# M. SC. (ANALYTICAL CHEMISTRY) / M. SC. (ORGANIC CHEMISTRY) /M. SC. (INORGANIC CHEMISTRY) SEM-II (CHOICE BASED CREDIT & GRADE SYSTEM) : SUMMER - 2018

## SUBJECT: FUNDAMENTALS OF ANALYTICAL CHEMISTRY

Day : **Thursday** Time : **03.00 PM TO 06.00 PM**
Date : **19/04/2018** **S-2018-0873** Max. Marks : 60

**N. B. :**

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Answers to both the sections should be written in **SEPARATE** answer book.
4) Neat diagrams must be drawn **WHEREVER** necessary.
5) Use of logarithmic table/ calculator is **ALLOWED**.

## SECTION - I

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

**a)** Give a schematic diagram for HPLC set up and explain the function of each component.

**b)** What are resins and discuss the principle of ion exchange chromatography.

**c)** Explain multiple extractions are better than single extraction.

**d)** Describe the principle of gas chromatography? Explain the flame ionization detector is detail.

**e)** Write a note on column chromatography.

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

**a)** Give the principle of paper chromatography and thin layer chromatography and compare the advantages and disadvantages of the two techniques.

**b)** Write a note on GC-MS.

**B)** Solve **Any TWO** of the following : **(10)**

**a)** Two litre of aqueous solution contains 32 gm of an ascorbic acid. Calculate amount of ascorbic acid extracted in ether. After
   i) Single extraction with 100 ml ether and
   ii) Four extractions with 50 ml ether each where D = 10.

**b)** In chromatography separation of mixture consists of A, B,C components. Solvent front is 13.2 cm while distance traveled by A is 8.3 cm, for B 5.6 cm and for C, 7.5 cm. The unknown compound D has $R_F$ value 0.5. Find out distance travelled by unknown compound.

**c)** A GLC peak had a retention time 50 sec. The box width of the peak obtained from intersection of base line with extrapolated sides of the peak 5.5 sec. Calculate the HETP in cm/ plate. Length of column is 4 m.

**P. T. O.**

## SECTION - II

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

**a)** Explain the analysis of $NO_x$ in air by different instrumental methods.

**b)** Write a note on Ozone hole.

**c)** Describe the various methods for the sampling of gaseous and vapours from air.

**d)** Give an account of inorganic particulate matter and how they differ from organic particulate matter.

**e)** Describe the chemistry involved in Bhopal disaster.

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

**a)** Give the broad classification of water pollutants. Explain briefly.

**b)** Describe the method for the estimation of the Ammonia in water sample.

**c)** Define pesticide. Discuss the persistence of pesticide in detail.

**d)** Explain oil pollution of water bodies.

**e)** Write a note on Eutrophication.

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