21ICH2C8L

Sl. No.

M.Sc. II Semester Degree Examination, Sept./Oct. - 2024
INDUSTRIAL CHEMISTRY

DSC - 8 : Instrumental Methods of Analysis (Analytical Chemistry - II) (NEP)

Time : 3 Hours — Maximum Marks : 70

Note : (i) Answer **any five** questions including **Q.No.1**.

  (ii) **Q.No.1** is **compulsory.**

1. (a) Define the ion exchange capacity, give equation and explain its significance.

   (b) Write a note on different types of columns employed in Gas chromatography.

   (c) Write the principle of HPLC and explain the different column materials employed in it with example.

   (d) Discuss the appplication of IEC in lanthanides separation.   **4+3+3+4=14**

2. (a) Explain the construction and working of hallow cathode lamp.

   (b) With a neat sketch discuss the instrumentation of AES.

   (c) Discuss the different excitation sources employed in atomic emission spectroscopy.   **5+5+4=14**

3. (a) Write the principle of conductometric titrations and discuss its advantages over classical titrations.

   (b) Discuss any one secondary reference electrode employed in potentiometric titrations.

   (c) Discuss the principle of pulse polarography and its instrumentation.   **5+5+4=14**

4. (a) Discuss the principle and instrumentation of SFC technique.

   (b) Write a note on gel electrophoresis.

   (c) What is electro-osmosis ? Discuss its advantageous over gradient elution in column chromatography.   **5+5+4=14**

5.   (a)   Discuss the principle and instrumentation of X-ray fluorescence.

   (b)   With a neat sketch explain the instrumentation TEM.

   (c)   Derive Koopman's theorem.   **5+5+4=14**

6.   (a)   Give an account of minimization of spectral and chemical interferences in AAS.

   (b)   Write a note on flames employed in Flame photometry.

   (c)   Write the principle of electrogravimetry and discuss its application in separation of metals.   **5+4+5=14**

7.   (a)   Discuss different amperometric titrations with examples.

   (b)   Explain the principle and applications of cyclic voltammetry.

   (c)   Discuss the principle and instrumentation of capillary electrophoresis.
                              5+5+4=14

8.   (a)   Explain the mechanism of separation in field flow fractionation, discuss its methodology and advantageous over chromatographic methods.

   (b)   Discuss the Debye Scherrer method of determining the single crystal parameters.

   (c)   Write a note on ESCA.   **5+5+4=14**

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