

### MAHISHADAL RAJ COLLEGE

(Govt. Sponsored)

NAAC Accredited 'A' Grade College DST (FIST) Govt. Of India approved College, NSDC Training Partner Estd.: 1946

Mahishadal : Purba Medinipur

Phone STD 03224 No. 240220

Ref. No. MRC /ADD on/1/2018-19

Date: 15.09.2018

## ADD ON COURSE 2018-19

## Organised by Department Zoology & Computer Science

**Topic: Basic Bioinformatics** 

. Add on course summary:

#### REPORT:

Name of the course-Basic Bioinformatics

Course coordinator: Dr. Shubhamoy Das, (Associate Professor, HOD, Department of Zoology, Mahishadal Raj College)

Date of commencement: 14.08.2018

Date of completion: - 31.08.2018

Number of participant enrolled: 30

Total duration day: 15

Total duration hour: 30

Evaluation method:- Paper pen MCQ and practical work

#### RESULT DETAILS:-

Number of student participate in this program: 30

Number of student completes this program: 28

Number of student got certificate in this program: 28

Name of the course: Basic Bioinformatics

Course coordinator: Dr. Shubhamoy Das, (Associate Professor, HOD, Department of Zoology, Mahishadal Raj College)







#### About the course:

Bioinformatics course is an interdisciplinary field of Science that deals with Biological information. The two main Sciences that find applications in bioinformatics are Molecular Biology and Genetics. Bioinformatics course is a fusion of many fields such as Computer Science, Mathematics, Engineering, and Statistics. These fields combine to examine and exemplify Biological data. In other words, a Bioinformatics course is a study of information on Biological data. The Bioinformatics course is among the fastest growing fields in the field of Science, which helps in advancements of Biology as well as the processing and storing of related data. These tools are used in Bioinformatics courses to advance Biology research and to handle and store data linked to Biology. In a Bioinformatics course, candidates can study a variety of areas holistically while earning their degree.

#### Learning outcomes:

Completing a bioinformatics course opens up various job opportunities in diverse sectors where biological data analysis and computational biology skills are in demand. Job opportunities in bioinformatics continue to grow as advancements in genomics, personalized medicine, and data-driven research become increasingly important in various industries. Completion of this course, you have job opportunities in the fields of computational biologist, genomic data analyst, clinical bioinformatician, biotech research scientist, data scientist in life science, agricultural bioinformatics specialist, and environmental bioinformatician. Along with the booming Bioinformatics career scope, it has also become one of the highest-paid sectors and is continually rising.

#### Target audience:

Any interested students (UG & PG), research scholars, faculty members and, Industrial personals. Persons who have very much interest in Software based work.

#### Course content overview:

Bioinformatics is an interdisciplinary field of science that develops methods and software tools for understanding biological data, especially when the data sets are large and complex. Bioinformatics uses biology, chemistry, physics, computer science, computer programming, information engineering, mathematics and statistics to analyze and interpret biological data. The subsequent process of analyzing and interpreting data is referred to as computational biology. Computational, statistical, and computer programming techniques have been used for computer simulation analyses of biological queries. They include reused specific analysis "pipelines", particularly in the field of genomics, such as by the identification of genes and single nucleotide polymorphisms (SNPs). These pipelines are used to better understand the genetic basis of disease, unique adaptations, desirable properties (esp. in agricultural species), or differences between populations. Bioinformatics also includes proteomics, which tries to understand the organizational principles within nucleic acid and protein sequences.



## Schedule: Total 30 hours

DAY	SCHEDULE
Day 1	Introduction to Bioinformatics (T) (2 hours)
Day 2	Nucleic acid databases and sequence retrieval (T+P) (2 hours)
Day 3	Sequence alignment- BLAST, pair wise sequence alignment, multiple sequence alignment. (T+P) (2 hours)
Day 4	Phylogenetic analysis and interpretation (T+P) (2 hours)
Day 5	Protein databases and protein structure analysis (T+P) (2 hours)
Day 6	Protein interaction study (T+P) (2 hours)
Day 7	Protein Tertiary structure and Visualization tools(T+P)(2 hours)
Day 8	Enzyme database. (T+P) (2 hours)
Day 9	Bioinformatics in Agriculture – Challenges and Opportunities (T) (2 hours)
Day 10	Basics of molecular interactions in medicinal chemistry and Drug design (P) (2 hours)
Day 11	Artificial Intelligence for Bioinformatics. (T) (2 hours)
D 10	Introduction to formation 1
Day 12 .	introduction to functional genomics data analysis (T) (2 hours)
Day 12 Day 13	Introduction to functional genomics data analysis (T). (2 hours)  Hands-on training session on "Genomics data analysis in R 1 (P). (2 hours)
	Hands-on training session on "Genomics data analysis in R 1 (P)

## **♣** Detail Work Schedule

Date	Day	Contents	Time.	Duration	Experts	Dosignation
14.08.18	1	Introduction to Bioinformatics (T)	12 to 2pm	2	Dr. Subhamoy Das	HOD DEP. of ZOOLOGY
16.08.18	2	Nucleic acid databases and sequence retrieval (T+P)	1 to 3 pm	2	Dr. Subhamoy Das	HOD DEP. of ZOOLOGY
17.08.18	3	Sequence alignment- BLAST, pairwise sequence alignment, multiple sequence alignment. (T+P)	3 to 5pm	2	Prof. Saheli Maiti	SACT Mahishadal Raj College
18,08.18	4	Phylogenetic analysis and interpretation (T+P)	03 to 05pm	2	Prof. Saheli Maiti	SACT Mahishadal Raj College
20.08.18	5	Protein databases and protein structure analysis (T+P)	02 to 04pm	2	Dr. Subhamoy Das	HOD DEP. of ZOOLOGY
21.08.18	6	Protein interaction study (T+P)	01 to 03pm	2	Dr. Subhamoy Das	HOD DEP. of ZOOLOGY
22.08.18	7	Protein Tertiary structure and Visualization tools(T+P)preparation (T+P)	03 to 05pm	2	Dr. Subhamoy Das	HOD DEP. of ZOOLOGY

23.08.18	8	Enzyme database	00 100	•	1 7	
		v	02 to 05pm	2	Prof. Sagnik Mandal	SACT Mahishadal Raj College
24.08.18	9 .	Bioinformatics in Agriculture – Challenges and Opportunities (T)	02 to 04pm	2	Prof. Manik Das	SACT Mahishadal Raj College
25.08.18	10	Basics of molecular interactions in medicinal chemistry and Drug design (P)	01 to 03pm	2	Prof. Manik Das	SACT Mahishadal Raj College
27.08.18	11	Artificial Intelligence for Bioinformatics. (T)	02 to 04pm	2	Prof. Moumita Jana	SACT Mahishadal Raj College
28.08.18	12	Introduction to functional genomics data analysis (T)	02 to 04pm	2	Dr. Rajkumar Guchhait	SACT Mahishadal Raj College
29.08.18	13	Hands-on training session on "Genomics data analysis in R 1 (P)	01 to 03pm	2	Dr. Rajkumar Guchhait	SACT Mahishadal Raj College
30.08.18	14	Hands-on training session on "Genomics data analysis in R 2 (P)	02 to 04pm	2	Dr. Rajkumar Guchhait	SACT Mahishadal Raj College
1.08.18	15	Hands-on training session on "Genomics data analysis in R 3 (P) Evaluation, valediction, feedback	02 to 04pm	2	Dr. Subhamoy Day, Dr. Rajkumar Guchhait, Prof. Sagnik Manadal, Prof. Manik Das and Prof.	HOD & SACT., Zoology; Principal, MRC
					Moumita Jana. DR.Asim Kr Bera	
				30 hours		
	-					
			•			
					10 00	



## **♣** Course structure and examination scheme:

Course name		Practical classes	Continuous	assessment	Total
	(hr.)	(hr.)	Theory	Practical Practical	marks
Basic bioinformatics	15	15	50	50	100

## Participant's Details and attendance:

## **Enrolment Details of Students**

Sl. No.	Class	Roll No.	Name	Signature
1.	B. Sc. General	2180404	RITTWIK CHAKRABORTY	Rittuik Chaknabonty
2. ·	B. Sc. Generic	21800142	INDRANI SEN	Indrani Sen.
·3.	B. Sc.,(HONS)	2170610	TAMALIKA DAS	Tamalika Das
4.	B. Sc. (HONS)	2170025	MAMPA DAS	Mampa Bas
5.	B. Sc.,(HONS)	2170032	SANGITA ADHIKARY	Sangita Adhikany.
6.	B. Sc.,(HONS)	2170278	AMIT PRAMANIK	Amit bramanik.
7.	B. Sc. General	2180447	NAIMA AKTAR	Naima Aktari.
8.	B. Sc. Generic	2180198	SOUMYATTAM BERA	Soumyattam Bera
9.	B. Sc.,(HONS)	2170280	SK . MUSTANGIR	5k. Mustangin
10.	B. Sc.,(HONS)	2170285	SUDIP DAS	Sudip Das
11.	B. Sc.,(HONS)	2170287	BITHI BERA	Bithi Bora
12.	B. Sc.,(HONS)	2170289	SRABANTI MISTRI	Snobanti Mistri
13.	B. Sc.,(HONS)	2170298	NAMITA BERA	Namita Bena
14.	B. Sc. General	2180458	SOUMYADIP PANDA	Soumyadip Panda
15.	B. Sc. Generic	2180531	SUTALIKA MAITY	sutalika Maity.
16.	B. Sc.,(HONS)	2170300	RAHUL ROY	Rahul Roy
17.	B. Sc. General	2180474	PAPIYA MAITY	Papiya Maity
18.	B. Sc. Generic	2180333	SHUVASIS KUNDU	Shuvasis Kundu

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19.	B. Sc.,(HONS)	2170302	TINA JANA	(
20.	B. Sc.,(HONS)	2170303	MOUSUMI GHORAI	Tina Jana
21.	B. Sc. General	2180475	JAYASHREE BHOWMIK	Jayashrue Bhowmin.
22.	B. Sc. Generic	2180543	PARAMITA MAJI	Paroamita Maji.
23.	B. Sc.,(HONS)	2170304	ARNAB DAS	Annab Das
24.	B. Sc.,(HONS)	2170307	RESHMA KHAN	Reshma Khan
25.	B. Sc.,(HONS)	2170311	PABITRA PATRA	Pabitna Patna
26.	B. Sc.,(HONS)	2170312	SHRABANTI PRAMANIK	Shrabanti Pramanih
27.	B. Sc.,(HONS)	2170322	SUPRIYA GIRI	Supreiya Giroi
28.	B. Sc.,(HONS)	2170342	SUVENDU DAS	Swendy Das
29.	B. Sc.,(HONS)	2170347	RESHMA KHATUN	Reshma Khatur
30.	B. Sc.,(HONS)	2170348	TRISHA MANDAL	Trisha Mandal.



## Add on course- 2018-2019

## Organized by Department Zoology

## <u>Topic: - Basic Bioinformatics</u>

Attendance Record (Day1-Day 8)

Sl. No.	Name of Students	14.08.18	16.08.18	17.08.18	18.08.18	20.08.18	21.08.18	22.08.18	23.08.18
1.	RITTWIK CHAKRABORTY	R. Charles		R. Chankuty	R. Chamiety	/	Rehombly		R. Charlest
2.	INDRANI SEN	T. sen	(*) E	Disen	. 6	Den		Esen	
3.	TAMALIKA DAS	T. Das	Das	T. Das	T	*	T. Das	T. Das	
4.	MAMPA DAS	M. Das	M. Das		M. Day	M. Das	e' Y	M. Das	
5.	SANGITA ADHIKARY	Adhinary		S. Adhinary	S. Adhi'kany	· ·		Sidnikany	40 18
6.	AMIT PRAMANIK	A.P	HP.		AP	AP	AP	/	MP.
7.	NAIMA AKTAR	Axtar.		ALLAY		Nita'	4 0	AKtar	
8.	SOUMYATTAM BERA	s. Bera	s. Bera		s. Bena	9,	S. Bona	s. Beng	
9.	SK . MUSTANGIR		SK. Mustangir	,	SK. Mustangit	,	SK. Mustangir	,	SK. Mustangi
10.	SUDIP DAS	5. Das		s. Das	s. Das		S. Das		S. Das
11.	BITHI BERA	B. Bena	5	Bena	,	Υ.	Bena	4	B. Bera
12.	SRABANTI MISTRI	s. Mistri	·s. Mistri	s. Mistri	s. mistri		S. Mishi		z, mistri
13.	NAMITA BERA	N.Box		n-Bern		N.Berg	**	Berk	
14.	SOUMYADIP PANDA	Panda		Pando			S. Panda	Q.	1, 1,
15.	SUTALIKA MAITY		S. malfy	maily R.		S. naity	9	s. maity	
16.	RAHUL ROY	Roy		Roy	3 tr	R. Roy	127	ROY	
17.	PAPIYA MAITY	mainy	naity		hairy	T,	mainy	<u>u</u>	maiso
18.	SHUVASIS KUNDU	S. Kunpu	The state of the s	Kund		19 N	Kunda	370	1.
19.	TINA JANA	Tisana		Ti Jana	T'Jana	Jana		Jana	2
20.	MOUSUMI GHORAI	m.	1		m' Ghonai			m. Ghonal	

