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UG/5th Sem/Zoo(H)/T/19

2019

B.Sc. (Honours)

5th Semester Examination

ZOOLOGY

Paper - C11T

[Molecular Biology]

Full Marks : 40

Time : 2 Hours

The figures in the margin indicate full marks.

*Candidates are required to give their answers
in their own words as far as practicable.*

1. Answer any five questions from the following :

5×2=10

- (a) What do you mean by Pribnow box ? What is co-repressor.
- (b) What is the role of RNA primer in DNA synthesis ?
- (c) Explain the role of Shine Dalgarno sequence in binding of mRNA.

[Turn Over]

5/65-2100



REDMI NOTE 8
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(2)

(d) Differentiate between Group I & Group II introns.

(e) How does Kozak's sequence differ from TATA box ?

(f) Explain the role of 5' capping in life of mRNA.

(g) What is SOS repair mechanism ?

(h) What is RNA editing ?

2. Answer any four questions from the following :

4×5=20

(a) How polyadenylation events occur ? What is the function of the poly A tail ?

3+2

(b) What are the important features of Watson-Crick Model or double helix model of DNA ?

(c) State the role of methylation in genomic imprinting ? Is genomic imprinting permanent ?

4+1

(d) What is Wobble effect ? State its importance.

3+2

(e) What are the components of trp-operon ? What is catabolite repression ?

2+2

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(3)

- (f) Explain Chargaff's rule. Differentiate nucleotide and nucleoside. 2+2

3. Answer any *one* question from the following :

$1 \times 10 = 10$

- (a) What are the differences between Western, Southern & Northern Blot ? What are the basic steps involved in Sanger DNA sequencing ? Write down the advantages of Sanger sequencing. 3+5+2

- (b) Explain how transcription is terminated in *E.coli* ? Explain how Nucleotide Excision repair differs from Base Excision repair. 5+5
-

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2019

B.Sc. (Honours)

5th Semester Examination

ZOOLOGY

Paper - C12T

[Genetics]

Full Marks : 40

Time : 2 Hours

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

1. Answer any five questions from the following :

5×2=10

- ✓ (a) What is XIST ?
- ✓ (b) What is thymine dimer ? How is it formed ?
1+1 $\frac{2}{2} \times 2 = 2$
- (c) What would be the sex of man and *Drosophila*
having 2A+XXY karyotype. 1+1 $\frac{2}{2} \times 2 = 2$
- ✓ (d) What are retrotransposons. Give examples.

[Turn Over]

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(2)

(e) What do you mean by chromosomal non disjunction ? What disease is caused by Trisomy-18 ?

(f) What are the differences between LINEs and SINEs ?

(g) Differentiate between F' and F^+ .

(h) Write a short account on pleiotropy.

2. Answer any *four* questions from the following :

4×5=20

(a) What do you mean by 'Dosage compensation' ? Discuss the mechanism of Dosage compensation in *Drosophila* sp. 2+3

(b) What genetic defect results in the disorder Xeroderma Pigmentosum (XP) in human ? Why are X-rays a more potent mutagen than UV-radiation ? What is trisomy ? 2+2+1

(c) "Sickle cell anemia is an ideal example of transversion type of mutation" — comment with justification.

(d) (i) "Sex limited trait is a form of sex influence trait". Explain.

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(3)

(ii) Differentiate between co-dominance and incomplete dominance. 2+3

(e) How does specialized transduction differ from generalized transduction ? What is the role of F factor in conjugation ? 3+2

(f) What do you mean by complete and incomplete linkage ? State the criteria for inheritance of X-linked recessive traits and Y linked genes. Give examples. 2+2+1

3. Answer any *one* question of the following :

1×10=10

(a) State the molecular mechanism with special emphasis to alternative splicing in sex determination of *Drosophila* species. 10

(b) (a) What is conditional lethal ?

(b) Discuss the roles of different proteins and enzymes in recombination of *E.coli*.

(c) Discuss how T9 element gain entry and exit from chromosome. 2+4+4

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B.Sc. (Honours)

5th Semester Examination

ZOOLOGY

Paper - DSE-1T

Full Marks : 40

Time : 2 Hours

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

[Reproductive Biology]

1. Answer any five questions from the following :

5×2=10

- (a) What do you mean by cryptorchidism ?
- (b) What is menopause ? Write two clinical features of menopause.
- (c) Define parturition. Write the hormones involved in it.
- (d) What is colostrum ? Mention its function.

[Turn Over]

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(2)

(e) What is Cowper's gland ? Mention its function.

(f) Write the secondary sex organs of female and male.

(g) Why does the menstrual blood not coagulate ?

(h) What is cryobank ?

2. Answer any *four* questions : $4 \times 5 = 20$

(a) Write briefly the hormonal regulation of menstrual cycle.

(b) Write short note on in-vitro fertilization and frozen embryo.

(c) Mention the names of the hormones of placenta and write their functions.

(d) Write the role of Leydig cell & Sertoli cell in spermatogenesis.

(e) Write the modern contraceptive device in female.

(f) Mention briefly the hormonal regulation of Parturation.

