

CHEMISTRY

Answers to this paper must be written on the paper provided separately

You will not be allowed to write for the first 10 minutes. This time is to be spent in reading the question paper

Section A is compulsory

Section B has 5 questions, solve any 4

SECTION A
QUESTION 1

Select the correct option. Do not copy the question Write only the answer (15)

- i) Glauber salt ,oil of vitriol is prepared using
- a) Ferric hydroxide b) Ferrous hydroxide
b) Ferric sulphate d) Ferric chloride
- ii) Chile salt petre has a chemical formula of
- a) KNO_3 b) $\text{Pb}(\text{NO}_3)_2$
c) NaNO_3 d) KNO_3
- iii) Gas liberated when manganese dioxide is reacted with conc hydrochloric acid
- a) Oxygen b) chlorine
c) sulphur dioxide d) hydrogen sulphide
- iv) Product of electrolysis of water is
- a) oxygen at cathode and hydrogen at anode
b) Oxygen at anode hydrogen at cathode
c) hydrogen at cathode no product at anode
d) Hydrogen at anode no product at cathode
- v) If E.F. of a compound is CH_2O then its molecular formula is
- a) $\text{C}_2\text{H}_2\text{O}_2$ b) $\text{C}_2\text{H}_4\text{O}$
c) $\text{C}_3\text{H}_6\text{O}$ d) $\text{C}_6\text{H}_{12}\text{O}_6$

vi) Largest atom

- a) Sodium b) Lithium
b) Potassium d) Rubidium

vii) Element having maximum Ionisation Potential

- a) Mg b) Na c) S d) Si

viii) Element having maximum electronegativity

- a) Cl b) Br c) F d) I

ix) Which salt gives you a brown precipitate with ammonium hydroxide and a white precipitate with barium chloride

- a) Ferric sulphate b) Ferrous sulphate c) Ferric chloride d) Ferrous chloride

x) Select the odd one out

- i) CaO ii) CuO iii) Aluminium oxide iv) Fe O

xi) A n aqueous solution contains Ag^+ , H^+ , Fe^{+2} , Zn^{+2} ions .Which ions will get discharged at the cathode

- i) Ag^+ ii) H^+ iii) Fe^{+2} iv) Zn^{+2}

xii) Common name for hydrochloric acid is

- i) Muriatic acid ii) chile salt petr iii) Nitre iv) sal ammoniac

xiii) A gas cylinder of capacity 20litre 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 hydrogen is 2g. What is the relative molecular mass of gas nX

- a) 5 b) 10 c) 15 d) 20

xiv) The relative molecular mass of a gas is 44, Therefore the V.D. of the gas is c

- a) 22 b) 11 c) 44 d) 88

xv) Which one of the following has a larger number of molecules

- a) 11g of CO_2 b) 12g of O_2 c) 2g of H_2 d) 21g of N_2

QUESTION 2

(i) With respect to electroplating a spoon with silver, answer the questions that follow (5)

a) Write down the name of the electrolyte

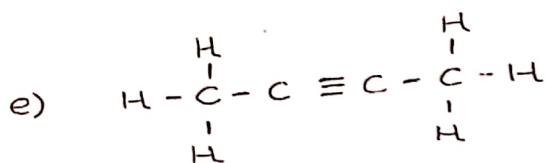
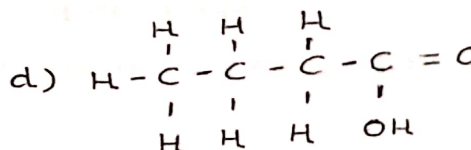
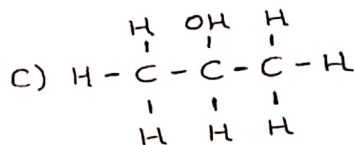
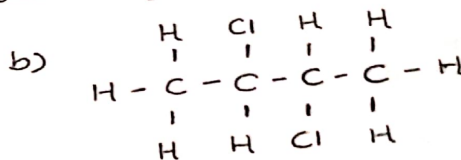
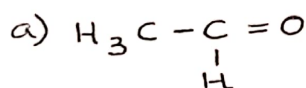
b) Give the equation for the dissociation reaction of the same

c) List 2 conditions necessary for electroplating (with reason)

d) What do you mean by electrometallurgy? Name a metal that is extracted by this method

ii) Give the IUPAC for the following organic compound .

