ICSE CLASS 10

CHEMISTRY

SAMPLE PAPER

(As Per Re-reduced Syllabus - For ICSE 2021 Exam)

Time allowed – 2 Hours 15 Mins **Max. Marks: 80**

General Instructions:

a) Answers to this paper must be written on the paper provided separately.
b) You will not be allowed to write during the first 15 minutes and to be spent in reading the Question paper.
c) The time given at the head of this paper is the time allowed for writing the answers.
d) Attempt all questions from Section A and any four questions from Section B.
e) The intended marks for questions or parts of questions are given in brackets [ ].

SECTION A (40 Marks)

Attempt **all the** questions from this section.

Q.1. a) Select the correct answer: - **[5 marks]**

i) The process of adding hydrogen to unsaturated compounds in the presence of nickel as catalyst is

A) Hydrogenation B) dehydration C) Dehydrogenation D) Oxidation

ii) Diluted liquor ammonia is added to zinc nitrate solution produces

A) White ppt. insoluble in excess reagent B) White ppt. partially soluble.
C) White ppt. soluble in excess reagent D) No characteristic observation.

iii) A compound that produces a grey substance when electrolyzed in the molten state contains the anion:

A) NO_2^- B) Br^- C) SO_4^{2-} D) Cl^-

iv) The molecular formula of the compound that has the empirical formula $AlCl_3$ with two repeating units is

A) Al_2Cl_6 B) AlCl
C) Al_3Cl_6 D) None of them

v) The barium chloride reagent is used to test for the presence of

A) $NO_3^{\ominus}$ B) SO_3^{2-} C) SO_4^{2-} D) S^{2-}

b) Name / State the following **[5 Marks]**

i) IUPAC name of the first member of the alkynes.
ii) The basicity of the oxyacid that stains the skin yellow.

iii) The pH of neutral water

iv) The periodic property that relates the nuclear change to the acceptance of electron in its valence shell.

v) A molecule with a lone pair of electrons.

c) State all the relevant observations for: - **[5 Marks]**

i) A drop of alkaline phenolphthalein is added to the product formed by reaction between the greenish yellow gas and a highly combustible gas.

ii) Copper sulphate solution is electrolyzed using graphite electrodes.

iii) Ethyne is passed through bromine water.

iv) Sodium nitrate Is heated with Cu – turnings in the presence of conc H_2SO_4.

v) Lead nitrate crystals are heated.

d) Write balanced equations for the following reactions — **[5 Marks]**

i) Conversion of ethane to bromoethane

ii) Dil. hydrochloric acid is added to sodium sulphide.

iii) Conc. nitric acid is added to carbon.

iv) Preparation of lead carbonate from lead oxide.

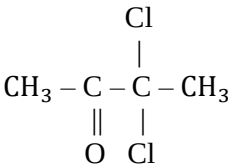
e) i) Draw the structural formula of: - **[5 Marks]**

A) The position isomer of butyne

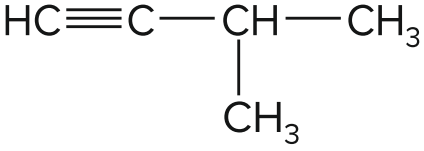
B) 2 – Bromo – 3 methylpentanal

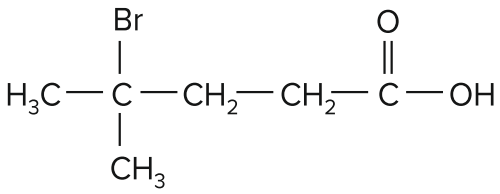
ii) Write the IUPAC names of:

A)



B)



C) 

f) Give relevant reasons for: - **[5 Marks]**

i) Reducing power of elements decreases across the period.

ii) Hydrogen chloride is a polar covalent molecule.

iii) About 90% hydrocarbons are organic compounds.

iv) P_2O_5 is not used to dry ammonia gas during ammonia preparation in the laboratories.

v) Aluminium oxide can be reduced by electrolysis.

g) i) Draw and label the experimental setup for electrorefining of impure copper block. Name the impurities collected at the bottom of the voltameter. **[5 Marks]**

ii) At which electrode does $Y - 2e \longrightarrow Y^{2+}$ takes place?

h) A compound has the following % composition **[5 Marks]**

Na = 18.60%, S = 25.80% , H = 4.03% and O = 51.58%

Calculate the molecular formula of the crystalline salt assuming that all the hydrogen in the compound is in combination with oxygen as water of crystallization. Molecular weight of the compound is 248. [Na = 23, O = 16, H = 1]

