

M.Sc. Examination, 2019
Semester-IV
Zoology
Paper – MZET-401 (i)
(Population and Community Ecology)

Time: 4Hours

Full Marks: 80

Questions are of value as indicated in the margin.

Answer **any eight** questions.

1. What do you mean by discrete generation of population? In discrete generation of population, find out the values of N_1 , N_2 , P_1 and P_2 with a suitable mathematical model, where $N_0=50$ (prey population) and $P_0=0.2$ (Predator population), growth rate $R=1.5$, $N_{eq}=100$, $B=0.005$, $C=0.5$ and $S=2.0$. 2+8=10
2. What do you mean by Transmission coefficient? Describe the infection model of pathogen population dynamics and with a model and how can you calculate the threshold value? 2+8=10
3. What is Allee effect? Describe Allee principle with some examples. Describe strong Allee effect from weak Allee effect with mathematical equation. 2+4+4=10
4. What is metapopulation? Describe metapopulation model of local extinction and colonization and with this model prove that the population persist only when $e/m < 1$, where m is the rate of patch colonization and e is the rate of patch extinction. 2+8=10
5. What is niche pre-emption? Suppose in a niche the amount of nutrient is 1.0 and during succession each species take the nutrient k fraction (50% of the total nutrient) of the remaining nutrient then what will be the intake of nutrient of i th species during its arrival? 2+8=10
6. What is a community? Discuss different emergent properties of a community. Write the difference between rivet and redundancy model. What is the principal analytical variable of quantitative community ecology and why? 2+5+2+1=10
7. What are different species abundance models? Describe with example the Preston's abundance model to explain distribution of species in a community. What is veil line? 3+6+1=10
8. How do you define Wildlife? Give an illustrative account of *in situ* conservations strategies of wildlife. How is Biosphere Reserve different from rest of protected areas? 2+7+1=10

P.T.O.

(2)

9. What are the different legal provision for protection and conservation of animals in India? Give a brief account of any one of them. 4+6=10
10. Write ***any two*** questions from the following: 5+5=10
- (a) Logistic growth of population
 - (b) “*r*” and “*k*” selection
 - (c) Project Tiger
 - (d) Human impact on ecosystem
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