2N57 / VI / Analytical Instrumentation

INST

09/06/15

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 frequancy of proton in H_0 = 14092 G : I = ±1/2 ; μ = 1.41 x 10^{-30} IG+ and h = 6.626 x 10^{-34} J sec.

2. (a) With a neatdiagram 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

JP-Con. 12461-15.