

(b) Discuss the role of plant biotechnology in production of edible vaccines and their significance. 5

7. With the help of certain examples, explain different genetic engineering approaches for attaining resistance against microbes, pests and herbicides. 15



Roll No. ....

Total Pages : 04

**756201**

**May 2026**

**M. Sc. (Botany) (Second Semester)**

**PLANT BIOTECHNOLOGY (BOP-102-V)**

*Time : 3 Hours]*

*[Maximum Marks : 75*

**Note :** It is compulsory to answer all the questions (1.5 marks each) of Part A in short. Answer any *four* questions from Part B in detail. Different sub-parts of a question are to be attempted adjacent to each other.

**Part A**

1. (a) How does allopolyploidy help in plant improvement ? 1.5
- (b) Role of auxin and cytokinin ratio in plant regeneration. 1.5
- (c) Role of Guha and Maheshwari in plant breeding. 1.5

- (d) What is Vitrification ? 1.5
- (e) What is Apomixis ? 1.5
- (f) What role does restriction endonucleases play in recombinant DNA technology ? 1.5
- (g) What are Cryoprotectants ? 1.5
- (h) Why is somatic embryo encapsulation important in crop improvement ? 1.5
- (i) Differentiate between LINEs and SINEs. 1.5
- (j) Define Phytoalexins. 1.5

### Part B

2. (a) With a labelled diagram, describe cryopreservation, its principle, methods and applications in plant germplasm conservation. 10
- (b) Explain how mitochondrial and chloroplast genome relates to the prokaryotic genome. 5

3. (a) Describe the occurrence of somaclonal variations and their importance in plant improvement. 5
- (b) With suitable diagram, elaborate the application of somatic hybridization in crop improvement. 10
4. Give a detailed strategy for the production of haploid plants. Also, give elaborative explanation about various factors affecting their production and their significance in agricultural improvement. 15
5. (a) How diploidization can be achieved for the production of homozygous plants ? 5
- (b) Discuss the role of secondary metabolites in defensive communication among plants and insects. 10
6. (a) Depict the whole strategy for the production of recombinant vaccines from plants. 10