Question Paper Code : 6459

M.Sc. (Semester-IV) Examination, 2018

BIOTECHNOLOGY

[BT-401]

(Plant Biotechnology & Tissue Culture)

Time : Three Hours] **[Maximum Marks : 70**

Note : Attempt **question no. 1** which is compulsory and **one** question from each unit. Marks allotted to each question are indicated at the right margin.

1. Answer the following questions : [3x10=30]

   (a) How the expression of a gene in transformed plant cells is quantified ?

   (b) How the physiological status of donor plants affects androgenesis ?

   (c) How the genetic markers can be used to determine phylogenetic relationship among closely/distantly related species ?

   (d) How indeterminate nodules are different from determinate nodules ?

(e) Define hyperhydricity.

(f) How the hybrid cells can be selected on morpho-physiological basis ? Discuss its limitations.

(g) How hyperaccumulators can maintain their growth and viability on metal contaminated soil ?

(h) Define genotyping.

(i) Write down the characteristic features of callus. How its growth can be maintained for long time ?

(j) What are biodegradable plastics ?

UNIT-I

2. What is the effect of gene copy number and how it can be minimized during transgenic production ? [10]

3. How desirable traits can be introduced in order to make plants (a) resistant to herbicides; and (b) tolerant to environment stresses ? [10]

UNIT-II

4. Describe any two methods for direct gene transfer in plant chloroplasts. [10]

5. What are symbiotic genes ? Outline the approaches to genetically transform plants for increased nitrogen fixation efficiency. [10]

UNIT-III

6. Describe the techniques to culture protoplasts at low cell density. What are the factors that affect their viability ? [10]

7. How single cells can be isolated from (a) intact plant organs; and (b) cultured tissues ? How the growth in suspension cultures can be measured ? [10]

UNIT-IV

8. Briefly describe the synthesis of isopentenyl pyrophosphates in higher plants. [10]

9. Write detailed notes on the following : [5x2=10]

(i) Positional cloning

(ii) Plant incorporated protectants

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