

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	
Day 1	SCHEDULE
	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
Day 4	Phylogenetic and help (2 hours)
Day 5	Phylogenetic analysis and interpretation (T+P) (2 hours)
	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)
Day 12	Introduction to functional genomics data analysis (T). (2 hours)
Day 13	Hands-on training session on "Genomics data analysis in R 1 (P).
	(2 hours)
Day 14	Hands-on training session on "Genomics data analysis in R 2 (P)
Day 15	Hands-on training session on "Genomics data analysis in R 3 (P)

♣ Detail Work Schedule

Date	Day	Contents	Time	Duration	Experts	Designation
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

			Marin Woolle			X
23.08.18	8	Enzyme database	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
31.08.18	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. Moumita Jana. DR. Asim Kr	HOD & SACT., Zoology; Principal, MRC
		in the second se	•	20 haves	Bera	· · · · · · · · · · · · · · · · · · ·
		*.		30 hours		
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♣ Course structure and examination scheme:

Course name	Theory classes	Practical classes	Continuous ass	sessment	Total
	(hr.)	(hr.)	Theory	Practica1	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	Rittwik Chaknaborty
2.	B. Sc. Generic	21800142	INDRANI SEN	Indroni Sen.
3.	B. Sc.,(HONS)	2170610	TAMALIKA DAS	Tamalika Das
4.	B. Sc. (HONS)	2170025	MAMPA DAS	Mampa Das
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	Soungattam 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	Bithe Bosa
12.	B. Sc.,(HONS)	2170289	SRABANTI MISTRI	Snabanti Mistri
13.	B. Sc.,(HONS)	2170298	NAMITA BERA	Namita Bena
14.	B. Sc. General	2180458	SOUMYADIP PANDA	Soumyadip Panda
15.	B. Sc. Generic	218,0531	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

	-		A Section	
19.	B. Sc.,(HONS)	2170302	TINA JANA	
20.	B. Sc.,(HONS)	2170303	MOUSUMI GHORAI	Tina Jana
21.	B. Sc. General	2180475	JAYASHREE BHOWMIK	Jayashree 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	Pabitra Patra
26.	B. Sc.,(HONS)	2170312	SHRABANTI PRAMANIK	Shrabanti Pramarih
27.	B. Sc.,(HONS)	2170322	SUPRIYA GIRI	Guprina Giroi

SUVENDU DAS

RESHMA KHATUN

TRISHA MANDAL

Swendy Das

Reshma Khatur

Trisha Mandal.

B. Sc.,(HONS)

B. Sc.,(HONS)

B. Sc.,(HONS) 2170348

28.

29.

30.

2170342

2170347



Add on course- 2018-2019

Organized by Department Zoology

Topic: - Basic Bioinformatics

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	Ri Charles	·i	R. Chomburty	R. Chamely	, .	Rehambly		R. Charlent
2.	INDRANI SEN	T. sen		T.sen	. 6	Isan		Esen	
3.	TAMALIKA DAS	T. Das	Tipos	T. Das	Tas		T. Das	T. Das	11
4.	MAMPA DAS	m. Das	M. Das		M. Day	M. Das		M. Das	. 0 ·
5.	SANGITA ADHIKARY	s. Adhikany	2 P	S. Adhinany	S. Adhi'kany			Sinikary	. 4
6.	AMIT PRAMANIK	A.P	AP.	. 0-	AP	AP	AP	- 1	AP.
7.	NAIMA AKTAR	AKtar.		AKtar		Nitar	94 Es	AKtor	
8.	SOUMYATTAM BERA	s. Bera	s. Bera		s. Bena	**	s. Bena	s. Beng	
9.	SK . MUSTANGIR	. ,	SK. Mustangir		SK. Mustangii)	SK. Mustangia	,	SK. Mustangin
10.	SUDIP DAS	5. Das		s. Das	s. Das	(4)	s. Das		S. Das
11.	BITHI BERA	Bina	•	Bena		*	Bena		B. Bera
12.	SRABANTI MISTRI	s. Mistri	·s. Mistroi	s. Mistri	s. mistri		s. Mishi		s, mistri
13.	NAMITA BERA	N.Born		n-Bern		N.Berg	ė (A)	Berg	
14.	SOUMYADIP PANDA	Panda		Panda		4	S. Panda	e t	
15.	SUTALIKA MAITY		Smally	5.		S. naity		s. naity	
16.	RAHUL ROY	Roy	7.0	maily Roy	2 %	ROY	,	ROY	
17.	PAPIYA MAITY	mainy	pairy		hairy	Ĵ	mainy	U	maisy
18.	SHUVASIS KUNDU	Sinpu		Kundu			s. o		4.
19.	TINA JANA	Tisana		T. Jana	T. Jana	Jana		T. Jana	9.
20.	MOUSUMI GHORAI	m.	1	i e	m' Ghorai			m. Ghonal	

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21.		Thownia	4	Showmix	Branmin 2.		Showmin		Showmik
22.	PARAMITA MAJI	nagi	P. nogi	P. maji	heli.		Puagi	P	
23.	ARNAB DAS		Dian	• • •	Dan.		A. Dar		Dar
24.	RESHMA KHAN	Ruchan	r. Khan		R. Khan			Richan	,
25.	PABITRA PATRA	P.	P. Patroa		Polma		Patxa	P. Patna	
26.	SHRABANTI PRAMANIK	Bramarit		3. marin		3. Pramarik	gramanit		5. Bramarik
27.	SUPRIYA GIRI	Crimi	5		Sirini	S. wiri		Sini	**
28.	SUVENDU DAS	S. Das		3/0	S. Das	S. Das	S. Das		S. Dors
29.	RESHMA KHATUN	R. Khatur	Khatun	Rhatur Whatur		Khatun		R. Water	
30.	TRISHA MANDAL	T. manda	1		manda	mandal			Timandal



Attendance Record (Day9-Day 15)

