PG/IIIS/ZOO-304/15

M.Sc. 3rd Semester Examination, 2015

ZOOLOGY

PAPER—ZOO - 304(Gr.-A & B)

Full Marks : 40

Time : 2 hours

The figures in the right-hand margin indicate marks

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

Illustrate the answers wherever necessary

Write the answers to Questions of each Group in separate books

[Special Paper : *Fishery*]

GROUP—A

(*Fish Taxonomy and Biology*)

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

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

Puntius ticto, Labeo timbriatus, Catla

catla, *Esomus darricus* *Amblypharyngodon mola*, *Channa striatus*, *Mugil Cephalus*, *Mystus vittatus*.

(*b*) State distinctive features of any *one* order with suitable examples : ophiocephaliformes, Lamniformes.

(*c*) Why Urophysis is called a neurohaemal organ ?

(*d*) What do you mean by "Potamodromous migration ?

2. Write any *two* questions of the following : 4 × 2

(*a*) Draw and discuss the relationship among Temperature, Photoperiod and fish growth.

(*b*) How salinity affects fish growth with special emphasis on "stenohaline" and Euryhaline fishes ?

(*c*) Migration of fish—state the influence of biotic and abiotic factors.

(*d*) Draw and label—different types of Accessory respiratory organs of fishes.

3. Answer *one* of the following : 8 × 1

(*a*) Calculate the percentage weight gain, protein Efficiency Ratio (PER), Feed Conversion Ratio (FCR) and comment on your results :

When,

Initial weight of fish – 05 g
Final weight of fish – 15 g
Number of fish – 20
Duration of experiment – 60 days
Protein percentage in dry feed – 40 %
Feed given @ 6% body weight
Protein in faecal matter – 45%

(*b*) Draw, label and describe the sagittal section of the pituitary gland of fish. State the hormones secreted by the different zones of the gland. Discuss in brief on the major hormes and their functions.

GROUP– B

(Limnology and Oceanography)

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

(*a*) Why marine pollution is to be noted as nonpoint sources of pollution ? 2

(*b*) State the probable budget of water in Biosphere. 2

(*c*) Note on : Copepoda (cyclopoida). 2

(*d*) Write the 'classical hydrochemistry parameters' of sea water. 2

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

(*a*) How you conserve the wetland in nature ? Note on : Marine Mollusca. 3 + 1

(*b*) Classify plankton on the basis of their size and site examples. 4

(*c*) Why restoration of coastal bio-diversity is essential in earth ? Distinguish between Epifauna and Infauna. 3 + 1

(*d*) What is tide ? How tides are originate in Ocean ? Note on : Up welling. 1 + 2+ 1

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

(*a*) Define Lake. Mention the basic causes of Lake origin. Briefly enlist the adaptive significance of cyclomorphosis. 2 + 4 + 2

(*b*) Write notes on (any *four*) : 4 × 2

(*i*) Deep sea mining.

(*ii*) Continental margin

(*iii*) Oligotrophic Lake.

(*iv*) Meiofauna

(*v*) Oceanic temperature

(*vi*) Rock inhabiting animal adaptation.

[Special Paper : *Ecology*]

GROUP – A

(*Biodiversity, Wildlife and Animal Behaviour*)

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

(*a*) Enlist different Hot-Spot's in India.

(*b*) Mention difference between Red Data Book and Green Data Book.

(*c*) SLOSS and its significance.

(*d*) Enlist four endemic wild avifauna.

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

(*a*) Discuss on Wildlife crime and wildlife trade.

(*b*) Mention different wildlife threatened categories based on recent IUCN version.

(*c*) Briefly highlight the underlying operating principles on Joint Forest Management at Arafari.

(*d*) Merits and demerits of GIS for the wild-life study.

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

(*a*) Mention the criteria for declaring a region as Biodiversity Hotspot : Mention the major

objectives of first International convention of biological diversity. Briefly discuss different types of extinction citing examples from animal kingdom. 1 + 2 + 5

(*b*) Differentiate Innate behaviour from learning behaviour. How does learning behaviour is related with intelligence ? State the basic components of animal intelligence. Add a note on Metacogniition and Discrimination learning. 2 + 2 + 2+ 2

GROUP– B

(*Aquatic Ecology*)

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

(*a*) Describe the symbiotic association between corals and zooxanthellae.

(*b*) Differentiate Intertidal zone from subtidal zone.

(*c*) State the significance of Upwelling.

(*d*) Distinguish between positive and negative estuary.

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

(*a*) Write briefly on the concept of ICZM.

(*b*) What is the role of sand dunes in coastal zone protection ?

(*c*) Why does continental shelf represent the most productive zone in marine ecosystem ?

(*d*) Explain the processes of reproduction in Hermatypic corals.

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

(*a*) Differentiate Lotic and Lentic aquatic systems based on physicochemical characteristics briefly classify various biotic components of a freshwater body. Add a note on the stream orders in a riverine system. 2 + 3 + 3

(*b*) Mention the criteria of a landscape to become a wetland. Give a brief classificatory scheme of wetlands in Indian perspective. Comment on threats to wetlands. 2 + 4 + 2

[Special Paper : *Genetics and Molecular Biology*]

GROUP – A

(*Genetics*)

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

   (*a*) What is the function of steroidogenic factox 1 ?

   (*b*) What is the consensus sequence of mammalian intron-exon boundaries ?

   (*c*) Draw an interaction site between a yeast 5' splice site and U6 Sn RNA.

   (*d*) State the function of grandzyme B.

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

   (*a*) Describe briefly the proapoptotic function of BH-3 only protein.

   (*b*) Outline the procedure of two-step lariat model of splicing with appropriate diagram.

   (*c*) How sex lethal gene (SXL) becomes

activated in female Drosophila sex determination ?

(*d*) Describe briefly the summary of wnt 4/β catenin loop specifying mammalian ovary development.

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

(*a*) How does cytochrome C trigger and activate caspase 9 for apoptosis ?

(*b*) How commitment complex (CC), B1 complex B2 complex and C1 and C2 complex are formed in yeast spliceosome cycle ?

GROUP– B

(*Molecular Biology*)

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

(*a*) How does poly ubiquitiration control NF-Kβ activation ?

(*b*) What do you mean by Pattern recognition receptors (PRRs) ?

(*c*) State the role of methylguanine-DNA methyl transferase in DNA repair.

(*d*) How does Dn mt 3 is involve in de Novo DNA methylation ?

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

(*a*) "DNA encounter G/T alternation occurred due to deamination of 5-methyl cytosine" – Illustrate DNA repair system under the given condition with proper diagram. 4

(*b*) What is histone code hypothesis ? How does methylated CPG Islands inhibit transcription ? 1 + 3

(*c*) Describe how the Cre-loxp recombination system is used to regulate the expression of transgene. 4

(*d*) Describe the mechanism of desensitization of TGβ/smad signalling. 4

6. Answer *one* of the following : 8 × 1

(*a*) (*i*) How does Hedgehog (Hh) precursor protein was processed intercellularly ?

(*ii*) Give a comparative account on Hedgehog (Hh) signalling in Drosophila and vertebrates. 3 + 5

(*b*) (*i*) Explain endosomal escape in Gene therapy.

(*ii*) Illustrate Adenoviral gene delivery system with proper diagram.

(*iii*) State the disadvantages of viral gene delivery system. 3 + 3 + 2
