2023

M.Sc.

4th Semester Examination

MICROBIOLOGY

PAPER : MCB-401.1 & 401.2

(Ecology and Environmental Microbiology)

Full Marks : 40

Time : 2 hours

The figures in the right-hand margin indicate marks.
Candidates are required to give their answers
in their own words as far as practicable.
Illustrate the answers wherever necessary.

Answer from **both** the Sections as directed.

SECTION—I

UNIT-401.1 (ECOLOGY)

Answer from **all** the Groups as directed.

GROUP—A

Answer *any* **two** questions from the following :

2×2=4

1. What is flagship species? Give one example. 2

2. Why is pyramid of energy always upright?   2

3. What is biome? Give one example.   2

4. What is immigration and emigration with respect to population?   2

GROUP—B

Answer *any* **two** questions from the following :

$4 \times 2 = 8$

5. 'Interconnected feeding relationship between food chains of a particular ecosystem endorse its stability' — Explain. 'Ecosystem obeys the law of thermodynamics' — justify.   2+2=4

6. What are the functional aspects of an ecosystem? Explain co-evolution with example.   2+2=4

7. Write short notes on :   2+2=4

     (i) Edge effect and *(ii)* IUCN Red List

8. Explain the logistic growth pattern of population with a suitable diagram. What is age pyramid?   4

GROUP—C

Answer *any* **one** question from the following : $8 \times 1 = 8$

9. What are the threats of biodiversity? Write in brief about biosphere reserve and its importance.   4+4=8

10. Differentiate between k-selection and r-selection. Explain the universal model of energy flow pattern in ecosystem.   4+4=8

SECTION—II

UNIT 401.2 (ENVIRONMENTAL MICROBIOLOGY)

Answer from **all** the Groups as directed.

GROUP—A

Answer *any* **two** questions from the following:

$2 \times 2 = 4$

11. What is activated sludge?　　　2

12. How will you quantify viable and non-viable fungal spores present in the air?　　2

13. What is anaerobic digester?　　　2

14. What do you mean by waste management?　2

GROUP—B

Answer *any* **two** questions from the following :

$4 \times 2 = 8$

15. 'Coliforms are commonly considered as indicator organisms of water pollution'– Explain. Differentiate between total coliforms and fecal coliform.　　　$3 + 1 = 4$

16. Write short notes on :

  (i) Burkard seven day volumetric sampler

  (ii) Membrane filter technique and its application. $2+2=4$

17. Describe the stages and procedure of decontamination. $2+2=4$

18. Briefly describe the industrial applications of marine microbes. 4

GROUP—C

Answer *any* **one** question from the following :

$8 \times 1 = 8$

19. What is MPN index and how is it related to water potability? Write a note on trickling filter method. $2+2+4=8$

20. What is biosafety? What are the different biosafety levels? Write a comparison between the requirements of different biosafety levels.

$2+2+4=8$

★ ★ ★