in the brain. Certain genes produce proteins that increase overnight and fade during the day. These changes activate feelings of wakefulness and sleepiness, which can affect when you sleep and how alert you are when awake.

MATERIALS REQUIRED:

- i) Clock
- ii) Pen
- iii) Notebook

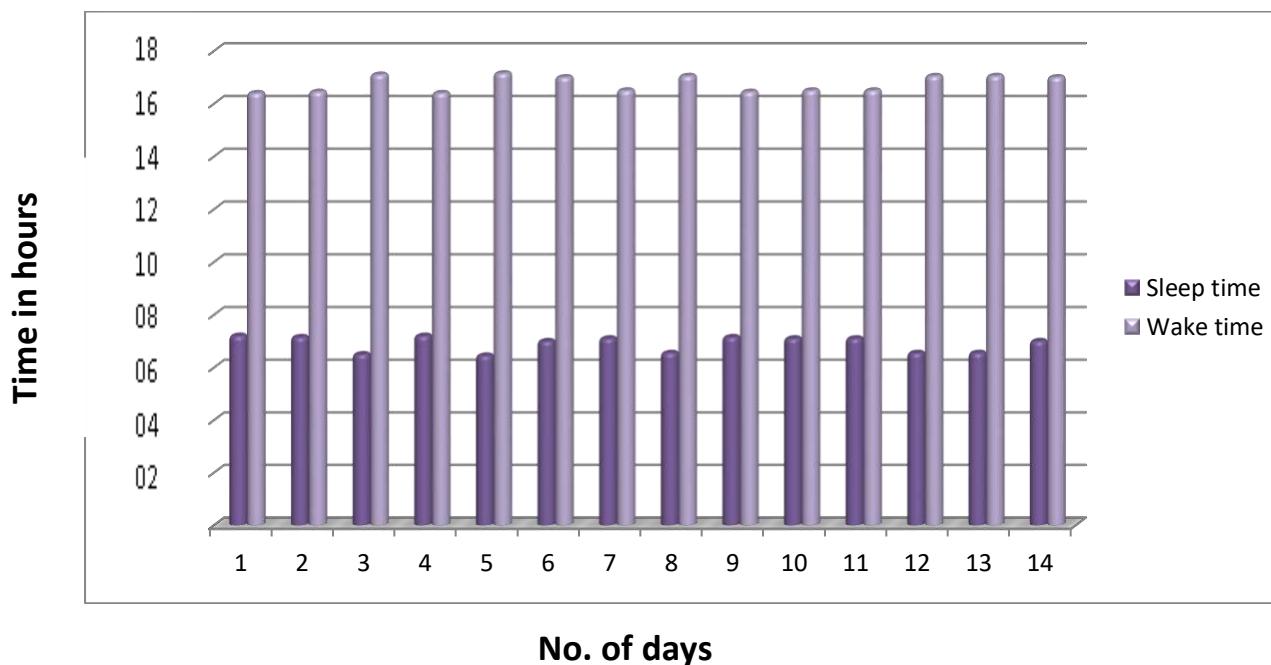
PROCEDURE:

- For this experiment, we have to monitor your daily sleeping and waking time using a 12-hour clock.
- Keep a record of the time when we sleep at night and the time when we wake up in morning.
- Record the timings for 14 consecutive days.
- Make a table and build a bar graph out of the collected data.
- No external stimulus like alarm clock is involved in this study.

OBSERVATION

DAY	TIME TO GO TO BED	TIME TO COME OUT FROM BED	SLEEPING TIME	WAKE TIME	FREE RUNNING PERIOD FOR SLEEPING TIME
1	11:30 pm	6:50 am	7 hours 20 min	16 hours 40 min	+5 min
2	11:20 pm	6:35 am	7 hours 15 min	16 hours 45 min	+15 min
3	11:40 pm	6:30 am	6 hours 50 min	17 hours 10 min	-5 min
4	11:30 pm	6:50 am	7 hours 20 min	16 hours 40 min	+5 min
5	11:35 pm	6:20 am	6 hours 45 min	17 hours 15 min	0 min
6	11:40 pm	6:40 am	7 hours	17 hours	-5 min
7	11:40 pm	6:50 am	7 hours 10 min	16 hours 50 min	-5 min
8	11:35 pm	6:30 am	6 hours 55 min	17 hours 5 min	0 min
9	11:20 am	6:35 am	7 hours 15 min	16 hours 45 min	+15 min
10	11:40 am	6:50 am	7 hours 10 min	16 hours 50 min	-5 min
11	11:45 am	6:55 am	7 hours 10 min	16 hours 50 min	-15 min
12	11:35 am	6:30 am	6 hours 55 min	17 hours 5 min	0 min
13	11:25 am	6:20 am	6 hours 55 min	17 hours 5 min	+10 min
14	11:30 am	6:30 am	7 hours	17 hours	+5 min

Sleep-Wake cycle



RESULT : The sleep-wake cycle follows a daily rhythm where 17 hours 15 minutes is the maximum daytime wakefulness and 7 hours 20 minutes is the maximum night-time sleep. The sleep pattern that is not adjusted to the 24-hour cycle in nature is called free running period that is 15 minutes (average).

COMMENTS : Sleep-wake cycle is a circadian rhythm which is regulated by pineal gland hormone Melatonin. During day time the light inhibits melatonin synthesis as the NAT (N-acetyltransferase) and HIOMT (Hydroxyindole-O-methyltransferase) is less. When eyes receive light from the sun, the pineal gland's production of melatonin is inhibited and keep the human awake. When the eyes do not receive light, melatonin is produced in the pineal gland and the human becomes tired. As a result serotonin level is high and serotonin is responsible for the wakefulness through out the day . From the evening 6pm onwards the NAT and HIOMT gradually increase which is pick at 12 midnight and melatonin is synthesised causing sleepiness as a serotonin is low in a person is not able to remain awaken.

STUDY OF CIRCADIAN RHYTHMICITY IN DAILY EATING

INTRODUCTION

The circadian rhythm has been shown to have a profound impact on feelings of hunger. Hunger and cravings are two different sensations. Our stomach hunger cycle, in a nutshell, begins with a hormone called ghrelin. When our bodies have burned up the food in our stomachs and our blood sugar and insulin levels begin to drop, ghrelin communicates with the hypothalamus in the brain. Leptin and ghrelin are two hormones that have been recognized to have a major influence on energy balance. Leptin is a mediator of long-term regulation of energy balance, suppressing food intake and thereby inducing weight loss. Ghrelin on the other hand is a fast-acting hormone, seemingly playing a role in meal initiation.

Ghrelin, the appetite increaser, is released primarily in the stomach and is thought to signal hunger to the brain. Leptin is a hormone, made by fat cells, that decreases your appetite.

MATERIALS REQUIRED:

- i) Clock
- ii) Pen
- iii) Notebook

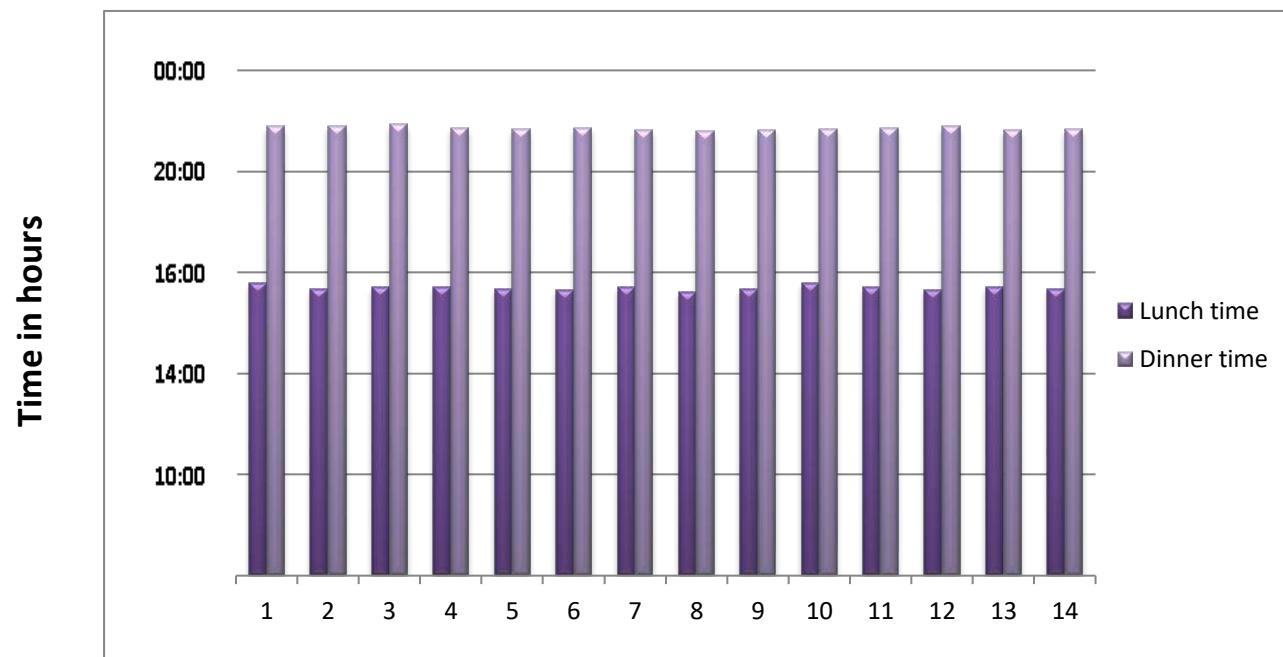
PROCEDURE:

- Here I have to record the time when I get hungry for lunch and dinner.
- Record the timing for 14 consecutive days.
- Make a table.

OBSERVATION:

DAY	LUNCH TIME	DINNER TIME
1	02:50 PM	10:20 PM
2	02:20 PM	10:25 PM
3	02:25 PM	10:30 PM
4	02:30 PM	10:15 PM
5	02:20 PM	10:10 PM
6	02:15 PM	10:15 PM
7	02:25 PM	10:05 PM
8	02:05 PM	10:00 PM
9	02:20 PM	10:05 PM
10	02:50 PM	10:10 PM
11	02:25 PM	10:15 PM
12	02:15 PM	10:20 PM
13	02:30 PM	10:05 PM
14	02:20 PM	10:10 PM

Circadian rhythm in daily eating



No. of days

RESULT : A particular rhythmicity is observed in daily eating cycle.

COMMENT : Hunger hormones (ghrelin) in our blood and an empty stomach signal the brain when we are hungry. When our stomach is empty, the hormone ghrelin, which is produced mainly in the stomach, signals our brain that we need to take in food. Our body produces more ghrelin during fasting (such as between meals) in order to stimulate hunger, and it produces less after food is consumed. Another hormone, Leptin is a hormone released by your fat cells that tells your brain when our body has had enough fuel and can start burning fat to create energy.

Here rhythmicity is found which indicates a conserved rhythmicity schedule of brain.

CONCLUSION:

Human circadian rhythm is identical for everyone as unique as possible, it is a biological process of an individual that can be explained as a synchronised 24-hour internal clock that comes from back of a person's brain. Circadian rhythm cycles become active every day with a regularity between sleepiness and alertness that is known as the sleep-wake cycle. Mainly, the sleep-wake cycle regulates the circadian rhythm. As circadian rhythm is a biological clock built in our brain throughout the functionality of everyone's day and night processes within a 24-hour clock frame, it devises our body to function in a healthy way of daily routines. Thus, the circadian rhythm becomes a self-control system of human body to regulate our eating habits, activities and body functionality. In this context, our 24-hour daily functionality should have concern over food, physical environment including lightings, exercises, work habits, sleeping and other activities concern. All in consideration, a mind clock in performing even a simple task should be perfectly set with routinised daily functionality. Circadian rhythms affect your sleep patterns as well as other ways your body works, like your hormones, body temperature, and eating habits. The circadian rhythm regulation plays a crucial role in people's healthy lives affected by factors consisting of cosmic events related to the universe and earth, environmental factors (light, night and day duration, seasons) and lifestyles. These factors changes lead to disturbance of circadian rhythm and it causes increasing the incidence of mental diseases like depression and physiological problems like cancers, cardiovascular disease and diabetes. Disruption of a circadian rhythm can become a main source for the severity of possible diseases within human body. It is therefore important for everyone to keep up and maintain a better circadian rhythm to overcome such irregularities in our day to day life.

ACKNOWLEDGEMENT

I hereby wish to express my gratitude for all those who provided help, support and assistance in diverse forms. It is not possible to mention names of all those people. However, it will not be possible to go ahead without mentioning few names of those individuals whose contribution was critical in completion of this study. Firstly, I would like to express my special thanks of gratitude to our principal mam **Dr. Debjani Dutta**, who gave me the golden opportunity to do this wonderful project. It helped me in doing a lot of research and I came to know about so many new things. I am obliged and grateful to our senior teachers. I also wish to acknowledge and thanks our **Zoology teachers Dr. Barnali Bera, Dr. Papia Das, Dr. Partha Pratim Chaudhury , and our lab assiatant Mr. Tapas Shaw** for their continuous help and guidance during the entire project work. Any attempts at any level cannot be satisfactorily completed without the support and guidance of my parents and friends, who helped me a lot in gathering different information, collecting data and guiding me from time to time in making this project successful.

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UNIVERSITY OF CALCUTTA

SEMESTER VI HONOURS PRACTICAL EXAMINATION (UNDER CBCS)

2023

DSE(A)-6-2 PRACTICAL (ZOOA)

**A Project Report On Animal Cloning, Its
Application And Ethical Issues**



Registration No. - 561-1211-0357-20

Roll No. - 203561-11-0004

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• **Introduction To Animal Biotechnology**

Animal biotechnology is a branch of biotechnology in which molecular biology techniques are used to genetically engineer (i.e. modify the genome of) animals in order to improve their suitability for pharmaceutical, agricultural or industrial applications. Animal biotechnology has been used to produce genetically modified animals that synthesize therapeutic proteins, have improved growth rates or are resistant to disease. It deals with monitoring the nutrition, health and reproduction of animals. The field has been influential in producing genetically altered animals that synthesize therapeutic proteins, have improved growth rates.

• **Animal Biotechnology In Animal Cloning**

- Cloning is the most recent evolution of selective assisted breeding in animal husbandry. Cloning animals is a reliable way of reproducing superior livestock genetics and ensuring herds are maintained at the highest quality possible. It's important to remember that cloning does not manipulate the animal's genetic makeup nor change an animal's DNA. It is simply another form of assisted reproduction. Cloning allows livestock breeders to create an exact genetic copy of an existing animal, essentially an identical twin. Clones are superior breeding animals used to produce healthier offspring. Animals can be cloned by embryo splitting or nuclear transfer.
- **Embryo Splitting** involves bisecting the multi cellular embryo at an early stage of development to generate "twins". This type of cloning occurs naturally and has also been performed in the laboratory with a number of animal species. Embryo splitting or embryo twinning refers to the formation of twins or multiple embryos in vitro to split an embryo in 2-, 4-, or 8-cell stages. The blastomeres can be still totipotent at the initial stage of embryogenesis. The ability has been considered for the in vitro production of a full organism. In many studies, it has been reported that splitting the 6- to the 8-cell embryo can be developmentally more efficient than the 2- to 5-cell-stage embryos. Embryo splitting is the same as the natural process of creating identical twins. Numerous advantages have been found for embryo splitting in research and reproduction programs. The benefit of an embryo splitting is the in vitro production of tissues or organs. In other words, if the offspring needs tissue or organ transplant, the other embryo, protected in the reproductive biological laboratory, can be used to produce the tissue or organ.

• Introduction To Animal Cloning

Cloning is the process of creating genetically identical copies of biological matter. This may include genes, cells, tissues or entire organisms. Animal cloning is a technique for the production of genetically indistinguishable copies of the desired animal. So far, adult animals such as cattle, pigs, rabbits, sheep, and goats have been cloned.

➤ **Types of Cloning**

When we speak of cloning, we typically think of organism cloning, but there are actually three different types of cloning.

- **Molecular Cloning:** Molecular cloning focuses on making identical copies of DNA molecules in chromosomes. This type of cloning is also called gene cloning.
- **Organism Cloning:** Organism cloning involves making an identical copy of an entire organism. This type of cloning is also called reproductive cloning.
- **Therapeutic Cloning:** Therapeutic cloning involves the cloning of human embryos for the production of stem cells. These cells could be used to treat disease. The embryos are eventually destroyed in this process.

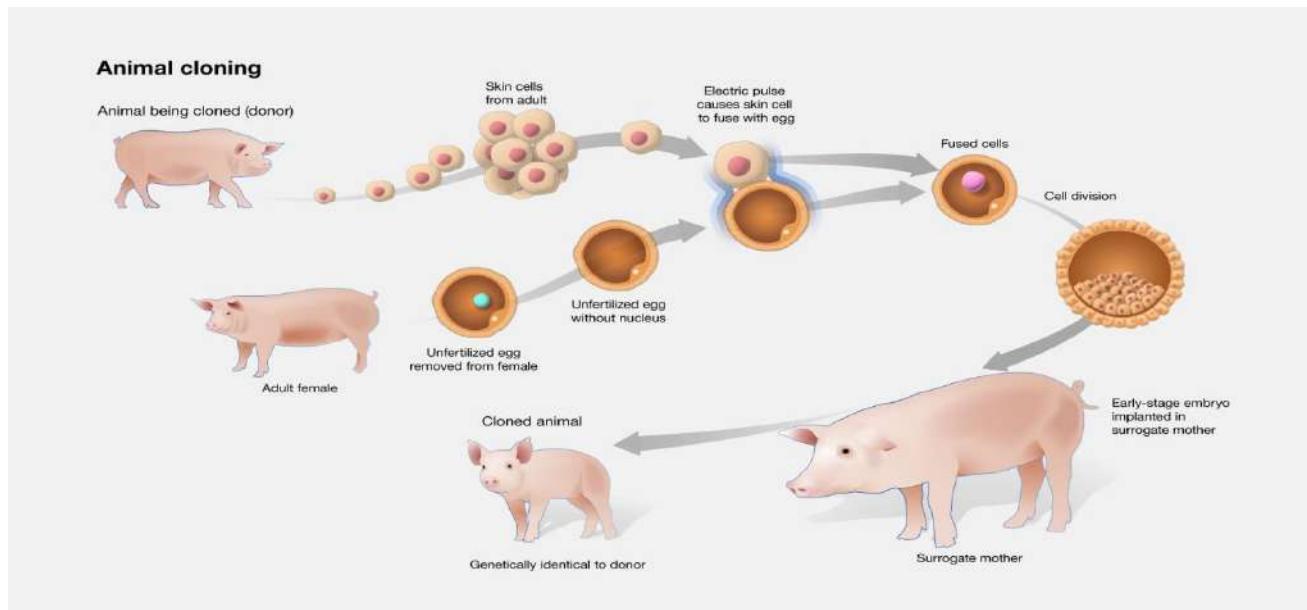
Reproductive Cloning Techniques

Cloning techniques are laboratory processes used to produce offspring that are genetically identical to the donor parent. Clones of adult animals are created by a process called somatic cell nuclear transfer. In this process, the nucleus from a somatic cell is removed and placed into an egg cell that has had its nucleus removed. A somatic cell is any type of body cell other than a sex cell.

- **Cloning animals refers to the production of genetically identical individuals, mainly through somatic cell nuclear transfer (SCNT), by transferring nuclei from in vivo- or in vitro-derived somatic cells into recipient enucleated oocytes. The “zygote” is activated to divide and is later implanted in a surrogate mother. Dolly the sheep was the first animal to be cloned via the transfer of nuclei derived from mammary gland cells. Since then, more than 20 animal species have been cloned, including goats.**

• Method In Animal Cloning

1. In reproductive cloning, researchers remove a mature somatic cell, such as a skin cell, from an animal that they wish to copy. They then transfer the DNA of the donor animal's somatic cell into an egg cell, or oocyte, that has had its own DNA-containing nucleus removed.
2. Researchers can add the DNA from the somatic cell to the empty egg in two different ways. In the first method, they remove the DNA-containing nucleus of the somatic cell with a needle and inject it into the empty egg. In the second approach, they use an electrical current to fuse the entire somatic cell with the empty egg.
3. In both processes, the egg is allowed to develop into an early-stage embryo in the test-tube and then is implanted into the womb of an adult female animal.
4. Ultimately, the adult female gives birth to an animal that has the same genetic makeup as the animal that donated the somatic cell. This young animal is referred to as a clone. Reproductive cloning may require the use of a surrogate mother to allow development of the cloned embryo.



Animal Cloning

• **Animal Cloning- Dolly And Polly**

- **Bioethics** is both a field of study and professional practice, in ethical issues related to health (primarily focused on the human, but also increasingly includes animal ethics), including those emerging from advances in biology, medicine, and technologies. Bioethics is concerned with the ethical questions that arise in the relationships among life sciences, biotechnology and medicine. It includes the study of values relating to ethical education in science, animal, and environmental ethics, and public health.

The term *Bioethics* (Greek bios, "life"; ethos, "moral nature, behavior") was coined in **1927** by Fritz Jahn in an article about a "bioethical imperative" regarding the use of animals and plants in scientific research. In **1970**, the American biochemist, and oncologist Van Rensselaer Potter used the term to describe the relationship between the biosphere and a growing human population. Potter's work laid the foundation for global ethics, a discipline centered on the link between biology, ecology, medicine, and human values.

- **History Of The Cloned Animal**

During the winter of **1995–96**, **Wilmut** was involved in three pivotal cloning experiments conducted at **Roslin**. In the first, Wilmut and his team of scientists performed embryonic cell nuclear transfer by using cultured embryonic cells that were nine days old. However, the experiment involved a different sheep breed; the cells used for nuclear transfer came from a **Poll Dorset sheep**. This first experiment resulted in the birth in **1996** of four Poll Dorset clones: **Cedric, Cecil, Cyril, and Tuppence**. In the second experiment, the team used fetal fibroblasts isolated from sheep fetuses after 26 days of development; these cells served as nucleus donors for transfer into an enucleated egg. This experiment resulted in the birth of two clones, **Taffy and Tweed**. In the third experiment, the scientists isolated adult cells (in this case, mammary gland cells) from a six-year-old ewe and used these cells as nucleus donors for transfer into egg cells; this technique inspired the later development of a procedure called **somatic cell nuclear transfer (SCNT)**. Wilmut and his team constructed **277 embryos** containing adult cell nuclei that were implanted into **13 surrogate mothers**, only one of which became pregnant. This pregnancy was carried to term successfully. The **Finn Dorset lamb**, born on **July 5, 1996**, was **Dolly**. Dolly, cloned animal.

In **1997**, following the publication in the **journal Nature** of a summary of their research leading to Dolly, **Wilmut, Campbell, and The Roslin Institute** instantly became known for having opened the door to a new era of controversial cloning research.

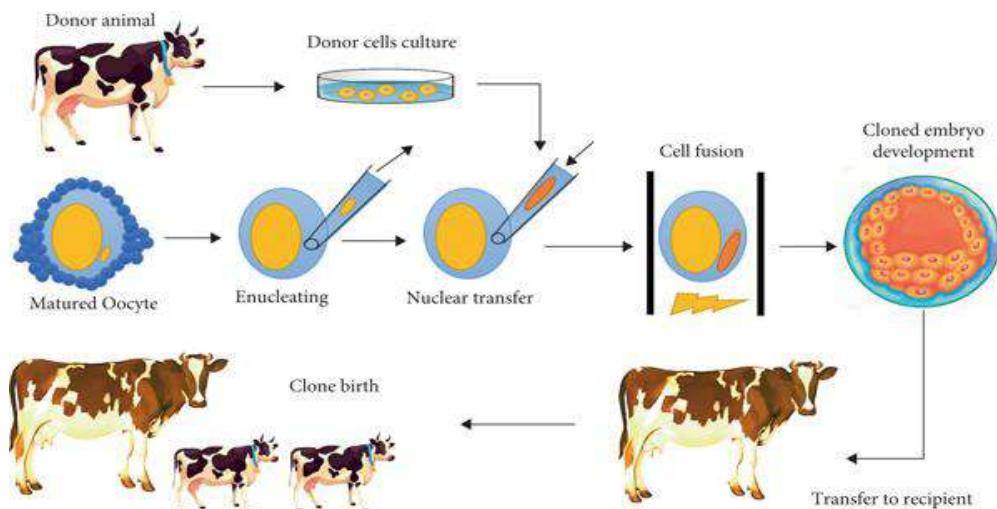
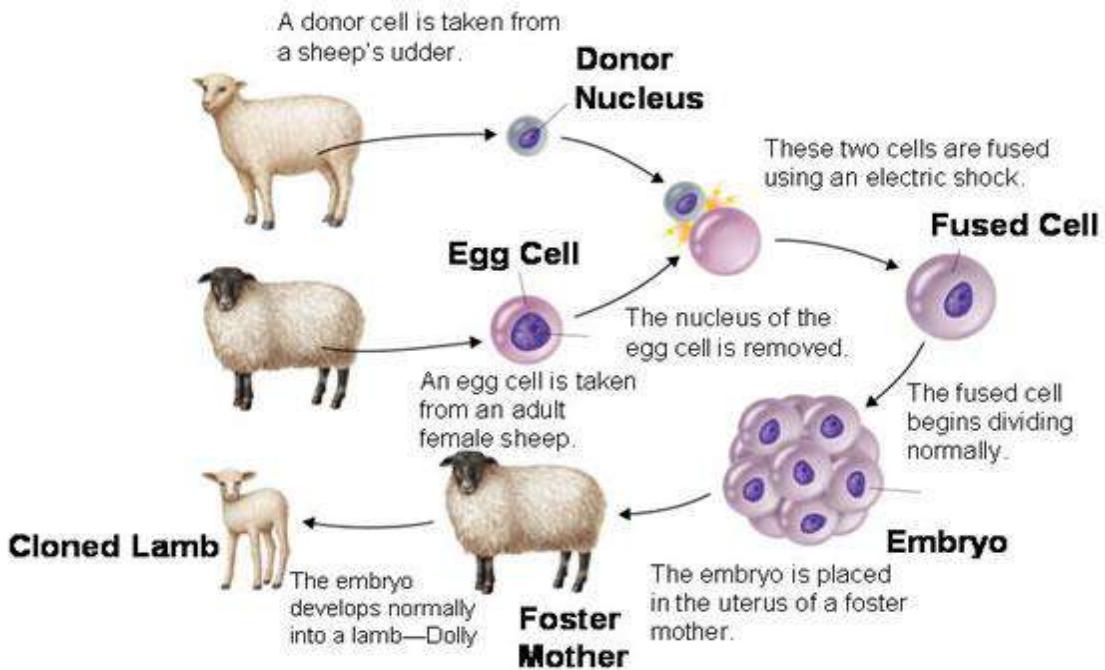
• Process Of The Animal Cloning- Dolly And Polly

- Dolly was cloned from a mammary gland cell taken from an **adult Finn Dorset ewe**.
- **Wilmut** and his team of researchers at **Roslin** created her by using electrical pulses to fuse the mammary cell with an **unfertilized egg cell**, the nucleus of which had been removed.
- The fusion process resulted in the transfer of the mammary cell nucleus into the egg cell, which then began to divide. In order for the mammary cell nucleus to be accepted and functional within the host egg, the cell first had to be induced to abandon the normal cycle of growth and division and enter a quiescent stage.
- Researchers deliberately withheld nutrients from the cells. Nevertheless, starting with a collection of **mammary cell nuclei** and **host egg cytoplasm** derived from **Scottish Blackface ewes**, a number of fused couplets successfully formed embryos.
- The reconstructed embryos were transferred to **surrogate Scottish Blackface ewes**. Of 13 **recipient ewes**, one became pregnant, and **148 days later**, which is essentially normal gestation for a sheep, Dolly was born.

In Gist-

1. Scientists took **udder cells**(somatic) from Dolly's DNA mother. They let the cells multiply and then they stopped the process when they had divided enough.
2. They took an **egg cell** from a different sheep and removed the nucleus.
3. They put one **udder cell**(somatic) next to the egg cell **without a nucleus** and joined them. The egg cell now contained all the **udder cell's DNA**.
4. The egg cell divided until it developed into an embryo. An embryo is the early stage of an animal before it has been born or hatched. This embryo was placed inside a third sheep. Five months later, this sheep gave birth to Dolly.

Dolly remained alive and well long after her birth, with a functional heart, liver, brain, and other organs, all derived genetically from the nuclear DNA of an adult mammary gland cell. The technique used to produce her later became known **as somatic cell nuclear transfer (SCNT)**. SCNT has since been used to generate a wide variety of mammalian clones, from different types of adult cells.



● Process of Animal Cloning- Dolly and Polly

● Embryo Splitting Process



- **Dolly and her surrogate**
- **Scottish embryologist, Ian Wilmut with his clone sheep Dolly**
- **Dolly and Polly with their scientists**

• **Reproductive Cloning**

Reproductive cloning involves the implantation of a cloned embryo into a real or an artificial uterus. The embryo develops into a fetus that is then carried to term. Reproductive cloning experiments were performed for more than 40 years through the process of embryo splitting, in which a single early-stage two-cell embryo is manually divided into two individual cells and then grows as two identical embryos. Reproductive cloning techniques underwent significant change in the 1990s, following the birth of Dolly, who was generated through the process of SCNT. This process entails the removal of the entire nucleus from a somatic (body) cell of an organism, followed by insertion of the nucleus into an egg cell that has had its own nucleus removed (enucleating). Once the somatic nucleus is inside the egg, the egg is stimulated with a mild electrical current and begins dividing. Thus, a cloned embryo, essentially an embryo of an identical twin of the original organism, is created. The **SCNT** process has undergone significant refinement since the 1990s, and procedures have been developed to prevent damage to eggs during nuclear extraction and somatic cell nuclear insertion. For example, the use of polarized light to visualize an egg cell's nucleus facilitates the extraction of the nucleus from the egg, resulting in a healthy, viable egg and thereby increasing the success rate of **SCNT**.

• **Result**

On February 14, 2003, Dolly was euthanized by veterinarians after being found to suffer from progressive lung disease. After her death The **Roslin Institute** donated Dolly's body to the **National Museum of Scotland in Edinburgh**, where she has become one of the museum's most popular exhibits. Dolly is back on display in the museum after an extensive gallery refurbishment, alongside an interactive exhibit on the ethics of creating transgenic animals featuring current research from **The Roslin Institute**.

Uses Of Animal Cloning

- Cloning allows farmers and ranchers to accelerate the reproduction of their most productive livestock in order to better produce safe and healthy food.
- Cloning reproduces the healthiest animals, thus minimizing the use of antibiotics, growth hormones and other chemicals.
- Consumers can benefit from cloning because meat and milk will be more healthful, consistent, and safe. Most of the foods from cloning will be from the offspring of clones that are not clones themselves, but sexually reproduced animals.
- Cloning can be used to protect endangered species.
- In biomedical research- animal as drug producer, xenotransplantation.
- In livestock breeding and agriculture- transgenic clones, changes to agriculture structures.

• **Ethical Issues Related To Animal Cloning**

Problems associated with cloning include:

1. Pre-Natal Failures: Only a small percentage of cloned pregnancies result in live births. A 2007 study found that animal cloning failure rates remain as high as 90 percent.
2. Surrogate (Host) suffering: "Host mothers" face grave suffering, much of which is caused by inordinately high rates of spontaneous abortions. Cloning often leads to a condition known as "large-offspring syndrome," whereby cloned offspring grow abnormally large, causing early-term and stressful caesarian deliveries. In one cattle cloning project, 3 out of 12 surrogate mothers died during pregnancy.
3. Post-Natal Animal Health: Most cloned animals born on a farm, outside a veterinary hospital, have little chance of surviving. Those animals that manage to survive until birth are likely to suffer a wide range of health defects and deformities including: enlarged tongues; squashed faces; intestinal blockages; immune deficiencies; diabetes; high rates of heart and lung damage; kidney failure; and brain abnormalities.

• **Application Of Animal Cloning**

- **Xenotransplantation-** Genetically modified pigs can also be used as a source of cells, tissues, and organs for transplantation into human recipients. Xenotransplantation is any procedure involving the transplantation, implantation, or infusion of cells, tissues or animal donor organs, and also body fluids, cells, tissues, and human organs (or their fragments), which had ex vivo contact with animal cells, tissues, or organs into a human recipient. Organ xenotransplantation would give us an unlimited and predictable source of organs and enable careful planning of the surgery and preoperative drug treatment of the donor. The animal that best meets the criteria for xenotransplantation is the domestic pig (*Sus scrofa domestica*). Pig and human organs show great anatomical and physiological similarities. Advances in genetic engineering have brought scientists closer to obtaining modified animals that would be useful for pig to human transplants.
- **Recombinant DNA Technology (Transgenic Animal)-** The most important outcome of the application of transgenic biotechnology has been the production of recombinant proteins from bacteria.

The first successes involved the production of recombinant growth hormone and insulin for human replacement therapy. The ability to produce offspring from cultured cells opens up relatively easy way to make genetically modified or transgenic animals. Such animals are important for research and can produce medically valuable human proteins.

By introducing key human genes into mammals, biologists can induce dairy animals to produce therapeutic proteins in the milk. The genetic engineer first constructs a trans-gene containing the gene of interest plus some of extra DNA, which correctly controls the function of the gene in the new animal. This trans-gene has then to be inserted into the new animal. Several transgenic techniques have been optimized to obtain transgenic animals, with different levels of efficiency in function of the species in which they had been employed. Principal techniques are now available in order to modify an organism as a whole and subsequently to obtain a germ line transgenic animal.

• Conclusion

Studies into animal cloning have diversified and have been extended into various fields, with major breakthroughs being reported in the biotechnology, pharmaceutical and agricultural fields. Through cloning, transgenic animals have been created that have the potential to produce novel human therapeutic molecules, thus helping in treating some diseases that previously were incurable. Animal cloning promises to revolutionize food production, with the potential of producing cattle, sheep, pigs, and other animals with superior quality and more resistant to diseases. This is bound to increase food availability.

Animal cloning proponents are of the opinion that cloning of animals will see an increase in food production globally. Moreover, the quality of food produced will increase and novel cures for diseases will result from pursuance of animal cloning. This is meant to prolong human life. Further, animal cloning is considered as significant in enhancing the comprehension of human beings and nature. It is evident that animal cloning will lead to the realization of animals that can mature earlier and those with qualities that are preferred by farmers. This supplements the traditional sexual reproduction methods that are slower and do not meet the population demands.

• **Acknowledgement**

I would like to convey my heartfelt gratitude to our professor **HOD Dr. Partha Pratim Chaudhuri** for his support and assistance in the completion of my project. I would also like to thank our Principal **Dr. Debjani Dutta**, for providing me with this wonderful opportunity to work on a project with the topic **Animal Cloning**. The completion of the project would not have been possible without his help and insights. I would like to express my special thanks to our lab attendant **Mr. Tapas Shaw** for his time and efforts he provided for doing the project. His useful advice and suggestions were really helpful to me during the project's completion. In all these following aspect, I am eternally grateful to him.

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B.Sc. Botany General

UNIVERSITY OF CALCUTTA

SYLLABUS

FOR

THREE-YEAR B.Sc. PROGRAMME IN

BOTANY (GENERAL COURSE)

UNDER CHOICE BASED CREDIT SYSTEM



BOTANY

Syllabus for three-year B.Sc. Botany Programme
(With effect from 2018-2019)

CORE COURSES (4)

Each theoretical course of 4 credits and practical of 2 credits.

1. Plant diversity I (Phycology, Mycology, Phytopathology, Bryophytes and Anatomy) –
a) Theoretical- BOT-G-CC-1-1-TH b) Practical- BOT-G-CC-1-1-P (... ... GE-1-1-TH & P)
2. Plant diversity II (Pteridophytes, Gymnosperms, Palaeobotany, Morphology and Taxonomy) – a) Theoretical- BOT-G-CC-2-2-TH b) Practical- BOT-G-CC-2-2-P (... ... GE-2-2-TH & P)
3. Cell biology, Genetics and Microbiology – a) Theoretical- BOT-G-CC-3-3-TH b)
Practical- BOT-G-CC-3-3-P (... ... GE-3-3-TH & P)
4. Plant physiology and metabolism – a) Theoretical- BOT-G-CC-4-4-TH b) Practical-
BOT-G-CC-4-4-P (... ... GE-4-4-TH & P)

N.B.: The above said four core courses (CC) may be considered as GE 1, 2, 3 & 4 respectively for the honours students of other allied disciplines opting Botany as one of the general courses.