								24.00.10	
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	Richalin		a bornty		2-chabo	R chaken	
2.	INDRANI SEN	I. Sen	I.Sen			T. SAN		Isen	
3	TAMALIKA DAS	T. Das		T. Das		TiDas		TiDas	•
4.	MAMPA DAS	M. Das		M. Das		m. Das	m. Das		M. Das
5.	SANGITA ADHIKARY	S-Adhikany	S. Adhikany	s:Adhikany		s.Adhikany	S:Adhikay		
6.	AMIT PRAMANIK	A. Prama	A. framo		A. Priama	-	anik	A. Pran	: .e
7.	NAIMA AKTAR	N.AKtor		N.Akpa		N.Akfan	N.Aldon	N. AKtar	
8.	SOUMYATTAM BERA	S. Bena	S. Boro		S.Bero		S.Berso		S.Boro
9.	SK . MUSTANGIR	5K. Mustangis	SK. Mudungin		S.K. Mustanzin	s.K. Mustangin		Mustangin	
10.	SUDIP DAS	S. Dan	S. Dad	8 ×	s. Das		s. Das	S. Das	·
11.	BITHI BERA	B. Dena	B.Bero			_B.Beno		14	-B. Bena
12.	SRABANTI MISTRI	s. Mistri.	s.Mistri	5. Mi Sthi			SiMistoi		S. Mistri
13.	NAMITA BERA	M. Besoa	N. Bera	· ·		NoBen		N.Bera	NiBera
14.	SOUMYADIP PANDA	s. Birda	5. Parda		5. Panda	£1. **	Silanda	١	S. Panda
15.	SUTALIKA MAITY	S. Maity	5. Maity	8.	s. Maity	/s:Maity		S.Maity	
16.	RAHUL ROY	R. Roy	R. . ROY	3	Roy		Roy.	R. Roy	Roy
17.	PAPIYA MAITY	P. Maity		Maity S.	P- Maity	* %	P. Maity		Maity
18.	SHUVASIS KUNDU	S. Kundu	s. Kundu	s. U Kundu		1 T	Kundu S.	S. Kundu	
19.	TINA JANA	T. 1	T. Jana		Ti Jana	T. Jana	T. Jana	,	
20.	MOUSUMI GHORAI	Morsani		worai		whorai	, s	whorai	• 00
21.	JAYASHREE BHOWMIK	J. Bhowmik		J. 1	Bhomin		J. Bhow mit		3. Browning
22.	PARAMITA MAJI	P. maji		P.moji		P·maji		P. maji	

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23.	ARNAB DAS	A. Das		Ai	A. Das	Bas		A' Das	A) Das
24.	RESHMA KHAN	R. khan.	R. Khan	r. Khan	.R. khan		r. nhan	- D	R. Khan
25.	PABITRA PATRA	bywa	byter		Patra		Patra	patra	
26.	SHRABANTI PRAMANIK	s. Poamanik	6	s. Inamanik		s. Pnamanik		S. Pnamanik	0 11 1
27	SUPRIYA GIRI	5. Gin	5-Gin	2 =		Sain		Sain	5.4:3
28.	SUVENDU DAS	San	SAM		S.Jan		S-Don		S.Dan
29.	RESHMA KHATUN		R. Khatun	R Whatun		R. Khatun	R. Khatun	khatun.	T. D
30.	TRISHA MANDAL	Mandal	Mardon	Y.	Manda Manda			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) Dayhoff
- (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:

BLASTX

2018/Add On Course/ Examination

(d)	SIM
۷.	Which of the factors listed below is not an advantage of BLAST?
	• ***
(p)	- misteat rigor
(c)	and the gaps
(q)	Perceptive
10.	The method of determining the relative position of genes on a chromosome is known as
-	and residue position of genes on a chromosome is known as
(a)	Gene monitoring
(b)	
(c)	
(d)	
11.	. There exist three types of interactions between domains. Which of the following is not one of
the	em?
(a)	Stable complex
	Transient interaction
(c)	Multi-domain protein
(d)	Unstable interaction
12	. Which of the following is not an advantage of Needleman-Wunsch algorithm?
	New algorithmic improvements as well as increasing computer capacity make it possible to align a
	ery sequence against a large DB in a few minutes
(b)	Similar sequence region is of same order and orientation
(c)	This does not help in determining evolutionary relationship
(d)	If you have 2 genes that are already understood as closely related, then this type of algorithm can
be	used to understand them in further details
13	. Which of the following does not describe PAM matrices?
(a)	These matrices are used in optimal alignment scoring
(b)	It stands for Point Altered Mutations
(c)	It stands for Point Accepted Mutations
(d)	It was first developed by Margaret Dayhoff
. 14	. What is the term for the laboratory work using computers and associated with web-based analysis
ge	nerally online?
(a)	In silico
(b)	Dry lab
(c)	Wet lab
(d)	All of the above
13	5. What does computer simulation refer to?
(8)	Dry lab
	Invitro
	In silico
(d)	Wet lab

2x10-20

2018/Add On Course/ Examination

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

Thrabanti Pramanik

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

Sublamey Da

Course Co-ordinator

. Sunder.

IQAC Co-ordinator

DATE: 29.08.2018

Spor

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 De

IOAC Co-ordinator

forder.

DATE: 29.08.2018

Spor

Principal

Course Co-ordinator



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

Date: 01.10.2018

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

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		1.0		Das	ZOOLOGY
04.07.16	2	Ecological structure and interactions	1 to 3 pm	2	Prof. Sagnik Mandal	SACT Mahishadal
05.09.18	3	Population and community ecology	3 to 5pm	2	Prof. Moumita Jana	Raj College 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

12.00.10						
13.09.18	10	Capturing and restraining wild animals	01 to 03pm	2	Prof. Manik Das	SACT Mahishadal
14.09.18	11	Conservation genetics	02 to 04pm	2	Dr. Subhamoy	Raj College HOD DEP.
15.09.18	12	Ex-situ conservation	02 to 04pm	2	Das Dr. Subhamoy	ZOOLOGY HOD DEP.
17.09.18	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
18.09.18	14	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
19.09.18	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	iviandai.	

♣ Course structure and examination scheme:

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



Participant's Details and attendance:

Enrolment Details of Students

B. Sc. Generic B. Sc. Generic	2170335	Name MAHAMAYA DAS	Signature
	2170335	MAHAMAYADAS	
B. Sc. Generic		diramiti ADAS	Mahamaya Das
	2170354	JULEKHA KHATUN	Julekha khatun
B. Sc.,(HONS)	2170357	SNEHA MONDAL	Sneha Mondal.
B. Sc. (HONS)	2170358	SRIPARNA SHIT	
B. Sc.,(HONS)	2170404	KRISHNA PARDHAN	Suipana Shit
B. Sc.,(HONS)	2170408	SUJATA MAITY	Knishna Pandhan Swiata Marty
B. Sc. Generic	2170586	MADHUMITA BERA	madhumita Bera
B. Sc. Generic	2170282	PARAMITA MONDAL	
B. Sc.,(HONS)	2170437	SUKCHAND JANA	Paxamitan Mandal
B. Sc.,(HONS)	2170446	SAMARPITA BHOWMIK	Sukchand Jana Samanpita Bhowmik
B. Sc.,(HONS)	2170528	PUJA BHOWMIK	Puja Bhownik.
B. Sc.,(HONS)	2170525	DIPTASREE MAITY	Siptashee maity,
B. Sc.,(HONS)	2170549	DISHA CHAWLAY	Disha Chawlay
B. Sc. Generic	2170288	BARNALI SHIT	Barmali shit
B. Sc. Generic	2170327	KRISHNA SAMANTA	Khishna Samanta.
B. Sc.,(HONS)	2170562	RIYA PACHHAR	Riya Pachhan
B. Sc. Generic	2170331	SOUMEN DAS	Soumen das
B. Sc. Generic	2170391	IPSRITA PRADHAN	Ipsroita Pradhan
B. Sc.,(HONS)	2170571	SUSMITA SAMANTA	Suamita Samueta
B. Sc.,(HONS)	2170572	SANKHADEEP ACHARYA	Susmita Samanta Saukhadeep Acharya
B. Sc. Generic	2170590	SRABANTI DOLAI	Snabanti Dolal
B. Sc. Generic	2170603	BIDISHA PATRA	
B. Sc.,(HONS)	2170578	RACHANA BHUNIA	Bidisha batra Rachana Bhuwia
	B. Sc. (HONS) B. Sc.,(HONS) B. Sc.,(HONS) B. Sc. Generic B. Sc. Generic B. Sc.,(HONS) B. Sc.,(HONS) B. Sc.,(HONS) B. Sc.,(HONS) B. Sc.,(HONS) B. Sc.,(HONS) B. Sc. Generic B. Sc. Generic B. Sc. Generic B. Sc.,(HONS) B. Sc. Generic	B. Sc. (HONS) 2170358 B. Sc.,(HONS) 2170404 B. Sc.,(HONS) 2170408 B. Sc. Generic 2170586 B. Sc. Generic 2170282 B. Sc.,(HONS) 2170437 B. Sc.,(HONS) 2170446 B. Sc.,(HONS) 2170528 B. Sc.,(HONS) 2170525 B. Sc.,(HONS) 2170549 B. Sc. Generic 2170288 B. Sc. Generic 2170288 B. Sc. Generic 2170327 B. Sc.,(HONS) 2170562 B. Sc. Generic 2170331 B. Sc. Generic 2170391 B. Sc.,(HONS) 2170571 B. Sc.,(HONS) 2170572 B. Sc.,(HONS) 2170572 B. Sc. Generic 2170590 B. Sc. Generic 2170603	B. Sc. (HONS) 2170358 SRIPARNA SHIT B. Sc.,(HONS) 2170404 KRISHNA PARDHAN B. Sc.,(HONS) 2170408 SUJATA MAITY B. Sc. Generic 2170586 MADHUMITA BERA B. Sc. Generic 2170282 PARAMITA MONDAL B. Sc.,(HONS) 2170437 SUKCHAND JANA B. Sc.,(HONS) 2170446 SAMARPITA BHOWMIK B. Sc.,(HONS) 2170528 PUJA BHOWMIK B. Sc.,(HONS) 2170525 DIPTASREE MAITY B. Sc.,(HONS) 2170549 DISHA CHAWLAY B. Sc.,(HONS) 2170288 BARNALI SHIT B. Sc. Generic 2170327 KRISHNA SAMANTA B. Sc.,(HONS) 2170562 RIYA PACHHAR B. Sc.,Generic 2170331 SOUMEN DAS B. Sc.,(HONS) 2170571 SUSMITA SAMANTA B. Sc.,(HONS) 2170572 SANKHADEEP ACHARYA B. Sc.,(HONS) 2170572 SANKHADEEP ACHARYA B. Sc.,Generic 2170590 SRABANTI DOLAI B. Sc., Generic 2170603 BIDISHA PATRA

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



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
1.	MAHAMAYA DAS	Mas	(Das	Mas	(Der)	(Des	Mass	Man	Boo.
2.	JULEKHA KHATUN	Thenatur	Thatun	Thating	7 Shatur	Theatur	Theatur	111	Thester
3.	SNEHA MONDAL	3. Monda		S. Morria		& Marda	3. Moral	8. Mondel	S. Monda
4.	SRIPARNA SHIT	58ml	8.864	S. Shit		8 shit		S. Shit	
5.	KRISHNA PARDHAN	Prodlen		Prodhen	Brodher		bruggen		Gradhan
6.	SUJATA MAITY	Smily	Snaith	Saity	Switz	Shuity	Shaity	Smity	Switz
7.	MADHUMITA BERA	MBerg.		Misera	M' Berg		Burg	7	Berg
8.	PARAMITA MONDAL	Amondal	P. Monda	P.Mondal	P.Mondal	P. Mondel	P.Mondal	P.Mondal	P-Mordel
9.	SUKCHAND JANA	Sjana		SJang	Sjans		Sjans		Sjans
10.	SAMARPITA BHOWMIK	Bhoww	Brownil	Showmin	Shoumik Bhoumik	Shownik	Bhowmik	Shownik	Shownik
11.	PUJA BHOWMIK	Pahowin	Brownik	•	Bhowmin		Brownix		Brown
12.	DIPTASREE MAITY	maity	W. way	Mark		Waity	Projly		Maity
13.	DISHA CHAWLAY	Chawby		Chewley		chowley	1 Mary	chawler	
14.	BARNALI SHIT	O. Shit	(O. Shi		B. Shit	rs . Shif	B. Ship		BJhit
15.	KRISHNA SAMANTA	Kemart		8 smarr	80 marks		8 Kment		Sananta
16.	RIYA PACHHAR	Pacher		Pachar		bacche 1		Paceher	
17.	SOUMEN DAS	5Das	J. Dol		S.Dos		J. Das	S. Das	8.Das
18.	IPSRITA PRADHAN	Frakor	Prodle		1 Prod to	Fradion	Pradom	Fredmi	Fradam
19.	SUSMITA SAMANTA	Exemple		gamont	e.	Samant	1	Samar	Samarte

20. SANKHADEEP 3. Acharya 3. Acharja ACHARYA S. Acharya S. Acherya Actorya Acharya SRABANTI DOLAI 21. Salai Sodai Solai Solai Solai Balai BIDISHA PATRA 22. Boatra Braina Bratra Boatra Bratna. RACHANA BHUNIA 23. R Bhunia Olunia Bhunia Phunia 24. **SUBHANWITA** Bhuria s. maity Swity Thaity Raity MAITY Staity Sivity 25. MOUMITA Mic M.C CHAKRABORTY NN.C M.C M·C M.C Mic BANDHAN BHUNIA 26. B. Churia B. Churia B. Churia Biunia 27. AMRITA SHARMA Asharma A. Sharma A: Sharma 28. **JAYEETA** 9.C J.p Jip **PRAMANIK** J.p g. P J.P 29. SHRABANTI MAJI Sign) s. Maji 30. **KEYA MAITY**