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21.	JAYASHREE BHOWMIK	Thownin	11 /4	S. Brownix	Branmir 2.		Bhowmin		Showmik
22.	PARAMITA MAJI	Pagi	P	P. maji	heli b		Pupi	P. Mass	
23.	ARNAB DAS		Dian		DA.	al , Fiz.	A. Dar		A. Dan
24.	RESHMA KHAN	Ruchan	r. Khan		R. Khan	7 <b>.</b>		Rhan	
25,	PABITRA PATRA	P.	P. Patra		Polma	3 S	Patxa-	P. Patna	
26.	SHRABANTI PRAMANIK	Pramarit		3. marin	, , , , ,	3. Pramarik	gramani	-	3. Bramaris
27.	SUPRIYA GIRI	Crimi	5.	,,	Sirixi	S. wini		Sini	71
28.	SUVENDU DAS	S. Das	1		S. Das	S. Das	S. Das		S. Dore
29.	RESHMA KHATUN	Khatun.	R. Katur	Rhatum		Khatun		Khatan	
30.	TRISHA MANDAL	T. manda	1000		manda	7.1			Timanda



## Attendance Record (Day9-Day 15)

Sl. No.	Name of Students	24.08.18	25.08.18	27.08.18	28.08.18	29.08.18	30.08.18	31.08.18	
1.	RITTWIK CHAKRABORTY	Richary	Richalden	×, 3	R chake		12-chabo		
2.	INDRANI SEN	I. Sen	I.Sen		E 1	T. Sen		Isen	
3	TAMALIKA DAS	T. Das		T. Das		TiDas		TiDay	
4.	MAMPA DAS	M. Das	193	M. Das		m. Das	m. Das		M. Das
5	SANGIȚA ADHIKARY	S-Adhikany	S. Adhikan	S:Adhikany	× si e	s.Adhikany	S:Adhikay)		
6.	AMIT PRAMANIK	A. Prama	A. framo		A. Priama		A. Pramanik	A. Pran	
7.	NAIMA AKTAR	N.AKtaro	N.Aktan	N.Akpar		N.AKtan	N.Aldon	N.AKtar	- 1
8.	SOUMYATTAM	S. Bena	S.Boro		S.Bero		S.Berso		s.bon
9.	BERA SK . MUSTANGIR	SK.	SK. Musturgin		S.K. Mustanzin	s.K. Mustagin	•	Mustagin	
10.	SUDIP DAS	S. Dan	S. Das	9	S. Das		s. Das	S. Das	140
11.	BITHI BERA	100000	B.Bero	100		B.Beno		B.Bena	
12.	SRABANTI MISTRI	s. Mistri.	s.Mistri	5. Mi Stai	S.Mishoi	5. Mishi	SiMistoi	5.	5.Mistra
13.	NAMITA BERA	N. Berra	N. Bero		Nigence	NeBen		N.Bem	N. Beac
14.	SOUMYADIP PANDA	s. Banda	5. Parda		5. Parda	S-Panda	190	١.	S:Panda
15.	SUTALIKA MAITY	S. Maity	s. Muity	8. M	s. Maity	15. Maily		S.Maitx	s.Maity
16.	RAHUL ROY	R. Roy	ROY		R°7		Roy.	Roy	Roy
17.	PAPIYA MAITY	P. Maity		P. Maity	P. Maity	* 4	P. Maity		Maity
18.	SHUVASIS KUNDU	S. Kundu	s. Kundu	S. Kundu			s. U	s. Kundu	u
19.	TINA JANA	T. 1	T. Jana		Ti Jana	T. Jana	T. Jama		= *
0.	MOUSUMI GHORAI	Mousure		worai		whorai	4 0	Mahorai	
1.	JAYASHREE BHOWMIK	D. Bhowmix	_	J	Bhomish-		J. Bhow mit		Drow w
2.	PARAMITA MAJI	p.maj;		P-maji	2:	Pimaji		P. maji	Y

100									
23.	ARNAB DAS	A. Das		Ai	A. Das	Bas		A' Dors	A, Das
24.	RESHMA KHAN	R. Khan.	R. Khan	P. Khan	.R. uhan		r. nhan		khan
25.	PABITRA PATRA		Patra		Patra	10	Patra	patra	
26.	SHRABANTI PRAMANIK	s. Pramanik		S. Pramanik		s. Pramanik	/(4	S. Pramanik	
27	SUPRIYA GIRI	& Gin	S-Gini			Sain		sqin	5.4:3
28.	SUVENDU DAS	San	SDA		S:Jon		S. Don		S.Dan
29.	RESHMA KHATUN		R. Khatun	R Whatun	71	R. Khatun	R. Whatun	r. Khatun	+ -
30.	TRISHA MANDAL	Mandal	4. 9	17	Manda Manda		are in the	Mandal	Mardal

## Sample Question of Examination

2018/Add On Course/ Examination

#### ADD ON COURSE Department of Zoology & Computer Science, Mahishadal Raj College **Basic Bioinformatics**

Full Marks: 50

Time: 2 hrs

The figures in the right-hand margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable. Illustrate the answers wherever necessary.

## A. Answer the following MCQ:

15x2=30

- 1. Can you identify the Homology and similarity tool from the options below? (a) BLAST
- (b) RasMol
- (c) EMBOSS
- (d) PROSPECT
- 2. When was the SWISSPROT protein sequence database initiated?
- (a) 1988
- (b) 1985
- (c) 1986
- (d) 1987
- 3. Who among the following scientists established the first Bioinformatics database?
- (a) Dayboff
- (b) Pearson
- (c) Richard Durbin
- (d) Michael J. Dunn
- 4. Approximately how many base pairs does the human genome contain?
- (a) 6 billion base pairs
- (b) 5 billion base pairs
- (c) 3 billion base pairs
- (d) 4 billion base pairs
- 5. What is the term for drug identification through genomic study?
- (a) Genomics
- (b) Pharmacogenomics
- (c) Pharmacogenetics
- (d) Cheminformatics
- 6. What is the term for drug identification through genomic study?
- (a) Genomics
- (b) Pharmacogenomics
- (c) Pharmacogenetics
- (d) Cheminformatics
- 7. What is the one fact about FASTA that is incorrect?
- (a) In reality, it was created before BLAST and was the first database similarity search tool.
- (b) A string of identical residues with a length of k is searched for using the "hashing" method by
- (c) The string of residues is referred to as a "block."
- (d) Its acronym is FAST ALL



8. Which of the following does not constitute an online resource for aligning sequence pairs?

(b)

(c)

BCM Search Launcher

B. Answer the following questions:

#### 2018/Add On Course/ Examination

(c)	BLASTX
(d)	SIM
9. W	nich of the factors listed by
(a)	nich of the factors listed below is not an advantage of BLAST?
(b)	Statistical rigor
(c)	Handling gaps
(d)	More perceptive
	he method of determinion that the
	he method of determining the relative position of genes on a chromosome is known as
(a)	Gene monitoring
(b)	Genome-walking
(c)	Genome mapping
(d)	Chromosome walking
then	here exist three types of interactions between domains. Which of the following is not one of
	table complex
	ransient interaction
	fulti-domain protein
	instable interaction
115 115	Which of the following is not an advantage of Needleman-Wunsch algorithm?
	ew algorithmic improvements as well as increasing computer capacity make it possible to align a
	sequence against a large DB in a few minutes
	imilar sequence region is of same order and orientation
	his does not help in determining evolutionary relationship
	you have 2 genes that are already understood as closely related, then this type of algorithm can
be u	ed to understand them in further details
13.	Which of the following does not describe PAM matrices?
(a) T	hese matrices are used in optimal alignment scoring
(b) I	stands for Point Altered Mutations
(c) I	stands for Point Accepted Mutations
(d) I	was first developed by Margaret Dayhoff
	What is the term for the laboratory work using computers and associated with web-based analysis
•	rally online?
	silico
	ry lab
The state of	et lab
	Il of the above
	What does computer simulation refer to?
	ry lab
	vitro
	silico
(d) V	(et lab
	2018/Add On Course/ Examination

2x10-20

1. Give the applications of bioinformatics in drug discovery, QSAR, microbial genome and crop improvement.

2. What is phylogeny? What are the various methods for phylogenetic analysis? Give differences between NJ, MP and ML trees. 10



SAMPLE CERTIFICATE OF COURSE COMPLETION



THIS IS TO CERTIFY THAT

Shrabanti Pramanik

has successfully completed the Add-on Course on Basic Bioinformatics held during 2018-19 academic year at Mahishadal Raj College.

Sublamy Da

Course Co-ordinator

. Stander.

IQAC Co-ordinator

DATE: 29.08.2018

Har

Principal



THIS IS TO CERTIFY THAT

Soumyadip Panda

has successfully completed the Add-on Course on Basic Bioinformatics held during 2018-19 academic year at Mahishadal Raj College.

Sublamey Dr

Jank ...

Ma

Course Co-ordinator

**IQAC Co-ordinator** 

DATE: 29.08.2018

Principal



### MAHISHADAL RAJ COLLEGE

(Govt. Sponsored)

NAAC Accredited 'A' Grade College DST (FIST) Govt. Of India approved College, NSDC Training Partner

Estd.: 1946

Mahishadal: Purba Medinipur

Phone STD 03224 No. 240220

-----Ref. No MRC/Add on/2/2018-19

Date: 01.10.2018

## **ADD ON COURSE 2018-19**

## **Organised by Department Zoology**

**Topic: Wildlife Ecology and Conservation** 

Add on course summary:

#### REPORT:

Name of the course- Wildlife Ecology and Conservation

Course coordinator: Dr. Shubhamoy Das, (Associate Professor, HOD, Department of Zoology, Mahishadal Raj College)

Date of commencement: 03.09.2018

Date of completion: - 19.09.2018

Number of participant enrolled: 30

Total duration day: 15

Total duration hour: 30

Evaluation method:- Paper pen MCQ and practical field work

#### **RESULT DETAILS:-**

Number of student participate in this program: 30

Number of student completes this program: 27

Number of student got certificate in this program: 27

Name of the course: Wildlife Ecology and Conservation

Course coordinator: Dr. Shubhamoy Das, (Associate Professor, HOD, Department of Zoology, Mahishadal Raj College)



Principal MAHISHADAL RAJ COLLEGE



## Wildlife Ecology and Conservation

### About the course:

Conserving the world's wildlife and protecting the planet are truly grand challenges and the motivation behind all that you will do with this major. This course focuses on student knowledge of the ecology, conservation, and management of wildlife and habitats for the economical, ecological, aesthetic, and recreational values. Conservation of biodiversity is one of the important themes of our course along with a blend of lectures, labs, and field trips.

## Learning outcomes:

Wildlife ecology and conservation is an ever-evolving field that not only captures the imagination of nature enthusiasts but also offers a multitude of career pathways. This course opens up various job opportunities in both the public and private sectors. Completion of this course, you have the job opportunity on field of wildlife biologist or ecologist, conservation scientist, park ranger or wildlife officer, environmental consultant, wildlife rehabilitation specialist, research scientist, environmental educator, wildlife manager, conservation planner, policy analyst, climate change specialist, and zoo or aquarium conservation specialist. Networking, gaining relevant experience through internships or volunteer work, and staying informed about current issues in wildlife conservation can enhance your chances of securing a rewarding career in this field.

## Target audience:

Any interested students (UG & PG), research scholars, faculty members and, Industrial personals.

### Course content overview:

Wildlife ecology is the science behind the practice of wildlife management that seeks to manage wildlife populations Wildlife ecology began as applied science discipline during the 1920s and 1930s at the University of Wisconsin–Madison with the development of an academic program by Aldo Leopold. Wildlife ecology is the science behind the practice of wildlife management that seeks to manage wildlife populations for the benefit of humans. Although people enjoy viewing wildlife and hunting animals for food and fur, conflicts arise because wild animals kill livestock, cause vehicle collisions, and damage crops. Wildlife ecology has become progressively more quantitative, especially since the 1990s; even so, it still retains a strong orientation toward techniques with an emphasis on statistical methods rather than ecological principles. In the early 1980s the discipline of conservation biology emerged mainly because wildlife ecology was slow to embrace modern ecological theory and broader concerns for the preservation of biodiversity. Since then, however, wildlife ecology has converged as essentially a subdiscipline of conservation biology focused largely on the applied ecology and management of wild populations of birds and mammals.