Skill enhancement courses (SEC, four courses to be selected strictly on 2 subjects out of 3 subjects opted taking 2 courses from each subject. Each general subject shall have 2 groups (A & B) of SEC papers. One paper from Group A from each of the 2 subjects to be chosen in the 3rd and 5th Semester, one paper from Group B of each of the 2 subjects to be chosen in the 4th and 6th Semesters. Each paper of 2 credits and theoretical only)

SEC A

1. Plant breeding and biometry (BOT-G-SEC-A-3/5-1)
2. Biofertilizers (BOT-G-SEC-A-3/5-2)

SEC B

1. Plant biotechnology (BOT-G-SEC-B-4/6-3)
2. Mushroom culture technology (BOT-G-SEC-B-4/6-4)

Discipline specific elective courses (DSE, two courses to be selected from the list taking one each from Group A in 5th semester and one from Group B in 6th Semester. Each course comprises of theoretical component of 4 credits and practical ones of 2 credits)

DSE A

1. Phytochemistry and medicinal botany- a) Theoretical- BOT-G-DSE-A-5-1-TH b) Practical- BOT-G-DSE-A-5-1-P
2. Natural resource management- a) Theoretical- BOT-G-DSE-A-5-2-TH, b) Practical- BOT-G-DSE-A-5-2-P

DSE B

3. Economic botany- a) Theoretical- BOT-G-DSE-B-6-3-TH, b) Practical- BOT-G-DSE-B-6-3-P
4. Horticultural practices and post harvest technology - a) Theoretical- BOT-G-DSE-B-6-4-TH, b) Practical- BOT-G-DSE-B-6-4-P

SEMESTER	CORE COURSES (CC-1-4)	ABILITY ENHANCEMENT COMPULSORY COURSE (AEC-1&2)	SKILL ENHANCEMENT COURSE (SEC-1-4)	DISCIPLINE SPECIFIC ELECTIVE COURSE (DSE-1&2)
I	PLANT DIVERSITY I (PHYCOLOGY, MYCOLOGY, PHYTOPATHOLOGY, BRYOPHYTES AND ANATOMY) BOT-G-CC-1-1-TH	AECC-1 ENGLISH COMUNICACION		
	PRACTICALS BOT-G-CC-1-1-P			
	OTHER DESCiplINES (2)			
II	PLANT DIVERSITY II (PTERIDOPHYTES, GYMNOSPERMS, PALAEOBOTANY, MORPHOLOGY AND TAXONOMY) BOT-G-CC-2-2-TH	AECC-2 ENVIRONMENTAL SCIENCE		
	PRACTICALS BOT-G-CC-2-2-P			
	OTHER DESCiplINES (2)			
III	CELL BIOLOGY, GENETICS AND MICROBIOLOGY BOT-G-CC-3-3-TH		SEC-A	
	PRACTICALS BOT-G-CC-3-3-P			
	OTHER DESCiplINES (2)			
IV	PLANT PHYSIOLOGY AND METABOLISM BOT-G-CC-4-4-TH		SEC-B	
	PRACTICALS BOT-G-CC-4-4-P			
	OTHER DESCiplINES (2)			
V			SEC-A	DSE-A (any one from GROUP A) THEORY & PRACTICAL
				OTHER DESCiplINES (2)
VI			SEC-B	DSE-B (any one from GROUP B) THEORY & PRACTICAL
				OTHER DESCiplINES (2)

DSE A (Group A)
PHYTOCHEMISTRY AND MEDICINAL BOTANY (BOT-G-DSE-A-5-1-TH)
THEORETICAL
(Credit 4, Lectures 60)

1. **Medicinal botany-** History, scope and importance of medicinal plants, a brief idea about indigenous medicinal sciences- Ayurveda, Siddha and Unani. Polyherbal formulations.
.....14 lectures
2. **Pharmacognosy-** 2.1 Scope and its importance, 2.2 Primary metabolites, 2.3 Secondary metabolites- alkaloids, terpenoids, phenolics and their functions.
.....10 lectures
3. **Organoleptic evaluation of crude drugs.**
.....10 lectures
4. **Pharmacologically active constituents:** Source plants (one example), parts used and uses of: 4.1 Steroids (Diosgenin, Digitoxin), 4.2 Tannin (Catechin), 4.3 Resins (Gingerol, Curcuminoids), 4.4 Alkaloids (Strychnine, Reserpine, Vinblastine), 4.5 Phenols (Capsaicin).
.....6 lectures
5. **Ethnobotany and folk medicine:** 5.1 Brief idea, 5.2 Applications of ethnobotany, 5.3 Application of natural product to certain diseases- Jaundice, Cardiac and Diabetics.
.....20 lectures

PRACTICAL- PHYTOCHEMISTRY AND MEDICINAL BOTANY (BOT-G-DSE-A-5-1-P)
(Credit 2)

1. Preparations of solution and buffers
2. Acquaintance with laboratory instruments- Autoclave, Incubator, Clinical centrifuge, Analytical balance, pH meter, Colorimeter, Water bath, Distillation plant, Laminar air flow.
3. Qualitative test for proteins and carbohydrates, reducing and non reducing sugar (glucose, fructose and sucrose)
4. Tests (chemical) for tannin and alkaloid
5. Identification of medicinal plants (list to be provided)
6. Field study (local) and listing of medicinal plants. Records to be substantiated with photographs and description.

Budge Budge College
Academic Session: 2022-23

Department of Botany

1.3.2 Percentage of students undertaking project work/field work/ internships (Data for the latest completed academic year)

List of students undertaking project work/field work/internship

Semester	Name of the course	Course code	Title of the project work	Sl. No.	Name of the Student	Registration No.	CU Roll No.	Name of the Supervisor
V	Phytochemistry and Medicinal Botany	BOT-G-DSE-A-5-1-P	Identification of Local medicinal plants	1.	Anindita Mondal	561-1211-1193-20	203561-12-0001	Dr. Samiran Panday and Mrs. Piyali Das

- **Objectives and outcomes of this project work:**

Semester	Name of the course	Course Code	Title of the Project work	Objectives	Outcomes
V	Phytochemistry and Medicinal Botany	BOT-G-DSE-A-5-1-P	Identification of Local medicinal plants	To impart students discipline specific knowledge of local medicinal plants and their Phytochemistry because 40% therapeutics primarily originate from natural plants.	Students practically are now aware of field oriented and practical training on the medicinal plants and their biochemical properties. Students' learning on the medicinal plants' role in human welfare.

TO WHOM IT MAY CONCERN

This is to certify that Shri/Ms. *Swaralipi Adhikary* bearing Roll no. **203561-12-0009**. and Registration no. **561-1214-1211-20** of 5th Semester Botany General Course (paper DSE A1) of Budge Budge College has successfully completed Field Project on Medicinal Plants during the academic session 2022 – 2023.

Signature of the Teacher:

Pomday
22/12/22



Field excursion with the 5th Semester Botany General students at Footghar, Akra

আন: ৩০৬৮

তারিখ: ১৬/১১/২২

ক্রমিক সংখ্যা	হানির নাম	বিজ্ঞানসম্মত নাম	গোত্র	স্বত্ব	সংক্ষিপ্ত বর্ণনা	ব্যবহৃত অংশ	তেজজ যাবহার	আলোকচিত্র
১.	বাঁচা কানার	<i>Stenoclea foetida</i>	<i>Stenocleaceae</i>	হৃষ্ট-				
২.	পুরাণ প্রিমিল	<i>Inga dulcis</i>	<i>Mimosaceae</i>	হৃষ্ট-				
৩.	পুরাণ চান্দ	<i>Albizia lebbeck</i>	<i>Mimosaceae</i>	পুরাণ	হৃষ্ট-			
৪.	পুরাণ শাহু	<i>Sternbergia asper</i>	<i>Monaceae</i>	পুরাণ	পুরাণ			
৫.	নলি পেঁজুল	<i>Leucena leucocephala</i>	<i>Mimosaceae</i>	পুরাণ	পুরাণ			
৬.	কানালিষ চান্দ	<i>Melia azedarach</i>	<i>Meliaceae</i>	পুরাণ, পুরাণ	পুরাণ			
৭.	কোমারু	<i>Cephaelandra indica</i>	<i>Cucurbitaceae</i>	বহুবর্ষী	বহুবর্ষী			
৮.	আলুখুল	<i>Opuncularia turpethum</i>	<i>Convolvulaceae</i>	বহুবর্ষী	বহুবর্ষী			
৯.	বন্দুরিমা	<i>Eichhornia crassipes</i>	<i>Pontederiaceae</i>	বৃক্ষ, পুরাণ	বৃক্ষ, পুরাণ			
১০.	ডেঁড়ুর	<i>Tamarindus indica</i>	<i>Caesalpiniaceae</i>	বহুবর্ষী	বহুবর্ষী			
১১.		<i>Cassia siamea</i>	<i>Caesalpiniaceae</i>					

List of medicinal plants observed during field study

Location:

Date: 16/11/12

Sl. No.	Local Name	Scientific Name	Family	Habit	Brief description	Parts used	Medicinal uses	Photograph
12.	খন্দকুন চান্দ	<u>Solanum torvum</u>	Solanaceae	পাতালোলি পুরাম পামুঁ				
13.		<u>Passiflora foetida</u>	Passifloraceae					
14.		<u>Aemra la-nota</u>	Amaranthaceae	বেগুন পুরাম পুরাম পুরাম				
15.	কারালি পাতা	<u>Mikania scandens</u>	Asteraceae	পাতালোলি পুরাম পুরাম পুরাম				
16.	বনকামি	<u>Pomoea aquatica</u>	Convolvulaceae	পিস পুরাম পুরাম পুরাম				
17.	পাতা কেমু	<u>Abutilon indicum</u>	Malvaceae	পিস				
18.		<u>Panthenium hysterophorus</u>	Asteraceae	পাতালোলি পুরাম				
19.		<u>Lantana canescens</u>	Vochysiaceae	পুরাম				
20.		<u>Triumfetta semibordia</u>	Tiliaceae	কাটি পুরাম				

ଅନୁମତି ନଂ	ଶାସକ ନାମ	ଅନୁମତି ଦିନ	ଅନୁମତି ପାତା	ଅନୁମତି ପାତା	ଅନୁମତି ପାତା
୧.	Allorhynchium cotteae	2020-09-01	2020-09-01	2020-09-01	2020-09-01
୨.	Ficus hispida	2020-09-01	2020-09-01	2020-09-01	2020-09-01
୩.	Sodalia longifolia	2020-09-01	2020-09-01	2020-09-01	2020-09-01
୪.	Punica reticulata	2020-09-01	2020-09-01	2020-09-01	2020-09-01
୫.	Tilia orientalis	2020-09-01	2020-09-01	2020-09-01	2020-09-01
୬.	Vitis Peda	2020-09-01	2020-09-01	2020-09-01	2020-09-01
୭.	Cassia alata	2020-09-01	2020-09-01	2020-09-01	2020-09-01
୮.	Annona reticulata	2020-09-01	2020-09-01	2020-09-01	2020-09-01
୯.	Syredrella nodiflora	2020-09-01	2020-09-01	2020-09-01	2020-09-01
୧୦.	Ruellia tuberosa	2020-09-01	2020-09-01	2020-09-01	2020-09-01

സംരക്ഷിക്കുന്ന അധികാരി	ഭൂമിയും സ്വർഗ്ഗ വിദ്യാഭ്യാസം മുമ്പ്	സ്വർഗ്ഗ	ഭൂമി
31.	പാലമ്പാൽ ഫൂഡ് <u>Butea monosperma</u>	Papilionaceae	പാലമ്പാൽ ചുവട്ടുനാട്ടിൾ
32.	തൃഥി	Euphorbiaceae	ചുവട്ടുനാട്ടിൾ
33.	<u>Uraria lobata</u>	Malvaceae	ചുവട്ടു നാട്ടിൾ
34.	കുഞ്ചി	Amaranthaceae	കുഞ്ചിപ്പറമ്പി ചുവട്ടു
35.	പെട്ടു	Venbenaceae	പെട്ടുപാലമ്പാളി ചുവട്ടു
36.	<u>Hyptis Serrulata</u>	Lamiaceae	ചുവട്ടു നാട്ടിൾ
37.	<u>Desmodium gangeticum</u>	Papilionaceae	ചുവട്ടു നാട്ടിൾ
38.	<u>Glycosmis Pentaphylla</u>	Rutaceae	ചുവട്ടു ചുവട്ടുപണിൾ
39.	<u>Sida condifolia</u>	Malvaceae	കൊല്ലംകു ചുവട്ടു നാട്ടിൾ
40.	<u>Caesalpinia bonduc</u>	Caesalpiniaceae	കൊല്ലംകു ചുവട്ടുനാട്ടിൾ
41.	<u>Anisomeles indica</u>	Lamiaceae	കുഞ്ചിപ്പറമ്പി- ചുവട്ടു നാട്ടിൾ
42.	നേരം	Asclepiadaceae	ചുവട്ടു നാട്ടിൾ
43.	വരമ്പന്താ	Acanthaceae	വരമ്പന്താ നീർപ്പിൾ

ക്രമിക അനുംതി	ജൂലീയിൽ നാമ	വിഭാഗങ്ങളായി നാമ	സ്വർഗ്ഗ	ബഹു
44.	വാക്കാശ്വരം	<u>Cassia</u> <u>sophena</u>	Caesalpiniaceae	രഖ്മാർ അറ്റപ്പ്
45.		<u>Cleome</u> <u>viscosa</u>	Capparaceae	രഖ്മാർ വള്ളംക്കാടിനി
46.	വാന്ത്രേഷം	<u>Solanum</u> <u>verbascifolium</u>	Solanaceae	ദോം-വുഡം അറ്റപ്പ്
47.	സിംഗപ്പുരം -ലിഫ്	<u>Sonneratia</u> <u>alba</u>	Connaraceae	ചുട്ടാക്കട്ട വുഡം ചുറ്റിപ്പ്
48.		<u>Acanthus</u> <u>illlicifolius</u>	Acanthaceae	ചുട്ടാക്കട്ട രഖ്മാർ അറ്റപ്പ്
49.		<u>Smilax</u> <u>Zeylanica</u>	Smilacaceae	രഖ്മാർ അറ്റപ്പ്
50.		<u>Sida</u> <u>acuta</u>	Malvaceae	രഖ്മാർ അറ്റപ്പ്-

(Ranabot
07/11/22)

ଜ୍ୟୋତିଷ ଔଷଧ ଜାଗରୂପ

(Identification of Medicinal Plants)



1. *Terminalia arjuna* (Roxb. ex DC) Weight & Aron.

গোলাপিলিক নাম - অর্জুন

গোড়া - Combretaceae

উচ্চিদেশ বর্ণনা :

অসমীয়া পর্যায়ে হচ্ছে:

বর্ণনা : সরীসূরি রঙের বাষপি, কৃত্তি বর্ণের বাতলা ফোঁৎ ফুক্ত ;
পাতা : বিপুরীত শিখৰপুর, অসুলা, উপরুক্তাবলু, খৰাঙ্গ, তাম্রাঘৰাঘৰু;

ফুল : ধোন্দি ফুল বিল্লাঙ্গ অঙ্গুত, মুদু, ~~উক্কালিঙ্গ~~, ~~চৈলেণ্ড~~;

ইঞ্জাইট ; বৃত্তাঙ্গ টেটি, পুতুলাটি ; দুর্গাঙ্গ টেটি, পুতুলাঙ্গ ;
পুজোকেলি টেটি, দুটি আবর্তে অঙ্গুত ; চাঁচুলেজ টেটি, উক্কালিঙ্গ
অবিজ্ঞত, পুঁটেজেলালায়, এক প্রকার পুতুলাঙ্গ, চাঁচুলু টেটি, মুদু,
চুর্ণচুলু পাট ;

ফল : ধাচুলো ফুক্ত লাট, কেলচুলি পচাল, ২-৩ মি. মি লঙ্ঘন ;

বীজ : অস্যুধ, ঝোট ;

উচ্চিদেশ ফোল্ড বেচিষ্টি :

বুরহুত অংশ

১. বৃক্ষলা

ফোল্ড শুণ / শুবলাঃ

২. কঁচুলা নির্মাণ :

- উচ্চিদেশ হৃদযোগ প্রতিবেদিত ;
- লিওড-সিলভার কোস প্রতিবেদিত ;
- ক্ষয়ক্রিয় সহায়তা ;
- বলকায়ক চানিক দ্রিশ্যে বুরহুত ;
- ক্রেস্টিভলজ মিলিন ;
- বুকুচপ মিলিন ;
- আল্যালিটিক ফ্লাচে উপকার্যকারী ;
- চৰ্জাংগালুগ ফ্লাচে উপকার রাখা ;

৩. বৃক্ষলোঁ-ছাঁচি :

- কামুকুমবিহু দুল প্রিলেজ প্রতিবেদিত ;
- চানে পাতার দুষ পশ্চাত্য মুলামু উপরান্তি ;



2. *Centella asiatica* (L.) Urban

ମୋର୍ଫାଲିକ ନାମ - ଆନନ୍ଦଗି

ଫେଲ୍ - Apiaceae (Umbeliferae)

ଉତ୍ତିଶ୍ୱର ବଳ୍ଲ

ଧୂର୍ମ : ବର୍ଜିବି, ସିଙ୍ଗୁ, ଅନ୍ଧା;

ଶ୍ଵର : ଦେଖାନିକ, ଏହି ଶ୍ଵର ଉପରେ ଉପରେ;

ବଳ୍ଲ : ଅର୍ଦ୍ଧବୀର୍ଯ୍ୟ, ବକ୍ରବୀର୍ଯ୍ୟ, ଆନନ୍ଦ ବେଳମାଳା ମିଶ୍ର, ଆନନ୍ଦ;

ପାତା : ବଳ୍ଲବୈଲି ପ୍ରାଚ୍ଛଳ ପୁରୁଷ, ଦୀର୍ଘ ପ୍ରାଚ୍ଛଳ ପୁରୁଷ, ପ୍ରାଚ୍ଛଳ-ଚାତ୍ର,
ଶ୍ଵର : ବଳ୍ଲବୈଲି, ଅମିଳାର୍ଜ ଦାଁଢାଳା, ବଳ୍ଲବୈଲି ପ୍ରାଚ୍ଛଳରଣ୍ଡା-
କିନ୍ତୁ ବିଲାର୍ଜ.

ଶ୍ଵରର ପୁରୁଷବିଳାର୍ଜ ଅନ୍ତିମ, ଅନ୍ଧାର, ତାତ୍ତ୍ଵବୀର୍ଯ୍ୟ;
ଛୋଟ; ବ୍ୟାପାର ରେ କୁକୁରାଟି; ଦୀର୍ଘ ରେ କୁକୁରାଟି; ପ୍ରାଚ୍ଛଳ
ରେ କୁକୁରାଟି; ତାତ୍ତ୍ଵବୀର୍ଯ୍ୟ ୨୮, ବଳ୍ଲବୈଲି ରେ କୁକୁରାଟି, ଅନ୍ଧାର, ପ୍ରାଚ୍ଛଳ-
କୁକୁରାଟି, ଚାତ୍ର ୨୮, ଚାତ୍ରକୁକୁରାଟିପୁରୁଷ, ଚାତ୍ରକୁକୁରାଟି ୨୮;

ଶ୍ଵର : ଶ୍ଵରବାର୍ଷ,

ଉତ୍ତିଶ୍ୱର ଶ୍ଵର ବିଳାର୍ଜ:

ଶ୍ଵରର ଅନ୍ଧାର

ଶ୍ଵରର ଶ୍ଵର / ଶ୍ଵରବାର୍ଷ

1. ବଳ୍ଲ ଓ ପାତା

(୧) ବଳ୍ଲର ପାତା ନିମ୍ନୀଁ—

- ଆମକିଳ ୩ ପ୍ରେଟର ଅନ୍ଧାର ଅନ୍ଧାରରେ ବଳ୍ଲ
ପିଚାଲିତ ଅନ୍ଧାର ନାମେ ବ୍ୟବସ୍ଥାପନ;
- ଶ୍ଵର (Leprosy) ହୋଇଥିବ ଅନ୍ଧାର ହିମାବ ଶ୍ଵରର
ହୀ,
- ଚମରକୋଟର ବିଳାର୍ଜ ଏକଟିମା, ପୋରିଯେ-
ତିଳ, ଲୁପାତା ହିନ୍ଦୁଦୀ କୋଟର ଉପରିଭାଗରେ
- ବଳ୍ଲବୈଲି ଜିନିକ ହିମାବ ଶ୍ଵର;
- ଏହାମୁଦ୍ରିତ ହିମାବ ଶ୍ଵର; ପାତାର ଅନ୍ଧାର,
ଶ୍ଵରକିଳି ବୃକ୍ଷର କାମରାଯି ଶ୍ଵରକିଳି
ଶ୍ଵରର ୨୫;
- ଅନ୍ତିମର ଶ୍ଵର ଶ୍ଵରକାଳୀ (Motukala)
ଅନ୍ଧାର, ପାତାର, ଅନ୍ଧାର ପୁରୁଷର ଶ୍ଵର ଅନ୍ଧାର
ନାମେ ଶ୍ଵରର ୨୫,

2. ଶ୍ଵର :

ଶ୍ଵରର ପୁରୁଷ କାମରାଯି,



3. Saraca asoca (Roxb.) Willd.

গোপ্তালিক নাম — দেশীক

বর্গ — Leguminosae, Sub-family Caesalpiniodeae

উচ্চিতা-বণনা :

ঘৰ অংশ : বৃক্ষ বৰ্ষায়িত চিৰায়িত বুক্স;

বৰ্ণনা : কষীল, পাতা—বল্পন্থৰ্মুক্ত;

পাতা : একঙ্কু, দাইপুক, শৈড় পাতা পৰিমাণ, পুরু ৪-২৫ মি. কি. লম্বা উচ্চিতাৰক্ত, লিপৰিত ময়ূৰ, কুলাঙ্গুলি;

ফুল-পুষ্প—বিপুল অস্তিত্ব, দাইপুক উচ্চিতাৰে, অতুলো, কুলাঙ্গুলি পুনৰ্বৃদ্ধি পুনৰ্বৃদ্ধি; বৃক্ষৰ পুষ্প ৪টি; পুনৰ্বৃদ্ধি ১টি; পুষ্পকার ৩-৮, কুলাঙ্গুলি পুনৰ্বৃদ্ধি পুনৰ্বৃদ্ধি, দাইপুক—১টি, অস্তিত্ব, একাপুরকৃতিপুনৰ্বৃদ্ধি অন্তৰ্ভুক্ত আছে;

ক্ষেত্ৰ;

৪-৮ মি. লম্বা

উচ্চিতা ক্ষেত্ৰ কুণ্ড :

শুবলুত অংশ — ক্ষেত্ৰ কুণ্ড / শুবলুত

১. কষীল:

বাবলুন্দু কুণ্ড —

- দুর্বল বাবলুন্দু পুৰুষ হিসাবে শুবলুত হয়,
- প্রয়োগৰ পৰিমাণ পুনৰ্বৃদ্ধি,
- দুর্বল অস্তিত্ব,

২. কুলাঙ্গুলি :

কুলাঙ্গুলি কুণ্ড —

- অক্ষেত্ৰ পুনৰ্বৃদ্ধি
- প্রয়োগৰ পৰিমাণ

৩. পুষ্পঃ

শুবলুত কুণ্ড পুনৰ্বৃদ্ধিৰ কুণ্ড,



4. Justicia adhatoda L. syn. Adhatoda vasica Nees

ନେପାଲିକା ନାମ — ସାମକ

ଫ୍ରେଗ୍ — Acanthaceae

ଡକ୍ଟିକ୍ ବଣିକ :

ପ୍ରକାଶ : ବୁଦ୍ଧିବଜୀରୀ ବିଳେମ କାଳାଖିତୁ ଝୁଲୁ;

ବଳ୍ପ : ଅନୁଷ୍ଠାନିକ, ନିର୍ବିଚ, ପରିଚୀତ, କାହୁଡ଼;

ପରିଚ୍ୟ : ଅନ୍ତିଷ୍ଠିତ ଡିମାନ୍‌ଡିମାନ୍, ଅନ୍ତିଷ୍ଠିତ, କାହୁଡ଼କ, ପକ୍ଷି,
ଏଲାକାକୁଳ, କିଳାର୍ଥ- ମର୍ଦ୍ଦ, ସୁଲ୍ଲାଙ୍ଗ;

ଫୁଲ : ଫୁଲକ ପୁରୁଷିନ୍‌ଗ୍ରେ ଅନ୍ତିଷ୍ଠିତ, ଏଲାକିନ କାହୁଡ଼କ
କୁ, ଓ କାହୁଡ଼କ କାହୁଡ଼କ, କାହୁଡ଼କ ଅନ୍ତିଷ୍ଠିତ, କାହୁଡ଼କ
କାହୁଡ଼କ, କାହୁଡ଼; ଇତ୍ତାଳୀ ଫୁଲ, ମୁକ୍ତରୁତି; କାହୁଡ଼କ
ଫୁଲ, ମୁକ୍ତରୁତି, କାହୁଡ଼କ କାହୁଡ଼କ; କାହୁଡ଼କ କାହୁଡ଼କ
କାହୁଡ଼କ କାହୁଡ଼କ କାହୁଡ଼କ କାହୁଡ଼କ, କାହୁଡ଼କ କାହୁଡ଼କ;

ଫୁଲ : କାହୁଡ଼କ;

ଫିଲ୍ଟି : ଉତ୍ତାଙ୍ଗ;

ଡକ୍ଟିକ୍ରିପ୍ଟ୍ କ୍ରେମଟିକ୍:

ବୁଦ୍ଧିବଜୀ ଅନ୍ତିଷ୍ଠିତ

1. ପାତା

କ୍ରେମଟିକ୍ / କ୍ରେମ

ପାତା ନିର୍ମିତ ପ୍ରାଣିଲିଙ୍ଗ ନାମକ
କ୍ରେମକୁ ଅନ୍ତିଷ୍ଠିତ କାହୁଡ଼କ କାହୁଡ଼କ —

- ପ୍ରକାଶିତିତର ଆତ୍ମ କିମ୍ବା ରଣ୍ଗ;
- କାହୁଡ଼କ କାହୁଡ଼କ କାହୁଡ଼କ ଅନ୍ତିଷ୍ଠିତ କାହୁଡ଼କ
କାହୁଡ଼କ କାହୁଡ଼କ କାହୁଡ଼କ କାହୁଡ଼କ;
- ଉତ୍ତାଙ୍ଗ କାହୁଡ଼କ କାହୁଡ଼କ କାହୁଡ଼କ କାହୁଡ଼କ;

2. ବଳ୍ପ କାହୁଡ଼କ ଅନ୍ତିଷ୍ଠିତ କାହୁଡ଼କ କାହୁଡ଼କ;

3. ଛୁଲ ଛୁଲ ନିର୍ମିତ ଉତ୍ତାଙ୍ଗ କାହୁଡ଼କ କାହୁଡ଼କ କାହୁଡ଼କ
ନିର୍ମିତ କାହୁଡ଼କ;

4. ଫୁଲ ଫୁଲ ନିର୍ମିତ — ପରିଚୀତ କାହୁଡ଼କ କାହୁଡ଼କ;

5. Andrographis Paniculata (Burm.f.) Nees

ଗୋପ୍ତାଲିକ ନାମ — କଣଙ୍ଗରେଖା

ଶୈଳୀ — Acanthaceae

ବ୍ୟାଳ :

ଫୁଲ : କର୍ମଚାରୀ ବିଛୁଃ,

ବାଣ୍ୟ : ଚାରିଜୀବୀ, ଉଦ୍‌ଧରିତ ପିଲାହା ଖୁବ;

ପାତା : କାନ୍ଦା, ଅରୁଡ଼, ଅବଳ, ଅତିର୍ମାତ୍ର, ଅଲାଙ୍କାର;

ଫୁଲ : ପାନିକୁଳେଟ୍ ପ୍ରେରିତ, ଦୁଇପଦ୍ମ ପ୍ରେରିତ;

ଫୁଲ : ଲାଙ୍ଘାଡ଼ ପ୍ରେରିତ;

ଫୁଲ : ସତ୍ତ୍ୱଶାଂଖକ, ଉପର୍ମାତ୍ର ପ୍ରେରିତ;

ଡକ୍ଟିଟ୍ରେଟି ଫେଲ୍‌ଟ୍ୱାନ୍ :

ଶ୍ରୀବନ୍ଦତ ଅପଥ

1. ଅରଜ କିମ୍ବା

ଶ୍ରୀବନ୍ଦତ

ଅରଜ-ଡକ୍ଟିଟ୍ରେଟି ନିର୍ମାତା —

- ① ମଧ୍ୟତାନିତ ଅନ୍ତର୍ଭାବ ଡାକ୍ତର, ଶ୍ରୀବନ୍ଦତ ଫେଲ୍‌ଟ୍ ଏହିମୁଦ୍ରା କ୍ଷେତ୍ରାଳୋକରୁକୁ ଦ୍ୱାରା,
- ② କିମ୍ବାଦୁଃ୍ଖ ପାନୀଯଗାଲିର ଶ୍ରୀବନ୍ଦତ ଉପର୍ମାତ୍ର କାନ୍ଦା;
- ③ ରୁକ୍ତିକିମ୍ବାଦୁଃ୍ଖକାନ୍ଦା-ଟେ ଅଥ ନିର୍ବାଚନ କାନ୍ଦା;

2. ନାମ୍ୟବିନ୍ଦୁ କଣଙ୍ଗରେଖା ଏ ପ୍ରତିକା ନାମ୍ୟ ଶ୍ରୀବନ୍ଦତ
ନାମ ରାଜ୍ୟ :

6. Aloe vera (L.) Burm. f. Syn. Aloe barbadensis Mill

ଓন্টেলিক নাম — ছুতঢুকুষি

গোপ্য — Xanthorrhoeaceae

বর্ণনা:

ফুল: বহুবর্ষজীবী, রঙ লাল, ঝুঁঝুঁ;

বীজ: চোটি;

পাতা: ক্ষুণ্ড, বৃংশ, অব্দুল রঙ লাল, চাপড়, কিনারা গুঁঁতুলা;

ফুল: ক্ষেত্ৰিক, উল্লেখযোগ্য লাল, দেহসূলভ, জাতে পুঁজি পুঁজি পুঁজি; ক্ষেত্ৰিক, উল্লেখযোগ্য লাল, দেহসূলভ, জাতে পুঁজি পুঁজি; ক্ষেত্ৰিক, উল্লেখযোগ্য লাল, দেহসূলভ, জাতে পুঁজি পুঁজি;

বৃক্ষ অংশ

১ পাতা

বৃক্ষস্থান

পাতা নির্মাণ —

- ক্ষেত্ৰিক (মাত্ৰ), মাত্ৰ পুঁজি মধৈয়ে হিয়াবুকুত ইঁঁঁ
- বাত ও ভারতীয় গুণিত ফোজ নির্মাণ কৰে, এইসাম্ৰ হিয়াবুকুত কৰিব; ভারতীয় ফোজ পুঁজি মধৈয়ে কৰিব;

পাতা — নির্মাণ —

- বৃক্ষ ও পুঁজি গুণিত ফোজ নির্মাণ কৰে;
- অঙ্গ নির্মাণ — চৰকু ফোজ কৰত আৰিমেলুৰ;
- অণ্ডিতা, নির্মাণ কৰকু ও পুঁজি পুঁজি;
- পাতা পুঁজি বাসিন্দা গুণিত কৰে আৰিমেলুৰ;

HM cinchonoides aff lancea (Dunal) D. Don

Papagei — som smalre
varia odontothrix — Rmet

Trifl.

Papagei, lunge, flikflik: tre v



7. *Hygrophila auriculata* (Schumach.) Heine *Asteracantha*
longifolia Nees

ଆମ୍ବଲିକ ନାମ — ହୁଗ୍ରଫିଲା

ଶ୍ରେଣୀ — Acanthaceae

ଡିଟିପ୍ରୋତ ବନମା:

ଫୁଲ : ବସୁକର୍ଷିତ ଫୁଲ;

ଫଳ : ଚାରିଲାଙ୍ଘ, ବ୍ୟାଘାତିକର୍ମଦ୍ୱାରା, ଧ୍ୟାନିତ, ଶାଳ ବନେ;

ପଦ୍ମ : ଅର୍ଥ ପ୍ରସିଦ୍ଧିକର୍ମଦ୍ୱାରା ଅନ୍ତିମ, ଅନୁରାଗିତ ଆହୁତି, ମଜ୍ଜା, ଯାଙ୍ଗକ-
 ପାଲାମ୍ବ୍ରୀ, କିମ୍ବାର - କର୍ମ୍ମ, ଦୁଃଖୀ, ସବୁ ଅନ୍ତର୍ବାଦ;

ଫୋଟା : କାରିକା, ଚିମ୍ବି ପୁଣ୍ୟବିନ୍ୟାସ ଅନ୍ତିମ; ପାଣିର ମଦ୍ଦିନ୍ଦିପାଦ-ଫୁଲ, ଅଛୁନ୍ତ,
 ଅଗରାଂଗ, ଉତ୍ତରିନ୍ଦା, କାରିକା, ପାଣିର ମଦ୍ଦିନ୍ଦିପାଦ-ଫୁଲ; ଇତ୍ୟାପରି
 ଫୁଲ, ଫୁଲଦ୍ୱାରା ପାଦ, ପାଦପାଦ, ପାଦପାଦଦ୍ୱାରା ପାଦ, ପାଦପାଦ
 ବନେ; ପ୍ରାଣଜଳର ଫୁଲ ଦ୍ୱାରା ପାଦ, ପାଦପାଦ ହାତ, ଫୁଲରେ
 ଡିକ୍ରିପ୍ତି ଏହିପାଦ, ପାଦପାଦଦ୍ୱାରା, ପାଦପାଦଦ୍ୱାରା; ପାଦପାଦ ଡିକ୍ରିପ୍ତି
 ଫୁଲ ପାଦପାଦ, ଅପାନ୍ତିକା-ଫୁଲ, ପାଦପାଦଦ୍ୱାରା;

ଫୋଟା : ଡିକ୍ରିପ୍ତି କୁମ୍ଭା;

ବୀର୍ଦ୍ଦ୍ଧ : ଅର୍ଦ୍ଧାଳ୍ପାଦ;

ଡିଟିପ୍ରୋତ ଫେମେଲ୍ ଫୁଲ :

ଶ୍ରୀବନ୍ଦ୍ର ଅବ୍ୟାପ

1. ଫୁଲ

ଫେମେଲ୍ ଫୁଲ / ଶ୍ରୀବନ୍ଦ୍ର

ଅନ୍ତର୍ବାଦ ଲିମ୍ବା

ଶ୍ରୀବନ୍ଦ୍ର ଫୁଲ ଉପରଭାଗ;

ଅନ୍ତର୍ବାଦ ଲିମ୍ବା;

ଶ୍ରୀବନ୍ଦ୍ର ଫୁଲ ଉପରଭାଗ;

ଅନ୍ତର୍ବାଦ ଲିମ୍ବା —

ଫୁଲରେ ଫୁଲ;

ଫୁଲରେ ଫୁଲ ଉପରଭାଗ;

ଫୁଲରେ ଫୁଲ ଉପରଭାଗ;

ଫୁଲରେ ଫୁଲ ଉପରଭାଗ;

ଅନ୍ତର୍ବାଦ ଲିମ୍ବା —

ଅନ୍ତର୍ବାଦ ଫୁଲ ଉପରଭାଗ;

ଅନ୍ତର୍ବାଦ ଫୁଲ ଉପରଭାଗ;

2. ପାଦ

ଅନ୍ତର୍ବାଦ ଲିମ୍ବା —

ଅନ୍ତର୍ବାଦ ଫୁଲ ଉପରଭାଗ;

ଅନ୍ତର୍ବାଦ ଫୁଲ ଉପରଭାଗ;

4. ବୀର୍ଦ୍ଦ୍ଧ ବୀର୍ଦ୍ଦ୍ଧ ବୀର୍ଦ୍ଦ୍ଧ ଫୁଲ ଉପରଭାଗ



Rauvolfia Serpentina (L.) Benth. ex Kunz

ରୋଫଲ୍‌ଲିଙ୍ଗ ନାମ — ଅପୋସିନେସେଟ୍

ଶୈଳୀ — Apocynaceae

ଉତ୍ତିଷ୍ଠିତ ବନରେ :

ଖାଦ୍ୟ : ସୁରକ୍ଷାତ୍ତିରେ ଜାହାନ ଖାଦ୍ୟ;

ଶୂନ୍ୟ : ଏକିନାଥୀଙ୍କ, ଅବିନାଶୀଳ;

ରାଶି : ଦେଲାମାଳା, କାର୍ଯ୍ୟ, କାର୍ଯ୍ୟ-ପରିକାଳ ମୁକ୍ତ ରାଶି;

ଧାରା : ଶାର୍କତ୍ତ ପ୍ରେରଣାଯେ, ଅନ୍ତର୍ମାତ୍ର ଅନନ୍ତରେ, ଉତ୍ତିଷ୍ଠିତ,
ଅବର୍ଦ୍ଦିନ; ବୁଝାଗଳ - ୫, ମୁକ୍ତ ରୂପ; ନାନାକାଳୀ
ମୁକ୍ତାଙ୍ଗ, ଦୁଇକୁଟି ମୁକ୍ତାଙ୍ଗ ପ୍ରେରଣାଯେ, ମାତ୍ର;

ଶୂନ୍ୟାଙ୍କରି - ୫୮୮, ନାନାକାଳୀ ଅନ୍ତର୍ମାତ୍ର ମୁକ୍ତ;

ଅନ୍ତର୍ମାତ୍ର - ୨୮୮, ମୁକ୍ତାଙ୍ଗାଙ୍କି, ଡିକ୍ରିମ୍‌ଫ୍ଲୋରିଚ
ମୁକ୍ତ; ଅନ୍ତର୍ମାତ୍ର ଆନ୍ତର୍ମାତ୍ରାହାତି;

୨୮୮, ପ୍ରତିକିରଣ ମତ ମୁକ୍ତ ଅନନ୍ତ ମୁକ୍ତ;

ଲୋଟି, କ୍ରୋଣାଳୀ;

ଉତ୍ତିଷ୍ଠିତ ପ୍ରେରଣାଙ୍କରି :

ଶୁରୁତ ଅନ୍ତର୍ମାତ୍ର ପ୍ରେରଣାଙ୍କରି / ଶୁରୁତୀ

୧. ଶୂନ୍ୟ ଶୂନ୍ୟ ଲିମାଇ (ରେଜାରପିନ୍) (Reserpine) ଓ
ଅନ୍ତର୍ମାତ୍ର ପ୍ରେରଣାଙ୍କରି - ରାତ୍ରି ଶାର୍କତ୍ତ, ଆହି ଶୂନ୍ୟ ଲିମାଇ
ଲାଗୁ କରିବାକୁ ପରିବାହାରିବାରେ

• ରାତ୍ରିରେ ରାତ୍ରିରେ ଅନ୍ତର୍ମାତ୍ର ରାତ୍ରି;

• ଲିମାଇରେ ରାତ୍ରି ରାତ୍ରି;

• ଆନାତିକି ରାତ୍ରି ପରିବାହାରାବାରେ;

• ବିଧିକୁ କରିବେ ରାତ୍ରି ରାତ୍ରି ଅନ୍ତର୍ମାତ୍ର ରାତ୍ରି ରାତ୍ରିରେ;

୨. ପାଞ୍ଜ ପାଞ୍ଜ ରାତ୍ରି ରାତ୍ରି ରାତ୍ରି ଉପରେତୁ ରାତ୍ରି

୨୨;



9. *Bacopa monnieri* (L.) Wettst. syn. *Herpestis monnieria* (L.) Rothm.

