ED-611

M.Sc. 3rd Semester
Examination, March-April 2021

CHEMISTRY

Paper - IV

Analytical Techniques and Data Analysis

Time : Three Hours] [*Maximum Marks* : 80
[*Minimum Pass Marks* : 16

Note : Answer **all** questions. The figures in the right-hand margin indicate marks.

Unit-I

1. (*a*) Explain principle, methodology and application of acid digestion. 10

(*b*) Explain the following : 10

(*i*) Accuracy and precision

(*ii*) Standard deviation and confidence limit

OR

(*a*) What is Sampling ? Discuss in brief the methodology used for sampling of river water. 10

(*b*) What is significant figure ? Give the significant figure of the following data : 7

(*i*) 0.800

(*ii*) 1.00

(*iii*) 1.05×10^{-6}

(*iv*) 0.051

(*v*) 43.00

(*c*) Discuss the Propagation of Error. 3

Unit-II

2. (*a*) What is chromatography technique ? Write in detail its classification and applications. 5

(*b*) Discuss the solvent extraction factor and its importance. 5

(*c*) Discuss the principle and methodology of Gas chromatography. 10

OR

(*a*) Define the term : synergic extraction and distribution co-efficient, countercurrent extraction and retardation factor. 10

(*b*) Discuss the principle and methodology and application of thin layer chromatography. 10

Unit-III

3. (*a*) Discuss the principle and methodology of flow injection analysis. 10

(*b*) Discuss the factors affecting and application of TGA. 6

(*c*) Explain the terms residence time and detector. 4

OR

(*a*) What is automated method ? Give the advantages of automated method. 8

(*b*) What is gas diffusion method ? Discuss the analysis of ammonium ions by the FIA method. 6

(*c*) Discuss the principle and methodology of DTA technique. 6

Unit-IV

4. (*a*) Write short notes on the following : 10

(*i*) Amperometric titration

(*ii*) Ilkovic equation

(*b*) Discuss the principle and instrumentation of the coulometry. 10

OR

(*a*) Discuss the principle, instrumentation and application of the cyclic voltammetry. 10

(*b*) Explain the term : Diffusion current, square wave polarography and equivalent conductance. 6

(*c*) Discuss about polarized electrode and micro electrode. 4

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