

P-1(1+1+1)H/10

2010

ZOOLOGY (Honours)

FIRST PAPER

Marks: 90

Time: Four Hours

The figures in the margin indicate full marks.

Group - A

1. Answer any four of the following:

- (a) What is amphimixis?
- (b) How a gastrozooid differs from a genezooid?
- (c) Why is the living Ascaris not digested in the human intestine?
- (d) What is coelomoduct?
- (e) What is coxal gland?
- (f) Define torsion.

2. Answer any four of the following: 4×4=16

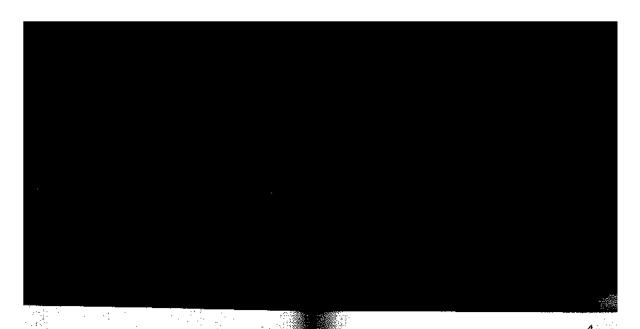
- (a) Write about the significance of conjugation.
- (b) Write a note on significance of metamerism.
- (c) Write a note on cell types in Porifera.
- (d) Write in brief about the locomotion in Hydra.

- (e) Why are echinoderms considered more closed related to chordates.
- (f) State the parasitic adaptations of Fasciola sp
- 3. Answer any two of the following: $10\frac{1}{2} \times 2$
 - (a) Classify phylum mollusca upto sub class will suitable reasons and examples.
 - (b) Give a brief account of canal system of Scypto-Write on its significance,
 - (c) Discuss in detail the structure of an insect exemphasizing on the mechanism of image formation.
 - (d) Describe the life history of Fasciola hepatic Discuss briefly on its control measures.

Group - B.

- 4. Answer any four of the following:
 - .
 - (a) What is filter feeding? Cite example.
 - (b) What is scroll valve?
 - (c) Mention two effects of neurotoxic venom.
 - (d) What is pecten? State its function.
 - (e) What is blubber?
 - (f) What is ductus caroticus?
- 5. Answer any four of the following:
- 4×4=1
- (a) Explain neoteny and paedogenesis.

- (b) Write a short note on endostyle.
- (c) Describe the structure of accessory respiratory organ of *clarius* sp.
- (d) Give a comparative account between born and
- (e) Write a note on echolocation in bat.
- (f) Write a short note on ammococte larva.
- 6. Answer any two of the following: $10\frac{1}{2} \times 2 = 21$
 - (a) Classify living reptiles upto sub-order level with suitable reasons and examples.
 - (b) Compare briefly the structure of aortic arches in vertebrates.
 - (c) Describe about the aerodynamics in the flight mechanism of birds.
 - (d) Give an account of parental care in amphibia.



P-11 (1+1+1)H/10

2010

ZOOLOGY (Honours)

THIRD PAPER

ull Marks: 90

Time: Four Hours

The figures in the margin indicate full marks.

Group - A

(Cell Biology and Histology)

1. Answer any four questions:

 $2 \times 4 = 8$

- (a) What is tubulin?
- (b) Give the sources of Haematoxylin and Carmine.
- (c) Define fixative.
- (d) What is proto-oncogene?
- (e) What is Philadelphia chromosome?
- (f) Define mordant.

2. Answer any four questions:

4×4=16

- (a) Write a note on primary cell culture.
- (b) Explain the purpose of metal shadowing in relation to microscopy.
- (c) Define continuous and discontinuous cellular secretion.

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(2)

(d) Why cytoskeleton is stated to be dynamic ?

- (e) What is microtomy?
- (f) Differentiate dye and stain.
- 3. Answer any two questions:

 $10\frac{1}{2} \times 2 = 2$

(a) Describe the structural details of an electron microscope. Discuss its working principles.

8+2

(b) What do you understand by cancer? Discuss the properties and behaviour of a cancer cell.

2 - 1

(c) Write the mechanism of ATP synthesis by ATP synthase in the mitochondrial inner membrane.

10-

(d) Outline the process of Ca²⁺ signaling pathway that involves calmodulin.

