

Your Roll No.....

M.Sc. BOTANY
SEMESTER III EXAMINATION – 2023
PAPER CODE: MBO-CC302
PAPER TITLE: PLANT ECOLOGY AND BIODIVERSITY

Time: 03 hours

Maximum Marks: 75

Attempt ALL questions. All parts of a question must be attempted in continuation. Start answering each question on a new page. Cite examples and draw labelled diagrams wherever necessary.

Q.1. Answer the following as directed

(A). Choose the most appropriate answer

[5 x 1 = 5]

i). In a population growing logistically and approaching Carrying Capacity (K), the change in density (N) per unit time (dN/dt) is maximum when N equals to:

- A). K^2 B). $K/2$
C). $2K$ D). K

ii). Which of the following equations represents the Exponential growth equation:

- P. $dN/dt = rN$
Q. $N_t = N_0 e^{rt}$
R. $dN/dt = rN(K-N/K)$

- A). P and Q only B). P and R only
C). Q and R only D). P, Q and R

iii). The term $(K-N/K)$ is:

- A. carrying capacity for a population
B. greater when K is very large
C. zero when population size equals carrying capacity
D. Increases in value as N approaches K
E. All the statements are correct

iv). Expanding population is characterized by

- P. A pyramid shaped age structure
Q. An urn shaped age structure
R. Pre-reproductive and reproductive age groups become more or less equal in size
S. Rapidly growing population with high birth rate

- A). P and R B). P and S
C). Q and R D). Q and S.

v). The 'thickness' of stratospheric Ozone layer is measured in/on:

- A). Sieverts B). Dobson units
C). Melson units D). Beaufort Scale

P.T.O.

B). Answer the following questions briefly.

[5 x 2 = 10]

- i. Which nutrient cycle is described as “Open cycle”?
- ii. How can primary productivity be expressed in terms of units?
- iii. The addition of net primary productivity with respiration gives?
- iv. IUCN Red Data book.
- v. What is edge effect?

Q.2. Differentiate between the following terms:

[3 x 5 = 15]

- a). Acclimation and acclimatization.
- b). Ecads and ecotypes.
- c). Ecological compression and character displacement.

OR

Elaborate the tradeoffs involved in life history strategies of ‘r- and k- selected’ organisms. **[15]**

Q3. a). A meteorite hit an island carrying 1000 individuals of pygmy hog. About 800 individuals suffered death. Calculate the survivorship of this population. **[8]**

b). Discuss the role of ecological equivalents and guild species. **[7]**

OR

Calculate the basic reproduction rate (R_0) from the following hypothetical life table? **[15]**

Age class	No. alive	No. dying	Age specific survivorship	Age specific fertility
0-10	1000	200	—	0.0
10-20	—	—	—	0.5
20-30	500	—	—	1.0
30-40	300	—	—	1.0
40-50	200	100	—	0.5

Q.4. Define ecological succession? What are its different types and mechanism? Give an illustrative overview of changes involved in hydrosere? **[15]**

OR

Write short notes on the following:

- a). Endemism and its types? Name any few endemic plant species of India? **[8]**
- b). NBPGR **[4]**
- c). Project Tiger **[3]**

Q.5. What is ecological efficiency or transfer efficiency? Discuss structure and function of ecosystem in detail. **[15]**

OR

Write short notes on:

- a). In situ mode of biodiversity conservation and its types **[7]**
- b). Discuss biogeochemical cycle and give a general model of phosphorus cycle on the earth. **[8]**
