 PG/IVS/MCB/402.1 & 402.2/25

M.Sc. 4th Semester Examination, 2025

MICROBIOLOGY

PAPER – MCB-402.1 & 402.2

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

MCB – 402.1

GROUP – A

Answer any two questions : 2×2

1. State the therapeutic importance of microbial secondary metabolites.

2. What do you mean by auxotroph and prototrophic microorganisms ?

3. What is the common mode of action of antifungal antibiotics ?

4. Mention the therapeutic applications of different type of microbial enzymes.

GROUP – B

Answer any **two** questions : 4×2

5. Define synbiotic and postbiotic. State the health beneficial role of prebiotics. 2 + 2

6. Classify antibiotics on the basis of chemical nature with examples.

7. State the target of vancomycin and penicillin on inhibition of cell wall synthesis. Mention the fermentation conditions of production of oxy-and chloro-tetracycline. 2 + 2

8. How different types of semi-synthetic penicillins are prepared from natural penicillin ?

GROUP – C

Answer any **one** question : 8×1

9. Describe the common mechanisms of antibiotic resistance. Why in mixture antibiotics containing atleast one beta-lactamase inhibitor is become popular today ? $6 + 2$

10. Define pharmacokinetics, pharmacodynamics and therapeutic index. How half-life of a drug influences the drug concentration in plasma ? $4\frac{1}{2} + 3\frac{1}{2}$

MCB – 402.2

(*Advanced Products and Biosafety Norms*)

GROUP – A

Answer any **two** questions : 2×2

11. Write any two effects of antibiotic resistance on modern medicine.

12. What does GMP stand for and what is its basic concept ?

13. What are the functions of trademark ?

14. What types of nanoparticles can be used for drug delivery system ?

GROUP – B

Answer any **two** questions : 4×2

15. Describe how bacteria become resistant to antibiotics through mutation and gene transfer.

16. Describe the process of immobilization of biological elements in biosensors.

17. Describe the components of quality control in pharmaceutical industry.

18. Write down the advantages and disadvantages of Top-down and Bottom-up approaches for the synthesis of nanoparticles.

GROUP – C

Answer any **one** question : 8×1

19. Which matters cannot be patentable ? What is Trade dress ? What are the essential features of trademark ? $3 + 2 + 3$

20. What are the ideal characteristics of a biosensor ? Briefly describe the working principle of a Class III biosafety cabinet. Name four microorganisms that should be handled at BSL-4. $3 + 3 + 2$

[Internal Assessment – 10 Marks]