

# Five Year Integrated M.Sc. Examination, 2019

Semester - VI

Course: CH-3-6-5

( Analytical Chemistry-II )

Time: Three Hours

Full Marks: 40

Questions are of value as indicated in the margin.

## Group-A

1. Answer *any five* questions: 5x2=10
- a) What are the advantage and disadvantage of ceric sulphate dosimetry?
  - b) What do you mean by fluorescence?
  - c) Distinguish between differential thermal analysis (DTA) and differential scanning calorimetry (DSC).
  - d) What do you understand by a calibration curve?
  - e) Establish the intermediate during the formation of cholesterol using labeling experiment.
  - f) Write down the names of various processes in a Flame AA.

## Group-B

Answer *any six* questions.

- 2. Explain the basic principle of neutron activation analysis (NAA). What are the possible pathways that can be adopted in NAA when a projectile interacts with the target nuclei? Give two important benefits of NAA. 2+2+1
  - 3. What is an ICP-MS? Write down the instrumentation and applications of ICP-MS. 1+4
  - 4. What is the basic principle of Atomic Absorption Spectroscopy? Explain the basic components of an AAS along with its interferences. 2+3
  - 5. What is the working principle behind centrifugation method? Explain the thermal decomposition of calcium oxalate monohydrate using thermogravimetric studies. 2+3
  - 6. Which are the two well-studied reactions that are used for chemical dosimetry? State the basic principles of the two methods. Draw the curves that are generated in the two methods (absorbance vs. time of radiation exposure). 1+2+2
  - 7. For two solutes, A (0.01 M) and B (1 M), with  $D_{cA} = 10$  and  $D_{cB} = 0.1$ , find out the recovery of A in phase 2 in two steps of counter current extraction using 10 mL of phase 1 and 2 in each step. 5
  - 8. Draw the typical plot for radiometric titration of  $Ag^+$  by  $Cl^-$  ions, labelled with  $^{36}Cl$ . Establish the reaction mechanism for oxidation of fumaric acid by  $KMnO_4$  using isotope labeling experiment. 2+3
  - 9. Draw the structure of one purine and one pyrimidine base and write their names. Explain how radiation interacts with such nucleic acid bases. What is the technique to damage DNA? 2+2+1
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