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(3)

3. Answer any *one* question : $1 \times 10 = 10$

- (a) Distinguish between spermatogenesis and oogenesis. Write the mechanism of steroid hormones action. What is corpus haemorrhagicum ? $3+5+2$
- (b) Write any test for pregnancy. Describe briefly the histological structure of Testis. Name the hormones of the ovary & mention its specific function. $2+5+3$
-

[Animal Behaviour & Chronobiology]

1. Answer any *five* questions from the following :

$5 \times 2 = 10$

- ✓ (a) Distinguish between Instinct and Learned behaviour.
- (b) Distinguish between Endogenous and Exogenous pathway of Bio-rhythm.
- ✓ (c) Distinguish between Extinction and Habituation.

[Turn Over]

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(d) What is zeitgebers ?

relations

100

~~(f) Wr~~

100

01/2007

2. An

(a) Wh

(b) W

~~(e)~~ Wri

(d)

(e) E

relationship
Hw
Ques. 150
and 160

(5)

3. Answer any *one* from the following.

10

(a) Discuss 'female choice' in sexual selection with the help of suitable example. Explain sexual dimorphism with reference to sexual selection.

7+3

(b) What is biological rhythm ? Explain different types of biological rhythm. Discuss biological clock with reference to endogenous pacemaker.

2+3+5

Interw. Biology is
clear, interesting
set, pacemaker

[Turn Over]



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[Fish and Fisheries]

1. Answer any *five* questions from the following :

5×2=10

- (a) State the distinct characteristics of Dipnoan fishes.
- (b) Define homocircle tail with example.
- (c) Distinguish between osmoregulator and osmoconformer.
- (d) What is indigenous fishing craft ?
- (e) Define aquaculture.
- (f) State the advantages of pen culture.
- (g) Compare among extensive and intensive aqua-farming.
- (h) What is homogenous and heterogenous nucleation ?

2. Answer any *four* from the following :

4×5=20

- (a) Briefly describe the feeding habit of carnivorous fishes.



(7)

(b) Write characteristics of following order with examples. $2 \times 2\frac{1}{2}$

(i) Siluriformes

(ii) Cypriniformes

(c) Explain osmoregulatory mechanism of any one anadromous fishes.

(d) Give an account on the bioluminescence of fishes.

(e) Write a brief note on the application of RS & GIS on fisheries resource exploitation.

(f) Briefly describe different indigenous fishing gears used in coastal West Bengal.

3. Answer any *one* from the following : $1 \times 10 = 10$

(a) (i) What is cage culture ?

(ii) Briefly describe composite fish culture with example.

(iii) Add a note on maintenance of home aquarium. $2+5+3$

[Turn Over]



REDMI NOTE 8

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(8)

(b) Short note :

4×2½

- (i) Treatment of bacterial diseases
 - (ii) Fish meal
 - (iii) Brood stock management
 - (iv) Transgenic fish.
-



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2019

B.Sc. (Honours)

5th Semester Examination

ZOOLOGY

Paper - DSE-2T

Full Marks : 40

Time : 2 Hours

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

[Animal Biotechnology]

1. Answer any five questions of the following :

5×2=10

(a) What is VNTR ? Give example.

(b) What are the two advantages of bacterial artificial chromosome Vector ?

[Turn Over]

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REDMI NOTE 8
AI QUAD CAMERA

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(2)

- (c) Will the sequence 5'-GGCC-3' and 3'-GGCC-5' in a double stranded DNA molecule be cut by the same restriction enzyme ?
- (d) What are the components used for Polymerase Chain Reaction (PCR) ? Why is Taq polymerase used in PCR technique ?
- (e) What do you mean by Hybridization Probe ?
- (f) What do you mean by Transgenic animal ?
- (g) State the difference between DNA fingerprinting and DNA footprinting.
- (h) What is meant by blue-white screening ?

2. Answer any *four* questions of the following :

$$4 \times 5 = 20$$

- (a) Distinguish between Cosmid Vector and Shuttle Vector.
- (b) What do you mean by restriction mapping ? Give example.

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(3)

- (c) What is Polymerase Switching and why is it necessary in eukaryotic replication fork ? 2+3
- (d) What is DNA microarray technique ? Enlist a major application of the procedure. 2+3
- (e) What is cDNA library ? Describe schematically the construction of cDNA library. 2+3
- (f) Briefly describe the procedure of inserting foreign DNA in *E.coli*. What is Padlock probe ? 3+2

3. Answer any *one* question of the following :

1×10=10



- (a) Write the Principle of Polymerase Chain Reaction (PCR). What is RT-PCR ? Write the advantages of RT-PCR over routine PCR. 4+2+4
- (b) (i) Describe briefly the DNA sequencing method of Sanger.
- (ii) Write note on Sickle cell anemia. 6+4

[Turn Over]

(4)

[Microbiology]

1. Answer any *five* questions of the following :

5×2=10

(a) Name the causative agent of Anthrax. Who discovered it ?

✓ (b) Write names of bacteria which get stained by acid-fast staining method.

✓ (c) Name two bacteria which are present in your body.

(d) What do you mean by broth culture ?

✓ (e) What is teichoic acid ?

