

GSQ/D-21**1092**

BIOTECHNOLOGY
(Plant Biotechnology)
Paper–XII

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt Question No. 1 (Compulsory) and *four* others, selecting *two* questions from each unit. All questions carry equal marks.

Compulsory Question

1. (a) Write the names of enzymes used in the isolation of protoplasts. 1
- (b) What are the somaclonal variations? 1
- (c) Describe the main contribution of the scientists 'Skoog and Miller' in plant tissue culture. 2
- (d) What is the significance of fructans production in transgenic plants? 2
- (e) What is the role of vir – E genes in *Agrobacterium* mediated plant transformation? 2

UNIT-I

2. Write short notes on the following :
 - (a) Suspension culture. 3
 - (b) Factors affecting organogenesis. 3
 - (c) Surface sterilization. 2

3. (a) Write a brief account on synthetic seeds. 4
(b) Discuss in brief the significance and limitations of callus cultures. 4
4. Write a note on the following :
- (a) Androgenesis. 4
(b) Embryo rescue. 4

UNIT-II

5. (a) Discuss the Binary and Co-integrate vectors with examples. 4
(b) Discuss the organization of Ti plasmid with special reference to its T-DNA and vir region. 4
6. (a) Explain briefly various methods of direct gene transfer. 5
(b) Discuss the advantages of antibodies production in plants. 3
7. Write a note on the following :
- (a) Industrial enzymes production in transgenic plants. 4
(b) Fungal disease resistance development. 4
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