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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	Bas	Mas	Das	Bar	@ en	Mes	Bas	, .
2.	JULEKHA KHATUN	zphatur	Theratur		Thiatan	Thatur	Thatun		Thatun
3.	SNEHA MONDAL	Frondal	Hondal	Hondal	Mondal	Mondal		0	Sindal
4.	SRIPARNA SHIT			pio	Pio	10.0	101	10.	Incomple
5.	KRISHNA PARDHAN					7)			Incomplete
6.	SUJATA MAITY	s-mait		s-maity		Simouty		Simoity	Simplify
7.	MADHUMITA BERA			4		4		4	4
8.	PARAMITA MONDAL	P.Mondal	P.mondal	P.Mondal	P-Mondal	P.Mondal	P.Mondal.	P.Mondal	
9.	SUKCHAND JANA								Incomplet
10.	SAMARPITA BHOWMIK	S-awmik	Showmin's	S. Bhownin	Showmik Bhowmik	S. Brownik	S-ownie Bhownie		5. Bhowmik
11.	PUJA BHOWMIK	Chamir			P. Brown	fosherin	-	Chronik	
12.	DIPTASREE MAITY	D- Maity		D. Maity		D. Maity		D. Maity	
13.	DISHA CHAWLAY	1.00-7	Debrien	maxiy	Dolumby	Some	D. Our	mary	
14.	BARNALI SHIT	Bishit			B.Shit		B.Bhit		Bishit
15.	KRISHNA SAMANTA	K. Sama	K. Sam		K. Sam		K.Sano	Ksam	
16.	RIYA PACHHAR	Poch we				Pachhar		Pachar	
17.	SOUMEN DAS	S.Das	100	S. Das	1	S. Das		S.Das	S.Das
18.	IPSRITA PRADHAN		I. Poadhan	I. Pradhan	I. Psadhan		I. Praadhan		I. Pradhan
19.	SUSMITA SAMANTA	5. Somanto		S. Samanta	5.	6.		S. Samanta	,
20.	SANKHADEEP ACHARYA	S. Achanya	s. Achanya		S.Ackany		S. Achonya		5. Acharya
21.	SRABANTI DOLAI	s. Dolai		S. Dolau'		s. Dolai		S. Dolai	3

			1						
22.	BIDISHA PATRA	Barra	Boalra		Batra	Bratia		Bana	Barra
23.	RACHANA BHUNIA	Bhunia	,	Rhumin	1		Chainia	7	Rhinin
24.	SUBHANWITA MAITY		quaity	101	Lawity	quarty	Snaity	Swaity	
25.	MOUMITA CHAKRABORTY	Chautain	7	Charrenon	•	Charmed)	1	charrace.	3
26.	BANDHAN BHUNIA	Bhuma		Bharia		Bruns			Bhung
27.	AMRITA SHARMA	A. Shamma	1	A		A. Shanma		A' Shamma	A. Shama
28.	JAYEETA PRAMANIK	Paramania		Pramania		Pranamin		Promenik	
29.	SHRABANTI MAJI	Sugi		wayi		řegi		ingi	magi
30.	KEYA MAITY	kmaity	k-maity	kimaity	K-maity	Kimaity	Kinaity	Kmelty	Kimusty



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

- 1. Illustrate the different aspects of GIS in wildlife conservation & management.
- 2. 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.

Aublamy Da

Course Co-ordinator

Jander.

IQAC Co-ordinator

DATE: 19.09.2018

Hor

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.

Sublamey 82

Course Co-ordinator

Junder.

IOAC 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)







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 <i>Anabas</i> and <i>Heteropneustes</i> . (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	12 to 2pm	2	Dr.	HOD DEP.
	1	breeding (T)			Subhamoy	of
	1				Das	ZOOLOGY
21.11.18	2	Natural and induced	1 to 3 pm	2	Dr.	HOD DEP.
		breeding of fish (T)			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
	1	Heteropneustes.				Raj College
26.11.18	6	Water quality management	01 to 03pm	2	Dr Rajkumar	SACT
20		in Anabas and			Guchhait	Mahishadal
	1	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

			The state of the s	•		
28.11.18	8	Induced breeding of Heteropneustes. (P)	02 to 04pm	2	Dr Rajkumar Guchhait	SACT Mahishadal Raj College
29.11.18	9	Rearing of hatchlings of Anabas and Heteropneustes(T+P)	02 to 04pm	2	Dr Rajkumar Guchhait	SACT Mahishadal Raj College
30.11.18	10	Planning and designing of fish farm.(T)	01 to 03pm	2	Prof. Manik Das	SACT Mahishadal Raj College
01.12.18	11	Entrepreneurship development through Anabas & Heteropneustes aquaculture and marketing.	02 to 04pm	2	Prof. Moumita Jana	SACT Mahishadal Raj College
03.12.18	12	Feeding and rearing of hatchlings (P)	02 to 04pm	2	Dr Rajkumar Guchhait	SACT Mahishadal Raj College
04.12.18	13	Plankton culture	01 to 03pm	2	Prof. Sagnik Manadal	SACT Mahishadal Raj College
05.12.18	14	Common disease and its management.	01 to 03pm	2	Prof. Saheli Maiti	SACT Mahishadal Raj College
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.	HOD & SACT., Zoology; Principal,
				30 hours		
	-					

♣ Course structure and examination scheme:

Course name	Theory classes	Practical classes	Continuous assessment		Total
	(hr.)	(hr.)	Theory	Practical	marks
Induced breeding and	12	18	40	10	50
seed production in					-
Anabas and	,	5	,		
Heteropneustes.					



Participant's Details and attendance:

Enrolment Details of Students

SI	Class	Roll no.	Name	Signature
no.				Signature
1.	B. Sc., 3 rd Year	2160027	AMINA KHATUN	Amina khatun
2.	PG 3 rd Sem	170062	Sanchita Maiti	Sancheta Maite
3.	PG 1 st Sem	5180038	Monoj Shee	Marin Shee
4.	B. Sc., 3 rd Year	2160030	SANJAY MAJI	Sanjay Mazi
5.	PG 3 rd Sem	170080	Swagata Das	Snagata Dars
6.	PG 1 st Sem	5180039	Suchanda Maity	Suhanda Maity
7.	B. Sc., 3 rd Year	2160541	DEEPNATH HAZRA	Deephath Hazra
8.	PG 3 rd Sem	170068	Kanchan Singha Mahapatra	Karchar Singha Mahapatoa
9.	PG 1 st Sem	5180040	Sabyasachi Barman	Sa bygsachi Banman
10.	B. Sc., 3 rd Year	2160520	MOUMITA PATRA	Mounita gatra
11.	PG 3 rd Sem	170079	Barun Maity	Barun Maity
12.	B. Sc., 3 rd Year	2160010	TUHIN KANTI SAMANTA	Tuhin kanti Samanta
13.	Generic	2170376	Amrita Sharma	Amorita Sharma
14.		170076	Mahuya Maiti	Mahuya Maitg
15.	Generic	2170409	Jayeeta Pramanik	Jayeeta Pramanik Souran dolai
16.		2160194	SOURAV DOLAI	Lowran dolai
17		5180062	Sk. Sayantina Banu	SK. Sayandina Banu
18	. PG 3 rd Sem	170063	Binapani Sahoo	Binapani Sahoo

