TE (Sem VI) / Instr) / CBGS / AI / 27-12-2016

Analytical Instrumentation

Q.P. Code : 598404

(3 hours) **Marks : 80**

Note : 1) Question No. **1** is **compulsory.**
2) Attempt **any 3** questions from remaining 5 questions.

1. Answer **any 05** out of the **06** questions given below: **20**
   a) Differentiate between Fluorescence and Phosphorescence spectroscopy.
   b) Explain in brief, Prism monochromator used in absorption instruments.
   c) Define chemical shift and explain its significance in NMR spectrometry.
   d) Write short notes on, Scintillation counter.
   e) Explain Resolution in Mass spectrometry.
   f) Explain in brief, working of Lamp regulator system used in spectrometers.

2. a. State and derive Beer-Lambert's law and Justify it as a limiting law. **10**
   b. Explain with diagram, the working of Single beam UV-VIS Spectrophotometer. **10**

3. a. Explain Raman Effect. With neat diagram, explain working of Raman spectrometer and give properties of Raman lines. **10**
   b. Explain the principle and concept of Atomic Absorption Spectrometer with neat diagram. **10**

4. a. Explain the working of Nuclear magnetic Resonance (NMR) spectrometer with Suitable diagram. **10**
   b. Explain with a neat diagram, working of Time-of-Flight Mass spectrometer. **10**

5. a. What are the different types of detectors used in Gas Chromatography. Explain Any one detector in detail. **10**
   b. Explain with a neat diagram, the working of Geiger Muller counter. **10**

6. Write short notes on (**any two**): **20**
   a. IR spectroscopy
   b. Gas density analyzer
   c. X-ray absorption meters
