

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY WAKNAGHAT

TEST -3 EXAMINATION-MAY 2026

M.Sc -4th Sem (Microbiology)

COURSE CODE(CREDITS): 21MS1MB412(3)

MAX. MARKS: 35

COURSE NAME: Plant & Agricultural Microbiology

COURSE INSTRUCTORS: Dr Hemant Sood

MAX. TIME: 2hrs

Note: a) All questions are compulsory. (b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems.

	Question	Marks
Q1.	A) Describe the role of rhizospheric and symbiotic microorganisms in modulating secondary metabolite pathways in medicinal plants. B) Explain how Agrobacterium-mediated hairy root culture technology enhances secondary metabolite production in medicinal plants. C) Analyze the industrial applications of plant secondary metabolites produced through microbial-assisted biotechnological approaches.	2.5+2.5+2
Q2.	Describe the principle of avoidance in plant disease management with suitable examples from crop production systems. Explain eradication as a plant disease management strategy. How do cultural, physical, and chemical methods contribute to eradication?	2.5+1.0+3.5
Q3.	A) Design a disease management strategy for a fungal disease affecting a horticultural crop using all major management principles. B) A medicinal plant cultivation unit reports reduced secondary metabolite content due to pathogen attack. How would you integrate microbial biocontrol agents and elicitors to improve both plant health and metabolite production.	3.5+3.5
Q4.	A tomato crop in a greenhouse shows severe fungal wilt symptoms despite repeated fungicide applications. As a plant pathologist, design an Integrated Disease Management (IDM) strategy to control the disease while minimizing chemical usage.	4.0
Q5.	Explain the contribution of plant growth-promoting rhizobacteria (PGPR) in disease suppression and plant health management. A highly susceptible crop variety is grown under favourable environmental conditions, but disease does not occur. Using the Disease Triangle concept, explain the possible reasons.	2.5+2.5
Q6.	A biotechnology company develops a drought-tolerant genetically modified crop and plans its commercial release in a developing country. Analyze the ethical, ecological, economic, and social issues associated with its adoption.	5.0