ଗୋଟିଲିକ-ଜାତୀ — ପ୍ରାଚୀ

— *Plantaginaceae*

ଡକ୍ଟିଲେୟୁସ୍ - ବଳ୍ଗା:

ପ୍ରକାଶ: ବରଣିଆ, ବିର୍ବୂ, କୁତ୍ତା;

ଫୁଲ: ଅଧ୍ୟାମିରା, ଏହି ହିନ୍ଦୁ ଉଦ୍‌ଦେଖ;

ବଳ୍ଗ: ପ୍ରେମଲାଲ୍, ମଧୁ;

ପାତା: ଅର୍ଦ୍ଧକ, ଅଯାମ, ଚାଷକାଳୀ, କିନାରା-ମଧୁ-ଅର୍ଦ୍ଧକ;

ଫୁଲ: • ବାନିକିରା-ଅଯାମ; ଅର୍ଦ୍ଧକ-ଅଯାମ, ଅର୍ଦ୍ଧକ-ଇନ୍ଦ୍ରଜିଲ-
କୁତ୍ତା, ମୁକୁରାତି; ଦୂରାଙ୍ଗ-କୁତ୍ତା, ଗୁଣାଙ୍ଗ, ଗୁଣାଙ୍ଗ-ଅଯାମିଆ,
ମୁମ୍ବେ, ପ୍ରେମଲାଲୀ; ପୁଣ୍ୟକାଳୀ-କୁତ୍ତା, ପୁଣ୍ୟକାଳୀ, ମୁକୁରାତି;
ହାତକେଳେ-କୁତ୍ତା, ମୁକୁରାତି, ପ୍ରେମଲାଲ୍-ଅର୍ଦ୍ଧକ,
କୁତ୍ତା ଅର୍ଦ୍ଧକ-ମୁକୁରାତି;

ଡକ୍ଟିଲେୟୁସ୍ ପ୍ରେମଲାଲ୍:

କ୍ରବୁତ ଅଗଣୀ ପ୍ରେମଲାଲ୍ / କୁତ୍ତା-

1. ଅର୍ଦ୍ଧକ-ଡକ୍ଟିଲେୟୁସ୍ ନିର୍ମାଣ / ପାତା ନିର୍ମାଣ

- ଇନ୍‌ଡିଆ ଅଯାମ ଇନ୍‌ଡିଆଲ୍ ଡିନିକ ପିଲାର୍
- ପାତା ଓ ଅଣାଟିକ କେବା ପ୍ରେମଲାଲ୍,
- ଅୟାମିଆକୁ କୁତ୍ତାକାଳୀ,

2. ପାତା

କୁତ୍ତାକୁତ୍ତା-ପ୍ରତିକରିତ,

- ସାତକ୍ରାଂତ ପ୍ରେମଲାଲୀ,
- କୁତ୍ତାକୁତ୍ତା-ଅଯାମିଆ,
- ଅଯାମାକୁତ୍ତା-କୁତ୍ତା ପ୍ରେମଲାଲୀ,

TO WHOM IT MAY CONCERN

This is to certify that Shri/Ms. *Ankan Paramanick* bearing
Roll no. *203561-22-0003*, and Registration no. *561-1111-1194-20*
of 5th Semester Botany General Course (paper DSE A1) of Budge Budge College
has successfully completed Field Project on Medicinal Plants during the academic
session 2022 – 2023.

Signature of the Teacher: *Fomday*
22/12/22



Field excursion with the 5th Semester Botany General students at Footghar, Akra

স্থান : মুকুটনগর

তারিখ : ১৬.১১.২০২২

ক্রমিক সংখ্যা	স্থানীয় নাম	বিজ্ঞানসম্মত নাম	গোষ	প্রভাব	সংক্ষিপ্ত বর্ণনা	ব্যবহৃত অংশ	ভৌজ ব্যবহার	আলোকিত
১.	<u>শৈতানদান</u>	<u>Stereulia foetida</u>	<u>Stereulia foetida</u>					
২.	গুধুলি	<u>Tinga dulcis</u>						
৩.	পিস্তিল গাছ	<u>Albizia lebbeck</u>						
৪.	কাণ্ডা গাছ	<u>Sterculia asper</u>						
৫.	লেনি তেঁচেন	<u>Leucaena leucocephala</u>						
৬.	কুমারী	<u>Melia azedron</u>						

List of medicinal plants observed during field study

Location:

Date:

Sl. No.	Local Name	Scientific Name	Family	Habit	Brief description	Parts used	Medicinal uses	Photograph
7.	গোকুলো	<u>Cephaelandra indica</u>	<u>Eueumbidaeae</u>	প্রস্তরাকৃতি বিলাতা				
8.		<u>Operculina turpethum</u>	<u>Convolvulaceae</u>	প্রস্তরাকৃতি বিলাতা জুর্দি				
9	শুণ্ডিরপনা	<u>Eichhornia crassipes</u>	<u>Pontederiaceae</u>	প্রস্তরাকৃতি লাল রঙ বিলাতা জুর্দি				
10	গোকুল	<u>Tamariindus indica</u>	<u>Euesulpinia eeu</u>	প্রস্তরাকৃতি গুঁড়াপুঁড়া জুর্দি				
11		<u>Cassia siamea</u>	<u>Caesalpiniaceae</u>					
12	বনহেমন	<u>Solanum torvum</u>	<u>Solanaceae</u>	প্রস্তরাকৃতি গুঁড়া পুঁড়া				

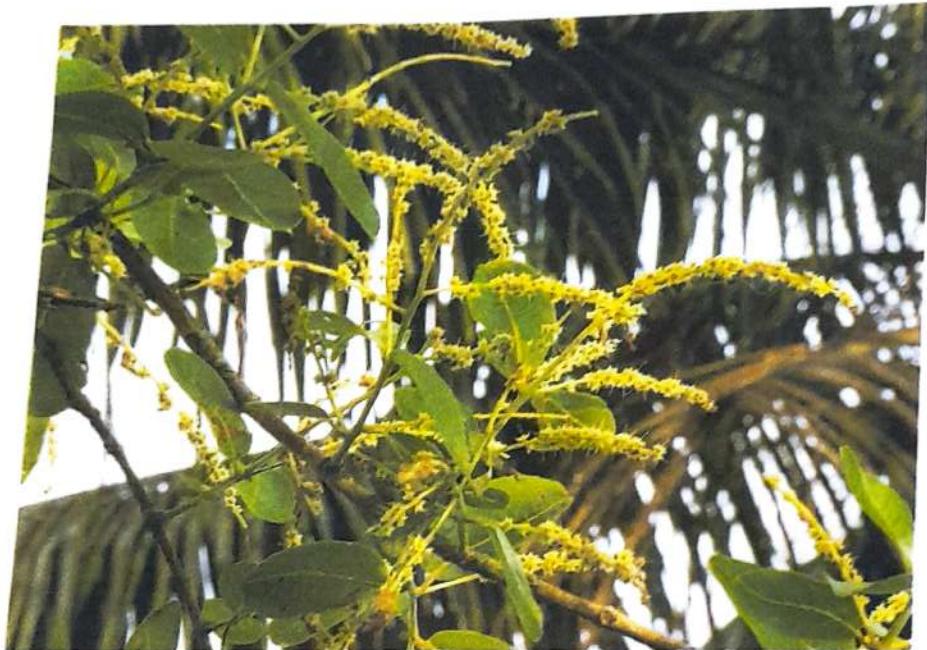
ଶର୍କିକ ନଂ	ଲମ୍ବାନ୍ତିମ ନାମ	ବିଜ୍ଞାନିକ ନାମ	ଗୋଟିଏ	ପ୍ରକାଶ				
13		<u>Passiflora</u> <u>foetida</u>	Passifloraceae					
14		<u>Aerva lanata</u>	Amarantaceae	ଆର୍ଵା-ଶି- ଆର୍ଵା ବି- ଲିଷ୍ଟ ଫୁଲ ଭାଜୀମ ହେଲ ଚାହୀସ				
15	ଲାକାଲିପାତା	<u>Mikania</u> <u>seundens</u>	Asteraceae	ଏକୁରି- ଶୀରି କି- ରୁଦ୍ରଭାଣ୍ଡ ଫିଲି				
16	ଏନ ଫଲାଟି	<u>Ipomoea</u> <u>aquatica</u>	Convolvulaceae	ଶିଖି ଭାଜୀମ ଓ- ଖଇ ଭାଜୀ ମୁଁ				
17	ଦୁର୍ବଳିନ୍ଦି	<u>Abutilon</u> <u>indicum</u>	Malvaceae	ଶିଖି ଭାଜୀମ ଆପାତ				

ଶ୍ରୀନାଥ ମହାଦେଵ ଜଗନ୍ନାଥ ମନ୍ଦିର

		ବିଦ୍ୟାଲୟରେ ପାଇଁ	ଫାଇଲ	ପ୍ରକାଶ
18.	ପାତାଳ ମାଦ	<u>Parthenium hysterophorus</u>	Asteraceae	ମାତା, ମାତ୍ର ଶୁଳ୍କ ଭାବିନ୍ଦ ଗାଈ।
19		<u>Lantana Camara</u>	Verbenaceae	ଗୁଣ୍ଡ ଭାବିନ୍ଦ କୋ ମଧ୍ୟ ଭାବିନ୍ଦ
20		<u>Thimelertia phombrioides</u>	Tiliaceae	ବାଂଗ ଭାବିନ୍ଦ ଗୁ ଲକ୍ଷ ଭାବିନ୍ଦ।
21	ଶାଖାଳ ମୂଳ	<u>Allophylus cobbe</u>	Sapindaceae	ଶୁଳ୍କ ଭାବିନ୍ଦ ଭାବିନ୍ଦ।
22	ଫୁଲ	<u>Ficus hispida</u>	Moraceae	ଶୁଳ୍କ ଭାବିନ୍ଦ ଭାବିନ୍ଦ।
23	<u>Sagittaria sagittifolia</u>	<u>Sagittaria sagittifolia</u>	Alismataceae	ଶୁଳ୍କ ଭାବିନ୍ଦ ଭାବିନ୍ଦ।
24	ଫୁଲଶୁଳ୍କ	<u>Eugenia reflexa</u>	Eupitheciaceae	
25	ଭାବିନ୍ଦ ବାବିଲୋନ ଭାବିନ୍ଦ	<u>Thespesia orientalis</u>	Ulmaceae	ଶୁଳ୍କ ଭାବିନ୍ଦ
26		<u>Vitis pedata</u>	Vitaceae	ଶୁଳ୍କ ଭାବିନ୍ଦ ଲାଙ୍ଘ ଭାବିନ୍ଦ।
27		<u>Cassia alata</u>	Papaveraceae	ଶୁଳ୍କ ଭାବିନ୍ଦ ଗୁଲାମ ଭାବିନ୍ଦ।
28	ଗଣା	<u>Annona reticulata</u>	Annonaceae	ଶୁଳ୍କ ଭାବିନ୍ଦ ଭାବିନ୍ଦ।
29		<u>Synchitella nodiflora</u>	Asteraceae	ଶୁଳ୍କ ଭାବିନ୍ଦ ଭାବିନ୍ଦ।
30	କାଳାଶଶୁଳ୍କ	<u>Ruellia tuberosa</u>	Acanthaceae	ଶୁଳ୍କ ଶିଶୁ ଭାବିନ୍ଦ।
31	କାଳାଶ ମୂଳ	<u>Butea monosperma</u>	Papilionaceae	ଶର୍କାରି ଶୁଳ୍କ ଭାବିନ୍ଦ ଗାଈ।
32	ଶର୍କାରି	<u>Ricinus communis</u>	Euphorbiaceae	ଶୁଳ୍କ ଭାବିନ୍ଦ ଗାଈ।
33		<u>Unona lobata</u>	Malvaceae	ଶୁଳ୍କ ଭାବିନ୍ଦ ଗାଈ।

ଅଧିକ ଲାଭ	ନାମ	ବିଜ୍ଞାନିକ ନାମ	ଫଳ	ପ୍ରକାଶ
34	ତୁମ୍ଭ ମୂଳ	<i>Achyranthes aspera</i>	Amaranthaceae	ବୁଦ୍ଧମର୍ତ୍ତିବିଶୁଳ୍ମ ଗୋଟିଏ ଫିଲ୍ଡିଆ।
35	ଅଲମୂଳ	<i>Elenodendron indicum</i>	Verbenaceae	ବିରିଦିତମାତ୍ର ଗୁଣ ହାତିଙ୍କ ଫିଲ୍ଡିଆ।
36		<i>Hyptis suaveolens</i>	Lamiaceae	ଗୁଣ ହାତିଙ୍କ ଫିଲ୍ଡିଆ।
37		<i>Desmodium gangeticum</i>	Papilionaceae	ଗୁଣ ହାତିଙ୍କ ଫିଲ୍ଡିଆ।
38		<i>Cyperosmis pentaphylla</i>	Rutaceae	ଚିକାରୁର ଗୁଣ ହାତିଙ୍କ ଫିଲ୍ଡିଆ।
39		<i>Sida cordifolia</i>	Malvaceae	ଖୋଲୁଙ୍ଗ ଗୁଣ ଗୁଣ ହାତିଙ୍କ ଫିଲ୍ଡିଆ।
40		<i>Caesalpinia bonduc</i>	Caesalpiniaceae	ଖୋଲୁଙ୍ଗ ଗୁଣ ହାତିଙ୍କ ଫିଲ୍ଡିଆ।
41		<i>Anisomeles indica</i>	Lamiaceae	ବୁଦ୍ଧମର୍ତ୍ତିବିଶୁଳ୍ମ ହାତିଙ୍କ ଫିଲ୍ଡିଆ।
42	ମେରନ	<i>Eulostropis gigantea</i>	Asclepiadaceae	ଗୁଣ ହାତିଙ୍କ ଫିଲ୍ଡିଆ।
43	ଏଲାନଦେହ	<i>Andrographis paniculata</i>	Acanthaceae	ବିକ୍ର୍ୟ ହାତିଙ୍କ ଫାଟୀ।
44	ଏଲାନଦୁଲା	<i>cussia sophera</i>	Caesalpiniaceae	ଗୁଣ ହାତିଙ୍କ ଫିଲ୍ଡିଆ।
45		<i>Cleome viscosa</i>	Capparaceae	ଗୁଣ ହାତିଙ୍କ ବୁଦ୍ଧମର୍ତ୍ତିବିଶୁଳ୍ମ ଫିଲ୍ଡିଆ।
46	ଏଲାନଦୁଲ	<i>Solanum verbaseifolium</i>	Solanaceae	ଦୋଢ଼ି ଗୁଣ ହାତିଙ୍କ ଫିଲ୍ଡିଆ।
47	ଜଗାନଦ୍ଵାରି ଫିଲ୍ଡିଆ	<i>Sommereria alba</i>	Comataceae	ଚିକାରୁର ଗୁଣ ହାତିଙ୍କ ଫିଲ୍ଡିଆ।
48		<i>Acanthus illicifolius</i>	Acanthaceae	ଚିକାରୁର ଗୁଣ ହାତିଙ୍କ ଫିଲ୍ଡିଆ।
49		<i>Smilax zeylanica</i>	Smilacaceae	ଗୁଣ ହାତିଙ୍କ ଫିଲ୍ଡିଆ।
50		<i>Sida acuta</i>	Malvaceae	ଗୁଣ ହାତିଙ୍କ

ବେଦାତ୍ମକ ଔଷଧଗୁଡ଼ିକ
(Identification of Medical Plants)



1. Terminalia arjuna (Roxb. ex De) Wight and Arn.

- ଅନୁକ୍ରମିକ ନାମ - ଅର୍ଜୁନ
- ଗୋପ - Combretaceae

ଫ୍ଲାଇଟର ସଂଖ୍ୟା :

- ଫ୍ଲାଇଟ : ଏତଙ୍କାଳୀ ଶୁଣ୍ଡ
- ଶାଖ : ଏକିତା ଆମ୍ବା ଶାଖାଳ, ଦୁଇର ବଳେକୁ ପାତା ଚିମ୍ବିଟ୍ୟୁଓ;
- ପାତା : ବିଷାକ୍ତ ତିର୍ଯ୍ୟକାଶ୍ଵାସ, ଗରନ୍ତ, ଛେନ୍ଦ୍ରାବାହୀ, ଧର୍ବାଣୀ, ଗାନ୍ଧୀ ଘରାନାମେ;
- ଫୁଲ : ଶ୍ଵାସିତ ପୁଷ୍ପ ବିଳାମ ଫର୍କ୍ରିଟ, ଫୁଲ, ପିତମିଳିକ୍, ଗାର୍ଜିଲା; ହଲ୍ଦାତ; ଶୁତ୍ରାକ୍ଷର ୫୦୦;
ଫୁଲକୁଡ଼ି; ଦାଳାକ୍ଷର ୫୦୦; ଫୁଲାଦଳ; ଫୁଲବେଳର ଫଟି, ଫୁଲ ପରିପର ଫର୍କ୍ରିଟ; ଗାର୍ଜିଲାକର ୫୦୦, ଡିଜ୍ଞା
କାମ ପାଇଁ, ଲୋହମାତାର, ଏକପ୍ରବେଶମ୍ଭୁତ୍ସର, ଗାର୍ଜିଲାକର ୫୦୦, ଲାଙ୍ଘା, ଗାର୍ଜିଲାକର ୫୦୦;
- ଫଳ : ପାତକାଳ ଫୁଲଳାଣି, ବୋନ୍ଦୁଳିଲ ଫଳ, ୨-୩ ମୀ ଲାଙ୍ଘା।
- ବୀଜ : ଅର୍ଜୁନ ମ୍ୟାକ୍, ଚେଟି;

ଫ୍ଲାଇଟର ଚେଷ୍ଟା ବିଳାମିଟ୍ :

- ଏକାକ୍ରମ ଫଳ -

1. ଏଲ୍ଲାଳ

ଫେରୁ ଫୁଲ / ଏଲ୍ଲାଳ

a) ଏଲ୍ଲାଳ ନିର୍ମାଣ :

- ଉଚ୍ଚପ୍ରମୋଦ ହୃଦୟର ପ୍ରତିଷେଷିତ;
- ଲିଙ୍ଗର-ଜିବୋଜିଜ ରୋଗ ପ୍ରତିଷେଷିତ;
- ମତ୍ୟକୁଡ଼ି ମୁଖ୍ୟକ;
- ଏଲ୍ଲାଳର ଭିତର ହିମାଯେ ଏକାକ୍ରମ;
- ମୋହିରକା ଲିବାରକ;
- ଶ୍ଵାସାପ ଲିବାରକ;
- ଉତ୍ସାହିତ ବୋତର ପ୍ରେଜନ ଏକକ;
- ଉତ୍ସାହିତ ବୋତର ପ୍ରେଜନ ଏକକ;

b) ଏଲ୍ଲାଳର ଫୁଲ :

- ଶାଖାବିତାର ଫୁଲ ବିଠିଲେ ତର ପ୍ରତିଷେଷିତ;
- ଟିକିଲେ ପାତାର ବୁନ୍ଦ ବାନେକୁ ମନ୍ଦଳାମ ଉପରାଗୀ।



2. *Centella asiatica* (L.) Urban

- ପାଦମୁଳିକ ନାମ - ଆଶ୍ରୁତି
- ଗୋଟି - Apiaceae (Umbelliferae)

ଚିହ୍ନଦେଶ ବର୍ଣ୍ଣା :

- ଫୁଲ : ଏକଶିରୀ, ବୀରୁଡ, ଅଶାତ;
- ଖଣ୍ଡ : ଜୀବାନିକ, ସଂଯେତ ଚକର୍କଟି
- ଶାଖା : ଉଚ୍ଚବାସୀୟ, ଏକଶିରୀ, କର୍ମ ବେଳଗାତାର ଲିଠି, କର୍ମତ;
- ପାତା : ଶାକୁଧାରୀଙ୍କ ଲାଭକାରୀ ମୁଣ୍ଡ, ଦିନ୍ଦ ପରାଶ୍ରୁତମୁଣ୍ଡ, ଲାଭକାରୀ-କର୍ମତ, ଶୁଦ୍ଧାକାର, ଏକଶିରୀ ଦାଁତାଳେ, ଏକଶିରୀର ଦ୍ୱାଳିକାବାର ଲିଙ୍ଗାବିନିକାମ।
- ଫୁଲ : ଶାକୁଧାର ଶୁଦ୍ଧାକାରୀର ମୁଣ୍ଡର, କର୍ମତ, ଉଚ୍ଚବାସୀୟ, ଏକଶିରୀ, କର୍ମତ, କର୍ମତ କର୍ମତ ଦାଁତାଳେ 5ଟି, ମୁଣ୍ଡର; କୁଣ୍ଠକର କଟି; ଗର୍ଜକର କଟି, ମୁଣ୍ଡର-ଶାର୍କରୀ, ଚିଞ୍ଚାକଟ ଦାଁତାଳେ, ଦିପବୋଷମୁଣ୍ଡ, ଗର୍ଜନ୍ତ କଟି, ନାରିଲୋପେନ୍ଦ୍ରିୟମୁଣ୍ଡ, ଗର୍ଜନ୍ତ କଟି।
- ଖଣ୍ଡ : ଶିଖରାପାଣୀ

ଚିହ୍ନଦେଶ ପ୍ରେସଟ୍ ବିଳିମିଳି :

ଏକଶୂତ ଡୋଳନ

1. ଶାକୁ ଓ ପାତା

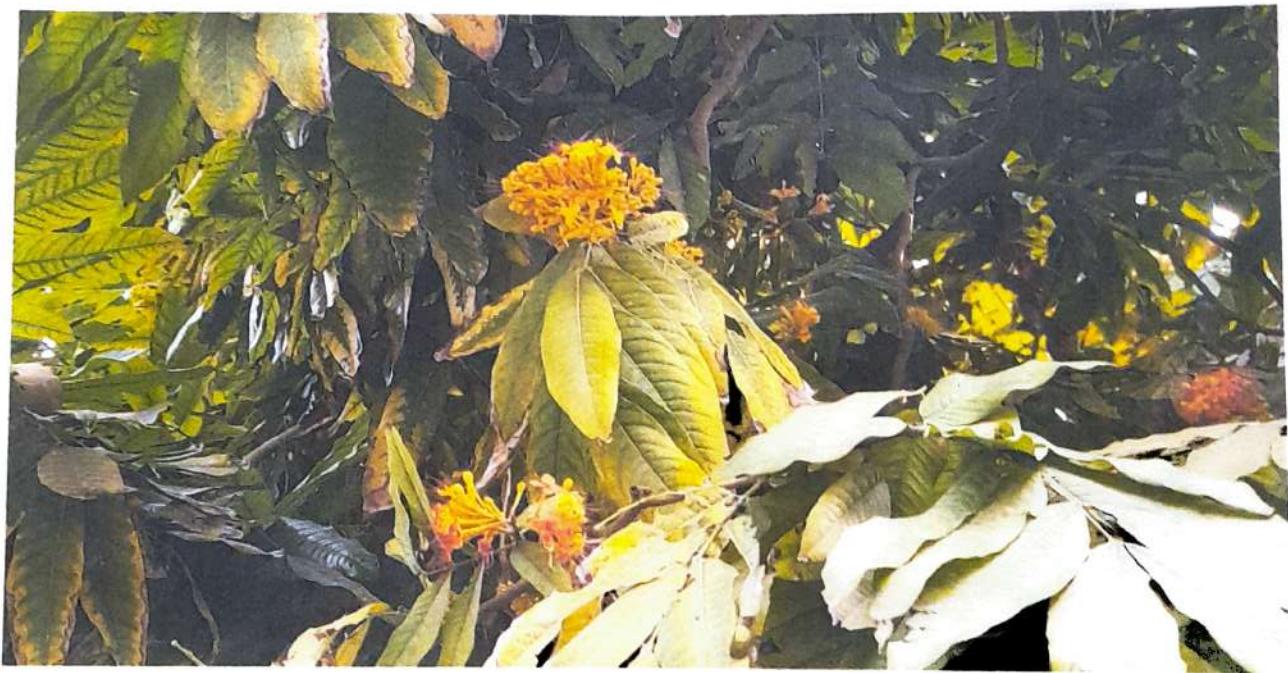
ପ୍ରେସଟ୍ ମୁଣ୍ଡ / ଏକଶୂତ

a) ଶାକୁ ଓ ପାତାର ତିର୍ଯ୍ୟକ -

- ଜୀବାନିକ ଓ ଲେଣିତମୁଣ୍ଡ ଉଚ୍ଚବାସୀୟ ଶାକୁ ପ୍ରାଚିଳିତିଷ୍ଠିତ କୁଣ୍ଠ କର୍ମତ;
- କୁଣ୍ଠ (Leptostylus) ବୋନ୍ଦ ଉଚ୍ଚବାସୀୟ ଏକଶୂତ ହୁଏ;
- କେନ୍ଦ୍ରୀଆ ବିଳିମିଳି ଏକଶୂତ, କେନ୍ଦ୍ରୀଆରିଆ, ଲୁପ୍ରାଯ (Luprav) ଉତ୍ତାନ୍ତ ବୋନ୍ଦ ଉଚ୍ଚବାସୀୟ ଏକଶୂତ;
- ଏଲବାରକ ଉଚ୍ଚବାସୀୟ ଏକଶୂତ;
- ଶ୍ଵାମୁର୍ତ୍ତିନିକ ବିଳାର ଏକଶୂତ; ଶାକୁ ଶ୍ଵାମୁର୍ତ୍ତିନିକ, ଶ୍ଵାମୁର୍ତ୍ତିନିକ ଶାକୁଧାରୀ ଉଚ୍ଚବାସୀୟ ଏକଶୂତ ହୁଏ;
- ଚିହ୍ନଦେଶ ଶ୍ଵାମୁର୍ତ୍ତିନିକ ଗୋଟୁକୋଳା (Gostu Kola) ଏକଶୂତ, ପ୍ରାଚିଳିତିଷ୍ଠିତ ଶ୍ଵାମୁର୍ତ୍ତିନିକ ବୋନ୍ଦ ଏକଶୂତ ହୁଏ;

2. ଖଣ୍ଡ

ମୁଲେର କଟି ଏଲବାରକ।



3. Saraca ascea (Roxb.) Willd.

- ঔপনিক নাম: তোকা
- গোত্র: Leguminosae, Sub-family Caesalpinoideae

চূড়ান্ত বর্ণনা:

- ফুলের: এবুকমগুলি উপর পুষ্টি;
- শাখা: শাখাগুল, শাখার বলুণ সৃষ্টি;
- পাতা: প্রৱাহু, ভর্তুক, তৃতৃক পাতা পাতা পোকা, প্রয়োগে 8.25cm লম্বা ফুলের পাতা, কিন্তু পাতা ছসুর, ভর্তুক;
- ফুল: সিস্ত পুষ্টি বিনামুদ্ধ নক্ষি ফুল, ভর্তুক ফুল লিপু, অসমিয়, সর্জিলা, পাতলা পুরু; পুরুজা-জন ৩টি; দালা-জন ৫টি; ফুলের ক্ষেত্র ৩-৪টি, ফুলের বর্ণ লেবিল পাতে, সর্জিক্ষেত্র - ১টি, জাঠোগু, রক্ত পুরুজা পুরু, পুরুজ জাঠোবিনাম।
- ফল: কিঞ্চু;
- শীতুর: ৪-৪টি লম্বা।

চূড়ান্ত সেতুগুল:

একাধিক গোত্র

১. শাখা:

চেমচেগুন / একশণার

শাখাগুলি কি-

- উচ্চতা বোতাম পুরুষ মিলাবে একাধিক রক্ত।
- প্রস্থাবের পরিমাণ বাধান,
- ভুরু জয়াস।

২. ফুল:

ফুলের পেশি +

- গোলো গোলো
- ক্রিন বোতিক

৩. শীতুর:

শীতুর পেশি প্রস্থাবক



4. *Justicia adhatoda* L. Sym.

Adhatoda vasica Nees

- ଶାଖାଲିଙ୍କ ଲାଗ - ଏକକ
- ପାତା - Acanthaceae

■ ଫ୍ରିଜ୍‌ଟରଣ :

- ଫ୍ରାଙ୍କିସ୍ଟାମ୍‌ପାଇନ୍ ବିଳେଷ ଗାନ୍ଧାରିଜ ଗୁମ୍ଫା;
- ଶାଖା : ଶାଖାଲିଙ୍କ, ନିକଟି, ସର୍ବଲାଲିତ, ଲକ୍ଷ୍ମୀତ;
- ପାତା : ଅଚିନ୍ତ୍ୟ ତିମିରାଙ୍ଗିନ, ତୁମିଶାହିକ, ଲକ୍ଷ୍ମୀତ, ଏକକ, ଡିଲ୍ଲାକାର, ବିଳାକ୍ଷା-ଫର୍ମିଟ, ଫୁଲିମ୍ବାଗ୍ରୀ;
- ମୂଳ : ପ୍ରାର୍ଥିତ ଫୁଲବିଳାଦେ ଲକ୍ଷ୍ମୀତ; ଏକାଠିତ ଲକ୍ଷ୍ମୀବିଳାଦ ମୁଦ୍ରା, ମଞ୍ଚିର ତାଙ୍କାଙ୍କି, ଚିତ୍ତଲିଙ୍କ, ଗାଈଲାଦ, ଲାଦା; ସୁତଜା-ଫର୍ମ 5 ଟି, ମୁଦ୍ରାକୁଡ଼ି; ଦାଳା-ଫର୍ମ 5 ଟି, ମୁଦ୍ରାଦଳ, ଉର୍ଧ୍ଵଚିତ୍ତକୁଡ଼ି; ମୁଦ୍ରାକୁଡ଼ିର ଏହି ଦଳମାତ୍ର; ଗାଈକୁଡ଼ିର 2 ମୁଦ୍ରାଗାର୍ ଲାଦି, ଡିଲ୍ଲାକାର ଲାଦି, ବିଳାକ୍ଷା-ଫର୍ମିଟମୁଦ୍ରା;

■ ଫ୍ରିଜ୍‌ଟର ଫେରିଗ୍ରାମ :

- ଏକାଠିତ ତାଙ୍କା -

1. ପାତା

2. ଶାଖା

3. ମୂଳ

4. ମୁଦ୍ରା

- ଫେରିଗ୍ରାମ / ଏକାଠାର୍

- ପାତାରୁ ଲିମର୍ସ ଡାକିଲିନ ଲାଗକ ଫେରାର ମହୁଆ ଘାଟାମ୍ବିହା-
- ପ୍ରାର୍ଥିତ କିମ୍ବା ପ୍ରାର୍ଥିତ ଫୁଲବିଳାଦ ଖରେ;
 - ଲାଦି ବାଲାକ ପ୍ରାର୍ଥିତ ତାଙ୍କାଙ୍କ ଉପରେ ଓ ମଧ୍ୟା ଦେଖାଯିବା ଖରାରୀ;
 - ହୋପାନ ବୋର୍ଦ ବିଳାଦେ ଏକାଠିତ ରୂପ;
 - କନ୍ଟରୋପ ବିଳାଦେ ଏକାଠିତ ରୂପ;
- ଶାଖାରୀତା ତାଙ୍କାର ବ୍ୟାପାର ବିଳାଦେ ଖରେ;
- ମୂଳରୀତା ଲିମର୍ସ ଫୁଲାଲେ ଖାନ୍ତି ଓ ମଧ୍ୟା କୋଟି ଲିମର୍ସମ୍ବନ୍ଧ ଖରେ ମୁଲରୀତା - ମଞ୍ଚାବୋର୍ଦ ବିଳାଦେ ଖରାରୀ;

5. Andrographis paniculata (Brum.f.) Nees

- ଭାଷ୍ଟୁଲିକ ନାମ — ଆଶମ
- ଗୋଡ଼ — Acanthaceae

■ ଫ୍ରିଜିଦର ସର୍ତ୍ତା :

- ଫ୍ରାଙ୍ଗିମ : ଏମଣିବି ବିକୁଳ
- ଖାଦ୍ୟ : ଚାରିବୋଳା, ଜ୍ଵାଳାପୁଣ୍ୟମା ମୁଣ୍ଡ;
- ପାଣା : ଗ୍ରୀ ମୃଦୁତ୍ୱ, ନିରାଳ, ଅଭିଭିନ୍ନ, ଉଲ୍ଲବ୍ଧକାର;
- ମୂଳର : ପାଇକୁଳରେ କେତୀମାତ୍ର, ଦ୍ଵିତୀ ମୋହି;
- ଖାଲ : ଲାହୁରେ ଏକାଗ୍ରାହୀଳ;
- ଶିଥୁର : ଏକୁନ୍ତ ଧରତ, ରୁଦ୍ଧାରେ ପାନୀ;

■ ଫ୍ରିଜିଦର ଚେଷ୍ଟୁ ଗୁପ୍ତ :

ଏକମୁଠ କଣଙ୍ଗ

1. ଗନ୍ଧୀ-ଫ୍ରିଜିଦ

ଚେଷ୍ଟୁ ଗୁପ୍ତ / ଏକମୁଠ

ଗନ୍ଧୀ-ଫ୍ରିଜିଦର ନିର୍ମାଣ—

- ପରୁତରୁଣିତେ ଓଦୁମ୍ରେତୁମ୍ରେ, ଜ୍ଵାଳରୋତ୍ର ୩ ବ୍ୟୁଜନ୍ମ ହୋଇ ଦ୍ଵାରା ନିର୍ମାଣ ହଣ୍ଡରେ;
 - କିମ୍ବୁଦେଇ ପାଇକୁଳର ବ୍ୟାପା ପରିକଳ୍ପନା ହଣ୍ଡରେ;
 - ବ୍ୟାପିକୁଳିତାକରନ୍ତିର ୩ ଦ୍ଵରା ନିର୍ମାଣ ହଣ୍ଡରେ;
- ଏକମୁଠ ଏବଂ ତେତେ ଭିନ୍ନକ ନାମ ସବୁଥିବା।

2. ପାଣ ଓ ନରତ ଗନ୍ଧୀ:

6. Aloe vera (L.) Burm. f. syn. Aloe barbadensis Mill.

- ପ୍ରାଚୀନ ନାମ: ମୁତ୍ତୁଶାଖୀ
- ପ୍ରକାଶ: Xanthorrhoeaceae

ଫୁଲର ସଂରକ୍ଷଣ:

- ପ୍ରତିଶ୍ରୁତି: ଏହି ସମ୍ପର୍କୀୟ, ବ୍ୟାଳୋ, ଗୁରୁତ୍ୱ
- ଦ୍ୱାରା: ଦେଖିବାରେ ପାଇଁ;
- ପାତା: ମଧ୍ୟଭାଗ, ପୁଅ, ଉପଭୂତି ବ୍ୟାଳୋ, ଜାର୍ଦ୍ଦା, ବିଳାରା ଦ୍ୱାରା;
- ମୂଳ: ମୁଣ୍ଡିତ, ହୃଦ୍ୟାଙ୍ଗ ଲାଙ୍କ, ଡିମ୍ବିଲିଯୁସ୍, ଗାର୍ଜିଆ, ମୁଦ୍ରିଷ୍ଟୁ-୬୩, ମୁଦ୍ରିତ ପରିପାତ ମୁଣ୍ଡିତ;
ଫ୍ରାଙ୍କୋନ୍ର-୬ ମୁଣ୍ଡିତ; ଗାର୍ଜିକାନ୍ତିଲ୍ଲି;

ଫୁଲର ଚେଷ୍ଟା ବିକିନ୍ସି:

ଏକଥିବା କାହାର

1. ପାତା

ଚେଷ୍ଟାଫୁଲ / ଏକଥିବା

ପାତାର ଗିର୍ଦ୍ଦର

- ବୋଲ୍ଫିକାରିଆ, ମୋଟ ପରିପାକ ବୁଦ୍ଧିତ ନାହିଁ କିମ୍ବା
ଦେବରକୁ ହୁଏ ।
- ଏତ ଓ ବାରଦାଳି ଉପିତ କୋଟ ନିରାମୟ ଏହି, ଜାର୍ଦ୍ଦା
ନେ ଶୁଦ୍ଧି କୋଟିକି; ଉପାଦେତ କୋଟ ଆକଳନକାରୀ;
- ପାତାର ଜିଞ୍ଜିଲ୍ଲେଟ୍-
- ମୁଣ୍ଡିତ ଓ ଲୀଶା ଉପିତ କୋଟ ନିରାମୟ ଏହି;
- ତାହା ଜିଞ୍ଜିଲ୍ଲେଟ୍ ଟାରେ କୋଟ କୋଟ ପାରିବେ ଦେଇ;
- ଡ୍ରିଙ୍କ, ନିରାମୟ ଏହି ଓ ଶୁଦ୍ଧିତାକା;
- ପାତାର ଗୁର୍ଜେ ଏକିଛିକ ଉପର୍କିନ୍ତି ମା ମଳ୍ଲା, କୁଳ୍ପ
ଶାନ୍ତି ଉତ୍ସାହ ଉପର୍କିନ୍ତି ଏହି;



7. *Hygrophila auriculata* (Sehumaeh.) Heine

- ପାଦ୍ମନିଳିଙ୍କ ନାମ - ଶୁଣୁଳାତା
- ଗୋଚର - Acanthaceae

ଡିପ୍ରିଟାର ସର୍ତ୍ତା:

- ଫୁଲାଶ : ଏହୁର ସଂଖ୍ୟାତ୍ମକ ମୂଳତ;
- ଗାନ୍ଧୁ : ଚାରବେଳା, କୋମାର୍କଟ୍‌ସ୍ଥୁତୀ, ପର୍ଯ୍ୟୁନିତ, ଲାଲ ରତ୍ନ;
- ପଦ୍ମ : ଉତ୍ତରଭାରତର ବିଭିନ୍ନ ଜାତିର ମୁହଁତ, ଗ୍ରାମୀକ ହରତକ, ପର୍ଯ୍ୟୁନିତ, ମହାଦେଶ-କ୍ଷେତ୍ରରେ, ବିଳାରୀ ମହୁନ, କିମ୍ବାରୀ, ପ୍ରମାଣେନ୍ଦ୍ରା;
- ମୂଳ : ବାଲିକା, ନିମିତ୍ତ ପୁଷ୍ଟିବିଳାମ୍ବନ ମୁହଁତ, ପର୍ଯ୍ୟୁନିତ, ଅନନ୍ଦାଶ୍ରମ, ପର୍ଯ୍ୟୁନିତ ଗର୍ବିଆ, ହାଲବଣ ଯୋଗୀ ରତ୍ନ; ବୁଢ଼ାଜୀର୍ଦ୍ଦୁ 5 ଟି, ମୁହଁତ୍ୟତି; ଦ୍ଵାରାଜ୍ଞ 5 ଟି, ମୁହଁତ୍ୟତି, ପର୍ଯ୍ୟୁନିତକାର୍ଯ୍ୟ, ହାଲବଣ ଯୋଗୀ ରତ୍ନରେ; କ୍ଷେତ୍ରକାରୀ 4-ଟି ଦ୍ଵାରାଜ୍ଞ, ପିଯାଦାନୀ; ଗର୍ବିଆ-୨୨୮, ମୁହଁତ୍ୟତିରେ, ଡିଜ୍ଞାମନ-ଲାଗାର୍, ନିମିତ୍ତବେଳିକ୍‌ସ୍ଥୁତୀ, ପର୍ଯ୍ୟୁନିତରେ ଡିଜ୍ଞବ୍ସ୍ଥୁତୀ, ଗାନ୍ଧୁତ ପର୍ଯ୍ୟୁନିତ, ଗାନ୍ଧୁତ-୧ଟି ଚାର୍ଟ୍‌ରେ।
- ମଳା : ଡିଜ୍ଞାମନ ପାନମୂଳ;
- ଶୀଘ୍ର : ଉଚ୍ଚଗୋଲାବାରୀ;

ଡିପ୍ରିଟାର ପ୍ରେମତର୍କୁଳ :

ପ୍ରେମତର୍କୁଳ ଠିକ୍‌ରୀତି

1. ମୃତ୍ତିବୀ

ପ୍ରେମତର୍କୁଳ / ଧରମହାରୀ

ମୃତ୍ତିବୀ ନିର୍ମାଣ :

- ପ୍ରେମତର୍କୁଳ ରୋଟି ପରମାନନ୍ଦବାବୀ;
- ଲାଲାଲାଜୁମିକ ହିମାଦି ପରମାନନ୍ଦ;
- ପରମାନନ୍ଦବାବୀ;
- ଲାଲାଲାଜୁମିକ ବାବୀ

ପାତା ନିର୍ମାଣ :

- ବ୍ୟାକ୍‌ତୁଳା ମୁହଁ ପଟର;
- ମୁହଁତକୁଳିତ ରୋଟି ପରମାନନ୍ଦ ପଟର;
- ପ୍ରେମତର୍କୁଳ ରୋଟି ପରମାନନ୍ଦବାବୀ;
- ମୃତ୍ତିବୀ ରୋଟି ପରମାନନ୍ଦବାବୀ;
- ମୃତ୍ତିବୀ ରୋଟି ପରମାନନ୍ଦବାବୀ;

ଶାନ୍ତିର ନିର୍ମାଣ :

- ଉତ୍ତରିଜ୍ଜିନ୍ ରୋଟି ପରମାନନ୍ଦବାବୀ;
- ବାଚବୋଲା ପରମାନନ୍ଦ ରୁମ୍;

ଶୀଘ୍ର ଶାନ୍ତି ପାଲାନ୍ତିର ରୋଟି ପରମାନନ୍ଦବାବୀ।

3. ଗାନ୍ଧୁ

4. ଶୀଘ୍ର



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8. *Rauvolfia serpentina* (L.) Benth. ex Kurz

- ପାଦ୍ମଲିଙ୍କ ନାମ — ରାଶିଗୁଡ଼ିଆ
- ଗୋଡ଼ — Apocynaceae

ଚିତ୍ରିତ ଏତନା:

- ଶ୍ରୀରାମ : ବୃକ୍ଷବିହାରୀ ପାଥିଲ ଗୁରୁତ୍ୱ;
- ଭାରତ : ପ୍ରାଚୀନ ଭାରତ, ଦେଖିଲାବାର;
- ପାତା : ବେଳାବାର, ଜାମୁଆ, ଆମା-ପ୍ରଜାମା ମୁଦ୍ରା, ଦୋଧା;
- ପାତା : ଉତ୍ତର ପାତାବିହାର, ମଧ୍ୟାମ୍ଭାର୍ଯ୍ୟ, ପିତିଲାଖ୍ୟ, ଗାଈପାନ, ପୁରୋହିତ-୫, ମୁଦ୍ରାକୁଣ୍ଡି; ଦେଖିଲାଖ୍ୟ ୫, ମୁଦ୍ରାମାଳ, ପ୍ରିନ୍ସିପିଟ ମୁଦ୍ରାକୁଣ୍ଡି ପାତାବିହାର, ଦୋଧା; ଏହାକେତୀ-୫୩, ଦୂରକାନ୍ତିର ନାମେ ମୁଦ୍ରା; ପାତାବିହାର-୨୩, ମୁଦ୍ରା-ଗର୍ଜାବୀ, ଜିଲ୍ଲାମାଳ ମୁଦ୍ରା ମୁଦ୍ରା; ଅର୍ଦ୍ଧାତ୍ମି ଏହାଟି ଡାକ୍ଘେଲାକୁଣ୍ଡି;
- ଭାରତ : ମୁଦ୍ରା, ଦୂରକାନ୍ତି ଭାରତ ମୁଦ୍ରା ତମିର ମୁଦ୍ରା;
- ଏତିରୁ : ଛୌଟି, ଗୋଲାବାର;

ଚିତ୍ରିତ ଜ୍ୟୋତିଶ୍ଵର :

ଏବୁତୁତ ଫୋଲ

1. ଭାରତ

ଜ୍ୟୋତିଶ୍ଵର / ଏବୁତୁତ

ଭାରତର ନିର୍ମାଣ ବ୍ୟସରମିନ (Reserpine) ଓ ଅନ୍ୟାନ୍ୟ ପ୍ରକାରୀ ଏହା
ପାତା, ତାହିଁ ଭାରତ ନିର୍ମାଣ ଲାଗା ବ୍ୟସ ପ୍ରକାରୀ-

- ବ୍ୟସର ବ୍ୟସର ପ୍ରିମିଟିକ୍ ଏବୁତୁତ ହୁଏ;
- ନିର୍ମାଣ ନିର୍ମାଣ ଏବୁତୁତ;
- ଜାମୁଆ ବ୍ୟସ ପ୍ରକାରୀ;
- ବିମାଞ୍ଚ ବୀକେତଖୁର ବ୍ୟସର ଏବୁତୁତ ଏବୁତୁତ ଏବୁତୁତ।

ପାତାର ରମ ଚୋମେର ପ୍ରାଣିର ପ୍ରିମିଟିକ୍ ଏବୁତୁତ ହୁଏ।

2. ଭାରତ



9. *Baeopa monnierii*(L.) Willst. Syn. *Herpestis monnieria*(L.) Rothm.

- ଅୟୁର୍ଦ୍ଧିକ ନାମ — ପ୍ରାଣ୍ତି
- ଗୋଚର — Plantaginaceae

ଡିକ୍ଟିନେଟ ସରଳା:

- ଶ୍ରାବ : ଏଷକ୍ତିଶୀ, ବିଶ୍ଵି, ପ୍ରାଣ୍ତି;
- ପ୍ଲାନ୍ : ଅୟୁର୍ଦ୍ଧିକ, ଏଥ ହିଂଦେ ଟିକଣ୍ଟ;
- ପାତା : ଗୋଲାକାର ଫ୍ଲୋର;
- ପାତା : ହୃଦୟକ, ହରଳ, ଚାନ୍ଦାକାର, ବିଳାକା-ଜମ୍ବା, ଫ୍ଲୁଟିଲ୍‌ପାତା;
- ଫୂଲ : ଏଷକ୍ତିକ ଫ୍ରାଙ୍କ; ଫ୍ଲୁଟି, କେମାଖ୍ଯାତ, ଗାଢ଼ିଆ; ପୁତ୍ରାଂଶ୍ଚ-5, ପୁତ୍ରାଂଶ୍ଚ-5, ପୁତ୍ରାଂଶ୍ଚ, ଆଶିକ ତମଜାଖ୍ୟାତ, ହିମ୍ବ ଗୋଲାକାର; ଫ୍ଲୁଟିକାନ୍ଦ୍ର-4, ଦଳଲାଖ୍, ଦିକ୍ଷାଦ୍ଵୀପି; ପୁତ୍ରକାନ୍ଦ୍ର-2, ପୁତ୍ରକାନ୍ଦ୍ର-ଦୀପି, ଡିମ୍ବାଙ୍ଗୁ-ଗାଢ଼ିଆ, ଫ୍ଲୁଟି ପ୍ରଯୋଗିତମ୍ବୁଦ୍ଧ;
- ଫୋଲ : ଏଷାମ୍ବାଲା।

ଡିକ୍ଟିନେଟ ଜ୍ୟୋତିଶ୍ଵର :

— ଏବତୁ ତଥାନ —

1. ହମ୍ମା ଡିକ୍ଟିନ୍

ଜ୍ୟୋତିଶ୍ଵର / ଏବତାର

ହମ୍ମା ଡିକ୍ଟିନେଟ ନିର୍ମାଣ / ପାତାର ନିର୍ମାଣ;

- ଶୁଦ୍ଧିକାରୀ ହେଲତା ଶୁଦ୍ଧିକାରିକାରୀ ହିମ୍ବାରେ ଏବତୁ,
- ଶୁଦ୍ଧି ଓ ଶାକିକ ରୋଟିପରାମରଣାରୀ,
- ଫ୍ଲୁଟିକାନ୍ଦ୍ର ସରିବଳା।

2. ପାତା :

ଶୁଦ୍ଧିକାରୀ ପ୍ରତିମତିକ,

- ଶାକରୋଟିପରାମରଣାରୀ,

■ ଶୁଦ୍ଧିକାରୀ ହୃଦୟକ,

- ଶାକରୋଟିପରାମରଣାରୀ।

B.Sc. Zoology General



UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

<u>Sl. No.</u>	<u>Subject</u>	<u>Sl. No.</u>	<u>Subject</u>
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2/AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1))	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2/AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2/AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

Ranul
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UNIVERSITY OF CALCUTTA

CBCS SYLLABUS FOR ZOOLOGY

**F
O
R**

**THREE-YEAR GENERAL
DEGREE COURSE OF STUDIES**



ZOOLOGY

2018

Genetics and Evolutionary Biology Lab ZOOG-CC4-4-P

Full marks 30	2 Credits
List of Practical:	
Verification of Mendelian Ratio using Chi square test. Identification of Human Aneuploidy using photo graph of karyotype. Phylogeny of horse with diagram of limb and skull. Study and identification of Darwin Finches from photographs. Visit to natural history museum and submission of report.	

BUDGE BUDGE COLLEGE

Academic Session: 2022-2023
Department of Zoology

1.3.2 Percentage of students undertaking project work/field work/ internships (Data for the latest completed academic year)

B.Sc. ZOOLOGY GENERAL
Semester-IV

Course Name: Genetics and Evolutionary Biology
COURSE Code: ZOO-G-CC/GE-4-4-P

Serial No.	Name of student	University Roll Number	Project Tittle	Supervisor
1	RUPSA GHOSH	213561-11-0014	"A Report On Visit To Indian Museum"	Dr.Papia Das, Dr.Barnali Bera
2	MAHEK SHAW	213561-11-0015	"A Report On Visit To Indian Museum"	Dr.Papia Das, Dr.Barnali Bera
3	PIYASA GHOSH	213561-11-0017	"A Report On Visit To Indian Museum"	Dr.Papia Das, Dr.Barnali Bera
4	SAHINA KHATUN	213561-11-0020	"A Report On Visit To Indian Museum"	Dr.Papia Das, Dr.Barnali Bera
5	RIMITA PRAMANICK	213561-11-0044	"A Report On Visit To Indian Museum"	Dr.Papia Das, Dr.Barnali Bera
6	PRIYA MONDAL	213561-11-0051	"A Report On Visit To Indian Museum"	Dr.Papia Das, Dr.Barnali Bera
7	TRISITA MONDAL	213561-11-0053	"A Report On Visit To Indian Museum"	Dr.Papia Das, Dr.Barnali Bera
8	TANOY ADHIKARY	213561-22-0001	"A Report On Visit To Indian Museum"	Dr.Papia Das, Dr.Barnali Bera
9	SHOVAN ADHIKARY	213561-22-0002	"A Report On Visit To Indian Museum"	Dr.Papia Das, Dr.Barnali Bera
10	ABHISHEK NASKAR	213561-22-0008	"A Report On Visit To Indian Museum"	Dr.Papia Das, Dr.Barnali Bera
11	ASHIK IKBAL MOLLA	213561-21-0009	"A Report On Visit To Indian Museum"	Dr.Papia Das, Dr.Barnali Bera
12	SAMPAD MONDAL	213561-22-0012	"A Report On Visit To Indian Museum"	Dr.Papia Das, Dr.Barnali Bera
13	RUPAM MONDAL	213561-22-0013	"A Report On Visit To Indian Museum"	Dr.Papia Das, Dr.Barnali Bera
14.	SRIMANTA SARDAR	213561-22-0015	"A Report On Visit To Indian Museum"	Dr.Papia Das, Dr.Barnali Bera



Budge Budge College

Estd. 1971

NAAC Accredited B+ & UGC 12B, 2(f)

Affiliated to the University of Calcutta

Ref. No.....

Date 10/05/2023

To
The Director
Indian Museum,
Kolkata, WB

Sub: Request for concession on entry fee.

Sir,

This is to inform you that a group of around 15 students, 2 teachers and 1 attendant of the Dept. of Zoology of this college will be visiting Indian Museum, Kolkata, on 12/05/2023 as per the curriculum of study of B. Sc. (Gen) Semester – IV of University of Calcutta for under graduate studies.

I shall be highly grateful if you could kindly extend your help and co-operation to make this endeavour a grand success by providing some concession on entry fees which are admissible in such cases.

With regards,

Yours faithfully,

Dr. Debjani Datta

Principal

DR. DEBJANI DATTA

M.Sc. (Gold Medalist), Ph.D

Principal

Budge Budge College

7, D.B.C. Road, Kol-700137

West Bengal, India

Department of Zoology

Field Trip 2022-2023

Visit to Indian Museum by students of Sem IV Zoology General course of Budge Budge College

Trip Duration/Time: 12th May 2023, 9AM-2PM

Objective of the visit:

1. In a museum, one can easily observe the preserved insects, different non chordates and chordate specimens of present-day world as well as specimens of some extinct animals which were once present on the earth.
2. One can find how different animal and plant specimens are preserved for display. Many animals are stuffed and exhibited here. This provides one with basic knowledge about taxidermy.
3. Helps to gain knowledge on evolutionarily important animals, prehistoric mammals etc.
4. Fossils records of different plants and animals help to give insight on different plants and animals of primitive world.

So the main objective of the present trip was to gain knowledge on evolutionarily important animals, from lower to higher groups, the process of their preservation and finally, to see some of the extinct animals that are not found on present earth.

Project Outcome:

The visit to Indian Museum has acquainted students about the great diversity of animals present on earth on recent days and the one's present on prehistoric world. They observed and gained knowledge about the extinct mammals which are the ancestors of present-day mammals. They also gained knowledge about the evolutionary relationship of different animals, their habitats. This trip to museum also helped students to understand in better way than our theoretical knowledge about how humans evolved on earth. They were very excited to see the Egyptian human mummy which was 4000 years old. They got an idea about the process of mummification. The present trip also helped students to get knowledge on how animal are stuffed and preserved in the museum for different scientific studies.

Department of Zoology

**Visit to Indian Museum by students of Sem IV Zoology General course
of Budge Budge College**



UNIVERSITY OF CALCUTTA

ROLL NO - 213561-22-0013

REG NO - 561 - 1112 - 1088-21

EXAMINATION-2023 , BSC. GENERAL

ZOOLOGY FIELD NOTE BOOK



A REPORT ON VISIT TO INDIAN MUSEUM



ଅନୁଷ୍ଠାନ =

ଅନୁଷ୍ଠାନ	ଅଳ୍ପ
• କ୍ରମିତା =	୧ ଟଙ୍କ
• ଶିଖିଲିଖ ଅନୁଷ୍ଠାନ ଫ୍ରାନ୍କର ଉଦ୍‌ଦେଶ୍ୟ =	୩ ଟଙ୍କ
• ଶିଖିଲିଖ ଅନୁଷ୍ଠାନ ନିର୍ଦ୍ଦେଶିତ =	୪ ଟଙ୍କ
• ଆମ୍ବାକାଳୀନ — (i) ଅନୁଷ୍ଠାନ ଆମ୍ବାକାଳୀନ ରୂପରେ (ii) ରେକର୍ଡାନ୍ତ ଆମ୍ବାକାଳୀନ ରୂପରେ (iii) ବିଭିନ୍ନ ସହ ରୂପରେ	୫ ଟଙ୍କ ୭ ଟଙ୍କ ୧୧ ଟଙ୍କ
• ପ୍ରତିଶ୍ରୁତିରେ	୧୮ ଟଙ୍କ

ପ୍ରଣିକ୍ଷା

ଅନୁଭବକାରୀ ଓ ଉତ୍ସମ୍ଭବ ପ୍ରାଣ ଅନୁଭବ ରହିଥାଏ ଏବଂ
ଅନ୍ତର୍ଭାବରେ ଯାହା ଉଲ୍ଲଙ୍ଘନ କରିବାକୁ କରି ରଖାଯାଇଛି ଯାହାର
ବ୍ୟାକୋର ବିଭାଗ ଓ ବିଭାଗରେ ଆମ ନିମ୍ନଲିଖିତ ଅନୁଭବକାରୀ ଅବେ ଲିଖାଯାଇଛି
ଯୁଦ୍ଧକାଳ ପରିକାରର ବା ଜାଗ୍ରତ୍ତା କାମେ ଅବିରତ ଏବଂ ହାତରେ ପାଇନା
ବିଭିନ୍ନ ଅନୁଭବକାରୀ ଚିତ୍ର, ଚାମର, ଆଶ୍ରମ, କ୍ଷେତ୍ରକାଳୀନ, ପାଇନା
ଜୀବିତ, କ୍ଷେତ୍ରର ଜୀବିତର ଅନ୍ତିମ ଅନ୍ତର୍ଭାବ ଅନ୍ତର୍ଭାବ ଅନ୍ତର୍ଭାବ
ବିଭାଗ ଅବେଳା ଓ ଅରଣ୍ୟ ବିଭାଗ ଅନ୍ତର୍ଭାବ ଅନ୍ତର୍ଭାବରେ
ଅନୁଭବ ଏବଂ ଯୁଦ୍ଧକାଳ ଅନ୍ତର୍ଭାବ-

ଆମର ଉତ୍ସମ୍ଭବ କହିଲୁଛି?

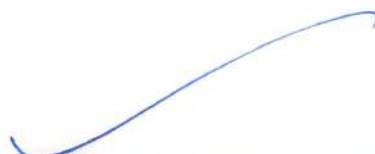
ଏହିମାତ୍ରର ଯୁଦ୍ଧକାଳୀନ କାମରେ ନିମ୍ନଲିଖିତରେ ଏହି ବି. ପ୍ରତା. ପା.
(B.Sc.) ବିଭାଗ ରେଣ୍ଡ ଅନୁଭବରେ ଅନୁଭବରେ ନିମ୍ନଲିଖିତ କାମର
କାମରେ ଅନ୍ତର୍ଭାବ ଲିଖାଯାଇଛା.



OUR GROUP PICTURE

କ୍ରିମିତି ବିଷୟ

- o ତାରିଖ = ୧୨.୦୫.୨୦୨୩ .
- o ଅଳ୍ପଶବ୍ଦ = ଦେଖ ୧୧ ଟଙ୍କା ସିଲାଇ, କୁଣ୍ଡଳ ୨ ଟଙ୍କା ୧୯ ଟଙ୍କା,
- o ପ୍ରୀତି = ଅଧିକାରୀ ଜ୍ଞାନପତ୍ର, କଲାକାରୀ, ଆନନ୍ଦପୂର୍ଣ୍ଣ ପତ୍ର କାହୁ,
ଏକହରାଳୀ ଏଥେବୁ ହାତ୍ର ଅପର୍ଚିତ ,
- o ଉପର୍ଯ୍ୟାନିକାଗାନ = ① ଏଃ ଆପିନ୍ଦା ଗ୍ରାମ ,
② ଏଃ ରାମଲୀ ଚମକା ,
- o ପରିଚାରକ = ଶ୍ରୀ କେମନ ଆର୍ଟ୍ ,



: ପ୍ରକାଶନେବୁ ଉତ୍ସମ୍ଭବ :

ଯେହିଏବୁ ଆଧୁନିକ ପଦ୍ଧତିରେ ଅନୁଯାୟୀ ଅନୁଯାୟୀ ଅନ୍ତର୍ଜାତି, ପରିବାର
ଜୀବିତ ବିଭିନ୍ନ କଣ୍ଠରେ ପ୍ରକାଶ ନାହିଁ କଣ୍ଠରେ ଦୂରୀ ପ୍ରକାଶ-
ଲୁପ୍ତ ବିଭିନ୍ନ ଦୂରୀ ଅନ୍ତର୍ଜାତି ଅନ୍ତର୍ବେଳେ କଥା- ଅନ୍ତର ହୁଏ,

ପ୍ରକାଶ ହାଜି ବିଭିନ୍ନ ଜୀବିତର କଣ୍ଠରେ ପ୍ରକାଶ ଅନ୍ତର୍ବେଳେ ଏହାର ଅନ୍ତର
କଥା- ହୁଏ,

ଆଜି ମୁଁ ପ୍ରକାଶ କଥା ଉତ୍ସମ୍ଭବ-ବ୍ୟାପ୍କ, ବିଭିନ୍ନ ଜୀବିତ
ଅନ୍ତର୍ବେଳେ ଦୂରୀ ବିଭିନ୍ନ କଣ୍ଠରେ ପ୍ରକାଶିତ ଅନ୍ତର୍ବେଳେ-
ଦୂରୀକୁଣ୍ଡର ଦୂରୀକୁଣ୍ଡ ଅନ୍ତର୍ବେଳେ ଏହାର ଅନ୍ତର କଥା-

: ଅଧ୍ୟାତ୍ମବେଦ ଶିତ୍ୟାଳ୍ସ :

୧୯୬୪ ଆବେ ପ୍ରକାଶିତ ହୋଲାନ୍ଡୀରେ ଏବଂ ଚାରିଜାଗରେ ଅଧିକତ ମୁଖ୍ୟମ୍ଭାବୀ
ପାଦପାଦକାଳ ପାଇଁ ଅଧ୍ୟାତ୍ମବେଦ ବାଣେ ଅଧିକତ କରି,
ମାତ୍ରମର ହେ ଉତ୍ସବ ରାତିରେ ୧୯୭୧ ଆବେ ନିରିତ, ମୁଖ୍ୟ -
ଆଧ୍ୟାତ୍ମବେଦ ପାଦପାଦକାଳ ଅଧିକତ ପ୍ରକାଶ ପାଇଁ, କୁଝ ପ୍ରକାଶ ପାଇଁ,
ପାଦପାଦକାଳ ମିଥିକ, ଅଧିକତ ମିଥିକ, ମାନମିଥିକ,
ଦାଶୀର ଅଧିକତ କି ଅଧିକତ ମିଥିକ, କୁଝ ମିଥିକ, ମିଥିକ ହୁଏ
ଅଧିକତ ମିଥିକ - ଆହ୍ୱାନ -

ଆଧ୍ୟାତ୍ମବେଦ ହୁଏ ଏହାର ବିଭିନ୍ନ —

- ଅଧିକତ ମିଥିକ ବିଭାଗ
- କାମ ବିଭାଗ
- ମୃତ୍ୟୁ ବିଭାଗ
- ଦୁ-ଦୁ ବିଭାଗ
- ଶ୍ରୀମତୀଅଜନ୍ମ ବିଭାଗ
- ଶିଥିନ୍ ବିଭାଗ.

• अमरुकांड़ी:

अमरुकांड़ी का विवरण - यह संकेतनीय और उच्च गुणवत्ता का संग्रह है। इसमें जल की अवधि अधिक होती है। इसके लिए यह अपेक्षित रूप से अधिक अवधि की आवश्यकता होती है।

• अमरुकांड़ी की जानीकारी:

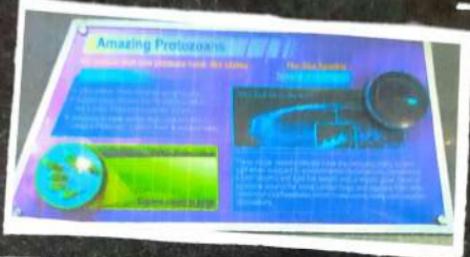
A. देशीजानीकारी

① Sea Sparkle	<u>Noctiluca scintillans</u>
---------------	------------------------------

B. विदेशीजानीकारी

① Giant Barrel Sponge.	<u>Xestospongia muta</u>
② Fresh water sponge	<u>Spongilla sp.</u>
③ Venus Flower Basket	<u>Euplectella aspergillum</u>

SEA SPARKLE



THE GIANT BARREL
SPONGE

③ terriblest

scariest - arst

i, Largest Cnidaria

fangs - scariest

Nemopilema nomurai

ii, Deadliest Smallest Cnidaria

Malo king

④ terriblest

scariest - arst

i, Fruit fly

fangs - scariest arst

Drosophila melanogaster

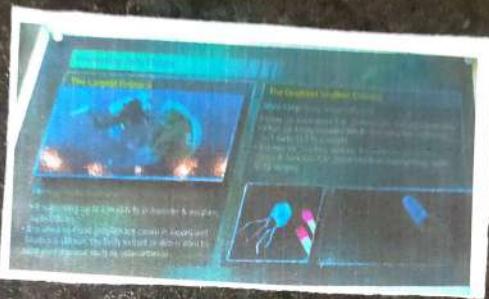
ii, Brazilian Treehopper

Bocydium globulare

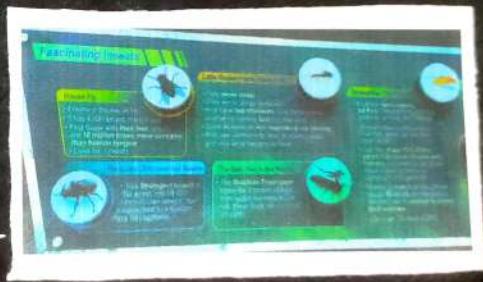
iii, Hercules Beetle

~~Dynastes hercules~~

The Largest cnidaria
Deadliest cnidaria



Hercules Beetle



: अस्त्रिहास ग्रन्थ :

— A. अस्त्रिहास —

1. फूट फूट वास्त

अस्त्रिहास	फौजिस्तानी हास्त
① Bhulung	<u>Labeo Pangasius</u>
② Tor Barb	<u>Tor Tor</u>

2. गंगा गंगा वास्त

बर्बाद हास्त	फौजिस्तानी हास्त
1. एंड शेल्स	<u>Anabas Testudineus</u>
2. लेप्ट	<u>Monopterus Cuchia</u>
3. मुर्गी	<u>Channa punctatus</u>
4. बोली	<u>Clarias Batrachus</u>
5. गोमती	<u>Channa striata</u>
6. फॉर्फर	<u>Heteropneustes Fossils</u>



Hamilton's Thoracica



Air Breathing fishes
↓



: mng forest :

-strait - nrf

- i) West African lungfish

=fagyrat strait - nrf

Protopterus annectens

: -Cifat forest :

-strait nrf = ce

- i. Long-tailed butterfly ray

=fagyrat strait nrf

Gymnura poecilura

- ii. Blue merline

Makaria nigricans

: -ap6 - forest :

-strait nrf

- i, Spotted scat

=fagyrat strait nrf

Scatophagus argus

- ii, Hamilton's thryssa

Thryssa hamiltoni



WEST AFRICAN LUNG
FISH



LONG
TAILED
BUTTERFLY
RAY

Spotted
Seat



B. ପ୍ରକାଶ ଜୀବିରେ

-ବ୍ୟାକାନ୍ତ ଜୀବ

i) Surinam toad

-ଫାଗସର୍ବାନ୍ତ ଜୀବ

ii) Gunther's high altitude toad

Pipa pipa

Coryphaenoides guentheri

C. ଅଧିକାନ୍ତ ଜୀବରେ

-ବ୍ୟାକାନ୍ତ ଜୀବ

-ଫାଗସର୍ବାନ୍ତ ଜୀବ

-ମାତ୍ର

i) Common Wolf snake

Lycodon ocellatus

ii) Banded Krait

Bungarus fasciatus

iii) Sea krait

Laticauda Colubrina

-କୋଣ୍ଠରେ

iv) Green Turtle

Chelonia mydas

Green turtle.



Surinam
toad.



Common
Dolph Snake

Banded
Krait
Snake

sea
krait



जानने का तरीका

उत्तरी भारत

Estuarine Crocodile

= जागरूकतावाला भारत

Crocodylus Porosus.

: D. बजामित एवं निष्ठा :

उत्तरी भारत

= जागरूकतावाला भारत

i) Barbary Sheep

Ammotragus Lervia

ii) Polar bear

Ursus maritimus.

iii) Common Seal

Phoca vitulina

iv) Bornean orangutan

Pongo Pygmaeus.



Estuarine Crocodile

BARBARY sheep



POLAR BEER





:=ମାନ୍ସ ପ୍ରାଚୀର୍ଦ୍ଧ:

ମାନ୍ସ ହେବାକୁ କାନ୍ତୁମନ୍ଦରେ ବିଭିନ୍ନ ଭୂତ ହାତ; ଉଗାଳିବିହାର ପ୍ରାଚୀର୍ଦ୍ଧ
ମାନ୍ସ କ୍ଷେତ୍ରରେ ଶୁଣିବିଲୁ ଭୂତ ବେ ବିଭିନ୍ନର ଭୂତ କୁଟେ, ପରିବର୍ତ୍ତନ ମିଟିର
ମାନ୍ସମନ୍ଦରେ ହେବାକୁ କାନ୍ତୁମନ୍ଦରେ ପାଇଁ ଏ ବିଭିନ୍ନର ଭୂତ କୁଟେ ଅନ୍ତର
ଭୂତ, ମଧ୍ୟ ମାନ୍ସ ଓ ବିଭିନ୍ନର ଭୂତ ଭୂତ ପାଇଁ ଏ ବିଭିନ୍ନର ଭୂତ ଭୂତ
ମାନ୍ସର ବିଭିନ୍ନର ଅନ୍ତର ବାବାତିକେ, ଚାହିଁ କିମ୍ବା ବିଜ୍ଞାନ ଭୂତ ଭୂତ.

