2017

M.Sc.

3rd Semester Examination

ZOOLOGY

SPECIAL PAPER —ZOO-303

Full Marks : 40

Time : 2 Hours

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.

ECOLOGY

Group—A

(Biodiversity, Wildlife and Animal Behaviour)

1. Answer any *two* questions from the following : 2×2

(a) Pug-Mark and its significance.

(b) Imprinting Behaviour.

(c) In-Situ conservation of biodiversity.

(d) Endemism.

2. Answer any *two* of the following : 2×4

(a) Highlight the concept of Joint Forest Management. Enlist different wild carnivorous of South West Bengal. 2+2

(b) Schematically highlight IUCN Red list version of conservation categories.

(c) Briefly discuss on wild life crime.

(d) Explain reproductive behaviour with special reference to sexual selection.

3. Answer any *one* question from the following : 1×8

(a) Highlight the origin and development of the concept of Biosphere Reserve. Explain Schematically the zonations and roles of Biosphere Reserve.

(b) Why complementary functional relationship between Forest and Wetlands act as prerequisite for the conservation of aquatic avian diversity ? What steps

should be taken for the holestic conservation of avifauna.

Group—B

(Aquatic Ecology)

4. Answer any *two* questions from the following : 2×2

   (a) Write down the categories of Macrophytes with examples.

   (b) Summarize the process of Upwelling.

   (c) Explain the symbiotic relationship bewteen corals and zooxanthellae.

   (d) State the objectives of I.C.Z.M.

5. Answer any *two* questions from the following : 2×4

   (a) Illustrate the vertical distribution of nutrients and oxygen in the ocean water. 4

   (b) Compare the characteristic features of Plankton and Benthos. Also provide their classification and example in each case. 2+2

(c) Mention the criteria for designating a landscape as to be 'Wetland'. Describe the structural excellence of a water molecule.

(d) What is meant by Fluvial hydrosystem ? Comment on the ecological significance of catchment sizes and stream orders. {1+(1+2)}

6. Answer any *one* question from the following : 1×8

(a) (i) Distinguish between waves and tides ; positive and negative estuary.

(ii) Diagrammatically represent the profile of the continental margin. 4+4

(b) (i) Write down the reasons for high biodiversity found in coral reef ecosystem.

(ii) Explain the niches of Periphyton and necton in lentic ecosystems. 4+4

FISHERY

Group—A

(Fish Taxonomy and Biology)

1. Answer any *two* of the following : 2×2

   (a) Place the following fishes in their appropriate orders (any *four*) :

   Puntius ficto, Cirrhinus reba, Angnillabengalensis Raja raja Wallago attu, Anabas testudiness pampus argentens, Trichiurus haumela.

   (b) State distinctive features of any one order : Beloniformes, syngnathiformes.

   (c) State the sources of EAA, EFA, vitamins and minerals in sea fishes.

   (d) Name the fish species which possess placosid, cyclosid, ctennoid and gnanoid scales.

2. Answer any *two* of the following : 2×4

   (a) Write the relationship between day length, Temperature and fish growth with suitable illustration.

(b) How stenohaline and euryhaline fishes (anadromous) maintain their growth rate.

(c) Which abotic factor affects fish growth both in culture and natural conditions ? Discuss in brief.

(d) Describe the structure and function of pituitary gland.

3. Answer any *one* question from the following : 1×8

(a) Find out the percentage of weight gain, Feed conversion ratio and protein efficiency ratio when,—

Initial weight of the fish—15 g

Final weight of the fish—20 g

Number of experimental fish—20 days

Duration of experimental trial—45 days

Feed given to fish @6% bw of fish

Protein present in feed 25%

Protein in faccal matter 40%.

(b) State the significance of oxygen in water and fish growth, in relation to O_2 concentration may be used as "growth index". Cite suitable illustration.

Group—B

(Limnology and Oceanography)

4. Answer any *two* questions from the following : 2×2

(a) What is upwelling ?

(b) Distinguish between Expifauna and Infauna.

(c) Noted on : Solution Lake.

(d) Wetlands are often described as natures Kidney—Justify.

5. Answer any *two* questions from the following : 2×4

(a) Define tide. How much does if formes in an oceanic system ? 4

(b) Mention different vertical zanes in an oceanic system. Notes on : Heat Flux. 3+1

(c) Describe different causes of ocean pollution with the help of suitable examples.

(d) (i) Classify planktons on the basis on their size. Notes on: Lofic animals. 3+1

6. Answer any *one* question from the following : 1×8

(a) Define Lake. Describe the origin of a lake on the basis of its physical characters. Notes on: Thermal statification. 2+4+2

(b) Answer any *four* of the following : 4×2

(i) microbial fond-web

(ii) Cyclomorphosis

(iii) Water budget of earth

(iv) Solution lake

(v) Oceanic animals

(vi) Benthos

(vii) Tide.

GENETICS & MOLECULAR BIOLOGY

Group—A

(Genetics)

1. Answer any *two* of the following : 2×2

   (a) What is the function of eFLIP protein ?

   (b) What is the consensus sequences at exon-intron boundaries in yeast mRNA precursors ?

