

**ANDHRA EDUCATION SOCIETY SCHOOLS**  
**NEW DELHI**  
**MID TERM EXAMINATION (2017-18)**  
**CLASS - XII**  
**SUBJECT - CHEMISTRY**

Pooja

Time : 3:00 Hrs.

Max Marks : 70

**Instructions.**

- i. Answer all the questions
- ii. Question from **1-5** each carries of **One** mark.
- iii. Question from **6-10** each carries of **Two** marks.
- iv. Question from **11-22** each carries of **Three** marks.
- v. Question number **23** value based and carries **Four** marks.
- v. Question from **24 to 26** each carries **Five** marks.

- 
1. Write the structure and IUPAC name of alkane of molecular formula  $C_5H_{12}$ , which gives single monochlorinated product.
  2. Draw the structure of the compound Hex-2-en-4-ynoic acid. (1)
  3. Atoms of element B form HCP lattice and those of the element A occupy  $\frac{2}{3}$ rd of tetrahedral voids. What is the formula of the compound formed?
  4. Define limiting molar conductivity of an electrolyte? 1/2
  5. Why does the reactivity of nitrogen differ from phosphorus? 1/2
  6. Give reasons for the following. ✓
    - i. Grignard reagent should be prepared under anhydrous conditions.
    - ii. Haloarenes are less reactive than ~~haloarenes~~ <sup>haloalkane</sup> towards nucleophilic substitution reactions. [Give two reasons].
  7. Give one chemical test to distinguish.
    - i. Ethanamine and aniline
    - ii. Methanamine and N-Methyl methanamine.
  8. **Account for the following**
    - i. Ethylamine is soluble in water where as aniline is not soluble.
    - ii. Aniline doesnot undergo Friedel-crafts reaction. PTO

OR

Arrange the following according to the property mentioned.

- i.  $C_2H_5NH_2$ ,  $C_6H_5NHCH_3$ ,  $(C_2H_5)_2NH$  and  $C_6H_5NH_2$   
(Decreasing order of the  $P^{kb}$  values in gas phase) 1/2
- ii.  $CH_3NH_2$ ,  $(CH_3)_2NH$ ,  $(CH_3)_3N$ ,  $NH_3$  (Increasing order of basic strength in aq. solution)

9. Copper Crystallises into a FCC lattice with edge length 361 pm  
Calculate its density. Atomic mass of Copper 63.5 g mole<sup>-1</sup>. 1/2

10. Explain the principle of following metallurgical processes (i) Zone refining (ii) chromatography. 2

(i) Prove the elevation in boiling point is a colligative property.

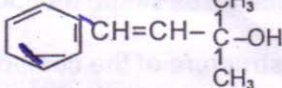
11. a. Arrange the following compounds in the order of  $SN^2$  reactivity.

1. Bromo-3-methyl butane, 2-Bromo-2-methyl butane, 2-Bromo-3-methyl butane

b. How will you convert.

i. 2-chloropropane to 1-Iodopropane 2 1/2 2

ii. Aniline to chloro benzene

12. a. Write the IUPAC name of  1/2

b. Explain the following

i. Reimer - Tiemann reaction

ii. Williamsons preparation of ethers.

13. a. Give reasons for the following.

i. O-Nitrophenol is steam volatile while

P-Nitrophenol is not

ii. Ethers cannot be prepared by acid catalysed dehydration of secondary and tertiary alcohols.

b. Give the mechanism of acid catalysed dehydration ethanol to ethene. 2

14. Describe the following reactions.

i. Clemmenson reduction 1/2

ii. Cannizzaro reaction

iii. Decarboxylation.

15. Accomplish the following conversions.

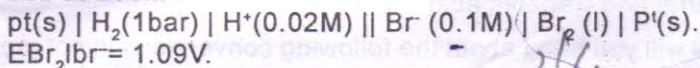
i. ~~Propanoic acid to Ethanoic acid.~~ Propanoic acid

ii. Nitrobenzene to Benzoic acid.

