



INDIAN SCHOOL SOHAR
PRE BOARD EXAM - 2015
CHEMISTRY

STD: XII
Date: 18-01-15

Marks: 70
Time: 3Hrs

Instructions:

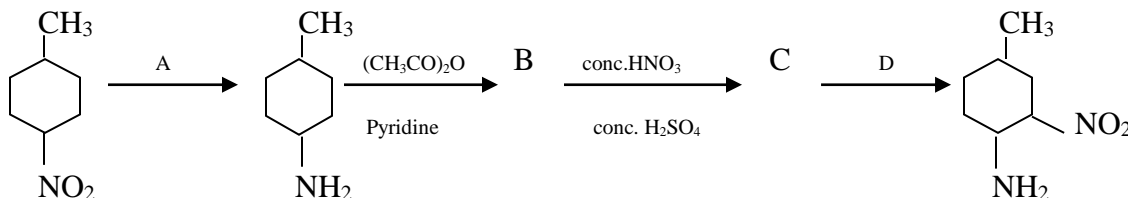
1. All questions are compulsory.
 2. Question nos. 1-5 are very short answer questions and carry one mark each.
 3. Question nos. 6-10 are short answer questions and carry two marks each.
 4. Question nos. 11-22 are also short answer questions and carry three marks each.
 5. Question no. 23 is value based question and carry four marks.
 6. Question nos. 24-26 are long answer questions and carry five marks each.
 7. Use log tables if necessary. Calculators are not allowed.
-

1. Why do some glass objects from ancient civilization found to be milky?
2. How does Fe^{3+} catalyses reaction between I^- and $\text{S}_2\text{O}_8^{2-}$ ions?
3. Based on disperse phase, which type of colloids are micelles?
4. What is the role of KCN in the extraction of silver?
5. Which of the following is most effective electrolyte in coagulation of $\text{Fe}(\text{OH})_3$ sol?
 AlCl_3 , K_3PO_4 , $\text{K}_4[\text{Fe}(\text{CN})_6]$, MgCl_2
- 6.a) What is colloidion? Give its use?
b) What is meant by electroosmosis?

OR

What are the characteristics of the following colloids? Give one example for each.

- a) Multimolecular colloids
 - b) lyophobic sols
7. If the density of water of a lake is 1.25gml^{-1} and 1kg of the lake water contains 92 g of Na^+ ions. Calculate the molarity of Na^+ ions in this lake water. (GAM of $\text{Na}=23\text{gml}^{-1}$).
 8. Predict the reagent or the product in the following reaction sequence:

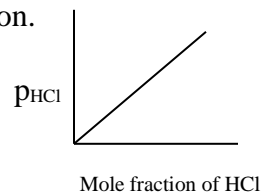


9. Draw the structure of the following compounds :
 - a) Peroxomonosulphuric acid
 - b) Polymetaphosphoric acid
- 10.a) Why does acetylation of $-\text{NH}_2$ group of aniline reduce its activating effect?
b) Give chemical test to distinguish between aniline and N-methylaniline.
11. How will you bring about the following conversions?
 - a) Acetyl chloride to acetone
 - b) Benzaldehyde to phenylacetic acid
 - c) Benzene to m-nitrobenzoic acid

12. Give the reaction of glucose with the following:
 a) Conc.HNO₃ b) HI/Δ c) NH₂OH
- 13.a) What happens when river water meets sea water?
 b) Why do physisorption and chemisorption behave differently with rise in temperature?
 c) What is meant by shape selective catalysis?

14. Differentiate between S_N1 and S_N2 mechanism of substitution reactions with examples.

15. a) Which law is illustrated by the graph? Give its mathematical expression.
 b) Give one application of the above law.
 c) What is the effect of temperature on K_H?



- 16.a) What is the name of the polymer formed by condensation of phenol and formaldehyde? Give its use.
 b) Give two differences between elastomers and fibres.

