

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.

Answer may be given either in English or in Bengali but all answer must be in one and same language.

Group-A.

1. Answer *any ten* questions (4x10=40)
- How old and new species are delimited?
 - Explain the terms 'bee pasturage' and 'emergency queen'.
 - What do you understand by goodness of fit?
 - What is meant by 'Ramsar' site?
 - State Hutchinson's proposition of niche concept.
 - Elucidate the location and function of Organ of Bojanus and Green Gland.
 - State the location and function of Mehlis's gland.
 - 'Running birds cannot fly' - Justify.
 - What is RAM ventilation. Explain with example.
 - Determine the systematic position of (i) Sea Fur (ii) Sea Horse.
 - Explain the 'concept of climax' with reference to ecological succession.
 - What is the difference between Deme and Cline?

Group-B

Answer *any four* questions

2. Distinguish between: (5X4=20)
- Errantia and Sedentaria
 - Ductus Caroticus and Ductus Botali
 - Protostomia and Deuterostomia
 - Basic pattern of aortic arches between Reptiles and Mammals
3. Write short notes on the following: (5X4=20)
- Affinities of Onychophora
 - Poison apparatus of Snake
 - Book gill
 - Ruminant stomach of Camel
4. Why is *Paramaecium* known as heterokaryotic animal? Give an account of ciliary movement in *Paramaecium*. Discuss the role of microfibrils in Amoeboid locomotion (4+8+8=20).
5. Justify the inclusion of *Balanoglossus* under Non-Chordata as an independent phylum. State the primitive characters of *Limulus*. State the salient features that distinguish Phylum Annelida from other Non-Chordate Phyla. (8+4+8=20)
6. How does double respiration take place in the lung of pigeon? Discuss the evolutionary position of Monotremata. (10+10=20)

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7. Explain (10+10=20)
- The phenomenon of eusociality in Termites.
 - Polymorphism in *Physalia*
8. Discuss the structural modifications present in Cetacea to enable echolocation. Elucidate the methods of sound production and reception in Chiroptera. (10+10= 20)

Group-C

Answer *any four* questions

9. Distinguish between: (5X4=20)
- Altruism and reciprocal altruism
 - Phenetic classification and cladistic classification
 - Panmictic and apomictic species
 - Ex-situ* and *in-situ* conservation
10. Write short notes on the following: (5X4=20)
- FAP
 - Reproductive isolating mechanisms
 - Keystone species
 - Heavy metal toxicity
11. a. A test cross of monohybrid gray mouse to an albino strain results in 64 gray and 48 albino progenies. Test the goodness of fit of these data to a 1:1 ratio, using the Chi-square test (use 5% level of significance and assume that for 1 degree of freedom, $\chi^2_{0.005} = 3.84$).
- b. What are the properties of 't'- distribution? Differentiate between unpaired and paired 't'- test. What do you mean by null hypothesis and alternative hypothesis? What is two-tailed t-test?
- c. Explain how genetic diversity is related to phenetic diversity? (5+5+3+2+5=20)
12. a. Discuss the role of Wildlife Protection Act, 1972 in the conservation of tigers.
- b. Narrate the utility of remote sensing for promotion of sustainable diversity.
- c. Differentiate with examples Acute and chronic toxicity in relation to water pollution.
- d. 'No two species can co-exist if they occupy the same niche' - explain with reasons. (6+6+4+4=20)
13. "The operations of an ecosystem is consistent with the laws of thermodynamics" Justify. Distinguish between race and species. What are sibling species? Why is recognition of kinship important in social behavior of animals. (8+4+4+4=20)
14. Explain 'J' shaped and 'S' shaped growth curves citing examples. What do you understand by 'group properties' of population? What is the difference between absolute growth rate and specific growth rate? Explain the influence of carrying capacity of habit on the intrinsic rate of population growth. (5+5+5+5=20)