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Question Paper Code: 31555

B.E. / B.Tech. DEGREE EXAMINATION, NOVEMBER 2015

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. What is meant by flame emission spectrometry?
3. List the various detectors used in gas chromatography.
4. Why high pressure pumps are used in HPLC?
5. Point out the various methods of NO_2 analyzer.
6. Define thermal conductivity.
7. What are the limitations of glass electrode?
8. Predict the advantages of ammonia electrode.
9. What is the principle of electron spin resonance?
10. Mention the advantages and disadvantages of flight mass spectrometer.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) With neat diagram, explain the operations of UV visible spectrophotometer. (8)
(ii) Explain the construction and working of FTIR spectrophotometers? (8)

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) With neat sketch, explain the construction and working of High Pressure Liquid Chromatography (HPLC) with advantages and disadvantages. (16)
13. (a) (i) Explain the construction and working of Infra-Red gas analyzers. (8)
- (ii) How Carbon Monoxide (CO) and Hydrocarbons are estimated? Explain in detail. (8)

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) (i) Illustrate the working of selective ion electrode. (8)
- (ii) With neat diagram, explain the construction and working of dissolved oxygen analyzer. (8)

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) (i) Explain in detail about the NMR Spectrometer. (8)
- (ii) Illustrate the working of Quadrapole Mass Spectrometer. (8)

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)