Pre-Board Examination : 2022-23

Class - X

Chemistry

Time allowed : Two Hours **Maximum Marks : 80**

Section – (A) **[40 Marks]**

(Attempt all questions.)

Question 1.

Choose the correct answer to the questions from the given options : **[15]**

(a) Bonding in this molecule can be understood to involve co-ordinate bonding :

(i) Carbon tetrachloride (ii) Hydrogen

(iii) Hydrogen chloride (iv) Ammonium chloride

(b) Identify the statement which does not describe the property of alkenes :

(i) They are saturated hydrocarbons

(ii) They decolourise bromine water

(iii) They can undergo addition

(iv) They undergo combustion with oxygen forming carbon dioxide and water

(c) The two main metals in Bronze are :

(i) Copper and zinc (ii) Copper and lead

(iii) Copper and nickel (iv) Copper and tin

(d) "Concentrated sulphuric acid is used in the laboratory preparation of nitric acid and hydrochloric acid because it is ..... in comparison to these two acids."

(i) Less volatile (ii) Strong oxidizing agent

(iii) More volatile (iv) Weak acid

(e) Pure water consists almost entirely of ..... .

(i) Only ions (ii) Only molecules

(iii) Both ions & molecules (iv) Neither ions nor molecules

(f) "By dissolving aluminium oxide in cryolite a ..... solution is produced.

(i) Conducting (ii) Non-conducting

(iii) Acidic (iv) Amphoteric

P.T.O.

(g) Why does pure nitric acid take on a yellowish brown colour when exposed to light ?
(i) Formation of nitrogen dioxide
(ii) Formation of nitric oxide
(iii) Oxidation of nitric acid
(iv) Dissolution of nitrogen dioxide

(h) Name the gas produced by heating of ammonium nitrate :
(i) Nitrogen (ii) Nitrogen dioxide
(iii) Dinitrogen oxide (iv) Nitric oxide

(i) Compounds containing carbon and hydrogen only is called ..... .
(i) Catenation (ii) Electrolyte
(iii) Isomers (iv) Hydrocarbon

(j) Sodium nitrate reacting with ..... sulphuric acid produces nitric acid.
(i) Dilute (ii) Concentrated
(iii) Acidic (iv) Electrolyte

(k) The percentage of phosphorus in the fertilizer super-phosphate $Ca(H_2PO_4)_2$. (H = 1; O = 16; P = 31; Ca = 40)
(i) 30.3 % (ii) 26.5% (iii) 20.4% (iv) 33.5%

(l) The empirical formula of compound is CH_2 & molecular formula is C_5H_{10}, the value of n is :
(i) 2 (ii) 6 (iii) 5 (iv) 10

(m) Ammonia can be obtained by adding water to :
(i) Ammonium chloride (ii) Ammonium nitrate
(iii) Magnesium nitride (iv) Magnesium nitrate

(n) The IUPAC name of acetylene is :
(i) Propane (ii) Propyne (iii) Ethene (iv) Ethyne

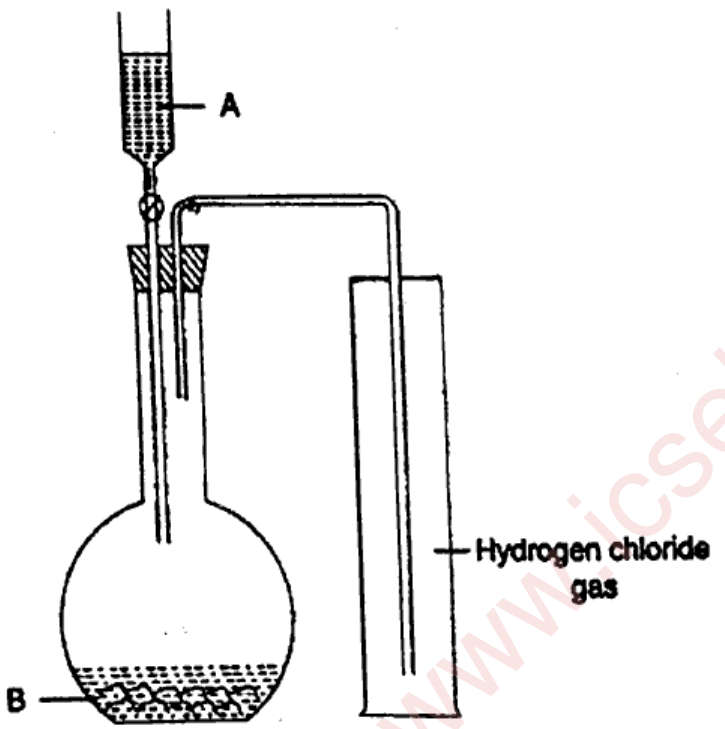
(o) Molecular formula of a compound is $C_6H_{18}O_3$. Find its empirical formula :
(i) CHO (ii) CH_3O (iii) C_2H_6O (iv) $C_2H_9O_3$