- ① ଭୂତ ৪-৭ ବିଭିନ୍ନର ଭୂତ ଭୋଲ କ୍ଲୋଟିରାମିନିମାନ୍ଦା କିମ - Ororin
ମଧ୍ୟ ମିଥା ମାନ୍ସି କିମ;
 - ② ଭୂତ ৪ ବିଭିନ୍ନର ଭୂତ ଭୋଲ Australopithecus ରେ ଅନ୍ତର
ଅନ୍ତର;
 - ③ ଭୂତ 2-৩ ବିଭିନ୍ନର ଭୂତ ଭୋଲ Paranthropus ରେ ଅନ୍ତର
ଅନ୍ତର;
 - ④ କ୍ଲୋଟିରାମିନିମାନ୍ଦା ଭୂତ ১.৬ - ২.৫ ବିଭିନ୍ନର ଭୋଲ ମିଟିର Homo
ମାନ୍ସର କ୍ଷେତ୍ରର ଅନ୍ତର;
- କ୍ଲୋଟିରାମିନିମାନ୍ଦା ଭୋଲ
Homo Sapiens

ଶ୍ରୀମତୀ-ଫାଟୋ-ର ପ୍ରକଳ୍ପ :

- ① ବିଜ୍ଞାନ ପରମା, ଶୈଳ୍ୟ ଧର୍ମ, ଦେଶଭାଷା ଓ ଭାଷା-ପରମା, ଅନୁଷ୍ଠାନିକ ଚାହୁଁରେ,
- ② ଦେଶଭାଷା 'ଶ' ଆକୃତିକୁ ଉପରେ କାହାର କାହାର କାହାର,
- ③ ଶ୍ରୀମତୀ ଫାଟୋ ଆକୃତିକୁ ପାଇଁ ପିଲାର, ମଣ୍ଡପୀ-ପାଥେର ତଥାରେ
ଆକୃତିକୁ ପାଇଁ ଏବଂ ଏବଂ ଏବଂ ଏବଂ ଏବଂ ଏବଂ ଆମାଙ୍ଗେ କାହାର
ଶ୍ରୀମତୀ-ଫାଟୋର ପିଲାର କାହାର,
- ④ -ଶ୍ରୀମତୀ କବାରିକୁ ଆମ କିମ୍ବାକୁ-କାହାର ଅନୁଷ୍ଠାନ
- ⑤ ମିଶନ ଓର୍ଜ୍ଯୁ-ପ୍ରାତିଶ୍ରୀମତୀ
- ⑥ ଦେଶଭାଷା କାହାର
- ⑦ -ଶ୍ରୀ-ମାତ୍ରାକୁ ଆମାଙ୍ଗେ କାହାର-

:= କୌଣସିବାରେ =

ଏହିଲିଖ ଜ୍ଞାନପତ୍ର ଆମଙ୍କର କୃତ୍ତବ୍ୟାତିରେ
ବିଶ୍ୱାସ ଓ ବିଦ୍ୟା ଅଧ୍ୟକ୍ଷମିତ୍ର କ୍ଷମାତରିତ କରିବାରେ ପ୍ରସ୍ତୁତ ଗାନ୍ଧି
ଅବସ୍ଥାକୁ ଉଚ୍ଛଵାରିତ କରିବାରେ ଆମ୍ବାର କାହାରେ ପ୍ରସ୍ତୁତ
ମିଳାଇଯାଇଲାକି ପ୍ରକାଶିତ କରିଲୁଛି- କ୍ଷମାତରିତ କରିବାରେ ପ୍ରସ୍ତୁତ
କରିଲାଇଯାଇଲା- ପ୍ରକାଶିତ, ମରିବିଲାଇ ଅବସ୍ଥାକୁ ମିଳାଇଯାଇଲା-
ପ୍ରକାଶିତ କରିଲାଇଯାଇଲା ଅବସ୍ଥାକୁ ମରିବାରେ ପ୍ରକାଶିତ କରିଲା-



Bar
23/7/2023

**B.A. / B.Sc. / B.Com AECC: Environmental
Studies**



UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

<u>Sl. No.</u>	<u>Subject</u>	<u>Sl. No.</u>	<u>Subject</u>
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCCI/ LCC2/AECC1))	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management – ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

santana paul
4/6/18
(Dr. Santana Paul)
Deputy Registrar

University of Calcutta

Under Graduate Curriculum under Choice Based Credit System (CBCS)

Syllabus for Ability Enhancement Compulsory Course-2 (AECC-2) in
Environmental Studies

Semester-2

Total Marks-100(Credit -2)

(50 Theory-MCQ type + 30 Project + 10 Internal Assessment + 10 Attendance)

[Marks obtained in this course will be taken to calculate SGPA & CGPA]

Theory

Unit 1	Introduction to environmental studies	2 lectures
	<ul style="list-style-type: none">• Multidisciplinary nature of environmental studies;• Scope and importance; Concept of sustainability and sustainable development.	
Unit 2	Ecology and Ecosystems	6 lectures
	<ul style="list-style-type: none">• Concept of ecology and ecosystem, Structure and function of ecosystem; Energy flow in an ecosystem; food chains, food webs; Basic concept of population and community ecology; ecological succession.• Characteristic features of the following:<ul style="list-style-type: none">a) Forest ecosystemb) Grassland ecosystemc) Desert ecosystemd) Aquatic ecosystems (ponds, streams, lakes, wetlands, rivers, oceans, estuaries)	
Unit 3	Natural Resources	8 lectures
	<ul style="list-style-type: none">• Concept of Renewable and Non-renewable resources• Land resources and landuse change; Land degradation, soil erosion and desertification.• Deforestation: Causes, consequences and remedial measures• Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state).• Energy resources: Environmental impacts of energy generation, use of alternative and nonconventional energy sources, growing energy needs.	
Unit 4	Biodiversity and Conservation	8 lectures
	<ul style="list-style-type: none">• Levels of biological diversity: genetic, species and ecosystem diversity;• Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots• India as a mega-biodiversity nation; Endangered and endemic species of India• Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions;• Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.• Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.	
Unit 5	Environmental Pollution	8 lectures
	<ul style="list-style-type: none">• Environmental pollution: concepts and types,• Air, water, soil, noise and marine pollution- causes, effects and controls• Concept of hazards waste and human health risks• Solid waste management: Control measures of Municipal, biomedical and e-waste.	

Unit 6 Environmental Policies and Practices	7 lectures
<ul style="list-style-type: none"> • Climate change, global warming, ozone layer depletion, acid rain and their impacts on human communities and agriculture • Environment Laws: Wildlife Protection Act; Forest Conservation Act. Water (Prevention and control of Pollution) Act; Air (Prevention & Control of Pollution) Act; Environment Protection Act; Biodiversity Act. • International agreements: Montreal Protocol, Kyoto protocol and climate negotiations; Convention on Biological Diversity (CBD). • Protected area network, tribal populations and rights, and human wildlife conflicts in Indian context. 	
Unit 7 Human Communities and the Environment	6 lectures
<ul style="list-style-type: none"> • Human population growth: Impacts on environment, human health and welfare. • Case studies on Resettlement and rehabilitation. • Environmental Disaster: Natural Disasters-floods, earthquake, cyclones, tsunami and landslides; Manmade Disaster- Bhopal and Chernobyl. • Environmental movements: Bishnois, Chipko, Silent valley, Big dam movements. • Environmental ethics: Role of gender and cultures in environmental conservation. • Environmental education and public awareness 	
Project/ Field work	Equal to 5 lectures
<ul style="list-style-type: none"> • Visit to an area to document environmental assets: Natural resources/flora/fauna, etc. • Visit to a local polluted site-Urban/Rural/Industrial/Agricultural. • Study of common plants, insects, fish, birds, mammals and basic principles of identification. • Study of ecosystems-pond, river, wetland, forest, estuary and agro ecosystem. 	
Total	50 Lectures

Suggested Reading:

- Asthana, D. K. (2006). *Text Book of Environmental Studies*. S. Chand Publishing.
- Basu, M., Xavier, S. (2016). Fundamentals of Environmental Studies, Cambridge University Press, India
- Basu, R. N., (Ed.) (2000). *Environment*. University of Calcutta, Kolkata
- Bharucha, E. (2013). *Textbook of Environmental Studies for Undergraduate Courses*. Universities Press.
- De, A.K., (2006). *Environmental Chemistry*, 6th Edition, New Age International, New Delhi.
- Mahapatra, R., Jeevan, S.S., Das, S. (Eds) (2017). *Environment Reader for Universities*, Centre for Science and Environment, New Delhi.
- Masters, G. M., & Ela, W. P. (1991). *Introduction to environmental engineering and science*. Englewood Cliffs, NJ: Prentice Hall.
- Odum, E. P., Odum, H. T., & Andrews, J. (1971). *Fundamentals of ecology*. Philadelphia: Saunders.
- Sharma, P. D., & Sharma, P. D. (2005). *Ecology and environment*. Rastogi Publications.

BUDGE BUDGE COLLEGE
Academic Session: 2022-2023

List of students undertaking field / project work follows:

B.A. / B.Sc. / B.Com. Honours and General Semester-II, 2023
Environmental Studies (ENVS) - AECC - 2 Project, CBCS system
Topic: Pond Ecosystem
Supervisor: Dr. Uttariya Roy

Serial Number	Roll Number	Registration Number	Name	Stream
1	221561-11-0022	561-1211-0426-22	Almida Khatun	B.Com (Honours)
2	221561-11-0015	561-1211-0400-22	Atashi Bag	B.Com (Honours)
3	221561-11-0013	561-1211-0395-22	Brishti Mondal	B.Com (Honours)
4	221561-11-0011	561-1211-0384-22	Diya Das	B.Com (Honours)
5	221561-11-0007	561-1211-0370-22	Isika Das	B.Com (Honours)
6	221561-11-0036	561-1215-0379-22	Jasminea Khatun	B.Com (Honours)
7	221561-11-0004	561-1211-0355-22	Jyoti Shaw	B.Com (Honours)
8	221561-11-0009	561-1211-0381-22	Madhumita Das	B.Com (Honours)
9	221561-11-0035	561-1215-0371-22	Nayna Khatun	B.Com (Honours)
10	221561-11-0028	561-1212-0385-22	Payel Das	B.Com (Honours)
11	221561-11-0037	561-1241-0433-22	Piyali Ghanta	B.Com (Honours)
12	221561-11-0002	561-1211-0348-22	Puja Mondal	B.Com (Honours)
13	221561-11-0030	561-1212-0404-22	Rajashree Hazra	B.Com (Honours)
14	221561-11-0006	561-1211-0367-22	Reshma Khatun	B.Com (Honours)
15	221561-11-0027	561-1211-0438-22	Ria Bej	B.Com (Honours)
16	221561-11-0024	561-1211-0435-22	Ritashree Naskar	B.Com (Honours)
17	221561-11-0034	561-1215-0365-22	Salina Khatun	B.Com (Honours)
18	221561-11-0010	561-1211-0383-22	Salini Kumari Jaiswal	B.Com (Honours)
19	221561-11-0003	561-1211-0350-22	Sangita Nath	B.Com (Honours)
20	221561-11-0021	561-1211-0423-22	Sangita Paul	B.Com (Honours)
21	221561-11-0023	561-1211-0429-22	Sathi Mukherjee	B.Com (Honours)
22	221561-11-0005	561-1211-0364-22	Shreya Nath	B.Com (Honours)
23	221561-11-0001	561-1211-0334-22	Shrimanti Bose	B.Com (Honours)
24	221561-11-0017	561-1211-0411-22	Snigdha Ghosh	B.Com (Honours)
25	221561-11-0008	561-1211-0377-22	Snigdha Payra	B.Com (Honours)
26	221561-11-0014	561-1211-0399-22	Sohana Parvin	B.Com (Honours)
27	221561-11-0016	561-1211-0408-22	Soumili Das	B.Com (Honours)
28	221561-11-0025	561-1211-0436-22	Sreema Dutta	B.Com (Honours)
29	221561-11-0019	561-1211-0416-22	Sreha Mondal	B.Com (Honours)
30	221561-11-0033	561-1215-0337-22	Subana Khatun	B.Com (Honours)
31	221561-11-0029	561-1212-0401-22	Sumona Mondal	B.Com (Honours)
32	221561-11-0026	561-1211-0437-22	Susmita Baitha	B.Com (Honours)
33	221561-11-0020	561-1211-0421-22	Susmita Mukherjee	B.Com (Honours)
34	221561-11-0031	561-1212-0410-22	Swarnali Mondal	B.Com (Honours)
35	221561-11-0032	561-1212-0420-22	Swyankita Mondal	B.Com (Honours)
36	221561-21-0032	561-1111-0402-22	Amal Nath	B.Com (Honours)
37	221561-21-0006	561-1111-0346-22	Amit Kumar Dutta	B.Com (Honours)
38	221561-21-0047	561-1111-0430-22	Anish Porey	B.Com (Honours)
39	221561-21-0062	561-1112-0393-22	Ankan Naskar	B.Com (Honours)
40	221561-21-0015	561-1111-0361-22	Ankan Shee	B.Com (Honours)
41	221561-21-0044	561-1111-0425-22	Ankit Bag	B.Com (Honours)

Serial Number	Roll Number	Registration Number	Name	Stream
42	221561-21-0002	561-1111-0339-22	Ansh Chetri	B.Com (Honours)
43	221561-21-0021	561-1111-0375-22	Arghadeep Saha	B.Com (Honours)
44	221561-21-0012	561-1111-0358-22	Arijit Adhikary	B.Com (Honours)
45	221561-21-0034	561-1111-0405-22	Ariyan Rahaman Mufti	B.Com (Honours)
46	221561-21-0036	561-1111-0409-22	Arpan Adhikary	B.Com (Honours)
47	221561-21-0064	561-1114-0335-22	Ayan Ghosh	B.Com (Honours)
48	221561-21-0053	561-1112-0340-22	Banshidhar Sarder	B.Com (Honours)
49	221561-21-0019	561-1111-0373-22	Bibek Shaw	B.Com (Honours)
50	221561-21-0040	561-1111-0417-22	Debrup Nayak	B.Com (Honours)
51	221561-21-0057	561-1112-0357-22	Dhrubajyoti Mondal	B.Com (Honours)
52	221561-21-0043	561-1111-0422-22	Heet Chakraborty	B.Com (Honours)
53	221561-21-0056	561-1112-0356-22	Indrajit Naskar	B.Com (Honours)
54	221561-21-0067	561-1114-0407-22	Koushik Ghosh	B.Com (Honours)
55	221561-21-0005	561-1111-0345-22	Kushal Khan	B.Com (Honours)
56	221561-21-0038	561-1111-0413-22	Md Maruyar Hossain	B.Com (Honours)
57	221561-21-0059	561-1112-0369-22	Nilotpal Chowdhury	B.Com (Honours)
58	221561-21-0061	561-1112-0389-22	Partha Kumar Mondal	B.Com (Honours)
59	221561-21-0004	561-1111-0342-22	Pitam Maity	B.Com (Honours)
60	221561-21-0055	561-1112-0344-22	Prasad Mondal	B.Com (Honours)
61	221561-21-0027	561-1111-0390-22	Pratim Bhowmick	B.Com (Honours)
62	221561-21-0037	561-1111-0412-22	Pritam Kumar Mistry	B.Com (Honours)
63	221561-21-0045	561-1111-0427-22	Prithiviraj Mitra	B.Com (Honours)
64	221561-21-0010	561-1111-0352-22	Rahul Chowhan	B.Com (Honours)
65	221561-21-0049	561-1111-0434-22	Rajdip Shil	B.Com (Honours)
66	221561-21-0031	561-1111-0398-22	Rajib Rao	B.Com (Honours)
67	221561-21-0014	561-1111-0360-22	Ranit Ghosh	B.Com (Honours)
68	221561-21-0016	561-1111-0363-22	Ranjit Jana	B.Com (Honours)
69	221561-21-0054	561-1112-0343-22	Rohit Mondal	B.Com (Honours)
70	221561-21-0026	561-1111-0388-22	Ronit Bera	B.Com (Honours)
71	221561-21-0046	561-1111-0428-22	Saabarna Das	B.Com (Honours)
72	221561-21-0011	561-1111-0353-22	Saptaswa Khamaru	B.Com (Honours)
73	221561-21-0009	561-1111-0351-22	Sayondeep Mukherjee	B.Com (Honours)
74	221561-21-0018	561-1111-0368-22	Shatadru Das	B.Com (Honours)
75	221561-21-0030	561-1111-0397-22	Shivam Shaw	B.Com (Honours)
76	221561-21-0069	561-1115-0372-22	Sk Imtajul	B.Com (Honours)
77	221561-21-0041	561-1111-0418-22	Sk Irfan	B.Com (Honours)
78	221561-21-0042	561-1111-0419-22	Sk Kaif	B.Com (Honours)
79	221561-21-0070	561-1115-0382-22	Sk Toufique	B.Com (Honours)
80	221561-21-0022	561-1111-0376-22	Soham Das	B.Com (Honours)
81	221561-21-0028	561-1111-0391-22	Sohel Aktar Mondal	B.Com (Honours)
82	221561-21-0007	561-1111-0347-22	Sohom Samanta	B.Com (Honours)
83	221561-21-0050	561-1111-0439-22	Sombit Dawan	B.Com (Honours)
84	221561-21-0023	561-1111-0378-22	Souptick Chaudhuri	B.Com (Honours)
85	221561-21-0020	561-1111-0374-22	Sourav Baidya	B.Com (Honours)
86	221561-21-0052	561-1112-0336-22	Souvik Ghanti	B.Com (Honours)
87	221561-21-0029	561-1111-0396-22	Souvik Samanta	B.Com (Honours)
88	221561-21-0017	561-1111-0366-22	Subojit Khanra	B.Com (Honours)
89	221561-21-0065	561-1114-0354-22	Sudip Santra	B.Com (Honours)
90	221561-21-0013	561-1111-0359-22	Suman Das	B.Com (Honours)
91	221561-21-0063	561-1112-0431-22	Sumit Kumar Baidya	B.Com (Honours)
92	221561-21-0060	561-1112-0380-22	Surajit Pramanik	B.Com (Honours)
93	221561-21-0058	561-1112-0362-22	Swarup Halder	B.Com (Honours)

Serial Number	Roll Number	Registration Number	Name	Stream
94	221561-21-0051	561-1111-1154-22	Swastik Chakraborty	B.Com (Honours)
95	221561-21-0039	561-1111-0414-22	Tanmoy Majee	B.Com (Honours)
96	221561-21-0035	561-1111-0406-22	Tonmoy Das	B.Com (Honours)
97	221561-21-0033	561-1111-0403-22	Tuhin Hazra	B.Com (Honours)
98	221561-21-0003	561-1111-0341-22	Tushar Bose	B.Com (Honours)
99	221561-21-0066	561-1114-0392-22	Tushar Das	B.Com (Honours)
100	221561-22-0025	561-1112-1141-22	Abir Baidya	B.Com (General)
101	221561-22-0014	561-1111-1147-22	Apurbo Das	B.Com (General)
102	221561-22-0015	561-1111-1148-22	Arghyadeep Datta	B.Com (General)
103	221561-22-0001	561-1111-1124-22	Asmit Ghosh	B.Com (General)
104	221561-22-0020	561-1111-1153-22	Bisal Maji	B.Com (General)
105	221561-22-0008	561-1111-1138-22	Bishal Das	B.Com (General)
106	221561-22-0004	561-1111-1131-22	Deepayan Das	B.Com (General)
107	221561-22-0013	561-1111-1145-22	Gorachand Paul	B.Com (General)
108	221561-22-0029	561-1115-1146-22	Mohiuddin	B.Com (General)
109	221561-22-0022	561-1112-1127-22	Monoj Mondal	B.Com (General)
110	221561-22-0006	561-1111-1135-22	Pritam Das	B.Com (General)
111	221561-22-0018	561-1111-1151-22	Rajarshi Ray	B.Com (General)
112	221561-22-0028	561-1115-1136-22	Rohan Mollah	B.Com (General)
113	221561-22-0010	561-1111-1140-22	Rohit Jha	B.Com (General)
114	221561-22-0026	561-1112-1142-22	Shouvik Biswas	B.Com (General)
115	221561-22-0003	561-1111-1129-22	Subhadeep Adhikary	B.Com (General)
116	221561-22-0023	561-1112-1128-22	Sudipta Sardar	B.Com (General)
117	221561-22-0017	561-1111-1150-22	Suman Nath	B.Com (General)
118	221561-22-0005	561-1111-1134-22	Suman Mondal	B.Com (General)
119	221561-22-0024	561-1112-1133-22	Supriyo Roy	B.Com (General)
120	221561-22-0011	561-1111-1143-22	Sushovan Baidya	B.Com (General)
121	221561-22-0016	561-1111-1149-22	Suvashish Mondal	B.Com (General)
122	221561-22-0019	561-1111-1152-22	Tanay Porel	B.Com (General)
123	221561-22-0002	561-1111-1126-22	Tanoy Manna	B.Com (General)
124	211561-12-0002	561-1211-1134-21	Neha Khanra	B.Com (General)
125	221561-12-0002	561-1212-1123-22	Manisha Naskar	B.Com (General)
126	222561-11-0059	561-1211-0103-22	Afia Zahin	ENGA
127	222561-11-0043	561-1211-0076-22	Afroza Khatun	EDCA
128	222561-11-0102	561-1211-0210-22	Afsana Khatun	PLSA
129	222561-11-0184	561-1215-0048-22	Afsari Khatun	BNGA
130	222561-11-0067	561-1211-0125-22	Aleya Khatun	GEOA
131	222561-11-0195	561-1215-0218-22	Aleya Khatun	PLSA
132	222561-11-0033	561-1211-0061-22	Amina Khatun	EDCA
133	222561-11-0093	561-1211-0194-22	Ananya Samanta	PHIA
134	222561-11-0045	561-1211-0080-22	Ananya Gharui	EDCA
135	222561-11-0031	561-1211-0057-22	Anindita Dutta	EDCA
136	222561-11-0191	561-1215-0160-22	Anisa Khatun	HISA
137	222561-11-0189	561-1215-0131-22	Anisa Khatun	GEOA
138	222561-11-0113	561-1211-0229-22	Anisa Khatun	PLSA
139	222561-11-0068	561-1211-0129-22	Anisha Parvin	GEOA
140	222561-11-0099	561-1211-0202-22	Anjali Bera	PLSA
141	222561-11-0052	561-1211-0091-22	Anjana Kandi	EDCA
142	222561-11-0026	561-1211-0047-22	Ankita Chakraborty	BNGA
143	222561-11-0012	561-1211-0025-22	Anusree Das	BNGA
144	222561-11-0150	561-1212-0085-22	Arpita Bedanta	EDCA
145	222561-11-0106	561-1211-0215-22	Arpita Chakraborty	PLSA
146	222561-11-0049	561-1211-0087-22	Arpita Maji	EDCA

Serial Number	Roll Number	Registration Number	Name	Stream
147	222561-11-0020	561-1211-0039-22	Arpita Mondal	BNGA
148	222561-11-0163	561-1212-0203-22	Asha Mondal	PLSA
149	222561-11-0112	561-1211-0228-22	Aspia Khatun	PLSA
150	222561-11-0100	561-1211-0206-22	Ayesa Khatun	PLSA
151	222561-11-0082	561-1211-0166-22	Baishakhi Manna	HISA
152	222561-11-0171	561-1214-0036-22	Barsha Das	BNGA
153	222561-11-0003	561-1211-0006-22	Bidisha Adhikary	EDCA
154	222561-11-0123	561-1211-0246-22	Bilkis Khatun	PLSA
155	222561-11-0111	561-1211-0227-22	Bipasa Khatun	PLSA
156	222561-11-0149	561-1212-0083-22	Bristhi Sardar	EDCA
157	222561-11-0069	561-1211-0130-22	Debashmita Das	GEOA
158	222561-11-0167	561-1212-0225-22	Dipa Mondal	PLSA
159	222561-11-0090	561-1211-0188-22	Dipannita Adak	HISA
160	222561-11-0170	561-1214-0024-22	Disha Paul	BNGA
161	222561-11-0094	561-1211-0195-22	Disha Saha	PHIA
162	222561-11-0122	561-1211-0244-22	Diya Samanta	PLSA
163	222561-11-0072	561-1211-0140-22	Esha Paul	HISA
164	222561-11-0127	561-1211-0251-22	Eshani Naskar	PLSA
165	222561-11-0130	561-1211-1155-22	Fiza Khatun	EDCA
166	222561-11-0190	561-1215-0146-22	Habiba Khatun	HISA
167	222561-11-0041	561-1211-0071-22	Habiba Parvin	EDCA
168	222561-11-0114	561-1211-0232-22	Hema Khatun	PLSA
169	222561-11-0101	561-1211-0207-22	Ishika Khatun	PLSA
170	222561-11-0038	561-1211-0068-22	Itika Parvin	EDCA
171	222561-11-0071	561-1211-0134-22	Jamima Parvin	GEOA
172	222561-11-0008	561-1211-0016-22	Jasmin Khatun	HISA
173	222561-11-0136	561-1212-0023-22	Jayeta Biswas	BNGA
174	222561-11-0061	561-1211-0105-22	Juyairiya Khatun	ENGA
175	222561-11-0036	561-1211-0065-22	Kabita Adhikary	EDCA
176	222561-11-0196	561-1221-0109-22	Kasturi Halder	ENGA
177	222561-11-0174	561-1214-0116-22	Khushi Paramanick	ENGA
178	222561-11-0084	561-1211-0170-22	Koyel Karmakar	HISA
179	222561-11-0017	561-1211-0033-22	Koyel Sardar	BNGA
180	222561-11-0019	561-1211-0038-22	Krishna Chatterjee	BNGA
181	222561-11-0083	561-1211-0169-22	Kuyasa Kanthal	HISA
182	222561-11-0095	561-1211-0197-22	Lipsa Khanra	PLSA
183	222561-11-0030	561-1211-0053-22	Lipta Das	BNGA
184	222561-11-0054	561-1211-0093-22	Lisha Das	EDCA
185	222561-11-0154	561-1212-0133-22	Madhusri Shikari	GEOA
186	222561-11-0010	561-1211-0021-22	Mallika Ranjit	BNGA
187	222561-11-0011	561-1211-0022-22	Meghna Das	BNGA
188	222561-11-0181	561-1214-0257-22	Minakshi Das	PLSA
189	222561-11-0182	561-1215-0007-22	Mohamina Parvin	EDCA
190	222561-11-0141	561-1212-0052-22	Moly Karmakar	BNGA
191	222561-11-0183	561-1215-0027-22	Monalisa Parvin	BNGA
192	222561-11-0165	561-1212-0217-22	Moumita Patla	PLSA
193	222561-11-0119	561-1211-0240-22	Moumita Patra	PLSA
194	222561-11-0029	561-1211-0051-22	Moupriya Dutta	BNGA
195	222561-11-0147	561-1212-0066-22	Mousumi Bag	EDCA
196	222561-11-0152	561-1212-0117-22	Mukti Rajak	GEOA
197	222561-11-0096	561-1211-0198-22	Muskan Mallick	PLSA
198	222561-11-0051	561-1211-0089-22	Nafisa Sareng	EDCA
199	222561-11-0176	561-1214-0149-22	Nasrin Parveen	HISA

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200	222561-11-0124	561-1211-0247-22	Nawrin Khatun	PLSA
201	222561-11-0177	561-1214-0178-22	Nazrin Parveen	HISA
202	222561-11-0126	561-1211-0250-22	Neha Khatun	PLSA
203	222561-11-0148	561-1212-0079-22	Neha Mondal	EDCA
204	222561-11-0009	561-1211-0020-22	Neha Paul	BNGA
205	222561-11-0138	561-1212-0030-22	Nisha Kayal	BNGA
206	222561-11-0032	561-1211-0060-22	Nisha Dey	EDCA
207	222561-11-0125	561-1211-0248-22	Papia Koley	PLSA
208	222561-11-0110	561-1211-0226-22	Papiya Das	PLSA
209	222561-11-0160	561-1212-0173-22	Papu Kayal	HISA
210	222561-11-0145	561-1212-0059-22	Payel Shankhari	EDCA
211	222561-11-0153	561-1212-0126-22	Payel Naskar	GEOA
212	222561-11-0157	561-1212-0158-22	Payel Sardar	HISA
213	222561-11-0070	561-1211-0132-22	Pinki Khatun	GEOA
214	222561-11-0185	561-1215-0082-22	Pinky Khatun	EDCA
215	222561-11-0047	561-1211-0084-22	Piya Das	EDCA
216	222561-11-0103	561-1211-0212-22	Prity Adhikary	PLSA
217	222561-11-0013	561-1211-0028-22	Prity Halder	BNGA
218	222561-11-0168	561-1212-0253-22	Prity Naskar	PLSA
219	222561-11-0178	561-1214-0209-22	Priya Bhor	PLSA
220	222561-11-0077	561-1211-0151-22	Priya Roy	HISA
221	222561-11-0023	561-1211-0043-22	Priyanka Bera	BNGA
222	222561-11-0151	561-1212-0115-22	Priyanka Das	ENGA
223	222561-11-0016	561-1211-0032-22	Priyanka Hazra	BNGA
224	222561-11-0161	561-1212-0184-22	Priyanka Mondal	HISA
225	222561-11-0056	561-1211-0095-22	Puja Doyari	ENGA
226	222561-11-0024	561-1211-0045-22	Puja Sarkar	BNGA
227	222561-11-0086	561-1211-0179-22	Purba Mondal	HISA
228	222561-11-0040	561-1211-0070-22	Rachana Das	EDCA
229	222561-11-0022	561-1211-0042-22	Rajashree Halder	BNGA
230	222561-11-0027	561-1211-0049-22	Rajiya Khatun	BNGA
231	222561-11-0063	561-1211-0113-22	Rakiya Khatun	ENGA
232	222561-11-0074	561-1211-0143-22	Renua Khatun	HISA
233	222561-11-0143	561-1212-0056-22	Rimpa Singh	EDCA
234	222561-11-0172	561-1214-0040-22	Rimpa Sipui	BNGA
235	222561-11-0155	561-1212-0135-22	Rittwika Sardar	GEOA
236	222561-11-0075	561-1211-0144-22	Ritu Adhikary	HISA
237	222561-11-0134	561-1212-0013-22	Ritu Mondal	BNGA
238	222561-11-0018	561-1211-0037-22	Riya Bag	BNGA
239	222561-11-0085	561-1211-0175-22	Riya Chakraborty	HISA
240	222561-11-0079	561-1211-0153-22	Riya Das	HISA
241	222561-11-0159	561-1212-0171-22	Riya Das	HISA
242	222561-11-0080	561-1211-0154-22	Riya Mete	HISA
243	222561-11-0014	561-1211-0029-22	Riyanka Das	BNGA
244	222561-11-0198	561-1214-1163-22	Rohini Das	BNGA
245	222561-11-0104	561-1211-0213-22	Rubina Khatun	PLSA
246	222561-11-0194	561-1215-0205-22	Ruhina Khatun	PLSA
247	222561-11-0193	561-1215-0193-22	Ruksar Parvin	HISA
248	222561-11-0192	561-1215-0165-22	Ruksha Khatun	HISA
249	222561-11-0129	561-1211-0259-22	Rupali Sau	PLSA
250	222561-11-0116	561-1211-0235-22	Rupsha Chakraborty	PLSA
251	222561-11-0108	561-1211-0222-22	Sabnam Parvin	PLSA
252	222561-11-0135	561-1212-0019-22	Saheli Naskar	BNGA

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253	222561-11-0139	561-1212-0034-22	Sahely Roy	BNGA
254	222561-11-0053	561-1211-0092-22	Saiba Parvin	EDCA
255	222561-11-0002	561-1211-0004-22	Sakshi Porey	PLSA
256	222561-11-0109	561-1211-0223-22	Sanchita Bag	PLSA
257	222561-11-0166	561-1212-0219-22	Sangeeta Mondal	PLSA
258	222561-11-0169	561-1212-0256-22	Sangita Ghorui	PLSA
259	222561-11-0187	561-1215-0107-22	Sarmina Khatoon	ENGA
260	222561-11-0025	561-1211-0046-22	Sathi Adhikary	BNGA
261	222561-11-0064	561-1211-0118-22	Sayani Patra	GEOA
262	222561-11-0132	561-1212-0009-22	Sewali Hazra	EDCA
263	222561-11-0081	561-1211-0159-22	Shayantani Santra	HISA
264	222561-11-0118	561-1211-0238-22	Shilpi Ghosh	PLSA
265	222561-11-0107	561-1211-0216-22	Shrabani Acharya	PLSA
266	222561-11-0039	561-1211-0069-22	Shraboni Mondal	EDCA
267	222561-11-0105	561-1211-0214-22	Shreya Roy	PLSA
268	222561-11-0065	561-1211-0119-22	Simraan Muskaan	GEOA
269	222561-11-0046	561-1211-0081-22	Sk Sahana Parvin	EDCA
270	222561-11-0035	561-1211-0064-22	Sneha Das	EDCA
271	222561-11-0173	561-1214-0106-22	Sneha Hazra	ENGA
272	222561-11-0062	561-1211-0108-22	Soha Sarmin Khatun	ENGA
273	222561-11-0001	561-1211-0003-22	Sohana Khatun	PLSA
274	222561-11-0005	561-1211-0012-22	Sohini Paramanick	HISA
275	222561-11-0186	561-1215-0096-22	Somaiya Khatoon	ENGA
276	222561-11-0004	561-1211-0010-22	Somali Malik	BNGA
277	222561-11-0007	561-1211-0015-22	Soniya Sardar	PHIA
278	222561-11-0073	561-1211-0141-22	Soumi Banerjee	HISA
279	222561-11-0058	561-1211-0102-22	Suchandra Sau	ENGA
280	222561-11-0158	561-1212-0168-22	Sumana Kayal	HISA
281	222561-11-0140	561-1212-0035-22	Sumona Kayal	BNGA
282	222561-11-0179	561-1214-0230-22	Susmita Ghosh	PLSA
283	222561-11-0137	561-1212-0026-22	Suvamita Naskar	BNGA
284	222561-11-0115	561-1211-0234-22	Suvechya Paul	PLSA
285	222561-11-0162	561-1212-0185-22	Swarnasree Bar	HISA
286	222561-11-0076	561-1211-0148-22	Tamanna Khatun	HISA
287	222561-11-0037	561-1211-0067-22	Tamanna Rahaman	EDCA
288	222561-11-0117	561-1211-0236-22	Tandra Pramanick	PLSA
289	222561-11-0078	561-1211-0152-22	Tania Khatun	HISA
290	222561-11-0142	561-1212-0055-22	Tania Mondal	EDCA
291	222561-11-0088	561-1211-0183-22	Tanya Khatun	HISA
292	222561-11-0091	561-1211-0189-22	Tina Ghosh	HISA
293	222561-11-0087	561-1211-0181-22	Tista Biswas	HISA
294	222561-11-0044	561-1211-0077-22	Tiyasha Das	EDCA
295	222561-11-0128	561-1211-0252-22	Tulika Adhikary	PLSA
296	222561-11-0120	561-1211-0241-22	Turaifa Parvin	PLSA
297	222561-11-0180	561-1214-0254-22	Usha Shaw	PLSA
298	222561-21-0047	561-1112-0124-22	Apurba Mondal	GEOA
299	222561-21-0046	561-1112-0123-22	Arijit Makhal	GEOA
300	222561-21-0038	561-1111-0245-22	Arpan Kumar Santra	PLSA
301	222561-21-0019	561-1111-0150-22	Ayan Banerjee	HISA
302	222561-21-0022	561-1111-0157-22	Ayan Maity	HISA
303	222561-21-0045	561-1112-0120-22	Bedhi Ranjan Samaddar	GEOA
304	222561-21-0005	561-1111-0054-22	Bidhan Chandra Ghosh	EDCA
305	222561-21-0050	561-1112-0163-22	Biswajit Dalui	HISA

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306	222561-21-0028	561-1111-0180-22	Biswajit Hazra	HISA
307	222561-21-0024	561-1111-0164-22	Dabojit Mondal	HISA
308	222561-21-0030	561-1111-0186-22	Debopriya Adak	HISA
309	222561-21-0029	561-1111-0182-22	Hamidul Molla	HISA
310	222561-21-0056	561-1112-0249-22	Harish Ch Bag	PLSA
311	222561-21-0016	561-1111-0139-22	Indrajit Malick	HISA
312	222561-21-0064	561-1114-0255-22	Irfan Ali Khan	PLSA
313	222561-21-0040	561-1112-0002-22	Kaushik Kumar Khan	PLSA
314	222561-21-0066	561-1115-0097-22	Khursid Alam Mistry	ENGA
315	222561-21-0057	561-1112-0258-22	Manish Polley	PLSA
316	222561-21-0010	561-1111-0101-22	Md Javed Akter Kazi	ENGA
317	222561-21-0004	561-1111-0018-22	Nasibuddin Laskar	BNGA
318	222561-21-0068	561-1115-0239-22	Nasim Mallick	PLSA
319	222561-21-0023	561-1111-0161-22	Nilufa Khatun	HISA
320	222561-21-0036	561-1111-0233-22	Rajjak Kayal	PLSA
321	222561-21-0001	561-1111-0005-22	Rangan Mondal	BNGA
322	222561-21-0007	561-1111-0074-22	Riku Das	EDCA
323	222561-21-0021	561-1111-0156-22	Ritesh Bhowmick	HISA
324	222561-21-0013	561-1111-0122-22	Rohit Nuniya	GEOA
325	222561-21-0058	561-1112-0260-22	Rupam Das	PLSA
326	222561-21-0063	561-1114-0204-22	Sagar Pal	PLSA
327	222561-21-0065	561-1115-0001-22	Samiul Molla	HISA
328	222561-21-0020	561-1111-0155-22	Sandip Mallick	HISA
329	222561-21-0051	561-1112-0177-22	Sandip Purkait	HISA
330	222561-21-0054	561-1112-0199-22	Saswata Kanji	PLSA
331	222561-21-0043	561-1112-0100-22	Sayan Sapui	ENGA
332	222561-21-0012	561-1111-0112-22	Seharon Piada	ENGA
333	222561-21-0067	561-1115-0221-22	Sekh Sohail	PLSA
334	222561-21-0053	561-1112-0196-22	Shakshi Barman	PLSA
335	222561-21-0003	561-1111-0017-22	Shankhajit Bag	BNGA
336	222561-21-0025	561-1111-0167-22	Sk Anish Mohammad	HISA
337	222561-21-0039	561-1111-0261-22	Sk Arbaz	PLSA
338	222561-21-0034	561-1111-0224-22	Sk Nasir	PLSA
339	222561-21-0017	561-1111-0142-22	Sk Rahul	HISA
340	222561-21-0033	561-1111-0220-22	Sk Sariul	PLSA
341	222561-21-0002	561-1111-0008-22	Somnath Bera	HISA
342	222561-21-0037	561-1111-0237-22	Soumya Sau	PLSA
343	222561-21-0042	561-1112-0098-22	Soumya Das	ENGA
344	222561-21-0031	561-1111-0192-22	Sreebarna Mondal	HISA
345	222561-21-0027	561-1111-0176-22	Subhajit Nandi	HISA
346	222561-21-0011	561-1111-0111-22	Subhodip Chattopadhyay	ENGA
347	222561-21-0055	561-1112-0242-22	Sudipta Mondal	PLSA
348	222561-21-0049	561-1112-0162-22	Sujay Das	HISA
349	222561-21-0052	561-1112-0190-22	Suman Ram	HISA
350	222561-21-0059	561-1112-1157-22	Surojit Mondal	HISA
351	222561-21-0006	561-1111-0073-22	Surya Das	EDCA
352	222561-21-0015	561-1111-0138-22	Susanta Chakraborty	HISA
353	222561-21-0061	561-1113-0128-22	Susar Hansda	GEOA
354	222561-21-0035	561-1111-0231-22	Swapnamoy Das	PLSA
355	222561-21-0026	561-1111-0174-22	Swarup Sardar	HISA
356	222561-21-0032	561-1111-0211-22	Trideb Pandit	PLSA
357	222561-21-0062	561-1114-0172-22	Tubai Mondal	HISA
358	222561-12-0108	561-1211-0742-22	Afrin Khatun	BA General