(5)



iii) Fill in the blanks

(3)

- _____ is the process of converting the ore into an oxide by burning it in excess air
- Basicity of acetic acid is _____
- Sodium zincate is a _____ type of salt
- _____ is a substance found in the earth's crust from which the metal can be feasibly extracted
- _____ is the process of coating a metal with zinc
- The formula of Haematite is _____

- iv) Solve the following (2)
A compound has O=61.32%, S = 11.15 %, H = 4.88% and Zn = 22.65%. The relative molecular mass of the compound is 287 a.m.u. Find the molecular formula of the compound, assuming that all the hydrogen is present as water of crystallisation
- v) Identify the following (5)
- Substance added to an ore to remove gangue
 - Substance left behind after electrolysis during electrorefining
 - Drying agent for ammonia
 - Conditions in Habers process
 - Compound formed when ammonia undergoes catalytic oxidation
- vi) Draw the structure of the following compounds (5)
- ethanol
 - methanoic acid
 - acetaldehyde
 - but-2ene
 - propylene

SECTION B

SOLVE ANY 4 FROM THE GIVEN 6 QUESTIONS

QUESTION 3

- i) With respect to the lab preparation of ammonia (5)
- Give an equation for the same
 - Give an equation to show why sulphuric acid is not used as a drying agent for ammonia
 - Why is ammonia preferred to CFC as a refrigerant
 - Give the difference between the formula of liquor and liquid ammonia
 - Give an equation for the large scale production of ammonia
- ii) Give equations for the following conversions (5)
- salt to methane
 - alkyl halide to ethane
 - alcohol to ethane
 - ethane to ethane
 - ethane to 1,1,2,2 tetra chloro ethane

QUESTION 4

- i) Draw the electron dot diagram of the following (2)
- a) ammonium ion
 - b) hydronium ion
- ii) a) 450 cc of carbon monoxide and 200 cc of oxygen are ignited. Calculate the composition of the resultant mixture (3)
- b) State Gay Lussacs law (3)
- iii) Define alloy. List any 2 alloys of aluminium and give their composition (3)
- iv) Give 2 reasons why large number of organic compounds are found. (2)

QUESTION 5

- i) With respect to the large scale preparation of sulphuric acid (5)
- a) Give an equation for the catalytic reaction
 - b) Why is the sulphur trioxide obtained not directly dissolved in water to obtain sulphuric acid ?
 - c) How is sulphuric acid diluted? Why?
 - d) Give an example of sulphuric acid acting as a dehydrating agent
- ii) Complete the following equations (5)
- a) $\text{CH}_4 + \text{Cl}_2 \longrightarrow$
 - b) $\text{S} + \text{HNO}_3 \longrightarrow$
 - c) $\text{NH}_4\text{NO}_3 \longrightarrow$
 - d) $\text{K}_2\text{Cr}_2\text{O}_7 + \text{HCl} \longrightarrow$
 - e) $\text{C}_2\text{H}_2 + \text{Cl}_2 \longrightarrow$

QUESTION 6

- i) Give a chemical test to differentiate between the following (5)
- a) Ethane and ethyne
 - b) Dilute and concentrated nitric acid'
 - c) Dilute and concentrated sulphuric acid
 - d) Ammonium hydroxide and sodium hydroxide
 - e) Silver nitrate and lead nitrate

ii) Give an equation for the preparation of the following salts, Also mention the type of reaction in each case (5)

- Sodium nitrate
- Lead chloride
- Zinc chloride
- Blue vitriol
- Ferric chloride

QUESTION 7

i) With respect to the large scale preparation of nitric acid (5)
Aluminium is a common metal obtained through metallurgy, involving a series of processes. Answer the questions that follow

- What is the importance of caustic alkali in Bayer's process?
- Give an equation to obtain aluminium hydroxide
- With respect to Hall-Heroult's process give dissociation reaction for the electrolyte
- Name the substances added to the main electrolyte, Give a reason why each one is added

ii) Write a chemical equation for the following reactions (5)

- hydrogenation of ethyne
- combustion of ethane
- addition of ammonium hydroxide to copper sulphate
- Brown Ring test
- Addition of concentrated sulphuric acid to sulphur

QUESTION 8

i) What would you observe (5)

- When dry ammonia is passed over heated copper oxide
- Ammonium hydroxide is added to zinc nitrate solution first a few drops and then in excess
- Ethene is bubbled through carbon tetrachloride containing bromine
- Lead nitrate is heated
- concentrated sulphuric acid is added to sugar crystals

ii) Complete the following table. Only write answers from 1 to 10 (5)

Homologous series	General Formula	First Member	No. of Bonds	Saturated or un saturated
Alkane	1	Methane	Single covalent bond	2
Alkene	3	4	5	6
Alkyne	7	8	9	10

ii) Complete the following table. Only write answers from 1 to 10

(5)

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