

**G. D. SOMANI MEMORIAL SCHOOL**  
**PRELIM EXAMS**

SUB: CHEMISTRY

DATE: 18/1/08

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MARKS: 80

TIME: 1½ HRS.

Answers to this Paper must be written on the paper provided separately. You will not be allowed to write during the first 15 minutes. This time is to be spent in reading the question paper. The time given at the head of this Paper is the time allowed for writing the answers.

**Section I is compulsory. Attempt any four questions from Section II**  
The intended marks for questions or parts of questions are given in brackets [ ]

**SECTION - I [40 MARKS]**

Attempt all questions from this Section.

Question: I

- [A] Elements A, B, C, D have Atomic numbers 20, 8, 6, 17 respectively. Without identifying the element, answer the following questions: [3]

Write the formula of the compound and type of bond formed between-

- i. A and B
- ii. C and D
- iii. A and D

- [B] i. Write down the atomicity of an alkali metal and halogen. [1]  
ii. Name the particles present in a liquid compound, which is a non-electrolyte. [1]

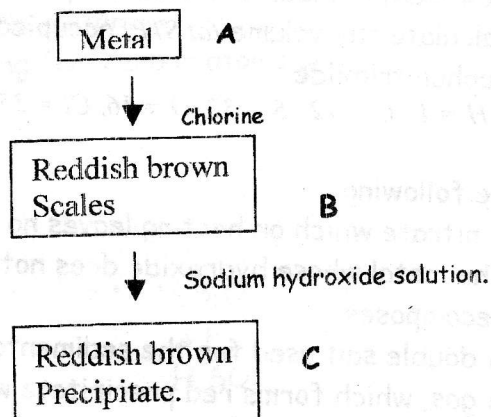
Question: II

Give reasons for the following: [5]

- i. Solid ionic compounds are non-electrolyte.
- ii. Iron (III) chloride is stored in air tight bottles.
- iii. Carbon tetrachloride does not dissolve in water.
- iv. Sugar chars after sometime when it comes in contact with concentrated sulphuric acid.
- v. The temperature of gases is lowered before they enter into oxidation chamber during Ostwald's process.

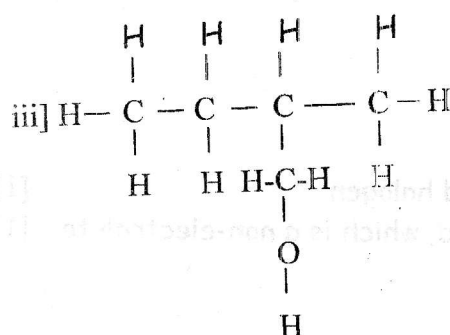
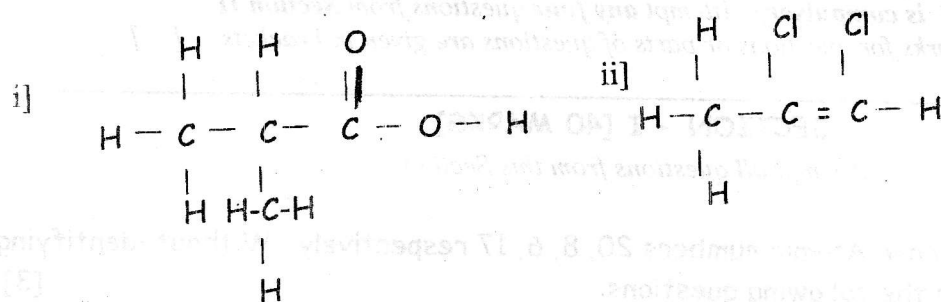
Question: III

[A]



- i. Identify A, B and C. [1½]  
 ii. What are the conditions for the reaction between metal 'A' and chlorine to get 'B'. Give equations also. [1½]  
 iii. Write the balanced chemical equation when 'C' is heated strongly. [1]

[B] Write the IUPAC name of: [3]



[C] Copy and complete the following table: [3]

Substance	Reaction with dilute/Concentrated acid.	Gas Produced.
(i)	(ii)	Carbon dioxide
(iii)	(iv)	Chlorine
(v)	(vi)	Ethylene

Question: IV

- [A] i. What is the mass in grams of 560ml of methane at STP. [1½]  
 ii. How many number of moles are present in 3.55gm of chlorine? [1½]  
 iii. Calculate the volume (at STP) occupied by  $12.046 \times 10^{23}$  molecules of sulphur trioxide. [2]  
 {  $H = 1, C = 12, S = 32, O = 16, Cl = 35.5, \text{Avagadro No.} = 6 \times 10^{23}$  }

[B] Name the following: [5]

- i. A nitrate which on heating leaves no residue.  
 ii. The metal whose hydroxide does not decompose on heating but its nitrate decomposes.  
 iii. A double salt used for the sedimentation of muddy water.  
 iv. A gas, which forms red precipitate with Fehling's solution.  
 v. A black metallic oxide, which dissolves in nitric acid to give greenish blue solution.

