BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – B.Sc.(Ag)-Hons-2022
Course Name – Micro Propagation Technologies
Course Code - EC-BAG571D (T)
(Semester V)

Full Marks : 50 **Time : 2:0 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 20=20

1. *Choose the correct alternative from the following :*

(i) Which is defined correctly-Ability of plant cell/tissue to transform into complete mature plant under favorable conditions is called.

a) Pluripotency b) Totipotency
c) Regeneration d) None of these

(ii) Who is the -Father of Plant Tissue Culture ?

a) Skoog b) Morgan, T.H
c) Gottlieb Haberlandt d) Toshio Murashige

(iii) Select the right option against the statement- The field where high value Pharmaceuticals under in vitro condition with higher rate can be synthesized.

a) Agriculture b) Pisiculture
c) Permaculture d) Tissue Culture

(iv) Label the specialized instrument which is used to culture any explant under completely aseptic condition in plant tissue culture.

a) Autoclave b) Laminar Air Flow
c) PCR d) Hot Air Oven

(v) Identify the mineral nutrient that plays a vital role in growth and differentiation of cultured tissues.

a) N b) P
c) K d) All

(vi) Relate which option is perfectly appropritae for the following statement -The development of shoot primordia from regenerated callus in PTC.

a) Caulogenesis b) Rhizogenesis

c) Callusogenesis d) Organogenesis

(vii) What does PTC stand for in plant biotechnology?

a) Plant Tissue Culture b) Plant Toxin Culture
c) Plant Totipotent Cells d) Plant Transport Cell

(viii) Define: What is the correct term for developing adventitious roots?

a) Organogenesis b) Rhizogenesis
c) Somatic embryogenesis d) Caulogenesis

(ix) Which growth regulator is used to enhance axillary branching?

a) Auxin b) Gibberellin
c) Cytokinin d) Ethylene

(x) What is the term for virus eradication using meristem culture?

a) Cryotherapy b) Meristemming
c) Callusing d) Organogenesis

(xi) Explain: How are meristem tips sterilized for culture?

a) With ethanol b) With NaOCl
c) With water d) With nitrogen

(xii) What is the advantage of somatic embryogenesis?

a) Production of sterile plants b) Improved pollination
c) Generation of true-to-type plants d) Seed dormancy breaking

(xiii) Which explant is commonly used in somatic embryogenesis?

a) Root tips b) Leaf mesophyll
c) Flower bud d) Stem section

(xiv) What is the importance of Micropropagation?

a) Increased seed production b) Production of disease-free plants
c) Faster pollination d) Improved fruit quality

(xv) Which stage involves transplanting plantlets to the field?

a) Stage 4 b) Stage 3
c) Stage 2 d) Stage 1

(xvi) What stage of pollen grains is preferred for pollen culture?

a) Binucleated stage b) Uninucleated stage
c) Trinucleated stage d) Tetranucleated stage

(xvii) When does the induction of microspore androgenesis typically increase in anther culture?

a) High-temperature treatment b) Low-temperature treatment
c) Darkness d) High humidity

(xviii) Which tissue culture technique is widely used to eradicate pathogens from plants?

a) Protoplast culture b) Somaclonal variation
c) Meristem culture d) Synthetic seed culture

(xix) Which plant species is commonly propagated using tissue culture techniques?

a) Banana b) Maize
c) Tomato d) Wheat

(xx) When the cryopreservation of plant tissues is most successful?

a) No protectant b) A single cryoprotectant
c) A combination of cryoprotectants d) Natural enzymes

Group-B

(Short Answer Type Questions) 2.5 x 10=25

2. Classify the different types of plant tissue culture techniques. (2.5)
3. Tell the importance of sterilization in plant tissue culture. (2.5)
4. Which medium is most commonly used for plant tissue culture? (2.5)
5. Classify the materials required for plant tissue culture. (2.5)
6. Distinguish between direct and indirect organogenesis. (2.5)
7. Justify the use of micropropagation for slow-to-propagate plants. (2.5)
8. Classify the two types of Somatic Embryogenesis. (2.5)
9. When was the first haploid plantlet obtained through anther culture? (2.5)
10. Determine the role of cryoprotectants in the freezing process. (2.5)
11. Design a protocol for surface sterilization of explants in tissue culture. (2.5)

OR

Design a tissue culture protocol for producing synthetic seeds. (2.5)

Group-C

(Long Answer Type Questions) 5 x 1=5

12. Distinguish between shoot tip culture and meristem culture and justify their use in virus eradication. (5)

OR

Distinguish between somaclonal variation and gametoclonal variation in plant tissue culture. (5)

****