Q.P. Code :01403

[Time: Three Hours] **[Marks:80]**

Please check whether you have got the right question paper.

N.B:
1. All Question are compulsory.
2. Figures to right indicate full marks.
3. Draw neat labelled diagram, write chemical reaction and give example wherever necessary.
4. Attempt each main question on new page.

Q.1 a) Explain the terms (05)

i) Equivalence point.
ii) iodometry
iii) Precision
iv) Buffer capacity
v) Back Titration.

b) Answer the following (10)

i) Convert 0.1 Molar NaOH solution into PPM.

ii) Balance following equations for each of following redox reaction
(a) Mn^{+2} + H_2O_2 → MnO_2 + H_2O
(b) IO_3^- + I^- → I_2

iii) What is half Wave potential?

iv) Give the meaning of following.
(i) Constant potential Electrolysis
(ii) Overvoltage

v) For a solute X, the partition coefficient between water and ether iS 5. If 20 ml of an aqueous solution of the solute is extracted with 25 ml of ether, what percentage of the solute will be found in ether layer and in aqueous layer after equilibrium?

Q.2 a) Give principle, reactions and indicator used for the standardization of silver nitrate and for the assay of KCL. (04)

b) Explain the composition and standardization of KFR. Give one application of aquametry with example. (04)

OR

Explain the theory and methods of end point determination of amperometric titration.

c) Explain labeling and differentiating effect of solvents in Non-aqueous titration. (03)

Q.3 a) Enlist instrumental and Non-Instrumental methods for quantitative analysis. Give principle and reaction involved in the assay of soluble Aspirin Tablet. (04)

b) Write short notes on pulse polarography and give applications of polarography. (04)

c) Give indicator and titrant for (03)

(i) Assay of KI
(ii) Assay of $KMnO_4$
(iii) Assay of H_2O_2

TURN OVER

Q.4 a) Explain the following. (04)

(i) Resonance theory of neutralization indicator.
(ii) Neutralization curve of weak acid by strong Base

b) What is gravimetric analysis? Give the details of unit operation in gravimetry. (04)

c) Give principle and reactions involved in the assay of Ascorbic acid Tablet. (03)

Q.5 a) Write short notes (04)

(i) Determination of mixture of lead, zinc and magnesium in a sample by complexometric titration.
(ii) Discuss the effect of pH on the stability of the complex.

b) What is separability factor? Write a note multiple extraction. (04)

c) A sample of drug X was analysed and the % concentration obtained after analysis was as follows:- (03)
5.61, 5.95, 5.06, 5.46, 5.62
Calculate mean, median and RSD for the given data.

Q.6 a) (i) Calculate the PH of the solution in which (04)
$[H^+] = 5 \times 10^{-5}$ mol / litre

(ii) When 100 ml HCl is titrated with 0.1M NaOH. Calculate the pH after addition of 30 and 50 ml of 0.1 M NaOH.

b) (I) A 20 mg of API containing nitrogen was analyzed by Kjeldahl method. Before the ammonia was steam distilled, 22 ml of 0.020 M HCl was placed in the receiver. After distillation 12.5 ml of 0.020 M NaOH was required to back titrate the excess acid. Calculate the percentage of the nitrogen present in the sample. (04)

(ii) Give the principle and reaction for the assay of sulphacetamide sodium.

c) Give reaction involved in the gravimetric assay of (03)

(i) Nickel by dimethylglyoxime
(ii) Array of Ba^{+2} as BaSO4