

M.Sc. BOTANY
THIRD SEMESTER
BIOPHYSICAL INSTRUMENTATIONS, BIOTECHNOLOGY &
DEVELOPMENTAL BOTANY
MSB-302

(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:

1×20=20

1. In which type of chromatography, the stationary phase held in a narrow tube and the mobile phase is forced through it under pressure?
 - a. Column chromatography
 - b. Liquid chromatography
 - c. Planar chromatography
 - d. Gas chromatography
2. Differential centrifugation relies on the differences in..... of biological particles of different.....
 - a. Size, density
 - b. Size, structure
 - c. Sedimentation rate, sizes and density
 - d. Mass, size
3. Which of the following is immobilized on the micro titer well in sandwich ELISA?
 - a. Detection antibody
 - b. Sample
 - c. Capture antibody
 - d. Secondary antibody conjugated to an enzyme
4. Which of the following statements is true about migration of biomolecules?
 - a. The rate of migration is directly proportional to the resistance of medium.
 - b. Rate of migration is directly proportional to current.
 - c. Low voltage is used for separation of high mass molecules.
 - d. Rate of migration is inversely proportional to current.
5. Which of the following factors does not influence electrophoretic mobility?
 - a. Molecular weight
 - b. Size of molecule
 - c. Shape of molecule
 - d. Stereochemistry of molecule
6. Introduction of Recombinant DNA into bacterial cell by current shock is called?
 - a. Transformation
 - b. Electroporation
 - c. Conjugation
 - d. Transduction
7. A vector should have which of the following properties?
 - a. MCS
 - b. Small Size
 - c. Multiple Ori
 - d. Single Ori
 - a. a, b, c
 - b. a, b, d
 - c. a, b, c, d
 - d. a, b, d
8. A labelled DNA or RNA segment which is used to find a specific sequence of nucleotides in a DNA molecule is named as:
 - a. Vector
 - b. BAC
 - c. YAC
 - d. Probe
9. Klenow fragment is derived from:
 - a. DNA Polymerase - I
 - b. DNA Polymerase - II
 - c. DNA Ligase
 - d. Reverse Transcriptase

10. Which of the following statements are true for *Agrobacterium* mediated gene transfer?
 a. Vir genes are essential for gene transfer.
 b. T-DNA borders are essential for gene transfer.
 c. Both a and b.
 d. None of these.
11. Suitable temperature for protoplast culture is?
 a. 24-28 °C
 b. 15-28 °C
 c. 20-28 °C
 d. 24-35 °C
12. Which plant hormone is not derived from terpenoid pathway?
 a. Gibberellic acid
 b. ABA
 c. Cytokinin
 d. Auxin
13. The cells or plants containing nucleus of one species but cytoplasm from both the parental species:
 a. Symmetric hybrid
 b. Cybrid
 c. Asymmetric hybrid
 d. Hybrid
14. Somaclonal variation are the one:
 a. Caused by mutagen
 b. Produced during tissue culture
 c. Caused by gamma ray
 d. Induced during embryogeny
15. DMSO is used as:
 a. Gelling agent
 b. Chelating agent
 c. Cryoprotectant
 d. Both a and b
16. Which of the following chemical enhances *vir* gene expression?
 a. Cyanidin
 b. Glutennin
 c. Acetosyringone
 d. Dextran
17. Entry of pollen tube through micropyle is:
 a. Chalazogamy
 b. Mesogamy
 c. Porogamy
 d. Pseudogamy
18. Expression vectors differ from a cloning vector in having:
 a. An origin of replication
 b. Suitable marker gene
 c. Control elements
 d. Unique restriction sites
19. Pollenkit is present in the pollen wall of:
 a. Anemophilous flowers
 b. Zoophilous flowers
 c. Entomophilous flowers
 d. Malacophilous flowers
20. Which of the following enzyme is essential for PCR reaction?
 a. Taq polymerase
 b. Ligase
 c. Only a
 d. Both a and b

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(PART-B : Descriptive)

Time : 2 hrs. 40 min.

Marks : 50

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

1. What is somatic hybridization? Describe the technique of somatic hybridization. 1+9=10
2. What is the principle of electrophoresis? Discuss the method of separation of proteins by SDS PAGE. 2+8=10
3. What is centrifugation? What is the role of centrifugation in biological sciences? Discuss the instrumentation of Analytical ultracentrifuge. 1+2+7=10
4. What are Restriction Enzymes? Give an account of the different types of Vectors used in Genetic Engineering. 2+8=10
5. Write notes on: 5+5=10
 a. Ti Plasmid
 b. cDNA Library
6. What is anther culture? Describe the different pathways of anther culture. 1+9=10
7. What is blotting technique? Explain in detail about the western blotting technique with diagram. 2+8=10
8. Write notes on: 5+5=10
 a. Polyembryony.
 b. *Agrobacterium* mediated gene transfer.

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