MASTER OF SCIENCE (CHEMISTRY) (CBCS - 2018 COURSE) M.Sc. (Chemistry) Sem-II : SUBJMER- 2022 SUBJECT : FUNDAMENTALS OF ANALYTICAL CHEMISTRY

Time: 03:00 PM-06:00 PM Day: Tuesday S-20147-2022 Max. Marks: 60 Date: 19-07-2022 N.B. All questions are **COMPULSORY**. 1) Figures to the right indicate FULL marks. 2) Attempt both the section in SEPARATE answer books. 3) SECTION - I (15)Attempt any **THREE** of the following. Q.1 Explain the term percent extracted. Discuss the factors affecting it. a) Sketch the schematic diagram of a Gas Chromatography and describe its b) different components. Give principle of paper chromatography and column chromatography. c) Compare its advantages and disadvantages. Discuss any one application of Ion exchange chromatography. Describe d) what is meant by cation and anion exchange resins. Explain the terms: e) 1) Distribution coefficient 2) Distribution ratio Derive the relation between them by taking a suitable example. (05)Attempt any **ONE** of the following. Q.2 A) What is solvent extraction? Explain multiple extractions are better than a) single extraction. Write a note on: Flame Ionization Detector. b) (10)Solve any **TWO** of the following. B) In solvent extraction of Uranium with 8-hydroxyquinoline in CHCl₃, the a) volume of aqueous and organic phase was 25ml each. When the percentage extraction was 99.8%. Calculate the distribution ratio. A mixture of Benzene, Toluene and Xylene is analyzed by gas b) chromatography. The peak areas were found to be $30 \,\mathrm{cm}^2$, $15 \,\mathrm{cm}^2$ and $55 \,\mathrm{cm}^2$ cm² respectively. Calculate the percentage composition of the mixture. Calculate HETP from the following data for peak c) Peak I: Retention time t1=85 sec, Peak width= 5.5sec Peak II: Retention time t1= 126sec, peak width=8.5sec. SECTION - II Q.3 Attempt any THREE of the following. (15)What do you mean by a term 'Smog'? How does photochemistry play a a) role in formation of photochemical smog? Explain environmental chemistry of mercury in an aquatic ecosystem. b) c) Discuss the Nitrogen cycle in detail with a schematic diagram. Describe the measurement of DO and ammonia in water sample. d) Write a note on ozone hole and its impact on human health. **e**) **Q.4** Attempt any **THREE** of the following. (15)Discuss sources and control of following: a) i) SO_X ii) NO_X Define pesticide. Discuss about the persistence of pesticide and b) biodegradation of pesticides. Describe various preservation techniques used to preserve water sample c) for analysis. Explain the analysis of carbon monoxide in air by different instrumental d) methods. Explain the chemistry of Bhopal disaster. e)