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

Question Paper Code: 31555

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

Fifth Semester

Electronics and Instrumentation Engineering

01UEI505 – ANALYTICAL INSTRUMENTS

(Common to Instrumentation and Control Engineering)

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. State Beer's Law.
2. What are the techniques used for handling solid samples in IR spectroscopy?
3. What are the different chromatography techniques?
4. What are the requirements for a pumping system in HPLC?
5. What is the use of chemiluminescence method?
6. Write the types of H_2S analyzer.
7. What are the properties of reference electrode?
8. Write a note on silicon analyzer.
9. Write the types of NMR spectrometer.
10. What are the applications of mass spectrometry?

PART - B (5 x 16 = 80 Marks)

11. (a) With a neat sketch explain the principle and operation of instrumentation of atomic absorption spectrophotometer. (16)

Or

(b) Explain the working principle of FTIR spectrophotometers with neat sketch. (16)

12. (a) With a neat diagram explain the principle of separation in gas chromatography and write the advantages and disadvantages of gas chromatography. (16)

Or

(b) (i) Describe the operation and working of HPLC with neat diagram. (12)

(ii) What are the advantages of HPLC over gas chromatography? (4)

13. (a) (i) Explain briefly about the principle of infrared analyzers. (6)

(ii) Explain the types of IR analyzers and its application with neat sketch. (10)

Or

(b) (i) Explain with neat diagram of thermal conductivity analysers. (6)

(ii) Describe with neat diagram about the estimation of carbon monoxide in a gas. (10)

14. (a) Describe the constructional details of reference electrode used for different pH ranges and write the precautions in the use of reference electrodes. (16)

Or

(b) Explain with neat sketch of dissolved oxygen analyzer. (16)

15. (a) Describe about the construction and working of basic ESR spectrometer with neat block diagram. (16)

Or

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

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