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[A-92] No. of Printed Pages: 2

SARDAR PATEL UNIVERSITY
M.Sc. (III Semester- CBCS) Examination
Subject: MICROBIOLOGY
PS03EMIC01; Plant Biotechnology
Monday, April 27, 2015
Time: 2.30 p.m. to 5.30 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) Cellular differentiation and morphogenesis *in vitro* is primarily controlled by
(a) Auxins alone (b) cytokinins alone
(c) auxin-cytokinin ratio (d) growth hormone

ii) Conditions required for in vitro hardening of plantlets
(a) High humidity, low temperature and light
(b) Low temperature, high humidity and light
(c) Low light, humidity and temperature
(d) Low light, high humidity and temperature

iii) Young zygotic embryos require high concentration of sucrose whereas mature embryos require low concentration of sucrose in nutrient medium due to their:
(a) Heterotrophic in nature
(b) Autotrophic in nature
(c) Heterotrophic and autotrophic in nature
(d) Autotrophic and heterotrophic in nature

iv) Which substance is used to separate protoplasts during the isolation procedure?
(a) Glucose (b) Starch
(c) Mannitol (d) Sucrose

v) Crown galls are often seen on:
(a) Dicot plants (b) Monocot plants
(c) Gymnosperms (d) Both (a) & (b)

vi) One of the unique features of type IV restriction enzymes is
(a) They cut outside the recognition site (b) they are dimmers
(c) They have discontinuous recognition sites (d) none of the above

vii) In RAPD we detect only
(a) Dominant markers (b) Co-dominant markers
(c) Recessive markers (d) All these markers

viii) Molecules that induce the defense responses in plants are known as ____
(a) Elicitors (b) Inducers
(c) Enhancers (d) Stimulators

Contd. Page 2

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

(i) Distinguish between PEDCs and IEDCs
(ii) Distinguish between Zygotic embryo and somatic embryo
(iii) Clonal propagation
(iv) Cryopreservation
(v) Bioreactors
(vi) Non-compatible ligation
(vii) Type IV restriction endonucleases
(viii) GATT
(ix) Plant breeder's rights

Q3. (a) What are the different pathways of *in vitro* morphogenesis? Explain various factors that regulate the *in vitro* morphogenesis. (6)

(b) Write notes on synthetic seeds. (6)

OR

(b) Write notes on Haploids and their importance in agriculture (6)

Q4 (a) Describe the procedure for isolation of protoplasts and their fusion for generating the somatic hybrids. (6)

(b) Write notes on meristem tip cultures and their importance (6)

OR

(b) Explain various factors controlling the *in vitro* production of secondary metabolites. (6)

Q5 (a) Describe the methods for direct DNA delivery systems for genetic transformations. (6)

(b) Write notes on *Agrobacterium tumefaciens* and its role in production of transgenic plants. (6)

OR

(b) Outline the basic principle of AFLP. What are its advantages and disadvantages? (6)

Q6 (a) What are preformed defense mechanisms in plants? Explain structural and chemical barriers with examples. (6)

(b) What are QTLs? Explain how Marker Assisted Selection is used in QTL identification (6)

OR

(b) Write short note on Intellectual property rights (6)

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