

**M.Sc. 4th Semester Examination, 2024**

**MICROBIOLOGY**

**PAPER – MCB-401.1 & 401.2**

*Full Marks : 50*

*Time : 2 hours*

**Answer all questions**

*The figures in the right hand margin indicate marks*

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

**PAPER – MCB-401.1**

*( Ecology )*

[ Marks : 20 ]

**GROUP – A**

**Answer any two questions :            2 × 2**

1. What do you mean by Stability of ecosystem ?
2. Define commensalism and amensalism.
3. Define age pyramid.
4. What do you mean by Red data Book ?

GROUP-B

Answer any **two** questions :  $4 \times 2$

5. What is flagship and umbrella species ?  
Give example.  $2 + 2$
6. Explain survivorship curves of different types of population exist on the earth. 4
7. Explain the universal model of energy flow with suitable diagram. 4

8. Differentiate between *k*- and *r*-selection.  
What is niche ? 3 + 1

GROUP - C

Answer any **one** question : 8 × 1

9. Write short note on : 2 × 4

(i) Density dependent mechanism of population regulation

(ii) Biosphere reserve

(iii) Ecotone

(iv) Types of food web.

10. What is co-evolution ? Give one example.  
Define biodiversity hotspots with example.  
What are the necessity to uphold biodiversity ?  
Differentiate between GPP and NPP.

(1 + 1) + 2 + 2 + 2

**PAPER – MCB-401.2**

( *Environmental Microbiology* )

[ Marks : 20 ]

**GROUP – A**

Answer any **two** questions of the following :  
2 × 2

11. What is bioterrorism ?

12. Mention the importance of marine microbes.

13. What is biomagnification ?

14. What microbiological contaminants are found in drinking water ?

**GROUP – B**

Answer any **two** questions from the following :  
4 × 2

15. How can you separate heavy metals from liquid waste ? Differentiate thermophile from psychrophile organisms. 3 + 1

16. Write short note on : 2 + 2

(i) Biosafety Guide line of a microbiological laboratory.

(ii) How microbes impart beneficial effect on fish growth ?

17. What is superbug and their application ?  
Write the procedure of oil recovery using microorganisms. 2 + 2

18. Mention any two tests to differentiate between fecal and non-fecal coliform bacteria. 4

### GROUP – C

Answer any **one** of the following questions : 8 × 1

19. Give the concept about microbes based mineral extraction from 'ore'. Mention the chemical properties of domestic solid waste. Which microbes can deteriorate wood ?

4 + 3 + 1

20. What is bioremediation ? State the advantage and disadvantage of bioremediation. Write down the possible pathway of TNT and PCB biodegradation. 2 + 2 + 4

**[ Internal Assessment — 10 Marks ]**

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