

**POST-GRADUATE DEGREE PROGRAMME**

**Term End Examination — December, 2024**

**ZOOLOGY**

**Paper-2A : ECOLOGY, ENVIRONMENTAL BIOLOGY &  
TOXICOLOGY**

Time : 2 hours ]

[ Full Marks : 50

Weightage of Marks : 80%

**Special credit will be given for accuracy and relevance in the answer. Marks will be deducted for incorrect spelling, untidy work and illegible handwriting. The weightage for each question has been indicated in the margin.**

1. Answer *two* questions : 9 × 2 = 18
- a) What is Evolutionarily Stable Strategy (E.S.S.) ? How one can predict ESS based on parental expenditure by males and females ? Mention different conflicts those are being encountered between parents and offsprings. 3 + 3 + 3
- b) Write short notes on the following :
- (i) Hypoxia
- (ii) Thermoneutral zone of a species
- (iii) Molecular 'chaperones' 3 + 3 + 3
- c) Write briefly about the Coastal Regulation Zone Notifications under EPA 1986. State about the classification of coastal stretches within this zone. Mention the prohibited activities within CRZ. 2 + 4 + 3
- d) Define 'Metapopulation'. What are the factors that characterize metapopulations and what conditions need to be satisfied in order for metapopulations to persist ? Describe what data you would collect to test whether populations in a fragmented habitat were behaving as a metapopulation. 2 + ( 3 + 2 ) + 2

2. Answer *three* questions : 6 × 3 = 18
- a) What do you understand by 'rain-shadow effect' ? Write briefly the effect of temperature on growth of animals with special reference to Bergman's Rule. 2 + 4
- b) What is meant by effective population size ( $N_e$ ) ? What does the ratio  $N_e/N$  tell you about population processes and how might this be applied to population management ? 2 + 4
- c) Discuss the merits and demerits of Environment Protection Act, 1986. 3 + 3
- d) What is stress ? Mention some implications of the stress gradient hypothesis for how species respond to environmental change for example global warming ? 2 + 4
- e) Define Lek species. How many Lek species of mammals and birds have so far been reported ? Explain different hypothesis to explain Lek behaviour. 2 + 1 + 3
- f) Write short notes on the following :
- (i) Ecological efficiency of animals
- (ii) Ecological niche
- (iii) Parasitism. 2 + 2 + 2
3. Answer *two* questions : 4 × 2 = 8
- a) What is foraging behaviour ? State the basic elements of the process. 2 + 2
- b) Give examples of mutualistic and antagonistic interactions and discuss some ecological and evolutionary consequences of these interaction. Also comment on which interaction is more important for network in communities and why ? 3 + 1
- c) Explain Verhulst-Pearl Logistic growth model with case studies one from field and one from laboratory studies.
- d) Define eutrophication. Show schematically how it affects the food web in an ecosystem. 1 + 3

4. Answer *two* questions : 3 × 2 = 6
- a) Explain why most species with a high capacity for population growth tends to have smaller individuals, while those with a low capacity have bigger ones.
- b) What is ROS ? Give some examples of scavenger enzymes which remove ROS. 2 + 1
- c) Categorize three types of mutualism between the partner organisms with examples.
- d) Write a short note on acid rain.
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