Gandaki Boarding School

(Regional School)
Lamachaur ,pokhara

SEND UP EXAMINATIONS, 2074

Class: 12 Full Mark: 75
Subject: Chemistry Time: 3:00 hours

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

Group A

Attempt any **fifteen** questions*:* **(15 × 2= 30)**

1. Why types of hybridization occur in ethylene molecule? Draw orbital diagram of ethylene molecule showing σ and π bond.
2. Define end point. How it differ from equivalence point?
3. Calculate the P^H of (i) 0.4 gm/lit NaOH (ii) 0.5 N H_2SO_4.
4. Define specific conductance. The molar conductance of 1.5 M solution of an electrolyte is 138.9 Scm^2. What would be the specific conductance of this solution?
5. Define extensive and intensive properties with examples.
6. What is meant by spontaneous process? Write the criteria of spontaneity in terms of entropy and free energy change.
7. The half-life period of a first order reaction is one and half hour. Find the time required to complete 68% of reaction.
8. Explain why…..?
   i. Benzene is considered as aromatic compound.
   ii. Benzene do not decolourize pink colour of Baeyer's reagent.
9. Identify A, B, C, D to complete the reaction sequence.

$$CH_3CH_2CH_2Br \xrightarrow[A]{alc.KOH} \xrightarrow[B]{+ HBr} \xrightarrow[C]{aq.KOH} \xrightarrow[D]{K2Cr2O7/\ H+}$$

10. What happens when
    i. Phenol is treated with aq. Bromine.
    ii. Phenol is treated with mixture of conc. HNO_3 and conc. H_2SO_4.
11. Starting from ethanol, how would you obtain (i) ethoxy ethane (ii) methoxy ethane?
12. Write the functional isomers of C_3H_6O. Identify which isomer respond to both iodoform and Tollen's test.
13. Write suitable visible chemical test to distinguish formic acid from acetic acid with reaction involved.
14. Why nitrobenzene gives meta substituted product during electrophilic substitution reaction?
15. Give 1^0, 2^0 and 3^0 isomers of C_3H_9N. Among them which give positive carbylamines test?
16. Physically fats are solid whereas oils are liquid at room temperature but how they differ to each other chemically? What happens when oil is treated with hydrogen in presence of catalyst?
17. What is meant by denaturation of protein? Write with suitable examples.
18. How addition polymers differ from condensation polymers? Write with suitable examples.
19. What is meant by antipyretic drug? Give an example of it.
20. Write molecular formula of
    i. Philosopher's wool iii. Mohr's salt
    ii. Calomel iv. Lunar caustic
21. What happens when
    i. Zinc white is heated with cobalt nitrate?
    ii. Alkaline copper sulphate solution is heated?
22. How is Nessler's reagent prepared? Write its one use.

Group B

Attempt any **five** questions: **(5 × 5 = 25)**

23. Why is it important to calculate the normality factor during titration?
    1.97 gm of mixture of $CaCo_3$ and $MgCO_3$ was dissolved in 400 ml of 0.15 N HCl solution. After the reaction was completed, the resulting solution was diluted to 300 ml. 15 ml of this solution required 18 ml of 0.05 N NaOH solution for complete neutralization. Calculate the percentage composition of component in mixture.
24. Write any two difference between Galvanic cell and electrolytic cell. How many grams of silver is plated on the tray when electrolysis is done in solution of Ag^+ ion by current of 8.2 amphere for 8 hours? What is the area of tray if thickness of silver plating is 0.0025 cm? (2+3)
    (Given: At. wt. of Ag = 108, Density of Ag = 10.5 gm/cc)
25. Define rate law.
    For given reaction; 2A + B → Products; following data were obtained:

Expt. No.	Initial Concentration of A (Mol l^{-1})	Initial Concentration of B (Mol l^{-1})	Rate of Reaction Initial rate of formation mol $^{-1}$ sec^{-1}
	0.1	0.1	0.05
2	0.2	0.1	0.1
3	0.1	0.2	0.05

    i. Find the order with respect to each component and also over all order of reaction.
    ii. Calculate the value of rate constant with its unit. (1+2+2)
26. Identify the following compounds.

    M N O P

    i. What happens when N is treated with Zn in NH_4Cl?
    ii. What happens when O is treated with aq.Br_2?
    iii. What happens when O is reacted with P? (2+3)
27. Describe lab preparation method of nitrobenzene with well labelled diagram. Write suitable steps of reaction to convert aniline into nitrobenzene. (4+1)
28. What is meant by Rust? Explain electrochemical theory of rusting. Give any suggestion to prevent iron from rusting. (1+3+1)
29. Explain the extraction process of copper from copper pyrite.

Group C

Attempt any **two** questions: **(2 × 10 = 20)**

30. State and explain Hess's law of constant heat summation. Draw energy profile diagram for both catalyzed and uncatalyzed, exothermic reaction. Calculate the heat of formation of naphthalene ($C_{10}H_8$), if heat of combustion of naphthalene, carbon and hydrogen is -1231.6 Kcal, -94.405 Kcal and -68.3 Kcal respectively. (4+2+4)
31. Describe the lab preparation of aniline with well labelled diagram. Explain why aniline is less basic than aliphatic amine? Why amino group of aniline is protected before nitration? Explain how aniline is nitrated to get O- and P-nitro aniline? (5+2+1+2)
32. a. Write example of the following reactions: (5x1)
        i. Decarboxylation reaction
        ii. Wolf-Kishner reduction
        iii. Carbylamines formation
        iv. Hoffmann's bromamaide reaction
        v. Reduction of nitrobenzene in alkaline medium
    b. An alkene (A) undergoes ozonelysis to give two carbonyl compounds (B) and (C). The compound (B) on reduction with Zn-Hg/ H^+, give propane. The compound (C) on treating with HCN and followed by hydrolysis, give 2-hydroxy propanoic acid as major product. Identify A, B and C with including the reactions involved. (5)
33. Write short notes on (any two): (2x5=10)

i. Common ion effect and its application
ii. Extraction of mercury
iii. Separation of 1^0, 2^0 and 3^0 amines by Hoffmann's method
iv. Chemistry of white vitriol

The End