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SARDAR PATEL UNIVERSITY  
 M.Sc. (IV Semester) Examination  
 Subject: Biotechnology  
 PS04CBIT01; Plant Biotechnology  
 Friday, November 30, 2012  
 Time: 10.30 a.m. to 1.30 p.m.

Total Marks: 70

Figures in brackets indicate marks

Answer all the questions in the given answer book

Q1. Attempt all the multiple choice questions given below: (8x1=8)

(i) Which theory is involved in wound healing process of explants and/or initiation of callus

- (a) Leptohormone theory (b) Habituation  
 (c) Conditioning principle (d) None of these

(ii) To reduce phenolic substances exudation from the explants which chemicals are used when cultured on a nutrient medium

- (a) Ascorbic acid (b) Citric acid  
 (c) Polyvinyl pyrrolidone (d) all of them

(iii) Which growth hormone is generally used to reduce the precocious germination of somatic embryos?

- (a) Naphthalene acetic acid (b) 6-furfuryl amino purine  
 (c) Abscisic acid (d) Gibberellic acid

(iv) Which growth hormone is supplemented in the medium in lieu of suspensor during zygotic embryo cultures?

- (a) IAA (b) Kinetin (c) GA<sub>3</sub> (d) ABA

(v) Somaclonal variation in plant cell, tissue and organ cultures arise mainly due to:

- (a) Chromosomal mosaicism of explants cells  
 (b) Higher concentrations of growth hormones  
 (c) Single gene mutations in cultured cells due to culture conditions  
 (d) All of these

(vi) Crown galls are often seen on:

- (a) Dicot plants (b) Monocot plants  
 (c) Gymnosperms (d) Pteridophytes

(vii) The signal molecules that induce an array of defense response in plants are called:

- a) Elicitors (b) Pesticides  
 c) Inducers (d) Phytoalexins

(viii) Intellectual property rights not patentable are protected by

- (a) Trade right (b) Copy right  
 (c) Trade secret (d) All of them

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Q2. Answer any SEVEN of the following in brief. (7x2=14)

- a) Cell suspension cultures
- b) Organogenesis
- c) Clonal propagation
- d) Protoplast fusion products
- e) *In vitro* androgenesis
- f) Meristem tip cultures
- g) Significance of template DNA in PCR
- h) Elicitors
- i) Farmer's rights

Q3. Answer the following:

- (a) Explain the role of auxins and cytokinins for *in vitro* growth and development. (6)
  - (b) Describe the procedures for protoplasts fusion and their selection. (6)
- OR
- (b) Describe the procedure for *in vitro* production of synthetic seeds (6)

Q4. Write notes on:

- (a) *In vitro* conservation strategies (6)
  - (b) Variation through Genetic transformation using *Agrobacterium*. (6)
- OR
- (b) Explain the Marker assisted selection and its advantages and limitations. (6)

Q5. (a) Types of bioreactors for *In vitro* production of plant 2<sup>o</sup> metabolites. (6)

- (b) Write notes on PCR technology (6)
- OR
- (b) Write notes on *In vitro* mutations and selection. (6)

Q6. (a) Explain hypersensitive Response (HR). Describe its significance in plant defense mechanism. (6)

- (b) Outline the basic principle of RFLP. What are the advantages and disadvantages? (6)
- OR
- (b) Write notes on patent for higher plant genes and DNA sequences (6)