- "				
19.	B.Sc 4 th sem Generic	2170469	Shrabanti Maji	Shrabandi Maji
20.	B. Sc., 3 rd Year	2160457	RIKTA SANTRA	Rikta Santra
21.	PG 1 st Sem	5180079	Sunetra Das	Sunetra Das
22.	PG 3 rd Sem	170066	Sourav Mondal	Sourar Mondal
23.	B. Sc., 3 rd Year	2160105	SHRABANTI MONDAL	Shrabanti Mondal
24.	B.Sc 4 th sem Generic	2170540	Keya Maity	Keya Maity
25.	PG 1 st Sem	51800102	Indranath Giri	Indoanath Guri
26.	B. Sc., 3 rd Year	2160051	TANUSHREE GIRI	Tanushree Giri
27.	B. Sc., 3 rd Year	2160452	PUJA CHAKRABARTY	pyra chaknabarty
28.	PG 3 rd Sem	170082	Tuhin Patra	Turin Patra
29.	PG 1 st Sem	5180091	Biswarupa Panda	Biswarupa Panda
30.	B. Sc., 3 rd 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	AK	AX	AK	AK	DK-	AK	AK	AK
2.	SANCHITA MAITI	Shaifi	Suaiti		Sllaîti	Staiti		Maiti	Stlaiti"
3.	MONOJ SHEE	M. Shee		M. Shee	N.She	M. Shee	Mishee	M. Shee	U. Shee
4.	SANJAY MAJI	S.Mogi	S.Maji	S.Maji		S.Majî	S.Maji	S Maiji	
5.	SNAGATA DAS	S.Das		S.Dao	5.D00	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.Hazra	D. Hagn		D.1102	Ditter.	D.Han	DHazn
8.	KANCHAN SINGHA MAHAPATRA.	K.S.m.	K.S.M	K.S.M	K.S.M		K.S.M.	K.S.K.	K.Sm.
9.	SABYASACHI BARMANT	S.Ban.	SBm.	SBan.		SBar.	SB.	SBan	Spen
10.	MOUMITH PATRA	Mifatra	M. Patr.	M. Pahr	M.Pak.	M.Pam.	M.Pah.	M.Pah.	M.Pah.
11.	BARUN MAITY	B. Maily	B. Mary		Billaity	B. Mary	BHAITY	BHOILY	B. Maity
12.	TUHIN KANTI SAMANTA	T.K.S	T.K.S	TKIS	T.K.5	TKIS	T.KS	TIKIS	T.K.S
13.	AMRITA SHARMA	A. Sharm	AShouma	Y. Skarna		A. Sharm	A. Shanno	ASharm	A Shown.
14.	MAHUYA MAITY	M. Maity	M. Maity		MoMaity	MoMaity	M. Maity	M. Maity	M.Maiz
15.	JAYEETA PRAMANIK	frau K	Thama K	Flrain K	I Pran ux			Fram.K	
16.	SOURAY DOLAT	S. Dorai	S. Doice	S. Dolai		S. Dolai	S. Jolai	S. Dolai	S. Dolai
17.	SK. SAYANTINA BANU	Brown	Som	Ssam	SBom	SBam	Shaw	SBan	S.Bam.
18.	BINAPANI SAHOD		B. Sahoo		B. Sahoo			B. Sahoo	
19.	SHRABANTI MATI	S.Mis	S.Maji	S.Maji		S.Miji	S.Mayr	SMaji	S.Maji
20.	RIKTA SANTRA	R. Santa	R-Sann.		R. Santr.	R. Sant.	R. Sanh	•	R. Sanh
21.	SUNTETRA DAS	S.Das		S.Das	S.Das	S.Das	S.Das	-	S.Das.

		•						
SOURAN MONTDAL	S. Mondal	S. Mondal		S. Mondal	S. Monda		S.Mondal	S. Monday
SHRABANTI MONDAL	M.2	M.S	S.M	5.M	C.M	CM	SH	SM
KEYA MAITY	K. Maily	K-Maity	K. Miry	K-Maly	KINITY			KNAM
INDRAWATH GIRI	I. Giri							I Gire
TANTUSHRE GIRL	Tigiri	L. Givi	T.Giri		TGivi	T. Giri	U	T.Gin
PUJA CHAKRABORTY				INC	OM PL	E L'i		
TUHIN PATRA	Tatra.		Tatra.	Farm.	Barra.	Fadra	· Bata.	Badu
BISWARUPA PANDA	B. Ponda	B. Garal.	B. Jamo.		B. Panch	a Panela	,	B. Panela
MAITRI SAHOO.			-	MSoh.	M.Sah.			VSar.
	SHRABANTI MONDAL KEYA MAITY INDRANATH GIRI TANUSHRE GIRI PUJA CHAKRABORTY TUHIN PATRA BISWARUPA PANDA	SHRABANTI MONDAL C.M KEYA MAITY K.MMY INDRANATH GIRI I.Yiri TANUSHRE GIRI T.GIri PUJA CHAKRABORTY TUHIN PATRA BISWARUPA PANDA B.Ponda	SHRABANTI MONDAL C.M S.M KEYA MAITY K.Maity K.Maity INDRANATH GIRI I.Jivi I Jivi TANUSHRE GIRI T.Givi T.Givi PUJA CHAKRABORTY TUHIN PATRA BISWARUPA PANDA B. Ponda B. Ronat	SHRABANTI MONDAL C.M S.M S.M KEYA MAITY K.MANY K.MANY K.MANY INDRANATH GIRI I.JIVI I JAVI I.JIVI TANUSHRE GIRI T.GIVI T.GIVI T.GIVI PUJA CHAKRABORTY TUHIN PATRA BISWARUPA PANDA B.PONDA B.PONDA B.PONDA	SHRABANTI MONDAL C.M S.M S.M S.M S.M KEYA MAITY K.MAITY TATES TO TATES TO THE TOTAL	SHRABANTI MONDAL C.M S.M S.M S.M S.M S.M S.M S.M KEYA MAITY K.MANY K.MAN	SHRABANTI MONDAL C.M S.M S.M S.M S.M S.M S.M S.M S.M S.M S	SHRABANTI MONDAL C.M S.M S.M S.M S.M S.M S.M S.M S.M S.M S



