

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 132853

Roll No.

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B.TECH.

Theory Examination (Semester-VIII) 2015-16

ANALYTICAL INSTRUMENTS

Time : 3 Hours

Max. Marks : 100

Section-A

Q1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. (2×10=20)

- (a) State Beer-Lambert's law.
- (b) Comment on attenuated total reflectance.
- (c) Why packing of column is done in column chromatography?
- (d) Differentiate between adsorption chromatography & column chromatography.

- (e) Define ion-exchangers.
- (f) List a few types of gas analyzers.
- (g) What you mean by redox potential?
- (h) Distinguish between glass electrode and reference electrode.
- (i) What is grating in spectroscopy?
- (j) Define mass spectroscopy.

Section-B

UPTU NOTES

Q2. Attempt any five question.

(10×5=50)

- (a) With neat schematic diagram discuss separation principle of HPLC.
- (b) With necessary diagram explain the adsorption chromatography techniques.
- (c) Explain working principle of thermal conductivity analyser with neat schematic diagram and derive it.

- (d) With neat instrumentation setup, explain any one method to estimate sulphur dioxide present in air.
- (e) With neat diagram explain atomic absorption spectrophotometers in detail.
- (f) Explain fluorescence spectrophotometers in detail with necessary diagrams.
- (g) Illustrate single and double beam instruments in detail.
- (h) Describe the working principle of oxygen analyzer with suitable diagram and derive the same.

Section-C

Attempt any two questions.

(15×2=30)

- Q3. Explain the construction and working principle of hydrogen electrode to measure pH. Use neat diagrams to explain.
- Q4. Describe the working principle of Gamma camera and explain, how signal processing is done. Also discuss about its spatial resolution.

Q5. Describe the working of double beam mass spectrometer and give its application.

