Class : 11

Register Number

COMMON HALF YEARLY EXAMINATION, 2025 - 26

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

PART – I

I. Choose the correct answer. 15x1=15

1. Which one of the following represents 180g of water?
   a) 5 moles of water
   b) 90 moles of water
   c) $\frac{6.022 \times 10^{23}}{180}$ molecule of water
   d) 6.022×10^{24} molecules of water
2. Two electrons occupying the same orbital are distinguished by
   a) Azimuthal quantum number
   b) Spin quantum number
   c) Magnetic quantum number
   d) Orbital quantum number
3. How does electron affinity change when we move from left to right in a period in the periodic table?
   a) Generally increased
   b) Generally Decreases
   c) Remains unchanged
   d) First increases and then decreases
4. Ionic hydrides are formed by
   a) Halogens b) Chalcogens c) Inert gas d) Group one elements
5. When CaC_2 is heated in atmospheric nitrogen in an electric furnace the compound formed is
   a) $Ca(CN)_2$ b) CaNCN c) CaC_2N_2 d) $CaNC_2$
6. What is the density of N_2 gas at 227° C and 5.00 atm pressure? [R=0.082 L atm $k^{-1}mol^{-1}$]
   a) 1.40 g / L b) 2.81 g/ L c) 3.41 g/ L d) 0.29 g /L
7. Heat of Combustion is always
   a) positive b) negative c) zero d) either positive or negative
8. An Equilibrium constant for a reaction at room temperature is k_1 and that at 700 K is k_2 if $k_1 > k_2$ then
   a) The forward reaction is endothermic
   b) The forward rection is endothermic
   c) The reaction does not attain equilibrium
   d) The reserve reaction is exothermic
9. **Assertion** : An ideal solution obey's Raoults law
   Reason : In an ideal solution solvent - Solvent as well as solute - solute interactions are similar to solute - solvent interactions.
   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
10. In which of the following compounds does the central atom obey the octet rule
    a) XeF_4 b) $AlCl_3$ c) SF_6 d) SCl_2
11. The Isomer of ethanol is
    a) Acetaldehyde b) Dimethyl ether c) Acetone d) Methyl Carbinol
12. The Geometrical shape of carbocation is
    a) Linear b) tetrahedral c) planar d) pyramidal
13. Which of the following is optically active
    a) 2- methyl Pentane b) Citric Acid c) Clycerol d) None of these
14. The name of $C_2F_4Cl_2$ is
    a) Freon - 112 b) Freon - 113 c) Freon - 114 d) Freon - 115
15. Bhopal Gas Tragedy is a case of
    a) Thermal Pollution b) Air Pollution c) Nuclear Pollution d) Land Pollution

PART - II

II. Answer any six questions. Question No. 24 is compulsory. 6x2=12

16. How many Orbitals are possible for n =4?
17. What is water gas shift reaction?
18. How is plaster of paris Prepared?
19. Explain intensive properties with two examples?
20. Define Bond order?
21. Write short notes on Resonance.
22. Which is considered to be earth's protective umbrella? Why?
23. Write a note on Williamson Ether Synthesis.
24. If 45g of glucose is dissolved in 2 kg of water, Calculate the molarity of the solution.

PART - III

III. Answer any six questions. Question No. 33 is compulsory. 6x3=18

25. **Calculate the oxidation number of underlined elements.**
    a) $K\underline{Mn}O_4$ b) $\underline{O}F_2$
26. Explain the Diagonal relationship?
27. What is Bleaching powder? How is it prepared?
28. State Joule - Thomson Effect?
29. If there is no change in concentration why is the equilibrium state considered dynamic.
30. What is Osmosis and Osmotic Pressure?
31. What is Functional group? Give Two examples?
32. What happen when acetylene undergoes Ozonolysis.
33. Complete the following reactions.

    i) $CCl_4 + H_2O \xrightarrow{\Delta}$ ii) $CH_3CH=CH_2 \xrightarrow{\text{Peroxide}}$

PART - IV

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 % find the Empirical formula of the compound. (5)

    (OR)

    b) i) Describe the Aufbau principle. (3)
    ii) Give the General electronic configuration of lanthanides and Actinides. (2)

35. a) i) Discuss the three types of Covalent hydrides. (3)
    ii) State Boyle's Law. (2)

    (OR)

    b) Describe briefly the biological importance of calcium and magnesium. (5)

36. a) Derive K_p and K_c for the formation of HI. (5)

    (OR)

    b) i) State Clausius statement of second law of thermodynamics. (2)
    ii) What are Colligative properties? List any three. (3)

37. a) Draw the M.O diagram for oxygen molecule calculate its bond order and show that O_2 is Paramagnetic. (5)

    (OR)

    b) i) What are Electrophiles and Nucleophiles? Give suitable examples for each. (3)
    ii) Write IUPAC name for the following compounds. (2)
    a) $CH_3-CH=CH-CH_3$ b) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-C\equiv CH$

38. a) Explain any three types of structural isomerism in organic compounds. (5)

    (OR)

    b) i) What is Green Chemistry? (2)
    ii) How will you prepare acetic acid using Grignard reagent? (3)