(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt Five questions in all including Question no. 1 which is compulsory.

1. (a) Define the following:

   (i) Compensatory predation
   (ii) Biotic Potential
   (iii) Ecotypes
   (iv) Metapopulation
   (v) Fecundity
   (vi) Synecology
   (vii) Peck-order

(b) Differentiate the following:

   (i) Niche and Habitat
   (ii) Commensalism and Mutualism
   (iii) Dispersal and Dispersion
(iv) Scramble and Contest Competition

(v) Gully Erosion and Rill Erosion

(vi) Allopatric and Sympatric Speciation

(c) Give contributions of the following scientists:

(i) A.G. Tansley

(ii) G.F. Gause

(iii) Joseph Grinnell

(iv) Ernst Haeckel

(d) Illustrate the following with the help of diagrams ONLY (No description required): 4

(i) Zonation in pond

(ii) Universal energy flow model

2. (a) Define survivorship curves with emphasis on their significance. Explain the different types of curves with suitable examples.

(b) Describe the various types of life tables. 8+4

3. (a) Describe the various density dependent and independent factors which affect the population growth.

(b) What is species diversity? Give Shannon-Weiner index of diversity and explain it. 8+4

4. (a) Explain with suitable diagrams and equations the exponential and sigmoid growth form of populations.

(b) Discuss r- and k- strategies of populations. 8+4
5. (a) How does a predator respond to a change in prey density?
(b) What is Ecological Succession? Give the differences between pioneer and climax community.
(c) Give the Lotka-Volterra equations for prey and predator.

6. (a) Explain the Gauss's experiments on competition.
(b) What are r-and k-related species? Explain.

7. Write short notes on any three of the following:
(i) Biogeochemical Cycles
(ii) Sigmoid growth form of populations.
(iii) Laws of Tolerance
(iv) Terrestrial Ecosystem
(v) Raunkiaer's life forms