## **♣ Schedule:** Total 30 hours

DAY	SCHEDULE					
Day 1	Introduction to wildlife, ecology and conservation (2 hours)					
Day 2	Ecological structure and interactions (2 hours)					
Day 3	Population and community ecology (2 hours)					
Day 4	Distribution and abundance (2 hours)					
Day 5	Human Ecology (2 hours)					
Day 6	Applied ecology (2 hours)					
Day 7	Monitoring wild animals (2 hours)					
Day 8	Monitoring and managing habitat (2 hours)					
Day 9	Management of wildlife diseases (2 hours)					
Day 10	Capturing and restraining wild animals (2 hours)					
Day 11	Conservation genetics (2 hours)					
Day 12	Ex-situ conservation (2 hours)					
Day 13	Field trip (Terrestrial Ecology ). (2 hours)					
Day 14	Field trip (Aquatic Ecology). (2 hours)					
Day 15	Doubts clear and Discussion					

## Detail Work Schedule

Date	Day	Contents	Time	Duration	Experts	Designation
03.09.18	1	Introduction to wildlife, ecology and conservation	12 to 2pm	2	Dr. Subhamoy	HOD DEP.
04.09.18	2	Ecological structure and interactions	1 to 3 pm	2	Das Prof. Sagnik Mandal	ZOOLOGY SACT Mahishadal Raj College
05.09.18	3	Population and community ecology	3 to 5pm	2	Prof. Moumita Jana	SACT Mahishadal Raj College
06.09. 18	4	Distribution and abundance	03 to 05pm	2	Prof. Saheli Maiti	SACT Mahishadal Raj College
07.09.18	5	Human Ecology	02 to 04pm	2	Prof. Manik Das	SACT Mahishadal Raj College
08.09.18	6	Applied ecology	01 to 03pm	2	Dr Rajkumar Guchhait	SACT Mahishadal Raj College
10.09.18	7	Monitoring wild animals	03 to 05pm	2	Prof. Sagnik Mandal	SACT Mahishadal Raj College
11.09. 18	8	Monitoring and managing habitat	02 to 04pm	2	Prof. Moumita Jana	SACT Mahishadal Raj College
12.09.18	9	Management of wildlife diseases	02 to 04pm	2	Prof. Saheli Maiti	SACT Mahishadal Raj College

10	Capturing and restraining wild animals	01 to 03pm	2	Prof. Manik Das	SACT Mahishadal
11	Conservation genetics	02 to 04pm	2	Dr. Subhamov	Raj College HOD DEP. of
12	Ex-situ conservation	02 to 04pm	2	Das Dr.	ZOOLOGY HOD DEP.
13	Field trip (Terrestrial Ecology)	01 to 03pm	2	Das Dr. Subhamoy Das, Prof. Moumita jana, Prof. Soheli Jana, Prof. Manik Das	ZOOLOGY HOD DEP. of ZOOLOGY, SACT Mahishadal
	Field trip (Aquatic Ecology)	01 to 03pm	2	Dr. Subhamoy Das, Dr. Rajkumar Guchhait, Prof. Sagnik Mandal	Raj College HOD DEP. of ZOOLOGY, SACT Mahishadal Raj College
15	Evaluation, valediction, Discussion	12 to 2 pm	2	Dr. Subhamoy Das, Prof. Moumita jana, Prof. Soheli Jana, Prof. Manik Das, Dr. Rajkumar Guchhait, Prof. Sagnik Mandal.	HOD DEP. of ZOOLOGY, SACT Mahishadal Raj College
-			30 hours		
-					
	11 12 13	restraining wild animals  11 Conservation genetics  12 Ex-situ conservation  13 Field trip (Terrestrial Ecology)  14 Field trip (Aquatic Ecology)	restraining wild animals  11 Conservation genetics 02 to 04pm  12 Ex-situ conservation 02 to 04pm  13 Field trip (Terrestrial Ecology) 01 to 03pm  14 Field trip (Aquatic Ecology) 01 to 03pm	restraining wild animals  11 Conservation genetics  12 Ex-situ conservation  13 Field trip (Terrestrial Ecology)  14 Field trip (Aquatic Ecology)  15 Evaluation, valediction, Discussion  16 O3pm 2  17 Discussion  18 Discussion  2 Discussion  3 Discussion  4 Discussion  5 Discussion  5 Discussion  5 Discussion  6 Discussion  7 Discussion	restraining wild animals  11 Conservation genetics  12 Ex-situ conservation  13 Field trip (Terrestrial Ecology)  14 Field trip (Aquatic Ecology)  15 Evaluation, valediction, Discussion  16 Dr. Subhamoy Das  17 Dr. Subhamoy Das  18 Dr. Subhamoy Das  19 Dr. Subhamoy Das, Prof. Moumita jana, Prof. Soheli Jana, Prof. Sagnik Mandal  19 Dr. Subhamoy Das, Prof. Manik Das  20 Dr. Subhamoy Das, Prof. Manik Das  21 Dr. Subhamoy Das, Prof. Sagnik Mandal  22 Dr. Subhamoy Das, Dr. Rajkumar Guchhait, Prof. Soheli Jana, Prof. Sagnik Mandal.

## ♣ Course structure and examination scheme:

Course name	Theory	Practical	Internal	E	Total		
	classes (hr.)	Classes (hr.)	Marks	Theory	Practical	Field report	Marks
Wildlife Ecology and Conservation	20	10	20	50	20	10	100



## Participant's Details and attendance:

## **Enrolment Details of Students**

Sl. No.	Class	Roll No.	Name	Signature
1.	B. Sc. Generic	2170335	MAHAMAYA DAS	Mahamaya Das
2.	B. Sc. Generic	2170354	JULEKHA KHATUN	Julekha Khatun
3.	B. Sc.,(HONS)	2170357	SNEHA MONDAL	Sneha Mondal.
4.	B. Sc. (HONS)	2170358	SRIPARNA SHIT	And the second s
5.	B. Sc.,(HONS)	2170404	KRISHNA PARDHAN	Suipanna Shit
6.	B. Sc.,(HONS)	2170408	SUJATA MAITY	Swiata marty
7.	B. Sc. Generic	2170586	MADHUMITA BERA	madhumita Bera
8.	B. Sc. Generic	2170282	PARAMITA MONDAL	Paxamitan Mandal
9.	B. Sc.,(HONS)	2170437	SUKCHAND JANA	Sukchand Jana
10.	B. Sc.,(HONS)	2170446	SAMARPITA BHOWMIK	Samanpita Bhowmik
11.	B. Sc.,(HONS)	2170528	PUJA BHOWMIK	Puja Bhowmik.
12.	B. Sc.,(HONS)	2170525	DIPTASREE MAITY	Siptashee maity,
13.	B. Sc.,(HONS)	2170549	DISHA CHAWLAY	Disha Chawlay
14.	B. Sc. Generic	2170288	BARNALI SHIT	Baxmali shit
15.	B. Sc. Generic	2170327	KRISHNA SAMANTA	Khishna Samanta.
16.	B. Sc.,(HONS)	2170562	RIYA PACHHAR	Riya Pachhan
17.	B. Sc. Generic	2170331	SOUMEN DAS	Soumen des
18.	B. Sc. Generic	2170391	IPSRITA PRADHAN	Ipsroita Pradhan
19.	B. Sc.,(HONS)	2170571	SUSMITA SAMANTA	Suamita Samuela
20.	B. Sc.,(HONS)	2170572	SANKHADEEP ACHARYA	Suamita Samanta Saukhadeep Acharya
21.	B. Sc. Generic	2170590	SRABANTI DOLAI	Snabanli Dalal
22.	B. Sc. Generic	2170603	BIDISHA PATRA	
23.	B. Sc.,(HONS)	2170578	RACHANA BIIUNIA	Bidisha batra Rachana Bhuwa

24.	B. Sc.,(HONS)	2170579	SUBHANWITA MAITY	Subhanwita Maity
25.	B. Sc.,(HONS)	2170582	MOUMITA CHAKRABORTY	Moumita Charcoaborty
26.	B. Sc.,(HONS)	2170625	BANDHAN BHUNIA	Bondhan Bhunia
27.	B. Sc., Generic	2170376	AMRITA SHARMA	Amrita Sharma
28.	B. Sc., Generic	2170409	JAYEETA PRAMANIK	Jayeda Pramanik
29.	B. Sc., Generic	2170469	SHRABANTI MAJI	Shorabanti Maji
30.	B. Sc., Generic	2170540	KEYA MAITY	keya Maity



# Add on course- 2018-2019 Organized by Department Zoology Topic: - Wildlife Ecology and Conservation

## Attendance Record (Day1-Day 8)

Sl. No.	Name of Students	03.09.18	04.09.18	05.09.18	06.09. 18	07.09.18	08.09.18	10.09.18	11.09.18
l.	MAHAMAYA DAS	Mas	(Das)	(Mas	Der?	Bas	Mass	Dan	Dan.
2.	JULEKHA KHATUN	Theratur	Theatun	2	Thatus	Heatur	Thating		Theste
3.	SNEHA MONDAL	3. Monda		S. Morria		& Marda	3. Moral	8. Mords	S. Mond
4.	SRIPARNA SHIT	S&ul	8.86	S. Shit		8 shit		S. shit	
5.	KRISHNA PARDHAN	Pradley		Prodhan	Produce		Kodkan		Gradfor
6.	SUJATA MAITY	Smily	Smaith	Saity	Saity	Shuity	Shaity	Smity	Switz
7.	MADHUMITA BERA	MBerg		Misera	Bern		Burg	7	Berg
8.	PARAMITA MONDAL	Amonda	P. Mondd	P.Mondal	P.Mondel	P. Mondal	P-Mondal	P.Mondal	P-Insirda
9.	SUKCHAND JANA	Sjana		SJang	Sjans		Syans		Sjan
10.	SAMARPITA BHOWMIK	Bhoww	Showmil	Shownin	Bhoumix	Shownik	Showmik	Shownik	Sowmi
11.	PUJA BHOWMIK	Pahoumik	Brownik	•	Bhowmin		Brownix		Blowni
12.	DIPTASREE MAITY	maity	Worky	mark		maity	Proil		Maity
13.	DISHA CHAWLAY	Chamby		chewlad	Y	chawley	I von 7	chawler	
14.	BARNALI SHIT	O. Shit	( Shi		B. Shit	rs shif	B. Ship		Boh
15.	KRISHNA SAMANTA	Kemark		Samen	Komenta		8 Kman		Sanant
16.	RIYA PACHHAR	Pacha		Pachar		Backer 1		Pacehor	
17.	SOUMEN DAS	5 Das	S. Dol		S.Dos		J. Das	S. Das	8.Da
18.	IPSRITA PRADHAN	Fredtor	Prodle	ar.	1 Prod to	33.35	Fradom	Product	Frada
19.	SUSMITA SAMANTA	Grant	<b>&gt;</b>	gamont		Samant		Samait	

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20.	SANKHADEEP								
	ACHARYA	*charya		3. Acharya	3. Acharja		3. Actorga	B.	B. Acheeyo
21.	SRABANTI DOLAI	Salai	Sodai	# 4	Solai		-	Acrond	
22.	BIDISHA PATRA				The same of the sa	Solai	Solai		Balai
23.	3330	Bratica	Spatra		Bratna	Врагла		Вратла	
	RACHANA BHUNIA	Chunio	R	R		R	R	6	
24.	SUBHANWITA	Chunia Siaity	Suria		40 140	Bhunia	Ohunia	Churia	
25.	MAITY MOUMITA		Raity	Switz	giaity		quaity	Sivity	
26.	CHAKRABORTY	Mic	W.C	di	M.C	M.C	M.C	M.C	Mic
26.	BANDHAN BHUNIA	B. Huria	Bibhunia	Biblionia		Bunia	•		_
27.	AMRITA SHARMA	Asharma	100		100	Buria	Shunio		Brunia
28.	JAYEETA		Astarm	**************************************	Alarma		A: Sharma		A. Vierma
	PRAMANIK	J.6	J.P	J.p		J.p	Jip	J-P	
29.	SHRABANTI MAJI	Riagl	S. maji		S: Maji	8	8		3
30.	KEYA MAITY	Kuaify	16 Mait	Kinitu	May	Kiaity	Maji	-	Mayi
		1, 0	100	-Maril		Maril	mout)	- 1 - 5	marty



## Attendance Record (Day9-Day 15)

SI. No.	Name of Students	12.09.18	13.09.18	14.09.18	15.09.18	17.09.18	18.09.18	19.09.18	
1.	MAHAMAYA DAS	Man	Man	Mas	Mari	Ben	Mes	Bas	
2.	JULEKHA KHATUN	Thatur				Commenced (1600)			Thatus
3.	SNEHA MONDAL	Swords	Hondal	Mondal		Mondal	Fonda	0	7
4.	SRIPARNA SHIT		10	pio.	Pior	More	101-	POIL	Incomp
5.	KRISHNA PARDHAN								Incomplete
6.	SUJATA MAITY	s-maity		s.maity		Simouty		Simoity	Simolity
7.	MADHUMITA BERA			4		4	<b>)</b>	4	4
8.	PARAMITA MONDAL	P.Mondal	P.Mondal	P.Mondal	P-Mondal	P.Mondal	P.Mondal.	P.mondal	
9.	SUKCHAND JANA								Incomple
10.	SAMARPITA BHOWMIK	S-ownik	Showmin Bhowmin	S. Bhowmin	5. Bhownik	S. Brownik	5. Bhownik		S. Bhownik
11.	PUJA BHOWMIK	Chownik				fahrun		Chroix	<i>V</i> .
12.	DIPTASREE MAITY	D- Maity		D. Maity		D. Maity		D. Maity	
13.	DISHA CHAWLAY	1.0.7	Debrien	many /	Doluver	Dehum	D. our	mary	
14.	BARNALI SHIT	B.Shit	B. Shit		B.Shit		B.Bhit		Bishit
15.	KRISHNA SAMANTA	K. Sama	K. Sam		k. Sam		K. Sano	K. Som	
16.	RIYA PACHHAR	Poch we			,	Pachhax		Pachar	
17.	SOUMEN DAS	S.Das	-1	S. Das	li li	S. Das		S.Das	S.Das
18.	IPSRITA PRADHAN		I. Pradhan	I. Pradhan	I. Poadhan		I. Proadhan		I. Pradhan
19.	SUSMITA SAMANTA	5. Somanta		S. Samanta	5.	6.		S. Samanta	
20.	SANKHADEEP ACHARYA	S. Achanya	s. Achanya		S.Ackany		S. Achonya		s. Acharya
21.	SRABANTI DOLAI	s. Dolai		S. Dolai		s. Dolai		s. Dolai	

