Sub.Code : 212'D'

# HSEB-GRADE XII
## 2072 (2015)
## Chemistry

*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 $\Delta S$ and $\Delta G$ for conversion of ice into water when they are equilibrium at $0^oC$ ($\Delta H = 4$ 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) $CH_3 - \underset{Br}{CH} - CH_3 \xrightarrow[\Delta]{Na/ether}$

   ii) $CH_3 - CH_3 - Br \xrightarrow[\Delta]{LiAlH_4}$

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

11. Write IUPAC name of $CH_3OCH(CH_3)_2$ and use Williamson's synthesis method for its preparation. 1+1

12. How does benzaldehyde reacts with : 1+1
    i) Conc. NaOH
    ii) Acetic anhydride

13. Predict the major products of the following reaction : 1+1
    i) $(CH_3CO)_2 \xrightarrow[\Delta]{LiAlH_4}$
    ii) $(CH_3COO)_2Ca \xrightarrow{\Delta}$

14. Convert nitrobenzene into : 1+1
    i) P-aminophenol
    ii) Hydrazobenzene

15. How does aniline react with : 1+1
    i) aquous bromine
    ii) $NaNO_2$+HCl at low temperation

16. Define the terms : 1+1
    i) zwitter ions
    ii) denaturation of protein

17. What is saponification? Give an example of it. 1+1

18. Write down the molecular formula of monomers of : 1+1
    (i) Bakelite
    ii) Nylon - 66

19. Write down the structural formula of each of the following: 0.5x4=2
    i) azo-dye
    ii) analgesic drug
    iii) pesticides
    iv) nitrogen fertilizer

20. What happens when Corrosive sublimate is : 1+1
    i) treated with excess KI solution?
    ii) heated with excess $SnCl_4$ solution.

Contd...

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
    i) Electrochemical equivalent.
    ii) Standard electrode potential.

    How many coulombs are required to produce:
    i) 80 gm of aluminium from molten $Al_2O_3$
    ii) 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. 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

$$CHCl_3 \xrightarrow[\text{alkali}]{\text{acetone}} (A)$$

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

Contd...

## Group 'C'

Attempt any **two** questions: 2x10=20

30. What is meant by the terms:
    i) common ion effect
    ii) solubility product constant ($Ks_p$)

    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 aquous solution of HCl (pH = 2) with 300 ml of an aquous 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 :

$$A \xrightarrow[\Delta]{Zn} B \xrightarrow[Alcl_3]{CH_3cl} C \xrightarrow{CeO_2/H^+} D$$

    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.