Sr. No. of Question Paper : 797   E   **Your Roll No**...............

Unique Paper Code   : 217203

Name of the Course   : **B.Sc. (H) Chemistry**

Name of the Paper   : Analytical Methods in Chemical Analysis (CHHT-204)

Semester   : II

Duration : 3 Hours   Maximum Marks : 75

Instructions for Candidates

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

2. Attempt **six** questions in all.

3. Question No. **1** is compulsory.

1. Attempt any **five** of the followings:

   (i)   Compare between accuracy and precision

   (ii) Explain what is DTA? What is an ideal DTA curve?

   (iii) What are glass electrodes and their functions?

   (iv) Explain how many types of monochromotors are used in an optical instrument.

   (v)   Give the advantages of thin layer chromatography over the other commonly used Chromatographic techniques.

   (vi) Draw a block diagram of various steps involved in a chemical analysis.

                                                        (3×5)

2. (i) Give one example each of cation exchange and anion exchange resin and explain how their total ion exchange capacity is determined.

(ii) Write the Basic principal involved in thin layer chromatography. How is the choice of absorbent and solvent determined for using thin layer chromatography?

(iii) State Nernst distribution law. Derive the expression

$$\%E = \frac{100D}{D+Vaq/Vorg}$$

(4×3)

3. (1) What are the advantages of conductometric titrations over ordinary titrations.

(2) Draw and explain the conductometric curve for the following titrations.

(i) HCL against NaOH

(ii) Phosphoric acid against NaOH

(iii) Ammonia against HCL

(3) Explain how Redox titration are determined by conductometric titrations.

(4×3)

4. (i) How many types of interferences are generally produced in atomic absorption -—spectroscopy. Explain them.

(ii) Give a schematic diagram showing the essential components of a flame spectrophotometer.

(iii) Give the advantages of Atomic absorption spectroscopy over emission Flame spectroscopy.   —   (4×3)

5. (i) What is sampling? What is its importance in chemical analyses?

   (ii) What are systematic and random errors? How can systematic errors be removed.

   (iii) What do you mean by the resolving power of a monochromator. Give the formula to find the resolving power of a monochromator. (4×3)

6. (i) StateLambart Beer's Law and its limitations

   (ii) How many fundamental frequencies would you expect to observe in the Infra red absorption spectrums of CO_2 explain?

   (iii) Which type of molecules are Infraredactive? Which are the two models of vibration of atoms in polyatomic molecules? Explain. (4×3)

7. (i) Give the principal of null point thermo balance. Draw a neatly labelled diagram of thermo balance.

   (ii) Discuss the factors affecting a DTA curve.

   (iii) A pure compound may be either Mgo, $MgCO_3$ or MgC_2O_4 A thermo -gram of the compound shows a loss of 91.0 mg from a total of 175.0 mg used for analysis. What is the formula of the compound? (4×3)

8. (1) Explain the following terms briefly.

   (a) Selective retardation

   (b) Retention Volume

   (c) Elute

   (d) Nebulizer (1×4)

(2) Expand the following terms and give its applications and uses.

    (a) EDTA

    (b) HPLC

    (c) DSC

    (d) ICP   (2×4=8)