

(3 Hours)

[Total Marks: 70]

- N.B.:** (1) Question No.1 is compulsory.
(2) Draw neat diagrams wherever necessary.

1. a) Explain the terms : (05)
- Sequestering agent
 - Solubility product
 - Buffer capacity
 - Standard reduction potential
 - Reducing agent
- b) Answer the following : (10)
- Define primary and secondary standard and give one example of each.
 - Explain potentiostatic coulometric method.
 - Balance the following equations of redox reactions :
 - $MnO_4^- \rightarrow Mn^{+2}$
 - $Cr^{3+} + IO_3^- \rightarrow Cr_2O_7^{2-} + I^-$
 - Discuss any two factors affecting physical properties of the deposit in electrogravimetry.
 - A 0.15 gm sample of phthalic acid was dissolved in 100 ml of water. When 20 ml of diethyl ether was used to extract phthalic acid, 0.05 gm of phthalic acid was recovered. Find out the distribution coefficient for this extraction.
2. a) Explain mohrs method and write principle, reaction and indicator used in assay of NaCl. (04)
- b) Give principle, composition and standardization of Karl Fisher reagent. (04)
- c) Explain different types of non-aqueous solvents. (03)
3. a) Write therapeutic category, labeling and principle of assay of calcium gluconate injection. (04)
- b) Write construction and working of dropping mercury electrode. (04)
- c) Write the type of redox titration and titrant used for ascorbic acid, $KMnO_4$ and paracetamol. (03)
4. a) Explain the neutralization curve for titration of strong acid vs strong base. (04)
- b) Discuss various unit operations of gravimetric analysis. (04)
- c) Write principle, indicator and titrant used for permanganometry titration. (03)
5. a) Discuss factors affecting solvent extraction. (04)
- b) Enlist the type of complexometric titration and write the suitable method used for determination of water hardness. (04)
- c) Define the term accuracy and write a note on types of error. (03)
6. a) Solve the following sums : (04)
- How will you prepare 100 ml of 0.02 M $KMnO_4$ solution using 1M stock solution of $KMnO_4$?
 - When 50 ml of 0.1 M HCl is titrated with 0.1 M NaOH. Calculate the pH for successive addition of 10 and 20 ml of NaOH.
- b) Write a note on Kjeldahl method. (04)
- c) Write a note on assay of Ba^{+2} as $BaSO_4$. (03)