22BTP316N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2025
(Third Semester)

Branch - **BIOTECHNOLOGY**

PLANT BIOTECHNOLOGY

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	RFLP markers are based on variation in _____. (a) Restriction enzyme sites (b) DNA methylation (c) Protein sequences (d) RNA length	K1	CO1
	2	DNA fingerprinting in plants is often done using _____. (a) RAPD (b) AFLP (c) SSR (d) All of the above	K2	CO1
2	3	Which of the following is produced through Anther culture a) Diploids b) Haploids c) Triploids d) Tetraploids	K1	CO2
	4	What is induced by high auxin : cytokinin ratio a) Shoot formation b) Root formation c) Callus necrosis d) Embryogenesis	K2	CO2
3	5	Relate from the following the T-DNA transfer is mediated by _____. a) Vir genes b)Opine genes c) Nptll gene d) 35S promoter	K1	CO3
	6	Which of the following bacterium induces hairy root culture ? *a) Agrobacterium tumefaciens* *b) Pseudomonas putida* *c) E.coli* *d) Agrobacterium rhizogenes*	K2	CO3
4	7	Widely used reporter gene in plant biotechnology is _____. a) GUS b) BAR c) VirD2 d) Opine synthase	K1	CO4
	8	Spell out the PAM sequence for Cas9 a) TATA b) NGG c) CCAAT d) AATA	K2	CO4
5	9	Choose the correct one related to Molecular pharming. a) Herbicide resistance b) Nematode resistance c) Enhancing soil fertility d) Producing antibodies and drugs in plants	K1	CO5
	10	Cry genes in Bt crops encode _____. a) Herbicide detoxifying enzymes b) Endotoxins c) PolyA tails d) Auxin signaling proteins	K2	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.	Enlist the uses of AFLP in Plant breeding.	K3	CO1
		(OR)		
	11.b.	Outline the applications of DNA fingerprinting in crops.		
2	12.a.	Illustrate the importance of aseptic techniques in plant tissue culture.	K3	CO2
		(OR)		
	12.b.	Summarize the Cybrids with their applications.		
3	13.a.	Write short notes on Agrobacterium mediated transformation in plants.	K3	CO3
		(OR)		
	13.b.	Explain about biolistics with its applications in crop improvement.		
4	14.a.	Organize brief notes on promoters used in plant gene constructs.	K3	CO4
		(OR)		
	14.b.	Enlist major applications of RNAi in crop improvement.		
5	15.a.	Explain about biofortification in plants and its importance.	K4	CO5
		(OR)		
	15.b.	Write short note on the applications of male sterility in crop improvement.		

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	Explain about the development and applications of SSR markers in crop improvement.	K4	CO1
2	17	Explain in detail about protoplast isolation, culture and regeneration.	K4	CO2
3	18	Explain in detail about the hairy root culture and their role in secondary metabolite production.	K5	CO3
4	19	Explain in detail about CRISPR/Cas9 system: component, mechanism and its applications in Crop improvement.	K5	CO4
5	20	Explain the transgenic approaches for drought, salinity, and cold tolerance in plants.	K4	CO5

Z-Z-Z END