

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2023

M.Sc.-I Semester (Microbiology)

COURSE CODE (CREDITS): 20MS1MB111 (03)

MAX. MARKS: 35

COURSE NAME: General Microbiology and Bacteriology

COURSE INSTRUCTORS: Ashok Kumar Nadda

MAX. TIME: 2.0 Hour

Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Section I

(a) What types of genetic material can be taken up by bacteria during transformation? [1 Mark]

(b) Can you provide examples of specific bacterial diseases where transduction plays a significant role in pathogenesis? [1 Mark]

(c) How do probiotics contribute to gut health and the balance of the microbiota? [1 Mark]

(d) What specific adaptations do extremophiles have that enable them to withstand extreme pressures or salinity? [1 Mark]

(e) How do thermophiles, extremophiles that thrive in high-temperature environments, contribute to the stability of enzymes used in industrial processes? [1 Mark]

Section II

Q 2 How does antimicrobial resistance affect the treatment of common infections and medical procedures such as surgery? How can healthcare professionals balance the need for effective treatment with the need to prevent the development of antimicrobial resistance?

[3 Marks]

Q 3 Can you describe the typical symptoms of typhoid and how they progress over the course of the illness? Can you explain the life cycle of the bacterium *Salmonella Typhi*? What is the incubation period for typhoid, and how is it diagnosed by healthcare professionals? **[4 Marks]**

Q 4 Can you explain the role of nitrogen-fixing bacteria in biofertilizers and how they benefit plant growth? What are the advantages and disadvantages of using biofertilizers in agriculture? How do the biofertilizers contribute to sustainable farming practices? **[4 Marks]**

Q 5 What are biopesticides used against Botrytis fruit rot and Powdery mildew of banana? and how do they differ from traditional chemical pesticides? Can you provide examples of organisms commonly used in the production of biopesticides? What are the advantages and limitations of using biopesticides in pest management? **[4 Marks]**

Section III

Q 6 What are the typical symptoms of malaria, and how do they vary between uncomplicated and severe cases? Can you explain the life cycle of the malaria parasite within the human body? **[5 Marks]**

Q 7 What is cholera, and what are the main symptoms, causes, and methods of prevention for this infectious disease? How is cholera diagnosed, and what are the treatment options for individuals infected with cholera? **[5 Marks]**

Q 8 How do probiotics survive the digestive process to reach the gut and exert their beneficial effects? Can probiotics help with conditions like irritable bowel syndrome (IBS) or inflammatory bowel disease (IBD) cancer and cardiovascular diseases? **[5 Marks]**