Class: X **Subject: Chemistry** **Topic:** **Date:**

TIME: 2 hrs **M MARKS: 80**

Question No. 1

(a) In each case, choose the correct option: [10]

(i) The gas that is liberated at the anode during the electrolysis of dilute solution of sodium chloride is:
(A) oxygen
(B) hydrogen chloride
(C) chlorine
(D) hydrogen

(ii) The number of carbon-hydrogen bonds in acetaldehyde is:
(A) four
(B) three
(C) five
(D) six

(iii) The hydrocarbon with a vapour density of 22 is:
(A) ethylene
(B) propane
(C) propyne
(D) ethane

(iv) A gas cylinder of capacity $20dm^3$ is filled with a gas X, the mass of which is 10g. When the same cylinder is filled with hydrogen gas at the same temperature and pressure, the mass of the hydrogen is 2g. The relative molecular mass of the gas X is:
(A) 5
(B) 10
(C) 15
(D) 20

(v) The formation of chloroform from methane and chlorine is an example of:
(A) addition reaction
(B) substitution reaction
(C) decarboxylation reaction
(D) dehydration reaction

vi) The physical and chemical properties of elements are periodic function of their.

A) Atomic masses

B) Atomic number

C) Electron

D) Proton

vii) All acids have _____ as their constituent element.

a) OH-

b) H+

c) H2

d) O2

viii) Reduction takes place at __

a) Anode

b) Cathode

c) Both depending on electrolytes

d) Depending on ions discharged at electrodes

ix) __oil is present during froath floatation process.

a) Sunflower

b) Coconut

c) Pine

d) Seasam

x) __metals can be purified using electro-refining method.

a) Iron

b) Gold

c) Calcium

d) Lead

State the conditions required for the following reactions to take place:

1. Catalytic hydrogenation of ethyne.
2. Preparation of ethyne from ethylene dibromide.

3. Catalytic oxidation of ammonia to nitric oxide.
4. Any two conditions for the conversion of sulphur dioxide to sulphur trioxide. [5]

Distinguish between the following pairs of compounds using the test given within brackets:

1. Iron (II) sulphate and iron(III) sulphate (using ammonium hydroxide)
2. A lead salt and a zinc salt (using excess ammonium hydroxide)
3. Sodium nitrate and sodium sulphite (using dilute sulphuric acid)
4. Dilute sulphuric acid and dilute hydrochloric acid (using barium chloride solution)
5. Ethane and ethene (using alkaline potassium permanganate solution. [5]

Question No. 2

(a) A compound Y consists of 4.8% carbon and 95.2% bromine. [4]

(i) Determine the empirical formula of the compound. (C = 12, Br = 80)

(ii) If the vapour density of the compound is 252, what is the molecular formula of the

compound?

b) Give the balanced chemical equations for the following [6]

(i) preparation of methane from sodium ethanoate

(ii) complete combustion of ethane

(iii) reaction of calcium carbide and cold water

(iv) catalytic hydrogenation of ethne

(v) preparation of ethene from ethanol

(vi) bromoethane is heated with hot, concentrated, alcoholic KOH solution

(c) Fill in the blanks from the choices given in brackets: [5]

(i) The energy required to remove an electron from a neutral isolated gaseous atom and convert it into a positively charged gaseous ion is called ……. (electron affinity, ionization potential, electronegativity)
(ii) The compound that does not have a lone pair of electrons is (water, ammonia, carbon tetrachloride)
(iii) When a metallic oxide is dissolved in water, the solution formed has a high concentration of ions. (H^+, H_3O^+, OH^-)
(iv) Potassium sulphite on reacting with hydrochloric acid releases …….. gas. (Cl_2, SO_2, H_2S)
(v) The compound formed when ethene reacts with Hydrogen is …… (CH_4, C_2H_6, C_3H_8)

(d) (i) Draw the structural formula for each of the following: [5]
1. 2, 3 – dimethyl butane
2. diethyl ether
3. propanoic acid
(ii) From the list of terms given, choose the most appropriate term to match the given de-scription.
(calcination, roasting, pulverization, smelting)
1. Crushing of the ore into a fine powder.
2. Heating of the ore in the absence of air to a high temperature.

Question No. 3

(a) 6 litres of hydrogen and 4 litres of chlorine are mixed and exploded. if water is added to the gas formed, find the volume of the residual gas mixture. [2]

(b) A metal article is to be electroplated with silver The electrolyte used is sodium argentocyanide solution. [6]

(i) Why is it preferred to silver nitrate solution as an electrolyte?

(ii) Mention what are used an cathode and anode

(iii) Write the reactions at the cathode and anode

(iv) Mention one condition that will ensure that the deposition is smooth, firm and long Lasting.

(c) Give reasons why. [2]

(i) electrolysis of molten lead bromide is a redox reaction.

(ii) ethene is more reactive than ethane.

(d) State the observations at the anode and at the cathode during the electrolysis of: [4]
(i) fused lead bromide using graphite electrodes.
(ii) copper sulphate solution using copper electrodes.

(a) (i) Propane bums in air according to the following equation: [4]
$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$.
What volume of propane is consumed on using 1000 cm^3 of air, considering only 20% of air contains oxygen?
(ii) The mass of 11..2 litres of a certain gas at s.t.p. is 24g. Find the gram molecular mass of the gas.

(c) Write a balanced chemical equation for the preparation of each of the following salts: [2]
(i) Copper carbonate
(ii) Ammonium sulphate crystals

Question No. 4:

(a) Define: [2]
(i) catenation
(ii) electrorefining

(b) Give the reaction and observation at the cathode when a solution of copper sulphate is. [2]
electrolyzed using copper electrodes

(c) Give a balanced chemical equation for each of the following: [4]
(i) Action of cone. Nitric acid on Sulphur.
(ii) Catalytic oxidation of Ammonia.
(iii) Laboratory preparation of Nitric acid.
(iv) Reaction of Ammonia with Nitric acid.

(d) Identify the term or substance based on the descriptions given below: [4]
(i) Ice like crystals formed on cooling an organic acid sufficiently.
(ii) Hydrocarbon containing a triple bond used for welding purposes.
(iii) The property by virtue of which the compound has the same molecular formula but different structural formulae.
(iv) The compound formed where two alkyl groups are linked by imageee group.

(e) Name the following: [4]
(i) The process of coating of iron with zinc.
(ii) An alloy of lead and tin that is used in electrical circuits.
(iii) An ore of zinc containing its sulphide.
(iv) A metal oxide that can be reduced by hydrogen.

(f) State the inference drawn from the following observations: [4]

1. On carrying out the flame test with a salt P a brick red flame was obtained. What is the cation in P?
2. A gas Q turns moist had acetate paper silvery black. Identify the gas Q.
3. pH of liquid R is 10. What kind of substance is R?
4. Salt S is prepared by reacting dilute sulphuric acid with copper oxide. Identify S.