-22.48			1						
22.	BIDISHA PATRA	Barra	Bodra		Batra	Bratra		Bana	Batra
23.	RACHANA BHUNIA	Churia		Rhumin	,		Rhuinia	7	Rhuinin
24.	SUBHANWITA MAITY		quity	1811	Lowly	Swity	Snaity	Swaity	
25.	MOUMITA CHAKRABORTY	M Chautalon		Charrenory		the error	1	down mon	3
26.	BANDHAN BHUNIA	Bhuma		Bhoria		Bruns			Bhuma
27.	AMRITA SHARMA	A: Shamma		A		A·		A'	A.
28.	JAYEETA PRAMANIK	Paramania	Í	Shorma		Spanno		Promenik	Shama
29.	SHRABANTI MAJI	Siegi		wasi		Sy'		ingi	magi
30.	KEYA MAITY	kmuity	k-maity	kimuity	Kimmy	Hismey	Kimaity	Kmelty	Kennedty



## Sample Question of Examination

2018/ Add on Course/ Examination

# ADD ON COURSE Department of Zoology, Mahishadal Raj College Wildlife Ecology and Conservation

Full Marks: 50

Time: 2 Hrs

The figures in the right-hand margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

### Answer the following MCQ questions:

10x1=10

- 1. What is the animal symbol of W. W. F (World Wildlife Fund)?
- a. Red Panda, b. Giant Panda, c. Tiger, d. Kangaroo
- 2. Red Data Book Provides data on
- a) Red flowered plants b) Red coloured fishes c) Lists of plants and animals d) Endangered plants and animals
- 3. Viable material of endangered species can be preserved by
- a) Gene bank b) Gene library c) Gene pool d) Herbarium
- 4. Which group of vertebrates comprises the highest number of endangered species?
- a) Mammals b) Fishes c)Birds d) Reptiles
- 5 When did World Wild Fund for Nature-India (WWF-India) established?
- a) 1956 b) 1969 c) 1976 d) 1997
- 6. Which is the natural habitat of Indian lion?
- a) Western Ghats b) Sunderban delta c) Gir forest d) Himalayas
- 7. What is called for a scheme to protect and conserve biodiversity?
- a) Biosphere b) Bio-reserve c) Biotechnology d) Bio-ecology
- 8. Which lake in Northeast India has the world's only floating National Park?
- a) Dal Lake b) Loktak Lake c) Lake Tsomgo d) Shilloi Lake
- 9. Bandipur National park is located in which of the given states?
- (a) Andhra Pradesh , (b) Rajasthan , (c) Assam , (d) Karnataka
- 10. Which one of the given options was the first National Park established in India?
- (a) Kanha National park, (b) Dudhwa National park, (c) Jim Corbett National park, (d) None of these



## 2018/ Add on Course/ Examination

## Answer the following SAQ questions:

10x2=20

- 1. What do you mean by habitat analysis?
- 2. What is ecological perturbation?
- 3. Define carrying capacity?
- 4. What is ecological footprint?
- 5. What do you mean by community reserve?
- 6. State the difference between national park & sanctuary.
- 7. Write down the difference between ex-situ & in-situ conservation?
- 8. What do you mean by eco-tourism?
- 9. What are the difficulties faced in habitat restoration?
- 10. What do you mean by quarantine?

## Answer the following questions:

10x2=20

- Illustrate the different aspects of GIS in wildlife conservation & management.
- Briefly describe the salient features of wildlife protection act.



SAMPLE CERTIFICATE OF COURSE COMPLETION



THIS IS TO CERTIFY THAT

Sankhadeep Acharya

has successfully completed the Add-on Course on Wildlife Ecology and Conservation held during 2018-19 academic year at Mahishadal Raj College.

And Lamoy Da

Course Co-ordinator

Jander.

**IQAC** Co-ordinator

DATE: 19.09.2018

Alex

Principal



THIS IS TO CERTIFY THAT

Samarpita Bhowmik

has successfully completed the Add-on Course on Wildlife Ecology and Conservation held during 2018-19 academic year at Mahishadal Raj College.

Sublamoy Da

Course Co-ordinator

Junder.

**IQAC Co-ordinator** 

DATE: 19.09.2018

Spor

Principal



#### MAHISHADAL RAJ COLLEGE

(Govt. Sponsored)

NAAC Accredited 'A' Grade College DST (FIST) Govt. Of India approved College, NSDC Training Partner

Estd.: 1946

Mahishadal: Purba Medinipur

Phone STD 03224 No. 240220

...... Ref. No. MRC/ADD ON/03/2018-19

Date: 24.12.2018

## ADD ON COURSE 2018-19

## Organised by Department Zoology & Nutrition Topic: Induced breeding and seed production of Anabas and Heteropneustes.

Add on course summary:

#### REPORT:

Name of the course- Induced breeding and seed production of Anabas and Heteropneustes.

Course coordinator: Dr. Shubhamoy Das, (Associate Professor, HOD, Department of Zoology, Mahishadal Raj College)

Date of commencement: 20.11.2018

Date of completion: - 06.12.2018

Number of participant enrolled: 30

Total duration day: 15

Total duration hour: 30

Evaluation method:- Paper pen MCQ and practical work

#### **RESULT DETAILS:-**

Number of student participate in this program: 30

Number of student completes this program: 29

Number of student got certificate in this program: 29

Name of the course: Induced breeding and seed production of Anabas and Heteropneustes.

Course coordinator: Dr. Shubhamoy Das, (Associate Professor, HOD, Department of Zoology, Mahishadal Raj College)



MAHISHADAL RAJ COLLEGE



## Induced breeding and seed production of Anabas and Heteropneustes

#### **♣** About the course:

Induced breeding and seed production are essential aspects of aquaculture that involve controlled reproduction of fish for commercial purposes. These practices help ensure a steady and reliable supply of fish for food and other purposes. Induced breeding is a technique that involves manipulating environmental conditions and employing hormonal treatments to stimulate fish to spawn under controlled conditions. These courses on these topics typically cover the theoretical aspects of fish reproductive biology, practical techniques for induced breeding, and the management of hatchery and nursery operations. They are valuable for individuals involved in aquaculture, fisheries management, and related fields. These courses of induced breeding and seed production in fish are indispensable components of modern aquaculture practices. Through the manipulation of environmental conditions and advanced reproductive techniques, fish farmers can ensure a consistent and reliable supply of fish for various purposes. Despite the challenges, ongoing research and innovations continue to enhance these courses, contributing to the sustainability and growth of the aquaculture industry

#### Learning outcomes:

This course of induced breeding and seed production in fish aquaculture not only contributes to meeting the global demand for fish but also opens a diverse array of career opportunities. From hands-on technical roles to managerial positions, entrepreneurial ventures, and research-focused careers, individuals with expertise in these specialized areas are well-positioned to make meaningful contributions to the sustainable development of the aquaculture industry. As the world looks towards innovative solutions for food security, the job opportunities in induced breeding and seed production are set to grow, offering a promising and fulfilling career path for those passionate about aquatic sciences and environmental sustainability. This course opens different job opportunities such as aquaculture technician, hatchery manager, research scientist, aquaculture consultant, Entrepreneurs in Aquaculture, Fisheries and Aquaculture Extension Officers, and Quality Control Specialists.

#### Target audience:

Any branch of life sciences students (UG and PG), research scholars, and faculties who have interest in fishery and industrial fishery. Fish farmers who have very much interest may join the programme.

#### Course content overview:

Induced breeding is a technique where by ripe fish breeders are stimulated by pituitary hormone or any other synthetic hormone introduction to breed in captive condition. Then the carps being excited lay eggs in the pond water and the process is called inducedbreeding. This process of breeding is also known as hypophysation. Major carps are most important species from the point of view of their high food and nutritive values. Hence they have kept attention of scientists and aqua farmers. They have peculiar habit of breeding in running waters of rivers and streams where they have large space for movement. The breeding technique in which the breeders use hormones to ripe the fish artificially is known as induced breeding. This leads to the release of eggs and sperms from the fish at a specific time interval. As induced breeding is an artificial technique it is also known as artificial breeding. The hormone used during induced breeding is gonadotrophin. Gonadotrophin comprises that follicle-stimulating hormone (FSH) which induces early gametogenesis in fish.



## ♣ Schedule: Total 30 hours

DAY	SCHEDULE
Day 1	Introduction to fish breeding (T) (2 hours)
Day 2	Natural and induced breeding of fish (T) (2 hours)
Day 3	Brood fish collection and rearing(T+P) (2 hours)
Day 4	Different types of pond or concrete tank preparation (T+P) (2 hours)
Day 5	Soil quality management in Anabas and Heteropneustes. (T+P) (2 hours)
Day 6	Water quality management in Anabas and Heteropneustes. (T+P) (2 hours)
Day 7	Induced breeding of Anabas (P) (2 hours)
Day 8	Induced breeding of Heteropneustes. (P) (2 hours)
Day 9	Rearing of hatchlings of Anabas and Heteropneustes(T+P) (2 hours)
Day 10	Planning and designing of fish farm.(T)) (2 hours)
Day 11	Entrepreneurship development through Anabas and
	Heteropneustes aquaculture and marketing.(T) (2 hours)
Day 12	Feeding and rearing of hatchlings (P) (2 hours)
Day 13	Plankton culture (2 hours)
Day 14	Common disease and its management. (2 hours)
Day 15	Discussions & Evaluation. (2 hours)

## **♣** Detail Work Schedule

Date	Day	Contents	Time	Duration	Experts	Designation
20.11.18	1	Introduction to fish breeding (T)	12 to 2pm	2	Dr. Subhamoy	HOD DEP.
					Das	ZOOLOGY
21.11.18	2	Natural and induced	1 to 3 pm	2	Dr.	HOD DEP.
		breeding of fish (T)	207	1	Subhamoy	of
					Das	ZOOLOGY
22.11.18	3	Brood fish collection and	3 to 5pm	2	Dr. Rajkumar	SACT
		rearing(T+P)			Guchhait	Mahishadal
						Raj College
23.11.18	4	Different types of pond or	03 to 05pm	2	Dr. Rajkumar	SACT
		concrete tank preparation			Guchhait	Mahishadal
		(T+P)				Raj College
24.11.18	5	Soil quality management in	02 to 04pm	2	Dr. Rajkumar	SACT
		Anabas and			Guchhait	Mahishadal
		Heteropneustes.				Raj College
26.11.18	6	Water quality management	01 to 03pm	2	Dr Rajkumar	SACT
		in Anabas and			Guchhait	Mahishadal
		Heteropneustes.				Raj College
27.11.18	7	Induced breeding of	03 to 05pm	2	Dr Rajkumar	SACT
27.11.10	1	Anabas (P)			Guchhait	Mahishadal
						Raj College

29.11.18 9 Rearing of hatchlings of Anahas and Heteropneustes(T+P) 2 Dr Rajkumar Guchhait Mahishada Raj Colleg 30.11.18 10 Planning and designing of fish farm.(T) 2 Prof. Manik Das Mahishada Raj Colleg 01.12.18 11 Entrepreneurship development through Anahas & Heteropneustes aquaculture and marketing. 02 to 04pm 2 Prof. Moumita Raj Colleg 03.12.18 12 Feeding and rearing of hatchlings (P) 2 Dr Rajkumar Guchhait Mahishada Raj Colleg 04.12.18 13 Plankton culture 01 to 03pm 2 Prof. Sagnik Mahishada Raj Colleg 05.12.18 14 Common disease and its management. 01 to 03pm 2 Prof. Saheli Mahishada Raj Colleg 05.12.18 14 Common disease and its management. 01 to 03pm 2 Prof. Saheli Mahishada Raj Colleg 04.12.18 14 Common disease and its management. 01 to 03pm 2 Prof. Saheli Mahishada							and the second second
29.11.18 9 Rearing of hatchlings of Anabas and Heteropneustes(T+P)  30.11.18 10 Planning and designing of fish farm.(T)  11 Entrepreneurship development through Anabas & Heteropneustes aquaculture and marketing.  12 Feeding and rearing of hatchlings (P)  13 Plankton culture  14 Common disease and its management.  15 Discussions, Evaluation, valediction, feedback  16 Prof. Manik Das Mahishada Raj Colleg Dr Rajkumar Guchhait Manishada Raj Colleg Dr. Sagnik Manadal, Prof. Manik Das Mandel Prof. Manik Das Manadal, Prof. Manik Das Manadal, Prof. Manik Das Manadal, Prof. Manik Das Manadal, Prof. Manik Das Mandel Prof. Moumita Jana.	28.11.18	8		02 to 04pm	2		Mahishadal
fish farm.(T)  Das Mahishada Raj Colleg O1.12.18    Il Entrepreneurship development through Anabas & Heteropneustes aquaculture and marketing.  O3.12.18    I2 Feeding and rearing of hatchlings (P)  O4.12.18    I3 Plankton culture O1 to 03pm    O5.12.18    O6.12.18    O6.12.18    O6.12.18    Das Mahishada Raj Colleg Prof. Moumita Jana SACT Mahishada Raj Colleg Prof. Sagnik Manadal Raj Colleg SACT Manadal Raj Colleg SACT Mahishada Raj Colleg SACT SACT Najkumar Guchhait, Prof. Sagnik Manadal, Prof. Manik Das and Prof. Manik Das and Prof. Moumita Jana.	29.11.18	9	Anabas and	02 to 04pm	2		
development through Anabas & Heteropneustes aquaculture and marketing.  12 Feeding and rearing of hatchlings (P)  13 Plankton culture  14 Common disease and its management.  15 Discussions, Evaluation, valediction, feedback  16 Discussions, Evaluation, valediction, feedback  17 Discussions, Evaluation, valediction, feedback  18 Discussions, Evaluation, valediction, feedback  19 Discussions, Evaluation, Mahishada Raj Colleg  20 Dr. Subhamoy Day, Dr. Rajkumar Guchhait, Prof. Sagnik Manadal, Prof. Manik Das and Prof. Manik Das and Prof. Moumita Jana.	30.11.18	10		01 to 03pm	2		SACT Mahishadal Raj College
hatchlings (P)    Discussions, Evaluation, valediction, feedback   Discussions and Prof. Sagnik Manadal, Prof. Manik Das and Prof. Moumita Jana.	01.12.18	11	development through  Anabas & Heteropneustes	02 to 04pm	2		SACT Mahishadal Raj College
Manadal Mahishada Raj Colleg  05.12.18 14 Common disease and its management.  01 to 03pm 2 Prof. Saheli Mahishada Raj Colleg  06.12.18 15 Discussions, Evaluation, valediction, feedback  12 to 2 pm 2 Dr. Subhamoy Day, Dr. Rajkumar Guchhait, Prof. Sagnik Manadal, Prof. Manik Das and Prof. Moumita Jana.	03.12.18	12		02 to 04pm	2		SACT Mahishadal Raj College
management.  Mahishada Raj Colleg  Dr. Subhamoy Day, Dr. Rajkumar Guchhait, Prof. Sagnik Manadal, Prof. Manik Das and Prof. Moumita Jana.  Mahishada Raj Colleg	04.12.18	13	Plankton culture	01 to 03pm	2		SACT Mahishadal Raj College
valediction, feedback  Day, Dr. Rajkumar Guchhait, Prof. Sagnik Manadal, Prof. Manik Das and Prof. Moumita Jana.	05.12.18	14	H	01 to 03pm	2		SACT Mahishadal Raj College
30 hours	06.12.18	15		12 to 2 pm	2	Day, Dr. Rajkumar Guchhait, Prof. Sagnik Manadal, Prof. Manik Das and Prof.	SACT., Zoology;
					30 hours		
l l							

