VILLUPURAM DIST.

Class : 11

Register Number

COMMON QUARTERLY EXAMINATION 2024 - 25

CHEMISTRY

Time Allowed : 3.00 Hours] [Max. Marks : 70

PART – I

15x1=15

I. **Answer the following:**

1. An ion (or atom) in a compound is replaced by an atom (or ion) of another element are called ---------- reactions.
   a) Oxidation b) Reduction c) displacement d) Disproportionate
2. What would be the IUPAC name for an element with atomic number 112?
   a) Nilnilbium b) Unbibium c) Ununbium d) Bibibium
3. Which of the following element will have the highest electron affinity?
   a) Chlorine b) Nitrogen c) Cesium d) Fluorine
4. Water gas is ----------
   a) H_2O (g) b) $CO + H_2O$ c) $CO + H_2$ d) $CO + N_2$
5. The value of the gas constant R is ----------
   a) 0.082 dm^3atm b) 0.987 cal $mol^{-1} K^{-1}$ c) 8.3 J $mol^{-1}K^{-1}$ d) 8 erg $mol^{-1}K^{-1}$
6. The work done by the liberated gas when 55.85 g of iron (molar mass 55.85 g mol^{-1}) reacts with hydrochloric acid in an open beaker at 25°C
   a) – 2.48 kJ b) – 2.22 kJ c) + 2.22 kJ d) + 2.48 kJ
7. Δng value for the reaction $2NH_{3(g)} \rightleftharpoons N_{2(g)} + 3H_{2(g)}$?
   a) -2 b) 2 c) 1 d) 0
8. In which of the following equilibrium, K_P and K_C are equal?
   a) $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g) + O_2(g)$ b) $2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$
   c) $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$ d) $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$
9. Select the molecule which has only one π bond.
   a) $CH_3 – CH = CH – CH_3$ b) $CH_3 – CH = CH – CH = CH_2$
   c) $CH_3 – CH = C = C – CH_3$ d) All of these
10. The isomer of ethanol is ----------
    a) Acetaldehyde b) Dimethyl ether c) Acetone d) Methyl carbinol
11. In a chemical equilibrium, the rate constant for the forward reaction is 2.5×10^2 and the equilibrium constant is 50. The rate constant for the reverse reaction is ----------
    a) 11.5 b) 5 c) 2×10^2 d) 2×10^{-3}
12. The IUPAC name of the compound $CH_3–CH= CH – C \equiv CH$ is ----------
    a) Pent - 4 - yn-2-ene b) Pent -3-en-l-yne
    c) pent – 2– en – 4 – yne d) Pent – 1 – yn –3 –ene
13. Volume strength of 1.5N H_2O_2 is ----------
    a) 1.5 b) 4.5 c) 16.8 d) 8.4
14. Which of the following species is not electrophilic in nature?
    a) Cl^+ b) BH_3 c) H_3O^+ d) $^+NO_2$
15. What is the hybridisation state of benzyl carbonium ion?
    a) sp^2 b) spd^2 c) sp^3 d) sp^3d

PART – II

Answer any 6 questions. (Question number 24 is compulsory) 6x2=12

16. Define equivalent mass.
17. State Hund's rule
18. What are isoelectronic ions? Give examples.
19. Explain the exchange reactions of deuterium

20. Explain why aerated water bottles are kept under water during summer?
21. Write Graham's law of diffusion
22. Show the heterolysis of covalent bond by using curved arrow notation and complete the following equations. Identify the nucleophile is each case
    i) $CH_3 - Br + KOH \rightarrow$ ii) $CH_3 - O-CH_3 + HI \rightarrow$
23. Explain how will you predict thedirection of a equilibrium reaction
24. Give the IUPAC names for the following compounds
    i) t-butyl alcohol ii) m-dinitro benzene

PART – III

Answer any 6 questions. Question number 33 is compulsory. 6x3=18

25. Balance the following equations by oxidation number method
    $Cu + HNO_3 \rightarrow Cu(NO_3)_2 + NO_2 + H_2O$
26. Give the electronic configuration of Cu and Cr
27. Explain the pauling method for the determination of ionic radius
28. How do you convert para hydrogen into ortho hydrogen?
29. What is Joule-Thomson effect?
30. Write down the Born-Haber cycle for the formation of NaCl
31. State Le-Chatelier principle
32. Explain inductive effect with suitable example.
33. 0.24g of an organic compound gave 0.287 g of silver chloride in the carius method. Calculate the percentage of chlorine in the compound.

PART – IV

Answer all the questions. 5x5=25

34. a) A Compound on analysis gave Na = 14.31% S = 9.97% H= 6.22% and O= 69.5% calculate the molecular formula of the compound, if all the hydrogen in the compound is present in combination with oxygen as water of crystallization. (molecular mass of the compound is 322).

(OR)

b) Explain i) Azimuthal quantum number (3)
ii) Spin quantum number (2)

35. a) i) Define electron affinity(2)
ii) Explain the periodic trend of ionisation potential. (3)

(OR)

b) i) Write the uses of Hydrogen. (2)
ii) Define H-bonding. Explain the types of H-bonding with examples.(3)

36. a) Derive the values of critical constants in terms of van der Waals constants.

(OR)

b) Derive the relation between ΔH and ΔU for an ideal gas.

37. a) State the various statements of second law of thermodynamics.

(OR)

b) Derive the relation between K_p and K_c.

38. a) i) What are enantiomers? Give example (2)
ii) Write any five possible isomers for $C_4H_{10}O$ (3)

(OR)

b) i) Difference between electrophiles & nucleophiles (3)
ii) Write note on 'Resonance'. (2)