

**H-4/07/22**

Roll No. ....

**IV Semester Examination, 2022****M.Sc.****BOTANY**

Paper III

(Biotechnology-I)

Time : 3 Hours ]

[ Max. Marks : 80

**Note :** All questions are compulsory. Question Paper comprises of 3 sections. Section **A** is objective type/multiple choice questions with no internal choice. Section **B** is short answer type with internal choice. Section **C** is long answer type with internal choice.

**SECTION A****1×8=8****(Objective Type/Multiple Type Questions)***Choose the correct answer :*

- 1.** The capacity to generate a whole plant from any cell is known as :  
 (a) Explant (b) Totipotency  
 (c) Micropropagation (d) Regeneration
- 2.** Essential requirements of an artificial medium in which explant is being regenerated is :  
 (a) a sulphur source (b) a carbon source  
 (c) a nitrogen source (d) all of these

P.T.O.

- 3.** Which of the following scientist was not responsible for developing somatic hybrids ?  
 (a) Steward (b) Halperin  
 (c) Wetherell (d) Skoog
- 4.** What are somaclones ?  
 (a) Plants chemically identical to original plant  
 (b) Plants morphologically identical to original plant  
 (c) Plants anatomically identical to original plant  
 (d) Plants genetically identical to original plant
- 5.** Cryoprotectants are used in cryopresentation to :  
 (a) Prevent damage of cells by freezing  
 (b) Preserve cells from pathogens  
 (c) Preserve cells from freezing  
 (d) Preserve cells from aggregation
- 6.** Which among the following is not a correct statement regarding patent ?  
 (a) A patent is a legal protection granted for an invention that is new, non-obvious and useful.

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- (b) The patent grants the patent holder the exclusive right to make use or sell the patented product or process.
- (c) The exclusive purpose of the patent system is to benefit the patent holder.
- (d) The Indian Patent Act, 1970 was emended and made effective from January 1, 2005.
- 7.** Production of secondary metabolite by plant tissue culture technique is preferred because :
- (a) Production yield is very high
- (b) Product recovery is easy
- (c) Aseptic conditions are easy to maintain
- (d) No skilled persons are required
- 8.** Name the technique which is used to enhance the life of tomato :
- (a) Antisense technology
- (b) In-vitro gene transfer
- (c) Ex-vivo gene transfer
- (d) Molecular farming

**SECTION B****6×4=24****(Short Answer Type Questions)****Note :** Attempt *one* question from each unit.**H-4/07/22**

P.T.O.

**Unit-I**

- 1.** Describe applications of cell culture.

*Or*

Explain the fundamentals of direct adventitious organ formation in plants.

**Unit-II**

- 2.** Explain the utility of somatic embryogenesis and androgenesis with suitable example.

*Or*

Describe achievements and limitations of protoplast research.

**Unit-III**

- 3.** Describe the method of determination of survival viability of cryopreserved plant tissue.

*Or*

Make a note on ethical concerns of IPR.

**Unit-IV**

- 4.** Write short notes on problems associated with secondary metabolite production through tissue culture.

*Or*

Give a brief account on terminator seed technology.

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## SECTION C

12×4=48

## (Long Answer Type Questions)

**Note :** Attempt *one* question from each unit.

**Unit-I**

1. Write an essay on clonal propagation.

*Or*

Give a detailed protocol for isolation of single cell suspension culture and culture of single cell using tissue culture technique.

**Unit-II**

2. Describe the method of regeneration of hybrid plants after somatic hybridization and also comment on verification and characterization of somatic hybrids.

*Or*

What do you understand by somatic embryos ? Describe the mechanism and technique to obtain somatic embryos and its utility.

**Unit-III**

3. Define cryoprecipitation and discuss the steps under following heads; raising sterile tissue cultures, addition of protectants, pretreatment and freezing before storage.

*Or*

Write an essay on importance of intellectual property rights.

**Unit-IV**

4. Give detailed account on production of secondary metabolites through plants tissue culture.

*Or*

Discuss formation of transgenics for resistance to biotic and abiotic stress in plants.

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