



QP Code : 5087

(3 Hours)

[Total Marks : 80

- N.B. : (1) Question No.1 is compulsory.
 (2) Answer any three questions from the remaining five questions.
 (3) Assume suitable data wherever necessary.

1. Answer the following 20
 - (a) Compare classical and Instrumental techniques of chemical analysis.
 - (b) Why is column temperature so critical in GC?
 - (c) List any 4 characteristic properties of Raman lines.
 - (d) State Beer-Lambert's law and justify it as a limiting law.
 - (e) Determine resonance frequency of proton in $H_2O = 14092 \text{ G}$:
 $I = \pm 1/2$; $\mu = 1.41 \times 10^{-30} \text{ IG}^+$ and $h = 6.626 \times 10^{-34} \text{ J sec}$.
2.
 - (a) With a neat diagram explain the working of Single beam UV-VIS Spectrometer. 10
 - (b) Explain in detail the concept of Fluorescence and Phosphorescence. State the factors that influence Fluorescence. Also explain the working of Double beam Filter Fluorometer with neat diagram. 10
3.
 - (a) Describe working and application of GM counter with neat diagram, 10
 - (b) Explain in detail working of Atomic Absorption Spectrometer with neat diagram. 10
4.
 - (a) What is meant by Raman effect? Draw and explain the construction of Raman spectrometer with applications. 10
 - (b) Explain the working of Gas Chromatograph with a neat diagram. Also state its applications. 10
5.
 - (a) Explain the basic working principle of Mass spectroscopy. Also with a neat diagram explain principle and working of Time of Flight Mass Spectrometer. 10
 - (b) Explain the concept of Nuclear Magnetic Resonance. With a neat diagram explain in brief NMR spectrometer. 10
6. Write short notes on 20
 - (a) Monochromators
 - (b) Chemical shift in NMR
 - (c) X-ray tube
 - (d) Oxygen analyzers