Question 2.

(a) Match the following column A with column B : **[5]**

Column A	Column B
(i) Acid	(1) Caustic soda
(ii) Base	(2) Vineger
(iii) Normal salt	(3) Copper
(iv) Inert electrode	(4) Sodium chloride
(v) Active electrode	(5) Platinum

(b) The diagram shows an apparatus for the laboratory preparation of hydrogen chloride : [5]



(i) Identify A and B.
(ii) Write the equation for the reaction.
(iii) How would you check whether or not the gas jar is filled with hydrogen chloride ?
(iv) Name the method of collection of evolved gas ?

(c) Complete the following by choosing the correct answers from the bracket : [5]

(i) If pH value of a solution is more than 7, solution is ..... . (acidic / alkaline).
(ii) ..... ($AgCl$ / $PbCl_2$) white precipitate is soluble in excess NH_4OH.
(iii) Cold, dilute nitric acid reacts with copper to give ..... . (Nitrogen dioxide / Nitric oxide)
(iv) Hot, concentrated nitric acid reacts with sulphur to form ..... . (Sulphur dioxide / Sulphuric acid)
(v) The metallic ions that should be present in the electrolyte when an article made of copper is to be electroplated with silver ..... . (nickel / silver)

(d) Identify the following : [5]

(i) This gas is used as a reducing agent in reducing copper oxide to copper.

(ii) The acid which produces sugar charcoal from sugar.

(iii) Process by which ethane is obtained from ethene.

(iv) The tendency of an atom to attract electrons to itself when combined in a compound.

(v) The product formed at the anode during the electrolysis of acidified water using platinum electrodes.

(e) Arrange the following elements as directed : [5]

(i) Ar, He, Ne (In increasing order of electron shells)

(ii) Li, F, C, O (In increasing order of electron affinity)

(iii) Ethane, methane, propane (In increasing order of molecular mass) {H =1, C=12}

(iv) Fe^{2+}, Cu^{2+}, Pb^{2+}, H^+
(An aqueous electrolyte consists of the ions mentioned in the list, the ion which could be discharged most readily during electrolysis.)

(v) Sulphuric acid, nitric acid, phosphoric acid (In the increasing order of basicity of an acid)

Section – (B) [40 Marks]

(Do any FOUR questions.)

Question 3.

(a) Differentiate between the terms strong electrolyte and weak electrolyte. (Stating any two differences). [2+2+3+3=10]

(b) Write equations for the reactions taking place at the two electrodes (mentioning clearly the name of the electrode) during the electrolysis of Molten lead bromide with inert electrodes.

(c) A gaseous hydrocarbon contains 82.76% of carbon. Given that its vapour density is 29, find its molecular formula. [C = 12, H = 1]

(d) Calcium carbide is used for the artificial ripening of fruits. Actually the fruit ripens because of the heat evolved while calcium carbide reacts with moisture. During this reaction calcium hydroxide and acetylene gas is formed. If 200 cm^3 of acetylene is formed from a certain mass of calcium carbide, find the volume of oxygen required and carbon dioxide formed during the complete combustion. The combustion reaction can be represented as below :

$$2C_2H_2(g) + 5O_2(g) \rightarrow 4CO_2(g) + 2H_2O(g)$$

Question 4.

