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**24-BO-41**

**M.Sc. IV SEMESTER [MAIN/ATKT] EXAMINATION  
JUNE - JULY 2024**

**BOTANY**

Paper - I

**[Plant Cell Tissue and Organ Culture]**

*[Max. Marks : 75]*

*[Time : 3:00 Hrs.]*

*[Min. Marks : 26]*

**Note :** Candidate should write his/her Roll Number at the prescribed space on the question paper.  
Student should not write anything on question paper.  
Attempt five questions. Each question carries an internal choice.  
Each question carries **15 marks**.

- Q. 1 a)** What do you mean by Cytodifferentiation ? Explain it with examples of tracheary and sieve elements. (7 Marks)
- b)** Comment upon cytoquiescence and cytosenesescence. (4 Marks)
- c)** Factors affecting cytodifferentiation. (4 Marks)

**OR**

- a)** What do you mean by Callus Culture ? Explain the morphology and characteristics of callus with the example of soft and hard callus. (5 Marks)
- b)** Describe various steps involved in callus culture sequentially. (6 Marks)
- c)** Comment upon suspension culture. (4 Marks)

- Q. 2 a)** Explain direct and indirect processes of somatic embryogenesis with suitable examples. (10 Marks)
- b)** Comment upon factors affecting somatic embryogenesis. (5 Marks)

**OR**

Write a detailed essay on Anther culture under following headings - (15 Marks)

Introduction and History, Androgenesis, Nutrient Medium, Basic steps of Anther Culture Technique, Factors Affecting Anther Culture and Significance.

- Q. 3 a)** Explain Electro fusion and Polyethylene Glycol (PEG) fusion techniques of protoplast fusion. (10 Marks)
- b)** Major applications of Protoplast Culture. (5 Marks)

**OR**

**P.T.O.**

- a) Explain mechanical and enzymatic methods of protoplast isolation. (10 Marks)
- b) Comment upon purification and viability of protoplast. (5 Marks)

- Q. 4 a)** What is Somaclonal Variation ? Discuss general features, types, causes and factors affecting somaclonal variation. (10 Marks)
- b)** Give examples of some disease resistant crop plants obtained by somaclones. (5 Marks)

**OR**

Write explanatory notes on -

- i) Stress Resistant plants. (5 Marks)
- ii) Herbicide Resistant plants. (5 Marks)
- iii) Virus free plants. (5 Marks)

- Q. 5 a)** Describe method used to prepare desiccated and hydrated artificial seeds in detail. (10 Marks)
- b)** Comment upon germplasm storage. (5 Marks)

**OR**

- a)** What are Plant Secondary Metabolites ? Why do plants produce them ? (5 Marks)
- b)** Discuss any five secondary plant metabolites and their uses. (10 Marks)

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