

JB-110
January-2018
M.Sc., Sem.-I
404 : Chemistry
(Analytical Chemistry)

Time : 3 Hours]

[Max. Marks : 70

- Instructions :** (1) Each questions carries 14 marks.
(2) All question are compulsory

1. Answer the following :

14

- (a) Explain types of errors and discuss ways to express Accuracy and Precision.

OR

Discuss the importance of F-test and Q-test in statistical treatment.

In given sample, amount of SO_4^{2-} on doing Four time analysis obtained as follows : 44.28 % , 44.56 % , 44.37 % , 44.33 % . Should 44.56 result be rejected ?
[$Q_{90} = 0.76$]

- (b) What is Quality Assurance? Describe various parameters for method Validation as per Good Laboratory Practices.

OR

Write a brief note Confidence limit. Two students have obtained values of Toluene from Benzene as follow :

Student X : 21.0 , 22.7 , 21.4 , 21.5 , 22.1 , 21.2 , 22.2

Student Y : 21.3 , 21.5 , 21.8 , 21.7 , 21.4

2. Answer the following :

14

- (a) How will you find the 'best straight line' using least square linear regression?

OR

Discuss Sampling and Sample Preparation with general steps involved in chemical analysis.

- (b) What is Calibration Curve ? How can you construct a calibration curve ?

OR

Write a note on the use of internal standards and standard addition technique with an illustration.

3. Answer the following :

14

(a) Derive Lambert-Beer's Law and state its limitations.

OR

Discuss in detail the various components of visible spectrophotometer.

(b) Explain in brief Circular Dichroism and Optical Rotatory Dispersion.

OR

Explain Photometric accuracy using Ringbom Plot.

4. Answer the following :

14

(a) Explain: The analysis of mixture with resolved and unresolved spectra.

OR

Explain : The measurement of an equilibrium constant using Scatchard Plot.

(b) Discuss the important and explain the various types of photometric titrations.

OR

Explain: The Job's method of continuous variation for determining the composition of a complex.

5. Answer in brief : (1 mark each)

14

(1) Define Term: Qualitative analysis.

(2) What is selective test ?

(3) How many significant figures are there in following values ?

(i) 0.00607 (ii) 200.06

(4) Give use of student t-test.

(5) How can you calibrate a burette ?

(6) What are quality control charts ?

(7) What does the value of correlation coefficient, $r = 0$ suggest ?

(8) Define Normality.

(9) What is Chromophore ?

(10) State the function of a Monochromator.

(11) Explain : Vibrational Spectra.

(12) Give Relation between Absorbance and Transmittance.

(13) State the wavelength region for UV radiation.

(14) Give names of any two reference books of analytical chemistry.