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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 _____.

(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 in NOT a plant growth regulator ?

(a) Auxin

(b) Cytokinin

(c) Abcisic 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

(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

(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 ?

(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

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**

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 mychorrhizal 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**