



PHARMACEUTICAL ANALYSIS—III (Separation Techniques)

Paper—3

Time : Three Hours]

[Maximum Marks : 80

- N.B. :—** (1) Question No. 1 is compulsory.  
(2) Attempt any **four** questions out of remaining.  
(3) Draw neat labelled diagram wherever necessary.  
(4) Discuss the reaction, mechanism wherever necessary.

1. Solve any **five** questions :

- (a) Differentiate between column chromatography and HPLC.
- (b) Justify batch extraction procedure is better than single extraction.
- (c) Write about various pumps used in HPLC.
- (d) Differentiate between TLC and HPTLC.
- (e) Write about adsorption Isotherms.
- (f) Explain various column development techniques. 4×5=20

2. Give the principle of paper chromatography. Describe paper development techniques and detection of spots in paper chromatography. 15

3. Draw block diagram of Gas chromatograph. Explain various carrier gas and detectors used in Gas chromatography. 15

4. Give the principle, instrumentation and applications of HPLC. 15

5. Define Ion exchanger and classify them. Give synthesis of various ion-exchangers and applications of ion-exchange chromatography. 15

6. Explain liq-liquid extraction techniques. Describe in detail counter current distribution and its applications. 15

7. Write notes on (any **three**) :

- (a) HPTLC
- (b) Electrophoresis
- (c) Rate theory of chromatography
- (d) Preparation of plates and application of spots in TLC. 5×3