   (c) Why Sxl is considered as masterswitch in sex determination of Drosophila.

   (d) What happens in the genital ridge in human if y chromosome is absent ?

2. Answer any *two* of the following : 2×4

   (a) Explain the process of interaction between a yeast 5′ splice site and small nuclear RNAS with the help of a model.

   (b) How a death-including signaling complex is formed ?

   (c) Enumerate the function of So × 9 gene in human sex determination.

(d) Describe briefly the function of sex-lethal gene in Drosophila.

3. Answer any *one* question from the following : 1×8

(a) Illustrate yeast spliceosome cycle with the help of a diagram.

(b) Describe briefly the process a formation of apoptosome and its binding of earpase 9 leading to apoptosis with proper diagram.

Group—B

(Molecular Biology)

4. Answer any *two* questions from the following : 2×2

(a) What do you mean by autonomous and non-autonomous elements ?

(b) Genetically modified mice can be produced by a varity of routes. What are the routes ?

(c) Compare structural complexsity between TLR and IL-1R.

(d) What is the difference bewteen retrotranspom and retroposom ?

5. Answer any *two* questions from the following : 2×4

(a) Due to tautomerization of bases during DNA replication a G/T mutation occur. Discuss the stepwise repair mechanism of such non watson-crick base pair in DNA.

(b) How are Adeno-associated viral gene delivery system differ from Adeno viral gene delivery ?

(c) Peptidoglycan of a gram-positive bacteria bind with TLR-2 over the cell surface. How does the concerned cell will react thereafter ?

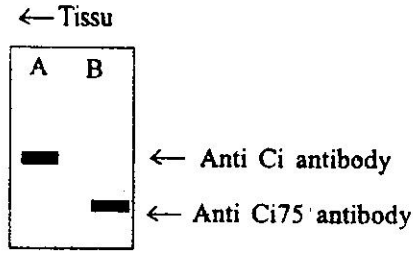
(d) In an immunofluorescence experiment using FITC conjugated anti NFKβ antibody the Nucleus of the cell gives green fluorescence under fluorescence microscope. Explain the signaling mechanism behind the process.

6. Answer any *one* question from the following : 1×8

(a) (i) Discuss the mechanism of formation of mature Hedgehog protein.

(ii) Nuclear fraction was isolated from two sets of embryonic tissue of *Drosophila*. Western blotting

profile of nuclear fraction are given below. Explain the mechanism. 3+5



(b) (i) What do you mean by sleeping Benty transform system.

(ii) Illustrate the strategies of using exogenous promoters (inducible) to regulate transgene expression. 2+6

PARASITOLOGY

Group—A

(Diversity and Biology of Parasite)

1. Answer any *two* questions from the following : 2×2

(a) What is hyperparasitism ? Give two examples.

(b) What are mesostomate and stenostomate cercariae ?

(c) What are rhoptries ? Mention its function.

(d) Place the following animals in their proper systematic position (*two* only) ?

(i) *Balantidium Coli*

(ii) *Diphyllobothrium latum*

(iii) *Schistosoma haematobium*

(iv) *Loa loa*

2. Answer any *two* of the following : 2×4

(a) Write the pathogenicity and clinical features caused by *Trichinella spiralis* infection.

(b) Enumerate the structure of Trematode tegument with labelled diagram.

(c) Write scientific names of human blood flukes and their intermediate hosts. Mention pathogenecity of any one of them.

(d) Give idea on the Protein metabolism of a gut Parasitic trematode.

3. Answer any *one* question from the following : 1×8

(a) Describe in brief the life cycle of *Loa loa*. Add a note on its Pathogenicity and Control. 5+2+1

(b) What is hydatid cyst ? Commet on its diagnosis and treatment. Add a note on primary Amoebic Menigoencephalitis (PAM). 2+3+3

Group—B

(Immunoparasitology)

4. Answer any *two* questions from the following : 2×2

(a) What do you mean by pattern Recognition receptor ?

(b) Distinguish between central tolerance and peripheral tolerence.

(c) Mention the application of Monoclonal antibody (mAb).

(d) *Comment on immunosuppressive therapy on graft* transplantation.

5. Answer any *two* questions from the following : 4×2

(a) (i) State the structural cromology and differences between TLR and IL-1R.

(ii) Match the following TLR according to its ligand.

1. TLR 2	A. Flagellin
2. TLR 4	B. CpG DNA
3. TLR 5	C. LPS
4. TLR 9	d. Lipoprotein

2+2

(b) Define Auto immunity. Discuss the causes and symptoms of Graves disease. 1+3

(c) Discuss different types of transplants with diagram. 4

(d) Discuss the general mechanism of type-I hypersensitivity reaction with proper illustration. 4

6. Answer any *one* question from the following : 1×8

(a) (i) Distinguish between High affinity IgE receptor and Low Affinity IgE receptor. 4

(ii) Discuss the alternative tickover pathway with diagram. 4

(b) (i) State the structure of C1q complex and discuss its role in activation classical complement pathway. 3+3

(ii) Comment on sensitization phase of Delayed Type Hypersensitivity (DTH). 2

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