M. SC. (Analytical Chemistry) / M. SC. (Organic Chemistry) /M. SC. (Inorganic Chemistry) Sem-II (Choice Based Credit & Grade System) : SUMMER - 2019

SUBJECT: FUNDAMENTAL OF ANALYTICAL CHEMISTRY

Day: Tuesday
Date: 16/04/2019

S-2019-1175

Time: 03.00 PM TO 06.00 PM
Max. Marks: 60

N.B:

1) All questions are **COMPULSORY**
2) Figures to the right indicate **FULL** marks.
3) Both sections should be written in **SEPARATE** answer book.

SECTION – I

Q. 1 Attempt any **THREE** of the following **(15)**

a) Explain the terms a) distribution co – efficient b) Distribution ratio. Derive the relation between them by taking a suitable example.

b) Describe the match – box model of chromatographic separation.

c) What is van Deemter equation? Explain clearly the terms involved in it.

d) Discuss the principle of ion exchange chromatography. Describe what is meant by cation and anion exchange resins.

e) Write a note on size exclusion chromatography.

Q.2 A) Attempt any **ONE** of the following **(05)**

a) Explain the thin layer chromatography technique of separation.

b) Write a note on HPLC technique.

B) Solve any **TWO** of the following **(10)**

a) A gas chromatographic peak has retention time of 58 seconds. Base width obtained from the intersection of the above line with extrapolated sides of the peak was 5.55. what is the value of HETP in cm / plate (Column length is 1m)

b) In solvent extraction of Uranium with 8 – hydroxyquinoline in $CHCl_3$, the volume of aqueous and organic phase was 25ml each. When the percentage extraction was 99.8% Calculate the distribution ratio.

c) In chromatographic separation of mixture consists of benzene, xylene, and naphthalene components solvent front is 15.2 cm while distance travelled by benzene is 9.3 cm, for xylene 6.4 cm and for naphthalene 8.5 cm. The unknown compound D has Rf value 0.65. Find out distance travelled by unknown compound.

SECTION – II

Q.3 Attempt any **THREE** of the following **(15)**

a) "El Nino is one of the major events occurring on the earth which affects the world economy" Explain.

b) Describe the analysis of carbon monoxide in air by different instrumental methods.

c) What do you understand by 'Chemical speciation'? Explain with suitable example.

d) What is the environmental impact of water pollution caused by pesticides and detergents?

e) What do you mean by term called "Smog"? How does photochemistry play a role in formation of photochemical Smog?

Q.4 Attempt any **THREE** of the following **(15)**

a) Describe any one pre concentration technique used to prepare sample before analysis.

b) Give an account of inorganic particulate matter, and show its differences from organic particulate matter.

c) Write a note on Bhopal disaster.

d) Describe method for the estimation of BOD from water.

e) Give an account of organic pollutants in water.

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