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Question Paper Code : 21425

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Fifth Semester

Electronics and Instrumentation Engineering

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

(Common to Instrumentation and Control Engineering)

(Regulation 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is total internal reflection in spectrometry?
2. State Beer-Lambert's law?
3. List the types of detectors used in gas chromatography.
4. What is HPLC?
5. Brief the principle of dust monitor.
6. What is thermal conductivity?
7. Define P_H of a solution.
8. List the demerits of glass electrode.
9. Brief the principle of scanning electron microscope.
10. What is mass spectrometer?

PART B — (5 × 16 = 80 marks)

11. (a) With a neat sketch, explain the instrumentation setup and working principle of IR spectrometer.

Or

- (b) With a neat diagram, explain the instrumentation setup of Atomic absorption spectrophotometer.

12. (a) With necessary diagrams, explain the working principle of HPLC. (High pressure liquid chromatography)

Or

- (b) With suitable diagrams, explain the various sampling techniques in Gas Chromatography.

13. (a) With a neat sketch, explain the construction and working principle of parametric oxygen analyzer.

Or

- (b) (i) With suitable diagrams, explain the construction of smoke meter and its working principle.

- (ii) Explain the working principle of NO₂ analyzer.

14. (a) With neat diagram explain the working principle of dissolved oxygen analyzer.

Or

- (b) With neat diagram, explain the set up of sodium analyzer used in industry.

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

Or

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