

D-6641

M.Sc. (IVth Semester) Examination, 2020

BOTANY

(In Vitro Technologies and Industrial Applications)

Time Allowed : Three Hours

Maximum Marks : 70

SECTION - A

Note : Attempt any ten questions. Each question carries one mark. **10×1=10**

Q. 1. Objective type :

Fill in the blanks :

- (1) The term "somaclonal variation" was coined by _____.
- (2) In cryopreservation technique tissues and cells are conserved in the presence of liquid _____.

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(2)

- (3) _____ is an excised piece of leaf or stem tissue used in micro propagation.
- (4) Protoplasts are produced from various cultures by enzymatic treatment with _____.
- (5) _____ method of plant propagation involves the use of girdling.

Multiple choice type :

- (6) Which of the following is NOT a plant growth regulator ?
 - (a) Auxin
 - (b) Cytokinin
 - (c) Abscisic acid
 - (d) Polyphenols
- (7) Which one of them is NOT the main effect of polyamines in the tissue culture system ?
 - (a) Promotion of tuber and bulb formation

(3)

- (b) Adventitious root formation
 - (c) Promotion of short formation
 - (d) Somatic embryogenesis
- (8) Mark the INCORRECT statement about agar, a gelling agent in plant tissue culture medium :
- (a) Not digested by plant enzymes
 - (b) It does not use in micropropagation work
 - (c) It does not react with media constituents
 - (d) Remain stable at incubation temperature
- (9) Out of the following which one is NOT the basic component of culture media used for plant cultivation ?
- (a) Complex mixture of salts
 - (b) Amino acids
 - (c) Serum albumin
 - (d) Sugar/Sucrose

(4)

- (10) Name the term given to the ability of single cells to divide and produce all the differentiated cell in the organism :
- (a) Unipotent
 - (b) Pluripotent
 - (c) Multipotent
 - (d) Totipotency
- (11) The growth of plant tissues in artificial media is called :
- (a) Gene expression
 - (b) Transgenesis
 - (c) Plant tissue culture
 - (d) Cell hybridization
- (12) Which of the following is the main effect of cytokines in the tissue culture system ?

(5)

- (a) Adventitious shoot formation
- (b) Induction of somatic embryos
- (c) Adventitious root formation
- (d) Shoot elongation

SECTION - B

Note : Attempt any five questions. Each question carries
2 marks. **5×2=10**

Q. 2. Very short answer type (25-30 words) :

Define the following terms :

- (1) Callus
- (2) Cryoprotectant
- (3) Mycorrhiza
- (4) Germplasm
- (5) Epigenetics
- (6) Secondary metabolite
- (7) Somaclones

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(6)

SECTION - C

Note : Attempt any five questions. Each question carries
4 marks. **5×4=20**

Q. 3. Short answer type (250 words) :

Write short notes on the following :

- (1) Meristem culture method
- (2) Germplasm conservation
- (3) Problems in plant tissue culture
- (4) Benefits and problems of bioreactor application
- (5) Recalcitrant seeds
- (6) Applications of tissue culture techniques
- (7) Embryo culture

SECTION - D

Note : Attempt any three questions. Each question
carries 10 marks. **10×3=30**

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(7)

Q. 4. Essay type (more than 500 words) :

(1) Comment on protoplast fusion. Add a note on current and future status of plant tissue culture. **6+4=10**

(2) Define the term organogenesis. Explain the process of organogenesis. Add a note on explant. **2+6+2=10**

(3) Provide a brief illustration about the problems in plant tissue culture application. Add a note on mycorrhizal association. **6+4=10**

(4) What is automation in plant tissue culture ? Mention the problems associated with automation process during plant tissue culture. **3+7=10**