

MSc DEGREE EXAMINATION MAY 2026
(Second Semester)

Branch -**BIOCHEMISTRY**

ADVANCED PLANT BIOCHEMISTRY

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Name the pigment that is responsible for absorbing light energy and transferring it to chlorophyll a. (i) Chlorophyll b (ii) Carotenoids (iii) Phycobilins (iv) Xanthophylls	K1	CO1
	2	Label the enzyme which is responsible for Carbon dioxide fixation in C3 plants? (i) PEP carboxylase (ii) RuBisCO (iii) Aldolase (iv) Triose phosphate isomerase	K1	CO1
2	3	What is the role of jasmonic acid in plants? (i) Defense against pathogens (ii) Cell elongation (iii) Root growth (iv) Flowering	K1	CO2
	4	Which nitrogenous compound is used as a natural insecticide? (i) Caffeine (ii) Morphine (iii) Nicotine (iv) Quinine	K1	CO2
3	5	What is the primary site of nitrogen fixation in legume plants? (i) Root hairs (ii) Nodules (iii) Leaves (iv) Stems	K1	CO3
	6	Which enzyme is involved in the reduction of sulfate to sulfite? (i) ATP sulfurylase (ii) APS reductase (iii) Sulfite reductase (iv) Cysteine synthase	K1	CO3
4	7	Choose the type of pathogen that typically utilizes specialized structures called stylets to puncture plant cell walls. (i) Bacteria (ii) Fungi (iii) Nematodes (iv) Viruses	K1	CO4
	8	Select the signaling molecule that plays a central role in the activation of Systemic Acquired Resistance (SAR). (i) Jasmonic acid (ii) Salicylic acid (iii) Ethylene (iv) Cytokinin	K1	CO4
5	9	Which complex is responsible for inserting carrier proteins into the inner mitochondrial membrane? (i) TIM 23 (ii) TIM 22 (iii) SAM complex (iv) OXA complex	K1	CO5
	10	Identify the signaling molecule which is primarily involved in plant defense against biotrophic pathogens. (i) Salicylic acid (ii) Jasmonic acid (iii) Ethylene (iv) Cytokinin	K1	CO5

Cont...

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain the organization and functions of light harvesting complexes in photosynthesis.	K5	CO1
		(OR)		
	11.b.	Assess the regulation of CAM photosynthesis and how it helps plants survive in arid conditions.		
2	12.a.	Infer the structure and biological functions of brassinosteroids in plant growth regulation.	K2	CO2
		(OR)		
	12.b.	Outline the commercial applications of secondary metabolites.		
3	13.a.	Evaluate the GOGAT pathway for ammonia assimilation.	K5	CO3
		(OR)		
	13.b.	Interpret the activation of sulfate in plants and its significance.		
4	14.a.	Plan how pathogens invade plant tissues and overcome host defences?	K3	CO4
		(OR)		
	14.b.	Organize the concept of R genes and their role in plant disease resistance.		
5	15.a.	Analyze how proteins are transported into plastids, including to the stroma and thylakoid membranes.	K4	CO5
		(OR)		
	15.b.	List the factors affecting transport and translocation in plants.		

SECTION -C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Analyze the ultrastructure of the chloroplast with a neat labeled diagram. Explain the functions of each component.	K4	CO1
2	17	Interpret the structure, biosynthesis and physiological functions of gibberellins.	K5	CO2
3	18	Explain the enzymatic reactions and energy utilization in biological nitrogen fixation.	K5	CO3
4	19	Analyze the consequences of plant-pathogen interactions on photosynthesis, respiration and growth.	K4	CO4
5	20	Explain the mechanisms by which plants adapt to stress through hormonal regulation.	K2	CO5

Z-Z-Z END