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**Question Paper Code : 51532**

**B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016**

**Fifth Semester**

**Electronics and Instrumentation Engineering**

**EI 2302/EI 52/10133 EI 505 — ANALYTICAL INSTRUMENTS**

**(Common to Instrumentation and Control Engineering)**

**(Regulations 2008/2010)**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions.**

**PART – A (10 × 2 = 20 Marks)**

1. State Lambert's law.
2. Write the wavelength range of IR radiation.
3. What is liquid chromatograph ?
4. Define partition ratio.
5. Define Ionization.
6. What is the use of gold films in Hydrogen Sulfide analyzer ?
7. Write the operational definition of  $P_{H_2}$ .
8. What are the different types of calomel reference electrode used ?
9. Brief the principle of scanning electron microscope.
10. What is mass spectrometer ?

**PART – B (5 × 16 = 80 Marks)**

11. (a) Explain the operating principle of Flame emission photometer with neat diagram. (16)

**OR**

- (b) Illustrate the working principle of double beam configuration of UV Spectrometer and write its advantage over single beam configuration. (16)

12. (a) Describe the different stages of gas chromatography in the separation of two phases with schematic diagram. (16)

**OR**

- (b) Explain in detail the HPLC, with neat instrumentation set up. (16)

13. (a) Explain in detail :

(i) IR Analyzer (8)

(ii) Thermal conductivity analyzer. (8)

**OR**

- (b) Write the notes on dust and smoke measurements. (16)

14. (a) What is meant by Selective Ion Electrodes ? How it is classified ? Also specify the advantages of Selective Ion Electrodes. (16)

**OR**

- (b) Explain the working principles of biosensors with a conceptual diagram Also specify the various parameters to be measured using Biosensor. (16)

15. (a) With a neat sketch, explain the NMR spectrometry and its instrumentation set up. (16)

**OR**

- (b) With a neat sketch, explain the instrumentation set up of Mass spectrometer and its function. (16)