LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **CHEMISTRY**

FIRST SEMESTER – **NOVEMBER 2024**

UCH1MC02 – ANALYTICAL CHEMISTRY

Date: 13-11-2024 Dept. No. Max. : 100 Marks

Time: 09:00 am-12:00 pm

		SECTION A - K1 & K2 (CO1)
Q.No	Levels	**Answer ALL the Questions** **(10 x 2 = 20)**
1	K1	Distinguish between accuracy and precision.
2		What are meant by carcinogenic chemicals? Give an example.
3		State the law of volumetric analysis.
4		How much volume of 0.2 N H_2SO_4 will be required to neutralise 20 ml of 0.15 N NaOH?
5		Mention any two organic precipitating agents.
6	K2	Define gravimetric factor.
7		Define R_f value.
8		Give two advantages of gas chromatography.
9		State the principle of TGA.
10		Write any two differences between TGA and DTA.
		SECTION B – K3 & K4 (CO2)
		Answer ALL the Questions **(4 x 10 = 40)**
11	K3	(a) Outline the general rules to be borne in mind in storage and handling of chemicals. (5) (b) Discuss the importance of MSDS of a chemical. (5) [OR]
12		(a) Write a note on determinate errors and how can we minimise these type of errors. (5) (b) Calculate the mean, median and range for the following data: 61.45, 61.51, 61.12 and 61.40 (5)
13		(a) What are the characteristics of a primary standard? (5) (b) Distinguish between the end point and equivalence point in a titration. (5) [OR]
14		(a) Explain the principle of complexometric titration of zinc using EDTA. (5) (b) Write a short note on theory of adsorption indicators. (5)
15	K4	(a) State and explain the effect of co-precipitation and post-precipitation in gravimetric analysis. (5) (b) What are the factors influencing the formation of a precipitate? (5) [OR]
16		What are argentometric titrations? Explain the principle and procedure involved in the determination of chloride by Volhard's method. (10)
17		(a) Describe the preparation of a column for chromatography. (5) (b) Write the principle and applications of gas chromatography. (5) [OR]
18		Discuss the principle and instrumentation of the DTA technique. (10)

SECTION C – K5 & K6 (CO3)

		Answer ALL the Questions (2 x 20 = 40)
19	K5	(a) Explain the key elements of a COSHH risk assessment that includes the identification of hazardous substances, exposure assessment, and control measures. (10) (b) Define the following terms: (i) Molarity (ii) Molality. (2+2) (c) 20 ml of a solution of NaOH required, for complete neutralisation, 22 ml of deci-normal solution of hydrochloric acid. Calculate (i) the normality of NaOH solution and (ii) the amount of NaOH present in 1 litre of the solution. (6) [OR]
20		(a) Derive Henderson equation for an acidic and basic buffer solutions. (10) (b) Summarize the factors affecting the solubility. (10)
21	K6	(a) Explain the basic principle and applications of ion exchange chromatography. (10) (b) How will you separate the components in a mixture by thin layer chromatography? (10) [OR]
22		(a) Explain the instrumentation involved in thermogravimetric analysis. (10) (b) Sketch and explain the TGA and DTA curve of calcium oxalate monohydrate. (10)