## ♣ Course structure and examination scheme:

Course name	Theory classes	Practical classes	Continuous	Total		
	(hr.)	(hr.)	Theory	Practical	marks	
Induced breeding and seed production in Anabas and Heteropneustes.	12	18	40	10	50	



## Participant's Details and attendance:

## **Enrolment Details of Students**

SI	Class	Roll no.	Name	Signature
no.		To observe a provincia e e e de acestrale de la compansión de la compansió		Signature .
1.	B. Sc., 3 <sup>rd</sup> Year	2160027	AMINA KHATUN	Amina khatun
2.	PG 3 <sup>rd</sup> Sem	170062	Sanchita Maiti	Sancheta Maite
3.	PG 1st Sem	5180038	Monoj Shee	Marin Shee
4.	B. Sc., 3 <sup>rd</sup> Year	2160030	SANJAY MAJI	Sanjay Mazi
5.	PG 3 <sup>rd</sup> Sem	170080	Swagata Das	Snagata Dars
6.	PG 1 <sup>st</sup> Sem	5180039	Suchanda Maity	Emhanda Maity
7.	B. Sc., 3 <sup>rd</sup> Year	2160541	DEEPNATH HAZRA	Deephath Hazra
8.	PG 3 <sup>rd</sup> Sem	170068	Kanchan Singha Mahapatra	Karchar Singha Mahapatoa
9.	PG 1 <sup>st</sup> Sem	5180040	Sabyasachi Barman	Sa bygsachi Basiman
10.	B. Sc., 3 <sup>rd</sup> Year	2160520	MOUMITA PATRA	Mounita gather
11.	PG 3 <sup>rd</sup> Sem	170079	Barun Maity	Barwn Maity
12.	B. Sc., 3 <sup>rd</sup> Year	2160010	TUHIN KANTI SAMANTA	Tuhin kanti Samanta
13.	B.Sc 4 <sup>th</sup> sem Generic	2170376	Amrita Sharma	Amorita Sharma
14.		170076	Mahuya Maiti	Mahuya Maity
15.	B.Sc 4 <sup>th</sup> sem Generic	2170409	Jayeeta Pramanik	Jayeeta Pramanix
16.		2160194	SOURAV DOLAI	Jayeeta Pramarix Sources dolai
17		5180062	Sk. Sayantina Banu	SK. Sayandina Banu Binapani Sahoo
18	PG 3 <sup>rd</sup> Sem	170063	Binapani Sahoo	Binapani Sahoo

19.	B.Sc 4 <sup>th</sup> sem Generic	2170469	Shrabanti Maji	Shrabandi Maji
20.	B. Sc., 3 <sup>rd</sup> Year	2160457	RIKTA SANTRA	Rikta Sant pa
21.	PG 1 <sup>st</sup> Sem	5180079	Sunetra Das	Sunetra Das
22.	PG 3 <sup>rd</sup> Sem	170066	Sourav Mondal	Sourar Mondal
23.	B. Sc., 3 <sup>rd</sup> Year	2160105	SHRABANTI MONDAL	Shrabanti Mondal
24.	B.Sc 4 <sup>th</sup> sem Generic	2170540	Keya Maity	Keya Maity
25.	PG 1 <sup>st</sup> Sem	51800102	Indranath Giri	Indnanath Guri
26.	B. Sc., 3 <sup>rd</sup> Year	2160051	TANUSHREE GIRI	Tanushree Giri
27.	B. Sc., 3 <sup>rd</sup> Year	2160452	PUJA CHAKRABARTY	pyo chakosab orty
28.	PG 3 <sup>rd</sup> Sem	170082	Tuhin Patra	Tuhin Patria
29.	PG 1 <sup>st</sup> Sem	5180091	Biswarupa Panda	Biswarupa Panda
30.	B. Sc., 3 <sup>rd</sup> Year	2160050	MAITRI SAU	Maitri sau



## Add on course- 2018-2019 Organized by Department Zoology & Nutrition

# Topic: - Induced breeding and seed production of Anabas and Heteropneustes Attendance Record (Day1-Day 8)

Sl. No.	Name of Students	20.11.18	21.11.18	22.11.18	23.11.18	24.11.18	26.11.18	27.11.18	28.11.18
1.	AMINA KHATUN	XX	AX-	AK	AK	AK_	AK	AK	AK
2.	SANCHITA MAITI	Shaifi	Suaiti	15	Shaiti	Stlaiti		Maiti	Suaiti'
3.	MONOJ SHEE	M. Shee		M. Shee	M. She	M. Shee	M. Shee	M. She	U. Shee
4.	SANJAY MAJI	S.Magi	S.Maji	S.Maji		S.Maji	S.Maji	S Maji	
5.	SHAGATA DAS	S.Das		S.Dao	S.Das	S.Das	S. Das	S.Das	S. Das
6.	SUCHANDA MAITY	sim	S.M	S.M	SIM		S.M	SM	SM
7.	DEEPNATH HAZRA	D. Hazri	D.Hazn	D. Hagr		D. Haza	Dittas.	D.Han	DHazn
8.	KANCHAN SINGHA MAHAPATRA.	K.Sm.	K.S.M	K.S.M	K.S.M		K.S.M	K.S.K.	K.Sm.
9.	SABYASACHI BARMANT	SBan.	Sam.	SBan.		SBar.	SBL.	SBan	Som
10.	MOUMITH PATRA	Mifatra	M. Patr.	M. Pahr	M.Par.	M.Pam.	M. Pah.	M. Patr.	M.Pah.
11.	BARUN MAITY	B. Maily	B. Mary		Billally	B. Mary	BHAITY	BHOILY	B. Mary
12.	TUHIN KANTI SAMANTA	T.K.S	T.K.S	TKIS	TKIS	TKIS	TKS	TIKIS	T. K.S
13.	AMRITA SHARMA	A. Sharm	AShouma	A. Sharma		A. Sharm	A. Shanner	ASharm	A Show.
14.	MAHUYA MAITY	M. Maity	M. Maity		MoMaity	MoMaily	M-Maity	M. Maity	M. Mary
15.	JAYEETA PRAMANIK	fraunk	Thamak	Fram K	& Pran uk			Fram.K	
16.	SOURAY DOLAT	S. Dorai	S. Doiai	S. Dolai		S. Dolai	S. Jolai	S. Dolai	S. Dolai
17.	SK. SAYANTINA BANU	Brown	Sam	Ssam	&Bom	SBam	& Bow	SBar	SBam.
18.	BINAPANI SAHOD	B. Sahoo	B. Sahoo		B. Sahoo	B. Sahoo		B. Sahoo	
19.	SHRABANTI MATI	S.Myi	S.Higi	S.Maji		S.Miji	J.Mayr	SMaji	S.Maji
20.	RIKTA SANTRA	R. Santa	R-Sann.		R. Santr.	R. Sant.	R. Sand	and the second second	R. Sanh
21.	SUNETRA DAS	S.Das		S.Dao	S.Das	S.Das	SiDao	-	S.Das.

22									
22.	SOURAN MONTDAL	S. Mondal	S. Mondal		S. Mondal	S.Monda		S.Mondal	S. Monda
23.	SHRABANTI MONDAL	M.2	5 W	S.M	5.M	S.M	SM	SH	SM
24.	KEYA MAITY	K. Maily	K-Maily	K. Hiry	K-Maly	KWith	EMail 8		Knark
25.	INDRAWATH GIRI	I. Giri		î giri	Tyiri		I.Giri		I Give
26.	TANTUSHRE GIRL	Tigiri	T. Givi	TiGiri	U	TGivi	T. Giri	U	T.Gin
27.	PUJA CHAKRABORTY				INC	OMPL			
28.	TUHIN PATRA	Tatra.		Tatra.	Farm.	Batra.	Tatra	Batr.	Bah.
29.	BISWARUPA PANDA	B. Panda	B. Grade	D. James	,	B. Paner	8. Panela	1	B. Panela
30.	MAITRI SAHOO.	M.Sah.	61	-	MSoh.	M.Sah.	0.10	M.Sah	VSar.



SI. No.	Name of Students	29.11.18	30.11.18	01.12.18	03.12.18	04.12.18	05.12.18	06.12.18	
1.	AMINA KHATUN	AK	AK		AK	AK		AK	
2.	SANCHITA MAITY	"Skaiti		Suaiti	ullaiti	Slati	Maiti	usllaiti.	
3.	HONOJ SHEE	H.Shu.	M. Shee	M. She		Hylu	M. shee	M. Shee	
4.	SANJAY MAJI	S.Maji		SMaji	5.M.j1	SMAji		S.Miji	
5.	SWAGATA DAS	5.Des	S.Dw	S.Das	· S.) no	S.Das	S.Das	S. Das.	
6.	SUCHANDA MAITY	SM	SM	SIM	SM	352	S.M	S.M	
7.	DEEPWATH HAZRA	Dollage		D Har	D.H2-	D. Harr		D. Hazu	
8.	KANCHANT SINGHA- MAHAPATRA	K.S.DL	K. Shr.	K.S	•	K.S.M.	K.S.M	K.S.M.	
9.	SABYASACHI BARMAN	SBar	SBor		SBan	SBor	SBar	SBar.	
10.	MOUMITA PATRA	M. Pah		M. Padr.		M. Par.			
11.	BARUN MAITY	B. Nairy	Billity	Bility	PHILPY		B. Maity	B. Maily	
12.	TUHIN KANTI -SAMANTA	- 4	TIKIS		Tikis	TKIS	TIKLS	T.K.S	
13.	AMRITA SHARMA	KShow	A. Sham.	A.Shan'	A.Shr.	ASham	Agharm	A. Sharm	
14.	MAHUYA MASTY	M. Haily	M·MWYY	MINNIN	M. Maity	M.Mily	0.	M·Maily	
15.	JAYEETA PRAMANIK		Frank	Irran K		Pranc	france	Frank	
16.	SOURAN DOLAT	S. Dolai	5. Johai		S. Dolai	S. Down	S. Dolai	S. Dolai	
17.	SK. SAYANTINA BANG	)	Shaw	SBan			Spann	SBan.	
18.	BINAPANI	B. Sahoo		B. Sahoo		B. Sahoo	B.Saho	B. Sahoo	
19.	SHRABANTI MATI	S.Maji	S. Mogi	S.Maji	S. Maji	S. Maji	S. Mayi	S.Haji	
20.		R. Jank		R. Sandr		R. Sant		R. Sand	
21.	SUNETRA DAS	SiDas	SiDas		SiDas		Silvao	SiDas	
22.	SOURAN MONDAL	S. Monda	1	S. Monda	1	S. Marda		SHardal	
23.	SHRABANTI MONDAL	S.M	s.M	SM	SM		sy	SM.	