Sl. 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	whaiti		Suaiti	ullaiti	Slati	Maiti	usllaiti.	
3.	HONOJ SHEE	H.Shu	M. Shee	M.Shu		Hylu	M. Shee	M. Shee	
4.	ITAM YATUAS	S.Maji		SMaji	5.Mmj1	SMAji		S.Muji	
5.	SWAGATA DAS	5.Das	S.Dw	S.Das	·5.)as	S.Das	S.Das	S. Das.	
6.	SUCHANDA MAITY	SM	SM	S·M	SM		S.M	S.M	
7.	DEEPNATH HAZRA	Dollago		D Harr	D.H2-	D. Harr		D. Hazu	
8.	KANCHANT SINGHA- MAHAPATRA	K.S.M.	K. Sh.	K.S. h-	•	K.S.M.	K.S.M	K.S.M.	
9.	SABYASACHI BARMAN	SBar	SBor		SBar	SBor	SBar	SBar.	
10.	MOUMITA PATRA	M. Pah		M. Padr.	M.Pah.	M. Pat.			
11.	BARUN MAITY	B. Hairy	Billity	Bilenty	philip		B. Maity	B. Maily	
12.	TUHIN KANTI -SAMANTA	F.K.5	TIKIS		T.K.S	TKIS	TIKLS	T.K.S	
13.	AMRITA SHARMA	KSton	A. Sham.	A.Shan'	A.Shr.	ASham	Asharm	ASharma	
14.	MAHUYA MAITY	M.Haly	M·Miry	MIMNIN	H. Maity	M. Mily		M. Maily	
15.	JAYEETA PRAMANIK		Thomas	fran K		Prank	Promer	Frank	
16.	SOURAN DOLAT	S. Dolar	S. Jolai		S. Dolai	S. Joiai	S. Dolai	S. Dolai	
17.	SK. SAYANTINA BANG		Shaw	SBam			Spann	Span.	
18.	BINAPANI	B. Sahoo		B. Sahen		B. Sahoo	B. Saho	B.Sahoo	
19.	SHRABANTI MAJI	s.Maji	S. Mogi	S.Moji	S.Môji	S.Maji	S.Mayi	S. Magi	
20.	RIKTA SANTRA.	R. Jank		R. Santin	`	R. Sant		R. Sard.	
21.	SUNETRA DAS		SiDas		SiDas		Silvas	SiDas	
22.	SOURAY MONDAL	S. Mondin	A	S. Monda	1	S. Marda		SHardal	
23.	SHRABANTI MONDAL	S.M	s.M	SM	SM		sy	SM.	·

			1						
24.	KEYA MAETY	Killopal		Knowy		Khryn	K.N.S.Y	K.Miny	
25.	INDRAWATH GIRL		I.yin	I. yiri	2. yir.	Igin:	T. Gir.		
26.	TAMUSHR EF GIRE	T. Giri		Tigiri		T.Gir.		T.Giri	
27.	PUTA CHAKRABORY		Inco	mporche	,				
28.	TUHIN PATRA	Fahr.		^	For.		Fat.		
29.	BISWARUPA PANDA	Bilanda		Blows	B. Jama	B. fan		B-land &	•
30.	MAITRE SAHOO		M. Saha	M. Salve	M. Cohi		M. Sahu	M. Sahu	

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E



♣ Sample Question of Examination

c)

d)

a)

b)

c)

d)

Lime

Formalin

Fan Lei

H.B. Wilson

T.V.R. Pillay

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.

15x2=30A. Answer the following MCQ: Which of the following is used for induced breeding in fishes? ı. MOET a) ART b) c) Hypophysation Artificial insemination d) An advantage of induced breeding in fishes is to 2. have more seeds a) b) have more fish 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. a) Absolute alcohol Glycerine b) c) Acetone d) Freezing Measurment of carbonate and bicarbonate ions is a-5. Hardness a) Alkalinity b) c) Transparency Turbidity d) Which chemical is used to control aquatic insect? 6. Hi-oxide a) 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)	Stenopliagic
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 swer the following questions: 2x10=20
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.

And Lawry 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.

Sublamoy Da

Course Co-ordinator

Starber.

IQAC Co-ordinator

DATE: 06.12.2018

Alex

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 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

Date	Day	Contents	Time	Duration	Experts	Designation
10.12.18	1	Orientation	12 to 1pm	1	Dr. Subhamoy Das	HOD DEP. of ZOOLOGY
10.12.18	1	What is science? History of science writing	1 to 4 pm	3	Dr. Suman Pratihar	Assit Prof Keshpur College
11.12.18	2	What makes good science writing?(4 hours)	1 to 5pm	4	Arif Ikbal Khan	Emenent Journalist
12.12.18	3	Shaping a structure and telling a story(4 hours)	01 to 05pm	4	Subhamoy Das	HOD DEP. of ZOOLOGY
13.12.18	4	Editing: how to write better(4 hours)	01 to 05pm	4	Pathik Guha	Emenent Journalist
14.12.18	5	Publishing your book(4 hours)	01 to 05pm	4	Dr Rajkumar Guchhait	SACT Mahishadal Raj College
15.12.18	6	Managing information (4 hours)	01 to 05pm	4	Sagnik Mondal	SACT Mahishadal Raj College
17.12.18	7	What Next? (4 hours)	01 to 05pm	4	Dr.Subikash Mukherjee	HOD, Economics, MRC
18.12.18	8	Evaluation, valediction, feedback(4 hours)	12 to 4 pm	4	Manik Das, DR.Asim Kr Bera	SACT., Zoology; Principal, MRC
				32 hours		



4 Course structure and examination scheme:

Course name	Theory	Practical Classes (hr.)	Internal Marks	External Marks			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 Chakneboty.
2.	B. Sc. Generic	21800142	INDRANI SEN	Induani 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 Adhikary Amit Proamanik
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 Mistor
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	SUTULIKU Muity
16.	B.Sc.,(HONS)	2170300	RAHUL ROY	Rahul Dow
17.	B. Sc. General	2180474	PAPIYA MAITY	Papiya Maity Shuvasic Kundu
18.	B. Sc. Generic	2180333	SHUVASIS KUNDU	Shuvasis Kundu
19.	B.Sc.,(HONS)	2170302	TINA JANA	Tinor Janor
20.	B.Sc.,(HONS)	2170303	MOUSUMI GHORAI	Mousumi Chonai
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	Pabitroa Patroa
26.	B.Sc.,(HONS)	2170312	SHRABANTI PRAMANIK	Shrabarti Pramanik
27.	B.Sc.,(HONS)	2170322	SUPRIYA GIRI	Supriya Uiri
28.	B.Sc.,(HONS)	2170342	SUVENDU DAS	Surendu Das
29.	B.Sc.,(HONS)	2170347	RESHMA KHATUN	Reshma Khafun
30.	B.Sc.,(HONS)	2170348	TRISHA MANDAL	Trisha Mandal



