Subject Title: Chemistry - VII Prepared by: K. Sunitha & Afshan Nahid
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UNIT- I : INORGANIC CHEMISTRY

1. What are inert and labile complexes. Explain with examples.
2. What is trans effect? Give any three applications.
3. Explain unimolecular and bimolecular Nucleophilic substitution reaction with mechanism in square planar complexes.
4. Explain the structure of Haemoglobin and chlorophyll.
5. Write a note on photosynthesis and its mechanism.
6. What are Toxic Elements? Explain Toxic Effects of lead and Arsenic.
7. Write two important functions of Na+ and K+ ions in the body.
8. Write the important functions of Cobalt, Magnesium and calcium.
9. Explain Pearson's concept of Hard and Soft Acids and Bases with its application and limitation.

UNIT: II- ORGANIC CHEMISTRY

10. What are carbohydrates. How are they classified? Give examples of each class.
11. Write a note on Mutarotation and Osazone Formation.
12. Give a note on Epimers and Anomers.
13. Explain Killiani Fischer synthesis with Example.
14. Explain Ruff's Degradation Synthesis with Example.
15. Illustrate some chemical properties to explain the structure of glucose and fructose.
16. How the following conversions takes place

    a) Glucose – Fructose

    b) Glucose – Mannose

    c)Fructose -- Glucose
17. What are Reducing and Non Reducing Sugars.
18. What are amino acids. How are they classified.

19. Give a note on Preparation of amino acid by Strecker's Synthesis.
20. Explain the following terms – **a)** Zwitter ion **b)** Isoelectric point **c)** Electrophoresis.
21. What are Lactams. How are they Formed.

UNIT- III : PHYSICAL CHEMISTRY

22. Define the Following terms – Isolated system , Extensive Properties, Intensive Properties.
23. Write a note on Enthalpy.
24. Give a note on Reversible and Irreversible Process.
25. State and Explain First Law Of Thermodynamics.
26. Define and Explain Internal Energy in different Paths.
27. Define Heat Capacity of system. Explain the relationship between Cp & Cv in Gaseous System.
28. Explain the work done in Isothermal Reversible Expansion of an Ideal Gas.
29. State and Explain Joule Thomson Coefficient.
30. Derive an expression for Adiabatic Process and Work done in Adiabatic Process.
31. Derive Kirchoff's Equation and Mention its Applications.
32. Explain and Derive Carnot's Cycle.

UNIT – IV : GENERAL CHEMISTRY

33. What are Equivalent Proton and non Equivalent Protons.
34. Define the terms-

    a) chemical shift

    b) Shielding and Deshielding of Protons

    C) Splitting of Signals
35. Give the NMR Spectrum of following compounds

    a) Ethyl Bromide

    b) Ethyl Acetate

    c) 1,1,2 Tri Bromo Ethane

    d) Acetaldehyde
36. Explain the basic principle of mass spectroscopy.

37. Explain the following terms:
    - **a)** Daughter Nuclei
    - **b)** Base peak
    - **c)** Meta stable Peak
38. How the following compounds can be presented by Mass Spectrum:
    - **a)** Ethyl Bromide
    - **b)** Ethyl chloride
    - **c)** Ethyl Alcohol
    - **d)** Acetone
39. Write a note on McLafferty Rearrangement.
40. State and Explain Entropy.
41. How entropy changes takes place in Reversible and Irreversible Adiabatic process.
42. Explain the concept of Free Energy Function **(G & A)**
43. Derive Gibb's Helmholtz Equation.