

2122

M. Sc. (Biotechnology) Third Semester  
MBIO-303: Plant Biotechnology

Time allowed: 3 Hours

Max. Marks: 80

**NOTE:** Attempt five questions in all, including Question No. 1 which is compulsory and selecting one question from each Unit.

x-x-x

1. Attempt the following:-

- i) Name the various Phytohormones used to promote rooting in Plant cultures.
- ii) What is the difference between *A. Tumefaciens* and *A. rhizogenes*
- iii) Can SiRNAs be used for prevention of viral diseases?
- iv) Are the peptide vaccines safer than conventional vaccines?
- v) How can antibiotics be added in Plant Tissue Culture media to avoid contamination?
- vi) Define - SCAR
- vii) Give the principle involved in cryopreservation.
- viii) Is 35S a strong promoter?

(8X2 =16)

**UNIT-I**

- Q.2. (a) Discuss the various components of Plant Tissue Culture media.  
(b) What is micropropagation? Outline the different stages steps essential to establish the laboratory grown plants from to fields.

(8,8)

- Q.3. (a) Describe the various techniques of isolation of protoplasts and their culturing,  
(b) Discuss the production of haploid plants in vitro.

(8,8)

**UNIT-II**

- Q.4 (a) What are Reporter genes? Discuss some important reporter genes used in plant transformation.  
(b) Describe how insect resistant transgenic plants can be developed using protease inhibitor and alpha-amylase inhibitors.

(8,8)

- Q.5 (a) Discuss the metabolic pathways involved in fruit ripening and how delayed ripening be achieved for increasing shelf life in transgenics.



(2)

- (b) Describe the mechanism of inducing herbicide resistance in plants giving suitable examples.

(8,8)

### UNIT-III

- Q.6 (a) Why is chloroplast transformation considered as a potentially useful mechanism for preventing unintended outcrossing of transgenic plants with non-transgenic plants? What are the difficulties associated with chloroplast transformation?

- (b) What are Biotherapeutics? Discuss the suitability of plants for production of therapeutic proteins.

(8,8)

- Q.7 (a) Discuss the principle and the pre-requisites involved in large scale production of cultured cells in a Bioreactor.

- (b) Write briefly the benefits of Biodegradable plastics that are produced from transgenic plants over the synthetic plastics.

(8,8)

### UNIT-IV

- Q.8 (a) What are RAPD markers? Discuss their role in crop improvement.

- (b) Briefly describe the PCR-based markers that have a role to play in enhancing plant productivity.

(8,8)

- Q.9 (a) What is QTL mapping? Describe the various QTL mapping strategies used in plant breeding.

- (b) What is Greenhouse technology? Under what conditions is GH technology useful? Describe the micro-environment maintained inside a greenhouse.

(8,8)