OR

- a) Write the reaction for the preparation of the following polymers:
 i) Buna-N ii) Terylene
- b) Arrange the following in the increasing order of their intermolecular forces:
 Nylon 6,6 Buns-S, Polythene
- 17.a) The activation energy for a hypothetical reaction $A \longrightarrow P$, is 12.49 K cal/mol. If temperature is raised from 295 to 305K, by what % will the rate of reaction increase? ($R = 2 \text{ cal K}^{-1}\text{mol}^{-1}$)
 b) A first order reaction has a rate constant of $5.5 \times 10^{-14} \text{ s}^{-1}$. Find the half life of the reaction.
18. a) Write the IUPAC name for the linkage isomer of $[\text{Co}(\text{NH}_3)_5\text{SCN}]\text{Cl}_2$.
 b) Why is CO a stronger complexing agent than NH₃.
 c) On the basis of valence bond theory, predict the geometry and magnetic behavior of $[\text{Co}(\text{NH}_3)_6]^{3+}$ (Atomic no. of Co = 27)
- 19.a) Which type of stoichiometric defect is shown by NaCl and why?
 b) Why does LiCl acquire pink colour when heated with Li vapours?
 c) The length of the unit cell edge of a body centred metal crystal is 352pm. Calculate the radius of an atom of the metal.

20. State the role of each of the following :

- a) depressant in froth floatation process
 b) graphite rod in the electrolytic reduction of alumina.
 c) cryolite in the metallurgy of aluminium.
21. When an oxide of manganese (A) is fused with KOH in the presence of an oxidizing agent and dissolved in water, it gives a dark green solution of compound (B). Compound (B) disproportionates in neutral or acidic solution to give purple compound (C). An alkaline solution of compound (C) oxidizes potassium iodide solution to a compound (D) and compound (A) is also formed. Identify compounds A to D and write the reactions.
- 22.a) Write the structure of 2-bromo-3-methylbut-2-ene-1-ol.
 b) Give two reactions that show the acidic nature of phenol. Compare the acidity of phenol with that of ethanol.
23. Synthetic detergents are cleansing agents which have all the properties of soaps but which actually do not contain any soap. These can be used in both hard as well as soft water as they give foam even in hard water.
 a) What type of detergents are used in toothpaste? Give the reaction for the preparation of this kind of detergent.

- b) Which type of detergents have germicidal properties and are used in hair conditioners?
- c) What is the main problem in using detergents?
- d) What is the solution to above problem? How can we save our environment?

24.a) A copper-silver cell is set up. The copper ion concentration is 0.1M. Calculate the concentration of silver ions in the cell if the cell potential is 0.422V.

Given $E^{\circ}_{\text{Ag}^+/\text{Ag}} = +0.80\text{V}$; $E^{\circ}_{\text{Cu}^{2+}/\text{Cu}} = +0.34\text{V}$.

- b) Define Faraday.
- c) State and explain Faraday's first law of electrolysis.

OR

a) A solution of copper sulphate is electrolysed between platinum electrodes using a current of 5 A for 20 minutes. What mass of copper will be deposited at the cathode.

Given atomic mass of Cu = 63.5 gmol⁻¹ ; 1F = 96500 C

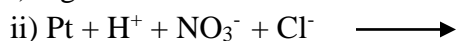
b) What are fuel cells? Write the reactions taking place at the electrodes in H₂-O₂ fuel cell. What are the advantages of H₂-O₂ fuel cell?

25. Account for the following:

- a) O-O bond is weaker than S-S bond.
- b) H₃PO₂ is a better reducing agent than H₃PO₃.
- c) SbCl₅ is more covalent than SbCl₃.
- d) HCl is more acidic than HF in aqueous medium.
- e) PCl₅ can act as oxidizing agent but not as a reducing agent.

OR

a) Complete the following reactions:



b) Give the formula and draw the structure of a noble gas species which is isostructural with

- i) ICl_4^-
- ii) IBr_2^-

26.a) Give reasons:

- i) There are two -NH₂ groups in semicarbazide but only one is involved in formation of semicarbazone.
- ii) Carbonyl group in benzoic acid is meta directing group.
- iii) Carboxylic acids contain carbonyl group but do not show the nucleophilic addition reactions like aldehydes or ketones.

b) What is Tollen's reagent? Explain what happens when ethanal is warmed with Tollen's reagent.

OR

a) Illustrate the following with an example:

- i) Etard reaction
- ii) Wolff Kishner reduction

b) Arrange the following in the increasing order of their boiling point and justify:



c) Write the mechanism for Esterification reaction .

---oOo---