

M.Sc. BOTANY
THIRD SEMESTER (SPECIAL REPEAT)
BIOPHYSICAL INSTRUMENTATION, PLANT TISSUE CULTURE, PALYNOLOGY &
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:

1X20=20

1. The separation technique of charged molecules under the influence of electric current is called:
 - a. Colony hybridization
 - b. Dot blot techniques
 - c. Electrophoresis
 - d. Western blotting
2. Which of the following is not an application of high performance liquid chromatography?
 - a. Analysis of proteins, drugs and explosives
 - b. Separation of pharmaceutical drugs
 - c. Elimination of undesirable substances from blood
 - d. Separation of lipids, fatty acids and steroids
3. Which of the following statements about lattices and unit cells is correct?
 - a. Lattice points are chosen to lie on atoms
 - b. Lattice points all have identical surroundings
 - c. Lattices can be primitive or centred
 - d. Different possible unit cell shapes define the seven crystal systems
4. What is meant by the 'phase problem' in X-ray crystallography?
 - a. The sample must be in the crystalline solid phase
 - b. The phase of an X-ray wave changes when it is scattered by an atom.
 - c. The relative phases of diffracted X-ray beams are lost when the diffraction pattern is recorded
 - d. Non-centrosymmetric crystal structures always give centrosymmetric diffraction patterns
5. Which chemical is use for protoplast fusion?
 - a. Polyphenyl glycerol
 - b. Polyacetylene glycol
 - c. Polyethylene glycol
 - d. None of the above
6. Which of the following is indispensable for plant tissue culture?
 - a. Gibberellin
 - b. Cytokinin
 - c. Ethylene
 - d. Auxin
7. The material or component of which of the following plant is widely used in the preparation of culture medium?
 - a. Pinus longifolia
 - b. Cocos nucifera
 - c. Borassus flabellifer
 - d. Cycas revoluta
8. The enzyme functions as genetic glue in joining the pieces of DNA together is:
 - a. Restriction endonuclease
 - b. Reverse transcriptase
 - c. DNA ligase
 - d. Amylase

9. PCR technique is applied in:
- | | |
|------------------|--------------------------|
| a. DNA profiling | b. DNA transcription |
| c. Translation | d. DNA-RNA hybridization |
10. For pollen study, pollen preparation is made by the process:
- | | |
|-----------------|---------------|
| a. Plasmolysis | b. Acetolysis |
| c. Antherolysis | d. Haemolysis |
11. When the funicle, chalaza and micropyle lie in one and the same vertical line in the ovule, the ovule is known as:
- | | |
|----------------|------------------|
| a. Anatropus | b. Orthotropus |
| c. Amphitropus | d. Campylotropus |
12. In indirect somatic embryogenesis, embryos are formed due to:
- | | |
|---|---|
| a. Induced embryogenic determined cells (IEDCs) | b. Pre-embryogenic determined cells (PEDCs) |
| c. Post embryonic determine cells | d. None of the above |
13. Restriction endonuclease breaks:
- | | |
|------------------------|------------------------|
| a. Single stranded DNA | b. Double stranded DNA |
| c. Both a and b | d. None |
14. Endosperm is:
- | | |
|-------|-------|
| a. 3n | b. 2n |
| c. n | d. 4n |
15. What is the approximate size of fragment given off by EcoRI?
- | | |
|---------|---------|
| a. 1 kb | b. 2 kb |
| c. 3 kb | d. 4 kb |
16. Which DNA is restricted in making Genomic Library?
- | | |
|------------|------------|
| a. Genomic | b. Plasmid |
| c. Phages | d. Plant |
17. Genomic library construction is concerned with.....
- | | |
|-------------------|-----------------------|
| a. Gene isolation | b. Protein production |
| c. Antibiotics | d. Regeneration |
18. Western blotting is the technique for the detection of:
- | | |
|---------------------------------|------------------------------------|
| a. Specific DNA in a sample | b. Specific RNA in a sample |
| c. Specific Protein in a sample | d. Specific glycolipid in a sample |
19. Preserving germplasm in frozen state:
- | | |
|-------------------------|------------------|
| a. Cryopreservation | b. Cold storage |
| c. In situ preservation | d. Vernalization |
20. Embryo sac is a:
- | | |
|---------------------|--------------------|
| a. Microgametophyte | b. Megagametophyte |
| c. Microsporangium | d. Megasporangium |

(PART-B : Descriptive)

Time : 2 hrs. 40 min.

Marks : 50

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

1. What are somatic hybrids and its importance? Describe the methods of its production. 4+6=10
2. What is the principle of electrophoresis? Discuss the method of separation of proteins by SDS PAGE. 2+8=10
3. Write short notes on: 5+5=10
 - a. X-Ray crystallography
 - b. Analytical Ultracentrifuge
4. What is plant tissue culture and its importance? Discuss the various steps involved in plant tissue culture. 4+6=10
5. What is restriction endonuclease? Discuss the various types of restriction endonuclease. 2+8=10
6. Discuss the various type of blotting techniques. What are the various methods of gene transfer? 5+5=10
7. What is an endosperm? Discuss the various types of endosperm with suitable diagram. 2+8=10
8. Write short notes: (*any two*) 5+5=10
 - a) Binary and shuttle vector
 - b) DNA modifying enzymes
 - c) Ligase
 - d) cDNA libraries

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