

15G-106

May-2015

M.Sc., Sem.-II

410 : Chemistry

(Analytical Chemistry)

Time : 3 Hours]

[Max. Marks : 70

Instructions : All questions are compulsory and carry equal marks.

1. Answer the following :

14 :

(a) Explain the process of extracting method from aqueous to non-aqueous phase.

OR

Derive a relation between distribution ratio and partition coefficient with a suitable illustration and justify the relationship.

(b) How is Crag's counter current extraction useful in extracting analytes having similar partition coefficients?

OR

Describe the process for accelerated and microwave assisted extraction.

2. Answer the following :

14

(a) Give comparison between TLC and HPTLC of their salient features.

OR

Discuss the principle of chromatography. Explain its classification based on mechanism of retention / interaction.

(b) Explain the process of hydrodynamic and hydrostatic equilibrium in counter current chromatography.

OR

Give the importance of plate theory and rate theory in chromatography.

3. Answer the following :

14

(a) Discuss different applications of conductometric titrations with suitable examples.

OR

Explain modern definition of pH and discuss in brief the validity of the equation.

(b) Give the different application of calcium ion selective electrode and explain the working mechanism of the electrode.

OR

Explain the process of measuring pH by glass electrode and state its limitation.

4. Answer the following :

(a) State the working of  $\text{CO}_2$  and  $\text{O}_2$  gas sensing probes and give their application in the analysis of environmental samples. 14

OR

Write a short note on European, American and IUPAC concept of sign convention for expressing the electrode potential.

(b) Explain the application of potentiometric titration with suitable examples.

OR

Give different applications of fluoride ion selective electrode and explain the working mechanism of the electrode.

5. Answer in brief :

- (1) Define Volume flow rate.
- (2) What is distribution coefficient?
- (3) Give the relation between Activity coefficient and Ionic strength.
- (4) What is Chromatographic resolution? GujaratStudy.com
- (5) Explain asymmetric potential.
- (6) Give two limitation of liquid-liquid extraction.
- (7) What is a chromatogram?
- (8) Give van-Deemter equation for plate height measurement.
- (9) Give the composition of glass used for pH measurement.
- (10) Define capacity factor and give its equation.
- (11) Give the unit of conductance and resistance.
- (12) What are enzymic electrodes?
- (13) Give two application of potentiometry.
- (14) Define : Specific and Equivalent Conductance.