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**M.Sc. (Fourth Semester)
EXAMINATION, May - June, 2022
BOTANY
Paper Third
(Biotechnology - II)
(Plant Cell, Tissue Culture and Organ Culture)**

Time : Three Hours]

[Maximum Marks:80

Note: Attempt all sections as directed.

**(Section - A)
(Objective/Multiple Choice Questions)
(1 mark each)**

Note: Attempt all questions:

Choose the correct answer:

1. Haploid plants are produced in large number by by:
(A) Anther culture
(B) Ovary culture
(C) Both (A) and (B)
(D) Embryo culture

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2. The culture of cells in liquid agitated medium is called:
(A) Liquid culture
(B) Micro propagation
(C) Agri culture
(D) Suspension culture
3. What is dimethyl selfoxide used for:
(A) Celling agent
(B) Cryoprotactant
(C) Chelating agent
(D) Alkalyting agent
4. The formation of embryoids from the pollen grains in the tissue culture medium is due to:
(A) Organogenesis
(B) Test tube culture
(C) Double fertilization
(D) Cellular totipotency
5. Elicitors are molecule that
(A) Induce cell division
(B) Stimulates production of secondary metabolite
(C) Stimulate hairy root formation that accumulate secondary metabolite
(D) None of these

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6. Which of the following chemicals are most widely used to protoplast fusion:
- (A) Mannitol
 - (B) Polyethylene glycol
 - (C) Sorbitol
 - (D) Mannol
7. Which of the following plant part is free from the attack of the virus:
- (A) Stem
 - (B) Root
 - (C) Meristem
 - (D) Leaves
8. The variation in invitro culture is called as:
- (A) Invitro variation
 - (B) Mutation
 - (C) Somaclonal Variation
 - (D) All of these
9. The preserved embryoids are termed as:
- (A) Natural seeds
 - (B) Synthetic seeds
 - (C) Semi Synthetic seeds
 - (D) Fermented seeds

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10. Which of the following is not a characteristics of a transgenic crop:
- (A) Herbicide resistance
 - (B) Bt insect resistance toxin
 - (C) Increased methionine content
 - (D) None of these
11. What is protoplast?
- (A) Cell wall + plasma membrane
 - (B) Plant cell - cell wall
 - (C) Cytoplasm + cell wall
 - (D) Plasma membrane - cytoplasm
12. A copyright will be valid for _____ years.
- (A) 20
 - (B) 40
 - (C) 50
 - (D) 60
13. In culture medium the element required in the concentration greater than 0.5m mol. l are called as:
- (A) Macronutrients
 - (B) Micronutrients
 - (C) Organic nutrients
 - (D) Staff agents

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14. Which alkaloid is used for antihypertensive property-
- (A) Reserpine
 - (B) Vincristine
 - (C) Morphine
 - (D) Emetine
15. Which of the following compound has been produced in transgenic plants to improve tolerance to salt stress and water deficit?
- (A) Sucrose
 - (B) Mannitol
 - (C) Nicotine
 - (D) Octopine
16. Ornithine is the precursor for biosynthesis of which alkaloid:
- (A) Atropine
 - (B) Emetine
 - (C) Lysergic acid
 - (D) Quinine
17. Which of the following gene detoxify herbicide bromoxynil?
- (A) Nitrilase
 - (B) Glutathione - S-transferase (GST)
 - (C) Phosphinothricin acetyl transferase
 - (D) All of these

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18. Somatic embryogenesis is:
- (A) Germ line cells developing into embryo
 - (B) Non-germ line cells developing into embryo
 - (C) Embryo developing from zygote
 - (D) Embryonic tissue becoming Somatic
19. Cryogenic injuries are avoided by:
- (A) Cryopreservation (freeze - drying)
 - (B) Cold storage
 - (C) Used to prevent plant material from pathogen
 - (D) Both (A) and (C)
20. Which of the following is not the class of secondary metabolite-
- (A) Amino acids
 - (B) Terpenes
 - (C) Phenolics
 - (D) Alkaloids

Section - B

(Very Short Answer Type Questions)

(2 marks each)

Note: Attempt all questions.

1. What are the advantages of micro-propagation?
2. What are cryoprotectant?
3. Why is Agar is used in plant tissue culture media?

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4. What do you mean by cybrid?
5. What do you understand by artificial seed?
6. How do plant growth regulator effect mophogenesis?
7. What do you mean by cybrid?
8. What is an explants?

Section - C

(Short Answer Type Questions)

(3 marks each)

Note: Attempt all questions.

1. Discuss about the role of auxins in regeneration of plant.
2. What are different stages of micro- propagation.
3. What is callus e tissue? Describe the protocol of callus culture.
4. Write notes on:
(1) Indirect somatic embryogenesis
5. What is the difference between true seeds and artificial seed.
6. Write note on protoplast fusion induced by PEG method of:
7. Describe methods of protoplast viability test.
8. What is the difference between primary and secondary metabolite?

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Section - D

(Long Answer Type Questions)

(5 marks each)

Note: Attempt all questions.

1. Describe the basic composition of general plant tissue culture medium.

OR

Give an outline of the principle of cell suspension culture and describe the different categories of suspension culture.

2. Explain the induced methods of protoplast fusion

OR

Describe the techniques of somatic embryogenesis.

3. Give a brief account of method of cryopreservation and role of cryoprotectants.

OR

Write brief note on-copyright and patent.

4. Write the methods for extraction of secondary metabolites for yield enhancement.

OR

Write note on - Terminator seed technology.

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