

[63] SARDAR PATEL UNIVERSITY
M.Sc. (IV Semester- CBCS) Examination
Subject: Biochemistry
PS04EBIC02; Plant Biotechnology
Saturday; 02/04/2015
Time: 2.30 p.m. to 5.30 p.m.

Total Marks: 7

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) What is the general photoperiod used for various culture systems
 - a) 24 hr light regime
 - b) 12:12 hr Light: dark regime
 - c) 16:8 hr Light :dark regime
 - d) 8:16 hr light : dark regime

- ii) Which chemical treatment is most effective and widely used for obtaining diploid plants from *in vitro* raised haploid plants?
 - a) Colchicine
 - b) Fluorodioxuridine
 - c) Nitrous oxide
 - d) Naphthalene acetic acid

- iii) Production of dihaploids is possible through:
 - (a) Zygotic embryo cultures
 - (b) Anther cultures
 - (c) Callus cultures
 - (d) Meristem tip cultures

- iv) Which explants are generally used to obtain disease free plants?
 - (a) Internode
 - (b) shoot tip
 - (c) Anther
 - (d) leaf

- v) Which of the following methods is suitable for the production of random sized DNA fragments for cloning?
 - (a) Ultrasonication
 - b) Needle
 - c) homogenizer
 - d) all of these

- vi) 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

- vii) *Agrobacterium tumifaciens* is often used to transform plant cells. The T-DNA of *Agrobacterium* in plant cells is found in the form of
 - (a) An autonomously replicating plasmid
 - (b) a mitochondrial plasmid
 - (c) A chloroplast plasmid
 - (d) integrated into the plant genome

- viii) Which of the following is NOT patentable?
 - a) A novel process for protein purification
 - b) A new vector for cloning
 - c) A new drug molecule
 - d) a surgical procedure

Q2. Answer any SEVEN of the following in brief:

(7x2=

- (a) Types of in vitro growth
- (b) Synthetic seed
- (c) Which in vitro culture system show maximum somaclonal variation? Give reasons.
- (d) Nurse culture technique
- (e) Biotransformation
- (f) Co-integrative vectors
- (g) Functions of vir D1 and vir D2
- (h) Near Isogenic Lines
- (i) Crt 1 gene and its role in Golden rice

Q3.

- (a) Explain the role of auxin and cytokinin for in vitro growth and development.
- (b) Discuss the *In vitro* morphogenetic potential of cell, tissue or organs for *in vitro* morphogenesis. What are the different pathways of in vitro morphogenesis?

OR

- (b) Explain the different stages of micropropagation in brief.

Q4 (a) Write a note on anther cultures and their importance in agriculture

- (b) Describe the method for isolation of protoplasts stepwise from leaf explants.

OR

- (b) Write note on strategies for in vitro germplasm storage.

Q5 (a) Describe the role of linkers and adapters in ligation of DNA in detail.

- (b) Write a note on in vitro production of secondary metabolites.

OR

- (b) Describe the methods for obtaining the somatic hybrids and any one method for their selection.

Q6 (a) Explain how Marker Assisted Selection is useful in crop improvement?

- (b) Explain the mechanism of T-DNA integration in plant chromosome from the Ti plasmid.

OR

- (b) Discuss the various issues associated with BT brinjal. Why such issues are not raised against BT cotton?

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