28/11/18 (Morning)

This question paper contains 3 printed pages.

Your Roll No. .....

Sl. No. of Ques. Paper: **239** **I**

Unique Paper Code : **32173902/42173923**

Name of Paper : **Basic Analytical Chemistry**

Name of Course : **B.Sc. (H) Chem. / B.Sc. (Prog.) : SEC**

Semester : **III**

Duration : **2 hours**

Maximum Marks : **38**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt four questions in all.
Question No. 1 is compulsory.

1. (a) What are the requirements of potable water? Explain any *two* methods used in the purification of water.

   (b) Account for high stability of EDTA-metal complexes.

   (c) Differentiate between (any *two*):

   (i) Analyte and reagent

   (ii) Random and gross sample

   (iii) Micro analysis and trace analysis. 2,2,4

2. (a) Name any *three* systematic types of errors. While

P. T. O.

preparing a standard solution, what types of errors appear?

(b) Define chelation and give two examples of chelating agents with their structures.

(c) Discuss phenolphthalein and methyl orange acidity of water sample.

(d) Give structure of cation or anion exchange resin. How is their ion exchange capacity determined? 2·?×4

3. (a) A high degree of precision does not always imply high accuracy. Comment.

(b) In a set of measurements, the following concentrations of iron (ppm) were reported: 20·2, 20·4, 20·3, 20·1, 19·9, 20·0 and 19·8. Calculate standard deviation and coefficient of variation.

(c) Define following terms (any *two*):

(i) Absorbant, absorbate and absorption

(ii) Titrant, titrand and titration

(iii) Eluent, eluate and elution. 2,2,3×2

4. (a) Combination of hydroxide and bicarbonate alkalinity is not recorded in any water sample. Justify it.

(b) Explain which technique is better, paper chromatography or thin layer chromatography.

(c) Give one word or phrase for the following:

(i) A solution prepared from all the reagents but no analyte.

(ii) Ratio of the distance travelled by the solute to the distance travelled by the solvent from the line of application.

(iii) Wavelength of maximum absorbance.

(iv) Collection of a material from bulk material.

(v) Indicator used to determine dissolved oxygen in any water sample.

(d) When can zero be used as significant figure? 2,2,5,1

5. (a) Give composition of soil and its major nutrients.

(b) Explain why unidendate ligands are usually poor complexing titrants.

(c) Define Beer's law and its utility in spectrophotometric analysis.

(d) Name any *four* detectors used in gas chromatography.

(e) Draw the structure of phenolphthalein in acidic medium, alkaline medium and indicate the colours. 2×5