

B.Sc. Semester - 2 (NEP-2020) Examination

MARCH/APRIL-2026

MIC: Microbial Physiology -2 (Major-4)

Time: 2:00 Hours

Marks:50

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

- Que.1 1) Define atom, molecule, and element. List the subatomic particles of an atom with their charges. (05)
- 2) Describe the importance of water in microbial life with reference to its chemical properties. (05)

OR

- Que.1 1) Predict how a sudden change in pH can affect microbial growth and enzyme activity. (05)
- 2) Illustrate how hydrogen bonds contribute to the stability of biological molecules in microorganisms. (05)
- Que.2 1) Explain the differences between chemolithoautotrophs and chemoheterotrophs with suitable examples. (05)
- 2) Justify how the diversity of microbial nutritional types contributes to ecological balance and biogeochemical cycles. (05)

OR

- Que.2 1) Describe the nutritional classification of microorganisms based on their carbon and energy sources. (05)
- 2) A bacterium uses CO₂ as a carbon source and derives energy from oxidation of inorganic compounds. Classify the organism and justify your answer. (05)
- Que.3 1) Explain the concept of uniport, symport, and antiport with suitable examples. (05)
- 2) Differentiate between primary and secondary active transport based on energy source, mechanism, and examples. (05)

OR

- Que.3 1) Predict what would happen to a cell if the proton pump stops functioning. Justify your answer. (05)
- 2) Justify the importance of iron uptake mechanisms in microbial survival and pathogenicity. (05)
- Que.4 1) Explain how antibiotics inhibit cell wall synthesis and give one suitable example. (05)
- 2) Describe the mechanism of action of antifungal and antiviral chemotherapeutic agents. (05)

OR

- Que.4 1) Explain how microbiological assay is used to determine the potency of an antibiotic. (05)
- 2) Differentiate between antibiotics that inhibit nucleic acid synthesis and those that inhibit specific enzyme systems. (05)
- Que.5 1) Justify why an understanding of basic chemistry is essential for microbiologists in studying metabolism and microbial physiology. (05)
- 2) Define chemolithotroph and photolithotroph. Mention their primary energy sources. (05)

OR

- Que.5 1) Define passive diffusion and facilitated diffusion. Mention one difference between them. (05)
- 2) List the characteristics of an ideal chemotherapeutic agent. (05)