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359	222561-12-0177	561-1211-0923-22	Afrin Parvin	BA General
360	222561-12-0342	561-1215-1009-22	Afroja Khatun	BA General
361	222561-12-0147	561-1211-0853-22	Afsara Parvin	BA General
362	222561-12-0076	561-1211-0656-22	Afsona Khatun	BA General
363	222561-12-0206	561-1211-0976-22	Aksima Khatun	BA General
364	222561-12-0024	561-1211-0497-22	Albira Khatun	BA General
365	222561-12-0140	561-1211-0823-22	Alisa Parvin	BA General
366	222561-12-0233	561-1211-1041-22	Almina Khatun	BA General
367	222561-12-0166	561-1211-0894-22	Amrita Ghosh	BA General
368	222561-12-0304	561-1214-0870-22	Anamika Bakuli	BA General
369	222561-12-0194	561-1211-0953-22	Anamika Khatun	BA General
370	222561-12-0287	561-1212-1008-22	Anamika Mondal	BA General
371	222561-12-0065	561-1211-0639-22	Ananaya Samanta	BA General
372	222561-12-0151	561-1211-0862-22	Anannya Das	BA General
373	222561-12-0039	561-1211-0535-22	Ananya Dutta	BA General
374	222561-12-0162	561-1211-0886-22	Ananya Malick	BA General
375	222561-12-0251	561-1212-0528-22	Ananya Mondal	BA General
376	222561-12-0036	561-1211-0524-22	Anindita Das	BA General
377	222561-12-0335	561-1215-0891-22	Anisa Khatun	BA General
378	222561-12-0193	561-1211-0951-22	Anisa Khatun	BA General
379	222561-12-0205	561-1211-0975-22	Anisha Khatun	BA General
380	222561-12-0309	561-1215-0529-22	Anisha Khatun	BA General
381	222561-12-0190	561-1211-0947-22	Anisha Khatun	BA General
382	222561-12-0225	561-1211-1014-22	Anisha Khatun	BA General
383	222561-12-0075	561-1211-0655-22	Ankita Bera	BA General
384	222561-12-0232	561-1211-1033-22	Ankita Mata	BA General
385	222561-12-0087	561-1211-0695-22	Annwita Bose	BA General
386	222561-12-0201	561-1211-0967-22	Anu Sree Kunti	BA General
387	222561-12-0124	561-1211-0783-22	Anushka Das	BA General
388	222561-12-0224	561-1211-1013-22	Arafa Khatun	BA General
389	222561-12-0100	561-1211-0715-22	Aratrika Pramanick	BA General
390	222561-12-0132	561-1211-0804-22	Arifa Khatun	BA General
391	222561-12-0214	561-1211-0993-22	Arifa Khatun	BA General
392	222561-12-0327	561-1215-0824-22	Arina Khatun	BA General
393	222561-12-0351	561-1211-0615-22	Armina Khatun	BA General
394	222561-12-0129	561-1211-0798-22	Armina Khatun	BA General
395	222561-12-0330	561-1215-0836-22	Armina Khatun	BA General
396	222561-12-0299	561-1214-0492-22	Arpita Nath	BA General
397	222561-12-0176	561-1211-0921-22	Arpita Pora	BA General
398	222561-12-0130	561-1211-0800-22	Arpita Das	BA General
399	222561-12-0179	561-1211-0925-22	Arpita Panja	BA General
400	222561-12-0254	561-1212-0543-22	Arpita Sardar	BA General
401	222561-12-0289	561-1212-1036-22	Asima Das	BA General
402	222561-12-0141	561-1211-0832-22	Asmina Khatun	BA General
403	222561-12-0325	561-1215-0781-22	Aspia Khatun	BA General
404	222561-12-0229	561-1211-1026-22	Ayesa Siddika	BA General
405	222561-12-0220	561-1211-1004-22	Baisakhi Debnath	BA General
406	222561-12-0027	561-1211-0507-22	Barnali Gayen	BA General
407	222561-12-0013	561-1211-0471-22	Beauty Adhikary	BA General
408	222561-12-0178	561-1211-0924-22	Beauty Khatun	BA General
409	222561-12-0219	561-1211-1002-22	Beauty Khatun	BA General
410	222561-12-0115	561-1211-0758-22	Benjir Parvin	BA General
411	222561-12-0324	561-1215-0780-22	Bosira Parveen	BA General

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412	222561-12-0157	561-1211-0873-22	Chayanika Chakraborty	BA General
413	222561-12-0263	561-1212-0622-22	Chumki Mondal	BA General
414	222561-12-0181	561-1211-0929-22	Dipika Ghosh	BA General
415	222561-12-0255	561-1212-0558-22	Dipti Sardar	BA General
416	222561-12-0290	561-1212-1038-22	Diya Mondal	BA General
417	222561-12-0185	561-1211-0934-22	Dona Ghosh	BA General
418	222561-12-0034	561-1211-0519-22	Esha Dutta	BA General
419	222561-12-0300	561-1214-0560-22	Esha Karmakar	BA General
420	222561-12-0283	561-1212-0952-22	Esha Roy	BA General
421	222561-12-0008	561-1211-0464-22	Farhana Khatun	BA General
422	222561-12-0149	561-1211-0856-22	Farin Khatoon	BA General
423	222561-12-0011	561-1211-0469-22	Habiba Khatun	BA General
424	222561-12-0322	561-1215-0757-22	Hasina Khatun	BA General
425	222561-12-0247	561-1212-0495-22	Indira Majhi	BA General
426	222561-12-0288	561-1212-1020-22	Isha Naskar	BA General
427	222561-12-0029	561-1211-0511-22	Isha Shaw	BA General
428	222561-12-0005	561-1211-0455-22	Jahanara Khatun	BA General
429	222561-12-0198	561-1211-0957-22	Jahira Khatun	BA General
430	222561-12-0137	561-1211-0816-22	Jamima Parvin	BA General
431	222561-12-0119	561-1211-0768-22	Jasmin Parvin	BA General
432	222561-12-0066	561-1211-0642-22	Jasmina Khatun	BA General
433	222561-12-0082	561-1211-0676-22	Jasmina Parbin	BA General
434	222561-12-0226	561-1211-1018-22	Jayshree Debnath	BA General
435	222561-12-0138	561-1211-0817-22	Jeba Khatun	BA General
436	222561-12-0145	561-1211-0849-22	Jenia Parvin	BA General
437	222561-12-0279	561-1212-0865-22	Joti Bag	BA General
438	222561-12-0060	561-1211-0621-22	Juaria Khatun	BA General
439	222561-12-0217	561-1211-0998-22	Juspiya Khatun	BA General
440	222561-12-0164	561-1211-0890-22	Khadija Khatun	BA General
441	222561-12-0105	561-1211-0736-22	Koyel Bhattacharjee	BA General
442	222561-12-0035	561-1211-0520-22	Koyel Paul	BA General
443	222561-12-0197	561-1211-0956-22	Laxmi Chakraborty	BA General
444	222561-12-0043	561-1211-0554-22	Lipika Das	BA General
445	222561-12-0062	561-1211-0632-22	Liza Mondal	BA General
446	222561-12-0235	561-1211-1043-22	Madhurima Khan	BA General
447	222561-12-0207	561-1211-0981-22	Mafuja Khatun	BA General
448	222561-12-0339	561-1215-0966-22	Mahima Khatun	BA General
449	222561-12-0059	561-1211-0620-22	Maksuda Khatun	BA General
450	222561-12-0253	561-1212-0542-22	Mandira Naskar	BA General
451	222561-12-0334	561-1215-0878-22	Manisha Khatun	BA General
452	222561-12-0103	561-1211-0734-22	Marufa Khatun	BA General
453	222561-12-0296	561-1212-1087-22	Megha Dolui	BA General
454	222561-12-0238	561-1211-1075-22	Mehar Parvin	BA General
455	222561-12-0064	561-1211-0634-22	Mehnaz Khatun	BA General
456	222561-12-0294	561-1212-1065-22	Mili Sardar	BA General
457	222561-12-0257	561-1212-0575-22	Modhumita Dalui	BA General
458	222561-12-0143	561-1211-0844-22	Mohini Khatun	BA General
459	222561-12-0317	561-1215-0670-22	Momotaj Khatun	BA General
460	222561-12-0172	561-1211-0913-22	Monalisa Das	BA General
461	222561-12-0230	561-1211-1030-22	Monira Khatun	BA General
462	222561-12-0227	561-1211-1019-22	Monisha Khatun	BA General
463	222561-12-0313	561-1215-0578-22	Monisha Khatun	BA General
464	222561-12-0200	561-1211-0965-22	Monolisa Khatun	BA General

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465	222561-12-0204	561-1211-0973-22	Mou Samanta	BA General
466	222561-12-0167	561-1211-0896-22	Mousumi Khatun	BA General
467	222561-12-0080	561-1211-0671-22	Mousumi Bag	BA General
468	222561-12-0154	561-1211-0868-22	Mousumi Das	BA General
469	222561-12-0180	561-1211-0926-22	Mousumi Ram	BA General
470	222561-12-0211	561-1211-0989-22	Mursida Khatun	BA General
471	222561-12-0019	561-1211-0489-22	Muskan Gayen	BA General
472	222561-12-0077	561-1211-0660-22	Muskan Khatun	BA General
473	222561-12-0158	561-1211-0876-22	Muskan Parvin	BA General
474	222561-12-0242	561-1211-1090-22	Muslima Khatun	BA General
475	222561-12-0223	561-1211-1012-22	Nahida Jasmin	BA General
476	222561-12-0030	561-1211-0512-22	Najneen Parvin	BA General
477	222561-12-0004	561-1211-0450-22	Namrata Mahato	BA General
478	222561-12-0310	561-1215-0536-22	Nasima Khatun	BA General
479	222561-12-0195	561-1211-0954-22	Nasima Khatun	BA General
480	222561-12-0213	561-1211-0991-22	Nasrin Parvin	BA General
481	222561-12-0127	561-1211-0794-22	Nasrinnesa Khatun	BA General
482	222561-12-0006	561-1211-0458-22	Nazima Khatun	BA General
483	222561-12-0272	561-1212-0809-22	Neha Das	BA General
484	222561-12-0093	561-1211-0706-22	Neha Khatun	BA General
485	222561-12-0241	561-1211-1085-22	Neha Khatun	BA General
486	222561-12-0312	561-1215-0571-22	Nilufa Khatun	BA General
487	222561-12-0192	561-1211-0950-22	Nilufar Khatun	BA General
488	222561-12-0003	561-1211-0447-22	Pallabi Panchal	BA General
489	222561-12-0303	561-1214-0845-22	Pallabi Paramanick	BA General
490	222561-12-0236	561-1211-1057-22	Pallabi Polley	BA General
491	222561-12-0174	561-1211-0916-22	Payel Kundu	BA General
492	222561-12-0107	561-1211-0741-22	Pieu Naskar	BA General
493	222561-12-0244	561-1212-0446-22	Pinki Gayen	BA General
494	222561-12-0070	561-1211-0648-22	Piu Mondal	BA General
495	222561-12-0246	561-1212-0484-22	Piyali Mondal	BA General
496	222561-12-0187	561-1211-0943-22	Piyali Chakraborty	BA General
497	222561-12-0282	561-1212-0942-22	Piyali Mondal	BA General
498	222561-12-0153	561-1211-0867-22	Piyalika Majumdar	BA General
499	222561-12-0092	561-1211-0705-22	Piyasha Pal	BA General
500	222561-12-0079	561-1211-0663-22	Poulami Das	BA General
501	222561-12-0139	561-1211-0822-22	Poulami Das	BA General
502	222561-12-0352	561-1211-0937-22	Preeti Prasad	BA General
503	222561-12-0134	561-1211-0810-22	Priti Chakraborty	BA General
504	222561-12-0280	561-1212-0881-22	Priti Das	BA General
505	222561-12-0277	561-1212-0857-22	Priti Mondal	BA General
506	222561-12-0284	561-1212-0974-22	Priya Sardar	BA General
507	222561-12-0026	561-1211-0505-22	Priya Adhikary	BA General
508	222561-12-0049	561-1211-0587-22	Priya Bisai	BA General
509	222561-12-0261	561-1212-0613-22	Priya Das	BA General
510	222561-12-0258	561-1212-0601-22	Priyanka Tokal	BA General
511	222561-12-0044	561-1211-0562-22	Priyanka Mondal	BA General
512	222561-12-0069	561-1211-0647-22	Priyanka Samanta	BA General
513	222561-12-0259	561-1212-0607-22	Puja Rong	BA General
514	222561-12-0168	561-1211-0897-22	Puja Yadav	BA General
515	222561-12-0307	561-1214-1031-22	Purna Pal	BA General
516	222561-12-0021	561-1211-0491-22	Pushpita Adhikary	BA General
517	222561-12-0237	561-1211-1068-22	Rafija Khatun	BA General

Serial Number	Roll Number	Registration Number	Name	Stream
518	222561-12-0347	561-1215-1067-22	Rahima Khatun	BA General
519	222561-12-0343	561-1215-1016-22	Rahita Khatun	BA General
520	222561-12-0329	561-1215-0833-22	Raima Halder	BA General
521	222561-12-0311	561-1215-0545-22	Rani Parvin	BA General
522	222561-12-0326	561-1215-0808-22	Reshma Nasrin	BA General
523	222561-12-0337	561-1215-0958-22	Reshma Parvin	BA General
524	222561-12-0316	561-1215-0659-22	Rijiya Khatun	BA General
525	222561-12-0001	561-1211-0441-22	Rimi Manna	BA General
526	222561-12-0215	561-1211-0995-22	Rimi Pramanick	BA General
527	222561-12-0101	561-1211-0722-22	Rimi Roy	BA General
528	222561-12-0054	561-1211-0603-22	Rimjhim Chakraborty	BA General
529	222561-12-0240	561-1211-1083-22	Rimpa Bhattacharya	BA General
530	222561-12-0191	561-1211-0948-22	Rimpa Roy	BA General
531	222561-12-0122	561-1211-0775-22	Rinki Dutta	BA General
532	222561-12-0090	561-1211-0701-22	Rinki Samanta	BA General
533	222561-12-0135	561-1211-0812-22	Rittiqa Bhakta	BA General
534	222561-12-0249	561-1212-0515-22	Ritu Mondal	BA General
535	222561-12-0273	561-1212-0821-22	Riya Majhi	BA General
536	222561-12-0276	561-1212-0841-22	Riya Kayal	BA General
537	222561-12-0234	561-1211-1042-22	Riya Pramanick	BA General
538	222561-12-0271	561-1212-0803-22	Riya Roy	BA General
539	222561-12-0341	561-1215-1003-22	Rokeya Khatun	BA General
540	222561-12-0159	561-1211-0882-22	Roshni Khatun	BA General
541	222561-12-0102	561-1211-0723-22	Rubaiya Khatun	BA General
542	222561-12-0182	561-1211-0930-22	Rubina Parvin	BA General
543	222561-12-0104	561-1211-0735-22	Ruksar Khatun	BA General
544	222561-12-0305	561-1214-1001-22	Ruksar Khatun	BA General
545	222561-12-0315	561-1215-0609-22	Runalayla Khatun	BA General
546	222561-12-0117	561-1211-0763-22	Sabana Khatun	BA General
547	222561-12-0110	561-1211-0745-22	Sabrin Khatun	BA General
548	222561-12-0338	561-1215-0962-22	Sadia Parvin	BA General
549	222561-12-0081	561-1211-0675-22	Sadiya Parvin	BA General
550	222561-12-0292	561-1212-1056-22	Sagorika Naskar	BA General
551	222561-12-0088	561-1211-0697-22	Sahani Parvin	BA General
552	222561-12-0349	561-1211-1160-22	Saheli Barman	BA General
553	222561-12-0202	561-1211-0970-22	Sahima Khatun	BA General
554	222561-12-0321	561-1215-0755-22	Sahin Khatun	BA General
555	222561-12-0218	561-1211-0999-22	Sahina Khatun	BA General
556	222561-12-0040	561-1211-0544-22	Saima Khatun	BA General
557	222561-12-0208	561-1211-0982-22	Saimina Parvin	BA General
558	222561-12-0025	561-1211-0503-22	Salu Pradhan	BA General
559	222561-12-0046	561-1211-0582-22	Samina Parveen	BA General
560	222561-12-0188	561-1211-0945-22	Sampurna Pore	BA General
561	222561-12-0057	561-1211-0614-22	Sanaara Khatun	BA General
562	222561-12-0186	561-1211-0938-22	Sangita Khanra	BA General
563	222561-12-0170	561-1211-0906-22	Sania Kazi	BA General
564	222561-12-0173	561-1211-0914-22	Sania Khatun	BA General
565	222561-12-0028	561-1211-0509-22	Sania Parveen	BA General
566	222561-12-0015	561-1211-0482-22	Sarika Khatun	BA General
567	222561-12-0160	561-1211-0883-22	Sarmila Khatun	BA General
568	222561-12-0267	561-1212-0664-22	Sarnali Mondal	BA General
569	222561-12-0295	561-1212-1079-22	Sathi Sardar	BA General
570	222561-12-0248	561-1212-0510-22	Sathi Kayal	BA General

Serial Number	Roll Number	Registration Number	Name	Stream
571	222561-12-0256	561-1212-0569-22	Sathi Mondal	BA General
572	222561-12-0285	561-1212-1000-22	Sathi Purkait	BA General
573	222561-12-0118	561-1211-0765-22	Saubiya Parvin	BA General
574	222561-12-0269	561-1212-0782-22	Sayani Dhali	BA General
575	222561-12-0038	561-1211-0530-22	Sayani Jana	BA General
576	222561-12-0133	561-1211-0806-22	Sayantani Jana	BA General
577	222561-12-0209	561-1211-0985-22	Selima Khatun	BA General
578	222561-12-0032	561-1211-0516-22	Selki Santra	BA General
579	222561-12-0189	561-1211-0946-22	Seren Parven	BA General
580	222561-12-0169	561-1211-0902-22	Serina Khatun	BA General
581	222561-12-0114	561-1211-0752-22	Shawviya Mollick	BA General
582	222561-12-0144	561-1211-0848-22	Shayane Purkait	BA General
583	222561-12-0308	561-1215-0445-22	Sheerin Sanfui	BA General
584	222561-12-0072	561-1211-0650-22	Shilpa Mata	BA General
585	222561-12-0085	561-1211-0692-22	Shrabani Barui	BA General
586	222561-12-0012	561-1211-0470-22	Shrabani Panja	BA General
587	222561-12-0275	561-1212-0835-22	Shreya Singha	BA General
588	222561-12-0109	561-1211-0743-22	Simran Khatun	BA General
589	222561-12-0163	561-1211-0888-22	Simran Parvin	BA General
590	222561-12-0116	561-1211-0760-22	Sitara Khatun	BA General
591	222561-12-0270	561-1212-0797-22	Smriti Majhi	BA General
592	222561-12-0016	561-1211-0485-22	Snahe Samanta	BA General
593	222561-12-0203	561-1211-0972-22	Sneha Chakraborty	BA General
594	222561-12-0156	561-1211-0871-22	Sneha Paul	BA General
595	222561-12-0033	561-1211-0517-22	Sneha Adhikary	BA General
596	222561-12-0083	561-1211-0683-22	Sneha Bera	BA General
597	222561-12-0319	561-1215-0689-22	Sohana Khatun	BA General
598	222561-12-0146	561-1211-0850-22	Sohana Parvin	BA General
599	222561-12-0094	561-1211-0707-22	Sonia Mukherjee	BA General
600	222561-12-0301	561-1214-0597-22	Soumi Das	BA General
601	222561-12-0212	561-1211-0990-22	Soumita Mukherjee	BA General
602	222561-12-0120	561-1211-0769-22	Sovana Khatun	BA General
603	222561-12-0298	561-1214-0454-22	Srimoyee Nath	BA General
604	222561-12-0222	561-1211-1010-22	Suhana Mallick	BA General
605	222561-12-0096	561-1211-0709-22	Suhana Pervin	BA General
606	222561-12-0199	561-1211-0960-22	Suhani Parvin	BA General
607	222561-12-0002	561-1211-0444-22	Sukannya Biswas	BA General
608	222561-12-0328	561-1215-0827-22	Sultana Khatun	BA General
609	222561-12-0333	561-1215-0877-22	Sultana Khatun	BA General
610	222561-12-0022	561-1211-0494-22	Sumaiya Khatun	BA General
611	222561-12-0023	561-1211-0496-22	Sumaiya Khatun	BA General
612	222561-12-0086	561-1211-0694-22	Sumaiya Khatun	BA General
613	222561-12-0332	561-1215-0843-22	Sumaiya Parvin	BA General
614	222561-12-0165	561-1211-0892-22	Sumana Das	BA General
615	222561-12-0268	561-1212-0732-22	Sunayana Sardar	BA General
616	222561-12-0051	561-1211-0596-22	Susmita Gunin	BA General
617	222561-12-0291	561-1212-1049-22	Swagata Gayen	BA General
618	222561-12-0041	561-1211-0548-22	Swapna Mondal	BA General
619	222561-12-0336	561-1215-0900-22	Tabassum Sultan	BA General
620	222561-12-0063	561-1211-0633-22	Tananya Das	BA General
621	222561-12-0106	561-1211-0738-22	Tandra Bag	BA General
622	222561-12-0091	561-1211-0702-22	Tania Parbin	BA General
623	222561-12-0152	561-1211-0864-22	Taniea Mondal	BA General

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624	222561-12-0228	561-1211-1022-22	Taniya Khatun	BA General
625	222561-12-0131	561-1211-0802-22	Taniya Ghorui	BA General
626	222561-12-0121	561-1211-0774-22	Taniya Sanfui	BA General
627	222561-12-0331	561-1215-0838-22	Tanjim Khatun	BA General
628	222561-12-0350	561-1211-1164-22	Tiyasa Das	BA General
629	222561-12-0278	561-1212-0858-22	Tiyasa Das	BA General
630	222561-12-0078	561-1211-0661-22	Trisa Das	BA General
631	222561-12-0018	561-1211-0488-22	Trisha Biswas	BA General
632	222561-12-0161	561-1211-0884-22	Tuhina Khatun	BA General
633	222561-12-0306	561-1214-1024-22	Tulika Gayen	BA General
634	222561-22-0062	561-1111-0604-22	Afrati Khan	BA General
635	222561-22-0051	561-1111-0580-22	Ajibur Rahaman Mallick	BA General
636	222561-22-0025	561-1111-0508-22	Akash Chakraborty	BA General
637	222561-22-0004	561-1111-0453-22	Akash Halder	BA General
638	222561-22-0267	561-1114-0746-22	Akash Paul	BA General
639	222561-22-0203	561-1111-1069-22	Altamas Mollick	BA General
640	222561-22-0155	561-1111-0918-22	Aman Sepay	BA General
641	222561-22-0259	561-1112-1073-22	Amar Sanfui	BA General
642	222561-22-0174	561-1111-0969-22	Amit Maity	BA General
643	222561-22-0190	561-1111-1035-22	Ananya Singha	BA General
644	222561-22-0189	561-1111-1029-22	Anas Sha	BA General
645	222561-22-0266	561-1114-0658-22	Anchit Shee	BA General
646	222561-22-0240	561-1112-0772-22	Anish Mondal	BA General
647	222561-22-0230	561-1112-0617-22	Anish Dalui	BA General
648	222561-22-0162	561-1111-0935-22	Anish Kaji	BA General
649	222561-22-0241	561-1112-0778-22	Ankur Das	BA General
650	222561-22-0058	561-1111-0593-22	Anshu Santra	BA General
651	222561-22-0095	561-1111-0704-22	Argha Das	BA General
652	222561-22-0265	561-1114-0590-22	Argha Ghosh	BA General
653	222561-22-0154	561-1111-0910-22	Arnab Ghosh	BA General
654	222561-22-0023	561-1111-0502-22	Arpan Manna	BA General
655	222561-22-0072	561-1111-0629-22	Asfak Molla	BA General
656	222561-22-0204	561-1111-1070-22	Asif Molla	BA General
657	222561-22-0016	561-1111-0481-22	Asit Dutta	BA General
658	222561-22-0198	561-1111-1055-22	Atabuddin Laskar	BA General
659	222561-22-0087	561-1111-0686-22	Atanu Chatterjee	BA General
660	222561-22-0214	561-1111-1089-22	Ayan Khara	BA General
661	222561-22-0219	561-1112-0456-22	Ayan Mondal	BA General
662	222561-22-0005	561-1111-0460-22	Ayan Naskar	BA General
663	222561-22-0273	561-1115-0459-22	Bajid Ali Mallick	BA General
664	222561-22-0014	561-1111-0478-22	Bikash Halder	BA General
665	222561-22-0247	561-1112-0852-22	Bikram Bag	BA General
666	222561-22-0243	561-1112-0825-22	Bikrom Malick	BA General
667	222561-22-0101	561-1111-0726-22	Chiranjit Senapati	BA General
668	222561-22-0028	561-1111-0521-22	Debjeet Khara	BA General
669	222561-22-0149	561-1111-0904-22	Debjit Chakraborty	BA General
670	222561-22-0236	561-1112-0737-22	Debobrata Sardar	BA General
671	222561-22-0231	561-1112-0631-22	Deep Bag	BA General
672	222561-22-0261	561-1112-1082-22	Deep Kumar Dalui	BA General
673	222561-22-0194	561-1111-1047-22	Dipak Thakur	BA General
674	222561-22-0270	561-1114-0887-22	Dipan Bakuli	BA General
675	222561-22-0008	561-1111-0465-22	Dripan Kala	BA General
676	222561-22-0020	561-1111-0499-22	Elhan Mansiz Mollick	BA General

Serial Number	Roll Number	Registration Number	Name	Stream
677	222561-22-0200	561-1111-1060-22	Eshan Hazra	BA General
678	222561-22-0063	561-1111-0605-22	Firoz Khan	BA General
679	222561-22-0218	561-1112-0449-22	Gourab Pramanick	BA General
680	222561-22-0107	561-1111-0740-22	Hedayet Mallick	BA General
681	222561-22-0254	561-1112-0903-22	Himansu Maji	BA General
682	222561-22-0124	561-1111-0791-22	Indranil Karmakar	BA General
683	222561-22-0197	561-1111-1054-22	Irbaz Mollick	BA General
684	222561-22-0281	561-1115-0636-22	Irfan Ali Molla	BA General
685	222561-22-0312	561-1115-1161-22	Irfan Mallick	BA General
686	222561-22-0307	561-1115-1063-22	Irfan Mollick	BA General
687	222561-22-0233	561-1112-0674-22	Jeet Mondal	BA General
688	222561-22-0238	561-1112-0764-22	Jeet Khamrui	BA General
689	222561-22-0142	561-1111-0847-22	Jit Karmakar	BA General
690	222561-22-0049	561-1111-0577-22	Kaif Mollick	BA General
691	222561-22-0193	561-1111-1046-22	Krishnendu Adak	BA General
692	222561-22-0022	561-1111-0501-22	Manab Sardar	BA General
693	222561-22-0253	561-1112-0899-22	Manash Kumar Ukil	BA General
694	222561-22-0102	561-1111-0727-22	Md Akim Ali Gayen	BA General
695	222561-22-0285	561-1115-0667-22	Md Mijanur Rahaman Molla	BA General
696	222561-22-0286	561-1115-0700-22	Md Sahim	BA General
697	222561-22-0114	561-1111-0761-22	Md Samser	BA General
698	222561-22-0152	561-1111-0908-22	Moinul Jamadar	BA General
699	222561-22-0223	561-1112-0504-22	Moon Sakhari	BA General
700	222561-22-0085	561-1111-0682-22	Mostak Mistry	BA General
701	222561-22-0300	561-1115-0986-22	Moudud Sepai	BA General
702	222561-22-0128	561-1111-0801-22	Nabidul Hassan	BA General
703	222561-22-0010	561-1111-0474-22	Nadim Hossain	BA General
704	222561-22-0093	561-1111-0698-22	Nisrin Khatun	BA General
705	222561-22-0268	561-1114-0788-22	Osman Ahmed Molla	BA General
706	222561-22-0207	561-1111-1074-22	Pallab Polley	BA General
707	222561-22-0086	561-1111-0684-22	Pappu Mondal	BA General
708	222561-22-0003	561-1111-0452-22	Partha Jana	BA General
709	222561-22-0226	561-1112-0555-22	Pitam Bag	BA General
710	222561-22-0185	561-1111-1015-22	Pranab Sarkar	BA General
711	222561-22-0150	561-1111-0905-22	Prasun Das	BA General
712	222561-22-0091	561-1111-0693-22	Prem Balmiki	BA General
713	222561-22-0225	561-1112-0549-22	Pritam Gayen	BA General
714	222561-22-0201	561-1111-1062-22	Priyam Das	BA General
715	222561-22-0242	561-1112-0789-22	Pronojit Gayen	BA General
716	222561-22-0037	561-1111-0541-22	Puskar Das	BA General
717	222561-22-0167	561-1111-0941-22	Rajdeep Manna	BA General
718	222561-22-0239	561-1112-0771-22	Rahul Mal	BA General
719	222561-22-0212	561-1111-1086-22	Raj Paik	BA General
720	222561-22-0246	561-1112-0840-22	Raju Mondal	BA General
721	222561-22-0127	561-1111-0799-22	Rakibul Mollick	BA General
722	222561-22-0118	561-1111-0776-22	Ramiz Raja Sanfui	BA General
723	222561-22-0220	561-1112-0457-22	Ranish Naskar	BA General
724	222561-22-0208	561-1111-1078-22	Ranit Hazra	BA General
725	222561-22-0215	561-1111-1091-22	Rigankar Mondal	BA General
726	222561-22-0224	561-1112-0526-22	Rohan Sardar	BA General
727	222561-22-0080	561-1111-0672-22	Rohisuddin Kazi	BA General
728	222561-22-0205	561-1111-1071-22	Rohit Ghosh	BA General
729	222561-22-0227	561-1112-0556-22	Rohit Mondal	BA General

Serial Number	Roll Number	Registration Number	Name	Stream
730	222561-22-0017	561-1111-0483-22	Roni Saha	BA General
731	222561-22-0156	561-1111-0919-22	Rupak Mondal	BA General
732	222561-22-0029	561-1111-0522-22	Rupan Adak	BA General
733	222561-22-0050	561-1111-0579-22	Rupankar Gayen	BA General
734	222561-22-0179	561-1111-0980-22	Rupantan Dey	BA General
735	222561-22-0123	561-1111-0790-22	Sagar Pal	BA General
736	222561-22-0133	561-1111-0818-22	Sahariyar Khan	BA General
737	222561-22-0089	561-1111-0688-22	Sahid Kazi	BA General
738	222561-22-0163	561-1111-0936-22	Sahid Mallick	BA General
739	222561-22-0171	561-1111-0961-22	Sahil Sardar	BA General
740	222561-22-0131	561-1111-0813-22	Saieb Ali Khan	BA General
741	222561-22-0202	561-1111-1064-22	Sakil Aktar Mondal	BA General
742	222561-22-0137	561-1111-0829-22	Samanta Bachar	BA General
743	222561-22-0030	561-1111-0523-22	Sanjib Singha	BA General
744	222561-22-0045	561-1111-0564-22	Santanu Das	BA General
745	222561-22-0256	561-1112-1017-22	Sawan Mondal	BA General
746	222561-22-0090	561-1111-0691-22	Sayan Bose	BA General
747	222561-22-0018	561-1111-0486-22	Sayan Mondal	BA General
748	222561-22-0232	561-1112-0640-22	Sayan Bag	BA General
749	222561-22-0178	561-1111-0979-22	Sayan Bodak	BA General
750	222561-22-0066	561-1111-0616-22	Sayan Mondal	BA General
751	222561-22-0115	561-1111-0767-22	Sayan Purkait	BA General
752	222561-22-0151	561-1111-0907-22	Sayan Samanta	BA General
753	222561-22-0157	561-1111-0920-22	Sayan Singha	BA General
754	222561-22-0283	561-1115-0641-22	Sekh Jahed	BA General
755	222561-22-0251	561-1112-0880-22	Shyan Das	BA General
756	222561-22-0071	561-1111-0628-22	Sk Izaz Ahamed	BA General
757	222561-22-0043	561-1111-0561-22	Sk Kaif	BA General
758	222561-22-0042	561-1111-0553-22	Sk Mijanur	BA General
759	222561-22-0035	561-1111-0539-22	Sk Ramez	BA General
760	222561-22-0169	561-1111-0949-22	Sk Shahil	BA General
761	222561-22-0134	561-1111-0819-22	Sk Zian Uddin	BA General
762	222561-22-0293	561-1115-0811-22	Sk Abdul Malick	BA General
763	222561-22-0176	561-1111-0977-22	Sk Akil Ali	BA General
764	222561-22-0002	561-1111-0448-22	Sk Alamgir	BA General
765	222561-22-0192	561-1111-1045-22	Sk Anis	BA General
766	222561-22-0302	561-1115-1027-22	Sk Anisur	BA General
767	222561-22-0130	561-1111-0807-22	Sk Anowar	BA General
768	222561-22-0141	561-1111-0846-22	Sk Anwaruddin	BA General
769	222561-22-0138	561-1111-0831-22	Sk Arif	BA General
770	222561-22-0294	561-1115-0851-22	Sk Arif Hossen	BA General
771	222561-22-0290	561-1115-0731-22	Sk Ariyan Hossain	BA General
772	222561-22-0103	561-1111-0728-22	Sk Arman	BA General
773	222561-22-0213	561-1111-1088-22	Sk Arman Ali	BA General
774	222561-22-0140	561-1111-0842-22	Sk Asraful	BA General
775	222561-22-0211	561-1111-1084-22	Sk Ayaz Akhter	BA General
776	222561-22-0309	561-1115-1095-22	Sk Ejajul	BA General
777	222561-22-0031	561-1111-0531-22	Sk Emran	BA General
778	222561-22-0001	561-1111-0443-22	Sk Farhan	BA General
779	222561-22-0125	561-1111-0792-22	Sk Hafijul Rahaman	BA General
780	222561-22-0153	561-1111-0909-22	Sk Injamul	BA General
781	222561-22-0077	561-1111-0666-22	Sk Irfan Ali	BA General
782	222561-22-0275	561-1115-0566-22	Sk Jahir Hossain	BA General

