COMMON HALF YEARLY EXAMINATION - 2024 | Reg. No. | | | | | | |

XI - CHEMISTRY

Time Allowed : 3-00 Hrs.   Maximum Marks: 90

PART - I

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

1. The oxidation number of Sulphur in SO_2
   a) +2   b) 0   c) +4   d) –2

2. Splitting of spectral lines in an electric field is called
   a) Zeeman effect   b) Shielding effect   c) Compton effect   d) Stark effect

3. The nature of Beryllium Hydroxide is
   a) Acidic   b) Basic   c) Neutral   d) Amphoteric

4. The hardness of water can be determined by volumetrically using the reagent
   a) Sodium thio sulphate   b) Potassium permanganate
   c) Hydrogen peroxide   d) EDTA

5. Lithium shows diagonal relationship with
   a) Sodium   b) Magnesium   c) Calcium   d) Aluminium

6. In a closed room of 1000 m^3 a perfume bottle is opened up. The room develops a smell. This is due to which property of gases?
   a) Viscosity   b) Density   c) Diffusion   d) None

7. In an adiabatic expansion of an ideal gas
   a) $W = -\Delta U$ b) $W = \Delta U + \Delta H$ c) $\Delta U = 0$ d) $W = 0$

8. In which of the following equilibrium, K_P and K_C are not equal?
   a) $2NO_{(g)} \rightleftharpoons N_{2(g)} + O_{2(g)}$ b) $SO_{2(g)} + NO_{2(g)} \rightleftharpoons SO_{3(g)} + NO_{(g)}$
   c) $H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$ d) $PCl_{5(g)} \rightleftharpoons PCl_{3(g)} + Cl_{2(g)}$

9. Which of the following is ideal solution?
   a) benzene -Toluene   b) benzene - acetone
   c) 'a' and 'b'   d) none of the above

10. Which one of the following is diamagnetic?
    a) O_2 b) O_2^{2-} c) O_2^+ d) none of these

11. The isomer of ethanol is
    a) Acetaldehyde   b) Dimethyl ether
    c) Acetone   d) Methyl carbenol

12. The geometrical shape of carbocation is
    a) Linear   b) Tetrahedral   c) Planar   d) Pyramidal

13. Which of the following is aliphatic saturated hydrocarbon?
    a) C_8H_{18} b) C_9H_{18} c) C_8H_{14} d) All of these

14. **Assertion :** In mono haloarenes, electrophilic substitution occurs at ortho and para positions.
    Reason : Halogen atom is a ring deactivator.
    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

15. The greenhouse effect is caused by
    a) CO   b) NO   c) NO_2 d) CO_2

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PART - II

II. Answer any 6 questions. (Q.No.24 is compulsory)   6 x 2 = 12

16. Define Hund's rule.
17. What is effective nuclear charge?
18. Explain the exchange reactions of deuterium.
19. Define inversion temperature.
20. Identify the state and the path functions out of the following :
    a) Enthalpy   b) Heat   c) Work   d) Free energy
21. Define Van't Hoff Factor.
22. Give example for elimination reaction.
23. What happens when ethylene is passed through cold dilute alkaline potassium permanganate?
24. Write the structure   i) 1,4 - dichlorobut-2-ene
                                ii) 2 - chloro - 3 - methyl pentane

PART - III

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

25. Define equivalent mass.
26. Why ionisation potential of 'N' is greater than that of 'O'?
27. Mention the uses of Plaster of Paris.
28. What are spontaneous reactions? What are the conditions for the spontaneity of a process?
29. Write the geometrical structure of the following :   i) NH_3 ii) PCl_5 iii) IF_7
30. Give the general characteristics of organic compounds.
31. How does Huckel rule help to decide the aromatic character of a compound?
32. Differentiate : BOD and COD
33. At particular temperature $K_C = 4 \times 10^{-2}$ for the reaction $H_2S_{(g)} \rightleftharpoons H_{2(g)} + \frac{1}{2}S_{2(g)}$

    Calculate K_C for each of the following reaction.

    i) $2H_2S_{(g)} \rightleftharpoons 2H_{2(g)} + S_{2(g)}$ ii) $3H_2S_{(g)} \rightleftharpoons 3H_{2(g)} + \frac{3}{2}S_{2(g)}$

PART - IV

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

34. a) i)   Calculate the molar mass of the following compounds.
             (A) Urea $[CO(NH_2)_2]$
             (B) Acetone $[CH_3COCH_3]$
             (C) Sulfuric acid $[H_2SO_4]$ (3 marks)
        ii) Define Modern periodic law.   (2 marks)   **(OR)**
    b) Explain the Bohr model of atom.
35. a) i)   What are isotopes? Write the name of isotopes of hydrogen.   (3 marks)
        ii) Mention the uses of Deuterium. (2 marks)   **(OR)**
    b) i)   Describe the biological importance of calcium. (3 marks)
        ii) Derive ideal gas equation.   (2 marks)
36. a) List the characteristics of internal energy.   **(OR)**
    b) i)   State law of mass action.   (3 marks)
        ii) Write the limitations of Henry's law.   (2 marks)
37. a) Discuss the formation of 'N_2' molecule using Molecular Orbital Theory.   **(OR)**
    b) Explain the following types of constitutional isomerism in organic compounds.
             i)   Chain isomerism
             ii)   Functional isomerism
             iii) Metamerism
38. a) i)   Explain electromeric effect.   (3 marks)
        ii) Write Markow Nikoff's rule.   (2 marks) **(OR)**
    b) i)   Write the preparation of DDT with reactions.   (3 marks)
        ii) How is acid rain formed?   (2 marks)

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