

**B.Sc. BIOTECHNOLOGY**  
**FOURTH SEMESTER (REPEAT)**  
**PLANT BIOTECHNOLOGY**  
**BBT-402**

(Use separate answer scripts for Objective & Descriptive)

Duration: 3 hrs.

Full Marks: 70

**[ PART-A : Objective ]**

Time: 20 min.

Marks: 20

*Choose the correct answer from the following:*

**1X20=20**

1. Which is the most preferred carbon source in plant tissue culture media?
  - a. Glucose
  - b. Sucrose
  - c. Fructose
  - d. Galactose
2. Which plant media is the most widely used?
  - a. Nitch
  - b. Gamborg
  - c. White
  - d. Murashige and Skoogs
3. Cytokinin, a plant hormone is used for
  - a. Fruit ripening
  - b. Flower opening
  - c. Root growth
  - d. Shoot elongation
4. Which among the following is a cytokinin?
  - a. Zeatin
  - b. Abscisic acid
  - c. Indole acetic acid
  - d. Indole butyric acid
5. Proplasts are cells without
  - a. Plasma membrane
  - b. Cell wall
  - c. Nucleus
  - d. Cytoplasm
6. Cybrids are also known as
  - a. Somatic hybrids
  - b. Cytoplasmic hybrids
  - c. Haploids
  - d. Diploids
7. IAA is a
  - a. Auxin
  - b. Gibberelin
  - c. Ethylene
  - d. Cytokinin
8. *Agrobacterium tumefaciens* causes
  - a. Crown gall disease
  - b. Brown gall disease
  - c. Rot disease
  - d. Wilting
9. *Agrobacterium tumefaciens* uses agropine as a
  - a. Carbon
  - b. Energy
  - c. Nitrogen
  - d. Oxygen
10. Which among the following is a direct method of gene transfer?
  - a. Electrophoresis
  - b. Electroporation
  - c. Sonication
  - d. Heat Transfer

11. T<sub>R</sub> region of Ti plasmid does not contain
  - a. Oncogene
  - b. Protein
  - c. RNA
  - d. DNA
12. Which among the following is a transgenic plant?
  - a. Bt cotton
  - b. Bt mango
  - c. Ct cotton
  - d. Ct turmeric
13. The enzyme responsible for cell wall degradation is
  - a. Cellulase
  - b. Pectinase
  - c. Lipase
  - d. Amylase
14. Variation occurring due to culture of cells in tissue culture is known as
  - a. Somaclonal Hybridization
  - b. Somaclonal Variation
  - c. Somatic Hybridization
  - d. Somatic Variation
15. The process of regeneration of embryos from somatic cells is known as
  - a. Somatic embryogenesis
  - b. Somatic variation
  - c. Organogenesis
  - d. Cytoplasmic embryogenesis
16. Clonal propagation *in vitro* is known as
  - a. Callus culture
  - b. Micropropagation
  - c. Suspension culture
  - d. Organogenesis
17. *Agrobacterium tumefaciens* is a
  - a. Gram positive bacteria
  - b. Gram negative bacteria
  - c. Fungi
  - d. Virus
18. The *vir* region and ORI is present in
  - a. Ri plasmid
  - b. YAC vector
  - c. BAC vector
  - d. Ti plasmid
19. Androgenic method of haploid production involves which gametophyte
  - a. Male gametophyte of gymnosperm
  - b. Female gametophyte gymnosperm
  - c. Male gametophyte of angiosperm
  - d. Female gametophyte of angiosperm
20. First report on plant regeneration through protoplast was from
  - a. *Magnifera indica*
  - b. *Nicotiana tabacum*
  - c. *Messua ferrea*
  - d. *Camellia sinensis*

**PART-B : Descriptive**

Time: 2 hrs. 40 min.

Marks: 50

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

1. Briefly elaborate what you understand by a transgenic plant. Describe the method of *Agrobacterium* mediated gene transfer? 3+7=10
2. Describe the various components of the T-DNA. State and explain some direct methods of gene transfer? 5+5=10
3. What is somatic hybridization and somaclonal variation? State the advantages and disadvantages of both. 4+6=10
4. What are protoplasts cells? How are protoplasts isolated? Explain with a diagram how protoplast fusion can be achieved. 2+3+5=10
5. What is haploid culture? Describe how haploid production is carried out. State the advantages of haploid culture. 2+4+4=10
6. Define the types of aseptic culture of plants. Discuss the importance of tissue and cell culture. 4+6=10
7. What are the different categories of embryo culture? Mention their objectives. Discuss the importance of embryo culture in horticulture and agriculture? 5+5=10
8. What is shoot tip culture? What are the differences between the shoot tip and meristem culture? Describe the method of culturing shoot tips of plants and its uses in different fields of plant science. 2+3+5=10

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