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MCH-002

P.G. DIPLOMA IN ANALYTICAL CHEMISTRY (PGDAC)

Term-End Examination

00366

June, 2014

MCH-002 : SEPARATION METHODS

Time : 3 hours *Maximum Marks : 75*

Note : *Answer any **five** questions. All questions carry equal marks.*

1. (a) Discuss the methods of separation in which partition and surface activity play main role in the separation of the components of a mixture.

(b) Explain with examples the Ion Pair Formation in solvent extraction. *8, 7*

2. (a) Explain the role of diluents in the solvent extraction of metal ions.

(b) Illustrate the significance of HETP in chromatography. *10, 5*

3. (a) What are the essential characteristics of a stationary phase material for liquid-liquid partition chromatography ?

(b) Write in brief about the high performance thin layer chromatography (HPTLC). *10, 5*

4. Discuss the following in regard of gas chromatography :

   (a) Solvent Efficiency

   (b) Thermal Conductivity Detector

   (c) Applications *5, 5, 5*

5. (a) Compare high performance liquid chromatography (HPLC) with gas chromatography (GC).

   (b) Draw a schematic illustration for Thermospray method interfacing of HPLC with MS and explain it. *7, 8*

6. Describe in brief any ***three*** of the following :

   (a) Synthetic Inorganic Ion Exchangers

   (b) Ion Exchange Resins Selectivity

   (c) Dipicrylamine-specific Cation Exchanger

   (d) Liquid Ion Exchangers *5, 5, 5*

7. (a) Discuss the preparation, properties and applications of polyacrylamide gels.

   (b) Derive the following for osmotic pressure in membrane separation process.

   $$\pi = iCRT.$$ *7, 8*

8. Write notes on the following :

(a) Electrodialysis

(b) Ion Selective Membrane Electrode

(c) Capillary Electrophoresis *5, 5, 5*