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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 60532

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 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. What is total internal reflection in spectrometry?
2. State Beer-Lambert's law.
3. What is retention time?
4. Define chromatography.
5. Define thermal conductivity analyzer.
6. Mention the different types of Gas analyzers.
7. What is the need to measure pH in a solution?
8. What is the purpose of biosensors?
9. State the principle used in Electron spin resonance spectroscopy.
10. Define the term NMR.

PART B — (5 × 16 = 80 marks)

11. (a) Explain in detail about FTIR spectrophotometer with neat optical path diagram and block diagram of the instruments. (16)

Or

(b) Explain in detail about grating mono chromator system with neat diagram. (16)

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 neat diagram, explain the working principle of thermal conductivity analyzer and IR analyzers. (8 + 8)

Or

(b) Suggest a method to estimate the amount of sulphur-di-oxide and nitrogen oxides. (8 + 8)

14. (a) Explain the operating principle of kathrometer in measuring dissolved oxygen. (16)

Or

(b) Describe the operation of Sodium analyzer with neat sketch. (16)

15. (a) What are the basic components of Electron Spectroscopy? Also explain the working principle of Electron spectroscopy with a block diagram. (16)

Or

(b) Explain in detail the construction and working principle of single focusing mass spectrometer. (16)

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