

## Subject : Chemistry

Paper – VI (A) : Instrumental Methods of Analysis (DSE E- I)

Time : 3 Hours

Max. Marks: 60

## PART – A (5 x 3 = 15 Marks)

(Short Answer Type)

Note : Answer any FIVE of the following questions.

- 1 What is partition co-efficient? Define the term "distribution Law"?
- 2 What do you understand by the term Retention factor ( $R_f$ ) value? Write the factors effecting  $R_f$  value.
- 3 What is meant by Ion-exchange chromatography? Name any two Cation and Anion exchangers.
- 4 Write the advantages of gas chromatography.
- 5 Define the following terms:  
(a) Transmittance (b) Absorbance
- 6 Mention the Lamps used as energy sources in spectrophotometry.
- 7 Explain Normal hydrogen electrode.
- 8 Define the terms (a) over potential (b) polarisation

## PART – B (45 Marks)

(Essay Answer Type)

Note: Answer ALL questions.

- 9 (a) (i) Discuss counter current extraction method. (5)  
(ii) Explain about ascending and descending methods of development of chromatograms in paper chromatography. (6)  
OR  
(b) (i) How do you determine Iron (III) by solvent extraction technique? (5)  
(ii) What is two dimensional chromatography? Write its applications. (5)
- 10 (a) (i) Discuss the selection criteria of mobile phase solvents for electing polar, non-polar compounds in column chromatography. (5)  
(ii) Discuss the principle and Instrumentation of HPLC. (6)  
OR  
(b) (i) Draw the block diagram of Gas chromatography. (5½)  
(ii) Discuss the applications of Gas liquid chromatography. (5½)
- 11 (a) (i) Explain single beam UV-visible spectrophotometry with block diagram. (5)  
(ii) Explain estimation of Iron in water samples by thiocyanate. (6)  
OR  
(b) (i) Draw the block diagram of FT-IR spectrophotometer. (5)  
(ii) Explain the estimation of chromium in steel by UV-visible spectro photometer. (6)
- 12 (a) (i) (A) Write the principle involved in potentiometry. (3)  
(B) Write about different types of Electrochemical cells. (3)  
OR  
(b) (i) How do you determine Asprin with KOH? (6)  
(ii) Explain assay of Sulphanilamide. (6)