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	Phakma boty	Rhakna boty	Phakno boty	Phahra	Rhack	Rhakre bony	Phakra
2.	INDRANI SEN	Ison	Ison.	Isen	Ben	I.Son	Tson	Isen	I:son
3.	TAMALIKA DAS	Cos	Day	Day	Des	Das	Day	Das	Das
4.	MAMPA DAS	Mas	M. Daz	M.Daz	M. Day	H. Day	H. Day	M.Day	MiDay
5.	SANGITA ADHIKARY							Incom	pilete
6.	AMIT PRAMANIK							Incom	plete
7.	NAIMA AKTAR	N.AKTON	M.AKtan	N. AKtan	N-AKta7	N.AKta	N. AKta)	N.NKta	N. Akta
8.	SOUMYATTAM BERA	Serv	Spera	Spera	Spera	Spore	Spern	Spera	Spera
9.	SK . MUSTANGIR			,	<u>I</u>	comple	te		
10.	SUDIP DAS	Das	San	Dans	Dan	Edas	Das	Can	Sxan
11.	BITHI BERA	B.Bera	B.Bera	B:Bera	B.Bera	B.Bera	BBera	B-Bera	B. Bena
12.	SRABANTI MISTRI	S. Mestri	S.Mistri	S.Mistri	S. Mistri	S.Mistri	S. Mistri	S. Mishi	S. Mistri
13.	NAMITA BERA	N. Bora	N. Bera	N. Bera	N. Bera	N. Bera	N. Ova	N. Reva	N.Bera
14.	SOUMYADIP PANDA	5. Brid	S. Pand	SiPand	SiPand	SPand	s.Pand	S. Panda	S. Pando
15.	SUTALIKA MAITY				In	compre	fe		
16.	RAHUL ROY	PROY	R.ROY	R. Roy	R.Poy	P.Roy	R.Roy	RIRM	RIROY
17.	PAPIYA MAITY			4	Ince	mple	-	d	d
18.	SHUVASIS KUNDU	S. Kurd	S. Kund	SoKundi	Sokund	u S.Kurdi	S-Kurdu	S.Kurdi	S. Kurdu
19.	TIŅA JANA	T. Jana	T. Jana	T. Jana	T. Jana	T. Jana	T. Jana	T. Jana	T. Jana
20.	MOUSUMI GHORAI	Minoral	Michonai	M. Choral	Michonal	2 roposod	Minoral	Minoral	Mharai
21.	JAYASHREE BHOWMIK				Inco	mplet			

			7						
22	DADAM								
22.	PARAMITA MAJI	P.Moji	P. Maji	P.Mai.	D. Mad.	D. Nadi	D M +	D.M.	D.M.
23.	ARNAB DAS	A. Da	A. Om	A 0.	A. D.	7.0.0	P. Maji	1 11/03	0.0
24.	RESHMA KHAN	A. Day	O VI	7.000)	n. Don	(שע דו	H. Day	14.000	H. Cas
25.	PABITRA PATRA		R·Khan		K. Khan	K·Khan	R.Khai	Rikhai	K.Khar
		Popatro	p. patra	1.	P. patra	P. Patra	p. Patra	p. Patra	P. Patra
26.	SHRABANTI PRAMANIK	Promoviv	5-promite	S-marit	S. oronord		S. garanix	S'makir	
27.	SUPRIYA GIRI	ร. หา๊า		S. બોના		S. Girei			જ વિધા
28.	SUVENDU DAS	S. Das		S. Das	S-Zas	Sians	S. Das	S. Das	S-20 as
29.	RESHMA KHATUN	Rikhalum	R. Khatum	R. Khatur	R. Khadun	R. Khadum	R. Khatun	R. Khatur	Rikhatun
30.	TRISHA MANDAL	T. Mordal	T- Mandal	Marda	T. Mardal	9. Monda	T.	Mandal	Mandal

♣ Sample Question of Examination

2018/Add 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.

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),

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

theoretical modelers (knowledge)

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

Sublamy Da

Course Co-ordinator

Jande .

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 Da

Course Co-ordinator

Jander.

IQAC Co-ordinator

DATE: 18.12.2018

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

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		
	1					

♣ Course structure and examination scheme:

Course name	Theory classes	Practical	Internal	External marks		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
1.	B. Sc. (HONS)	2180118	Aditi Bhunia	Adili Bhunia
2.	B. Sc. (HONS)	2180217	Arpita Ghorai	Anpita Urhanai
3.	M. Sc. 1 st Sem	5180029	Baishali Pal	Baishali Pal
4.	B. Sc. (HONS)	2180185	Chayanika Bera	Choyonika Beno
5.	B. Sc. (Generic)	2170465	Dipika Sahoo	Dipika sahoo
6.	M. Sc. 1 st Sem	5180036	Ipsita Maji	IPsita nasi
7.	B. Sc. (HONS)	2180182	Mahadeb Pramanik	Mahadeb Framarik
8.	B. Sc. (Generic)	2170273	Mihir Mondal	Mihim Mondal
9.	M. Sc. 1 st Sem	5180038	Monoj Shee	Monoj shee
10.	M. Sc. 1 st 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	Parbati Sana
16.	B. Sc. (HONS)	2180196	Poulami Kar	Poulami Kar
17.	B. Sc. (HONS)	2170370	Premesh Kr. Das	Premesh Kr. Das
18.	B. Sc. (HONS)	2180159	Priyanka Das	Briyanka Das
19.	B. Sc. (Generic)	2170330	Rini Rani Mondal	Rini 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	Shreya Dinda
23.	B. Sc. (HONS)	2180117	Snehasis Das	Snehasis Das
24.	B. Sc. (HONS)	2180206	Subhashree Mondal	Subharhmee Mondal