Group - B

(Genetics and Immunology)

4. Answer any four questions:

2×4=8

- (a) What is hemizygocity?
- (b) What is non-sense mutation?
- (c) What is holandric trait?
- (d) Differentiate between triploidy and trisomy?

(e) Write full forms of DTP and BCG.

(3)

(f) What is F_c region?

5. Answer any four questions:

4×4=16

- (a) Prove that crossing over occurs at four stranded stage.
- (b) What are the characteristics of X-linked recessive inheritance?
- (c) What is a gynandromorph? Add a note on mosachism.
- (d) What is a macrophage? State its role in immune system,
- (e) Explain Clonal selection hypothesis of immune response.
- (f) Write a note on functional cytokines.

6. Answer any two questions:

 $10\frac{1}{2} \times 2 = 21$

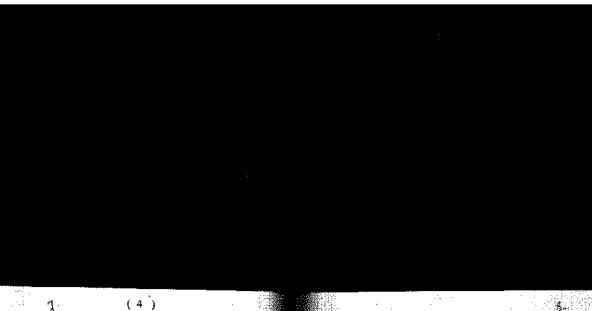
(a) Discuss the cytological basis of crossing over. Give one experimental evidence to show that crossing over occur due to breakage and reunion.

 $10\frac{1}{2}$

(b) Singed bristles (Sn), Cross veinless wings (cv) and vermilion eye (v) colour are due to recessive mutant alleles of three sex-linked genes in Drosophila. When a female heterozygous for

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(4)

each of the three genes was test crossed with singed, cross veinless, vermilion male, following progeny were obtained:

Singed, Cross veinless, Vermilion-

Crossveinless, Vermilion-

Vermilion-

Crossveinless—

Singed, Cross veinless-

Singed, Vermilion—

Singed-

Wild type-

What is the correct order of the three genes of the chromosome ? What are the genetic man distances between these genes ? What coefficient of coincidence?

- (c) What do you mean by B-cell activation? Prove that both T-cell and B-cell are responsible for immune response. Describe the role of TH cell in the activation of B cell,
- (d) Explain the principle of vaccination, Explain active and passive immunization with example.

P- (1+1+1)H/10

2010

ZOOLOGY (Honours)

FOURTH PAPER

Marks: 90

Time: Four Hours

The figures in the margin indicate full marks.

Group - A

(Ecology)

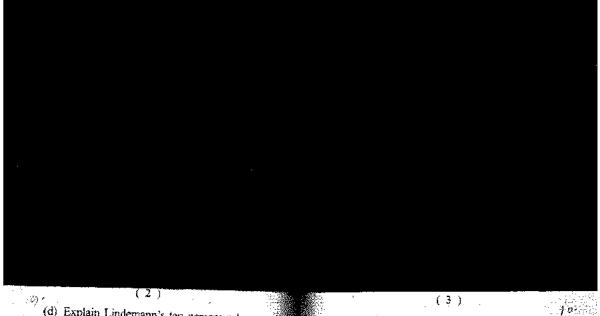
1. Answer any four questions:

- (a) Define ecosystem.
- (b) What is edge-effect?
- (c) What is Helisotherm?
- (d) What in lithosere?
- (e) Define commensalism.
- (f) What is facultative parasite?

2. Answer any four questions:

- (a) Distinguish between grazing and detritus food
- (b) Explain Bergman's principle with appropriate examples.
- (c) State the characteristics of euphotic, aphotic and disphotic zone in relation to animal distribution.

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(d) Explain Lindemann's ten percent rule regarding energy-flow in an ecosystem.

(e) Describe the biological characters of Tunda biome.

(f) Explain predation and forage ratio.

