

(Time: 3 Hours)

Total Marks: 100

- N.B.:** (1) All questions are compulsory.
 (2) Figures to the right indicate full marks.
 (3) Use of log table/ non-programmable calculator is allowed.

Q.1 Attempt any four of the following. **20**

- A) Define the term quality. Explain the term quality control and quality assurance.
- B) What are the functions of a QC lab? What are the characteristics of LR, AR and GR grade reagents?
- C) What is ppm? How many grams of KCl should be weighed to prepare 2.0 L of 25 ppm solution of K^+ .
- D) An aqueous solution of H_2SO_4 (mol.wt.=98) contains 10.78 g of acid per dm^3 of the solution. The density of acid solution is 1.123 g/ml Calculate i) molarity, ii) normality and iii) mole fraction of the acid in the solution.
- E) What are the difficulties encountered in sampling of solid? Explain the term bulk ratio and size to weight ratio.
- F) Write a note on –
 i) sampling of Homogeneous liquids,
 ii) Ambient sampling

Q.2 Attempt any four of the following. **20**

- A) Calculate the potential of 20 ml of 0.1M Fe(II) with 0.1M $KMnO_4$ at i) equivalence point ii) beyond the equivalence point of the titration.
- B) Explain the conditions to be fulfilled by substance to be used as a metal ion indicator.
- C) Justify the statement - EDTA is a good titrant for estimation of metal cations.
- D) Explain back titration and alkalimetric titration with respect to EDTA titration.
- E) Draw a titration curve of 20 ml of 0.1M Fe(II) with 0.1M Ce(IV) solution.
- F) Discuss any two methods to increase the selectivity of EDTA.

Q.3. Attempt any four of the following. **20**

- A) Discuss the principle of Atomic Absorption Spectroscopy. Explain the role of rotating chopper in AAS.
- B) Name the burners used in FES. Discuss any one burner.
- C) With the help of Jablonski diagram explain phosphorescence and fluorescence.
- D) Explain the applications of fluorescence spectroscopy.
- E) Discuss the working of turbidimeter with the help a labelled diagram.
- F) Explain: - 1) Turbidimetric titrations 2) Phase titrations

