

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2023
(Sixth Semester)

Branch – BIOTECHNOLOGY

**DISCIPLINE SPECIFIC ELECTIVE – 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 x 1 = 10)

- 1 The production of secondary metabolites requires the use of _____.
(i) Meristem (ii) Protoplast
(iii) Auxillary buds (iv) Cell suspension
- 2 Synthetic seeds are produced by the encapsulation of somatic embryos with _____.
(i) Sodium acetate (ii) Sodium nitrate
(iii) Sodium chloride (iv) Sodium alginate
- 3 Haploid plants can be obtained from _____.
(i) Anther culture (ii) Bud culture
(iii) Leaf culture (iv) Root culture
- 4 Which of the following chemicals are most widely used for protoplast fusion?
(i) Mannitol (ii) Polyethylene glycol
(iii) Sorbitol (iv) Mannol
- 5 Which of the following plant cells shows totipotency?
(i) Cork cells (ii) Meristem
(iii) Sieve tube (iv) Xylem vessels
- 6 Which of the following is the main application of embryo culture?
(i) Clonal propagation (ii) Production of embryoids
(iii) Induction of somaclonal variations (iv) Overcoming hybridisation barriers
- 7 Which of the following gene detoxify herbicide bronoxynil?
(i) Nitrilase (ii) Glutathione S-transferase (GST)
(iii) Phosphinothricin acetyl transferase (iv) All of these
- 8 Phosphinothricin acetyl transferase is encoded by
(i) gene *bxn* in *Klebsiella pneumoniae* (ii) *bar* gene in *Streptomyces* spp
(iii) both (1) and (2) (iv) none of these
- 9 Which of the following compounds has been produced in transgenic plants to improve tolerance to salt stress and water deficit?
(i) Sucrose (ii) Mannitol
(iii) Nicotine (iv) Octopine
- 10 Tomatoes exhibiting delayed ripening express antisense RNA against
(i) glycerol 1 phosphate acyl transferase (ii) polygalactouranase
(iii) ACC deaminase (iv) sucrose phosphate synthase gene

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SECTION - B (25 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 5 = 25)

- 11 a Explain in detail about the constituents of plant tissue culture media.
OR
b Examine the applications of suspension culture.
- 12 a Describe in detail about the protoplast isolation.
OR
b Demonstrate the procedure of embryo culture.
- 13 a List the applications of somaclonal variations in crop improvement.
OR
b Infer the steps involved in meristem culture.
- 14 a Demonstrate the process of *Agrobacterium* mediated gene transfer.
OR
b Summarize the importance of edible vaccines.
- 15 a Examine the steps involved in the production of disease resistance plants.
OR
b Enlist the current status and regulations of GM crops.

SECTION -C (40 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 8 = 40)

- 16 a Summarise the production method used for artificial seed.
OR
b Recall the procedure for callus culture.
- 17 a List the applications of cybrids.
OR
b Relate the somatic hybridization for generation of new variety.
- 18 a Explain the steps involved in Micropropagation.
OR
b Criticize the parts of Bioreactor.
- 19 a Recall the procedure for particle bombardment method of gene transfer.
OR
b Summarize the applications of transgenic plants related to the useful protein production.
- 20 a Explain the production method of herbicide resistance plants.
OR
b Examine the strategy for pest resistance plants.

Z-Z-Z

END