SET A

B.Sc. BIOTECHNOLOGY
FIFTH SEMESTER [SPECIAL REPEAT]
PLANT BIOTECHNOLOGY
BBT-503

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs. **Full Marks: 70**

Objective

Time: 30 mins. **Marks: 20**

Choose the correct answer from the following: ***1×20=20***

1. Endomitosis refers to:
   a. Doubling of chromosome with division
   b. Doubling of chromosome without division
   c. Both a & b
   d. All of these

2. Which temperature is adequate for callus formation?
   a. 22-28^{0}C
   b. 23-28^{0}C
   c. 26-28^{0}C
   d. All of these

3. B5 medium is developed by:
   a. Gamborg
   b. Chu
   c. Gottlieb Haberlandt
   d. Murashige and Skoog

4. What is role of Auxin?
   a. Root development
   b. Cell Division
   c. Callus induction
   d. All of these

5. The optimal pH of Plant Tissue Culture is:
   a. 5-6
   b. 5.5-5.8
   c. 6
   d. All of these

6. Which is important to enhance the callus growth and induces dwarf plantlets to elongate?
   a. Auxins
   b. Gibberellins
   c. Abscisic acid
   d. All of these

7. Gynogenic haploids are developed from:
   a. Ovary culture
   b. Anther culture
   c. Leaf culture
   d. All of these

8. The first successful regeneration of protoplast was achieved by:
   a. Tekebe
   b. Dekebe
   c. Rakabe
   d. None of these

9. Which of the following is responsible for hairy root disease?
   a. *A. rhizogenes*
   b. *R. rhizogenes*
   c. Both a & b
   d. None of these

10. Which vegetables are regenerated from protoplast?
    a. *Capsicum annuum*
    b. *Brassica oleracea*
    c. *Cucumis sativus*
    d. All of these

11. Which gene has **NO** essential functions in CaMV?
    a. II
    b. VI
    c. VIII
    d. All of these

12. Commercially produced particle bombardment apparatus is:
    a. PDS-1000/HC
    b. PDS-1000/CH
    c. DDS-1000/HC
    d. All of these

13. Which stain binds to the newly formed cell walls?
    a. Calcofluor white
    b. Evans blue dye
    c. Fluorescein diacetate
    d. None of these

14. In-plant tissue culture, the callus tissues are generated into a complete plantlet by altering the concentration.....
    a. Hormones
    b. Amino acids
    c. Sugars
    d. All of these

15. Biolistic method of gene transfer is invented by:
    a. Stanford
    b. Standford
    c. Sanford
    d. Senford

16. Which enzymes are used for protoplast isolation
    a. Pectinase
    b. Cellulase
    c. Hemicellulase
    d. All of these

17. The pair of hormones required for a callus to differentiate are.....
    a. Auxin and Cytokinin
    b. Ethylene and Auxin
    c. Auxin and Abscisic acid
    d. None of these

18. The production of secondary metabolites requires the use of.....
    a. Cell suspension
    b. Axillary buds
    c. Protoplast
    d. All of these

19. Polyethylene Glycol-mediated transformation needs:
    a. PEG, mannitol & calcium nitrate solution
    b. PEG, glucose & calcium nitrate solution
    c. PEG, sorbitol & calcium nitrate solution
    d. None of these

20. Which is the most used non-ionic osmoticum?
    a. Sorbitol
    b. Mannitol
    c. Glucose
    d. None of these

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Descriptive

Time : 2 hr. 30 mins. **Marks : 50**

[Answer question no.1 & any four (4) from the rest]

1. Give details on the cell culture of plants. 10

2. Write short notes on: 5+5=10
   a) Basic techniques of plant tissue culture.
   b) Organic supplements and growth regulators.

3. Explain the objectives behind haploid plant production. What are the methods for increasing the chromosome number? Explain the methods. What will be the outcome of such procedures? Write in your own words. What is the advantage of pollen culture over anther culture? Define gynogenesis. 2+4+1+2+1=10

4. According to you, which method is more effective in delivering DNA ago plant cells – vectors mediated or vector less? Justify your answer. Is there any future of transgenic crops? Explain in your own words citing different examples. What is transgene, phenomenon of Transgenesis and lipofection? 3+4+3=10

5. Write short notes on: 5+5=10
   a) Technique of Micropropagation
   b) Culture of protoplast

6. What is somatic hybridization? Discuss on the details process and mechanism for successful development of somatic hybrid plants. 10

7. Is there any difference between micropropagation and production of haploids? Justify your answer. If you are asked to go for germplasm storage of pure lines, what method will you choose to produce a pure line? Explain the method which gives better results. How will you define haploid plants in your own words? What is the method used to check the stages of germ cells before production of haploid plants? Explain the methods. 2+4+1+3=10

8. Write short notes on: (*any two*) 5+5=10
   a) Biolistic method
   b) PEG method of gene delivery
   c) Electroporation of gene delivery

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