

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS- 2024

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

Q.No	Question	Marks
	<b>Section I</b>	
Q1	(a) What are Hfr plasmids? How does the genetic material can be taken up by bacteria during transformation?	1
	(b) Can you provide examples of specific bacterial diseases in which contaminated food and water is responsible for the spread of disease?	1
	(c) What are probiotics? How do prebiotics contribute to gut health and the balance of the microbiota?	1
	(d) What specific adaptations do extremophiles have that enable them to withstand extreme pressures or temperature?	1
	(e) What are the plant growth promoting rhizobacteria (PGPRs)? How do these help the improvement of crop yield?	1
	<b>Section I</b>	
Q 2	What are biopesticides used against Botrytis fruit rot and Powdery mildew of banana? How do they differ from traditional chemical pesticides? Can you provide examples of organisms commonly used in the production of biopesticides?	3
Q3	Can you explain the role of nitrogen-fixing bacteria in biofertilizers and how they benefit plant growth? Explain the mechanism of symbiosome formation? How do the biofertilizers contribute to sustainable farming practices?	3
Q 4	Explain the process of transduction in bacteria. How does lytic and lysogenic cycle differ from each other?	3
Q5	Can you describe the typical symptoms of cholera and how they progress	3

	over the course of the illness? Can you explain the life cycle of causal organism? What is the incubation period for cholera, and how is it diagnosed by healthcare professionals?	
Q6	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
	<b>Section III</b>	
Q7	How do probiotics survive the digestive process to reach the gut and exert their beneficial effects? Can probiotics help with conditions of diarrhea, cancer and cardiovascular diseases?	3
Q8	What are methanogens, and why are they important in the context of archaeobacteria? Describe the role of archaeobacteria in the production of methane in both natural and industrial processes. What are the unique features of the genetic material in archaeobacteria compared to bacteria?	4
Q9	How do extremophiles, such as alkaliphiles, adapt to very basic (alkaline) environments? What mechanisms do extremophiles use to protect their DNA, proteins, and cellular structures from extreme stress? Describe the potential industrial applications of extremophiles, such as in biotechnology, waste treatment, or food production.	4
Q10	What are the mechanisms behind bacterial sporulation, and how does it affect growth in unfavorable conditions? Discuss the various steps in the formation of a spore. How does spore undergo germination when it is incubated under favourable conditions.	4
	<b>Total</b>	<b>35</b>