2025

(FYUGP)

(3rd Semester)

ENVIRONMENTAL SCIENCE

(MINOR)

Paper Code : EVS/M–3T

(Ecology and Ecosystem)

Full Marks : 75 *Pass Marks* : 40%

Time : 3 hours

(PART : B—DESCRIPTIVE)

(*Marks* : 50)

The figures in the margin indicate full marks for the questions

1. What is landscape ecology? Explain Eltonian niche and Hutchinsonian niche. 2+8=10

Or

Define thermoregulation. Discuss the strategies of adaptations in plants and animals. 2+8=10

2. Explain, in detail, the characteristic of a population. 10

Or

Define r- and K-selected species. Write a note on limits to population growth. 2+8=10

3. What is edge effect? Describe the climax community concepts. 2+8=10

Or

What is ecological succession? Explain the negative species interactions in ecosystem. 2+8=10

4. Define estuarine ecosystem. Describe the abiotic and biotic components of ecosystem. 2+8=10

Or

Explain primary production and models of energy flow. 10

5. What is biotic accumulation? Explain the various stages of invasion. 2+8=10

Or

Describe the role of polyploidy and genome size in determining invasiveness. 10

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(PART : A—OBJECTIVE)

(*Marks* : 25)

The figures in the margin indicate full marks for the questions

A. Put a Tick (✓) mark against the correct answer in the brackets provided : 1×15=15

1. A biome is a

   (a) group of ecosystems on a continent with similar vegetation structure ( )

   (b) part of the earth where life can exist ( )

   (c) collection of different species of population in an area ( )

   (d) community of living organisms with their non-living environment ( )

2. Palearctic ecozones include

(a) most of North America ( )

(b) Eurasia and North Africa ( )

(c) South America and the Caribbean ( )

(d) Polynesia, Fiji and Micronesia ( )

3. The ability of individual genotype to produce different phenotypes when exposed to different environmental conditions is called

(a) thermoregulation ( )

(b) acclimatization ( )

(c) ecological amplitude ( )

(d) phenotypic plasticity ( )

4. A stochastic model is one that explicitly includes randomness in prediction of state variable dynamics.

(a) True ( )

(b) False ( )

5. Plants that are adapted to low stress and high disturbance are called

   (a) competitors ( )

   (b) stress tolerators ( )

   (c) ruderals ( )

   (d) None of the above ( )

6. Which of the following types of population growth model shows J-shaped curve?

   (a) Exponential growth ( )

   (b) Logistic growth ( )

   (c) Geometric growth ( )

   (d) All of the above ( )

7. In ecological succession, co-action means

   (a) successful establishment of species ( )

   (b) pioneer species adjusting to prevailing conditions ( )

   (c) process of removal of vegetation from an area ( )

   (d) species affecting each others life due to close proximity ( )

8. Allogenic succession is the type of succession where the community itself modifies the environment which in turn causes its own replacement.

(a) True ( )

(b) False ( )

9. Gradual and continuous change in species composition between two ecosystems is called

(a) ecocline ( )

(b) ecotone ( )

(c) ecozone ( )

(d) edge effect ( )

10. Which ecological pyramid can be both upright and inverted?

(a) Pyramid of numbers ( )

(b) Pyramid of biomass ( )

(c) Pyramid of energy ( )

(d) Pyramid of productivity ( )

11. The percentage of energy in food that organisms absorb and use is called

(a) production efficiency ( )

(b) assimilation efficiency ( )

(c) consumption efficiency ( )

(d) decomposition efficiency ( )

12. During which phase in decomposition, chemicals in leaves are dissolved by rainwater?

(a) Fragmentation ( )

(b) Catabolism ( )

(c) Leaching ( )

(d) Humification ( )

13. Through which of the following processes, nutrient enters in an ecosystem?

(a) Weathering ( )

(b) Atmospheric input ( )

(c) Biological nitrogen fixation ( )

(d) All of the above ( )

14. In which process, ammonia is converted into nitrate by the actions of bacteria in the soil?

(a) Ammonification ( )

(b) Assimilation ( )

(c) Nitrification ( )

(d) Denitrification ( )

15. Which of the following is/are the characteristic/ characteristics of invaders?

(a) Rapid growth and high dispersal rate ( )

(b) High reproduction rate ( )

(c) Exhibiting phenotypic plasticity ( )

(d) All of the above ( )

B. Write notes on any *five* of the following : 2×5=10

1. Liebig's Law of the Minimum

2. Ecosystem resilience

3. Metapopulation

4. Wetland ecosystem

5. Keystone species

6. Economic cost of biological invasion

7. Nutrient budget

8. Ecotone

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