

2 ½ Hours

Total Marks: 75

1. Attempt **all** questions.
2. **All** questions carry **equal** marks.
3. Draw **neat labelled diagrams** wherever necessary.
4. Use of **log tables** and **non-programmable calculator** is **allowed**.
5. For **Q 2, Q 3 and Q 4** attempt A and B **OR** C and D.

**Q 1 Do as directed (Any fifteen)****15**

1. Define the term 'dispersion of light'.
2. Who first demonstrated the phenomenon of interference of light?
3. What does the term 'active medium' in a laser refer to?
4. In colorimetric assay, a plot of concentration of standards versus their respective absorbance is called \_\_\_\_\_.
5. The focusing of electron beams in an electron microscope is done using \_\_\_\_\_.
6. \_\_\_\_\_ microscopy allows the localisation of molecules within the cellular microenvironment for TEM and on the cell surface for SEM.
7. Give any one application of UV-Vis spectroscopy.
8. The maximum displacement of a vibrating particle from its position of rest is called its \_\_\_\_\_.
9. In a \_\_\_\_\_ wave the particles vibrate at right angles to the direction of propagation of the wave.
10. In \_\_\_\_\_ type of magnetism, the strength of the resultant magnetic field decreases on application of an external magnetic field.
11. Explain the term 'viscosity of a fluid.'
12. The ability of a liquid to maintain contact with a solid surface is called \_\_\_\_\_.
13. The unit used for measurement of magnetic strength is \_\_\_\_\_.
14. The principle mode of heat transfer in solids is \_\_\_\_\_.
15. Acronym APS in PAGE/SDS-PAGE stands for \_\_\_\_\_.
16. The support matrix in PAGE is \_\_\_\_\_.
17. Agarose is obtained from \_\_\_\_\_.
18. Define: 'Zwitterion'.

19. Define : 'tracking dye' as used in electrophoresis.
20. Name any one stain used to detect proteins on PAGE

**Q 2 A** Explain construction of single and double beam spectrophotometer. **08**

**Q 2 B** Compare the properties of a laser light against normal light. **07**

**OR**

**Q 2 C** Explain sample preparation for SEM and TEM. **08**

**Q 2 D** Explain the laws governing light absorption. Write a note on its significance in quantitative estimation of molecules. **07**

**Q 3 A** What is a thermocouple? Explain its use in measurement of temperature. **08**

**Q 3 B** Enlist the applications of ultrasound waves. **07**

**OR**

**Q 3 C** Describe the construction and use of an Ostwald's viscometer. **08**

**Q 3 D** Give an account of different types of magnetism observed in matter. **07**

**Q 4 A** Differentiate between AGE and PAGE. **08**

**Q 4 B** Describe the general technique of paper electrophoresis. **07**

**OR**

**Q 4 C** Explain the general principle of electrophoresis **08**

**Q 4 D** What is native-PAGE? Explain its principle. **07**

**Q 5** Write Short notes on **any three** of the following **15**

- Immuno-electron microscopy.
- Characteristics of electromagnetic waves.
- Doppler Effect.
- Two-Dimensional electrophoresis- Principle
- Electrophoretic mobility.