

- (G) Describe Rh antigen and its clinical significance.
- (H) Explain the use of microbes in biocomposting and waste management.
4. Answer **any one** of the following : 10
- (A) Elaborate on the Germ Theory of Disease with contributions of Louis Pasteur and Robert Koch.
- (B) Discuss horizontal gene transfer in bacteria and its evolutionary importance.
- (C) Describe in detail the role of microorganisms in biogeochemical cycling of N and P.
- (D) Discuss microorganisms in extreme environments and their adaptations.
- (E) Discuss host-pathogen interactions and the immune responses generated.
- (F) Explain different types of immunity and their roles in pathogen defense.
- (G) Describe in detail the production and use of SCP and fermented foods.
- (H) Discuss the use of microorganisms in pollution control and oil exploration.

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1 (Sem-4) BOT 3

2025

BOTANY

Paper : BOT0400304

(Microbiology)

Full Marks : 45

Time : 2 hours

The figures in the margin indicate full marks for the questions.

1. Choose the right option : 1×5=5
- (A) Koch's postulates were designed to
- (a) Discover antibiotics
- (b) Classify bacteria
- (c) Prove germ theory of disease
- (d) Observe microbial motility
- (B) Which phase in a bacterial growth curve shows maximum metabolic activity?
- (a) Lag phase
- (b) Log phase
- (c) Stationary phase
- (d) Death phase

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- (C) Which of the following lacks a protein coat?
- (a) Prion
- (b) Viroid
- (c) Virus
- (d) Bacteriophage
- (D) The Baltimore classification is based on
- (a) Host type
- (b) Capsid shape
- (c) Type of nucleic acid and replication method
- (d) Disease caused
- (E) Mycoplasma differs from other bacteria by lacking
- (a) DNA
- (b) Cell wall
- (c) Ribosomes
- (d) Flagella
2. Answer **any five** very briefly : 2×5=10
- (A) Name the major nutritional types of microorganisms based on carbon and energy source.
- (B) Define Koch's postulates in brief.

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- (C) Name *two* RNA viruses that infect humans.
- (D) Mention *two* agriculturally important bacteria.
- (E) What role do soil microorganisms play in plant health?
- (F) Name *two* fungal diseases of plants and their causative organisms.
- (G) Name *two* primary lymphoid systems.
- (H) Define biopesticide with *one* example.

3. Answer **any four** of the following : 5×4=20

- (A) Explain the phases of microbial growth curve with a diagram.
- (B) Compare the life cycles of lytic and lysogenic bacteriophages.
- (C) Describe the ultrastructure of a bacterial cell.
- (D) Explain conjugation and its genetic significance in bacteria.
- (E) Discuss the role of microbes in carbon and phosphorus cycling.
- (F) Explain the mechanism of plant defense against fungal pathogens.

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Contd.