	1		1						
24.	KEYA MALTY	Killaly		Kunty		KNYYY	KNIN	K.Miny	
25.	INDRANATH GIRL		J. y ?	I. giri	2. 9in:	Igin:	T. Gir.	1. yiri	
26.	TAMUSHR EF GIRE	T. Giri	<b></b>	Tigini		T.Gir.		T.Giri	
27.	PUTA CHAKRABORY		Inc	mpoleka					
28.	TUHEN PATRA	- Commence		^	For.	(*)	Fat.	Fers.	
29.	BISWARUPA-PANDA	Bilanda		Beloven	B-low-	B. Pan		Blando	
30.	MAITRE SAHOO		Thorse was in	M.Salue	M.Sahi		M. Sahu	M-Sahu	

(1(s))-



#### Sample Question of Examination

c)

d)

7.

a) b)

c)

d)

Lime

Formalin

Fan Lei T.V.R. Pillay

H.B. Wilson

V.G. Zingram

2018/Add On Course/ Examination

#### ADD ON COURSE

## Department of Zoology & Nutrition, Mahishadal Raj College Induced breeding and seed production of Anabas and Heteropneustes

Full Marks: 50

Time: 2 hrs

The figures in the right-hand margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable. Illustrate the answers wherever necessary.

#### A. Answer the following MCQ:

15x2=30

Which of the following is used for induced breeding in fishes? 1. MOET a) ART b) Hypophysation c) Artificial insemination d) An advantage of induced breeding in fishes is to 2. have more seeds a) have more fish b) earn more money c) have all of the above three d) In India peak breeding season of common carp is ------3. Summer a) Winter b) Monsoon c) d) None of the above Pituitary extract is preserved with ------4. Absolute alcohol a) Glycerine b) Acetone c) d) Freezing Measurment of carbonate and bicarbonate ions is a-5. Hardness a) b) Alkalinity c) Transparency d) Turbidity Which chemical is used to control aquatic insect? 6. a) Hi-oxide Bleaching powder b)

The book Classic of Fish Culture was written by-



## 2018/Add On Course/ Examination

8.	Fishes feeding on single type of feed are known as
a)	Stenophagic
b)	Monophagic
c)	Euryphagic
d)	Carnivorous
9.	Major nitrogenous waste products excreted by fish
a)	Urea
b)	Ammonia
c)	Uric acid
d)	Amino acid
10.	Each milliliter of ovaprim, a synthetic hormonal preparation contains sGnRH and
	domperidone.
a)	20 mg, 10μg
b)	0.2 mg, 10µg
c)	20 μg, 10 mg
d)	2.0 mg, 10µg
11.	is a leading country in export of ornamental fishes.
a)	USA
b)	UK
c)	Singapore
d)	India
12.	First scientific fish farm in India was constructed under the guidance of -
a)	H. B. Vora
b)	H. B. Wilson
c)	G. E. Fogg
d)	Lo-Chai Chen
13.	Two or more species culture in the same pond is known as -
a)	Polyculture
b)	Monoculture
c)	Raceway culture
d)	Pen culture
14.	The average fish consumption in urban part of India is
a)	1 to 2 kg/person/year
b)	3 to 5 kg/person/year
c)	6 to 8 kg/person/year
d)	8 to 10 kg/person/year
15.	Polyculture of fishes were first developed in—
a)	India
b)	China
c)	Thailand
d)	Taiwan
B. An	swer the following questions: 2x10=20

What is induced breeding? What are the various stages of induced breeding technique?

Describe the role of quality of water in aquaculture.

1.

2.



## **♣ SAMPLE CERTIFICATE OF COURSE COMPLETION**



THIS IS TO CERTIFY THAT

Swagata Das

has successfully completed the Add-on Course on Induced breeding and seed production held during 2018-19 academic year at Mahishadal Raj College.

Allamoy Da

Course Co-ordinator

IOAC Co-ordinator

DATE: 06.12.2018

Principal



THIS IS TO CERTIFY THAT

Kanchan Singha Mahapatra

has successfully completed the Add-on Course on Induced breeding and seed production held during 2018-19 academic year at Mahishadal Raj College.

Sublamy De

Course Co-ordinator

Stander.

**IQAC** Co-ordinator

DATE: 06.12.2018

Spor

Principal



#### MAHISHADAL RAJ COLLEGE

(Govt. Sponsored)

NAAC Accredited 'A' Grade College DST (FIST) Govt. Of India approved College, NSDC Training Partner Estd.: 1946

Mahishadal: Purba Medinipur

Phone STD 03224 No. 240220

Ref. No. MRC/ADDON/04/2018-19

/2018-19 Date: 05.01.2019

## ADD ON COURSE 2018-19

# Organised by Department Zoology

**Topic: Popular Science Writing** 

Add on course summary:

#### REPORT:

Name of the course-Popular Science Writing

Course coordinator: Dr. Shubhamoy Das, (Associate Professor, HOD, Department of Zoology, Mahishadal Raj College)

Date of commencement: 10/12/18

Date of completion: - 18/12/18

Number of participant: 31

Total duration day: 08

Total duration hour: 32

Evaluation method:- Paper pen MCQ and practical field work

#### **RESULT DETAILS:-**

Number of student participate in this program: 22

Number of student completes this program: 21

Number of student got certificate in this program: 21

Name of the course: Popular Science Writing

Course coordinator: Dr. Shubhamoy Das, (Associate Professor, HOD, Department of Zoology, Mahishadal Raj College)







## Popular science writing

#### Aims of the course:

To familiarise students with a range of perspectives on the value and purposes of science writing to explore a range of styles and techniques for writing about science, with a focus on writing narrative non-fiction books and essays to develop students' skills as effective and engaging science writers

## Learning outcomes:

As a result of the course, within the constraints of the time available, students should be able to:

- 1. Critique science writing and recognise what makes science writing appropriate to particular audiences and aims
- 2. Develop ideas for, and draft, of a piece of non-fiction writing (a book chapter or a long feature, of approximately 5,000 words), using elements of narrative storytelling.
- 3. Develop a proposal and pitch for a popular science book
- 4. Edit their work to enhance their writing for particular readerships and production contexts.

#### Target audience:

Students who aren't necessarily practicing scientists or trained in science, but who are interested in communicating science to the general public Students who are academics at any stage of their careers and are keen to write effectively about their science for a wide audience, beyond their peers .Students who are keen to write popular science books or long features for journals and magazines.

The student specially Zoology, Botany, Physiology, Nutrition Physics, Chemistry Mathematics and Computer science are entitled in the course. Irrespective general generic and honours all the students who have scientific attitude and temperament and the student who are willing to established in the field of writing they can attend the courses.

#### Course content overview:

This course introduces the craft of writing about science for non-specialist readerships, also known as popular science writing. Students will learn how to read, analyse and critique the work of other science writers, to develop their own skills in effectively communicating science to non-specialist publics., Students will each develop an idea and draft text for a long piece of narrative non-fiction writing of their choice, most likely a chapter for book or a long feature. Students will practise their own science writing, with short writing exercises alongside their own work to produce a long feature or a chapter for a book. Feedback from tutors will be available throughout the course. Students will learn how to get their writing published.



## **♣ Schedule:** Total 32 hours

DAY	SCHEDULE
Day 1	Orientation (4hours)
Day 2	What makes good science writing? (4 hours)
Day 3	Shaping a structure and telling a story (4 hours)
Day 4	Editing: how to write better (4 hours)
Day 5	Publishing your book (4 hours)
Day 6	Managing information (4 hours)
Day 7	What Next? (4 hours)
Day 8	Valediction, feedback (4 hours)

## **♣** Detail Work Schedule

Contents	Time	Duration	Experts	Designation
Orientation	12 to 1pm	1	Dr. Subhamoy Das	HOD DEP. of ZOOLOGY
What is science? History of science writing	1 to 4 pm	3	Dr. Suman Pratihar	Assit Prof Keshpur College
What makes good science writing?(4 hours)	1 to 5pm	4	Arif Ikbal Khan	Emenent Journalist
Shaping a structure and telling a story(4 hours)	01 to 05pm	4 .	Subhamoy Das	HOD DEP. of ZOOLOGY
Editing: how to write better(4 hours)	01 to 05pm	4	Pathik Guha	Emenent Journalist
Publishing your book(4 hours)	01 to 05pm	4	Dr Rajkumar Guchhait	SACT Mahishadal Raj College
Managing information (4 hours)	01 to 05pm	4	Sagnik Mondal	SACT Mahishadal Raj College
What Next? (4 hours)	01 to 05pm	4	Dr.Subikash Mukherjee	HOD, Economics, MRC
Evaluation, valediction, feedback(4 hours)	12 to 4 pm	4	Manik Das, DR.Asim Kr Bera	SACT., Zoology; Principal, MRC
		32 hours		
			32 hours	32 hours



# 4 Course structure and examination scheme:

Course	Theory	Practical Classes (hr.)	Internal Marks	E	Total		
	classes (hr.)			Theory	Practical	Field work	Marks
Popular science writing	20	12	20	50	20	10	100



# Participant's Details and attendance:

# **Enrolment Details of Students**

Sl. No.	Class	Roll No.	Name	Signature
1.	B. Sc. General	2180404	RITTWIK CHAKRABORTY	RittWik Chaknaboty.
2.	B. Sc. Generic	21800142	INDRANI SEN	Indrani Sen
3.	B.Sc.,(HONS)	2170610	TAMALIKA DAS	Tamelika Das.
4.	B. Sc.(HONS)	2170025	MAMPA DAS	Mampa Das
5.	B.Sc.,(HONS)	2170032	SANGITA ADHIKARY	
6.	B.Sc.,(HONS)	2170278	AMIT PRAMANIK	Sangita Adhikavy Amit Poarranik
7.	B. Sc. General	2180447	NAIMA AKTAR	Naima Aktan
8.	B. Sc. Generic	2180198	SOUMYATTAM BERA	Soumyattam Bena
9.	B.Sc.,(HONS)	2170280	SK. MUSTANGIR	SK. Mustangio
10.	B.Sc.,(HONS)	2170285	SUDIP DAS	Sudip Das
11.	B.Sc.,(HONS)	2170287	BITHI BERA	Bishi Bena
12.	B.Sc.,(HONS)	2170289	SRABANTI MISTRI	Srabanti Mistai
13.	B.Sc.,(HONS)	2170298	NAMITA BERA	Namita Bena
14.	B. Sc. General	2180458	SOUMYADIP PANDA	Soumyadlp Panda
15.	B. Sc. Generic	2180531	SUTALIKA MAITY	SUTULIKU Muisy
16.	B.Sc.,(HONS)	2170300	RAHUL ROY	Rahul Roy
17.	B. Sc. General	2180474	PAPIYA MAITY	Papiya Maity
18.	B. Sc. Generic	2180333	SHUVASIS KUNDU	Shuvasis Kundu
19.	B.Sc.,(HONS)	2170302	TINA JANA	Tinon Jona
20.	B.Sc.,(HONS)	2170303	MOUSUMI GHORAI	Mousumi lihona
21.	B. Sc. General	2180475	JAYASHREE BHOWMIK	Jayashrel Bhowmik
22.	B. Sc. Generic	2180543	PARAMITA MAJI	Paramita Maji

23.	B.Sc.,(HONS)	2170304	ARNAB DAS	Annab Das
24.	B.Sc.,(HONS)	2170307	RESHMA KHAN	Reshma khan
25.	B.Sc.,(HONS)	2170311	PABITRA PATRA	Pabilina Patroa
26.	B.Sc.,(HONS)	2170312	SHRABANTI PRAMANIK	Shroabanti Proamanik
27.	B.Sc.,(HONS)	2170322	SUPRIYA GIRI	Supreiga Uniri
28.	B.Sc.,(HONS)	2170342	SUVENDU DAS	Surendu Das
29.	B.Sc.,(HONS)	2170347	RESHMA KHATUN	Reshma Khatun
30.	B.Sc.,(HONS)	2170348	TRISHA MANDAL	Trisha Mandal
4	T	1		



# Add on course- 2018-2019

# Organized by Department Zoology

# Topic: -Popular Science Writing

## **Attendance Record**

Sl. No.	Name of Students	10.12.18	11.12.18	12.12.18	13.12.18	14.12.18	15.12.18	17.12.18	18.12.18
1.	RITTWIK CHAKRABORTY	Rhakma	Phakmo boty	Phakene boty	Phakme boty	Phakro	Rhack	Phakra bony	Photo
2.	INDRANI SEN	Ison	Ison.	Isen	Ben	I.son	Bon	Isen	I.sen
3.	TAMALIKA DAS	By	Day	Day	Des	Das	Day	Day	Das
4.	MAMPA DAS	Mas	M. Day	M. Day	M. Day	H. Day	H. Day	M.Day	M.Day
5.	SANGITA ADHIKARY							Incom	pilete
6.	AMIT PRAMANIK							Incom	plete
7.	NAIMA AKTAR	M·AKTON	M.AKtan	N. AKAON	N.AKtall	N.AKta	N. AKHO)	N. MKła	N. Alxdat
8.	SOUMYATTAM BERA	Serv	Spera	Spera	Spera	Spore	Spern	Spera	Spera
9.	SK . MUSTANGIR				Î.	comple	te		
10.	SUDIP DAS	Das	San	Dans	Das	Edas	Das	(C)an	Sasas
11.	BITHI BERA		-	B:Bera	B:Bera	B.Bera	BBera	B-Bera	B. Bena
12.	SRABANTI MISTRI	S. Mistri	S.Mistri	S.Mistri	S. Mistri	s.Mistri	S. Mistri	S. Mishi	S. Mistri
13.	NAMITA BERA	N. Bera	N. Bera	N. Bera	N. Bera	N. Bera	N. Bura	N. Reva	N. Bera
14.	SOUMYADIP PANDA	5. Brid	S. Pand	SiPand	SiPand	Spand	s.Pand	25 Pand	S.Pando
15.	SUTALIKA MAITY				In	compre	fe		
16.	RAHUL ROY	PROY	R. ROY	R. Roy	Rogor	P.RO7	RROY	RAPP	RIROY
17.	PAPIYA MAITY			4	Ince	mple	e	d	d
18.	SHUVASIS KUNDU	S. Kurd	S.Kund	S. Kundi	SoKund	u S.Kurdu	S-Kurdu	S.Kundi	S. Kundi
19.	TIŅA JANA	T. Jana	T. Jana	T. Jano	T. Jana	T. Jana	T. Jana		
20.	MOUSUMI GHORAI	Minoral	Michonai	M. Chorai	Michonal	2 roposed	Minoral	whonal	Tahorai
21.	JAYASHREE BHOWMIK				Inco	mplet			

