UNIT I

1. Explain the Arrhenius, Lowry - Bronsted and Lewis concepts of acid and bases with suitable examples.
2. How is thorium extracted from its ore?
3. Write a note on lanthanide contraction.
4. How is platinum extracted from its ore?
5. What are the general properties of d and f block elements.
6. Explain about the existence of Hg ions.
7. Give a brief account on alloys of copper and uses.

UNIT II

1. Explain the preparation, properties and uses of organo phosphorous compounds.
2. Explain the preparation, properties and uses of organo lead compounds.
3. Explain the preparation, properties and uses of organo lithium compounds.
4. Explain the preparation, properties and uses of organo magnesium compounds.
5. Explain the preparation, properties and uses of organo boron compounds.
6. Explain the preparation, properties and uses of organo zinc compounds.
7. Explain the preparation, properties and uses of organo copper compounds.

UNIT III

1. Explain the reactions of alcohols with following reagents. (a) Active metals (b) Phosphorous halides (c) hydrogen halides
2. How are ethers prepared by the following methods (a) dehydration of alcohols (b) Williamson Ether synthesis
3. Explain the mechanism of Riemer Tiemann reaction.
4. Explain (a) Oxymercuration (b) Hydroboration
5. Explain about the crown ethers.
6. Give a detailed account on chemical properties of phenol with equations.

UNIT IV

1. Derive the relationship between Cp and Cv.
2. Derive Kirchoff's equation.
3. Derive the equation for workdone for expansion of real gases under isothermal and adiabatic conditions.
4. Define the following. (a) Internal Energy (b) Heat Capacity (c) Isolated System (d) Open System (e) State of the system
5. Derive the relationship between qp and qv
6. What do you understand by the terms internal energy change (ΔU) and enthalpy change (ΔH) of a system? Derive the relationship between ΔU and ΔH.

7. Write a note on (a) Isothermal process (b) Intensive and extensive properties (c) First law of thermodynamics
8. Define (a) Molar heat capacity (b)Reversible and irreversible processes.
9. Define (a) Adiabatic Process (b) Enthalpy
10. Calculate the changes in thermodynamic properties such as q, w, ΔU and ΔH when an ideal gas undergoes isothermal expansion.
11. Explain (a) bond energy (b) Integral and differential heats of solution and dilution

UNIT V

1. Derive Arrhenius equation.
2. Describe the Lindemann theory of unimolecular reaction.
3. Explain the collision theory of reaction rates.
4. On the basis of ARRT, derive the rate constant for bimolecular reaction.
5. Compare collision theory and ARRT.
6. What is half-life period? Calculate the half-life period of a first order reaction.
7. What is the effect of temperature on reaction rate.
8. Discuss the limitations of collision theory.
9. Derive the rate constant for first order reaction.
10. Explain the theory of absolute reaction rates
11. Describe the different methods of determination of order of a reaction.
12. Distinguish between order and molecularity of a reaction.
13. Distinguish between rate and rate constant of a reaction.