QUARTERLY EXAMINATION - 2024 | 11 - STD

CHEMISTRY

| Marks 70 | Time 3.00 Hrs. |

PART - I

I. Choose the correct answer.   15 × 1 = 15

1. Which one of the following is used as standard for atomic mass?
   a) $_6C^{12}$ b) $_6C^{12}$ c) $_6C^{13}$ d) $_6C^{14}$

2. The equivalent mass of a trivalent metal element is 9 g ef $^{-1}$ the molar mass of its anhydrous oxide is
   a) 102 g b) 27 g c) 170 g d) 78 g

3. a macroscopic particle of mass 100g and moving at a velocity of 100 cm s^{-1} will have de Broglie wavelength of
   a) 6.6×10^{-29} cm b) 6.6×10^{-30} cm c) 6.6×10^{-31} cm d) 6.6×10^{-32} cm

4. The element with positive electron gain enthalpy is
   a) Hydrogen b) Sodium c) Argon d) Fluorine

5. In a given shell the order of screening effect is
   a) s > p > d > f b) s > p > f > d c) f > d > p > s d) f > p > s > d

6. Water gas is
   a) $H_2O_{(g)}$ b) $CO + H_2O$ c) $CO + H_2$ d) $CO + N_2$

7. Half life period of Tritium is
   a) 12.3 years b) 13.2 years c) 12.3 months d) 13.2 months

8. Maximum deviation from ideal gas is expected from
   a) $CH_{4(g)}$ b) $NH_{3(g)}$ c) $H_{2(g)}$ d) $N_{2(g)}$

9. In an adiabatic process, which of the following is true?
   a) q = w b) q = 0 c) $\Delta E = q$ d) $P \Delta V = 0$

10. The correct thermodynamic conditions for the spontaneous reaction at all temperature is
    a) $\Delta H < 0 , \Delta S > 0$ b) $\Delta H < 0 ; \Delta S < 0$ c) $\Delta H > 0 ; \Delta S = 0$ d) $\Delta H > 0 ; \Delta S > 0$

11. In which of the following equilibrium, Kp and Kc are not equal ?
    a) $2 NO \rightleftharpoons N_2 + O_2$ b) $SO_2NO_2 \rightleftharpoons SO_3 + NO$ c) $H_2 + I_2 \rightleftharpoons 2HI$ d) $PCl_5 \rightleftharpoons PCl_3 + Cl_2$

12. The isomer of ethanol is
    a) acetaldehyde b) dimethyl ether c) acetone d) methyl carbinol

13. In an organic compound phosphorous is estimated as
    a) $Mg_2P_2O_7$ b) $Mg_3(PO_4)_2$ c) H_3PO_4 d) P_2O_5

14. What is the hybridisation state of benzyl carbornium ion?
    a) SP^2 b) SPd^2 c) SP^3 d) SP^2d

15. The geometrical shape of carbocation is
    a) Linear b) tetrahedral c) planar d) pyramidal

PART - II

Answer any six questions. Q.No. 24 is compulsory.   6 × 2 = 12

16. State Avogadro's law.

17. State Aufban principle.

18. What are isoelectronic ions?

19. Write the uses of heavy water.

20. Define inversion temperature.

21. Calculate the entropy change during the melting of one mole if ice into water at 0°C and 1 atm pressure. Enthalpy of fusion of ice is 6008 J mole^{-1}.

22. State law of mass action.

23. Define sublimation. Give an example.

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24. Identify the functional group for the following compounds.
   i) Acetone   ii) oxtoxy ethane   iii) Butanal   iv) methanol

PART - III

Answer any six questions. Q.No. 33 is compulsory.   6 x 3 = 18

25. Derive De-Broglie equation.
26. Write note on diagonal relationship.
27. How will you convert para hydrogen to ortho hydrogen?
28. Write any three characters of internal energy
29. Differentiate Homogeneous and hetrogeneous equilibrium.
30. What is functional isomerism? Give an example
31. Write structural formula for the following compounds.
   i) m-dinitro benzene   ii) p-dichloro benzene   iii) 1, 3, 5 - Trimethyl benzene
32. Differentiate nucleophile and electrophile
33. Calculate the molar mass of the following compounds
   i) Glucose $(C_6H_{12}O_6)$ ii) Ethanol (C_2H_5OH) iii) Urea $CO(NH_2)_2$

PART - IV

Answer all the questions.   5 x 5 = 25

34. a) i) Differentiate Oxidation and reduction
   ii) Calculate oxidation number of underline element in the following compounds
   1) $\underline{C}O_2$ 2) $H_2\underline{S}O_4$ 3) $\underline{Cr}_2O_7$

(OR)

   b) Calculate the empirical and molecular formula of a compound containing 7.. carbon, 6.38% hydrogen and rest of oxygen its vapour density is 47.

35. a) Explain principal quantum number and azimuthal quantum number (OR)
   b) i) State modern periodic law.
   ii) Write the characteristics of transition elements.

36. a) i) What are the three types of covalent hydrides?
   ii) Write any three characters of Gibbs free energy.

(OR)

   b) Derive critical constant value from Van der Walls constant

37. a) i) State Le-Chatelier's principle.
   ii) Derive relation between Kp and Kc.   (OR)
   b) Write the IUPAC name for the following compounds.

(i) $CH_3-CH_2-CH-CH_2-CH_3$
                      $|$
                      CH_3

(ii)
               CH_3
               $|$
       CH_3-C-OH
               $|$
               CH_3

(iii) CH_3-O-CH_3 (iv) CH_3CH_2COOH (v) $CH_3-CH_2-\overset{\overset{O}{||}}{C}-CH_2-CH_3$

38. a) i) Explain cis trans isomerism with example.
   ii) Define enantiomers.

(OR)

   b) i) 0.284 g of an organic substance gave 0.287 g AgCl in a carius method for the estimation of halogen. Find the percentage of Cl in the compound.
   ii) What is resonance?

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