

# COMMON HALF YEARLY EXAMINATION - 2025

A

Standard XI

Reg.No.

CHEMISTRY

Time : 3.00 hrs

Part - I

Marks : 70

15 x 1 = 15

I. Choose the correct answer:

1. 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
2. Carbon forms two oxides, namely carbon monoxide and carbon dioxide. The equivalent mass of which element remains constant?
  - a) Carbon
  - b) Oxygen
  - c) Both carbon and oxygen
  - d) Neither carbon nor oxygen
3. 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)  $f > p > s > d$
4. Water is a \_\_\_\_\_.
  - a) Basic oxide
  - b) Amphoteric oxide
  - c) Acidic oxide
  - d) None of these
5. The suspension of slaked lime in water is known as \_\_\_\_\_.
  - a) Lime water
  - b) Quick lime
  - c) Milk of lime
  - d) Aqueous solution of slaked lime
6. Use of hot air balloon in sports and metrological observation is an application of
  - a) Boyle's law
  - b) Newton's law
  - c) Kelvin's law
  - d) Brown's law
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. Solubility of carbon dioxide gas in cold water can be increased by.
  - a) Increase in pressure
  - b) Decrease in pressure
  - c) Increase in volume
  - d) None of these
9. Osmotic pressure of a solution is given by the relation
  - a)  $\pi = nRT$
  - b)  $\pi V = nRT$
  - c)  $\pi RT = n$
  - d) None of these

10. The isomer of ethanol is \_\_\_\_\_.
- a) Acetaldehyde    b) Dimethyl ether    c) Acetone    d) Methyl carbinol
11. Assertion : Oxygen molecule is paramagnetic  
Reason : It has two unpaired electron in its bonding molecular orbital
- a) Both assertion andr reason are true and reason is the correct explanation of assertion  
b) Both assertion andr 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
12. Hyper conjugation is also known as
- a) No bond resonance    b) Baker-Nathan effect  
c) Both (a) and (b)    d) None of these
13. Among the following, which is meta directing group?
- a)  $-NH_2$     b)  $-NO_2$     c)  $-OCH_3$     d)  $-OH$
14. The name of  $C_2F_2Cl_2$  is
- a) Freon - 111    b) Freon - 113    c) Freon - 112    d) Freon - 11
15. The pH of normal rain water is
- a) 6.5    b) 7.5    c) 5.6    d) 4.6

## Part - II

II. Answer any 6 questions. (Q.No.24 is compulsory)

6 x 2 = 12

16. What do you understand by the term mole.
17. State Heisenberg's uncertainty principle.
18. Why sodium hydroxide is much more water soluble than sodium chloride?
19. Give the mathematical expression of compressibility factor 'Z'
20. Define Third law of Thermodynamics.
21. Define the term 'Isotonic solution'.
22. What is meant by a functional group? Identify the functional group in the following compounds.
- a) Acetaldehyde    b) Methylamine
23. What are electrophiles and nucleophiles? Give suitable examples for each.
24. How many moles of solute particles are present in in one litre of  $10^{-4}M$  potassium sulphate?

## Part - III

6 x 3 = 18

III. Answer any 6 questions. (Q.No.33 is compulsory)

25. Calculate the molar mass of the following compounds.

i) Urea  $[\text{Co}(\text{NH}_2)_2]$

ii) Acetone  $[\text{CH}_3\text{COCH}_3]$

iii) Boric acid  $[\text{H}_3\text{BO}_3]$

26. What are isoelectronic ions? Give examples.

27. Mention the uses of deuterium.

28. State Le-Chatelier principle.

29. Draw the Lewis structures for the following species.

i)  $\text{HNO}_3$

ii)  $\text{NH}_3$

30. Define entropy. What is the unit of entropy?

31. Explain the preparation of DDT.

32. Differentiate BOD and COD.

33. Identify the compound A, B, C in the following series of reactions.



## Part - IV

IV. Answer all the questions.

5 x 5 = 25

34. a) i) Calculate the empirical formula of a compound containing 76.6% carbon, 6.38% hydrogen and rest oxygen.

ii) Write a short note on azimuthal quantum number.

(OR)

b) Explain the Pauling method for the determination of ionic radius.

35. a) i) Discuss the three types of covalent hydrides.

ii) Give the electronic configuration of  $\text{Mn}^{2+}$  and  $\text{Cr}^{3+}$

(OR)

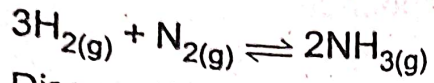
b) List the characteristics of Gibbs free energy.

36. a) i) State Raoult's law.

ii) Explain the correction term for volume in the Vander waals equation.

(OR)

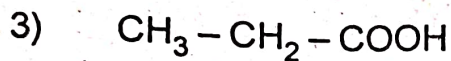
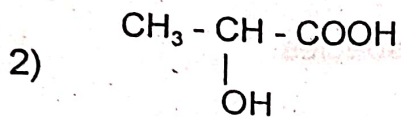
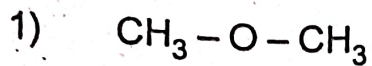
- b) Derive a general expression for the equilibrium constant  $K_p$  and  $K_c$  for the reaction.



37. a) Discuss the formation of  $\text{O}_2$  molecule using MO Theory with diagram.

(OR)

- b) i) Give the IUPAC name of the following compounds.



- ii) Compare  $\text{S}_\text{N}1$  and  $\text{S}_\text{N}2$  reaction mechanisms.

38. a) i) Starting from  $\text{CH}_3\text{MgI}$ , how will you prepare the following?

1) Acetic acid

2) Isopropyl alcohol

- ii) How does Huckel rule help to decide the Aromatic character of a compound?

(OR)

- b) What are the various methods you suggest to protect our environment from pollution?

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