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Question Paper Code: 31555

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

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. Name the different types of columns used in liquid chromatography.
5. Point out the various methods of NO_2 analyzer.
6. Describe the principle of thermal conductivity analyzer.
7. What are the limitations of glass electrode?
8. Tell the application of Silica analyzer.
9. What is the principle of electron spin resonance?
10. Classify the NMR spectrometer.

PART - B (5 x 16 = 80 Marks)

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

Or

- (b) (i) Illustrate the operations of single beam photometer and double beam photometer. (8)
- (ii) Discuss about the working of Atomic Absorption Spectrophotometer (AAS). (8)
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 (O_2) gas analyser. (16)

Or

- (b) (i) Explain in detail, how lead acetate tape staining is used to determine H_2S in flu gas? (8)
- (ii) Write short notes on optical method of smoke detector and ionization smoke detector. (8)
14. (a) Examine the measurement of pH using selective iron electrodes. (16)

Or

- (b) (i) Explain the operations of standard hydrogen electrode with neat diagram. (8)
- (ii) With neat diagram, explain the working of sodium analyzer. (8)
15. (a) Explain the construction and working principle of Electron Spin Resonance (ESR) spectrometer with neat diagram. (16)

Or

- (b) (i) Explain the working of a Scanning Electron Microscope (SEM) with neat sketch. (8)
- (ii) With a neat sketch, explain the construction and working of Transmission Electron Microscope (TEM). (8)