

INTERNATIONAL INDIAN SCHOOL RIYADH

First term examination 2015

Class XII
Sub Chemistry

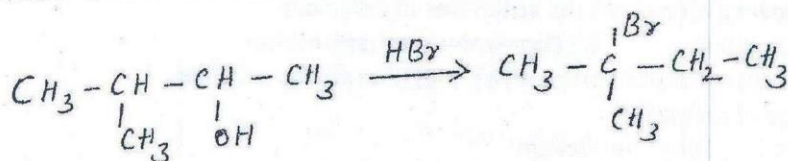
SET A

Time 3hrs
Maxmarks 70

General Instructions

1. Questions 1 to 5 are very short answer questions carrying one mark each
2. Questions 6 to 10 are short answer questions carrying two marks each
3. Questions 11 to 22 are short answer questions carrying three marks each
4. Question 23 is a value based question carrying four marks
5. Questions 24 to 26 are long answer question carrying five marks each
6. Use of calculator is not allowed. However log tables can be used if necessary

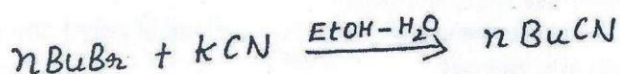
1. Explain minimum boiling azeotrope
2. What happens when white phosphorus is heated with concentrated sodium hydroxide solution in an inert atmosphere of carbon dioxide
3. Write the structure of melamine polymer
4. Give disproportionation reaction of Se_2Cl_2
5. Which point defect in crystals does not alter the density of the relevant solid
6.
 - i Define order of a reaction
 - ii Write the unit of rate equation for the gaseous reaction
7. What happens
 - i n-butyl Chloride is treated with alcoholic KOH
 - ii Chlorobenzene is subjected to hydrolysis
8. The rate constant for first order reaction 60 per second. How much time will it take to reduce the initial concentration of the reactant to its $1/16^{\text{th}}$ value
9. When 3-methylbutan-2-ol is treated with HBr, the following reaction takes place



Give mechanism

10. Out of $\text{C}_6\text{H}_5\text{CH}_2\text{Cl}$ and $\text{C}_6\text{H}_5\text{CHClC}_6\text{H}_5$, which is more easily hydrolysed by aqueous KOH
- OR

Write the mechanism of the following reaction



11. Write the differences between crystalline and amorphous solids
12. Explain the following
 - i Sandmeyer's reaction
 - ii Finkelstein reaction
 - iii Wurtz-Fittig reaction

13. i Compare the acidity of phenol with alcohol and water, Explain why
 ii Arrange the following compounds in increasing order of their acid strength
- | | | |
|-------------------|----------------------|----------------|
| Propan-1-ol | 2,4,6-trinitrophenol | 3-nitrophenol |
| 3,5-dinitrophenol | phenol | 4-methylphenol |
14. State Henry's law and mention two applications for this law
15. A reaction is first order in A and second order in B
- Write the differential rate equation
 - How is the rate affected on increasing the concentration of B three times
 - How is the rate affected when the concentrations of both A&B are doubled
16. a) Assign a reason for each of the following statement
- NH₃ is a stronger base than PH₃
 - Sulphur in vapour state exhibits a paramagnetic behaviour
- b) Give the resonating structures of N₂O₅
17. i What type of alignment of magnetic moments in
- Ferromagnetic
 - antiferromagnetic
- Explain the following
- (a) n-type semiconductor (b) p-type semiconductor
18. i Haloalkanes react with KCN to form alkyl cyanides as main product while AgCN forms isocyanides as the Chief product . Explain
- Arrange each set of compounds in order of increasing boiling points
 Bromomethane, bromoform, chloromethane, dibromomethane.
19. i State Raoult's law for a solution of volatile liquids
- The vapour pressure of pure liquids A and B are 450 and 700mm Hg respectively , at 350k. Find out the composition of the liquid mixture if total vapour pressure is 600mm Hg also find the composition of the vapour phase
20. i Define half life of a reaction
- The half life of radioactive decay of ¹⁴C is 5730 years. An archaeological artifact containing wood had only 80% of the ¹⁴C found in a living tree. Estimate the age of the sample
21. i Write the monomers used for getting Dacron
- Give an example for the following along with the structures of polymers
 (a) Homopolymers synthetic rubber (b) Copolymer synthetic rubber
22. Aluminium crystallises in a cubic close-packed structure. Its metallic radius is 125pm
- What is the length of the side of unit cell ?
 - How many unit cells are there in 1.00cm³ aluminium

OR

Calculate the packing efficiency in hcp and ccp structures

23. Polyethylene and Bakelite are the two important commercial polymers which are of immense importance in our daily life .In spite of their enormous valuable uses the indiscriminate use of these polymers is being banned

Answer the following questions

- What is polythene and Bakelite, and why their use is being discarded?
- As a student of chemistry, why would you advocate the use of paper bags instead of polythene bags?
- Which values are promoted through the use of paper bag
- Suggest two activities to promote these values

24. a) Define the following terms

- Mole fraction
- Van't Hoff factor

- b) Determine the amount of CaCl₂ (i=2.47) dissolved in 2.5 litre of water such that its osmotic pressure is 0.75m at 27°C

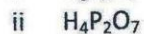
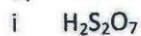
OR

- a) What is meant by

- Colligative properties

- ii Molarity of a solution
 b) Determine the osmotic pressure of a solution prepared by prepared by dissolving 25 mg of K_2SO_4 in 2 litres of water at $25^\circ C$, assuming, that it is completely dissociated

5. a) Draw the structure of the following



b) Account for the following

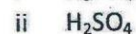
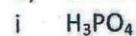
i Sulphur has a greater tendency for catenation than oxygen.

ii Phosphorous is much more reactive than nitrogen

c) Complete the equation $Ca_3P_2 + H_2O$

OR

a) Draw the structure of the following



b) All the bonds in PCl_5 molecule are not of the same length why

c) Why is H_2O a liquid and H_2S gas

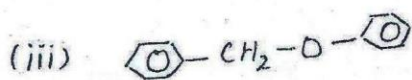
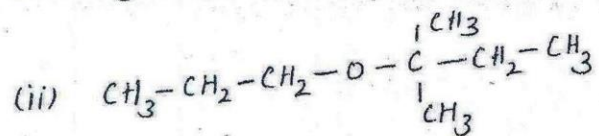
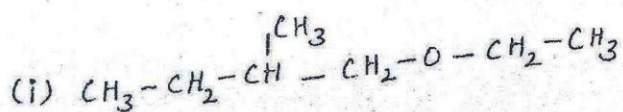
d) H_2S is less acidic than H_2Te why

6. a) How the following Conversions can be carried out

i Tertiary butyl bromide to 2-methyl propene

ii Phenol to salicylaldehyde

b) Give the major products that are formed by heating each of the following ethers with HI



OR

a) Write the reactions of Williamson synthesis of 2-ethoxy-3methylpentane starting from ethanol and 3-methylpentan-2-ol

b) Predict the products of the following reactions

