

KHAIRA COLLEGE KHAIRA, BALASORE

BOTANY QUESTION BANK

6TH SEMESTER

CORE COURSE :14 PLANT BIOTECHNOLOGY

1. Who is known as the Father of tissue culture?

- (a) Bonner
- (b) Laibach
- (c) Haberlandt
- (d) Gautheret

2. The production of secondary metabolites requires the use of _____.

- (a) Meristem
- (b) Protoplast
- (c) Axillary buds
- (d) Cell suspension

3. The pair of hormones required for a callus to differentiate are _____.

- (a) Ethylene and Auxin
- (b) Auxin and cytokinin
- (c) Auxin and Abscisic acid
- (d) Cytokinin and gibberellin

4. What is Dimethyl sulfoxide used for?

- (a) A gelling agent

- (b) Cryoprotectant
- (c) Chelating agent
- (d) An Alkylating agent

5. The formation of embryoids from the pollen grains in the tissue culture medium is due to _____.

- (a) Organogenesis
- (b) Test tube culture
- (c) Double fertilization
- (d) Cellular totipotency

6. Synthetic seeds are produced by the encapsulation of somatic embryos with _____.

- (a) Sodium acetate
- (b) Sodium nitrate
- (c) Sodium chloride
- (d) Sodium alginate

Sol: (d) Sodium alginate.

7. Totipotency refers to _____.

- (a) Development of fruits from flowers in a culture
- (b) Development of an organ from a cell in a culture medium
- (c) Flowering in a culture medium
- (d) All of the above

Sol: (b) Development of an organ from a cell in a culture medium.

8. Which of the following is the main application of embryo culture?

- (a) Clonal propagation
- (b) Production of embryoids
- (c) Induction of somaclonal variations
- (d) Overcoming hybridisation barriers

9. In tissue culture of parenchyma, mitosis is accelerated in the presence of _____.

- (a) Auxin
- (b) Cytokinin
- (c) Gibberellin
- (d) Both auxin and cytokinin

10. In which of the following conditions do the somaclonal variations appear?

- (a) Plants raised in tissue culture
- (b) Plants exposed to gamma rays
- (c) Plants growing in polluted soil or water
- (d) Plants transferred by a recombinant DNA technology.

11. Haploid plants can be obtained from_____.

- (a) Anther culture
- (b) Bud culture
- (c) Leaf culture
- (d) Root culture

12. In-plant tissue culture, the callus tissues are generated into a complete plantlet by altering the concentration_____.

- (a) Sugars

- (b) Hormones
- (c) Amino Acids
- (d) Vitamins and minerals

13. Which of the following is cultured to obtain haploid plants?

- (a) Embryo
- (b) Nucleus
- (c) Apical bud
- (d) Entire anther

14. Which of the following vectors is used in crop improvement and crop management?

- (a) Agrobacterium
- (b) Plasmid
- (c) Cosmid
- (d) Phasmid

Sol: (a) Agrobacterium.

15. Which of the following growth hormones produces apical dominance?

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

16. Cybrids are produced by

- (a) The nucleus of one species but cytoplasm from both the parent species

- (b) The fusion of two same nuclei from the same species
- (c) The fusion of two different nuclei from different species
- (d) None of the above

17. Which of the following mediums is composed of chemically defined compounds?

- (a) Natural media
- (b) Artificial media
- (c) Synthetic media
- (d) None of the above

Sol: (c) Synthetic media.

18. Which of the following chemicals are most widely used for protoplast fusion?

- (a) Mannitol
- (b) Polyethylene glycol
- (c) Sorbitol
- (d) Mannol

19. Which of the following plant cells shows totipotency?

- (a) Cork cells
- (b) Meristem
- (c) Sieve tube
- (d) Xylem vessels

20. What is Callus?

- (a) Tissues that grow to form an embryoid

(b) An unorganised actively dividing the mass of cells maintained in a culture

(c) An insoluble carbohydrate

(d) A tissue that grows from an embryo

A) Short Notes

a) Restriction Endonuclease

b) Cloning Vectors

c) Recombinant DNA

d) Polymerase Chain Reaction

e) Gene cloning.

f) Electroporation

g) Microinjection

h) Microprojectile bombardment

i) Transgenic Plants

j) Bt- Cotton Transgenic Plant

K) Flavr savr Tomato Transgenic Plant

l) Golden Rice Transgenic Plant

m) Roundup Ready Soybean Transgenic Plant.

n) Bacterial Transformation

o) Totipotency

p) Protoplast culture

q) Organogenesis

r) Somatic Embryogenesis

s) Zygotic Embryogenesis

t) Application of Tissue Culture

u) pUC 18 and 19

v) Ti plasmid

w) Androgenesis

x) Virus elimination

y) Bacterial Artificial Chromosome (BAC)

z) Direct Gene transfer Method

B) Long Answer

1) Describe the process of Plant Tissue Culture in details.

2) What is Recombinant DNA Technology?

3) Write the various steps in Micropropagation.

4) Why Agrobacterium is called a "Natural Vector"?

5) Explain the steps of Agrobacterium mediated gene transfer.

6) How biotechnology can be applied to improve plants such as in making of pest resistant, insect resistant etc?

7) How biotechnology can be applied to improve the food value or quality of the plants? Give two examples.

8) What are transgenic plants? Explain with examples.

9) What is Totipotency? How these properties of plants help in plant tissue culture?

10) Give a detail idea about nutrient and hormone requirements in plant tissue culture. Discuss the role of vitamins and hormones.