✓ (f) Write short note on mesosome.

(g) Write the purpose of streak culture.

(h) What is metagenomics ?



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(5)

2. Answer any *four* questions from the following :

4×5=20

(a) Briefly mention about Whittaker's Kingdom Concept.

(b) What is transfection ? Mention factors affecting competence generation during transformation process.

✓ (c) Differentiate between gram positive and gram negative bacteria with minimum five different characteristic features.

✓ (d) Write the characteristic features of Plasmid. Mention its application in biology.

✓ (e) Write down causative agent, symptoms and preventive measure of dengue.

✓ (f) Differentiate : (i) epidemic and endemic

(ii) Endotoxin and Exotoxin.

[Turn Over]

(6)

3. Answer any *one* question of the following :

1×10=10

(a) (i) Write about F^+ , F^- and Hfr.

6

(ii) What is transformation ? Write its application.

4

(b) Write down the name of causative agent, symptoms, pathogenesis, mode of action and preventive measure of Polio.

2×5=10

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2019

B.Sc. (Honours)

5th Semester Examination

ZOOLOGY

Paper - C11-P

Full Marks : 20

Time : 2 Hours

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

Molecular Biology

1. (a) Identify the given ^{The provided Photograph} photographs with proper ^{is} justifications. (Three) polystyrene 2+3 polystyrene
(b) Isolate and quantify genomic DNA from the ^{chromosome} given sample. procedure 6+4
2. Laboratory Note Book. Calculation
3. Viva-voce. 3

dilution $\rightarrow 1:50$ 50 ng
OD value $\rightarrow 1.3$

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2019

B.Sc. (Honours)

5th Semester Examination

ZOOLOGY

Paper - C12-P

Genetics

Full Marks : 20

Time : 2 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

1. The following numbers of progeny were obtained from test cross progeny *Drosophila*.

	Phenotypes	Numbers
1.	+ m +	218
2.	w + f	236
3.	++ f	168
4.	w m +	178

[Turn Over]

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(2)

5.	+ m f	95
6.	w + +	101
7.	+ + +	3
8.	w m f	1

Total 1000

Construct a genetic map. Calculate the map distance between genes and the coefficient coincidence. 15

Or,

Make a Chi-square test from the supplied data.

[Data supplied from the exam. centre.]

- | | |
|--------------------------|---|
| 2. Laboratory Note Book. | 2 |
| 3. Viva-voce. | 3 |

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UG/5th Sem/ZOO(H)/Pr/19

2019

B.Sc. (Honours)

5th Semester Examination

ZOOLOGY

Paper - DSE1-P

Full Marks : 20

Time : 3 Hours

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

Animal Behaviour and Chronobiology

- ✓ 1. Experimentally demonstrate hydrophilic behaviour of wood lice and comment on your finding. 8+2=10

Or,

Experimentally demonstrate geotaxis behaviour of earth worm and comment on your finding.

Or,

Experimentally demonstrate Phototaxis behaviour of Insect larvae and comment on your finding.

[Turn Over]

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3

(2)

- | | |
|--|---|
| 2. Submission of field report. | 5 |
| 3. Submission of Laboratory Note Book. | 2 |
| 4. Viva-voce. | 3 |
-

(3)

Fish and Fisheries

Full Marks : 20

Time : 3 Hours

1. Write scientific name, systematic position and Identifying characters of the specimen —

A)

B)

C)

D)

$(\frac{1}{2}+1+1)4=10$

2. Estimate pH of the supplied water sample and write comments on your result. $4+1=5$

3. Laboratory Note Book.

3

4. Viva-voce.

2

(4)

Reproductive Biology

Full Marks : 20

Time : 3 Hours

1. Stain the supplied slide and write down the procedure you applied. 6+4=10
 2. Identify with reasons the supplied histological sections. (A & B). $2\frac{1}{2}+2\frac{1}{2}=5$
 3. Laboratory Note Book. 2
 4. Viva-voce. 3
-

Total Pages - 3

UG/5th Sem/ZOO(H)/Pr/19

2019

B.Sc. (Honours)

5th Semester Examination

ZOOLOGY

Paper - DSE2-P

Full Marks : 20

Time : 2 Hours

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

Animal Biotechnology

1. (a) Write down the principle and procedure of genomic DNA isolation from *E. coli*. 5+5
- (b) In *E. coli* four Hfr strain donate the following genetic markers shown in order donate

Strain 1 : M Z X W C

Strain 2 : L A N C W

Strain 3 : A L B R U

Strain 4 : Z M U R B

[Turn Over]

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(2)

What is the order of these markers on the circular chromosome of the original F^+ ?

- | | |
|--------------------------|---|
| 2. Laboratory Note Book. | 2 |
| 3. Viva-voce. | 3 |

(3)

Microbiology

1. Prepare a stained slide of the bacterial culture provided using Gram staining method. Write the principle of the methodology used. Identify and draw a labelled diagram of a bacterium from the prepared slide.

Procedure : 5

Observation : 3

Principle : 4

Identification : 1

Drawing & labelling : 2 (1+1)

2. Viva-voce. 3

3. Laboratory Note Book. 2