Serial Number	Roll Number	Registration Number	Name	Stream
783	222561-22-0180	561-1111-0983-22	Sk Mohammed Sahil	BA General
784	222561-22-0291	561-1115-0733-22	Sk Masud	BA General
785	222561-22-0059	561-1111-0595-22	Sk Md Mhaboob Raja	BA General
786	222561-22-0038	561-1111-0546-22	Sk Minajul Islam	BA General
787	222561-22-0304	561-1115-1040-22	Sk Miraz	BA General
788	222561-22-0297	561-1115-0885-22	Sk Misbahul Islam	BA General
789	222561-22-0295	561-1115-0872-22	Sk Naquibul Hasan	BA General
790	222561-22-0191	561-1111-1039-22	Sk Parbhaj	BA General
791	222561-22-0110	561-1111-0753-22	Sk Raisuddin	BA General
792	222561-22-0064	561-1111-0606-22	Sk Rajmool	BA General
793	222561-22-0083	561-1111-0678-22	Sk Rakib	BA General
794	222561-22-0047	561-1111-0568-22	Sk Rakibul	BA General
795	222561-22-0280	561-1115-0635-22	Sk Riaz	BA General
796	222561-22-0068	561-1111-0625-22	Sk Rizwanuddin	BA General
797	222561-22-0306	561-1115-1053-22	Sk Sadik	BA General
798	222561-22-0143	561-1111-0859-22	Sk Sahajada Ali	BA General
799	222561-22-0282	561-1115-0637-22	Sk Sahid	BA General
800	222561-22-0113	561-1111-0759-22	Sk Sahid	BA General
801	222561-22-0195	561-1111-1050-22	Sk Sahid	BA General
802	222561-22-0070	561-1111-0627-22	Sk Sahil	BA General
803	222561-22-0106	561-1111-0739-22	Sk Sahin	BA General
804	222561-22-0082	561-1111-0677-22	Sk Saidul	BA General
805	222561-22-0301	561-1115-1011-22	Sk Sajib	BA General
806	222561-22-0199	561-1111-1059-22	Sk Samim	BA General
807	222561-22-0084	561-1111-0680-22	Sk Samir Hossain	BA General
808	222561-22-0088	561-1111-0687-22	Sk Samir Hossain	BA General
809	222561-22-0136	561-1111-0826-22	Sk Serif	BA General
810	222561-22-0160	561-1111-0928-22	Sk Sohel	BA General
811	222561-22-0060	561-1111-0600-22	Sk Soyel	BA General
812	222561-22-0299	561-1115-0984-22	Sk Tamim Hassan	BA General
813	222561-22-0187	561-1111-1025-22	Sk Waquab Ur Rahaman	BA General
814	222561-22-0206	561-1111-1072-22	Sk Yeasin Ali	BA General
815	222561-22-0069	561-1111-0626-22	Sk Zahid	BA General
816	222561-22-0308	561-1115-1094-22	Sk Zahid Hussain	BA General
817	222561-22-0276	561-1115-0567-22	Sk. Sanju Mistri	BA General
818	222561-22-0272	561-1114-1061-22	Somenath Bera	BA General
819	222561-22-0074	561-1111-0644-22	Soumadeep Mondal	BA General
820	222561-22-0012	561-1111-0476-22	Soumo Das	BA General
821	222561-22-0021	561-1111-0500-22	Soumodeep Naskar	BA General
822	222561-22-0027	561-1111-0518-22	Soumyadip Biswas	BA General
823	222561-22-0245	561-1112-0830-22	Sounak Polen	BA General
824	222561-22-0076	561-1111-0665-22	Sourin Khamaru	BA General
825	222561-22-0188	561-1111-1028-22	Souvik Mondal	BA General
826	222561-22-0262	561-1114-0538-22	Srijan Das	BA General
827	222561-22-0092	561-1111-0696-22	Srijan Ghosh	BA General
828	222561-22-0098	561-1111-0717-22	Srinjoy Chakraborty	BA General
829	222561-22-0257	561-1112-1044-22	Subha Pramanick	BA General
830	222561-22-0053	561-1111-0583-22	Subhadeep Parui	BA General
831	222561-22-0096	561-1111-0710-22	Subhankar Chakraborty	BA General
832	222561-22-0036	561-1111-0540-22	Subhankar Samanta	BA General
833	222561-22-0249	561-1112-0874-22	Subhasis Bag	BA General
834	222561-22-0075	561-1111-0662-22	Subho Sahani	BA General
835	222561-22-0217	561-1112-0442-22	Subhro Naskar	BA General

Serial Number	Roll Number	Registration Number	Name	Stream
836	222561-22-0184	561-1111-1005-22	Sudip Banerjee	BA General
837	222561-22-0235	561-1112-0719-22	Sudip Naskar	BA General
838	222561-22-0228	561-1112-0576-22	Sudipta Das	BA General
839	222561-22-0237	561-1112-0762-22	Sudipta Mondal	BA General
840	222561-22-0260	561-1112-1076-22	Sudipta Sardar	BA General
841	222561-22-0311	561-1111-1162-22	Sujan Kar	BA General
842	222561-22-0210	561-1111-1081-22	Sujoy Adhikary	BA General
843	222561-22-0094	561-1111-0703-22	Suman Das	BA General
844	222561-22-0147	561-1111-0893-22	Sunay Pramanick	BA General
845	222561-22-0108	561-1111-0744-22	Sunayan Naskar	BA General
846	222561-22-0032	561-1111-0532-22	Supriyo Chakraborty	BA General
847	222561-22-0274	561-1115-0472-22	Surajit Ghosh	BA General
848	222561-22-0221	561-1112-0473-22	Surojit Mistry	BA General
849	222561-22-0079	561-1111-0669-22	Suvojit Pradhan	BA General
850	222561-22-0271	561-1114-0915-22	Swanjan Paul	BA General
851	222561-22-0258	561-1112-1066-22	Tanusree Sardar	BA General
852	222561-22-0284	561-1115-0657-22	Tofayel Mollick	BA General
853	222561-22-0287	561-1115-0713-22	Touhid Mollick	BA General
854	222561-22-0263	561-1114-0557-22	Toushik Das	BA General
855	222561-22-0159	561-1111-0927-22	Utsha Das	BA General
856	223561-11-0052	561-1215-0266-22	Abida Khatun	ZOOA
857	223561-11-0054	561-1215-0281-22	Afroja Parveen	GEOA
858	223561-11-0053	561-1215-0273-22	Alka Yeasmin	ZOOA
859	223561-11-0041	561-1212-0310-22	Ananya Naskar	FNTA
860	223561-11-0005	561-1211-0270-22	Anindita Pramanick	ZOOA
861	223561-11-0024	561-1211-0320-22	Annanya Das	GEOA
862	223561-11-0025	561-1211-0321-22	Anwesa Banu	GEOA
863	223561-11-0026	561-1211-0325-22	Barsha Jana	GEOA
864	223561-11-0035	561-1212-0282-22	Bidisha Naskar	BOTA
865	223561-11-0027	561-1211-0328-22	Brishti Samanta	GEOA
866	223561-11-0040	561-1212-0308-22	Bristi Naskar	FNTA
867	223561-11-0034	561-1212-0277-22	Bristy Naskar	BOTA
868	223561-11-0032	561-1212-0267-22	Chaitali Malik	ZOOA
869	223561-11-0047	561-1214-0269-22	Debika Santra	ZOOA
870	223561-11-0009	561-1211-0279-22	Deboleena Chakraborty	BOTA
871	223561-11-0039	561-1212-0302-22	Debolina Santra	FNTA
872	223561-11-0018	561-1211-0301-22	Indrani Bhandari	FNTA
873	223561-11-0004	561-1211-0268-22	Maitry Adhikary	ZOOA
874	223561-11-0008	561-1211-0278-22	Mousumi Nath	FNTA
875	223561-11-0051	561-1214-0330-22	Oindrila Paul	GEOA
876	223561-11-0045	561-1212-0326-22	Piu Mondal	GEOA
877	223561-11-0042	561-1212-0312-22	Piyali Mondal	GEOA
878	223561-11-0020	561-1211-0305-22	Pritisha Addhya	FNTA
879	223561-11-0029	561-1211-0331-22	Ricta Chakraborty	GEOA
880	223561-11-0006	561-1211-0271-22	Rimika Manna	ZOOA
881	223561-11-0057	561-1215-0315-22	Rimna Khatun	GEOA
882	223561-11-0044	561-1212-0323-22	Ritu Das	GEOA
883	223561-11-0007	561-1211-0274-22	Riya Malakar	ZOOA
884	223561-11-0023	561-1211-0319-22	Sanghamitra Mazumder	GEOA
885	223561-11-0028	561-1211-0329-22	Sanjana Chandra	GEOA
886	223561-11-0055	561-1215-0304-22	Sannafa Perveen	FNTA
887	223561-11-0030	561-1211-0333-22	Sayani Das	GEOA
888	223561-11-0050	561-1214-0311-22	Shraya Adhikary	FNTA

Serial Number	Roll Number	Registration Number	Name	Stream
889	223561-11-0016	561-1211-0299-22	Shreya Mondal	FNTA
890	223561-11-0010	561-1211-0285-22	Sk Jariya Bakhtiar	ZOOA
891	223561-11-0021	561-1211-0307-22	Sneha Das	FNTA
892	223561-11-0056	561-1215-0309-22	Sneha Khatoon	FNTA
893	223561-11-0031	561-1212-0265-22	Sneha Naskar	GEOA
894	223561-11-0019	561-1211-0303-22	Sneha Roy	FNTA
895	223561-11-0017	561-1211-0300-22	Sneha Samui	FNTA
896	223561-11-0013	561-1211-0291-22	Sohelley Rayhan	ZOOA
897	223561-11-0033	561-1212-0272-22	Suchandra Sardar	ZOOA
898	223561-11-0058	561-1215-0332-22	Sumaita Parvin	GEOA
899	223561-11-0043	561-1212-0314-22	Supriya Mondal	GEOA
900	223561-11-0003	561-1211-0264-22	Susmita Debnath	GEOA
901	223561-11-0001	561-1211-0262-22	Sweta Kar	GEOA
902	223561-11-0014	561-1211-0297-22	Trisha Khanra	ZOOA
903	223561-11-0046	561-1212-0327-22	Trisha Mondal	GEOA
904	223561-11-0049	561-1214-0306-22	Tuhina Sepai	FNTA
905	223561-21-0015	561-1114-1159-22	Amiya Paul	GEOA
906	223561-21-0011	561-1114-0316-22	Mehdi Hassan Sepai	GEOA
907	223561-21-0009	561-1112-0295-22	Rana Mondal	ZOOA
908	223561-21-0005	561-1111-0296-22	Shouvik Mandal	ZOOA
909	223561-21-0001	561-1111-0276-22	Siraj Sekh	ZOOA
910	223561-21-0007	561-1111-0324-22	Sk Rafiqul	GEOA
911	223561-21-0014	561-1115-0318-22	Sk Sahil	GEOA
912	223561-21-0006	561-1111-0322-22	Soumodip Singha	GEOA
913	223561-21-0010	561-1114-0313-22	Suman Pal	GEOA
914	223561-12-0011	561-1211-1121-22	Aasema Yasmin	B.Sc. General
915	223561-12-0009	561-1211-1114-22	Koyel Banerjee	B.Sc. General
916	223561-12-0015	561-1215-1120-22	Muhsinah Perveen	B.Sc. General
917	223561-12-0006	561-1211-1108-22	Nazma Akbar	B.Sc. General
918	223561-12-0005	561-1211-1107-22	Neha Halder	B.Sc. General
919	223561-12-0007	561-1211-1109-22	Nitu Maji	B.Sc. General
920	223561-12-0008	561-1211-1112-22	Oishi Dutta	B.Sc. General
921	223561-12-0001	561-1211-1100-22	Puja Mondal	B.Sc. General
922	223561-12-0003	561-1211-1103-22	Riya Mondal	B.Sc. General
923	223561-12-0012	561-1211-1122-22	Shraya Dutta	B.Sc. General
924	223561-12-0014	561-1212-1119-22	Tithi Mondal	B.Sc. General
925	223561-22-0010	561-1114-1110-22	Arpan Das	B.Sc. General
926	223561-22-0009	561-1114-1096-22	Pritam Das	B.Sc. General

**UNIVERSITY OF
CALCUTTA**

**BUDGE BUDGE COLLEGE
PROJECT**

**ENVIRONMENTAL
STUDIES**

TOPIC

Pond Ecosystem

NAME: SREHA MONDAL

Semester: 2nd

Stream: B.Com(Hon)

University Roll No. 221561-11-0019

University Reg. No. 561-1211-0416-22

ପୁଷ୍ଟିକ୍ଷେତ୍ର ସାମ୍ପ୍ରଦାୟ ଓ ପ୍ରକାଶକ

[Study of Pond Ecosystem]

① (Section (Introduction))

⑥ सर्वांग (problem)

④ ପ୍ରକାଶ ଯେବୁ (Importance of the Problem)

ପ୍ରକାଶ ଯେବୁ ହେଉଥିବା ଏହି ପ୍ରକାଶ ଓ ତାଙ୍କ ପରିବାର
କୀମା ହେଉଥିବା ଏହି ପ୍ରକାଶ କୌଣସି କରିବାକୁ ପରିବାର
ଫାରାକ୍ସ ଏହି ପ୍ରକାଶ କରିବାକୁ ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପ୍ରକାଶ କରିବାକୁ ପରିବାର ଲୁଗାରୁ କରିବାକୁ
କାହାର ଜାରି କରିବାକୁ ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପ୍ରକାଶ କରିବାକୁ ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପ୍ରକାଶ କରିବାକୁ ପରିବାର ଲୁଗାରୁ କରିବାକୁ

⑤ ଉଲଟା ଲିଙ୍ଗ (Objectives of the Project)

- (1) ପ୍ରକାଶ ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ —
- (2) ପ୍ରକାଶ ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
- (3) ପ୍ରକାଶ ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
- (4) ପ୍ରକାଶ ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ

⑥ ପରିବାର (Plan of work)

ଏହି ପରିବାର ହେଉଥିବା ଏହି ପରିବାର ଲୁଗାରୁ
କରିବାକୁ ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ
ଏହି ପରିବାର ଲୁଗାରୁ କରିବାକୁ

চার্ট কর্তৃ পদ্মা দেবী গোস্বামী সাঁই শুভ্রমূল, কুমি কুমি, পদ্মালয়ে
কুমি কুমি পদ্মালয়ে গোস্বামী, গোস্বামী, গোস্বামী, পদ্মালয়ে
গোস্বামী কুমি | কুমি গোস্বামী চুপ্রিয়ে সুন্দর
শুভ্রমূল, পদ্মালয়ে গোস্বামী গোস্বামী গোস্বামী, কুমি কুমি
কুমি কুমি কুমি।

৬) হোম সংগ্ৰহ (Data Collection)

১) পৃষ্ঠা সং অনুসন্ধান সংখ্যা: ২৫/১০২০২০

২) বেগমান: প্রাচী | স্তুতি: পুরুষ স্তুতি: পুরুষ

বেগমান: পুরুষ

বেগমান: পুরুষ

বেগমান: পুরুষ ২৫ সেপ্টেম্বৰ

৩) সাময়িক সংখ্যা: ১২:৪৮

৪) সাময়িক তারিখ: ১৫/০৯/২০২০

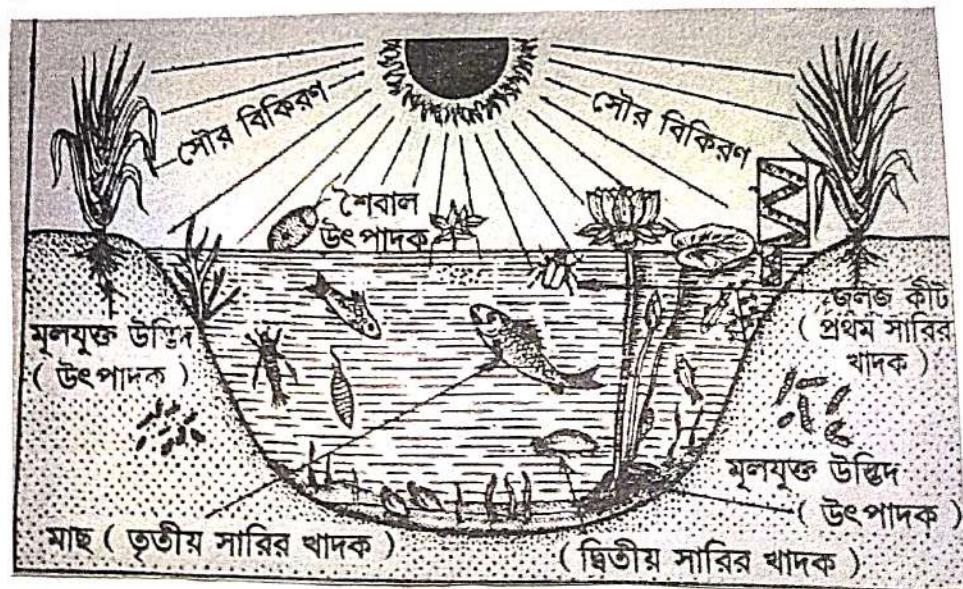
৫) পৃষ্ঠা সাত্ত্ব পুরুষ: গোস্বামী, শুভ্রমূল, পিণ্ডি, গোস্বামী,

৬) দৈর্ঘ্য পুরুষ: মুকুট, মুকুট, পুরুষ, পুরুষ, পুরুষ, পুরুষ, পুরুষ, পুরুষ,

৭) পুরুষ: পুরুষ, পুরুষ, পুরুষ, পুরুষ, পুরুষ, পুরুষ, পুরুষ, পুরুষ,
পুরুষ, পুরুষ, পুরুষ, পুরুষ, পুরুষ,

৮) বেগমান সাত্ত্ব: দলত মুকুট, কুমি, কুমি, কুমি, কুমি, কুমি,

৯) স্তুতি: মুকুট, পুরুষ, পুরুষ, পুরুষ,

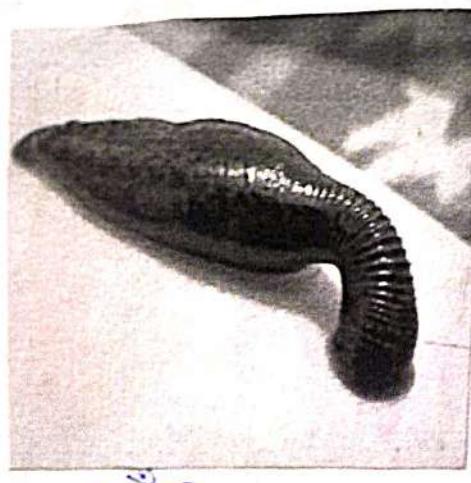
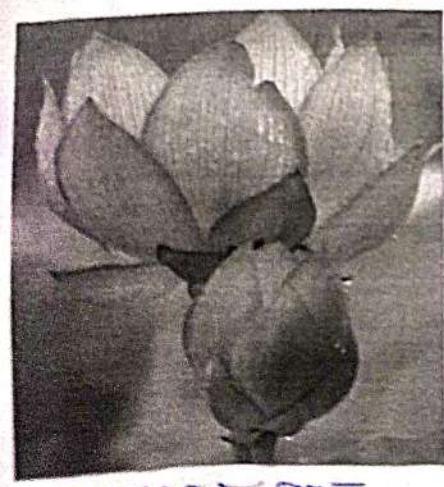


পৃষ্ঠা সংখ্যা

① Care analysis (Data analysis) → कारे विश्लेषण किसी विकल्प का कारे किमी विश्लेषण करने की क्रिया है। जो विकल्प का कारे किमी करने की क्रिया है। जो विकल्प का कारे किमी करने की क्रिया है। जो विकल्प का कारे किमी करने की क्रिया है। जो विकल्प का कारे किमी करने की क्रिया है।

प्रारंभिक कारे किमी

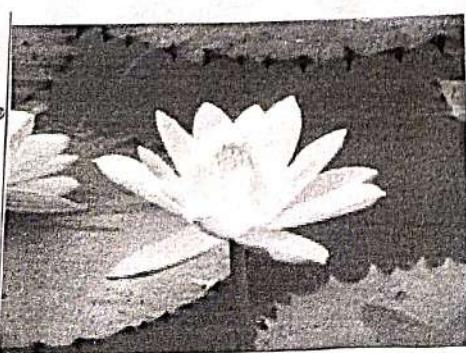
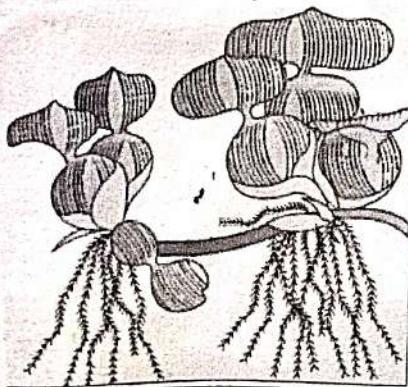
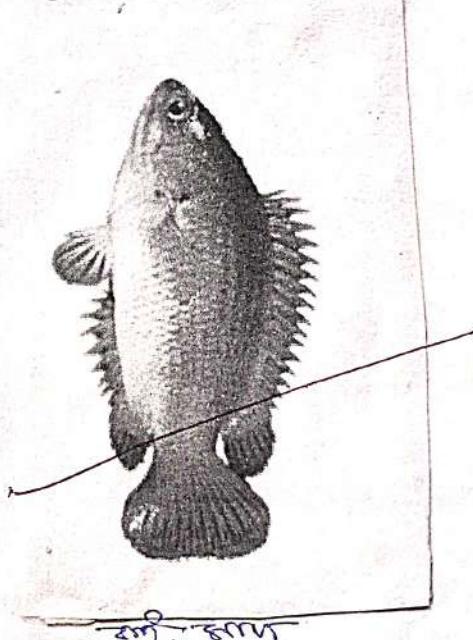
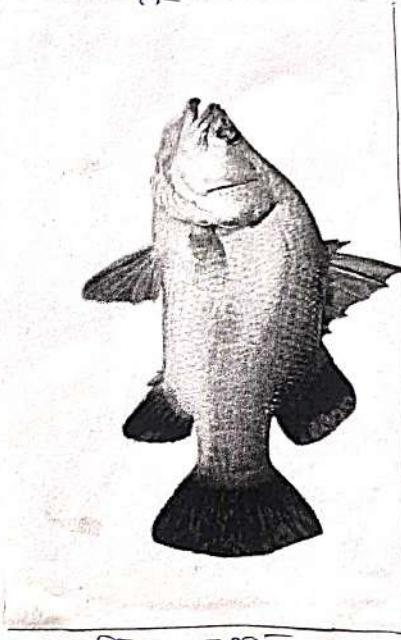
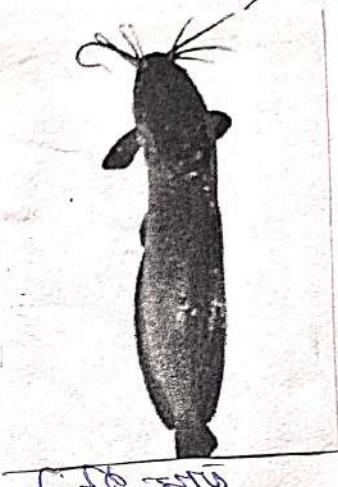
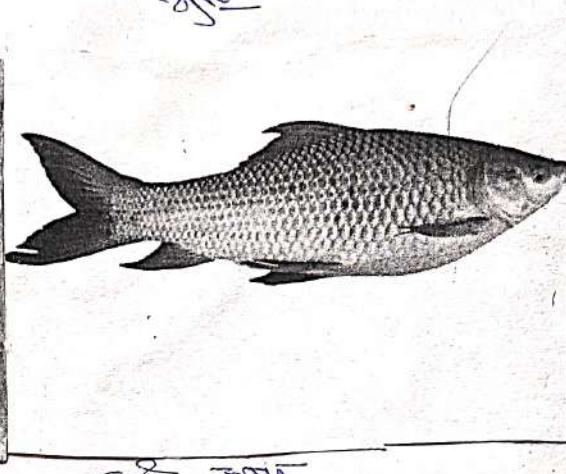
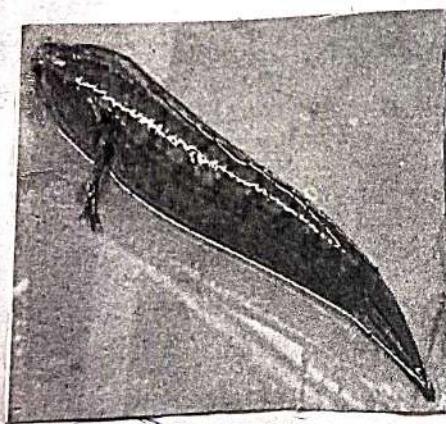
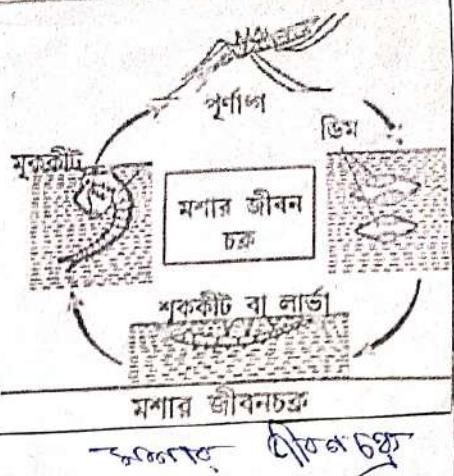
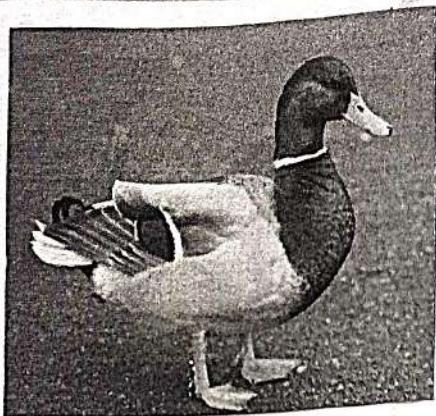
विकल्प	प्रारंभिक कारे किमी	प्रारंभिक कारे किमी	प्रारंभिक कारे किमी	प्रारंभिक कारे किमी
१) गंडा बांधना	प्रत्यक्ष और अप्रत्यक्ष सामग्री का समानांतर दृष्टि से देखना।	दृष्टि और सुनना। सामग्री, विद्युत, वात विनियोग की विवरण।	दृष्टि करना विद्युत, वात विनियोग	प्रारंभ
२) घटा बांधना	घटा	घटा (विद्युत)	घटा बांधना, विद्युत	प्रारंभ
३) गंडा बांधना	विद्युत, वात विनियोग	घटा बांधना	घटा बांधना वात विनियोग साथ साथ देखना।	प्रारंभिक
४) घटा बांधना	घटा बांधना विद्युत, वात विनियोग	घटा बांधना विद्युत, वात विनियोग विवरण साथ साथ देखना।	घटा बांधना विद्युत, वात विनियोग विवरण साथ साथ देखना।	प्रारंभ - विद्युत - वात - विनियोग
५) घटा	घटा	घटा बांधना विद्युत	घटा बांधना, विद्युत, वात विनियोग	प्रारंभ



प्रारंभिक कारे किमी

घटा

घटा



④ ଫ୍ରେଜାର୍ (Reference)

ମହାଦେଶୀରୁ ଏହି କାର୍ଯ୍ୟ ପରିପାଳନା କରିବାରେ ଅଧିକ ପ୍ରତିବନ୍ଦିତ ବ୍ୟାପକ ବିଷୟ ହେଉଥିଲା । କିମ୍ବା କିମ୍ବା ଏହି କାର୍ଯ୍ୟ କରିବାରେ ଅଧିକ ପ୍ରତିବନ୍ଦିତ ବ୍ୟାପକ ବିଷୟ ହେଉଥିଲା । ଏହି କାର୍ଯ୍ୟ କରିବାରେ ଅଧିକ ପ୍ରତିବନ୍ଦିତ ବ୍ୟାପକ ବିଷୟ ହେଉଥିଲା । ଏହି କାର୍ଯ୍ୟ କରିବାରେ ଅଧିକ ପ୍ରତିବନ୍ଦିତ ବ୍ୟାପକ ବିଷୟ ହେଉଥିଲା । ଏହି କାର୍ଯ୍ୟ କରିବାରେ ଅଧିକ ପ୍ରତିବନ୍ଦିତ ବ୍ୟାପକ ବିଷୟ ହେଉଥିଲା । ଏହି କାର୍ଯ୍ୟ କରିବାରେ ଅଧିକ ପ୍ରତିବନ୍ଦିତ ବ୍ୟାପକ ବିଷୟ ହେଉଥିଲା । ଏହି କାର୍ଯ୍ୟ କରିବାରେ ଅଧିକ ପ୍ରତିବନ୍ଦିତ ବ୍ୟାପକ ବିଷୟ ହେଉଥିଲା । ଏହି କାର୍ଯ୍ୟ କରିବାରେ ଅଧିକ ପ୍ରତିବନ୍ଦିତ ବ୍ୟାପକ ବିଷୟ ହେଉଥିଲା । ଏହି କାର୍ଯ୍ୟ କରିବାରେ ଅଧିକ ପ୍ରତିବନ୍ଦିତ ବ୍ୟାପକ ବିଷୟ ହେଉଥିଲା । ଏହି କାର୍ଯ୍ୟ କରିବାରେ ଅଧିକ ପ୍ରତିବନ୍ଦିତ ବ୍ୟାପକ ବିଷୟ ହେଉଥିଲା ।

⑤ ଅନ୍ୟାନ୍ୟ ଶର୍ତ୍ତାଙ୍କର (Limitation of the Study)

ଅନ୍ୟାନ୍ୟ ଶର୍ତ୍ତାଙ୍କର କାର୍ଯ୍ୟ କରିବାରେ ଅଧିକ ପ୍ରତିବନ୍ଦିତ ବ୍ୟାପକ ବିଷୟ ହେଉଥିଲା । ଏହି କାର୍ଯ୍ୟ କରିବାରେ ଅଧିକ ପ୍ରତିବନ୍ଦିତ ବ୍ୟାପକ ବିଷୟ ହେଉଥିଲା । ଏହି କାର୍ଯ୍ୟ କରିବାରେ ଅଧିକ ପ୍ରତିବନ୍ଦିତ ବ୍ୟାପକ ବିଷୟ ହେଉଥିଲା । ଏହି କାର୍ଯ୍ୟ କରିବାରେ ଅଧିକ ପ୍ରତିବନ୍ଦିତ ବ୍ୟାପକ ବିଷୟ ହେଉଥିଲା । ଏହି କାର୍ଯ୍ୟ କରିବାରେ ଅଧିକ ପ୍ରତିବନ୍ଦିତ ବ୍ୟାପକ ବିଷୟ ହେଉଥିଲା ।

⑥ ବାର୍ଗଣ୍ୟ (References)

- 1) ବିଦେଶୀ ବାର୍ଗ୍ - ବ୍ୟାପକ ବିଷୟ ସମ୍ବନ୍ଧ,
- 2) ବାର୍ଗ୍ - ବ୍ୟାପକ ବିଷୟ,
- 3) ବାର୍ଗ୍ - ବ୍ୟାପକ ବିଷୟ,

⑦ ଜ୍ଞାନକାରୀ ଧରଣ୍ୟ (Acknowledgement)

ଆମୁଡ଼ି ବିଷୟ / ବିଷୟକୁ ଆମିହାଙ୍କ ବିଜ୍ଞାନକାରୀ ଧରଣ୍ୟ

ଏହାକୁ ବିଜ୍ଞାନକାରୀ ଧରଣ୍ୟ କରିବାକୁ ଆମିହାଙ୍କ କମିଶନରେ କମିଶନରେ
ଏହାକୁ ବିଜ୍ଞାନକାରୀ ଧରଣ୍ୟ କରିବାକୁ ଆମିହାଙ୍କ କମିଶନରେ କମିଶନରେ
ଏହାକୁ ବିଜ୍ଞାନକାରୀ ଧରଣ୍ୟ କରିବାକୁ ଆମିହାଙ୍କ କମିଶନରେ କମିଶନରେ
ଏହାକୁ ବିଜ୍ଞାନକାରୀ ଧରଣ୍ୟ କରିବାକୁ ଆମିହାଙ୍କ କମିଶନରେ କମିଶନରେ

U.Ray
06.07.2023

CALCUTTA UNIVERSITY
BUDGE BUDGE COLLEGE

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REG. NO.: 561-1215-0205-22.