			7						
22.	DADAMITA			A Company of the Comp					
	PARAMITA MAJI	P.Moji	P. Maji	P. Mai	P. Mat.	P. nad	D Mati	P. M .:	P.M.S.
23.	ARNAB DAS	A. Day	A. Don	A. Dan	A . Dan	A. O. O.	1.1(2)	A . Des	A. Dan
24.	RESHMA KHAN	R.Ktan	R.Khan	R.Khan	R. Khan	Rikhan	Rivbau	R.Vhou	R.Khar
25.	PABITRA PATRA		p. patra						P. Patra
26.	SHRABANTI PRAMANIK	Promarie	1 '	100	S-ramaril		S. Ramerik		-
27.	SUPRIYA GIRI	ร์.	हैं कि हैं	S. 4879		S. Giroi	S. giri	S.Giri	5.61m
28.	SUVENDU DAS	S. Das		S. Das	S-Das	SIRAS	5.2as	S. Das	5.20 as
29.	RESHMA KHATUN	R. Khabin	R. Khatum	R. Khatur	R. Khatun	Ri Khadum	R. Khatun	R. Khatur	Rikhatun
30.	TRISHA MANDAL	T. Mardal	T- Mathdal	Marda Marda	T. Mardal	T. Honda	T. Handal	Mandal	Mandal

#### Sample Question of Examination

2018/4dd On Course/ Examination

#### ADD ON COURSE Department of Zoology, Mahishadal Raj College Popular Science Writing

Full Marks: 50

Time: 2 hrs

The figures in the right-hand margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable. Illustrate the answers wherever necessary.

#### A. Answer the following MCQ:

#### 1. What is the best description of scientific writing?

A)Scientific writing reports experiments using prose and metaphors.

B)Scientific writing is how scientists communicate the results of their experiments and work accurately and collaboratively.

C)Scientific writing is written for the layman using mainstream media as a source.

D)Scientific writing shares results of experiments that are neither peer reviewed nor edited.

2.What are some of the ways scientific writing is used?

A)Academics (scientific literature and curricula), social media (opinion blogs), theoretical modelers

B)Academics (scientific literature and curricula), medical and pharmaceutical fields (treatments), social media (opinion blogs)

C)Academics (scientific literature and curricula), medical and pharmaceutical fields (treatments), theoretical modelers (knowledge)

D)Social media (opinion blogs), medical and pharmaceutical fields (treatments), theoretical modelers

3.All the following are examples of ways the current style of scientific writing differs from other writing EXCEPT?

A)Scientific writing uses many metaphors.

(knowledge)

B)Scientific writing uses some terms (like 'significant' or 'correlation') differently and with specific mathematical or scientific meaning.

C)Scientific writing is clear, concise, and precise.

D)Scientific writing uses active voice and is written from the author's perspective.

4. What are some of the ways scientific writing is used?

A)Academics (scientific literature and curricula), social media (opinion blogs), theoretical modelers

B)Academics (scientific literature and curricula), medical and pharmaceutical fields (treatments), social media (opinion blogs)

C)Academics (scientific literature and curricula), medical and pharmaceutical fields (treatments),

D)Social media (opinion blogs), medical and pharmaceutical fields (treatments), theoretical modelers theoretical modelers (knowledge)





# B. Answer any ten of the following questions:

10x4=40

A)How can taxonomy be made a popular science again?

B)How important are visualizations for popular science?

C)Is videoconferencing a good instrument for popularizing science over the Internet?

D)What is the best place to publish feasibility studies and popular science articles?

E)What is the reason for the Saturn's hexagon?

F)Popular science research or problem solving research ???

G)What are the main requirements to write a good article in translation studies?

H)Source criticism in scientific literature?

U)Why, when simile and metaphor are so often discussed in popular science translation as closely related, there is only so much research on metaphor?

J)What is science communication?

K)Why do we need science communication?

L)What are the different kinds of science communication?

M)What is popular science writing?

N)Write different objectives of popular science writing.

O)Who can popularized science?

P)Explain popular hands writing is art.

Q)What are the different media for science popularisations?

R)What is science blog?

S)Write the features of language for science popularisations.

T)Give an example of science population simplicity.

U)Example the clarity of ideas in science popularisation.

V)How you should avoid technical terms in science writing

W)Describe with example about use of analogy

X)How you should avoid information overload?

Y)Give example use of avoidance of technical words

Z)Right different ethical points regarding popular science writing



# **▶** SAMPLE CERTIFICATE OF COURSE COMPLETION



THIS IS TO CERTIFY THAT

Mousumi Chorai

has successfully completed the **Add-on Course** on *Popular Science Writing* held during 2018-19 academic year at Mahishadal Raj College.

Sublamoy Da

Course Co-ordinator

Haral C.

IOAC Co-ordinator

DATE: 18.12.2018

Shor

Principal



THIS IS TO CERTIFY THAT

Arnah Das

has successfully completed the **Add-on Course** on *Popular Science Writing* held during 2018-19 academic year at Mahishadal Raj College.

Sullaway Dr

Course Co-ordinator

Jander.

**IQAC Co-ordinator** 

DATE: 18.12.2018

Flor

Principal



#### MAHISHADAL RAJ COLLEGE

(Govt. Sponsored)

NAAC Accredited 'A' Grade College DST (FIST) Govt. Of India approved College, NSDC Training Partner Estd.: 1946

Mahishadal: Purba Medinipur

Phone STD 03224 No. 240220

\_\_\_\_\_\_ Ref. No. MRC/ADD ON/05/2018-19

Date: 02.03.2019

## ADD ON COURSE 2018-19

# Organised by Department Zoology & Physiology

**Topic:** Gel electrophoresis

Add on course summary:

#### REPORT:

Name of the course- Gel electrophoresis

Course coordinator: Dr. Shubhamoy Das, (Associate Professor, HOD, Department of Zoology, Mahishadal Raj College)

Date of commencement: 04.02.2019

Date of completion: - 22.02.2019

Number of participant enrolled: 30

Total duration day: 15

Total duration hour: 30

Evaluation method:- Paper pen MCQ and practical work

#### RESULT DETAILS:-

Number of student participate in this program: 30

Number of student completes this program: 28

Number of student got certificate in this program: 28

Name of the course: Gel electrophoresis

Course coordinator: Dr. Shubhamoy Das, (Associate Professor, HOD, Department of Zoology, Mahishadal Raj College)







## Gel electrophoresis

## About the course:

Gel electrophoresis is a laboratory technique used in molecular biology and biochemistry to separate and analyze macromolecules such as DNA, RNA, or proteins based on their size and charge. It is a fundamental tool for various applications, including DNA profiling, gene expression analysis, and protein characterization. Courses on gel electrophoresis may be part of broader molecular biology, biochemistry, or biotechnology curricula, and they often involve a combination of theoretical lectures, hands-on laboratory experiments, and data analysis sessions. Practical experience is crucial for mastering gel electrophoresis techniques.

## Learning outcomes:

Completing a course on gel electrophoresis can open up various job opportunities in the fields of molecular biology, genetics, biotechnology, and biochemistry. This course opens up various job opportunities in both the public and private sectors. The potential job opportunities of this course are research assistant or technician, biomedical scientist, biotechnologist, quality control analyst, forensic scientist, academic research, pharmaceuticals research associate, biological data analyst, clinical research coordinator, environmental scientist and laboratory manager.

## ♣ Target audience:

Any branch of life sciences students (UG and PG), research scholars, and faculties.

#### Course content overview:

This course introduces the basic idea about Gel Electrophoresis Technique. Gel electrophoresis is a laboratory method used to separate mixtures of DNA, RNA, or proteins according to molecular size. In gel electrophoresis, the molecules to be separated are pushed by an electrical field through a gel that contains small pores. The molecules travel through the pores in the gel at a speed that is inversely related to their lengths. This means that a small DNA molecule will travel a greater distance through the gel than will a larger DNA molecule.

As gel electrophoresis involves an electrical field; in particular, this field is applied such that one end of the gel has a positive charge and the other end has a negative charge. Because DNA and RNA are negatively charged molecules, they will be pulled toward the positively charged end of the gel. Proteins, however, are not negatively charged; thus, when researchers want to separate proteins using gel electrophoresis, they must first mix the proteins with a detergent called sodium dodecyl sulfate. This treatment makes the proteins unfold into a linear shape and coats them with a negative charge, which allows them to migrate toward the positive end of the gel and be separated. Finally, after the DNA, RNA, or protein molecules have been separated using gel electrophoresis, bands representing molecules of different sizes can be detected.



## Schedule: Total 30 hours

DAY	SCHEDULE
Day 1	Introduction to molecular biology technique (T) (2 hours)
Day 2	Gel electrophoresis (T) (2 hours)
Day 3	Agarose gel electrophoresis for DNA (T+P) (2 hours)
Day 4	DNA sample preparation (T+P) (2 hours)
Day 5	Sample loading and gel run (T+P) (2 hours)
Day 6	Visualization and results interpretation (T+P) (2 hours)
Day 7	Agarose gel electrophoresis for RNA and sample preparation (T+P) (2 hours)
Day 8	RNA sample loading, gel run, visualization and data interpretation. (T+P) (2 hours)
Day 9	SDS PAGE (T) (2 hours)
Day 10	Sample preparation for SDS PAGE (T+P) (2 hours)
Day 11	Protein sample load and gel run (2 hours)
Day 12	Visualization of band and data interpretation. (2 hours)
Day 13	Native PAGE and Sample preparation. (2 hours)
Day 14	Gel run, visualization, and data interpretation. (2 hours)
Day 15	Doubts clear and revision

#### ♣ Detail Work Schedule

Date	Day	Contents	Time	Duration	Experts	Designation
04.02.19	1	Orientation & Introduction to molecular biology technique (T)	12 to 2pm	2	Dr. Subhamoy Das	HOD DEP. of ZOOLOGY
05.02.19	2	Gel electrophoresis (T)	1 to 3 pm	2	Dr. Rajkumar Guchhait	SACT Mahishadal Raj College
06.02.19	3	Agarose gel electrophoresis for DNA (T+P)	3 to 5pm	2	Dr. Rajkumar Guchhait	SACT Mahishadal Raj College
07.02. 19	4	DNA sample preparation (T+P)	03 to 05pm	2	Dr. Rajkumar Guchhait	SACT Mahishadal Raj College
08.02.19	5	Sample loading and gel run (T+P)	02 to 04pm	2	Dr. Rajkumar Guchhait	SACT Mahishadal Raj College
11.02.19	6	Visualization and results interpretation (T+P)	01 to 03pm	2	Dr Rajkumar Guchhait	SACT Mahishadal Raj College
12.02.19	7	Agarose gel electrophoresis for RNA and sample preparation (T+P)	03 to 05pm	2	Prof. Sagnik Mandal	SACT Mahishadal Raj College
13.02. 19	8	RNA sample loading, gel run, visualization and data interpretation. (T+P)	02 to 04pm	2	Prof. Sagnik Mandal	SACT Mahishadal Raj College

B						
14.02.19	9	SDS PAGE (T)	02 to 04pm	2	Prof. Manik Das	SACT Mahishadal Raj College
15.02.19	10	Sample preparation for SDS PAGE (T+P)	01 to 03pm	2	Prof. Manik Das	SACT Mahishadal Raj College
18.02,19	11	Protein sample load and gel run	02 to 04pm	2	Prof. Manik Das	SACT Mahishadal Raj College
19.02.19	12	Visualization of band and data interpretation.	02 to 04pm	2	Prof. Manik Das	SACT Mahishadal Raj College
20.02.19	13	Native PAGE and Sample preparation.	01 to 03pm	2	Prof. Moumita Jana	SACT Mahishadal Raj College
21.02.19	14	Gel run, visualization, and data interpretation.  Doubts clear and revision	01 to 03pm	2	Prof. Moumita Jana	SACT Mahishadal Raj College
22.02.19	15	Evaluation, valediction, feedback	12 to 2 pm	2	Dr. Subhamoy Day, Dr. Rajkumar Guchhait, Prof. Sagnik Manadal, Prof. Manik Das and Prof. Moumita Jana. DR.Asim Kr Bera	HOD & SACT., Zoology; Principal, MRC
				30 hours		

## **←** Course structure and examination scheme:

Course name	Theory classes	Practical	Internal	External m	Total	
	(hr.)	classes (hr.)	marks	Theory	Practical	marks
Gel	7	23	20	40	40	100
electrophoresis						



