

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2026
(Sixth Semester)

Branch - BIOTECHNOLOGY

**MAJOR ELECTIVE COURSE – II : PLANT TISSUE CULTURE AND TRANSGENIC
TECHNOLOGY**

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	MS medium was developed by _____. (i) Murashige and Skoog (ii) White (iii) Gamborg (iv) Nitsch	K1	CO1
	2	Callus is defined as _____. (i) Organized mass of differentiated cells (ii) Unorganized mass of undifferentiated cells (iii) Organized mass of undifferentiated cells (iv) Unorganized mass of differentiated cells	K2	CO1
2	3	Somatic hybridization involves fusion of _____. (i) Gametes (ii) Protoplasts (iii) Zygotes (iv) Embryos	K1	CO2
	4	Cybrids are produced by _____. (i) Nuclear fusion only (ii) Cytoplasmic fusion only (iii) Both nuclear and cytoplasmic fusion (iv) Transfer of organelles between cells	K2	CO2
3	5	Hairy root cultures are induced by _____. (i) <i>Agrobacterium tumefaciens</i> (ii) <i>Agrobacterium rhizogenes</i> (iii) <i>Bacillus thuringiensis</i> (iv) <i>Rhizobium leguminosarum</i>	K1	CO3
	6	Virus indexing is performed to _____. (i) Identify viral infections in plants (ii) Introduce viruses into plants (iii) Remove viruses from plants (iv) Culture viruses in vitro	K2	CO3
4	7	The particle bombardment method is also known as _____. (i) Electroporation (ii) Biolistics (iii) Microinjection (iv) Liposome fusion	K1	CO4
	8	The selectable marker gene commonly used in plant transformation is _____. (i) lacZ (ii) nptII (iii) ampR (iv) tetR	K2	CO4
5	9	Glyphosate is a _____. (i) Herbicide (ii) Insecticide (iii) Fungicide (iv) Growth regulator	K1	CO5
	10	AFLP stands _____. (i) Amplified Fragment Length Polymorphism (ii) Amplified Fragment Level Polymorphism (iii) Applied Fragment Length Polymorphism (iv) Analyzed Fragment Length Polymorphism	K2	CO5

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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.	Outline the aseptic techniques required for plant tissue culture laboratory.	K2	CO1
		(OR)		
	11.b.	Explain the establishment and maintenance of suspension cultures.		
2	12.a.	Demonstrate the procedure for embryo culture and rescue in agricultural crops.	K2	CO2
		(OR)		
	12.b.	Explain the applications of somatic hybridization in crop improvement.		
3	13.a.	Outline the technique of meristem culture for virus elimination.	K2	CO3
		(OR)		
	13.b.	Explain the sources and causes of somoclonal variation in tissue culture.		
4	14.a.	Demonstrate the particle bombardment method for gene transfer in plants.	K2	CO4
		(OR)		
	14.b.	Explain the role of promoters and selection markers in plant genetic engineering.		
5	15.a.	Outline the copy nature strategy for developing pest-resistant plants.	K2	CO4
		(OR)		
	15.b.	Explain the molecular markers RAPD, RFLP, and AFLP used in marker-assisted breeding.		

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	Assess the importance of cyto-differentiation in plant tissue culture and discuss the concept of artificial seeds with applications.	K5	CO1
2	17	Evaluate the significance of protoplast technology in plant breeding and discuss the selection methods for somatic hybrids.	K5	CO2
3	18	Critically analyze the role of micropropagation in commercial plant production and discuss the design considerations for bioreactors.	K6	CO3
4	19	Compare and contrast the Agrobacterium-mediated and particle bombardment methods of gene transfer with their advantages and limitations.	K5	CO4
5	20	Discuss the strategies for engineering disease resistance and abiotic stress tolerance in transgenic plants with relevant examples.	K5	CO4