## Questions: V

- [A] Acids dissolve in water to produce positively charged ions. Name the ion and draw its electron dot diagram. [2]
- [B] Why Ionisation potential and Electron affinity are called periodic property? How is ionization potential linked with atomic size. Explain giving suitable example. [3]
- [C] Choose from the list and answer the questions that follows- [5]  
 AgCl, BaSO<sub>4</sub>, Mg, S<sub>8</sub>, CuCO<sub>3</sub>, KOH, P.
- An element, which combines directly with nitrogen on heating.
  - A salt soluble in Ammonium Acetate.
  - A solution, which readily absorbs carbon dioxide
  - An element which combines with concentrated hydrochloric acid to form phosphoric acid.
  - A salt soluble in excess of ammonium hydroxide.

SECTION - II[Attempt any four questions]

## Question: I

- [A] A white crystalline solid is warmed with sodium hydroxide solution. A gas is given off which turns moist red litmus paper blue. [3]
- Name the gas evolved.
  - State one other characteristic of the gas, which helps to identify it.
  - Give the name and formula of the cation present in the solid.
- [B] In the following reaction: [3]
- $$\text{Fe} + \text{H}_2\text{O} \rightleftharpoons \text{Fe}_3\text{O}_4 + \text{H}_2$$
- If 40gm of iron reacts completely with water, Calculate:
- The weight of Fe<sub>3</sub>O<sub>4</sub> formed.
  - The volume of hydrogen evolved at STP.
- [Fe = 56, H = 1, O = 16]
- [C] Give the name and structural formulae of: [4]
- Carboxylic acid containing four carbon atoms.
  - Unsaturated hydrocarbon containing five carbon atoms and a triple covalent bond.

## Question: II

[A]



B ↓

A ↑

Sulphur

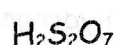
C →



D →



E →



↓ F



- i. Give the balanced equations for the above conversion of A, B, C, D, E, F, G. [3½]
- ii. Sulphur trioxide being sulphuric acid anhydride is not directly absorbed in water. Why? [1]
- iii. Name the catalyst used in this process. [½]

[B] What happens when – (Equation not required) [5]

- i. Sulphur dioxide is passed through bromine water?
- ii. Copper nitrate is heated.
- iii. Ethyne is bubbled through ammoniacal silver nitrate solution.
- iv. A mixture of sodium propionate and soda lime is heated in a round bottom flask.
- v. Concentrated nitric acid is added to copper.

### Question: III

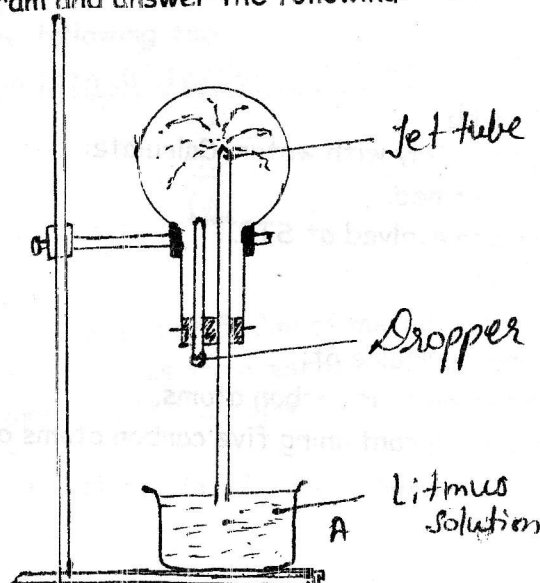
[A] An acid of Phosphorus has the following percentage composition: [5]  
 2.47% of hydrogen, 38.27% of Phosphorous, 59.26% of oxygen.  
 Find the empirical formula of this acid and its molecular formula, given that its relative molecular mass is 162. [H = 1, P = 31, O = 16]

[B] Write the balanced chemical equations for the following: [5]

- i. Ammonia is passed over bleaching powder.
- ii. Sulphur dioxide is passed through ferric sulphate solution.
- iii. Copper Carbonate is heated.
- iv. Ammonia is burnt in oxygen.

### Question: IV

[A] Observe the given diagram and answer the following:



- i. Name the experiment illustrated above. [½]
- ii. Which property of hydrogen chloride or ammonia is illustrated by this experiment? [½]
- iii. How can you identify hydrogen chloride and Ammonia gas with the help of this experiment using different litmus solution in beaker A. [2]

- [B] During electrolysis of molten Alumina- [3]
- Why are carbon anodes periodically replaced?
  - Why is the electrolytic mixture covered with coke and saw dust?
  - Write the balanced equation for ionization of alumina and reaction at cathode and anode.
- [C] i. How does chlorine react with ethane and ethene? Give the balanced chemical reactions for each. [2]
- ii. Write the preparation of - [2]
- Ethyne from calcium carbide.
  - Acetaldehyde from ethane.

Question: V

- [A] Write the equation for the reaction at anode and cathode during electrolysis of: [4]
- Dilute hydrochloric acid with inert electrode.
  - Nickel sulphate solution with Nickel electrode.
  - Sodium Argentocynide solution with silver electrodes.
  - Acidified copper sulphate solution with inert electrode
- [B] Write the equation for the following conversions: [2]
- Sodium sulphite to sodium sulphate.
  - Ferric salt to ferrous salt.
- [C] Name an alloy of iron used for making surgical instrument. Also write its composition. [1]
- [D] Give one test to distinguish between: [3]
- Zinc nitrate and calcium nitrate
  - Iron chloride and copper chloride.

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