Sub: Chemistry Set B F.M.: 75

Grade: XII Time: 3 Hrs

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

## Group A

Attempt any fifteen questions.

1. How would you interprete that all four C-H bonds of methane are identical? 2

2. Starting from benzene, how will you synthesize 1+1

i) benzenehexachloride ?

ii) acetophenone ?

3. What happens when the product obtained by heating ethanol with bleaching powder paste is heated with silver powder? 2

4. The boiling point of n-butyl alcohol is greater than its isomer ethoxyethene. Why? 2

5. What happens when- 1+1

i) Phenol is condensed with pthalic anhydride?

ii) Phenol reacts with aqueous bromine?

6. Convert methoxymethane to 1+1

i) methoxyethane

ii) methanol

7. For what purpose the following tests are used 1+1

i) Tollen's test?

ii) Iso-cyanide test?

8. Show your familiarity with 1+1

i) Hell - volhard - zelinsky reaction

ii) Claisen condensation

9. Why is aniline less basic than methylamine? 2

10. Define denaturation of protein. What are the essential conditions for this? 1+1

11. What are reducing and non reducing sugar? Give an example of each. 1+1

12. What are natural and synthetic polymers? Give an example of each. 1+1

13. Give an example of each of the following: [0.5 \times 4=2]

i) Phosphorus fertilizer ii) Insecticide

iii) azo - dye iv) analgesic drug

14. What is normality factor? A solution is found to be 0.63% by volume of nitric acid. Calculate its concentration into normality. 1+1

15. What is buffer solution? Why is the aqueous solution of Na_2CO_3 basic? 1+1

16. How many coulombs of electricity are required for 1+1

i) oxidation of 1 mole of MnO^{-}_4 into Mn^{+2}?

ii) 5 moles of Al^{+3} into Al?

17. "The heat of neutralization of strong acid and strong base is the highest & almost constant." Why? 2

18. The rate of reaction 2A \arrow Products becomes 3 times when concentration of A is increased by 27 times. Find the order of reaction. 2

19. What is rate constant? Why is molecualrity of reaction never zero? 1+1

20. Write the reaction of NH_3 gas with 1+1

i) mercuric chloride solution

ii) mercurous chloride solution

21. Write down the molecular formula & one important use of the followings. 1+1

i) philosopher's wool ii) Thomas slag

22. Give reason 1+1

i) copper sulphate crystal turns white on heating.

ii) spiegeleisen is added to molten cast iron.

## Group B

Attempt any five questions. [5 \times 5 =25]

23. Write any three methods of preparation of ethanal. How would you convert ethanal into [3+1+1]

i) 3 - hydroxybutanal?

ii) 2 - hydroxy - 2 - methylpropanoic acid?

24. Write down all the possible isomers of C_2H_7N with their IUPAC names. How can you sepearate these isomers by Hoffmann's method? Explain by reactions. [2+3]

25. How can you synthesize the following compounds starting from CH_3MgBr [1 \times 5]

i) ethanoic acid? ii) methane?

iii) 2 - propanol? iv) ethanol?

v) 2 - methyl - 2 - propanol?

26. Define end point & indicator. 3.12 gm of washing soda (Na_2CO_3.10H_2O) were dissolved in 200 ml of water. 20 ml of resulting solution is titrated with 21.8 ml of \frac{N}{10} H_2SO_4 for complete neutralization. Calculate the % of anhydrous NA_2CO_3 in the crystal. [1+1+1.5+1.5]

27. Differentiate between electrolytic cell & galvanic cell. Predict the feasibility of reaction

[2+1.5+1.5]

i) 2 Ag^+ + Cu \arrow Cu^{++} + 2 Ag

ii) 2 Al + 3 Sn^{+4} \arrow 2 Al^{+3} + 3Sn^{+2}

Given: E^0_{Ag^+/Ag}=+0.80 V, E^0_{Cu^{2+}/Cu}=+0.34 V

E^0_{Sn^{+4}/Sn^{+2}}=+0.15 V, E^0_{Al^{+3}/Al}=-1.66 V

28.Define Gibb's free energy. Derive Gibb's - Helmholtz equation. How can you predict the feasibility of exothermic reaction using Gibb's - Helmholtz eqaution. [1+2+2]

29. Name the chief ore of iron. Draw a neat labelled sketch of blast furnance for extraction of pig iron & write down chemical reactions involved at different zone. [1+4]

Group C

Attempt any two questions. [2 \times 10=20]

30. Describe the preparation of methanoic acid in the laboratory. How is anhydrous acid obtained from it? How does methanoic acid act upon [5+2+1+1+1]

i) Fehling's solution? ii) ethanol/H^+?
iii) Conc. H_2SO_4?

31. i) An alcohol (A) when heated with conc. H_2SO_4 gives an alkene (B). When (B) is bubbled through bromine water & the product obtained is dehydrohalogenated with alcoholic KOH solution; a new compound (C) is obtained. The compound (C) gives (D) when treated with warm dil. H_2SO_4 in presence of HgSO_4 . (D) can also be obtained either by oxidising (A) with acidified KMnO_4 or from acetic acid through its Calcium salt. Identify A, B, C, D.

ii) Convert the followings: [2+1.5+1.5]

a) Benzene to m-bromophenol

b) propanoic acid to ethanamine

c) Nitrobenzene to acetanilide

42. Define the terms. [1 \times 6 + 4]

i) salt hydrolysis ii) Lewis acid

iii) Ionic Product of water iv) Degree of ionisation

v) Solubility product vi) Common ion effect

A sample of AgCl is treated with 5 ml of 2 M Na_2CO_3 solution to produce Ag_2CO_3. The remaining solution contained 0.003 gm of Cl^- per liter. Calculate solubility product of AgCl.

(K_{sp} of Ag_2CO_3 = 8.2 \times 10^{-12})

33. Write short notes on (any two)

i) Lab. preparation of chloroform

ii) Extraction of zinc from zinc blende

iii) Chemistry of white vitrol

iv) Effect of temperature & catalyst on rate of reaction.