

C.U.SHAH UNIVERSITY

Winter Examination-2022

Subject Name: Analytical Chemistry-II

Subject Code: 5SC02ACH1

Branch: M.Sc. (Chemistry)

Semester: 2

Date: 21/09/2022

Time: 11:00 To 02:00

Marks: 70

Instructions:

- (1) Use of Programmable calculator and any other electronic instrument is prohibited.
 - (2) Instructions written on main answer book are strictly to be obeyed.
 - (3) Draw neat diagrams and figures (if necessary) at right places.
 - (4) Assume suitable data if needed.
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SECTION – I

- Q-1 Attempt the Following questions (07)**
- a** What is coefficient of variance (C.V.)? Write its equation. 1
 - b** Define the term precision 1
 - c** Define and write equation of standard deviation. 1
 - d** How many significant figures are there in 0.0234, 400.00 and 40.03? 1
 - e** What do you mean by SOP? 1
 - f** Find the mean and median for the given set of data: 25.4, 25.5, 25.3, 25.2 and 25.8. 1
 - g** Define accuracy 1
- Q-2 Attempt all questions (14)**
- a** Write a note on data processing. 07
 - b** Discuss the scope of analytical science and explain qualitative and quantitative analysis. 07
- OR**
- Q-2 Attempt all questions (14)**
- a** Explain in detail: Validation of analytical methods. 07
 - b** Discuss the control chart in detail used in analytical chemistry. 07
- Q-3 Attempt all questions (14)**
- a** Write a note on GLP. 05



- b** Explain confidence limit. **05**
- c** The following set of chloride analyses on separate aliquots of pooled serum were reported **04**
105, 108, 109 and 115 meq/L. One value appears suspect. Determine if it can be ascribed to
accidental error at the 95% confidence level.

OR

Q-3 Attempt all questions **(14)**

- a** You are developing a new colorimetric procedure for determining of glucose content and you **05**
have chosen Folin-Wu procedure with whom you are going to compare your obtained
experimental results. From the following two sets of replicates analyses on the same sample,
determine whether the variance of your method differs significantly (Test of significance)
from that of the standard method (The obtained results are given in following below table).

Sr. No.	Your method (mg/dL)	Folin-Wu method (mg/dL)
1	125	128
2	128	129
3	124	127
4	126	125
5	127	130
6	130	131
7	131	
Mean	$\bar{x}_1 = 127$	$\bar{x}_2 = 128$

- b** Discuss the types of errors. **05**
- c** A soda sample is analyzed in the analytical chemistry laboratory by titration with standard **04**
hydrochloric acid. The analysis is performed in triplicate with the following results: 94.50,
94.58 and 94.43 % Na₂CO₃. Within what range are you 95% confident that the true value
lies? (at 95% confidence level the tabulated value of t = 1.96).

SECTION – II

Q-4 Attempt the Following questions **(07)**

- a** Define the term calibration **01**
- b** What do you mean by Auxochrome? **01**
- c** What is called molarity? Give equation of molarity. **01**
- d** How much amount of KMnO₄ is required to prepare 0.5 N, 800mL solution? **01**
- e** Write the wavelength range for UV-Visible spectroscopy. **01**
- f** What is called Chromophore? **01**
- g** What do you mean by sampling? **01**



- Q-5** Attempt all questions (14)
- a** Write a note on instrumentation of UV-Visible spectroscopy. 07
 - b** Discuss the general steps for chemical analysis. 07

OR

- Q-5** Attempt all questions (14)
- a** Explain the various transitions in UV-Visible spectroscopy. 07
 - b** Explain the calibration of burette and burette. 07

- Q-6** Attempt all questions (14)
- a** Discuss the correlation coefficients (r). 05
 - b** Discuss various intensity and wavelength shifts in UV-Visible spectroscopy. 05
 - c** Explain the effect of conjugation in UV-Visible spectroscopy. 04

OR

- Q-6** Attempt all questions (14)
- a** Give any five applications of UV-Visible spectroscopy. 05
 - b** Write a note on standard addition method. 05
 - c** Write a note on solvent effects in UV-Visible spectroscopy. 04