# Participant's Details and attendance:

## **Enrolment Details of Students**

SI.		Roll No.	Name	Signature
	B. Sc. (HONS)	2180118	Aditi Bhunia	Adili Bhunia
2.	B. Sc. (HONS)	2180217	Arpita Ghorai	Ampita Orhomai
3.	M. Sc. 1" Sem	5180029	Baishali Pal	Jaisheli Pal
١.	B. Sc. (HONS)	2180185	Chayanika Bera	Chayonika Bena
5.	B. Sc. (Generic)	2170465	Dipika Sahoo	Dipika sahoo
6.	M. Sc. 1" Sem	5180036	Ipsita Maji	IPsita nasi
7.	B. Sc. (HONS)	2180182	Mahadeb Pramanik	Mahadeb Pramarik
8.	B. Sc. (Generic)	2170273	Mihir Mondal	Mihiro Mondal
9.	M. Sc. 1 Sem	5180038	Monoj Shee	Monoj shee
10.	M. Sc. 1 <sup>st</sup> Sem	5180037	Moumita Pramanik	Mounita Pramanik
11.	B. Sc. (HONS)	2180157	Mushlema Khatun	Mushloma Khatun
12.	B. Sc. (Generic)	2170369	Nabanita Das	Nabanita Das
13.	B. Sc. (Generic)	2170316	Nabanita Pal	Nabanita Pal
14.	B. Sc. (Generic)	2170284	Nasrin Nahar	Narrin Nahan
15.	B. Sc. (Generic)	2170352	Parbati Sana	Parbali Sana
16.	B. Sc. (HONS)	2180196	Poulami Kar	Poulani Kar
17.	B. Sc. (HONS)	2170370	Premesh Kr. Das	Bremesh Kr. Dao
18.	B. Sc. (HONS)	2180159	Priyanka Das	Briganka Das
19.	B. Sc. (Generic)	2170330	Rini Rani Mondal	Piri Rani Mondal
20.	B. Sc. (HONS)	2180321	Rinku Rani Samanta	Rinku Rani Samanta
21.	B. Sc. (Generic)	2170317	Sabari Mondal	Sabari Mondal
22.	B. Sc. (HONS)	2180205	Shreya Dinda	Shriya Dinda
23.	B. Sc. (HONS)	2180117	Snehasis Das	Snehasis Das
24.	B. Sc. (HONS)	2180206	Subhashree Mondal	Subhanhore Mondal

25.	B. Sc. (HONS)	2180313	Subinita Adhikary	Submita Adhikat
26.	M. Sc. 1st Scm	5180039	Suchanda Maity	Suchanda Maify
27.	B. Sc. (HONS)	2180216	Suchitra Maily	suchitra Maitu
28.	M. Sc. 1 <sup>st</sup> Scm	5180031	Suman Ghosh	Sumar Crihosh
29.	M. Sc.1 <sup>st</sup> Scm	5180030	Susmita Bhowmik	Susmila Bhowmik
30.	B. Sc. (Generic)	2170314	Tanushree Guchhait	Tanushnee Guchha



# Add on course- 2018-2019 Organized by Department Zoology Topic: - Gel electrophoresis

# Attendance Record (Day1-Day 8)

Sl. No.	Name of Students	04.02.19	05.02.19	06.02.19	07.02.19	08.02.19	11.02.19	12.02.19	13.02.19
	ADITI BHUNIA	A. Benna		A . Bhurica	A. Blumen	A. Bharrier	A. Bhuria		A. Bhun
2.	APPITA GHORAI	Ainomai		A. Chorai		A Cehopai	A. Ghorai	A. Chopai	
3.	BATSHALT PAL	B. Pal		BiPal			13 dal.	BPW	
1.	CHAYANIKA BERA	C. Bora		c. Bera	C. Bora	C. Bera			C. Bora
5.	DIPIKA SAHOO								Book
6.	IPSITA MAJI	I. Maji	I. Maji		I.	T.	I.		
7.	MAHADEB PRAMANIK	M. Promeint		M. Pramonik	Maji M. Ti Pramonik	Maji	Maji Pramonik	M. Pramanik	M. Pramoni
8.	MIHIR MONDAL	M. Mondal	M. Mondal		M. Hordal	M. Herdal	M. Mondal		M.
9.	MONOJ SHEE	M. Shee	M. Shee	M. Shee	pier (ice	M. Shee	M. Shee		Mondo M. shee
10.	MOUMITA PRAMANIK	17. Army	M. Pra	onee	M. Men	M. Pronmanik		M.	
11.	MUSHLEMA KHATUN	M. Khockur	M. Khachen		M. Khadan	Khartur		A CONTRACTOR OF THE PARTY OF TH	Khatur
12.	NABANITA DAS	N. Das	N. Dos.		N. Das	N. Dous		N. Does	N. Das
13.	NABANTTA PAL	N. Pal	N. Pal		N. Pal	N. Pal		r. Pal	
14.	MASRIK MAHAR.	N. Nahar	N. Nahar	N. Wahar	7501		N. Nahan	N. Nahar	IV. Nahas
15.	PARBATI SAWA	Prson		Psour	Paus	P. sows		Sana.	
16.	POULAMI KAR	P. Kan	P. Kan	P.		P. Karo	P. Kan	P. Kar	
17.	PREMESH KR. DAS		1.50.						
18.	PRIYANKA DAS	Bas		Sas	g~	Da on	Dar		Sas
19.	BUI RANT MONDAL	R. Mondai	R. Mondal R.	R. Mendat		p. Mondai	P. Morda		R. Mondal
20.	BAKU RANJ SMANTA		R. Samanla	1	R. Samanb	R.			Mordal R. Samont
21.	SABARI MONDAL	Sunder		Hordal		Sondel		Mandal	Mondy!

			1				Г		
22.	SHEEYA DINDA	S. Dinda		5. Dinda	s. Dinda	s. Dinda		S. Dinda	s. Dinda
23.	SMEHASIS DAS	3. Das	Sign		S. Das		5. Das	Das	Das_
24.	SUBHASHREE MONDAL	S. 1	Mondael	Mondael	Mondal		8. Mondad	S. Mondal	3. Mondal
25.	SUBINITA ADHIKARY	3. Adhikazy	Adhikany			3. Adhikovy		Adhikany	
26.	SUCHANDA MAITY	S. Maity		Sindy		S. Maity	S. Maity	S. Maity	S. Maity
27.	SUCHITRA MAITY	Maily	s. by	3. Maily		Mairy	mosely	/	maily
28.	SUMAN GHOSH	S. a. GHosh	S. GHash	S. Ghosh	•	3. Chash	6 hosh		Shash
29.	SUSMITA BHOWMIK	3. Bhownik	3. Bhowmik		Bhowmik		5. Bhowmik	5. Bhowmik	
30.	TANUSHREE GUCHHAIT.	T. Gruchha		7.	T.	T. Gruchhai		Ti buckhait	T. Guethais



# Attendance Record (Day9-Day 15)

Sl. No.	Name of Students	14.02.19	15.02.19	18.02.19	19.02.19	20.02.19	21.02.19	22.02.19	
l.	ADITI BHUNIA	A. Bluma	A. Ohma	A. rhumic		A. Bhuna		A. Bhusa	1-
2.		A. Chorai	Ghorai	A. Gharai		A. charoii		A. Cohorou	0-
3.	BAISHALI PAL	Pal	Bopal	Box		Bay		Bay	Box.
4.	CHAYANIKA BERA	C. Bena	вела		e. Dona		e. Bero		Beno
5	DIPIKA SAHOO						-		I.,
6.	IPSITA MATI	Maji	Maje		Maji		Maje		Możi.
7.	MAHADEB PRAMANIK	M. Proconovic	M. Provrock		M. Proconocrú M.		Promovik M.		Promos M.
8.	LATUTO MAINT AL	mondal	Mondael	947	Mondal		Mondael	M.	Monday M.
9.	MONOJ SHEE	Shee	shee	M.	shee		Shee.	Shee	shee
10.	MOUMITA	Blaumania M		Promanik M.	Pramania M.		M. 1	Posamania M. Khatur	M. /
11.	MUSHLEMA- KHATUN	M. Khatun		Khahun	N.	N,	Khatur	N.	Khadu
12.	MABANITA DAS	N. Das	N. Das N.		pas N.	Das N.		Das No.	Das.
13.	NABANITA PAL	Pal.	Pal		Pal	Paul	N4.	Pal	Pack
14.	MASRIN MAHAR	Nahar	Nahar	1 V	Nahar		Nahour	Pour	Naher
15.	PARBATI SANA	Isan		sava	Sana		Sana P.	50.	P,
16.	POULAMI KAR	P. Korz		Kor	Kour_		P.	P.	P. Das
17.	PREMESH KR. DAS	P. Das	P. Das	•	sas		Das	Das	THE S
18.	PRIYANKA DAS	0	R,		R.		R. 1-1	R. Mondal	R. Mondo
19.	RINI RANI MONDA	R. Momdal	Mondo		Mondal R. 1		R. )		R. Soonando
20.	RINKU RANI SAMANTA	Someon	1		Somourton		Soundal		Mon de
21.	SABARI MONDAL	Mendal	Mandel 3.		3.				3. Dind
22.	SHREYA DINDA	Dinda	Dêmdo		Dindo		Dimda	Dinda	DI III

5.6 Dinda 23. SNEHASIS DINKA Dinda Dinda 3. Dinda Dinda Dinda 24. SUBHASHREE Mondal Mondal Mondal Mondal Mondal Mandal MONDAL 5. s. 9. 25. 5. SUBINITA Adhikory Adhikooy Adhikory Adhikouy ADHIKARY 5. 5. 26. SUCHANDA MATTY D. Maitz Mail Maily Maile Mail Maile SUCHITRA MAITY 27. 5. 5. Mait Maity Maity Maity Mait Mait SUMAN GHOSA chash. chash 28. Ghosh Ghosh Chosh Chosh S. Bhownik Bhownik 29. 3. 3. SUSMITA Bhowmik Bhowmil Bhowmik BHOWMIK 下 T 30. T. 下 TANUSARE E bruchnait bruchhait buch hair bruchhait bruchhait bruchhait GUCHHAIT.



# Sample Question of Examination

2019 /Add On Course. / Examination

#### ADD ON COURSE Department of Zoology, Mahishadal Raj College Gel Electrophoresis

Full Marks: 50

Time: 2 Hrs

The figures in the right-hand margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable. Illustrate the answers wherever necessary.

## A. Answer the following MCQ type questions:

1. In an SDS-PAGE

a. proteins are denatured by the SDS

b. proteins have the same charge-to-mass ratio

- smaller proteins migrate more rapidly through the gel
- d. all of the above
- 2. Proteins can be visualized directly in gels by
  - a. staining them with the dye
  - using electron microscope only
  - measuring their molecular weight
  - none of these
- 3. In SDS-PAGE, the protein sample is first
- a. treated with a reducing agent and then with anionic detergent followed by fractionation by electrophoresis
- b. fractionated by electrophoresis then treated with an oxidizing agent followed by anionic detergent.
- treated with a oxidizing agent and then with anionic detergent followed by fractionation by electrophoresis
- d. none of the above
- 4. Electrophoresis of histones and myoglobin under non-denaturing conditions (pH = 7.0) results in

  - both proteins migrate to the anode histones migrate to the anode and myoglobin migrates to the cathode
  - c. histones migrate to the cathode and myoglobin migrates to the camode
    d. both proteins migrate to the cathode
- In isoelectric focusing, proteins are separated on the basis of their
   a. relative content of positively charged residue only
   b. relative content of negatively charged residue only
- d. relative content of positively and negatively charged residue

  6. Proteins are separated in an SDS-PAGE experiment on the basis of their

  a. positively charged side chains

  - b. molecular weight
  - c. negatively charged side chi d. different isoelectric points negatively charged side chains
- 7. The subunit molecular weight as well as the number of subunits in the quaternary structure can be determined by
  - a. SDS-PAGE electrophoresis
  - gel filtration chromatography
  - combining information from (a)and (b) isoelectric focusing
- 8. For the separation of DNA by electrophoresis, which of the following method is commonly used?
- a. Agarose vertical
- b. Agarose horizontal
- c. PAGE vertical d. PAGE - horizontal



#### 2019 /Add On Course. / Examination

- 9. Sodium dodecyl sulfate (SDS) used in SDS PAGE is
- a. An anionic detergent
- b. A cationic detergent
- c. A non-ionic detergent
- d. An anion exchanger
- 10. Function of  $\beta$ -mercaptoethanol in SDS-PAGE is
- a. To give negative charges to amino acids in the proteins
- b. For the oxidation of disulfide bonds in the proteins
- c. For the reduction of disulfide bonds in the proteins
- d. For breaking hydrogen bonds in the proteins

#### Answer the following questions

10x3=30

- 1. Write the principle of agarose gel electrophoresis. Write the application of it.
- 2. Write the principle of SDS PAGE. Write the application of it.
- 3. Write the differences between SDS PAGE and Native PAGE. Write the application of native PAGE.



SAMPLE CERTIFICATE OF COURSE COMPLETION



THIS IS TO CERTIFY THAT

# Aditi Bhunia

has successfully completed the Add-on Course on Gel electrophoresis held during 2018-19 academic year at Mahishadal Raj College.

Allany 8-

Course Co-ordinator

Junder.

**IQAC** Co-ordinator

Date: 22.02.2019

Sport

Principal



THIS IS TO CERTIFY THAT

# Snehasis Das

has successfully completed the Add-on Course on Gel electrophoresis held during 2018-19 academic year at Mahishadal Raj College.

Allany &

Course Co-ordinator

Jank r.

IQAC Co-ordinator

Date- 22.02.2019



Principal