



RAN-2003080601010002

M.Sc. (Sem.-I) Examination November - 2025 Microbiology - Microbial Diversity (CC-1)

Time: 3 Hours]

[Total Marks: 70

સૂચના : / Instructions

- (1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the above details on your answer book
- (2) All questions are compulsory.

Seat No.:

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Student's Signature

Q.1. Answer the following: (Any two)

18

- A. Explain prokaryotic classification, nomenclature, and identification, and elaborate on the concept of the bacterial species.
- B. Describe molecular techniques, particularly the use of probes applied for the identification of specific prokaryotic strains.
- C. Explain the nomenclature of a bacterial species and subspecies, providing examples of binomial and trinomial names.

Q.2. Answer the following: (Any two)

18

- A. Discuss in detail the common characteristics of Archaea and differentiate them based on their environmental habitats and physiological groups.
- B. Describe the physiology and ecological role of extremely thermophilic S^o-metabolizers in the Phylum *Crenarchaeota*.
- C. Explain the ecological interactions and lifestyles of *Deltaproteobacteria* focusing on sulfur-reducing and predatory species.

Q.3. Answer the following: (Any two)

18

- A. Discuss the principles of viral architecture by comparing the structure, assembly, and stability of icosahedral and helical capsids.
- B. Explain the viral strategies used to evade the host's innate immune responses, focusing on interference with interferon pathways and inhibition of apoptosis.
- C. Write a short note on the structural and genomic complexity of *Chlorella* viruses and their role in viral evolution.

Q.4. Answer the following: (Any two)

16

- A. Describe the biological species concept in fungi. Explain why it is difficult to apply to non-culturable or geographically isolated fungi.
- B. Describe growth of filamentous fungi through hyphal tip extension along with vegetative growth.
- C. Describe the main features of eukaryotic algal cells including chloroplast structure and the role of cell walls and mucilage.