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Question Paper Code : 11333

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2011

Fifth Semester

Electronics and Instrumentation Engineering

EI 2302 — ANALYTICAL INSTRUMENTS

(Common to Instrumentation and Control Engineering)

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions

PART A — (10 × 2 = 20 marks)

1. State Beer- Lambert's law.
2. What are the advantages of double beam spectrophotometer?
3. Define Thin Layer Chromatography.
4. What is meant by column packing in chromatography?
5. Write the principle of a smoke meter.
6. Mention the uses of IR analyzer.
7. What are called bio- sensors?
8. Give the principle of pH measurement.
9. What is the advantage of electron spin Resonance Spectroscopy?
10. Write down the principle of Mass Spectrometry.

PART B — (5 × 16 = 80 marks)

11. (a) With a schematic diagram, explain the Atomic absorption spectroscopy.

Or

- (b) With a neat instrumentation setup, explain the visible spectrophotometer.

12. (a) (i) With the necessary diagram, explain the adsorption chromatography techniques. (12)

- (ii) List the various detectors used for this purpose. (4)

Or

- (b) (i) With a neat schematic diagram, discuss the separation principle of HPLC (High Pressure Liquid Chromatography). (12)

- (ii) Enumerate the applications of HPLC. (4)

13. (a) (i) With a suitable diagram, explain the construction and working of oxygen analyzer. (10)

- (ii) Discuss the method of analysis based on ionization of gases. (6)

Or

- (b) (i) With necessary diagram, explain the working principle of thermal conductivity analyzer. (8)

- (ii) With neat instrumentation setup, explain any one method to estimate sulphur- di- oxide present in air. (8)

14. (a) Discuss, how pH of a solution is measured using glass electrode and reference electrode with necessary diagrams. (16)

Or

- (b) Explain the working principle of sodium analyzer and dissolved oxygen analyzer with neat diagram. (1)

15. (a) Describe, how various samples are analyzed using NMR spectrometer with neat sketch.

Or

- (b) With neat sketch, explain the construction and working principle of mass spectrometer.