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**MCH-002**

# P.G. DIPLOMA IN ANALYTICAL CHEMISTRY (PGDAC)

## Term-End Examination

01441 **December, 2017**

## MCH-002 : SEPARATION METHODS

*Time : 3 hours* *Maximum Marks : 75*

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

**1.** (a) Explain how molecular geometry of components of the mixture forms the basis of various separation methods. *5*

(b) Discuss the role of chelating agents in solvent extraction. *5*

(c) Explain the principle of supercritical fluid chromatography. Give two advantages of this technique. *5*

2. (a) How does the presence of masking agents affect solvent extraction ? 5

(b) Explain any ***two*** of the following parameters with reference to Chromatography : 5

(i) Distribution Constant

(ii) Retention Time

(iii) Retention Factor

(c) Define Stripping. Explain different types of stripping solutions. 5

3. (a) What is the basic difference between Liquid-Solid Chromatography (LSC) and Liquid-Liquid Chromatography (LLC) ? Also mention which will generally be faster. 5

(b) Explain the basic aspects of High Performance Liquid Chromatography (HPLC). 5

(c) Give the essential requirements of an appropriate stationary phase in Liquid-Liquid Partition Chromatography. 5

4. (a) Discuss the principle and applications of Paper Chromatography. 5

(b) Give the important properties of gels that are used in Size Exclusion Chromatography. 5

(c) How do you separate a mixture of two organic compounds by Thin Layer Chromatography (TLC) ? 5

**5.** (a) Give the basic requirements of the liquid phase to be used in GLC. 5

(b) Give the important features and working of an Electron Capture Detector used in Gas Chromatography (GC). 5

(c) What are the essential characteristics of a diluant used in solvent extraction ? 5

**6.** (a) Give at least five advantages of High Performance Liquid Chromatography (HPLC). 5

(b) Explain Electro-osmotic Flow using a suitable diagram. 5

(c) What are the natural ion exchangers ? Explain giving suitable examples. 5

**7.** (a) What is meant by capacity of an ion exchanger ? Give different types of capacity. 5

(b) Give the special properties and applications of synthetic inorganic ion exchangers. 5

(c) Discuss the principle and applications of Size Exclusion Chromatography. 5

8. (a) Explain Reverse Osmosis. What are the parameters associated with RO ? 5

(b) Discuss the principle of Electrodialysis, giving various transport processes. 5

(c) Write notes on any ***two*** of the following processes of separation : 5

(i) SDS-PAGE Gel Electrophoresis

(ii) Capillary Electrophoresis

(iii) Capillary Electrochromatography