Class : 11

Register Number

COMMON HALF YEARLY EXAMINATION 2024 - 25

Time Allowed : 3.00 Hours]

CHEMISTRY

|Max. Marks : 70

PART – I

I. **Answer the following:**   15x1=15

1. Which one of the following represents 180g of water?
   (a) 5 moles of water
   (b) 90 moles of water
   (c) $\dfrac{6.022 \times 10^{23}}{180}$ molecules of water
   (d) 6.022×10^{24} molecules of water

2. Which of the following pairs of d-orbitals will have electron density along the axes?
   (a) d_z^2, d_{xy}
   (b) d_{xy}, d_{yz}
   (c) $d_z^2, d_x^2 - y^2$
   (d) $d_{xy}, d_x^2 - y^2$

3. What is the IUPAC name of a element having atomic number 109?
   (a) Unnilennium
   (b) Unilenium
   (c) Unnil ennium
   (d) Unil enium

4. Ionic hydrides are formed by
   (a) Halogens
   (b) Chalcogens
   (c) Inert gases
   (d) Group one elements

5. Which colour is produced by Barium in flame test?
   (a) Bricks Red
   (b) Red
   (c) Apple Green
   (d) Crimson Red

6. If temperature and volume of an ideal gas is increased to twice its values, the initial pressure P becomes.
   (a) 4P
   (b) 2P
   (c) P
   (d) 3P

7. The values of ΔH and ΔS for a reaction are respectively 30 kJ mol^{-1} and 100 $JK^{-1} mol^{-1}$. Then the temperature above which the reaction will become spontaneous is
   (a) 300 K
   (b) 30 K
   (c) 100 K
   (d) 20°C

8. $2CO_{(g)} \rightleftharpoons CO_{2(g)} + C_{(s)}$. K_P is ----------------
   (a) $K_p = \dfrac{P^2 co_2}{P^2 co}$
   (b) $KP = \dfrac{P\, co}{Pco_2}$
   (c) $K_p = \dfrac{P^2 Co}{P\, co_2}$
   (d) $K_p = \dfrac{Pco_2}{P^2 co}$

9. Normality of 1.25M sulphuric acid is
   (a) 1.25 N
   (b) 3.75 N
   (c) 2.5 N
   (d) 2.25 N

10. Which one of the following is Diamagnetic?
    (a) O_2
    (b) O_2^{2-}
    (c) $O_2^{\cdot}$
    (d) None of the above

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

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. Which type of Plastic is to be Recycled easily?
    (a) 7
    (b) 5
    (c) 1
    (d) 3

14. Acetone $\xrightarrow[\text{ii) } H_2O/H^{-1}]{\text{i) } CH_3MgI}$ X. Here X is
    (a) 2 - Propanol
    (b) 2 - Methyl -2- propanol
    (c) 1 - Propanol
    (d) Acetonol

15. C - X bond is strongest in
    (a) Chloro Methane
    (b) Iodo methane
    (c) Bromo Methane
    (d) Fluoro Methane

PART - II

II. **Answer any 6 questions. Q.No. 24 is compulsory.**   6x2=12

16. Give the Electronic Configuration of Mn^{2+} and Cr^{3+}.

17. State Modern Periodic Law.

18. Mention the uses of Plaster of Paris.

KK / M/11 / Che / 1

19. State the First Law of Thermodynamics.
20. Define the Term Isotonic Solution.
21. **Give the general formula for the following class of organic compounds.**
    a) Alkanes   b) Alkenes
22. How can you convert benzene into BHC?
23. How is DDT Prepared?
24. 50 g of tap water contains 20 mg of dissolved Solids. What is the TDS value in ppm?

PART - III

III. **Answer any 6 questions. Q.No. 33 is compulsory**   6x3=18
25. Distinguish between Oxidation and Reduction.
26. How do you convert Para Hydrogen into Ortho Hydrogen?
27. Compare Diffusion and Effusion.
28. Write a Balanced Chemical Equation for an Equilibrium reaction for which the equilibrium constant is given by expression. $K_c = \dfrac{[NH_3]^4 \, [O_2]^5}{[NO]^4 \, [H_2O]^6}$
29. Define Bond order.
30. Explain Inductive Effect with suitable example.
31. Write Sabatier - Sendersens reaction.
32. How is Acid Rain Formed?
33. Calculate the effective Nuclear charge on $4S^2$ and $3d$ electron in Scandium.

PART - IV

IV. **Answer all the questions. Q.No. 38 is compulsory**   5x5=25
34. a)   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. **(5).**

(OR)

    b)   What are Quantum Numbers? Explain its type **(5).**
35. a)   What is Hydrogen Bonding and Explain its types. **(5)**

(OR)

    b)   Derive the values of Critical Constants in Terms of Vander - Waal's constants. **(5)**
36. a) i) List the characteristics of internal energy. **(3)**
       ii) Define Entropy? Give its unit. **(2)**

(OR)

    b)   Derive the Relations between Kp and Kc. **(5)**
37. a) i) Explain optical isomerism with an example. **(3)**
       ii) **Write the IUPAC name of the following compounds. (1 + 1)**
       a) CH$_3$ - CH- CH-CH$_3$ b) CH$_3$ - O - CH$_3$
              | |
          CH$_3$ Br

(OR)

    b) i) Give an example for β - Elimination reaction. (2) ii) Distinguish between BOD and COD (3)
38. a)   An Organic compound (A) with molecular formula C_2H_5Cl reacts with aqueous KOH gives compound (B) and with alcoholic KOH gives compound (C). Identify A, B and C. **(5)**

(OR)

    b)   An organic compound (A) C_2H_4 decolourises Bromine water. (A) On Reaction with Chlorine gives (B). (A) React with HBr to give (C). Identify A, B and C. **(5)**

KK / 11 / Che / 2