Suggestion 2023-24
Analytical ChemistryDSE-1 (DSECEMH1)

Time Allotted: 1 Hour 30 Minutes   Full Marks: 25

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.
All symbols are of usual significance.

Answer any *one* question from the following

(i) Write about determinate and indeterminate errors, How are determinate errors minimized.

(ii) Discuss the effect of pH on the solvent extraction of metal chelates.

(iii) What is the 'Weimarn's equation' about the velocity of precipitation ? Explain its implications in gravimetric analysis.

(iv) "Multiple washing is better than single washing with the same volume of wash solvent." discuss.

(v) What is solvent extraction? State the advantageous of this technique.

(vi) Discuss the principle and technique of thin layer chromatography.

(vii) How are non volatile inorganic salts used in gas chromatography.

(viii) Define R_f value. Explain the significance and uses. what are the factors on which R_F value depends?

(ix) "High degree of precision may not imply accuracy"-Justify.

(x) What is known as 'separation factor' in solvent extraction?

(xi) Describe briefly about possible sources of errors in quantitative analysis .

(xii) Why is representation necessary in gravimetric analysis.

(xiii) What are the requirements to be met for reactions to serve the gravimetric estimation.

(xiv) Discuss the use of complexing agent in solvent extraction.

(xv) Name one acidic and one basic solid adsorbent commonly used in column chromatography.

(xvi) Explain with example about what do you mean by accuracy and precision.

(xvii) In a set of measurements the following concentrations of iron (in ppm) were reported:
9.98, 9.99, 9.98, 9.95, 10.00, 10.20

 Calculate-

    (a) standard deviation;

    (b) coefficient of variation

(xviii) Elucidate date the principle of Gas liquid chromatography.

(xix) What do you mean by relative and absolute error ?

(xx) In column chromatography what do you understand by zone formation and zone migration ?

(xxi) Discuss the use of complexing agent in solvent extraction.

(xxii) What are the main criteria for choosing a career gas in gas liquid chromatography?

(xxiii) The percentage of a constituent A in an ore were found to be 48.32, 48.35, 48.24, 48.18 and 48.39. Calculate mean deviation and standard deviation.

(xxiv) Discuss the principle of separation of a mixture of amino acids by paper chromatography.

(xxv) In gravimetric analysis a precipitate is sometimes digested. Why?

(xxvi) Paper chromatography is a kind of partition chromatography comment.

(xxvii) In gas chromatography separation of benzene, toluene and xylene the areas under the peak were noted to be 31.0 cm^2, 14.5 cm^2 and 53.2 cm^2 respectively. Calculate the percentage of composition of the sample.

(xxviii) The molar concentrations of a particular solution were found to be 0.2043, 0.2049, 0.2039 and 0.2043 in four separate experiments. Find out the values of Mean, Median, range, average deviation, relative average deviation, standard deviation and coefficient of variance.

(xxix) Explain the mechanism through which co precipitation occurs.