

[39] SARDAR PATEL UNIVERSITY  
M.Sc. (IV Semester- CBCS) Examination  
Subject: Biotechnology  
PS04CBIT01; Plant Biotechnology  
Monday, April 9, 2018  
Time: 10.00 a.m. to 1.00 p.m.

Total Marks: 70

Note: Figures in brackets indicate marks

Answer all the questions in the given answer book

Q1. Choose the appropriate answer for the following multiple choice questions: (8x1=8)

- i) Callus induction in monocots occur due to the presence of \_\_\_\_\_ in nutrient medium  
(a) High conc. of Auxins      (b) High concentration of reduced nitrogen  
(c) both (a) & (b)              (d) Low concentration of auxin and reduced nitrogen
- ii) Which chemical treatment is most effective and widely used for obtaining diploid plants from *in vitro* raised haploid plants?  
(a) Colchicine              (b) Fluorodioxyuridine  
(c) Nitrous oxide          (d) Naphthalene acetic acid
- iii) Embryo culture is used for .....  
(a) Establishing embryonic cell suspension  
(b) Recovery of interspecific hybrid embryo  
(c) Somatic hybridization  
(d) Haploid embryo production
- iv) Secondary metabolites production is possible by the use of.....  
(a) Protoplast cultures      (b) Meristem tip cultures  
(c) Nodal cultures              (d) Cell suspension cultures
- v) One of the major advantages of protoplast fusion is that  
(a) It overcomes breeding barriers  
(b) allows transfer of unwanted genes of the donor  
(c) allows transfer of unwanted genes of the recipient  
(d) requires molecular markers
- vi) The metabolic pathway introduced in "Golden rice" is to synthesize  
(a) Vitamin B              (b) Flavanoids  
(c) Beta carotene          (d) Xanthophylls
- vii) Biolistics is a process in which  
(a) DNA coated microprojectiles are allowed to pierce host cells  
(b) DNA is directly injected into the host cells by a microcapillary  
(c) Two protoplasts are fused  
(d) A voltage is applied on host cells
- viii) A scientist has developed a novel vector for cloning. Which of the following is highly suited to protect this intellectual property?  
a) Trade mark      b) Copy right      c) Patent      d) trade secret

C.P.T.O.)

- Q2. Answer any SEVEN of the following in brief: (7x2=14)
- Differentiate between Organogenesis and embryogenesis
  - Differentiate IEDCs and PEDCs
  - Differentiate Normal seed and synthetic seed
  - Depict frequency of somaclonal variation in various culture systems schematically.
  - T4 DNA ligase
  - Binary vectors
  - Recombinant Inbred Lines (RILs)
  - Preformed defense in plants
  - Trips
- Q3. (a) How various tissue culture systems can be used in crop improvement? Discuss the applications of each culture system. (6)
- (b) Write notes on *In vitro* production of haploids and their importance in agriculture (6)
- OR
- (b) Discuss the different steps of micropropagation by using the various culture systems studied by you. (6)
- Q4 Write notes on: (6)
- Methods for Protoplast isolation from leaf explant and its regeneration.
  - Strategies for *In vitro* Germplasm conservation (6)
- OR
- Define bioreactor. Enlist the different types of bioreactors and explain the airlift bioreactor and its advantages. (6)
- Q5 (a) Outline the mechanism of T-DNA transfer by *Agrobacterium tumefaciens*. (6)
- Explain the principle, advantages and limitations of particle bombardment (6)
- OR
- Write a comparative account of NILs and RILs (6)
- Q6 (a) List the different methods of induced resistance in plants. Write in detail on Hypersensitive Response. (6)
- Explain the cellular signalling events during plant defense against pathogens (6)
- OR
- Write a note on intellectual property rights. (6)

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