

PLANT BIOTECHNOLOGY

III YR SEMESTER V

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