Class: XI **Subject: Chemistry**

Short Questions

1. Convert acetone into acetic acid.
2. Write down the reagents and conditions used to prepare propanoic acid from following.
   a. Propanal b. Propane nitrile c. Methyl propanoate
3. Hydration of alkenes in acid-catalyzed reaction. Justify and exemplify this statement by propene.
4. How Alkenes converted into Aldehyde? Explain your answer with mechanism of the reaction
5. Explain the ways to recognize the chemical equilibrium.
6. What is substitution reactions, Give mechanism of free radical substitution reaction of Ethane.
7. Catenation increases diversity of organic compounds. Define catenation and explain this statement with suitable examples.
8. Give the systematic names of following compounds.
   i. CH3CH2COCl ii . CH3CN iii. CH3OCH2CH3
9. What is the importance of functional group discuss briefly.
10. Explain the role of hydration in dissolving process.
11. Explore the impact of catalyst on energetics of chemical reactions?
12. Explain the effect of temperature on the rate of reaction, Also write mechanism for following reaction.
    $2NO2 + F2 \rightarrow 2NO2F$ rate= k(NO2)(F2)
13. Give mechanism for reaction of acid catalyzed esterification.
14. What is the mechanism of HCN addition to carbonyl compounds?
15. Define saponification give its chemical reaction?
16. Calculate H+ concentration of an aqueous solution having pH 10.6.
17. Analyze how hydrolysis contribute to pH of solution. Provide examples.
18. Define Ka,PKa, Aso drive the relationship between Ka and Kb.
19. An organic compound C2H4O2. Give followings properties.
    i. Evolve hydrogen with Na metal.
    ii. Forms salts with NaOH.
    iii. Give one method for its preparation.
20. Define solubility product and common ion effect with examples of each. Also justify how Ksp involve to predict the precipitation f reactions.
21. Explain the magnetic behavior of O_2, O_2^+ & N_2.
22. Give free radical mechanism substitution reaction of alkanes with any example
23. Give 5 postulates of VSEPR theory.
24. Write two defects of bohr's model.
25. What is zeeman effect and stark effect?
26. Write electronic configuration of following elements. a. 25Mn 55 b. 32P 64
27. A naturally occurring sample of cerium contains only four isotopes. 136Ce having isotopic mass of 135.91 and %age abundance 0.185%, 138Ce having isotopic mass of 137.91 and %age abundance of 0.25%, 140Ce having isotopic mass of 139.91 and %age abundance of 88.45%. The relative atomic mass of the Ce is 140.116.

Use these data to calculate the relative isotopic mass of the fourth isotope in this sample of cerium

28. For 6f orbital, give allowed values of following quantum numbers.
    i.Principal quantum number ii. Azimuthal quantum number iii. Magnetic quantum number
29. Calculate the mass of Mg metal required to consume 2560g of CO_2 in the reaction

    $2Mg + CO_2 \rightarrow 2MgO + C$ (Atomic mass of C=12, Mg=24, O=16)
30. Calculate covalent bond in 20g of CH_4 gas.
31. Prepare alcohol from any three different methods.
32. Give reasons that tertiary alcohol are not oxidized by acidic KMnO4 or K2Cr2O7?
33. Calculate mass of SO2 that will be produced with 155g of CU from roasting of CuS.

    CuS+ O2 $\rightarrow Cu + SO2$
34. Analyze the relationship between molar volume and Avogadro's number.
35. Graphite in crystalline form of carbon. Calculate followings

    a-How many moles are present in 315mg graphite.b- How many carbon atoms are there.
36. A. Draw molecular orbital energy diagram for nitrogen molecule.
    B. Also give reason why σ2px energy is greater than π2py & π2pz?
37. How can you interpret anomalous behavior of water?
38. Draw the shapes of molecules containing four electron pairs with all its possibilities?
39. Why 3d orbital has greater energy than 4s orbital?
40. Discuss the methods of preparations of amines? How would you prepare Diazonium salt?