JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Make-up Examination-Nov-2025

COURSE CODE (CREDITS): 18MIWBT134 (3) MAX. MARKS: 25

COURSE NAME: MICROBIAL ECOLOGY

COURSE INSTRUCTORS: AKN MAX. TIME: 1 Hour 30 Minutes

Note: 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
	Section I	
Q1	a) Which enzyme is used in RT-PCR but not in PCR?	1
	b) Which enzyme complex is responsible for nitrogen fixation? Which genus of cyanobacteria fixes nitrogen in rice fields?	1
	b) What is syntrophism? Give one example from anaerobic environments.	1
	d) What is the function of Nod factors in legume–rhizobia interactions?	1
	e) What is quorum sensing, and how does it affect plant–microbial communication?	1
	Section II	
Q 2	Explain commensalism and amensalism with an example of each. What are the benefits of cooperative interactions in microbial consortia?	2.5
Q 3	Compare conventional RT-PCR and Real-Time (qRT-PCR) techniques. What are the key components required for an RT-PCR reaction?	2.5
Q 4	Discuss the ecological and industrial significance of Archaebacteria. Explain how Archaebacteria serve as models for studying life in extreme environments	2.5
Q 5	Explain how antibiotics affect human–microbe interactions. What is the role of *Lactobacillus* in maintaining vaginal health?	2.5

9

	Section III	
Q 6	Explain how nematophagous fungi penetrate and digest nematode cuticles after capture. What enzymes are involved in the degradation of nematode tissue during infection?	5
Q 7	How are plant and bacterial membranes involved in forming the symbiosome membrane? What is the function of the peribacteroid membrane in legume nodules? Outline the sequence of events from root hair curling to nodule formation.	5
	Total	**25**