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



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
1.	ADITI BHUNIA	A. Buna		A . Bhurier	A. Blumen	A. Charmen	A. Bhuria		A. Bhurn
2.	ARPITA GHORAI	A: ahomai		A. Cehorai		A (chopai	A. Inhorai	A. Cahonai	
3.	BATSHALT PAL	B. Pal		BiPal			Bopal.	Bpa	
4.	CHATANIKA BERA	C. Bora		c. Bera	C. Bora	c. Bera			c. Bora
5.	DIPIKA SAHOO			**					
6.	IPSITA MAJI	I. Maji	I. Maji		I,	T. Maji	I.		
7.	MAHADEB PRAMANIK	M. Promeinik		M. Promonik	Maji M. Ti Pramonik	•	Maji M. Programik	M. Pramanik	M. Iramenik
8.	MIHIR MONDAL	Mondal	M. Mondal		M. Hordal	M- Herdal	M. Mondal		M. Monda
9.	MONOJ SHEE	M. Shee	M. Shee	Mo. Shee		M.	M. Shee		M. shee
10.	MOUMITA PRAMHUIK	17. Promp	M. Apa		M. Araman	M, Asonmanik		M. Bransis	
11.	MUSHLEMA KHATUNT	M. Khackur	M. Khachen		M. Khoetun	M. Khatur		M. Kheeker	
12.	MABANITA DAS	N. Dos.	N. Das.		N. Does	N. Does		N. Does	N. Das
13.	NABANITA PAL	N. Pal	N. Pal		N. Pal	N. Pal		r. Pal	
14.	MASRIM MERZAM	N. Nahar	N.	N. Vahar			N. Nahar	N. Nahar	Nahas
15.	PARBATI SAWA	Prsam		Psaun	Para	P. sow		Bana	, a see a
16.	POULAMI KAR	P. Kan	P. Kan	P. Kan		P. Karo	P. Kap	P. Kar	
17.	PREMESH KR. DAS								
18.	PRIYANKA DAS	Sas		Sas	Bu	N Q	Dar		Sas
19.	BINI RANT MONDAL		R. Mondal R.	R. Mendal	ė.	P. Mondai	P. Monda		P. Mondal
20.	BITKU RANJ SMMJA	R. Somante	R. Samanla	1 22	R. Samanb	R. Samant			Mordal Samonh
21.	SABARI MONDAL	Fronder		Mordal		Fordel		Mandal	Mond!

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22.	sheeya dinda	S. Dinda		5. Dinda	s. Dinda	s. Dinda		S. Dinda	S. Dinda
23.	SMEHASIS DAS	3. Das	5. Pas		S. Daz		5. Das	Das	s. Das
24.	SUBHASHREE MONDAL	S. Mondael	Mondael	S. Mondal	S. Mondal		3. Mondoul	Mondal	Mondal
25.	SUBTINITA ADHIKARY	3. Adhikazy	3. Adhikany			3. Adhikory		3. Adhikany	
26.	SUCHANDA MAITY	S. Maity		S. Maity		S. Maity	S. Maity	S. Maity	s. Maity
27.	SUCHITRA MAITY	Marity	s. maily	B. Maily		Maity	mosity.	/	Maily
28.	SUMAN GHOSH	S. 4 GHOSh	S. GHOSA	s. behosh		S. Chash	Chosh		S. Ghash
29.	SUSMITA BHOWMIK	3. Bholomik	5. Bhowmik	9	Bhowmik		5. Bhowmik	5. Bhæsmik	
30.	TANKACH PFF	1		1.	下	下		ボ	Ti
74,	GUCHHAIT.	Gruchhai	}	Guchhat	Guchhart	bruchhai	ł	buchhait	Guchain



Attendance Record (Day9-Day 15)

CI	Name of Students	14.02.19	15.02.19	18.02.19	19.02.19	20.02.19	21.02.19	22.02.19	
Sl. No.	Name of Students	14.02.19	15.02.19						
1.	ADITI BHUNIA	A. Bluma	A. Bhura	A. rhum'a		A. Bhura		A. Bhura	
2.	ARPITA GHORAL	A. Ghorai	A. Ghorai	A. Gharai		Aironi		A. Cohorou	0
3.	BAISHALI PAL	Pal	Popal	Bar		Par		Bay	Bon.
4.	CHAYANIKA BERA	C. Bena	е. Вела		ena		c. Bera		Bena
5	DIPIKA SAHOO						•		I,
6.	IPSITA MATI	T. Maji	Marje		T. Maji		Maji		Możi M.
7.	MAHADEB PRAMANIK	M.	M. Provnosia	•	M. Proconociú	S	M. Provnovik M.		Promosil M. 1
8.	LATUED MAIN AL	m. mondal	M. Mondael		Mondal M.		Mondael	M.	Mondail M.
9.	MONOJ SHEE	M. Shee	M. shee	M,	shee		Shee	M. Shee	shee
10.	MOUMITA	Brauna, pr		Promanik M.	Programine M.		Aparmemik M. 1	M. I	M. ,
11.	MUSHLEMA- KHATUNT	M. Khartun	•	Khatur	Khooter No	N.	Khatur	Khartur	N.
12.	NABANITA DAS	N. Das	N. Das N.		pas N.	Das N.		Das	Das_
13.	NABANITA PAL	Pal	Pol		Pal	Pail	N ₁	Pal '	Pal
14.	MASRIN MAHAR	Nahar	Nahar	IV	Nahor		Nahour	Pour	Nahor
15.	PARBATI SANA	tsan		Sava	Sana		Sava P.	30.	P,
16.	POULAMI KAR	P. Kar	0	Kour	Kouz P.		P.	P.	P. Das
17.	PREMESH KR. DAS	P. Das	P. Das		sas_		Das	pas	144)
18.	PRIYANKA DAS	0	R,		R.		R. 1-1	R. Mondal	R. Mondol
19.	RINI RANI MONDA	1 William	Mondal		Mondal R. 1		R.)		Soonanda
20.	RINKU RANI SAMANTA	Sources			Somourton		Soundal		Mon du
21.	SABARI MONDAL	Mendal	Mandel 3.	1	31		1	3.	3. Dinda
22.	SHREYA DINDA	3. Dindo	Dêndo	in a	Dindo		Dimdo	Dinda	Pulaq

S.B Dinda 23. S. WEHASIS DINKA Dinda Dinda Dinda Dinda 3. Dinda 5. 24. SUBHASHREE Mondal Mondal Mondal Mondal Mondal Mandal MONDAL Adhikasy S. Si 9. 25. s, ATENIAUZ Adhikory Adhikooy Adhikary Adhikan ADHIKARY 5. 5. 26. SUCHANDA MAITY Maily Maily Maile Mail Mail Maile 27. SUCHITRA MAITY 5. 5, Maity Maity Maity Mait Mait Maity SUMAN GHOSA chash. chosh 28. Ghosh Ghosh Short Ghosh 3. Bhowmil Bhowmik 5. 29. SUSMITA 5. Bhownik Bhownik Bhowmik BHOWMIK TANUSAREE 下 下 下 30. τ bruchnait bruchhait Guchhait Gruchhait Gruchhait 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
 - 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
- 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 a both proteins migrate to the cathode histones migrate to the cathode and myoglobin migrates to the anode
- 5. 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

 - molecular weight
 - negatively charged side chains
 - negatively charged side ch
 different isoelectric points
- 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 β -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 &

Course Co-ordinator

Jander.

IQAC Co-ordinator

Principal

Spor

Date: 22.02.2019



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

Jander.

IQAC Co-ordinator

Date- 22.02.2019





Principal