SECTION B (40 Marks)

Attempt **any four** questions from this section

Q.2. a) Two atoms X and Y have electronic configuration (2, 8, 2) and (2. 8, 7) respectively. Answer the following pertaining to X and Y. **[5 Marks]**

i) What is common in both X and Y w.r.t. their position in the periodic table?
ii) Write the formula of the compound between X and Y.
iii) Comment on the solubility of the compound in water.
iv) With the help of electron dot diagram show the formation of the compound in

b) Draw the electron dot diagram of the species formed between a proton and the gas formed in the Haber's process. State the number of lone pair of electrons in the ion. **[3 Marks]**

c) Identify the acid which matches the description: **[2 Marks]**

i) The acid that reacts with iron to form ferrous chloride.
ii) The organic acid having basicity one although it contains four H – atoms.

Q.3. a) Name / State the following: - **[4 Marks]**

i) The nature of the gas formed when ammonia is oxidized catalytically.
ii) The solvent that dissolve silver chloride.
iii) The pH of caustic soda compared to that of distilled water.
iv) The property that relates the energy change during the acceptance of electron in an atom.

b) What type of particles are present in: **[3 Marks]**

i) Potassium ferrocyanide solution.

ii) Sucrose in sugarcane
iii) The solvent that dissolves rubber.

c) Give one use of: - **[3 Marks]**
i) Boric acid ii) Ammonium sulphate iii) Ethylene

Q.4. a) Name the organic compounds prepared by the following reactions **[3 Marks]**
I) Acetylene is completely hydrogenated.
II) Methane is reacted with ac potassium dichromate solution
III) Ethylene is reacted with chlorine in the presence of carbon tetrachloride

b) What inferences can be drawn from the fountain experiment w.r.t. hydrogen chloride? **[2 Marks]**

c) Acetylene and benzene have the same empirical formula CH, but vapour densities of 13 and 39, respectively. Deduce their molecular formulae. **[3 Marks]**

d) Give one point of difference between: **[2 Marks]**
i) Alkane and alkene (Type of reaction)
ii) Alkene and alkyne (observation based on using ammoniacal $AgNO_3$)

Q.5. a) Write balance chemical equations for the following: - **[5 Marks]**
i) The conversion of NH_3 to NO in the Ostwald process.
ii) The conversion of NO_2 to HNO_3 in the Ostwald process.
iii) The conversion of Sugar to sugar charcoal.
iv) The reaction of S with hot concentrated HNO_3

b) Give scientific reasons for: - **[5 Marks]**
i) A monobasic acid cannot form an acid salt.
ii) The brown ring formed during testing $NO3^-$ ion is fragile.
iii) It is dangerous to burn hydrocarbons in limited supply of air.
iv) Ammonia can turn black copper oxide to red copper.
v) The formation of magnesium oxide is a redox process.

Q.6. a) A compound of Carbon, Hydrogen and Oxygen is found to contain 40% of Carbon, 6.7% of Hydrogen, and 53.3% of Oxygen. Calculate its empirical formula. If its vapour density is 30. Calculate the molecular formula.
[C=12, H =1, O = 16] **[4 Marks]**

b) Write chemical equations for reactions taking place during electrolysis.
(i) Dissociation of Sodium Silver Cyanide. **[4 Marks]**
(ii) Reaction at anode during electro refining of Copper.
(iii) Reaction at anode during electrolysis of acidified water.

(iv) Reaction at anode during electroplating of an article with Nickel.

c) Name the isomer of 2 – chloropropane. Draw the structure. **[2 Marks]**

Q. 7. a) Fill in the blanks. **[5 Marks]**

i) The catalyst used in conversion of ethene to ethane is commonly _____ (iron / cobalt / nickel).

ii) Sodium nitrate dissolves in water to form ions. The process is called _____ (dissociation / ionization)

iii) _____ are also called paraffins. (alkanes /alkenes /alkynes)

iv) The radius of a cation is _____ than the parent atom (identical / smaller than / greater than).

v) The reaction between an acid and a base is called _____ reaction. (synthesis / neutralization)

b) Name the following elements: - **[4 Marks]**

i) It forms a tripositive ion and is a constituent of cryolite.

ii) A variable metal ion present in the electrolyte used in silver electroplating

iii) The element preceeding the atom with electronic configuration (2, 4)

iv) The largest atom in Period – 2.

c) Name the acid that acts both as a drying and a dehydrating agent. **[1 Mark]**