SUB: ENVS

PAPER: AECC - 2

SESSION: 2022 - 2023

TOPIC OF PROJECT: [Study of pond Ecosystem]

ଶ୍ରୀମଦ୍ଭଗବତ

ଶବ୍ଦମାଳା

୧. ପ୍ରାଣୀ
୨. ଅକ୍ଷର
୩. ଅକ୍ଷରର ପୂର୍ବମୁଖ
୪. ପ୍ରବଲ୍ଲାପ ଅକ୍ଷର
୫. ବନ୍ଦେ ପରିଚାଳନା
୬. ଯେ ଅନ୍ତର୍ଗତ
୭. ଯେ ବୈଜ୍ଞାନିକ
୮. ଅନୁଭବ
୯. ବନ୍ଦେ ପରିଚାଳନା
୧୦. ଅନୁମତି
୧୧. ବୃତ୍ତାନ୍ତ ଦ୍ୱାରା

ପୂର୍ଣ୍ଣାଙ୍କା

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পুরুষ বাল্মীকি

[Study of pond Ecosystem]

পুরুষ: অধিকার কীর্তন কৃতি জলাধূমী হল পুরুষ, এটি হল শ্রীকান্ত পুরুষ গানের ভেট্টাদেশ বাল্মীকি।
পুরুষ লক্ষণসমূহ এবং প্রচলিত বাচাইয়ান, পুরুষ
বচনবর্ণনা, শীর্ষস্থান এবং স্বরের স্বৰূপ শিখিয়ে
অনেক পুরুষের শর্করাতে এইটি ঘোষণা, পুরুষের পুরুষ
হল খৃষ্ণসম্মত পুরুষের কথা। কোর্ত পুরুষ,
পুরুষের বেদান, বেদান, কর্মান ও নৈশ্বর্যে
কৃষ্ণবর্ণ পুরুষের পুরুষ পুরুষ বাচাইয়ান?
গানের পুরুষ, কৃতি শীর্ষস্থান (কুওণ, কুণি,
কুণি দুর্মিত কুণি কুণি, কুণি কুণি; কুণি পুরুষ পুরুষ
কুণি, পুরুষ পুরুষ পুরুষ) এবং কৃতি শীর্ষস্থান (কুণি
কুণি, কুণি পুরুষ) - পুরুষের হল পুরুষ
শীর্ষস্থান অনন্ত পুরুষ পুরুষের কাঠ, পুরুষ
শীর্ষস্থান অনন্ত পুরুষ পুরুষ পুরুষ পুরুষ
কুণি পুরুষ পুরুষ পুরুষ পুরুষ পুরুষ পুরুষ
পুরুষ পুরুষ পুরুষ পুরুষ পুরুষ পুরুষ পুরুষ

ক্ষমতা: প্রাণপন্থের আন বর্ণ, কর্মান পুরুষ, কামত
কাম, ক্ষমতা পুরুষ হল অবশ্য এই পুরুষ
পুরুষ এবং পুরুষ কুণি হল, কুণি কুণি কুণি
পুরুষ এবং কুণি পুরুষ পুরুষ, পুরুষ পুরুষ
কুণি কুণি পুরুষ কুণি কুণি, কুণি পুরুষ পুরুষ
পুরুষ পুরুষ কুণি কুণি, কুণি পুরুষ পুরুষ, কুণি

ଗୋଟିଏ, ପ୍ରଥମ କେବଳିବା ମନ୍ଦିରର ପ୍ରତିକର୍ମ ହୁଏଥିବା
କଲ ଦ୍ୱାରିତ ହୁଏ ଏହି ସୁର୍ବେ ଯେତେ ଜାତାଧିକାରୀ ଭାଇରେ
କାତାଧିକାର କଜଳ ପ୍ରତିକର୍ମ ଏହି ଦ୍ୱାରିତ ହେଲା କାହାରେ
ଫେରାଯି ପରିଷକ ହୁଏ, ଅଧିକାରୀ କଜଳ କାଲାଶଚିତ୍ରର ଜୟ
ବେଶେ ହୁଏଥିବା କାହାରେ ବିକିତ ବିକିତ ହେଲା ଏହି
କାହାରେ ପ୍ରତିକର୍ମ କାହାରେ କାହାରେ ଓ କାହାରେ କାହାରେ

ବୋବକ୍ଷୁକ,

- ଅଧିକାରୀର ପ୍ରତିକର୍ମ : ଅନ୍ୟଧ୍ୟାର ଫେରାଯି ଦ୍ୱାରିତ କଜଳ ପରିଷକ
କେତେ ବେଶେ ବେଶେ କଜଳର ପରିଷକ କାହାରେ ଥିଲା, ଏବେ କାହାରେ
କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ

- ପ୍ରକାଶର ଉଦ୍‌ଦେଶ୍ୟ : 'ପ୍ରତିକର୍ମ କାହାରେ କାହାରେ କାହାରେ'
ବ୍ୟାଖ୍ୟାନି ହିଁ -

- (1) ପ୍ରତିକର୍ମ କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ
କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ
କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ
କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ
- (2) ପ୍ରତିକର୍ମ କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ
କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ
କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ କାହାରେ

(3) ଦେଖିଯାଏ ମୁହଁରର ଅଧିକିତ୍ତ ପ୍ରକାଶ କାହାର କାଳ ପ୍ରତିକି
ବାନ୍ଧିଲେ କ୍ଷେତ୍ରରେ ବନ୍ଦ,

ସମ୍ବନ୍ଧିତ ବିଷୟରେ : ପ୍ରଥମ ଗୋବର କିଛିବା / କୀ

- ଏ ଅନ୍ତର୍ଭାବରେ ମୁହଁରର ବାନ୍ଧିଲେ ପରିମାଣ
ପ୍ରକାଶରେ ବନ୍ଦିତ ବାନ୍ଧିଲେ, ଏବଂ କେବଳ ମୁହଁରର ବାନ୍ଧିଲେ
ଗୋବର କାଳରେ ବନ୍ଦିତ ଏବଂ ମୁହଁରର ବାନ୍ଧିଲେ
ପରିମାଣ ହଜାର, ତାଙ୍କ ଲିଙ୍ଗରେ ମୁହଁରର ବାନ୍ଧିଲେ
ପରିମାଣ, ବାନ୍ଧିଲେ କାଳରେ କାଳରେ, ଏବଂ କାଳରେ
ଅତିଲାଭ୍ୟାସ କାରାର, ଗୋବର କାଳରେ ଉତ୍ତର କାରାର
ବାନ୍ଧିଲେ, ମୁହଁରର କାଳରେ କୌଣସି କାଳରେ ମୁହଁରର
କାଳରେ ଏବଂ ମୁହଁରର କାଳରେ କୌଣସି କାଳରେ ମୁହଁରର
କାଳରେ ଏବଂ ମୁହଁରର କାଳରେ କୌଣସି କାଳରେ ମୁହଁରର
କାଳରେ, ଗୋବର କାଳରେ ପ୍ରାଚୀରେ ଗୋବର କାଳରେ
ଅତିଲାଭ୍ୟାସ କାରାର କାଳରେ ପ୍ରାଚୀରେ କାଳରେ ଏବଂ
କାଳରେ ଆଶ୍ୟକ କାଳରେ ଏବଂ କାଳରେ ମୁହଁରର କାଳରେ
କାଳରେ ଏବଂ ମୁହଁରର କାଳରେ କୌଣସି କାଳରେ ମୁହଁରର
କାଳରେ ଏବଂ ମୁହଁରର କାଳରେ କୌଣସି କାଳରେ ମୁହଁରର
କାଳରେ, ଏବଂ ମୁହଁରର କାଳରେ କୌଣସି କାଳରେ,
ଗୋବର କାଳରେ ଏବଂ ମୁହଁରର କାଳରେ

୬୨୫ ୩୦୩୧ :

- ୧) ପୁରୁଷ ହାତାଳ୍ପିର ନାମ :- ଚନ୍ଦ୍ରକୁମାର ପାତ୍ର
- ୨) ଅବସ୍ଥା :- ଶ୍ରୀମତୀ ପର୍ବତୀ ପାତ୍ର
- ୩) ଅଧ୍ୟକ୍ଷଣର ଅବଶ୍ୟକତା :- ପରିଷଳା
- ୪) ଅଧ୍ୟକ୍ଷଣର ତାରିଖ :- ୨୦/୫/୨୦୨୩
- ୫) ଭାଇର ବାହ୍ୟର ଠିକ୍କିର ନାମ, ଜ୍ଯାତିଯାତ୍ମା, ବିଲାସ :
- ୬) ଭାଇର ବାହ୍ୟର ଠିକ୍କିର ନାମ, ଜ୍ଯାତିଯାତ୍ମା, ବିଲାସ :
- ୭) ଭାଇର ବାହ୍ୟର ଠିକ୍କିର ନାମ, ଜ୍ଯାତିଯାତ୍ମା, ବିଲାସ :
- ୮) ପାଲି :- ଚନ୍ଦ୍ରକୁମାର, ଲକ୍ଷ୍ମୀ, ପାତ୍ର, ପାତ୍ରକାଳୀ, କାନ୍ତାଳ,
- ୯) ପ୍ରେରଣାବଳୀ :- କ୍ଷେତ୍ର ପାତ୍ରକାଳୀ, ପାତ୍ରକାଳୀ, ପାତ୍ରକାଳୀ,
- ୧୦) ପାଲି :- କ୍ଷେତ୍ର ପାତ୍ରକାଳୀ, ପାତ୍ରକାଳୀ, ପାତ୍ରକାଳୀ,
- ୧୧) ଶ୍ରୀ ବୈଜ୍ଞାନିକ : ଅଂଶୁରାଜ ପାତ୍ର ଏହି ପାତ୍ରକାଳୀ ପାତ୍ରକାଳୀ ବାହ୍ୟର ଠିକ୍କିର ନାମ ଏହି ପାତ୍ରକାଳୀ ପାତ୍ରକାଳୀ ଏହି -
- କ୍ଷେତ୍ର ପାତ୍ରକାଳୀ ଏହି ଏହି ଏହି ଏହି ଏହି ଏହି
- ଏହି ଏହି ଏହି ଏହି ଏହି ଏହି ଏହି ଏହି ଏହି
କ୍ଷେତ୍ର ପାତ୍ରକାଳୀ ଏହି ଏହି ଏହି ଏହି ଏହି ଏହି
ଏହି - କ୍ଷେତ୍ର ପାତ୍ରକାଳୀ, କ୍ଷେତ୍ର ପାତ୍ରକାଳୀ, କ୍ଷେତ୍ର ପାତ୍ରକାଳୀ,
ପାତ୍ରକାଳୀ ଏହି ଏହି, ଏହି ଏହି, ଏହି ଏହି, ଏହି ଏହି
ଏହି ଏହି ଏହି ଏହି ଏହି ଏହି ଏହି ଏହି ଏହି ଏହି
ଏହି ଏହି ଏହି ଏହି ଏହି ଏହି ଏହି ଏହି ଏହି

ପ୍ରାଣୀର ନାମ	ଶ୍ଵାସ ପତ୍ର	ପ୍ରାଣ ଟେକ୍	ଫୋଟୋ	ଜୀବିତରେ ଯାଏ ଅଧିକାରୀ ହୋଇଥାଏ
୧) ଶୁଣ୍ଡ ମାଛ	ଶୁଣ୍ଡରଣ, ସୁନ୍ଦରାଳୀ ଶୁଣ୍ଡର ଉଚ୍ଚିତର ବାତୁ ଆବଳ କାର	ଶୁଣ୍ଡ ଓ ଲିଙ୍ଗାର୍ଡ ମାରା, ପ୍ରାତି, ମଟିଳ ଓ ଶ୍ରୀମତୀ	ଶୁଣ୍ଡ (ମାରା) ଶୁଣ୍ଡରାଳା, ଶୁଣ୍ଡ ବାତୁ,	୨୫ଟା
୨) ଶୁଣ୍ଡର ଚଂପା	ଶୁଣ୍ଡରାଳା	ଶୁଣ୍ଡର ଚଂପା	ଶୁଣ୍ଡ (ମାରା, ଶୁଣ୍ଡରାଳା)	୨୫ଟା
୩) ବ୍ୟାଙ୍ଗ	ବ୍ୟାଙ୍ଗର, ଶୁଣ୍ଡରାଳା	ଶୁଣ୍ଡର ଚଂପା	ଶୁଣ୍ଡ ଚଂପା ଏବଂ ନାନା ବ୍ୟାଙ୍ଗ ପାଇଁ	୨୫ଟା, ଶୁଣ୍ଡରାଳା.
୪) ଶକ୍ରା	ଶକ୍ରା ଓ ପିଣ୍ଡରା ଶକ୍ରାର କାରିକାନ ଶକ୍ରା ଅନ୍ଧାର ଶକ୍ରାରାଳୀ ଚାଲା	ଶକ୍ରାର କାରିକାନ ଶକ୍ରାରାଳୀ ଅନ୍ଧାର ଏବଂ ଶକ୍ରାରାଳୀ ଚାଲା ଶକ୍ରାର କାରିକାନ ଶକ୍ରାରାଳୀ	ଶକ୍ରାର କାରିକାନ ଏବଂ ଶକ୍ରାରାଳୀ ଶକ୍ରାର ଏବଂ ଶକ୍ରାରାଳୀ ଶକ୍ରାର ଏବଂ ଶକ୍ରାରାଳୀ	୨୫ଟା, ଶକ୍ରାରାଳୀ
୫) ଶ୍ରଦ୍ଧା	ଶ୍ରଦ୍ଧାରାଳା	ଶ୍ରଦ୍ଧାରା ଶ୍ରଦ୍ଧାରାଳା	ଶ୍ରଦ୍ଧାରା, ଶ୍ରଦ୍ଧା ଶ୍ରଦ୍ଧାରାଳା	୨୫ଟା

ଅନୁଭବ : ଅନ୍ଧାର ଶକ୍ରା ଓ ପ୍ରାଣୀର ବିଶେଷ ଅଧିକାରୀ ହୋଇଥାଏ ବାତୁ କେବଳ ଅନ୍ଧାର ଏବଂ ଶକ୍ରା ହେଉଥିବା ନାହିଁ, ବୁଝାଏ
କେବାହି ପାଇଁ ଜୀବ ପରିପାରର କେବଳ ବିଶେଷକାରୀ, କୌଣସି
କୌଣସି ଜୀବାକୁ ବିଶେଷ ଶରୀର ବାତୁ ବାତୁ କେବଳ ଅନ୍ଧାର ଏବଂ ଶକ୍ରା କେବଳ
ଶକ୍ରା ଏବଂ ଜୀବାକୁ ବିଶେଷ ପାଇଁ ଏହି ପ୍ରକାରି ଓ ଅନ୍ତର
ଅନ୍ତରିକ୍ଷର ବିଶେଷ ଜୀବାକୁ ଏକାକୀ ବାରପାରିକି କେବଳ -
ପ୍ରସ୍ତୁତି କାହାର କେବଳ ଏହି ପ୍ରାଣୀର ବିଶେଷ ବାତୁ
ବାତୁ କାହାର ବାତୁ ଏହି ବାତୁ କାହାର ବାତୁ,
ବାତୁ କାହାର ବାତୁ ଏହି ବାତୁ କାହାର ବାତୁ,
ବାତୁ କାହାର ବାତୁ ଏହି ବାତୁ କାହାର ବାତୁ,

কর্তৃপক্ষের জীবনায় কীভাবে হতা : পুরুষের বন্ধুত্ব সম্বোধনের জন্ম
অঙ্গে জীবের জীবনের বস্তা অন্তর দূর্ঘ ও প্রেরণ না,
গৃহের জীবনের বন্ধুত্ব সম্বোধন শৈশবের পুরুষ
বৈয়োজন সম্ভুত সম্বোধন বস্তা দূর্ঘ, কুসুমে
এই বন্ধুত্বে লেনা পৈয়োজনের সম্ভোধন বস্তা
পারিন, বলেন ফুর বস্তা অঙ্গে এবং একটি পুরুষ
জীবে বন্ধুত্ব অঙ্গে অঙ্গের বিনোদ পাওয়া যায়না,
এইটি জীবনের বন্ধুত্ব কীভাবে হতা, প্রতিশ্রুতি, প্রক্ষেপ
বন্ধুত্ব যে প্রযোজনের কারণে হচ্ছে গোপনীয়,
শুধু সম্ভুত চৈত্তীকণ, বস্তা অঙ্গ দূর্ঘন,

ক) প্রাণুপাদ্রী :

- 1) 'পরিবেশ কীভাবে' — কে জীবনের কীভাবে আছে,
- 2) আচ এ. : পরিবেশ কীভাবে,
- 3) জীবের পরিজ্ঞান সূচিটি — আর, প্রেরণ, আড়ে,
- 4) পরিবেশ পরিজ্ঞান — এস. প্রি. আরে,

କୁଣ୍ଡଳତା ଜୀବନ : ମୁଖ୍ୟର ରାଶିକ ପର୍ଯ୍ୟନ୍ତ ପ୍ରସରିତ
କୁଣ୍ଡଳର ବନ୍ଦର ଜଳ ପେଟାଦ୍ୱାରା ବଣିତାରେ ଆଧୁନିକ
ପରିବହନ ଗେତ୍ରାଷ୍ଟ୍ର କିଞ୍ଚିତର ବାହୁ ମୁଣ୍ଡ ପେଟା
ଆମ୍ବାଯ୍ ପାର୍ଶ୍ଵରେ, ଓବାର ଆମ୍ବାଯ୍ ଛାତ୍ରୀ ଏହି ପ୍ରକଳ୍ପର
କୁଣ୍ଡଳର ବନ୍ଦ୍ୟ ଅନ୍ତରମର ହେତୁ ନା, ସିଂଧୁବାନ ଜନାମ୍ଭ ଦ୍ଵାରା
କୁଣ୍ଡଳର ବାରୀ ମୁହଁରୀର ଦ୍ୱିତୀୟତ୍ତୁ ବାହୁର କାଳୀ
ଆର୍ଥିକ ଆମ୍ବାଯ୍ ବନ୍ଦ୍ୟର ।

U.R.C
05.07.2023

UNIVERSITY OF CALCUTTA
BUDGE BUDGE COLLEGE
SEMESTER → 2nd
B.Sc GEOGRAPHY HONOURS

REGISTRATION NO. - 561-1215-0315-22

ROLL NO. - 223561-11-0057

SUBJECT - ENVS

YEAR - 2023

TOPIC - ECOSYSTEM OF POND

ମୁକୁଟରେ ବାଧ୍ୟତା

ପ୍ରେମିକା (Introduction) :- ଅନୁକୂଳ ପାନ୍ଦିରେକୋର ଅନୁହାତ୍ୟେ ପ୍ରମିଲୀଏ ହେଲେ ଯୁଗର କୋଣୋ ଜୀବଜୋଷୀ ଫ୍ଲାକ୍‌ରିକ୍ଟାରେ ବୈଚା ଥାକେ, ତାକେ ପ୍ରାକୃତିକ ବାଜାରମି ଏଲେ, ପାନ୍ଦିରେକୋର ଅଳ୍ପ ପ୍ରାକୃତିକ ପାନ୍ଦିରେକୋର ଏକଟି ଶୁଭ୍ରପୂର୍ବ ଅନ୍ତର୍କାଳ ଆଚାର, Limnology ନାମକ ବିଜ୍ଞାନ ମିଥି ଉଲ୍ଲେଖ ପ୍ରାକୃତିକ ଲାଭିବେଳେ ନିମ୍ନେ ଆଲୋଚନା କରୁଥିଥୁ, ଆବଶ୍ୟକ ଜଳେର ପ୍ରାକୃତିକ ବାଜାରମି ବା ଲେମଟିକ ରୂପରେ ଏକ ଏକଟି ଶୁଭ୍ର ଉତ୍ସବରୂପ ରହ ପାରେ । ମୁକୁଟରେ ହେଲ ନାନାପ୍ରକାର ଉତ୍ସବ ଓ ସମ୍ମାନ ବାଜାରାନ, ମିଥି ଏକାକୀ ଅଛୀଦିତ ଏବଂ ଜୀବଜ ଉତ୍ସବରୀ ଏକ ଅନ୍ତର୍ଭାବ ଅଳ୍ପ ବିକ୍ରିଯିତ କିମ୍ବା ଏକଟି ବାଧ୍ୟତା ଶାନ୍ତି କରୁଥିଲେ, ମୁକୁଟରେ ବାଧ୍ୟତା ହେଲ ପ୍ରକାର ପ୍ରମାଣିତ ବାଧ୍ୟତା, ମୁକୁଟରେ ଏକଟି ଝୁଲିଦିପ୍ତ ମାନ୍ୟବୃକ୍ଷମଳୀ ଦେଖିବା ଯାଏ, ମାନ୍ୟବୃକ୍ଷମଳୀ ଉତ୍ସବରେ ରଖାଇ ତିନ ହରାନ୍ତରେ ଜୀବ ଦେଖିବା ଯାଏ, ସାଥୀ -ତେ ପାଦକାଳ ମାନ୍ୟ ଏବଂ ବିଶ୍ୱାଦକେ,

ଅନ୍ତର୍ଜ୍ଞାନ (Problems) :- ପ୍ରାମେ ମୁକୁଟରେ ଶୁଭ୍ରପୂର୍ବ ଅନ୍ତର୍ଜ୍ଞାନ, କରୁଣ ମୁକୁଟରେ ଉଲ୍ଲେଖ ମୂଳ, କାମିକ କାମାକାରୀ ମାତ୍ରା ଉଲ୍ଲେଖ କରୁଥିଲେ, କିନ୍ତୁ ମୁକୁଟରେ ଉଲ୍ଲେଖ ଉଲ୍ଲେଖିତିପକ୍ଷର ମୂଳ, ଆବଶ୍ୟକ ଜୀବକ୍ଷେତ୍ରର ସମଧନ କରୁଥିଲେ, କିନ୍ତୁ ମୁକୁଟରେ ଉଲ୍ଲେଖ ଉଲ୍ଲେଖିତିପକ୍ଷର ମୂଳ, ଆବଶ୍ୟକ ଜୀବକ୍ଷେତ୍ରର ଅବ୍ୟକ୍ତି କାଳିତ କାମାକାରୀ ଉଲ୍ଲେଖ ମୁକୁଟରେ ବାଧ୍ୟତାକୁ ଶୁଭ୍ର କରେ ଦିଲ୍ଲେ, ଯା ଏହାକିମିତିର ଉତ୍ସବାମ୍ବାଦିକେ ମିଥି କରେଥିଲେ । ଅଥ ମୁକୁଟରେ ବାଧ୍ୟତାକୁ ନାନାପ୍ରକାର ନାନାପ୍ରକାର କରୁଥିଲେ କରୁଥିଲେ କରୁଥିଲେ

ଉଦ୍ଦେଶ୍ୟ (Objectives) :-

- ୧) ଅରେ ମୁକୁଟରେ କି କି ଉତ୍ସବ ଓ ସମ୍ମାନ ଆବଶ୍ୟକ ତଥା ନାମ ନିର୍ଦ୍ଦିଷ୍ଟ କରୁଥିଲୁଛି
- ୨) ଉତ୍ସବରେ ବାଜାରମାନ ନିର୍ଦ୍ଦିଷ୍ଟ କରୁଥିଲୁଛି,
- ୩) ସମ୍ମାନରେ ଶ୍ଵାମାର୍ଗୀ, ମମନାର୍ଗୀ ଅବ୍ୟକ୍ତ ମାନ୍ୟ ନିର୍ଦ୍ଦିଷ୍ଟ କରୁଥିଲୁଛି,
- ୪) ମୁକୁଟରେ ଉଲ୍ଲେଖ କୋଣଜେବେ ପ୍ରମାଣିତ ହାତେ କିମା ଅବ୍ୟକ୍ତ ନିର୍ଦ୍ଦିଷ୍ଟ କରୁଥିଲୁଛି,
- ୫) କାର୍ଯ୍ୟରେ ପ୍ରମାଣ ନାମିରେ କରୁଥିଲୁଛି କରୁଥିଲୁଛି ଅବ୍ୟକ୍ତ ନିର୍ଦ୍ଦିଷ୍ଟ କରୁଥିଲୁଛି,

ଜାତୀୟ ଅନ୍ତର୍ଜ୍ଞାନ ଟୋଳୋଲିକ ଅଧ୍ୟାତ୍ମ (Location & Study Area) :-

- ୧) ମୁକୁଟରେ ନାମଃ ଚନ୍ଦ୍ରମାତ୍ରି ଦେଇ ମୁକୁଟ
- ୨) ମୁକୁଟରେ ଅଧ୍ୟାତ୍ମ (ପ୍ରାମ ଏ ପୌରାଜଙ୍ଗେ ନାମ) : ବଜାରା ପୌରାଜଙ୍ଗ
- ୩) ଦୂରସ୍ଥ (କାନ୍ଦି ଥିଲେ ରହିବାର ଅନ୍ତର୍ବିଦ୍ୟୁତ ଦୂରସ୍ଥ) : 10 ମିନିଟ୍

তথ্যগুরুত্বপূর্ণ পদ্ধতি (Methods of Data Collection):-

- ① প্রাইভেলি তথ্যসংগ্রহ :- আমি অন্তর্ভুক্ত মধ্যে নিচের
 পুরুষের সাথে বিজ্ঞ তথ্যসংগ্রহ করে নেওয়ার
 হোম প্রোফালাম। ক্ষেত্রের জাহানে বিজ্ঞ উপর ও প্রাণীর দ্বি
 তীক্ষ্ণাম, পুরুষের জন্ম স্বাক্ষর জন্ম সংগ্রহ করে কলেজ এবং শিল্পের
 প্রশ্ন জারুরোফ্ফা এবং বিজ্ঞ যন্ত্রণাতে জাহানে জন্ম স্বাক্ষর
 স্বীকৃতি করে বিজ্ঞ তথ্যসংগ্রহ করুন।
- ② ক্রেকেটারি তথ্যসংগ্রহ :- বিজ্ঞ বছো ও পরিষৎ থেকে প্রচলী ৩
 উপরের বিজ্ঞ গ্র্যাফ্টের ক্রেকেটারি তথ্যসংগ্রহ করেছি।

ফলাফল (Results) :-

Table : 1

উপরের নাম	ব্যবহার	মান্যবৃত্তির অবস্থা
A. শাহীন :		
১. বেস্টেল্যান্ডের (১) ক্রান্তী	চলের মধ্যে	ক্ষেপণ
B. শ্যামো :		
১. শুকানি ২. বলমি ৩. শালুক ৪. কুরমি	চলের ধারে চলের ধারে গাঢ়ির জন্ম জন্ম অসমান	ক্ষেপণ ক্ষেপণ ক্ষেপণ ক্ষেপণ

পুরুষের জন্মের উপর যেকে প্রত্যয় ক্ষেপণ তথ্যসংগ্রহ করে প্রোগ্র-
 ামিক জাহানে মান্য ক্ষেপণ করে। জন্ম কীভাবে হৃদয়ে প্রোগ্রামে
 দৃঢ়ি মান্য করে এবং তারে তারে শাহীন জন্ম কীভাবে হৃ-
 দুলিকে মান্য বিশেষ প্রক্রিয়া করে, পুরুষের জন্ম ৫ বছোরের প্রোগ্রামে
 রক্ষণ্যুক্তিজ্ঞাম, মাত্র মধ্যে প্রতিক্রিয়া জাহানে প্রোগ্রামের জাহানে চিহ্নিত
 করেছিলাম, বাকিটুলি মাত্র জন্মে দুর্ভাগ্যে প্রোগ্রামের, মাত্র মধ্যে

କିମ୍ବୁ ତାଣୁ ଡଳେର ସାଥେ ବନ୍ଦୋମ କରେ, ଆବଶ୍ୟକ କିମ୍ବୁ ତାଣୁ ଡଳେଟ ଜୟେଷ୍ଠେ
ବନ୍ଦୋମ କରିଛି। ଡାକ୍ଟରମ ମାତ୍ରେ ମହିନ୍ୟ ହିଂଜେ ସ୍ଵର୍ଗତ ହୃଦୟ ପ୍ରସ୍ତୁତ ହୁଏ ଏବଂ ବଢ଼େ
ଆହୁତିଲି ଡଳେ DO (Dissolve Oxygen) - ମୁଣ୍ଡ ଫଳ ବଜାୟେ ରଖିଥିଲା। ତା ହୃଦୟ
ଓରେ ଗାଢ଼େ କିମ୍ବୁ ଡଳେଟ ପତଙ୍ଗେରେ ବାଜାୟିଲା,

Table : 2

ପ୍ରକାର ନାମ	ବାତମ୍ବାନ	ମାନ୍ୟମାନଙ୍କରେ ଅଧିକ
A. ମାହୀରେ- 1. ହୃଦୟବ୍ୟକ୍ତିନ (a) ଚାରିନିଧି (b) ଆହୁତିଲି (c) ମାହୀରିତ (d) ମଧ୍ୟା	ଡଳେଟ ମର୍ମ୍ୟ ଡଳେର ମର୍ମ୍ୟ ଡଳେର ରତ୍ନ ଡଳେର ମର୍ମ୍ୟ	ମାନ୍ୟମାନ ମାନ୍ୟ ମାନ୍ୟମାନ ମାନ୍ୟ ମାନ୍ୟମାନ ମାନ୍ୟ ମାନ୍ୟମାନ ମାନ୍ୟ
B. ଧ୍ୟାନେ- 1. ଦେବକାମାରତ୍ନ (a) ଡଳେର ଶାରତ୍ତ୍ଵା (b) ଚିତ୍ତି 2. ରମାଲାଞ୍ଛା (a) କାନ୍ତୁ ୨୬ (b) କିମ୍ବୁ 3. ମାତ୍ର (a) ପ୍ରୀତି ମାତ୍ର (b) ମୌର୍ଯ୍ୟ ମାତ୍ର (c) ରତ୍ନକଣ୍ଠ ମାତ୍ର (d) ବୁଝ ମାତ୍ର (e) କୁଳନ ମାତ୍ର (f) କୋଳ ମାତ୍ର 4. ଅୟମିନିନିଧି (a) ଦ୍ୱାରୁ	ଡଳେର ସାଥେ ମାନ୍ୟମାନର ମର୍ମ୍ୟ ଡଳେଟ ତଳେ ମାହୀର ରତ୍ନ ଜାହିର କଣ୍ଠ ତଳିଟିର ମର୍ମ୍ୟ	ମାନ୍ୟମାନ ମାନ୍ୟ ମାନ୍ୟମାନ ମାନ୍ୟ ମାନ୍ୟମାନ ମାନ୍ୟ ମାନ୍ୟମାନ ମାନ୍ୟ
	ଡଳେର ଡେବକାମାରତ୍ନ ଡଳେର ଡେବକାମାରତ୍ନ ଡଳେର ଡେବକାମାରତ୍ନ ଡଳେଟ ମର୍ମ୍ୟରତ୍ନ ଡଳେର ନିମ୍ନରତ୍ନ ଡଳେର ଡେବ କାନ୍ତୁ ମର୍ମ୍ୟ	ମାନ୍ୟମାନ ମାନ୍ୟ ମାନ୍ୟମାନ ମାନ୍ୟ ମାନ୍ୟମାନ ମାନ୍ୟ ମାନ୍ୟମାନ ମାନ୍ୟ ମାନ୍ୟମାନ ମାନ୍ୟ ମାନ୍ୟମାନ ମାନ୍ୟ ଦ୍ୱାରୁ ଅନ୍ତିମ ମାନ୍ୟ
	ଡଳେର ସାଥେ	ଦ୍ୱାରୁ ଅନ୍ତିମ ମାନ୍ୟ

ପ୍ରାଣୀର ନାମ	ବାଯସ୍ୟତ	ମାନ୍ୟକୁଳରେ ଅବ୍ୟାହ
୧. ଡ୍ରାପିଟିଲ୍ୟୁ	ଜଳେର ବାବୁ	ତୃତୀୟ ଶାଖିର ମାନ୍ୟ
(a) ମାଳ (ଜଳଟୋହା)		
୨. ଗାନ୍ଧି	ପ୍ରକୃତେ ଲାକ୍ଷ - ଲାକ୍ଷ ଜଳ	ତୃତୀୟ ଆଶ୍ରିତ ମାନ୍ୟ
(a) ମାଟୁରାଙ୍ଗ		
(b) ଛାଂଜ	ପ୍ରକୃତେ ଜଳ ଜଗମାନ	ତୃତୀୟ ଆଶ୍ରିତ ମାନ୍ୟ

ପ୍ରକୃତେ ତଳେ ୧୩ ଟି ମୁଖ୍ୟମିର ମାନ୍ୟ; ଏ ଲି ତୃତୀୟ ଉଦ୍ଦିଷ୍ଟ ମାନ୍ୟ
କେବୁ ୨ ଟି ତୃତୀୟ ମାନ୍ୟ ମାନ୍ୟ ବର୍ତ୍ତମାନ। ପରଦର୍ଶ ସାମାଜିକ ପ୍ରକାଶ ଇତ୍ତାପାରେ
Niche ଆଳାଦା ଅଥେ ପରଦର୍ଶ ମର୍ଯ୍ୟ ଜୋଣ ମର୍ଗମର୍ମିତର ମୋର ବାଧ୍ୟନି।

Table : 3

ପ୍ରାଣୀର ନାମ	ଗମନାଳୀ	ପ୍ରାଣିକେ	ମାନ୍ୟ
୧. ପୁରୁଷ ମାନ୍ୟ	ମାଧ୍ୟମ	ମୁଳକା	ଅକ୍ଷେତ୍ରମ୍ଭ୍ୟାକ୍ଷରେ କେବୁ କୁଳମ୍ଭ୍ୟାକ୍ଷରେ
୨. ଚିତ୍ତି	କଳ କଳାଳୀ	ମୁଳକା	ଅକ୍ଷେତ୍ରମ୍ଭ୍ୟାକ୍ଷରେ କେବୁ କୁଳମ୍ଭ୍ୟାକ୍ଷରେ
୩. ବୋଲ ମାନ୍ୟ	ମାଧ୍ୟମ	ମୁଳକା	କେବୁ କେବୁ କୁଳମ୍ଭ୍ୟାକ୍ଷରେ
୪. ଏଟ୍ୟ	ଲିଙ୍ଗମା	ମୁଳକା	କୀଳାଳୀ
୫. ମାଟୁରାଙ୍ଗ	ମାଧ୍ୟମ	ମୁଳକା	କେବୁ ମାନ୍ୟ
୬. ହୀମ	ଲିଙ୍ଗମା	ମୁଳକା	କେବୁ ମୁଲି

ତଳେ ଟାଟିଲେ ଦ୍ୱାରା କେବୁ କ୍ୟ ମିଡିଲ୍ ପ୍ରାଣୀର ଗମନାଳୀ
ଆଳାଦା, ମେମନ-କର୍ମତ ମାଧ୍ୟମ, ଆବ୍ୟ କର୍ମତ ଲିଙ୍ଗମା, ଆବ୍ୟ
କର୍ମତେଷ୍ଟ କଳ କଳାଳୀ, କେବୁ ପ୍ରାଣୀର ହୀମ ଅର୍ପି ମୁଳକା ଅର୍ପି
କର୍ମତ ମୁଳକା, କେବୁ ତୁମ୍ଭ୍ୟାକ୍ଷରେ ମାନ୍ୟ, ଆବ୍ୟକ୍ଷେତ୍ର କୀଳାଳୀ ମାନ୍ୟ

ଧୀର୍ଜ ନିମ୍ନ ଦେଖାଇଲୁ ପାଞ୍ଚଟା ଟଙ୍କା ପୁଣ୍ଡରେ ତାର୍କ ପୁଣ୍ଡରେ
ଜାଳ ବାପ୍ତ କଣ୍ଠରେ, ଆହୁତି ୫-୬ ଟଙ୍କା ପୁଣ୍ଡରେ ତାର୍କ ଅନ୍ତରେ ଦୋଷରେ
ତର୍କମଳରେ ପୁଣ୍ଡରେ ଜାଳ ଧ୍ୱାନ କରାଯାଇଥାଏ। ଅନ୍ତରେ କର୍ମ୍ୟକରନେ ତାର୍କ
ଅନ୍ତରେ ଉଚ୍ଛିତ ବ୍ୟାପାର ପାଞ୍ଚଟା, ଥାଳେ ବିଶ୍ଵି ଚିକାଳ ଛୁଅନ୍ତି ପାରାର୍
ଦୂରେ ତର୍କରେ ପୁଣ୍ଡରେ ଜାଳ ମିଳେ ପୁଣ୍ଡରେ ଜାଳ ଦୂରେ ଥିଲା ୨୨,

ଆଜୋଚନ (Discussion):- ପୁଣ୍ଡରେ ବାପ୍ତରେ ତାର୍କ ପରିବାର ବାପ୍ତ
ଅନ୍ତରେ, ଏହି ବାପ୍ତରେ ପୁଣ୍ଡରେ ଅମାର୍ତ୍ତ ଅନ୍ତରେ
ପ୍ରେରଣ, ଉଚ୍ଛିତରେ କାନ୍ଧିରେ ମାରନ କରେ ଥାର୍କ ଡେପଳ କରେ, ମା
ମୂରମ କାନ୍ଧିରେ ମାରନ କରେ, କୁର୍ରି ମୂରମ କାନ୍ଧିରେ ମାରନକରେ ଦ୍ଵିତୀୟ
କାନ୍ଧିରେ ମାରନ କରେ ଥାର୍କ ହିଆବେ ଗରନ କରେ, ଆହୁତି ଦୂରୀତ୍ୟ କାନ୍ଧିର ଥାର୍କ
ଦ୍ଵିତୀୟ କାନ୍ଧିରେ-ଥାର୍କ ହିଜାବେ ଗରନ କରେ ଏବଂ ପୁରୁଷ ଦୁଇତ୍ୟ
ଅମାର୍ତ୍ତକୁହିମଳ ତାନେ କରେତେ ଯାପୁଣ୍ଡରେ ବାପ୍ତରେ ଅମାର୍ତ୍ତ
କୁହାନ ଦୁଇ କରେତେ। କିନ୍ତୁ ଶ୍ରୀପାତାଜାନେ ଏଥିନ ପୁଣ୍ଡରେ ଜଳ କରିବୁ ହେଁ,
ଅନ୍ତରେ ବିଭିନ୍ନ କାନ୍ଧିରେ ଜଳ ଦୂରୀତ୍ୟ କରେ ପଣ୍ଡିତ ଅଧ୍ୟାତ୍ମାରେ ହେଁ
ପଢ଼ୁ । ମୁଁ ମନେ ଆହୁତି ପୁଣ୍ଡରେ ଜଳେଇ ତୁଳର ନିର୍ଭବଶିଳ ଅନନ୍ତରେ ଧୂର
ହୁଏ ହୁଏ । ତାରେ ଶାମେରେ ଲୋକେଦେବୁ ଜଳେ କରେ ପୁରାଣେ କରେ ଧୂରିବିଲେ
ମିହି ଜଳେଇ ପଢ଼ିମାନ ପ୍ରିୟେ ପ୍ରିୟେ କାମ ମାତ୍ରେ; ଏହିନେଇ ଜଳେକେ ମହିନାର
ଶୁଦ୍ଧ ଶୁଦ୍ଧ ଜଳେଇ ପରି ଏହି ଜଳ ମାତ୍ର ଦୂରିତ ମା ହୁଏ ଦେଖିବିଲେ ଲକ୍ଷ୍ୟ
ବୁଝିବା ହେଁ ।

ପ୍ରାମାଣ୍ୟ (Suggestion) :-

- ୧) ଶାମେରେ କାନ୍ଧିରେ କରିବାରେ ଛାଇ ପୁଣ୍ଡରେ ଆଜି ଜଳମୁଖେକଟେଟେ—
ମାନେ, ତାରେ ଅନ୍ତରେ କରିବା ପାରିବା ନା,
- ୨) ବରଷାରେ ପୁଣ୍ଡରେ ଜଳେ ଶୁଦ୍ଧ ଧୂରି କରିବାରେ ଏହିଏବୀ,
- ୩) ପୁଣ୍ଡରେ ଉଚ୍ଛିତ କିମ୍ବା କିମ୍ବା ଜଳ ମାତ୍ର ଏବଂ ମାନେ ଦେଖିବିଲେ ଲକ୍ଷ୍ୟ
ବୁଝିବା ହେଁ ।
- ୪) ପୁଣ୍ଡରେ ଅନ୍ତରେ କାନ୍ଧିର ପାଇଁ କିମ୍ବା କିମ୍ବା କରାଯାଇ
ହେଁ ।

(6)

কাছের অধিবক্তা (Limitation of Study):-

বিভাগকে মাটি জাহির সহজে নথি করে উচ্চ

তথ্যসূত্র (References):-

- ① পরিবেশ কিছি - উচ্চমাধ্যমিক কাল্যান রাষ্ট্র
- ② পরিবেশ কিছি (কাছের বিলে) - এ. এড
- ③ পরিবেশ বিদ্যা - এ. আল
- ④ পরিবেশ - এ. চট্টানাধ্যান
- ⑤ পরিবেশ সমষ্টি - এম. টি. হাস ও এম. আ. পাঁচকা

কুণ্ডলী প্রিকার :-

আমি আমার জিজ্ঞাসকে অন্তরিক্ষ দ্বন্দ্ববন্দ আশায়।
তিনি প্রকল্পটি টেরী বন্ধার কাছে গোচক অবস্থা
ওহয়ে বলেছে। প্রকল্প টেরীর বঙ্গ ও মুক্তিবন
ওয়ার্ল্ড এই প্রকল্পটি অবগত বন্ধার কাছে উদ্ঘোষণা
বলেছেন।

তারিখঃ- 21.06.2023

✓
৫.১৫৪
০৫.০৭.২০২৩