Class : 11

COMMON HALF YEARLY EXAMINATION 2024 - 25

CHEMISTRY

Time Allowed : 3.00 Hours]

[Max. Marks : 70

I. Choose the most appropriate answer from the give four alternativesand write the option code and the corresponding answer.   15x1=15

1. Which of the following contain same number of carbon atoms as in 6 g of carbon-12.
    a) 7.5 g ethane
    b) 8 g methane
    c) both (a) and (b)
    d) None of these

2. What is the maximum number of electrons that can be associated with the following set of quantum numbers? n = 3 ; l = 1 and m = -1
    a) 4
    b) 6
    c) 2
    d) 10

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) Acidic oxide
    c) Amphoteric oxide
    d) None of these

5. Assertion : Generally alkali and alkaline earth metals form superoxide.
    Reason : There is a single bond between O and O in superoxides.
    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

6. We achieved _____ temperature by removing the magnetic property of Gadolinium Sulphate.
    a) 40 K
    b) -40 K
    c) 10^{-4} K
    d) 10^4 K

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

8. $\dfrac{K_c}{K_p}$ for the reaction, $N_{2(g)} + 3H_2 \rightleftharpoons 2NH_{3(g)}$ is
    a) $\dfrac{1}{RT}$
    b) $\sqrt{RT}$
    c) RT
    d) $(RT)^2$

9. Which of the following concentration terms is / are independent of temperature.
    a) Molality
    b) Molarity
    c) Mole Fraction
    d) (a) and (c)

10. Shape of XeF_4 is
    a) Octahedral
    b) Square plannar
    c) "T" shape
    d) None of these

11. The purity of an organic compound is determined by
    a) Chromatography
    b) Crystallisation
    c) Melting or boiling process
    d) Both (a) and (c)

12. Which of the following species does acts as a Nucleophile?
    a) RX
    b) ROR
    c) CH_3Br
    d) BF_3

13. Which of the following compounds will not undergo Friedal - crafts reactions easily?
    a) Nitro benzene
    b) Toluene
    c) Cumene
    d) Xylene

14. The raw material for Rasching process
    a) Chlorobenzene
    b) Phenol
    c) Benzene
    d) Anisole

15. Ozone depletion will cause --------------
    a) Forest fires
    b) Eutrophication
    c) Bio magnification
    d) Global warming

PART – II

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

16. Define the Aufban Principle.
17. How do you convert para hydrogen into Ortho hydrogen?
18. State Graham's law of Diffusion.
19. Define Molar Heat Capacity. Give it's unit.

TPR / 11 / Che / 1A

20. Draw the Lewis structure for the following species.
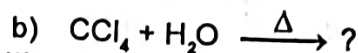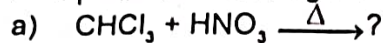   (i) SO_4^{2-} (ii) HNO_3

21. Identifly the functional group in the following compounds.
    (i)   di methyl ether   (ii)   2 - methyl butanal

22. Explain Birch Reduction.

23. Write a short note on BOD.

24. Complete the following reactions.
    a) $CHCl_3 + HNO_3 \xrightarrow{\Delta} ?$ b) $CCl_4 + H_2O \xrightarrow{\Delta} ?$

PART – III

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

25. Distinguish between Oxidation and Reduction.

26. How many radial nodes for 2s, 5d, 4f orbitals exhibit? How many Angular nodes?

27. Explain Diagonal Relationship.

28. How is Plaster of Paris prepared? Write it's one use?

29. The equilibrium concentration of NH_3, N_2 and H_2 are 1.8×10^{-2} m, 1.2×10^{-2} m and 3×10^{-2} m respectively. Calculate the equilibrium constant for the formation of NH_3 from N_2 and H_2

30. Define (i) Osmosis   (ii)   Osmotic pressure

31. Explain Electromeric Effect.

32. How do react ethylene with Baeyer's Reagent.

33. A Hydro Carbon C_3H_8 (A) reacts with HBr to form compound (B). Compound (B) reacts with aqueous Potassium hydroxide to give (c) of molecular formula C_3H_8O. What are (A), B and (C). Explain the reactions.

PART – IV

IV.   **Answer all the questions.**   5x5 =25

34. a)   i) A compound on analysis gave the following. Percentage composition C = 54.55%, H = 9.09% O = 36.36%. Determine the empirical formula of the compound.
       ii) Write short note on Principal quantum number.
(OR)
    b)   i) Discuss any three similarities between Lithium and Magnesium.
       ii) Write the biological importance of Sodium and Potassium.

35. a)   i) Explain the Pauling method for the determination of Ionic Radices.
       ii) Mention the uses of Deuterium.
(OR)
    b)   State the various statements of Second law of Thermodynamics.

36. a)   Dervie the values of Critical constants in terms of Van der Waals constants.
(OR)
    b)   i) Derive a expression for K_P and K_c for the formation of HI.
       ii) State Henry's law.

37. a)   Discuss the formation of N_2 molecule using MO theory with diagram.
(OR)
    b)   i) Give the IUPAC name for the following compounds.
         A) $CH_3 - C \equiv C - \underset{\underset{Cl}{|}}{CH} - CH_3$ B) $CH_3 - CH_2 - \underset{\underset{OH}{|}}{CH} - CHO$ C) $CH_3 - CH_2 - \underset{\overset{||}{O}}{C} - OH$
       ii) State Inductive Effect.

38. a)   i) How will you prepare Toluene from Benzene.
       ii) Write Finkelstein Reaction.
(OR)
    b)   i) Differentiate Viable particulates and Non - Viable particulates.
       ii) Write short note on Stone Leprosy.

TPR/ 11 / Che / 2