Note: Answer all questions. All questions carry equal marks.

1.a) i) Write a note on rejection of doubtful values. 6

ii) What are primary and secondary standard substances? Give examples. 8

OR

b) i) Define the terms :

A) Specificity B) Sensitivity 4

C) Linearity D) ruggedness

ii) Explain the calibration of volumetri'c flask. 4

iii) A substance was known to contain 15.20 ± 0.03% of a component, A. The results obtained by two experiments taking the same substance and employing the same analytical method as follows : 6

Experiment – I : % of A : 15.0, 15.31, 15.16 and 15.10

Experiment – II : % of A : 15.30, 15.34, 15.36 and 15.36

Discuss the results with reference to accuracy and precision of the measurements.

2.a) i) Calculate the pH of a 0.01 M acetic acid. (Dissociation constant pKa = 4.76). 4

ii) Write a note on different concepts of acid and bases. 6

iii) Write a note on common ion effect. 4

OR

b) i) Derive equations to calculate the pH value of aqueous solutions of salts obtained from weak acid and strong base. 10

ii) Write a note on amphoteric substances by giving few examples. 4

3.a) i) Describe the various steps involved in gravimetric analysis. 10

ii) How do you prepare and standardize 0.1 N sodium thiosulphate? 4

OR

b) i) Explain in detail about redox indicators. 7

ii) Explain Volhard's method for the determination of chlorides. 7

4.a) i) Write about different solvents and indicators used in non-aqueous titration. 7

ii) Discuss the theory and applications of complexometric analysis with examples. 7

OR

b) i) Explain Iodometry and Iodimetry with examples. 7

ii) Write the principle and procedure involved in assay of calcium gluconate. 7

5.a) i) Calculate the number of moles of sodium hydroxide in 500 ml. of 0.1 M sodium hydroxide solution. 4

ii) Calculate the percentage composition of the elements in Na_2CO_3 [Na=23 , C = 12, O = 16]. 5

iii) 0.202 gm of a carbon compound on combustion gave 0.361 gm of CO_2 and 0.147 gm of water. Calculate the empirical formula of the compound. 5

OR

b) i) Write the mass balance equation for the following : 2x3=6

A) Reaction between ammonium hydroxide and sulphuric acid

B) Reaction between sodium carbonate and hydrochloric acid

ii) Calculate the percentage composition of the elements in $Na_2S_2O_4$ [Na = 23, S = 32, O = 16]. 5

iii) Calculate the molarity of 17 g of pure Na_2CO_3 in 600 ml. of solution. 3

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