(i) Printed Pages : 3 Roll No. .....

(ii) Questions : 9 Sub. Code : 2 5 9 4 8

Exam. Code : 0 4 3 7

M.Sc. Bio-Technology 3rd Semester

(2124)

PLANT BIOTECHNOLOGY

Paper –MBIO-303

Time Allowed : Three Hours] **[Maximum Marks : 80**

Note :— Attempt **FIVE** questions in all by selecting **ONE** question from each unit. Section-A is compulsory. All questions carry equal marks.

SECTION—A

1. Compulsory Question :

Write in brief :

(1) What is the role of Amino acids and Vitamins in PTC medium ?

(2) What are Somaclonal variations ? Why do they occur in culture ?

(3) What is Virus Indexing and why is it done ?

(4) Role of Acetosyringone in *Agrobacterium* infection.

(5) What are Ribosomal Inactivating Proteins ?

(6) What are secondary metabolites and why are they produced by plants ?

(7) What are oleosins and what role do they play in oil seeds ?

(8) What are RAPD markers ? 2×8=16

UNIT—I

2. (a) Define Organogenesis. Describe the stages of somatic embryogenesis and the molecular aspects of somatic embryogenesis.

(b) What is rapid clonal propagation ? How are virus free plants developed ? 8,8

3. (a) Discuss the methods of protoplast fusion and how are somatic hybrids selected ?

(b) What is cryopreservation ? What are the factors that affect cryopreservation of plants ? 8,8

UNIT—II

4. (a) Discuss the various kinds of selectable and scorable markers and their significance.

(b) Explain the use of 35S and other promoters in plant transformation. 9,7

5. (a) Discuss the various types of viral vectors and their applications.

(b) Discuss the role of ACC synthase and ACC oxidase in fruit ripening. How are they manipulated to increase the shelf life of fruits ? 10,6

UNIT—III

6. (a) Define plant secondary metabolites. Discuss the various strategies of enhancing secondary metabolites in cultures.

   (b) What is Shikimate pathway and mention its role in production of secondary metabolites in plants. 8,8

7. (a) Mention the mechanism by which chloroplast transformation is carried out. Mention its advantages and disadvantages.

   (b) What are edible vaccines ? Describe how are they produced and what are the various factors which should be considered to develop edible vaccines. 8,8

UNIT—IV

8. (a) Discuss how AFLP and STS are used for developing markers to be used in plant breeding program.

   (b) What are QTLs ? How are QTLs used in mapping techniques for plant breeding ? 8,8

9. (a) Discuss the molecular marker assisted selection and breeding in plants.

   (b) What is Greenhouse technology ? How are green houses built and the micro environment maintained in them ? 8,8