2 ½ Hours

Total Marks: 75

1. Attempt **all** questions.
2. **All questions** carry **equal** marks.
3. Draw **neat labeled 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. What is wavelength of Electromagnetic Radiation?
2. Define the term 'Interference'
3. What is spectroscopy?
4. Explain the term Stoke's shift.
5. State Beer's Law
6. What is the role of pumping agent in a laser?
7. List any two chemical compounds used in specimen preparation of electron microscopy.
8. Enlist any two modes of heat transfer.
9. The unit for measuring frequency of sound is the _____.
10. The dip of the earth's magnetic field is measured with a _____.
11. The SI unit of viscosity is _____
12. Explain the term: Terminal velocity.
13. What is surface energy?
14. _____ waves of the electromagnetic spectrum have the longest wavelength.
15. Define Electrophoresis.
16. Name any one tracking dye used in electrophoresis
17. What is zwitterion?
18. State true or false: SDS PAGE is the second dimension in 2D PAGE.
19. State true or false: Ethidium bromide is used to stain DNA in AGE.
20. Give the full form of TEMED.

Q.2 A	Explain working principle and construction of SEM.	**08**
Q.2 B	Give detailed account of Single beam spectrophotometer and list its limitations.	**07**
	OR	
Q.2 C	Explain principle of florescent microscope with an application.	**08**
Q.2 D	Explain dual beam spectrophotometer.	**07**
Q.3 A	Enlist and explain the various uses of the Doppler effect.	**08**
Q.3 B	Explain the principle, construction, working and use of an Ostwald viscometer.	**07**
	OR	
Q.3 C	Explain the principle behind the construction and working of a platinum resistance electrode.	**08**
Q.3 D	Explain the different types of magnetism observed in nature.	**07**
Q.4 A	Describe principle of SDS PAGE and give any four applications.	**08**
Q.4 B	Discuss the various support matrices used in electrophoresis.	**07**
	OR	
Q.4 C	Discuss principle and applications of Agarose Gel Electrophoresis.	**08**
Q.4 D	Discuss Paper electrophoresis.	**07**

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

a Lasing action of a laser.

b Dispersion.

c Setup for calculation of η by falling sphere method.

d Angle of contact.

e Iso-electric focusing (IEF).
