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[29/44/A-14]

[ ] SARDAR PATEL UNIVERSITY
M.Sc. (II & III Semester- CBCS) Examination
Subject: Biochemistry/ Microbiology
PS02EBIC02/PS03EMIC01; Plant Biotechnology
Tuesday, April 18, 2017
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) The phenomena of callus formation and further formation of organized structures are called:
a) Differentiation and redifferentiation
b) Redifferentiation and dedifferentiation
c) Dedifferentiation and redifferentiation
d) Dedifferentiation and differentiation

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

iii) Among different culture systems used to generate in vitro plants _____culture system show the maximum frequency of somaclonal variation:
(a) Cell suspension cultures
(b) Protoplast cultures
(c) Anther cultures
(d) Meristem cultures

iv) Which type of cultures are used for production of homozygous plants in *in vitro.*
(a) Ovule cultures
(b) Anther cultures
(c) Both (a) & (b)
(d) Meristem cultures

v) The growth hormone responsible for apical dominance
(a) Ethylene
(b) cytokinin
(c) Gibberellin
(d) auxin

vi) The GFP reporter system is advantageous over other systems since
(a) it is a standalone system
(b) it is non toxic
(c) expressed in prokaryotic and eukaryotic cells
(d) all of these

vii) Induced resistance in plants against pathogens is a
(a) Energy requiring mechanism
(b) gene mediated response
(c) both (a) and (b)
(d) none of these

viii) Which of the following population is not suitable for mapping?
a) BC1
b) RILs
c) Doubled haploids
d) F1

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

a) Why sucrose requirement differ for globular stage and cotyledonary stage zygotic embryos?
(b) Show the theoretical products of protoplast fusion. Which of them are most commonly observed?
(c) Differentiate between organogenesis and embryogenesis.
(d) Give a brief note about Biotransformation.
(e) Explain in brief about Binary vectors.
(f) Why cultured anthers will permit pollen to develop into pollen embryos whereas cultured isolated pollen grains may not form embryos? Give reasons.
(g) What are the salient features of Systemic acquired resistance (SAR) ?
(h) Note on: Patenting.
(i) Role of Vir genes in Agrobacterium based transformation in plants.

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Q3. (a) Outline the methods for protoplast isolation and fusion. (6)

(b) Explain different stages of in vitro clonal propagation, its advantages and disadvantages. (6)

**OR**

(b) Describe in detail various pathways of in vitro morphogenesis. (6)

Q4 (a) Enlist the strategies used for production of disease free plants. Discuss any one in detail. (6)

(b) Explain the technique for the production of synthetic seeds. What are the merits and demerits of synthetic seeds?

**OR** (6)

(b) Define the term somaclonal variation. Write a note on somaclonal variation. (6)

Q5 (a) Provide a detailed description of Ti-plasmid mediated gene transfer in plants. (6)

(b) Describe various types of bioreactors used for in vitro production of secondary metabolites.

**OR** (6)

(b) Describe the direct DNA delivery systems for genetic transformation in plants. (6)

Q6 (a) Explain the role of Hyper sensitive response in plant defence mechanisms. (6)

(b) What are molecular markers? Explain principle, merits and demerits of RFLP and RAPD.

**OR** (6)

(b) Write a descriptive note on IPR.

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