

23/11/11

(2 Hours)

[Total Marks : 40

- N.B. :** (1) Question No. 1 is **compulsory**.
 (2) Attempt any **four** questions from the remaining **six** questions.
 (3) **Figures** to the **right** indicate **full** marks.
 (4) Draw **neat** and **labelled** diagrams wherever **necessary**.

1. (a) Explain the following terms (any **three**) :- 6
 - (i) Resolution
 - (ii) Isocratic elution
 - (iii) Correlation coefficient
 - (iv) Two dimensional TLC
- (b) Name the following (any **two**) :- 2
 - (i) Bulk property detector used in HPLC
 - (ii) Polarity of compound which would be easily eluted from a reverse phase column.
 - (iii) Technique in gas chromatography used to determine residual solvents.
2. (a) Describe the sampling techniques used for liquids. 4
- (b) Describe the various pumps used in HPLC. 4
3. (a) Explain the principle and functioning of differential Scanning Calorimetry. Discuss with suitable examples. 4
- (b) Describe the various columns used in gas chromatography. 4
4. (a) What is meant by precision of an analytical method ? Discuss the different types of precision. 4
- (b) Differentiate between the two types of size exclusion chromatography. 4
5. (a) Explain the use of the following in chromatography- 4
 - (i) Internal Standard
 - (ii) Reference Standard
 - (iii) Working Standard
 - (iv) Area Normalisation Method.
- (b) Distinguish between ion pair chromatography and ion exchange chromatography with respect to principle and column used. 4
6. (a) Describe the instrumentation for sample application and scanning in HPTLC. 4
- (b) In fluorimetric analysis of a sample, the following readings were obtained the standard solutions :- 4

Concentration ($\mu\text{g/ml}$)	Relative Fluorescence intensity (%)
2	23
4	44
6	58
8	78
10	100

Derive the equation for regression line and calculate concentration of sample if relative fluorescence intensity is 75,

7. Write short notes on any **two** :- 8
 - (a) Van Deemter Equation
 - (b) Developmental techniques in paper chromatography.
 - (c) Differential Thermal Analysis