Ahmedabad University

School of Arts and Sciences

BIO506 Ecology: Fundamental Concepts and Applications

End Term Examination 2024 (Winter Semester)

Total Marks = 30 **Time – 1.5 hours**

Date: 25-04-2024

No. of printed pages: 2

Section A (ATTEMPT ALL QUESTIONS)

1. a) Write the formula while explaining the notations for exponential and logistic growth equations. b) Using the exponential growth model, plot a graph showing population size (N) over number of generations for two different populations (1 and 2). Population 1 having r-value of 0.7 and population 2 having r-value of 0.2.

   Marks=2+2=4

2. a) Mention three differences between community and population. b) Two different tree species are planted in the same garden and are heavily competing with each other for access to resources. Mention two different ways in which they can partition resources to avoid competition, and draw graphs to depict the same.

   Marks=2+2=4

3. a) Define niche and guild. b) Tiger and leopard occupying the same forest have different breeding seasons (first interaction axis of their niche) but have the same feeding guild (the second interaction axis of their niche). Draw a graph to represent the example. *Marks=2+2=4*

4. a) Use a graph to show that populations 'X', 'Y' and 'Z' are metapopulations from time T_0 to T_1. b) A bottleneck effect has severely impacted population 'X'. What biological measures will represent the impact of bottleneck on population 'X'? Use graph to establish the same. *Marks=2+2=4*

5. a) Mention three differences between cline and ecocline. b) Which environmental factor may influence body shape and coloration of Koifish cline from river to mouth of estuary? Using a graph, plot the cline distribution of Koifish and mention on the graph the body shape trait that you have considered. *Marks=2+2=4*

Section B (ATTEMPT ALL QUESTIONS)

1. Fill in the blanks: *Marks 5*
   (a) Community ecology is a type of _____ study
   (b) Photoautotrophs and _____ contribute towards primary productivity
   (c) A forest has species 'A' and 'B', where A=33, and B= 87 individuals. As per Shannon Wiener equation, p_A = _____ and p_B = _____
   (d) A _____ is the physical grouping of genomic variants that tend to be inherited together

2. Whether True or False: *Marks 5*
   a) Fundamental to realized niche is an irreversible change
   b) *Oikos* means home
   c) $N_{t+1} = N_t + B + I – D – E$ is incorrect under ideal conditions
   d) Primary succession are rare in today's world
   e) Landscape function refers to the interaction among the flow of energy, nutrients, species, or genes among habitat patches.