REVISION TEST - Jan 2025

XI - Std **CHEMISTRY**

Time : 3.00 Hrs Marks : 70

SECTION – I 15 X 1 = 15

Note: 1) Answer all the questions. 2) Choose the most suitable answer from the given four alternatives and write the option code and the corresponding answer :-

1. Which of the following pairs of d-orbitals will have electron density along the axes ?
   a) d_{z2}, d_{xz} b) d_{xz}, d_{yz} c) d_{z2}, d_{x2-y2} d) d_{xy}, d_{x2-y2}
2. What is the mass of precipitate formed when 50 ml of 8.5 % solution of $AgNO_3$ is mixed with 100 ml of 1.865% potassium chloride solution?
   a) 3.59g b) 7g c) 14g d) 28g
3. Which of the following is amphoteric ?
   a) $Ca(OH)_2$ b) $Mg(OH)_2$ c) $Ba(OH)_2$ d) $Be(OH)_2$
4. **Assertion :** Permanent hardness of water is removed by treatment with washing soda.
   Reason : Washing soda reacts with soluble calcium and magnesium chlorides and sulphates in hard water to form insoluble carbonates
   a) Both assertion and reason are true and reason is the correct explanation of assertion.
   b) Both assertion and reason are true but reason is not the correct explanation of assertion.
   c) Assertion is true but reason is false d) Both assertion and reason are false
5. The name of the magnetic material used in adiabatic process of liquefaction of gas is
   a) Magnesium sulphate b) Gadolinium sulphate c) Gadolinium chloride d) silver chloride
6. Choose the correct pair:
   a) Sodium Lilac b) Calcium Yellow c) Barium Apple green d) Potassium Crimson red
7. The correct thermodynamic conditions for the spontaneous reaction at all temperature is
   a) $\Delta H < 0$ and $\Delta S > 0$ b) $\Delta H < 0$ and $\Delta S < 0$
   c) $\Delta H > 0$ and $\Delta S = 0$ d) $\Delta H > 0$ and $\Delta S > 0$
8. Which sequence for green house gases is based on GWP?
   a) CFC > N_2O > CO_2 > CH_4 b) CFC > CO_2 > N_2O > CH_4
   c) CFC > N_2O > CH_4 > CO_2 d) CFC > CH_4 > N_2O > CO_2
9. Among the following compounds, which has the highest boiling point?
   a) n-Butyl chloride b) Isobutyl chloride c) t-Butyl chloride d) n-propyl chloride
10. The compounds formed at anode in the electrolysis of an aqueous solution of potassium acetate are
    a) CH_4 and H_2 b) CH_4 and CO_2 c) C_2H_6 and CO_2 d) C_2H_4 and Cl_2
11. Decreasing order of nucleophilicity is
    a) OH^- > NH_2^- > $-OCH_3$ > RNH_2 b) NH_2^- > OH^- > $-OCH_3$ > RNH_2
    c) NH_2^- > CH_3O^- > OH^- > RNH_2 d) CH_3O^- > NH_2^- > OH^- > RNH_2
12. How many cyclic and acyclic isomers are possible for the molecular formula C_3H_6O?
    a) 4 b) 5 c) 9 d) 10
13. Of the following molecules, which have shape similar to carbon dioxide?
    a) $SnCl_2$ b) NO_2 c) C_2H_2 d) All of these.
14. In the reaction $Fe(OH)_{3(s)} \rightleftharpoons Fe^{3+}{}_{(aq)} + 3OH^-$ (aq), if the concentration of OH^- ions is decreased by 1/4 times, then the equilibrium concentration of Fe^{3+}
    a) will not be changed b) also decreased by 1/4 times
    c) increase by 4 times d) increase by 64 times
15. Which one of the following gases has the lowest value of Henry's law
    a) N_2 b) He c) CO_2 d) H_2

SECTION – II

Answer any six questions and question number 20 is compulsory :- 6 X 2 = 12

16. What is water-gas shift reaction ?
17. Define equivalent mass.
18. State Boyle's law.
19. What is lattice energy?
20. Calculate the molality of the solution containing 45 g of glucose dissolved in 2 kg of water.
21. What type of hybridisations are possible in the following geometries?
    a) octahedral b) square planer.
22. Identify the functional group in the following compounds.
    a) acetaldehyde b) oxalic acid
23. How will you prepare chloropicrin and mention it's use.
24. What is green chemistry?

SECTION – III

Answer any six questions and question number 33 is compulsory :- 6x3=18

25. Discuss the three types of Covalent hydrides.
26. Explain briefly the time independent schrodinger wave equation?
27. Write balanced chemical equation for each of the following chemical reactions.
    (i) Lithium metal with nitrogen gas (ii) heating calcium carbonate (iii) heating calcium with oxygen
28. Explain the effect of pressure on the solubility.
29. Describe Fajan's rule.
30. Write short notes on Column Chromatography .
31. Explain inductive effect with examples.
32. Calculate the lattice energy of $CaCl_2$ from the given data

$$Ca(s)+Cl_2(g)\rightarrow CaCl_2(s)\Delta H_1^0=-795kJmol^{-1}$$

$$Atomisation: Ca(s)\rightarrow Ca(g) \qquad \Delta H_1^0=+121kJmol^{-1}$$

$$Ionisation: Ca(g)\rightarrow Ca^{2+}(g)+2e^- \qquad \Delta H_2^0=+2422kJmol^{-1}$$

$$Dissociation: Cl_2(g)\rightarrow 2Cl(g) \qquad \Delta H_3^0=+242.8kJmol^{-1}$$

$$Electronaffinity: Cl(g)+e^-\rightarrow Cl^-(g) \qquad \Delta H_4^0=-355kJmol^{-1}$$

33. Distinguish : BOD and COD .

SECTION – IV

Answer all the questions :- 5 x 5 = 25

34. A. i) Explain the Pauling method for the determination of ionic radius (3)
    ii) Explain the diagonal relationship. (2) ***(OR)***
    B. i) How is plaster of paris prepared? Give its uses. (3)
    ii) Give the systematic names for the following. 1) trona 2) caustic potash (2)
35. A. i) What do you understand by the term mole? (2)
    ii) Calculate the empirical and molecular formula of a compound containing 76.6% carbon, 6.38% Hydrogen and rest Xxygen, its vapour density is 47. (3) ***(OR)***
    B. i) Derive De Broglie equation. (3) ii) Explain Aubau principle. (2)
36. A. i) Distinquish between diffusion and effusion. (3)
    ii) Aerated cold drinks are kept under cooling before opening during summer. why? (2) ***(OR)*** B. Derive the general expression for the equilibrium constants Kp and Kc for the reaction. (5) $PCl_5(g) \rightleftharpoons PCl_3(g)+Cl_2(g)$
37. A. i) Expalain Markownikoff's rule with suitable example. (3)
    ii) How does aromaticity of a compound decided by using Huckel rule. (2) ***(OR)***
    B. i) Explain mechanism of E2 reaction. (2)
    ii) What are Freons? Explain how they are named with a suitable example. (3)
38. A. i) What are ideal and non – ideal solution? (2)
    ii) What is Van't Hoff factor? Calculate the Van't Hoff factior for acetic acid. (3)
    (OR) B. i) In CH_4, NH_3 and H_2O, the central atom undergoes sp^3 hybridisation – yet their bond angles are different why? (3) ii) Which bond is stronger σ or π why? (2)