

2015

M.Sc. Part-II Examination
ENVIRONMENTAL SCIENCE

PAPER—IXB

Full Marks : 100

Time : 4 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Answer Q. No. 1 and any five questions from the rest.

1. Answer any ten questions of the following : 2×10

- (i) What is detritus food chain? Give example.
- (ii) State the regulatory functions of an ecosystem.
- (iii) Define humus. Mention different forms nitrogen available in the soil.
- (iv) Mention the ecological importance of soil micro-organisms.
- (v) Define Rhizosphere. Mention few micro organisms which are associated with phyllosphere.

(Turn Over)

- (vi) What is ecological succession ?
- (vii) Mention the situations where the pyramid of biomass becomes inverted.
- (viii) What is liquid biofertilizer ? Mention its advantages.
- (ix) What are K-selection and r-selection ?
- (x) What is Superdigested Compost ?
- (xi) State the differences between Solid State Fermentation (SSF) and Sub Merged Fermentation (SMF).
- (xii) Point out the differences between phagotrophs and saprotrophs and give example.
- (xiii) What is agroterrorism ?
- (xiv) Define gene pool.
- (xv) What is metagenome ?
- (xvi) Define aerosol. Name one important air borne toxin.
- (xvii) Define Cryo preservation and mention the name of one cryoprotective chemical.

2. Define biodiversity. State three levels of biodiversity. State the main causes of biodiversity loss ? Write in brief about the types of extinction. 2+3+3+8

3. (a) What is version 3.1 red list category of IUCN ? Define endangered species. How it differs from vulnerable species. Give example of a vulnerable animal in India.
- (b) What are hot spots ? Name two biodiversity hot spot in India. Mention five properties of a biosphere reserve.
- (2+2+2+1)+(2+2+5)

4. Define biofertilizer. Discuss types prospects and fertility potential of different biofertilizer. Give a flow chart of the large scale production of biofertilizer like Rhizobium.

2+4+6+4

5. Write a note on aeromicrobiological pathway for dispersion of micro organism. Describe one device that is used for the collection of bioaerosol. How bioaerosols can be controlled ?

8+5+3

6. (a) Draw, label and describe the various parts of Stirred Tank Bioreactor (STB).

(b) What is continuous fermentation ?

(c) Briefly describe scale-up and scale-down processes.

8+2+(3+3)

7. (a) What are the five characteristics used to predict population dynamics of changes ?
- (b) Write down the role of Keystone Species in a community.
- (c) What are primary and secondary succession ?
- (d) Write down role of soil microbes in nutrient recycling.
- 5+3+3+5
8. How changes in land-use pattern cause degradation of land and mention the measures that can be taken to arrest the process of degradation. Write a note on Industrial Plantation.
- 10+6
9. What are edaphon ? Classify soil animals on the basis of habitat, size and degree of dependence on soil. 1+15
10. (a) Classify aquatic biota on the basis of their position in the food chain and life habit.
- (b) Briefly describe the Nitrogen Cycle.

8+8