

TELANGANA UNIVERSITY
S.S.R. DEGREE COLLEGE, NIZAMABAD (C.C:5029)
VI SEMESTER INTERNAL ASSESSMENT I EXAMINATIONS
BOTANY (PLANT TISSUE CULTURE AND PLANT BIOTECHNOLOGY)
QUESTION BANK

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

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

Sol: (c) Haberlandt.

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

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

Sol:(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

Sol: (b) Auxin and cytokinin.

4. What is Dimethyl sulfoxide used for?

- (a) A gelling agent
- (b) Cryoprotectant
- (c) Chelating agent
- (d) An Alkylating agent

Sol: (b) Cryoprotectant.

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

Sol: (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

Sol: (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

Sol: (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.

Sol: (a) Plants raised in tissue culture.

11. Haploid plants can be obtained from _____.

(a) Anther culture

(b) Bud culture

(c) Leaf culture

(d) Root culture

Sol: (a) Anther 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

Sol: (b) Hormones.

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

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

Sol: (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

Sol: (c) Auxin.

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

Sol: (a) Nucleus of one species but cytoplasm from both the parent species.

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

Sol: (b) Polyethylene glycol.

19. Which of the following plant cells shows totipotency?

(a) Cork cells

(b) Meristem

(c) Sieve tube

(d) Xylem vessels

Sol: (b) Meristem.

20. What is Callus?

(a) Tissues that grow to form an embryoid

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

(c) An insoluble carbohydrate

(d) A tissue that grows from an embryo

Sol: (b) An unorganised actively dividing mass of cells maintained in culture.

21. Micro propagation involves

(a) small explants used for vegetative multiplication of plants

(b) microbes used for vegetative multiplication of plants

(c) microspores used for vegetative multiplication of plants

(d) megaspores and microspores used for non-vegetative multiplication of plants

Answer: (a)

22. Pick the incorrect statement – Agar is a gelling agent in plant tissue culture medium

(a) it is not digested by the enzymes of plants

(b) it is not used in micropropagation work

(c) does not react with media constituents

(d) remains stable at incubation temperature

Answer: (b)

23. Solidifying agent that is used in plant tissue culture is

(a) Agar

- (b) EDTA
- (c) Cobaltous chloride
- (d) Nicotinic acid

Answer: (a)

24. Benefit of clonal propagation or micropropagation is

- (a) multiplication of sexually derived sterile hybrids
- (b) multiplication of disease free plants
- (c) rapid multiplication of superior clones
- (d) all of these

Answer: (d)

25. Protoplasts can be synthesized from suspension cultures, intact tissues or callus tissues by the enzymatic treatment with

- (a) proteolytic enzymes
- (b) both pectolytic and cellulolytic enzymes
- (c) pectolytic enzymes
- (d) cellulolytic enzyme

Answer: (b)

26. Synthetic seeds are

- (a) artificially synthesized seeds
- (b) somatic embryos encapsulated in suitable matrix
- (c) seeds of plants modified genetically
- (d) none of these

27. Somatic embryoids are

- (a) identical with zygotic embryos and without seed coats
- (b) identical with zygotic embryos and with seed coats
- (c) non-identical with zygotic embryos and without seed coats
- (d) non-identical with zygotic embryos and with seed coats

28. The production of high quality and uniform embryos has been limited to only

- (a) carrot
- (b) alfalfa
- (c) both (a) and (b)
- (d) sandalwood

29. The preserved embryoids are termed as

- (a) synthetic seeds
- (b) semi-synthetic seeds
- (c) natural seeds
- (d) fermented seeds

30. Encapsulation is necessary to produce and protect synthetic seeds. The encapsulation is carried out by various types of hydrogels, which are

- (a) soluble in water
- (b) soluble in organic solvents
- (c) insoluble in water
- (d) insoluble in organic solvents

31. _____ types of cells are required to facilitate cell division

- a) Meristematic cells
- b) Palisade cells
- c) Parenchymatous cells
- d) Chollenchymatous cells

32. _____ is the requirements of callus culture

- a) Explants
- b) Culture media
- c) Only A
- d) A & B

33. Auxins are required for _____

- a) Callus culture
- b) Suspension culture
- c) Both
- d) None

34. The following are the methods for assessment for growth of cells EXCEPT:

- a) Cell counting
- b) Packed cell volume
- c) Cell fresh weight
- d) PCR

35. _____ is the method for assessment of viability of cells

- a) Cell counter method
- b) Packed cell volume
- C) Phase contrast microscopy
- d) Cell fresh weight

36. _____ is the method to differentiate viable and non-viable cells

- a) FDA method
- b) Evan's blue stain
- c) Both
- d) None

37. Centrifugation is done for _____ method to measure growth of cells

- a) Packed cell volume
- b) Cell weight

- c) Only A
- d) None

38. Cell size expansion is maximum in _____ phase of batch culture

- a) Lag phase
- b) Log phase
- c) Linear Phase
- d) Stationary phase

39. In batch culture cell division and cell growth depends on _____

- a) High O₂
- b) Low oxygen
- c) Nutrients
- d) None

40. Genetic Mutation is one of the limiting factor in _____

- a) Protoplast culture
- b) Cell culture
- c) Callus culture
- d) All

short answers

1. What is plant tissue culture?
2. What is Dedifferentiation?
3. What is micro propagation?
4. What are suspension cultures?
5. What is protoplast culture?
6. What are the explants?
7. Organogenesis mean?
8. Synthetic seeds mean?
9. Cryopreservation?
10. What is the Cybrids?