

Enrollment No: _____ Exam Seat No: _____

C.U.SHAH UNIVERSITY

Summer Examination-2017

Subject Name : Analytical Chemistry-II

Subject Code : 5SC02ACH1

Branch: M.Sc.(Chemistry)

Semester : 2

Date : 09/05/2017

Time : 02:00 To 05:00

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. Give the full form of GLP? (1)
 - b. Define: Accuracy (1)
 - c. Define: Precision (1)
 - d. Define: Confidence limit (1)
 - e. Define: Robustness (1)
 - f. Define: Spectra (1)
 - g. Define: Median (1)
- Q-2 Attempt all questions (14)**
- a) Write a note on quantitative and qualitative analysis. (7)
 - b) Described various parameters for the validation. (7)
- OR**
- Q-2 Attempt all questions (14)**
- a) Explain GLP in detail. (7)
 - b) Discuss standard addition techniques and internal standard in detail. (7)
- Q-3 Attempt all questions (14)**
- a) Given the following set of weights 29.8, 30.2, 28.6 and 29.7 mg. Calculate the average deviation and the standard deviation of the individual values and the average deviation and the standard deviation of the mean. Express these as absolute and relative values. (5)
 - b) Analysis of a sample of iron gave the following % value for the iron content: 7.08, 7.21, 7.09, 7.16, 7.14, 7.07, 7.14, 7.18 and 7.11. Calculate the mean, standard deviation and coefficient of variance. (5)
 - c) The % CI of a sample is given below. Calculate mean, average deviation and the range. (4)



% CI
24.39
24.19
24.36

OR

- Q-3 a)** Each of the following sets of data has what appears to be an outlying results. (5)
Apply the Q test (90% confidence) to determine whether this value should be retained or rejected. (Q_{tab} for A & C = 0.76, Q_{tab} for B = 0.94)

A	B	C
14.64	9.22	9.22
14.46	9.03	9.06
14.41	9.20	9.20
14.44	-	9.24

- b)** Calculate the average deviation and the average relative deviation of the following set of analytical results: 15.67, 15.69 and 16.03g. (5)
- c)** The amount of element A in AB compound in different experiments obtained as 48.32 %, 48.36 %, 48.23%, 48.11% and 48.38%. Then calculate median value, median deviation, mean value, relative average deviation and standard deviation (4)

SECTION – II

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

- a. Define: Chromophore (1)
- b. Define: Wavelength (1)
- c. State the expression of Lambert-beer law. (1)
- d. Define: Coefficient variance (1)
- e. Define: Transmittance (1)
- f. Define: Confidence level (1)
- g. Define: Absorbance (1)

- Q-5 Attempt all questions** (14)

- a) Explain general steps for chemical analysis. (7)
- b) How will you find the best straight line by least square regression? (7)

OR

- Q-5 a)** A new method for the analysis of mercury was tested against an ore sample that was known to assay 12.63 % Hg (7)

Trial	1	2	3	4	5
% Hg	12.76	12.57	12.72	12.79	12.76

- i) Calculate the standard deviation, s for these data.
 - ii) Calculate the 95 % confidence interval for the analysis.
 - iii) Is the assay mean within the bounds of a) the 95% confidence interval and b) the 80 % confidence interval?
(for 95 % level $t = 2.78$ for $v=4$, for 80 % level $t=1.53$, $\mu=12.6$ to 12.84)
- b)** An established method of analysis for chlorinated hydrocarbon in air sample has standard deviation of 0.030 ppm. (4)
- i) Calculate the 95% confidence limit for a group of four measurement



obtained by this method.

ii) How many measurements should be made if the 95% confidence limit is to be $\pm 0.017\%$?

(For 95% confidence level, $t=3.18$ for $v=3$)_

c) A new method for the determination of vitamin C was tested against tablets known to contain 500mg of ascorbic acid. The accompanying results were obtained. (3)

502, 500, 505, 501 and 504, mean = 502.4 and $s=2.1$. Establish whether a positive error is indicated at the 95% confidence? (At 95% level $t = 2.78$)

Q-6 Attempt all questions (14)

a) Write a note on chromophore and auxochrome with suitable examples. (7)

b) Draw the U.V instrument and discuss its various component. (7)

OR

Q-6 Attempt all Questions (7)

a) Write the note on electronic transition $\sigma \rightarrow \sigma^*$, $\pi \rightarrow \pi^*$ and $n \rightarrow \sigma^*$. (7)

b) Explain application of UV spectroscopy. (7)