3. Answer any two questions:

 $10\frac{1}{2} \times 2 = 2$

- (a) Explain prey-predator relationship with the help of Lotka-Volterra model.
- (b) Explain habitat, trophic and hypervolume nicht with suitable examples.
- (c) Mention the components of ecosystem. Explain biological nitrogen fixation. $4+6\frac{1}{2}$
- (d) Discuss phenotypic plasticity. Explain ctimas pattern theory. 5+5.4

Group - B

(Zoogeography, Wildlife and Biodiversity)

4. Answer any four questions :

2×4=8

- (a) Mention the parent and daughter atoms in case of radio-carbon dating of fossils.
- (b) Expand IARI and BNHS.
- (c) What is Wallace line?
- (d) What is afforestation?

(e) What is red data book?

(f) Define era.

5. Answer any four questions:

4×4=16

- (a) How petrified fossils are formed?
- (b) Name the zoogeographical realms proposed by Sclater (1858). To which realm does Lepidosiren exist?
- (c) How continental drift influences the faunal distribution?
- (d) Write a note on biosphere reserve.
- (e) Write a short note on bioindicator.
- (f) Define Endangered category of animal and distinguish it from a vulnerable category.
- 6. Answer any two questions:

10½×2≈21

- (a) What is the significance of the study of Zoogeography? Mention the noteworthy evolutionary advancements of animal groups during Palaeozoic era.
 5+5½
- (b) What is biodiversity hotspot? Mention the faunal characteristics of any one megadiverse zone of

India.

 $2 \div 8\frac{1}{2}$



- (c) Enumerate the causes of wildlife deplets Describe the strategies of wildlife conservation
- (d) Describe the role of different barriers in limits the dispersal of terrestrial animals.

B I (Three Year H) Under 1+1+1 System

2010

ZOOLOGY (Honours)

FIRST PAPER

(Revised New Syllabus)

me: 4 hours

Full Marks: 90

The figures in the margin indicate full marks.

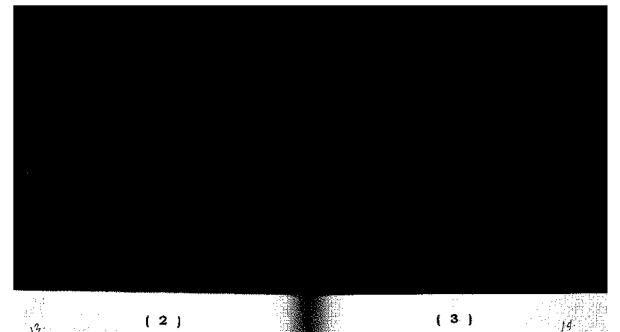
(Animal Diversity-I)

Answer any four questions :..

- (a) Give an example of a protozoan with-
 - (i) mixotrophic nutrition;
 - (ii) coprozoic nutrition.
- What are the advantages multicellularity?
- What are the features of a lagoon?
- Name two ciliary bands of Trocophore
- "Pila is an amphibious animal." Justify.
- Differentiate between nymph and maggot.

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2. Answer any four questions :

- State the importance of Poriferan spicules in classification.
- (b) Write a short note on Bryezoa.
- Write on the structural features of: hexacanth larva.
- (d) "Limulus is a living fossil." Justify.
- (e) Write a note on corpora allata.
- Why are echinoderms considered to be closely related to chordates than other invertebrates?

3. Answer any two questions :

10½×2÷2

(a) Write the general characters of S Mollusca. What is the speciality of the shell of Nautilus? State the taxonomic position of any three of the following:

Neopalina, Chiton, Doris, Dentalium, Sepia

- (b) Describe the life history of Ascaris. Add a note on its parasitic adaptations. 6+45
- Discuss the affinities and systematic position of Hormiphora.
- (d) What is metamorphosis? Describe the different types of metamorphosis in insects giving suitable examples in each case. Elucidate the role of different hormones in the process. 2+3%-

(Animal Diversity—II)

Answer any four questions :

- What is a solenocyte? In which chordate is it present?
 - What is spiral valve and where is it found?
 - What do you mean by mouth brooders? Give an example.
 - State four distinguishing characters of Gymnophiona.
 - Define pterylosis. (e)
 - What is acrodont dentition?

