

**Exam. Code : 210004**

**Subject Code: 5466**

**M.Sc. Botany 4th Semester**

**ANALYTICAL TECHNIQUES**

**Paper—BOTC-624**

Time Allowed—3 Hours]

[Maximum Marks—50

**Note :— Attempt ALL sections :**

- (1) **Section—A :** Attempt all parts. Answer to any part should not exceed 4 lines.  $8 \times 1 = 8$
- (2) **Section—B :** Attempt any SEVEN questions. Answer to any question should not exceed 2 pages.  $7 \times 3 = 21$
- (3) **Section—C :** Attempt any THREE questions. Answer to any question should not exceed 4 pages.  $3 \times 7 = 21$

Support your answer with neat and labelled diagram wherever necessary.

**SECTION—A**

1. (a) What is electro-phoresis and what is it used for ?
- (b) What is a cot curve ?
- (c) Briefly discuss the use of cytophotometry.

- (d) Write the principle of nucleic acid hybridization.
- (e) What is Northern blotting ?
- (f) What is meant by 'Resolution of a microscope' ?  
Cite a simple way to improve it.
- (g) Give one similarity and one difference between the working of scanning and transmission electron microscopes.
- (h) Explain ion-exchange chromatography.

### SECTION—B

2. Give a concise account of the applications of a flow cytometer.
3. What is polymerase chain reaction ? Enlist its various types briefly giving the importance of each.
4. What do you understand by spectroscopy ? Briefly describe the potential of plasma emission spectroscopy.
5. Write a short note on fixation and staining procedures.
6. What is density gradient ultracentrifugation ? Write its importance.
7. Describe the working and uses of phase contrast microscope.
8. What is electrofocussing ? How does it differ from electrophoresis ?

9. Write the principles of ESR spectroscopy.
10. What can you infer from a biopolymeric structure ?
11. Discuss briefly the principles of nucleic acid hybridization.

**SECTION—C**

12. Write a detailed account on the working and applications of TEM.
13. Enlist various methods used for analyzing biopolymeric structures. Discuss the principles of biophysical ones.
14. Bring out a detailed comparison between the principles and uses of TLC and HPLC.
15. Describe the principles and applicability of NMR spectroscopy in medicine.
16. Differentiate between Southern, Northern and Western blotting techniques. What are these important for and why ?