

HSEB-GRADE XII

2072 (2015)

Chemistry

Sub.Code : 212'D'

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

Time : 3 hrs.

Full Marks:- 75

Pass Marks:- 27

Group 'A'

Attempt any **fifteen** questions:

15x2=30

1. ✓ What are the features of tetrahedral hybridization? Write an example of it. 1+1
2. Which one has higher concentration and why? 1+1
 - a) 80 gm/litre NaOH solution and 3 M NaOH solution.
 - b) 5.3 gm/litre Na_2CO_3 and $\frac{N}{10}$ Na_2CO_3 solution.
3. ✓ Define Lewis concept of base and point out its limitation. 1+1
4. ✓ Why does AgNO_3 solution become bluish when copper rod is dipped in it? (The standard reduction potential of Cu and Ag are +0.3V and +0.8V respectively) 1+1
5. ✓ What is meant by state function? Give its example. 1+1
6. Calculate ΔS and ΔG for conversion of ice into water when they are equilibrium at 0°C ($\Delta H = 4 \text{ KJ/mole}$) 1+1
7. ✓ Define the terms : 1+1
 - i) activated complex
 - ii) rate of reaction
8. ✓ State Huckel's rule for aromaticity. 2
9. ✓ Give the major products in the following equations : 1+1
 - i) $\text{CH}_3 - \overset{\text{Br}}{\underset{|}{\text{CH}}} - \text{CH}_3 \xrightarrow[\Delta]{\text{Na/ether}}$
 - ii) $\text{CH}_3 - \text{CH}_2 - \text{Br} \xrightarrow[\Delta]{\text{LiAlH}_4}$

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10. Write down the structural formula and IUPAC name of tert. butyl alcohol. 1+1

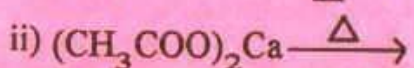
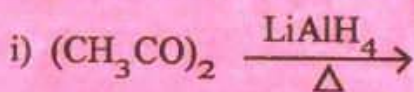
11. Write IUPAC name of $\text{CH}_3\text{OCH}(\text{CH}_3)_2$ and use Williamson's synthesis method for its preparation. 1+1

12. How does benzaldehyde reacts with :

- Conc. NaOH
- Acetic anhydride

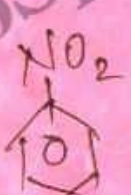


13. Predict the major products of the following reaction :



14. Convert nitrobenzene into :

- P-aminophenol
- Hydrazobenzene



15. How does aniline react with :

- aqueous bromine
- $\text{NaNO}_2 + \text{HCl}$ at low temperature

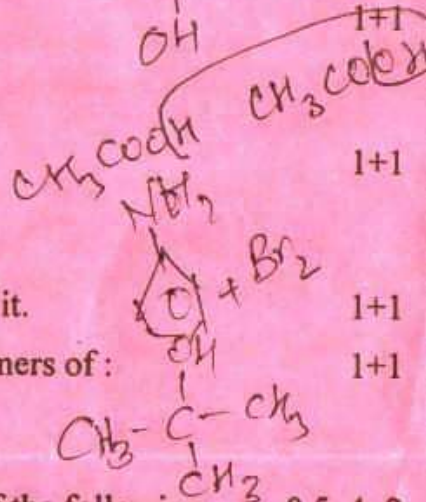
16. Define the terms :

- zwitter ions
- denaturation of protein

17. What is saponification? Give an example of it.

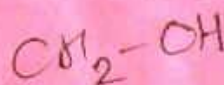
18. Write down the molecular formula of monomers of :

- Bakelite
- Nylon - 66



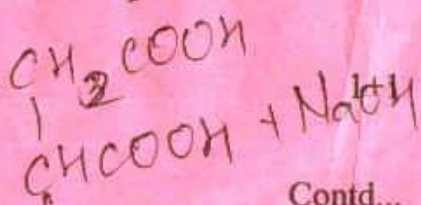
19. Write down the structural formula of each of the following:

- azo-dye
- analgesic drug
- pesticides
- nitrogen fertilizer



20. What happens when Corrosive sublimate is :

- treated with excess KI solution?
- heated with excess SnCl_4 solution.



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21. Why does silver nitrate produces permanent black stain on the skin? Write an important use of silver nitrate. 1+1
22. Write chemical reactions involved in zone of reduction of blast furnace during extraction of iron. 2

Group 'B'

Attempt any five questions:

5x5=25

23. Define the term: 2+1.5+1.5
- Electrochemical equivalent.
 - Standard electrode potential.

How many coulombs are required to produce:

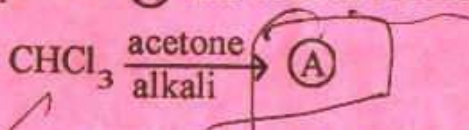
- 80 gm of aluminium from molten Al_2O_3
- 24 gm of magnesium from $MgCl_2$

24. Define heat of formation. Heat of combustion of methane, carbon and hydrogen are -210 KCal, -94 KCal and - 68 KCal respectively. Calculate the heat of formation of methane. $C + 2H_2 \rightarrow CH_4$ 1+4

25. What is meant by normality factor? How many ml of conc. HNO_3 of specific gravity 1.41 containing 69% by mass are required to prepare 500 ml of 0.5N HNO_3 . 1+4

26. How would you obtain blister copper from copper pyrites. 5

27. Give the chemical reaction for the preparation of trichloromethane from ethanal. What happens when it is heated with silver powder? Identify the product (A) and write its IUPAC name. 2+1+2



28. Suggest any three suitable chemical reactions for the preparation of ethanoic acid. How is ethanoic acid converted into methanoic acid. 3+2

29. An aliphatic compound (A) reacts with $SOCl_2$ to give (B). (B) on reduction with H_2 in presence of $Pd/BaSO_4$ to give (C). When HCN is added to (C), produces (D). On hydrolysis of (D) in acidic medium forms (E). Compound (C) gives iodoform test and produces silver mirror with Tollen's reagent. Identify (A), (B), (C), (D), (E) and write reactions involved. 5

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Group 'C'

Attempt any **two** questions:

2x10=20

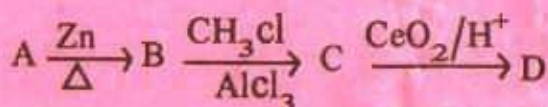
30. What is meant by the terms:

- i) common ion effect
- ii) solubility product constant (K_{sp})

Explain the common ion effect and solubility product principle in qualitative salt analysis. What will be the resulting pH of a solution prepared by mixing 200 ml of aqueous solution of HCl (pH = 2) with 300 ml of an aqueous solution of NaOH (pH = 12).

2+4+2+2

31. How is pure and dry aniline prepared in the laboratory? Identify A, B, C, D in the following reaction sequences :



Compound D when reacts with zinc amalgam in presence of acid gives toluene.

6+4

32. Describe Victor Meyer's method to distinguish propan-2-ol and 2-methyl propan-2-ol. Why is phenol more acidic than alcohol? How would you convert ethanal into propanone and vice-versa?

5+1+4

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

2x5

- a) Order and Molecularity of reaction
- b) Rusting of iron
- c) Chemistry of zinc white
- d) Distinction of 1°, 2° and 3° alcohol by Victor-Meyer's method.