Answer any four questions :

 $4 \times 4 = 16$

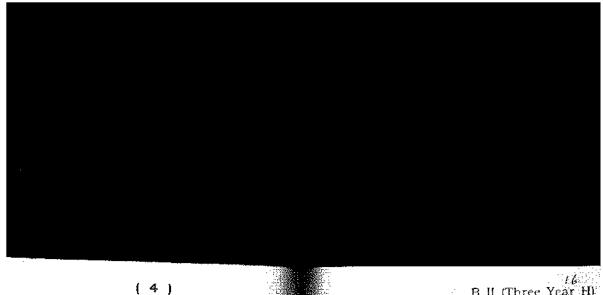
- specialized and the Mention degenerated characters of Cyclostomes.
- Differentiate between Neoteny and Paedogenesis.
- (c) Why do birds migrate?
- (d) Write a short note on reptilian affinities of Monotremata.
- (e) Write a short note on echolocation in bat.
- Draw and label (description not required) the schematic diagrams of aortic arches in an amphibian and a bird.

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15.

6. Answer any two questions :

10% 20%

(a) What is meant by retrogressive metamorphosis? Describe the life cycle of Ascidia.

- (b) State the peculiar features of Dipnoi. 10
- (c) Give a comparative account of the structure of heart of Telcost, Amphibia, Reptile and Mammal.
- (d) What is exoskeleton? Write short notes on any four of the following: %+(2½×4)
 - (i) Placoid scale
 - (ii) Horn and antier
 - (iii) Double respiration in Columba
 - (iv) Venous heart
 - (v) Metanephric kidney
 - (vi) Rectrices and remiges

B II (Three Year H) Under 1+1+1 System

2010

ZOOLOGY (Honours)

THIRD PAPER

(Revised New Syllabus)

Time: 4 hours

Full Marks: 90

The figures in the margin indicate full marks.

GROUP—A

| Cell Biology and Histology)

1. Answer any four questions :

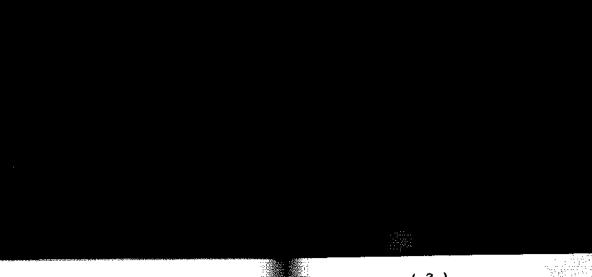
2×4=8

- (a) What is minimal medium?
- (b) Define plasmid.
- (c) What do you mean by vital stain? Give one example.
- (d) What is nucleoplasmic index?
- (e) What do you understand by membrane fluidity?
- (f) Why is haematoxylene a basic dye and eosin an acid dye?

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(Turn Over



12)

. Answer any four questions :

- (a) "G1 is the most variable period of the cell cycle." Elucidate the fact.
- (b) Discuss that "Differentiation is an irreversible process".
- (c) Write the differences between dye and stain.
- (d) Write the working principle fluorescent microscope. Why is mercury lamp used in it as a source of illumination?
- (e) Write a note on totipotency.
- Briefly describe the structure of a nucleoid.

3. Answer any two questions :

10½×2**≠2**€

- (a) What is cell signalling? Describe G protein mediated cell signalling with the help of suitable diagrams.
- (b) What is fixative? Mention the different types of fixative used in histology. Discuss briefly the principles of fixation.

- Describe different types of animal cell culture with examples for the study of 101/2 living cells.
- (d) Describe the structural details of electron microscope. Discuss working principle.

(Continued)

(3)

GROUP-B

(Genetics and Immunology)

Answer any four questions :

- What is position effect?
- What is Edwards' syndrome?
- What is the relation between linkage and crossing over?
- (d) What is gynandromorphy?
- What is immunogen?
- secreted Which interferon is NK cells?

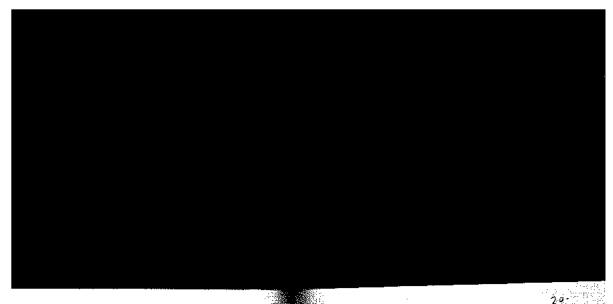
Answer any four questions :

- Why is the term 'Radio' used in Radioimmunoassay (RIA)? What are the different classes of antigens used in this technique?
- (b) "Bombay Phenotype is due to an epistatic effect." Discuss.
- How can you produce metafemale, metamale and intersex in Drosophila?
- (d) Describe antibody dependant cellular cytotoxicity (ADCC).
- (e) Distinguish between sex-linked, sexinfluenced and sex-limited traits with suitable examples.
- Write a brief note on clonal selection theory.

