

2015

M.Sc.

3rd Semester Examination

BIOTECHNOLOGY

PAPER—BIT-301

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Answer all questions.

Group—A

1. Answer any *five* questions from the following :
 - (a) What are the characteristic features of “*in vitro*” culture used in plant tissue culture? Give examples.
 - (b) What do you mean by epigenetic variation? Give an example.
 - (c) Name the two methods of conservation of germplasm resources. In which type of conservation method plant tissue culture is adopted with

- (d) What do you mean by CPMR in viral resistant plant development ?
- (e) Name two types of direct plant transformation method. Which method is more suitable for monocot plants ?
- (f) Name the bacteria from which insecticidal gene was successfully isolated and transformed into plant genome. Name the specific protein derived from the gene.
- (g) Name a crop plant where CMS (Cytoplasmic Male Sterile) lines have been successfully used in conventional breeding programme. Mention one biotechnological approach to make male sterile plants.
- (h) Mention two ethical issues related to GM crops.

Group—B

2. Answer any *two* questions from the following : 2×5
- (a) What is somaclonal variation ? State the genetic and epigenetic mechanisms of somaclonal variation. Mention one technique by which somaclonal variation can be detected. 1+3+1

- (b) Briefly discuss about the different types of pro used in plant transformation.
- (c) Describe briefly the procedure of isolation, purification and fusion of plant protoplasts. Write down importance of protoplast culture.
- (d) Write notes on (any two):
 - (i) Hairy root culture;
 - (ii) Embryo rescue;
 - (iii) Electroporation.

Group—C

3. Answer any two questions from the following :

- (a) What do you mean by *in vitro* clonal propagation? Describe the procedure for direct and indirect organogenesis in plant. State the importance of micropropagation.
- (b) With a schematic diagram describe transformation method using Particle Bombardment (Gene gun method). State the advantages of chloroplast transformation over nuclear transformation.

- (c) What are PR proteins? Describe the strategy of transgenesis by developing plants for fungal and bacterial resistance. 2+4+4
- (d) Write notes on (any two) : 5+5
- (i) Molecular farming ;
 - (ii) Antisense RNA Technology ;
 - (iii) Gene silencing in transgenic plants.
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