(i) Propanoic to Ethanoic acid

16. Explain the following terms with suitable examples.
- Schottky defect
  - Ferromagnetism.
  - Paramagnetism.
17. What are ideal and non-ideal solutions. Explain graphically taking suitable examples. 3M

18. Write the nernst equation and calculate the emf of the following cell at 298K.



OR

How much charge in coulombs is required for the following reductions (If = 96500C)

- 1 mol of  $\text{Al}^{3+}$  to Al
- 1 mol of  $\text{Cu}^{2+}$  to Cu
- 1 mol of  $\text{MnO}_4^-$  to  $\text{Mn}^{2+}$

*devis*

19. (A) Arrange the following metals in the order of increasing reducing power K, Zn, Mg, Fe

$$E^\circ_{\text{K}^+/\text{K}} = -2.93\text{V}, E^\circ_{\text{Zn}^{2+}/\text{Zn}} = -0.76, E^\circ_{\text{Mg}^{2+}/\text{Mg}} = -2.37\text{V}, E^\circ_{\text{Fe}^{2+}/\text{Fe}} = -0.44\text{V}$$

(b) What is corrosion of metals? Explain The mechanism of corrosion of Iron.

20. (a) State the role of Silica in the metallurgy of Copper.

(b) What is the role of Cryolite in the metallurgy of aluminium?

(c) Why is zinc not extracted from zinc oxide through reduction using carbon monoxide?

*20) Calculate the freezing point depression expected for 0.071m aq. sol<sup>n</sup> of Na<sub>2</sub>SO<sub>4</sub>.*

21. Describe the manufacture of  $\text{H}_2\text{SO}_4$  by contact process. Write the balanced equations.

22. Arrange the following in the order of property indicated.

- $\text{F}_2, \text{Cl}_2, \text{Br}_2, \text{I}_2$  - Increasing bond dissociation enthalpy.
- $\text{HF}, \text{HCl}, \text{HBr}, \text{HI}$  - Decreasing acid strength.
- $\text{NH}_3, \text{PH}_3, \text{AsH}_3, \text{SbH}_3, \text{BiH}_3$  → Increasing base strength.

*if this sol<sup>n</sup>, actually freezes at -0.320°C what would be the value of vant's*

23. A large number of polymers are quite resistant to the environmental degradation process and are thus, responsible for accumulation polymer solid waste materials. These solid waste materials cause acute environmental problems and remain undegraded for a quite Long time.

i. What are biodegradable polymers? Give example and how is it prepared.

ii. What are the values associated in using biodegradable

*kf for H<sub>2</sub>O is 1.86 K*

*hoff factor*

polymers.

iii. What are the limitations / constraints to switch over to biodegradable from non-biodegradable.

24. (a) Give simple chemical test to distinguish between the following pairs of compound.

- Ethanal and propanal
- Phenol and Benzoic acid

b. How will you bring about the following conversions in not more than two steps.

- Propanone to propene
- Ethanol to 3-Hydroxy butanal.
- Benzene to 4-Nitrotoluene.

OR

(a) Give reasons for the following.

- carboxylic acid is stronger acid than phenol.
- There are two  $\text{—NH}_2$  groups in semicarbazide. However, only one is involved in the formation of semicarbazones.

(b) How will you bring about the following conversions.

- Benzaldehyde to Acetophenone
- Ethanal to But-2-enal
- Benzene to m-Nitrobenzoic acid.

25. a. State Henry's law? Mention its two applications.

b. Calculate (a) Molarity (b) Molality of KI if the density of 20% (mass/mass) aqueous KI is  $1.202 \text{ g ml}^{-1}$ . (At-mass of K=39, I=127)

OR

a. Define reverse osmosis? What is its application.

b. Calculate the mass of non-volatile solute (Molar mass  $40 \text{ g mol}^{-1}$ ) which should be dissolved in  $114 \text{ g}$  Octane ( $\text{C}_8\text{H}_{18}$ ) to reduce its vapour pressure to 80%.

26. a. Draw the structures of

- (i)  $\text{XeF}_4$  (ii)  $\text{BrF}_3$

b. Give reasons for the following.

- Why does nitrogen dioxide dimerise.
- Halogens are strong oxidising agents.
- Ozone is a powerful oxidising agent

OR

a. Give the disproportionation reaction of  $\text{H}_3\text{PO}_3$ . Draw its structure. What is basicity?

b. Write balanced equations for the following.

- NaCl is heated with  $\text{H}_2\text{SO}_4$  in the presence of  $\text{MnO}_2$ .
- $\text{SO}_2$  is passed through an aqueous solution of Fe(III) salt.
- Reaction of  $\text{Cl}_2$  with hot and concentrated sodium hydroxide.