



Your answers should be specific to the questions asked.  
Draw neat labeled diagrams wherever necessary. Answer all questions

**LONG ESSAY (Answer any TWO)**

**2 X 20 = 40 Marks**

1. Explain the phenomena of optical rotation and circular polarization. Giving a schematic diagram, write about an ORD instrument. What are the applications of ORD and CD?
2. State the basic principles of mass spectrometry. Write about the different types of ions produced in a mass spectrometer. What are the general rules for fragmentation patterns in molecules?
3. Explain the functions of the various units of a gas chromatograph with emphasis on carrier gases, columns and detectors

**SHORT ESSAY (Answer any FIVE)**

**5 X 10 = 50 Marks**

4. Explain the working of the various detectors used in infrared spectrophotometers
5. How do you distinguish between the following molecules through their spectral characteristics?  
a) Maleic acid and Fumaric acid b) Salicylic acid and p-hydroxy benzoic acid
6. Write a note on splitting of signals in NMR spectra
7. Discuss the differences between HPTLC and ordinary TLC techniques
8. What are the factors that affect the migration of ions in electrophoresis?
9. Describe the types of Decoupling techniques in nmr spectroscopy

**SHORT NOTES**

**2 X 5 = 10 Marks**

10. Write about the t-test of significance
11. Van-Deemter Equation

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