(a) When nitric acid is prepared by the action of concentrated sulphuric acid on potassium nitrate, what is the special feature of the apparatus used & why ? [2+2+3+3=6]

(b) What is the name of the process by which sulphuric acid is manufactured ? Name the catalyst used in the process.

(c) Give balanced chemical equations for each of the following :
(i) Lab preparation of ammonia using an ammonium salt.
(ii) Reaction of ammonia with excess chlorine.
(iii) Dilute hydrochloric acid and sodium sulphite.

(d) Name the gas evolved in each case (formula is not acceptable) :
(i) The gas produced by the action of concentrated sulphuric acid on sodium chloride.
(ii) The gas produced by the action of dilute nitric acid on copper.
(iii) The gas that burns in oxygen with a yellowish green flame.

Question 5.

(a) For each of the substance listed below, describe the role played in the extraction of aluminium : [2+2+3+3=10]
(i) Cryolite (ii) Graphite

(b) What is the type of reaction taking place :
(i) Between ethane and chlorine to form mono-chloroethane ?
(ii) Between ethene and chlorine forms only one product ?

(c) Write the structural formula of butane & write its IUPAC name also.

(d) Write chief ore of :
(i) Iron (ii) Aluminium (iii) Zinc

Question 6.

(a) Fill in the blanks : [2+2+3+3=10]
The atomic size decreases as we move from left to right across the period, because the ..... increases but the ..... remains the same.

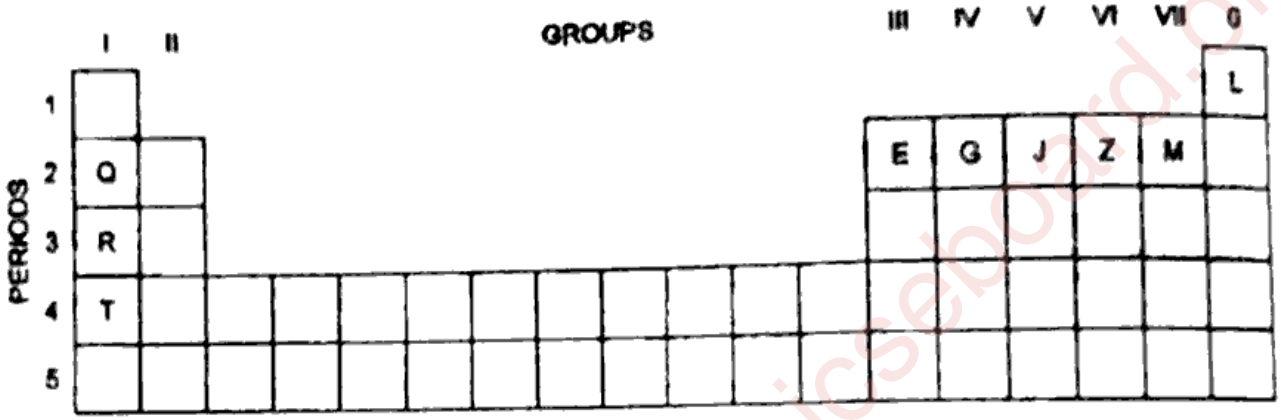
(b) Give reasons :
(i) Ionic compound stable
(ii) Hydrogen chloride can be termed as a polar compound.

(c) Draw electron dot formula of :

(i) Ammonium ion (ii) Methane

(iii) Calcium oxide

(d) Use the letters only written in the Periodic Table given below to answer the questions that follow :



(i) State the number of valence electrons in atom J.

(ii) Which element shown forms ions with a single negative charge ?

(iii) Which metallic element is more reactive than R ?

Question 7.

(a) State your observations when caustic solution is added drop by drop and then in excess in copper sulphate solution. [2+2+3+3=10]

(b) Define :

(i) pH of solution (ii) Ampoteric oxide

(c) Write word equation :

(i) $Mg + HCl \rightarrow$

(ii) $Na_2CO_3 + HCl \rightarrow$

(iii) $CaSO_3 + HCl \rightarrow$

(d) How does ammonium hydroxide help to distinguish between :

(i) Iron (II) chloride and Iron (III) chloride

(ii) Calcium sulphate and Lead nitrate

(iii) Copper sulphate & Zinc nitrate