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Printed Pages—3 **EIC033**

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

PAPER ID : 2930 **Roll No.** | | | | | | | | | | |

B. Tech.

(SEM. VIII) THEORY EXAMINATION 2011-12

ANALYTICAL INSTRUMENTATION

Time : 3 Hours *Total Marks : 100*

Note :—*All* questions are compulsory.

1. Attempt any ***four*** parts of the following :— **(5×4=20)**

   (a) Define Beer Lambert Law and state deviation from Beer Lambert Law.

   (b) Explain the principle of operation, on which, the working of Absorption based instrument depends upon.

   (c) Explain the working of Perkin-Elmer Lambda 9 double-Beam spectrophotometer.

   (d) Compare absorption filter with interference filter on the basis of their suitability.

   (e) Classify Photosensitive Detectors and explain them in detail.

   (f) What are the different types or variety of sample holders are employed in analysis of sample ?

2. Attempt any ***two*** parts of the following :— **(10×2=20)**

   (a) What are the different sources of error involved in spectrophotometric measurements ? List various

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components involved in Infrared Spectroscopic Measurement.

(b) List different types of detectors involved in infrared spectrometer for measurement and provide an overview of their roles.

(c) Classify the infrared spectrophotometers and explain their working in detail.

3. Attempt any ***two*** parts of the following :— **(10×2=20)**

(a) Explain the principle of operation and constructional details of Flame Photometry.

(b) What are the different sources of Interference in Atomic Absorption ? State method for curve correction in meter scale.

(c) Describe the standard methods for determination of concentration of unknown sample.

4. Attempt any ***two*** parts of the following :— **(10×2=20)**

(a) Mention various components of a mass spectrometer in correct sequence and explain each component in detail.

(b) Derive the expression of 'r', radius of curvature of the trajectory for Magnetic deflection mass spectrometer. Also explain the working of Nier 60° sector mass spectrometer.

(c) What types of columns are integrated in Gas chromatographs for analysis of the sample material ?

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5. Attempt any ***two*** parts of the following :— **(10×2=20)**

(a) Define the term 'Sensitivity'. Suggest how the sensitivity of Analytical NMR Spectroscopy can be enhanced.

(b) Explain the working of Nuclear magnetic resonance spectrometer with the help of diagram.

(c) Write short notes on :

(i) Various T-60 A NMR Spectrometer

(ii) Sample holder of NMR Spectrometer.