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| Turn Over

ARD-1320/87



(4)

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6. Answer any two questions :

10½×24

- (a) What is Vaccination? Briefly describe the principle of vaccination. Explain active and passive immunization. 2+43
- (b) Write the differences between cytoplasmic inheritance and nuclear gene inheritance. Explain cytoplasmic inheritance on the basis of mitochondrial genome.
- (c) What is Immunoelectrophoresis? How does it differ from immunodiffusion? What are cytokines? Mention its function. 2+3+2/4
- (d) What is Recombination? How does Holliday model explain the mechanism of recombination?

B II (Three Year H)
Under 1+1+1 System

2010

ZOOLOGY (Honours)

FOURTH PAPER

(Revised New Syllabus)

Time: 4 hours

Full Marks: 90

The figures in the margin indicate full marks.

GROUP-A

(Ecology)

1. Define any four of the following:

2×4=8

- (a) Commensalism
- (b) Xerosere
- (c) Photoperiodism
- (d) Protocooperation
- (e) Cline
- (f) Shelford's law of tolerance

2. Answer any four questions :

4×4=110

- (a) Distinguish between :
 - (i) Micro- and Macroparasite
 - (iii) Grazing and Detritus food chain

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(Turn Over.)

21-

Explain J-shaped curve of population growth.

(2)

- (c) Distinguish between facultative and obligatory mutualism with suitable example,
- (d) Diagrammatically represent nitrogen cycle,
- Distinguish between :
 - (i) Natality and Mortality
 - (ii) Fundamental and Realized Niche
- What do you mean by Y-shaped model of energy flow in an ecosystem? Why is it more realistic than box-pipe model?
- 3. Answer any two questions :

10½×2=21

(a) What do you mean by species richness? Explain Shannon index. Which of the following communities is more diverse and why? 2+4+41/2

	No. of individuals of species 1	No. of individuals of species 2
Community A	99	1
Community B	50	50

IRD-1320/88

(Continued)

- Where do you find inverted pyramids? What are the physical and biological features of desert? What do you know by Lindeman's 10% rule in an ecosystem? Distinguish between autotrophic and heterotrophic. 2+4+2+2% succession.
- What do you mean by age-specific and time-specific life table? Mention different types of survivorship curves. What do you mean by emigration and immigration? What are r- and k-selected species?
- (d) Give an account of the adaptations found in animals with reference to light. and temperature. 5+54

GROUP-B

(Zoogeography, Wildlife and Biodiversity)

4. Answer any four questions :

- What is cryopreservation?
- (b) Write the full name of TRAFFIC.
- Name two mammalian species that are common to Nearctic and Neotropical realms.

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(Turn Over

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- (d) Define wildlife.
- (e) What do you mean by Biosphere Reserve?

(4)

- (f) Name two sanctuaries of West Bengal.
- 5. Answer any four questions :

4×4±1

- (a) Write short note on biological magnification.
- (b) Comment on the faunal diversity of oriental and Ethiopean realms.
- (c) Discuss the effectiveness of barners in speciation.
- (d) Give a note on land bridges as the means of animal dispersal and the consequent evolutionary impact.
- (e) What is Red Data Book? What do you understand by critically endangered species?
- Mhat do you understand by era, period and epoch? What is Holocene epoch?

3÷

. Answer any two questions :

101/2×2=21

(a) Define fossil. Enumerate the conditions that favour fossilization. Give the evolutionary importance of fossils.

2+41/2+4

D-1320/88

(Continued)

(5)

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- (b) Name two biodiversity hot spots of India. What do you understand by Endemism? Why biodiversity hot spots need to be conserved? Write a brief account of any one biodiversity hot spot of India.
- (c) Discuss the faunal explosion during the Mesozoic era in the context of reptiles. 10%
- (d) Give an outline classification of different types of barriers to animal distribution.

 Discuss the impact of barriers on animal evolution.

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