Sub Code- 212

HISSAN KASKI-Grade XII

Pre- Board Examination – 2071

Chemistry

Programme: Science Full Marks: 75
Time: 3hrs Pass Marks: 27

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Shift : Day

Group-A

Attempt any ***fifteen*** questions [15× 2 = 30]

1. The bond angle at the central atom in H_2O is 104.5^0, whereas in H_2S is 92.5^0. What factor accounts for the difference in bond angles?
2. Differentiate sigma-bond and pi-bond?
3. Account for the fact that aryl halide is less reactive than alkyl halide towards nucleophilic substitution reaction?
4. Give a chemical test to distinguish between ethanol and methanol.
5. What is ozonolysis? Which products are formed by ozonolysis of 1-butene? Give complete reaction.
6. What is Williamson's synthesis of ether? Explain with one example.
7. Give a chemical test to distinguish between methanal and ethanal.
8. Why is boiling point of carboxylic acid higher than corresponding alcohol?
9. Why is phenol more acidic than ethanol?
10. What is coupling's reaction? Explain with one example.
11. Account for the fact that $-NO_2$ group is meta- directing group towards Electrophilic aromatic substitution.
12. What is an analgesic drug? Write an example with its structure.
13. What is hydrogenation of oil?
14. What is Zwitter-ion? Give an example of dipeptide.
15. 0.41 g of NaOH is placed in 100ml of 0.1N H_2SO_4. Find the pH of the resulting solution.
16. A first order reaction will takes 100 minutes to complete 60% of reactant into product. What time will it take to complete 90% of reactant into product?
17. 0.4 gm of a metal was dissolved in 50 cc of 0.64 (N) HCl and the solution diluted to 100 cc. 25 cc of this solution then required 27.3 cc of 0.11 (N) NaOH for neutralization. Find the equivalent weight of the metal.
18. Calculate the equivalent conductance of 1M H_2SO_4 solution, if its conductivity is 26×10^{-2} ohm^{-1} cm^{-1}.
19. What is conjugate acid–base? Explain with one example.
20. The entropy of vaporization of acetone is 93.0 $JK^{-1}mol^{-1}$. If boiling point of acetone is 56^0C. Calculate the heat required for vaporization of 1 gm of acetone.
21. Write four ores of copper with chemical formula.
22. What happens when zinc white is treated with cobalt nitrate solution?

Group - B

Attempt any ***five*** questions: [5×5 = 25]

23. You are given standard reduction potential of Zn^{2+} / Zn and Ag^+ / Ag as − 0.76 V and + 0.80 V respectively
    a) Construct a galvanic cell indicating anode and cathode.
    b) Write the cell reaction, cell notation and calculate the standard Emf of the cell.
24. What is Gibb's free energy? Prove that decrease in free energy is measure of useful work. [1+4]
25. What is zero order reaction?
    For a reaction, $2X+Y \rightarrow X_2Y$ the following data were obtained by experiment.

Experiment No.	[X] mol L^{-1}	[Y] mol L^{-1}	Rate, $mol^{-1}L^{-1}$ s^{-1}
1	0.10	0.10	1.3×10^{-4}
2	0.10	0.20	2.6×10^{-4}
3	0.20	0.20	1.4×10^{-3}

    i) Find the order of reaction with respect to X, Y and overall reaction.
    ii) Find the value of rate constant with its units.
    iii) What is the initial rate of the reaction when the initial concentration of X and Y are 1M and 0.5M respectively. [1+4]
26. Describe the Extraction of pig iron from its oxide ore.

27. How can 1^0, 2^0 and 3^0 amines be separated from their mixture by Hofmann's method?
28. Describe the laboratory preparation of pure trichloromethane.
29. Identify A, B, C and D in the following reaction:

$$CH_3COOH \xrightarrow{SOCl_2} A \xrightarrow[\Delta]{H_2/Pd/BaS} B \xrightarrow{HCN} C \xrightarrow{H_2O/H^+} D$$

What major product would you obtain when B is treated with alkaline solution of hydrazine and ethylene glycol? [4+1]

Group-C

Attempt any ***two*** questions: [2×10= 20]

30. a) Describe the laboratory preparation of pure aniline. [7]

b) What happens when -

(i) Aniline is diazotized.

(ii) Benzoic acid is nitrated.

[1+1+1]

(iii) Nitrobenzene is reduced in neutral medium

31. a) Write short notes on: Aldol condensation and Cannizaro's reaction.

[2+2]

b) How can you convert- i) 1-propanol to 2-propanol ii) Benzaldehyde to benzene iii) Aniline to benzoic acid iv) Methoxymethane to ethoxyethane

[1.5×4 = 6]

32. (a) What do you mean by degree of ionization is 0.2? State and explain Ostwald dilution law.

[1+ 4]

(b) What is enthalpy of formation of compound? The standard enthalpy of combustion of benzene is -3268 KJ. The standard enthalpy of formation of CO_2 (g) and H_2O (ℓ) are-393.5 and -285.8 KJ respectively. Calculate the enthalpy of formation of benzene.

[1+4]

33. Write short note on any ***two:***

[2×5= 10] (a) Extraction of Mercury (b) Chemistry of Blue vitriol

(c) Solubility product and solubility product principle

(d) Fermentation

❋❋❋❋❋❋❋❋