

(185 & A-64)

No. of Printed Pages : 2

[] SARDAR PATEL UNIVERSITY
 M.Sc. (III Semester- CBCS) Examination
 Subject: MICROBIOLOGY
 PS03EMIC01; Plant Biotechnology
 Thursday, November 9, 2017
 Time: 2.00 p.m. to 5.00 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 chemicals ascorbic acid, citric acid or polyvinyl pyrrolidone are used either alone or in combination along with nutrient medium to reduce _____ from explants.
 (a) Phenolic substances (b) fungal and bacterial growth
 (c) secondary metabolites (d) callus formation
- ii) Which stage of the microspores is selected for anther cultures:
 (a) Microspore tetrad stage (b) Uninucleate microspore stage
 (c) Binucleate microspore stage (d) Microspore mother cell stage
- iii) _____ occur in plant cell, tissue and organ cultures due to chromosomal mosaicism of explants cells and/or high concentrations of growth hormones
 (a) Genetic variation (b) organelle variation
 (c) somaclonal variation (d) None of these
- iv) _____ are synthesized in plants, but not utilized by the plants for growth and development. However helps in plant protection and has economic value.
 (a) Secondary metabolites (b) Primary metabolites
 (c) Both (a) & (b) (d) Growth hormones
- v) In protoplast formation which of the following enzyme(s) involved
 (a) Cellulase (b) Hemicellulase
 (c) Pectinase (d) All of these
- vi) Phytoanticipins are those substances of plants, that are involved in
 (a) Preformed defense (b) Induced defense
 (c) Hypersensitive response (d) Systemic Acquired Resistance
- vii) Which of the following is not the organization of interlectual property rights
 (a) GATT (b) TRIPS
 (c) WTO (d) NATO
- viii) During Agrobacterium infection, the phenolic substance released by wounded plant cells are recognized by
 (a) Vir D2 and E2 (b) Vir D1 and D2
 (c) Vir A and G (d) Vir B only

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(P.T.O.)

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- Q2. Answer any SEVEN of the following in brief: (7x2=14)
- (a) Differentiate between somatic and zygotic embryo.
 - (b) Why *in vitro* developed plantlets need hardening before transfer to soil? Give reasons.
 - (c) Write the practical applications of zygotic embryo cultures
 - (d) Why meristem tips are preferred over mature explants for production of disease free plants?
 - (e) Bioreactor
 - (f) PR proteins
 - (g) Differentiate screening and selection
 - (h) Recombinant Inbred Lines
 - (j) TRIPS

- Q3. (a) Explain how totipotency can be demonstrated *in vitro*? Give the experimental evidences. (6)
- (b) Discuss the cellular competence in *in vitro* morphogenesis. Write in detail the different pathways of *In vitro* morphogenesis? (6)

OR

- (b) Write notes on anther cultures and their importance in plant breeding. (6)
- Q4 (a) Explain the methods for isolation of protoplasts from leaf explants and their uses. (6)
- (b) Define somaclonal variation. Write a brief account on Somaclonal variation and their applications. (6)

OR

- (b) Explain various factors controlling the *in vitro* production of secondary metabolites. (6)
- Q5 (a) Write a note on the steps involved in the transfer of T-DNA from *Agrobacterium* to the plant chromosome. (6)
- (b) Explain different strategies for *in vitro* germplasm conservation. (6)

OR

- (b) Explain the properties, advantages and limitations of microprojectiles used in Biolistics. (6)
- Q6 (a) Describe the types and the mechanism of action of R proteins in plant defense. (6)
- (b) What is Marker Assisted Selection? Outline the steps involved in MAS. (6)

OR

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

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