

Seat No. : _____

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.
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