

**M.Sc. BOTANY**  
**THIRD SEMESTER**  
**PLANT ECOLOGY**  
**MSB-303**

**Duration: 3 Hrs.**

**Marks: 70**

PART : A (OBJECTIVE) = 20  
PART : B (DESCRIPTIVE) = 50

**[ PART-B : Descriptive ]**

**Duration: 2 Hrs. 40 Mins.**

**Marks: 50**

**[ Answer question no. One (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. Elaborate Nitrogen and Sulphur cycle in detail with suitable diagrams. (5+5=10)
3. Describe in detail the qualitative and quantitative characteristics of a community. (10)
4. Write short notes on: (*any two*) (5+5=10)
  - a. Inter and intra specific interactions.
  - b. r and k selection.
  - c. Species diversity indices.
5. What is ecological succession? Discuss the various successional stages of hydrosere along with the suitable diagram. (2+8=10)
6. What is air pollution? Discuss briefly the various types and sources of air pollution. (2+8=10)
7. What is biodiversity conservation? Discuss briefly the different strategies for biodiversity conservation. (2+8=10)
8. Write short notes: (*any two*) (5+5=10)
  - a. Cryopreservation.
  - b. Sustainable development.
  - c. Acid rain.

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**[ PART-A : Objective ]**

**Choose the correct answer from the following:**

**1×20=20**

- Property/Properties of biological organization, including ecosystems is/are:
  - Ecosystems exist independently of specific components.
  - Its components are interdependent.
  - A sliding scale of organization exists.
  - All of the above.
- Which phenomenon is not a result of Pyramid of numbers?
  - A great many small units are required to equal to the mass of one big unit.
  - The pattern of many small organisms and few large ones is the food chain.
  - Horizontal size of the metabolic rate pattern.
  - Inverse size metabolic rate pattern.
- Energy flow provides a suitable index for comparing any and all components of an ecosystem by:
  - P+R
  - R+R
  - P+P
  - None of the above
- Logistic model is represented by:
  - $\frac{dN}{dT} = \frac{rN(K-N)}{K}$
  - $\frac{dN}{dT} = rN$
  - $(k-N) = rN$
  - $dN=Dt$
- The loss of individuals under a given environmental condition -not a constant but varies with population and environmental conditions is termed as:
  - Realised natality
  - Realised mortality
  - minimum mortality
  - minimum natality
- When a stationary and stable age distribution exists, the specific growth rate is called:
  - co- efficient of population growth.
  - carrying capacity.
  - age structure.
  - intrinsic rate of natural increase.
- 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:
  - commensalism
  - mutualism
  - proto-cooperation
  - symbiosis
- $e = \sum(n_i/N)^2$  designate:
  - Shannon index of general diversity.
  - Evenness index.
  - Dominance index.
  - Index of similarity.
- Density increases rapidly in exponential or compound interest fashion and stops abruptly as environmental resistance or another limit become effective more or less suddenly in:
  - the J shaped form of growth curve.
  - sigmoid form.
  - acceleration phase.
  - survivorship curve.
- Suppose in an ecosystem considering the availability of space, food and availability of minimum space requirement of an individual of species.  $K=100$ .  $N=99$ . What is the carrying capacity?
  - 1
  - 0.01
  - 0
  - 0.001
- Air is a mixture of various gases. One of the gases is 21% part of the air. This gas is:
  - Nitrogen
  - Oxygen
  - Carbon dioxide
  - Argon
- Which of the following is not a source of air pollution?
  - Automobile exhaust
  - Burning of firewood
  - Windmill
  - Power plant
- Which of the following is not a greenhouse gas?
  - Nitrogen gas
  - Water vapour
  - Methane gas
  - Carbon dioxide
- Which of the following is not a primary contributor to the greenhouse effect?
  - Carbon dioxide
  - Carbon monoxide
  - Chlorofluorocarbons
  - Methane gas

15. The presence of high coliform counts in water indicate:
- contamination by human wastes.
  - phosphorus contamination.
  - decreased biological oxygen demand.
  - hydrocarbon contamination.
16. The pioneer in xerach succession:
- Crustose lichen
  - Mosses
  - Foliose lichen
  - Shrubs
17. Succession that occurs on abandoned agricultural fields is best described as:
- coevolution
  - primary succession
  - secondary succession
  - tertiary succession
18. IUCN (The International Union For Conservation Of Nature And Natural Resources) headquarters is at:
- Morges, Switzerland
  - Paris, France
  - Vienna, Austria
  - NewYork, USA
19. Approximately, 50% of total world species are present on:
- tropical rain forest.
  - temperate rain forest.
  - temperate deciduous forest.
  - coral reefs.
20. Sacred groves are especially useful in:
- generating environmental awareness.
  - preventing soil erosion.
  - conserving rare and threatened species.
  - preventing air pollution.

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Course : .....

Semester : ..... Roll No : .....

Enrollment No : ..... Course code : .....

Course Title : .....

Session : ..... 2017-18 ..... Date : .....

**Instructions / Guidelines**

- The paper contains twenty (20) / ten (10) questions.
- Students shall tick (✓) the correct answer.
- No marks shall be given for overwrite / erasing.
- Students have to submit the Objective Part (Part-A) to the invigilator just after completion of the allotted time from the starting of examination.

Full Marks	Marks Obtained
20	

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*Scrutinizer's Signature*

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*Examiner's Signature*

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*Invigilator's Signature*