

2016

## ZOOLOGY - PAPER-I

Time Allowed : 3 Hours

Full Marks : 200

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answers may be given either in English or in Bengali but all answers must be in one and the same language.

GROUP-AAnswer any ten questions.

1. a) Describe the mouth parts of insects.
- b) Write on the role of Mt DNA (Mitochondrial DNA) in tracing molecular phylogenesis.
- c) What is Dominance Hierarchy in mating system ?
- d) What is the role of sternum in vertebrates ? In which group of animals they appeared first ?
- e) Define mean deviation. How does it differ from standard deviation ?
- f) Biodiversity is rich in the tropics -- Why ? --- give reasons.
- g) List the type of Vertebrae found in animals.
- h) What environment protection acts were promulgated in the year 1977, 1981, 1986, 1988 ?
- i) Where can you locate flame cells ? Describe it briefly.
- j) Make a labelled diagram of mammalian molar tooth.
- k) Place these animals in their respective phyla, class and sub-class/order.

Dolphin, Nereis, Unio, Lamprey.

- l) What is IUCN ? What is its aim ?
- m) Explain the polyphyletic theory of evolution. Who proposed it ?

4x10

GROUP-BAttempt any four questions.

2. a) Distinguish between macro and micronucleus of Paramecium on the basis of their functions.
  - b) What are metazoans and how do they differ from metaphyta ?
  - c) Write notes on : madrepora and Zooids.
  - d) Describe a corellite. 5x4
3. a) Distinguish between the following using two most important characters in each case :
    - i) Phylum Cephalochordata and Urochordata
    - ii) order Squamata and Crocodilia
    - iii) osmoregulation in freshwater and marine fishes
    - iv) skin of bird and mammal 2x4

P.T.O.

3. b) With the help of labelled diagrams distinguish between the digestive system of insectivores, herbivores and carnivores. Explain how the digestive system of these animals are adapted for their food habit. 6+6
4. a) Why hemichordates are not considered as true chordates? List the affinities they show with echinoderms. 10
- b) Describe the excretory organs found among the various groups of non-chordates. 10
5. a) Distinguish between :
- i) Foramen magnum and foramen ovale
  - ii) Ductus venosus and Ductus Bottalus
  - iii) Syrinx and Larynx
  - iv) endostyle and urostyle
  - v) Physostomous and Physoclistous air bladder
- 2x5
- b) Write notes on :
- i) Ommatidium of Prawn
  - ii) Aristotle Lantern
- 5x2
6. a) Describe the industrial products that are obtained from non-chordates. 10
- b) Write notes on :
- Trochophore Larva, Glochidium Larva,  
Veliger Larva and Ammocoetes Larva. 2½x4

GROUP-C

Answer any four questions.

7. a) Write notes on :
- Type specimen  
Numerical taxonomy  
Phenetic classification  
Artificial system of classification 2½x4
- b) Explain industrial melanism and genetic repatterning during isolation with examples. 10
8. a) Why proteins are regarded as 'chemical fingerprints' of evolutionary history? State the laws governing the protein evolution that are similar to those for heritable traits, Why? Place suitable examples to show protein evolution. Explain Kimura's Neutral theory of protein evolution. 2+4+2+2
- b) What are the two information necessary to calculate biodiversity? State what you know about  $\alpha$ ,  $\beta$  and  $\gamma$  - diversity. 10

9. a) Explain with suitable mathematical expression how natality and mortality of a population interact to determine the pattern of growth ? 5+5

b) I. State the difference between sanctuary and National Park. Mention the fauna of the following wild life Sanctuaries in India :

- i) Chandraprabha Sanctuary
- ii) Rajgiri Wild life Sanctuary
- iii) Itangki Wild life Sanctuary
- iv) Ranthambore Wild life Sanctuary

II. What are 'Fossil Parks' ? Where are they found ?

III. Mention the fauna of Ethiopian realm. 4+4+2

10. Write notes on :

- a) Radioactive pollution.
- b) Range management.
- c) Quantum speciation.
- d) Macroevolution.

5x4

11. a) What is imprinting ?

b) How does genetic drift change the gene frequency of a population ?

c) What is Biodiversity hot spot ? Name two Biodiversity hot spots in India.

d) What do you mean by point and non-point sources of pollution ?

e) Ecolocation in birds and aquatic mammals.

4x5