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Question Paper Code: 55505

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2019

Fifth Semester

Electronics and Instrumentation Engineering

(Common to Instrumentation and Control Engineering)

01UEI505 – ANALYTICAL INSTRUMENTS

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Define Beer-Lambert law.
2. List the different types of spectrophotometers.
3. List the various detectors used in gas chromatography.
4. What are the requirements for a pumping system in HPLC?
5. List the method used for measuring oxygen in flue gas.
6. Define thermal conductivity.
7. Define pH value.
8. Write a note on silicon analyzer.
9. What are the advantages of NMR spectrometer?
10. What are the applications of mass spectrometry?

PART - B (5 x 16 = 80 Marks)

11. (a) Illustrate the working principle of double beam IR spectrophotometers. (16)

Or

(b) Explain the single beam and double beam spectrophotometers. (16)

12. (a) (i) Describe the operation of flame ionization detector in detail. (8)

(ii) With a help of neat sketch, explain the construction and working of Katharometer. (8)

Or

(b) Analyze the components and operation of the high performance liquid chromatography. (16)

13. (a) Summarize the working principle of any one type of Oxygen (O₂) gas analyser. (16)

Or

(b) Explain the measurement of sulphur dioxide and carbon monoxide. (16)

14. (a) With neat diagram, explain the construction and working of dissolved oxygen analyzer. (16)

Or

(b) Examine the working principle of sodium analyzer. (16)

15. (a) Explain the working of a Scanning Electron Microscope (SEM) with neat sketch. (16)

Or

(b) Explain the principle of operation of a mass spectrometer. (16)