



INDIAN SCHOOL SOHAR
PRE BOARD EXAM
CHEMISTRY

STD: XII
Date: 11-1-2017

MARKS: 70
TIME: 3Hrs

Instructions:

1. All questions are compulsory.
2. Question nos. 1-5 are very short answer questions and carry 1 mark each.
3. Question nos. 6-10 are short answer questions and carry 2 marks each.
4. Question nos. 11-22 are short answer questions and carry 3 marks each.
5. Question no. 23 is short answer question and carry 4 marks.
6. Question nos. 24-26 are long answer questions and carry 5 marks each.
7. Write serial no. of the question before attempting it.
8. Use log tables for calculations.

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1. H₂S is less acidic than H₂Se. Why?
 2. What are 12-16 compounds?
 3. Which forces are responsible for the stability of α -helix?
 4. Why is bithional added to soap?
 5. What is meant by vulcanization of rubber?
 6. What are secondary cells? Write the overall reaction taking place in a Nickel-Cadmium storage cell.
 - 7.a) Which form of sulphur shows paramagnetic behavior and why?
b) What happens when H₃PO₃ is heated?
 8. E^o values for some of the first row transition elements are given below:

	V	Cr	Mn	Fe	Co	Ni	Cu	Zn
E ^o _{M²⁺/M}	-1.18	-0.91	-1.18	-0.44	-0.28	-0.25	+0.34	-0.76V

Give suitable explanation for the irregular trend in these values.
 9. Give reasons:
 - a) CaCl₂ is used to clear snow from roads on hill stations.
 - b) A person suffering from high blood pressure is advised to take less quantity of common salt
 10. Illustrate the following with an example:
 - a) Carbylamine reaction
 - b) Hoffmann Bromamide degradation reaction.

OR

Account for the following:

- a) Diazonium salts of aromatic amines are more stable than those of aliphatic amines.
 - b) Aniline does not undergo Friedel Crafts reaction.
11. An element with molar mass 2.7×10^{-2} Kg mol⁻¹ forms a cubic unit cell with edge length 405 pm. If its density is 2.7×10^3 Kg m⁻³, what is the nature of the cubic unit cell?

12. The vapour pressure of pure liquids A and B are 450 and 700 mm Hg at 350K respectively. Find the composition of the liquid mixture if total vapour pressure is 600 mm Hg. Also find the composition of the vapor phase.
13. One half cell in a voltaic cell is constructed from a silver wire dipped in silver nitrate solution of unknown concentration. The other half cell consists of a zinc electrode dipping in 1.0M solution of zinc nitrate. A voltage of 1.48 V is measured for this cell. Calculate the concentration of silver nitrate solution. (Given $E^0_{Zn^{2+}/Zn} = -0.76V$; $E^0_{Ag^+/Ag} = +0.80V$)
- 14.a) Calculate the overall order of a reaction whose rate expression is $Rate = K [A]^{1/2} [B]^{3/2}$.
 b) What is the effect of temperature on the rate constant of a reaction? How can this temperature effect on rate constant be represented quantitatively?
15. What is the difference between multimolecular and macromolecular colloids? Give one example for each. How are associated colloids different from these two types of colloids?

OR

Explain the terms : a) Electro-osmosis b) Peptization c) Electrodialysis

- 16.a) How is leaching carried out for low grade copper ores ?
 b) What is the role of depressant in froth floatation process?
 c) What criterion is followed for the selection of the stationary phase in chromatography?
17. Complete the following reactions:
 a) $Cr_2O_7^{2-} + H_2S + H^+ \rightarrow$
 b) $MnO_4^- + SO_3^{2-} + H^+ \rightarrow$
 c) $Cr_2O_7^{2-} + 14H^+ + 6e^- \rightarrow$
- 18.a) Draw the cis and trans isomers of $[CrCl_2(ox)_2]^{3-}$. Which one is optically active and why?
 b) Why is geometrical isomerism not possible in tetrahedral complexes having two different types of unidentate ligands coordinated with the central metal ion?
- 19.a) What is meant by shape selective catalysis? Explain with an example.
 b) State Hardy Schultz rule and give one example.
- 20.a) An alkyl halide X of molecular formula $C_6H_{13}Cl$ on treatment with potassium tert-butoxide gives two isomeric alkene Y and Z (C_6H_{12}). Both alkenes on hydrogenation give 2,3-dimethylbutane. Predict the structures of X, Y and Z. Write all the reactions.
 b) Neopentyl bromide undergoes nucleophilic substitution reactions very slowly. Why?
- 21.a) Write the zwitter ion of amino acid.
 b) Explain the structure of DNA.
- 22.a) Arrange the following polymers in the increasing order of their intermolecular forces:
 Polythene , Buna-S, Nylon-6,6
 b) Write the reaction for the preparation of the following polymers:
 i) Terylene ii) Nylon-6
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) What are the conditions for the maximum yield of sulphuric acid by Contact process?
- b) Account for the following:
- i) $R_3P=O$ exists but $R_3N=O$ does not where R = alkyl group.
 - ii) NH_3 is basic but BiH_3 is only feebly basic.
 - iii) Noble gases have comparatively large atomic size.

OR

- a) Assign reasons for the following:
 - i) In solid state PCl_5 behaves as an ionic species.
 - ii) White phosphorous is more reactive than red phosphorous.
 - b) Draw the structure for the following:
 - i) IBr_2^- ii) $H_2S_2O_8$ iii) XeF_4
- 25.a) Which is more easily protonated- phenol or alcohol? Justify.
- b) Write the reactions of Williamson synthesis of 2-ethoxy-3-methylpentane starting from ethanol and 3-methylpentan-2-ol.
- c) Give a reaction to show the acidic nature of phenol? Compare its acidity with ethanol.

OR

- a) Out of phenol and benzene, which is more easily nitrated and why?
 - b) You are given benzene, conc. H_2SO_4 and NaOH. Write the equations for the preparation of phenol using these reagents.
 - c) Write the mechanism for the reaction of HI with methoxymethane.
- 26.a) How will you bring about the following conversions?
- i) Benzyl alcohol to phenylethanoic acid
 - ii) 3-nitrobromobenzene to 3-nitrobenzoic acid
 - iii) Propyne to acetone.
- b) Explain the mechanism for the nucleophilic attack on the carbonyl group of an aldehyde.

OR

- a) What is meant by the following terms of the reaction? Give an example in each case.
 - i) Acetal ii) Cyanohydrin iii) 2,4-DNP derivative
- b) Give simple chemical tests to distinguish between the following pairs of compounds:
 - i) Phenol and benzoic acid ii) Pentan-2-one and pentan-3-one.