# M.Sc. BOTANY
## FOURTH SEMESTER
## PLANT ECOLOGY
## MSB-402 D

(Use separate answer scripts for Objective & Descriptive)

**Duration : 3 hrs.** Full Marks : 70

## [ PART-A : Objective ]

**Time : 20 min.** Marks : 20

***Choose the correct answer from the following:*** *1x20=20*

1. Raunkiaer classified higher plants into how many major life forms?
   a. 1 b. 2 c. 4 d. 5

2. Which of the following is not a type of age pyramid?
   a. Expanding age pyramid
   b. Realized age pyramid
   c. Stable age pyramid
   d. Diminishing age pyramid

3. Diagramatic representation of phonological events is called:
   a. phenogram
   b. phytophases
   c. phenography
   d. none

4. Smaller hypervolume occupied by a species is called:
   a. fundamental niche
   b. niche overlapping
   c. realised niche
   d. none

5. Transitional zone or junction zone between two or more diverse communities is called:
   a. seral communities
   b. qualitative feature of community
   c. ecotone
   d. euphotic zone

6. Each ecosystem can sustain a fixed number of organisms depending on its size and productivity. This is called:
   a. carrying capacity
   b. biotic potential
   c. natality
   d. mortality

7. Property/properties of biological organization, including ecosystems is/are:
   a. ecosystems exist independently of specific components.
   b. its components are interdependent.
   c. a sliding scale of organization exists.
   d. all of the above.

8. Which phenomenon is not a result of Pyramid of numbers?
   a. A great many small units are required to equal to the mass of one big unit.
   b. The pattern of many small organisms and few large ones is the food chain.
   c. Horizontal size of the metabolic rate pattern.
   d. Inverse size metabolic rate pattern.

9. Energy flow provides a suitable index for comparing any and all components of an ecosystem by:
   a. P+R
   b. R+R
   c. P+P
   d. None of the above

10. Logistic model is represented by:
    a. $\frac{dN}{dT} = rN \frac{(K-N)}{K}$
    b. $\frac{dN}{} = rN$
    c. $(k-N) = rN$
    d. dN=Dt

11. The loss of individuals under a given environmental condition not a constant but varies with population and environmental conditions is termed as:
    a. realised natality
    b. realised mortality
    c. minimum mortality
    d. minimum natality

12. When a stationary and stable age distribution exists, the specific growth rate is called:
    a. co-efficient of population growth
    b. carrying capacity
    c. age structure
    d. intrinsic rate of natural increase

13. The term used for ecological interaction between two species where one species obtains a benefit from the relationship and the second species is unaffected by it:
    a. commensalism
    b. mutualism
    c. proto-coperation
    d. symbiosis

14. $e = \sum(ni/N)^2$ designate:
    a. Shannon index of diversity
    b. Eveness index
    c. Dominance index
    d. Index of similarity

15. Density increases rapidly in exponential or compound interest fashion and stops abruptly as environmental resistance or other limit become effective more or less suddenly in:
    a. the J shaped form of growth curve
    b. sigmoid form
    c. acceleration phase
    d. survivorship curve

16. Ecosystems are organizations consisting of a unified group of components forming:
    a. mineral cycle
    b. systematized whole
    c. energy flow
    d. niche

17. Hyper volume niche concept is given by:
    a. Hutchinson
    b. Odum
    c. Koromondy
    d. Merrell

18. If the environment is constant, selection favours slow development, longer life span, low or medium metabolic rate, longer body size are the characteristics of:
    a. population fluctuation
    b. biological clock
    c. r selected species
    d. k selected species

19. The species is a natural biological unit together by the sharing of a common gene pool. The concept is given by:
    a. Merrell, 1962
    b. Volpe, 1967
    c. Savage, 1969
    d. Wallace and srb,1961

20. Organisms that occupy the similar ecological niches in different geographical regions are known as:
    a. Ecological displacement
    b. Ecological community
    c. Ecological equivalent
    d. Allopatry

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## ( PART-B : Descriptive )

**Time : 2 hrs. 40 min.** **Marks : 50**

[ Answer question no.1 & any four (4) from the rest ]

1. Deduce intrinsic rate of natural increase in an environment where the resources are unlimited. Discuss different types of population growth form (J and S shaped) and concept of carrying capacity. 5+4+1=10

2. Write short notes on: 5+5=10
   (i) Aggregation and Allee's principle.
   (ii) Biotic potential and natality.

3. Write a note on seasonal population fluctuation. Describe the factors responsible for fluctuation. Also write a note on resource partitioning. 2+5+3=10

4. What are the types of communities? Illustrate the quantitative and qualitative characteristics of a community. 2+8=10

5. What is fundamental and realized niche? Explain the different types of niches and character displacement with suitable examples. 10

6. Intricate the different intra and interspecific competitions with suitable examples. 5+5=10

7. What is ecological succession? What are the general processes of succession? 10

8. What is biogeochemical cycle? Elucidate Nitrogen cycle with suitable diagrams. 2+8=10

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