# COMMON HALF YEARLY EXAMINATION - 2025

## Standard XI

Reg.No. | | | | | | |

## CHEMISTRY

*Time : 3.00 hrs* — **Part – I** — *Marks : 70*

**I. Choose the correct answer:** 15 x 1 = 15

1. The correct increasing order of the oxidation state of sulphur in the anions $SO_4^{2-}$, $SO_3^{2-}$, $S_2O_4^{2-}$, $S_2O_6^{2-}$ is
   a) $SO_3^{2-} < SO_4^{2-} < S_2O_4^{2-} < S_2O_6^{2-}$ b) $SO_4^{2-} < S_2O_4^{2-} < S_2O_6^{2-} < SO_3^{2-}$
   c) $S_2O_4^{2-} < SO_3^{2-} < S_2O_6^{2-} < SO_4^{2-}$ d) $S_2O_6^{2-} < S_2O_4^{2-} < SO_4^{2-} < SO_3^{2-}$
2. The maximum number of electrons in a subshell is given by the expression
   a) $2n^2$ b) $2\ell + 1$ c) $4\ell + 2$ d) none of these
3. What would be the IUPAC name for an element with atomic number 222 ?
   a) bibibiium b) bididium c) didibium d) bibibium
4. Tritium nucleus contains
   a) 1p+ 0n b) 2p+1n c) 1p+2n d) none of these
5. The name 'Blue John' is given to which of the following compounds?
   a) $CaH_2$ b) $CaF_2$ c) $Ca_3(PO_4)_2$ d) CaO
6. Maximum deviation from ideal gas is expected from
   a) $CH_{4(g)}$ b) $NH_{3(g)}$ c) $H_{2(g)}$ d) $N_{2(g)}$
7. $\Delta S$ is expected to be maximum for the reaction
   a) $Ca_{(s)} + \frac{1}{2} O_{2(g)} \rightarrow CaO_{(s)}$ b) $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$
   c) $N_{2(g)} + O_{2(g)} \rightarrow 2NO_{(g)}$ d) $CaCO_{3(s)} \rightarrow CaO_{(s)} + CO_{2(g)}$
8. Equimolar concentrations of $H_2$ and $I_2$ are heated to equilibrium in a 1 litre flask. What percentage of initial concentration of $H_2$ has reacted at equilibrium if rate constant for both forward and reverse reactions are equal.
   a) 33% b) 66% c) (33)²% d) 16.5%
9. According to Raoults law, the relative lowering of vapour pressure for a solution is equal to
   a) mole fraction of solvent b) mole fraction of solute
   c) number of moles of solute d) number of moles of solvent
10. Which of the following is electron deficient?
    a) $PH_3$ b) $(CH_3)_2$ c) $BH_3$ d) $NH_3$
11. The IUPAC name of the compound $CH_3 - \underset{\displaystyle OH}{\underset{|}{CH}} - COOH$ is
    a) 2– Hydroxy propionic acid b) 2–Hydroxy propanoic acid
    c) Propan–2–ol–1–oic acid d) 1–carboxyethanol
12. Which of the group has highest +I effect?
    a) $CH_3$– b) $CH_3$–$CH_2$– c) $(CH_3)_2$–CH– d) $(CH_3)_3$–C–
13. $C_2H_5Br + 2Na \xrightarrow{\text{dry ether}} C_4H_{10} + 2NaBr.$
    The above reaction is an example of which of the following?
    a) Reimer–Tiemann reaction b) Wurtz reaction
    c) Aldol Condensation d) Hoffmann reaction

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 6 questions. (Q.No.24 is compulsory)** **6 x 2 = 12**

16. Define equivalent mass.
17. Give the electronic configuration of $Mn^{2+}$ and $Cr^{3+}$.
18. What are isoelectronic ions? Give example.
19. State Boyle's law.
20. What is lattice energy?
21. State law of mass action.
22. What is meant by functional group? Identify the functional group in the following Compounds:
    a) Acetaldehyde b) Oxalic acid c) Dimethyl ether d) Methylamine
23. Define Smog.
24. Complete the following : (i) 2–butyne $\xrightarrow{\text{Lindlar catalyst}}$ (ii) $\underset{\text{Br}}{\overset{\text{CH}_2-\text{CH}_2}{|\quad|}}{}_{\text{Br}} \xrightarrow{\text{Zn / } C_2H_5OH}$

**Part - III**

**III. Answer any 6 questions. (Q.No.33 is compulsory)** **6 x 3 = 18**

25. Distinguish between Oxidation and Reduction.
26. State Aufbau's principle
27. Explain the exchange reactions of deuterium.
28. Give the uses of gypsum.
29. List the characteristics of Gibbs free energy (any 3)
30. What type of hybridisations are possible in the following geometries.
    a) Octahedral b) Tetrahedral c) Square planar
31. Briefly explain geometrical isomerism in alkene by considering 2-butene as an example.
32. Explain Markownikoff's rule with suitable example.
33. An organic compound (A) with molecular formula $C_2H_5Cl$ reacts with KOH gives compounds (B) and with alcoholic KOH gives compound (C) Identify (A), (B), and (C)

**Part - IV**

**IV. Answer all the questions.** **5 x 5 = 25**

34. a) Calculate the empirical and molecular formula of a compound containing 76.6%. carbon, 6.38% hydrogen and rest oxygen its vapour density is 47. ***(OR)***
    b) Write the postulates of Bohr's atom model.
35. a) Briefly give the basis for Pauling's scale of electronegativity. ***(OR)***
    b) Derive the values of critical constant in terms of Vander Waals Constant.
36. a) State the various statements of Second law of Thermodynamics. ***(OR)***
    b) Derive the relation between Kp and Kc.
37. a) Draw Mo diagram of CO and calculate its bond order. ***(OR)***
    b) Describe the classification of organic compounds based on their structure.
38. a) Starting from $CH_3MgI$, How will you prepare the following?
    i) Acetic acid (ii) Acetone (iii) Methyl cyanide ***(OR)***
    b) How is acid rain formed? Explain its effect.

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