

**CARMEL COLLEGE OF ARTS, SCIENCE & COMMERCE FOR WOMEN,  
NUVEM- GOA**

**B.Sc. CBCS Semester V Examination, January 2021**

**Subject Code:CHD 101      Subject name: Basic Topics In Analytical Chemistry**

**Total Marks: 60**

**Duration: 2 Hours**

**Total No. of Pages:03**

*Instructions: All Questions are compulsory*

*Figures to the right indicate full marks*

**Q1. Answer ANY FOUR of the following:**

**4x3=12 marks**

- i) What is complexometric titrations? Also write its classification.
- ii) Define the following terms : (a) Gross Sampling (b) Increment (c) Sampling Unit
- iii) In an organic estimation of acetone the following burette volumes were recorded, 25.4ml, 26.6ml, 26.0ml, 27.0ml, 26.5ml and 25.1ml .Using the 2.5d and 4d rule state whether the last observation of 25.1 ml can be rejected.
- iv) Describe Batch Extraction method.
- v) Explain any 3 types development techniques used in paper chromatography.
- vi) With a neat labelled diagram explain the apparatus involved in electrogravimetry.

**Q2A) i) What is Coulometry? Explain the working of silver Coulometer.**

**3 marks**

ii) List out any 6 differences between accuracy and precision.

**3 marks**

**OR**

**Q2A) iii) Explain the principle and working of Hydrogen oxygen coulometer.**

**3 marks**

iv) Differentiate between the types of ion exchangers used in ion exchange chromatography.

**3 marks**

**Q2B) i) Explain the four areas of chemical analysis.**

**3 marks**

ii) Define the following terms

**3 marks**

a) Deposition potential

b) Dissolution potential

**Q3A) i) Describe Continuous Extraction method.**

**3 marks**

ii) List the factors that affect the column efficiency in column chromatography.

**3 marks**

**OR**

**Q3A) iii) Explain the term Sample thief. How is it used for sampling of liquids? 3 marks**

iv) Explain the steps involved in paper chromatography. **3 marks**

**Q3B) i) Write the procedure for the determination of  $\text{Ca}^{2+}$  in the presence of  $\text{Mg}^{2+}$**

**3 marks**

ii) Describe the method of Counter Current Extraction

**3 marks**

**Q4A) a) Two different spectrometric methods were used to determine copper content in an alloy.**

The results obtained in ppm are

Method I	Method II
0.386	0.450
0.392	0.420
0.400	0.395
0.421	0.410
0.380	0.424

Are the two means significantly different?

**4 marks**

$T_{\text{tab}}$  at 95% probability level=2.31

$F_{\text{tab}}$  at 95% probability level= 6.39

**b) Find the number of significant figures in the following.**

**2 marks**

i) 0.0003643

ii) 9996

iii)  $7.3 \times 10^{-9}$

iv) 1.00120

**OR**

**Q4A) a) From the data given below derive an equation for the type  $y=mx+c$  by the method of averages**

**4 marks**

x	1	2	3	4	5	6
y	1.4	2.1	2.6	3.2	3.4	3.9

**b) Solve and round off to three significant figures**

**2 marks**

i)  $3.004+5.3+6009+1.340+3.605$

ii)  $4.56+8.09+0.006+3.460+3.200$

**Q4B)** Explain the steps involved in gravimetric analysis

**6 marks**

**Q5 A) i)** Differentiate between Qualitative and Quantitative analysis (3 points each)

**3 marks**

ii) Explain how copper can be determined quantitatively using constant current electrolysis.

**3 marks**

**OR**

**Q5 A) iii)** Explain any one type of Redox titration.

**3 marks**

iv) What are the applications of polarography in organic and inorganic analysis?

**3 marks**

**Q5B) i)** What is  $R_f$  value in chromatography? State the factors on which  $R_f$  value depends.

**3 marks**

ii) What is meant by Bulk ratio? What is meant by size to weight ratio? Explain the importance of these in sampling.

**3 marks**