GREENLAWNS HIGH SCHOOL

PRELIMINARY EXAMINATION

CHEMISTRY

X –20/01/26

Maximum Marks: 80

Time allowed: Two hours

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

The time given at the head of this Paper is the time allowed for writing the answers.

Section A is compulsory. Attempt any four questions from Section B.

The intended marks for questions or parts of questions are given in brackets [ ].

SECTION A
(Attempt all questions)

Question 1

Choose the correct answers to the questions from the given options.

(Do not copy the question, Write the correct answer only.) **[15]**

(i) As we move across a period, hydroxides of the elements change from.

(a) strongly acidic to amphoteric to basic

(b) weakly basic to amphoteric to strongly acidic

(c) strongly amphoteric to basic to acidic

(d) strongly basic to amphoteric to acidic

(ii) Non-polar covalent bonds are formed between

(1) identical atoms

(2) hydrocarbons

(3) metal and non-metal

(4) metal and metal

(a) all of the above

(b) 1 and 2 only

(c) 1, 2 and 3

(d) 3 and 4

(iii) Assertion (A) : Most of the acids dissolve in water.

Reason (R) : pH of an acid is less than 7.

(a) Both A and R are true and R is a correct explanation for A

(b) Both A and R are true and R is not a correct explanation for A

(c) A is true but R is false

(d) A is false but R is true

(iv)

Test	Observation
Zn^{2+} treated with excess of NH_4OH.	Colourless is solution formed due to formation of '**A**'
Zn^{2+} treated with excess of NaOH.	Colourless is solution formed due to formation of '**B**'

(a) **A** – Tetrammine zinc sulphite **B** – Sodium zincate

(b) **A** – Sodium zincate **B** –Tetrammine zinc sulphate

(c) **A** – Tetrammine zinc sulphate **B** – Sodium zincate

(d) **A** – Tetrammine zinc sulphate **B** – Sodium zinc oxide

(v) A compound with empirical formula XY_2 has vapour density twice its empirical formula. Its molecular formula is

(a) X_2Y_2

(b) X_4Y_8

(c) X_8Y_4

(d) X_4Y_4

(vi) Which of the following is true about electrolysis of $CuSO_4$ using platinum electrodes.

(1) The blue colour of the electrolyte fades.

(2) The anode decreases in size.

(3) The anode increases in size.

(4) The coloured gas is liberated at anode.

(a) only 2 (b) 1 and 4

(c) only 1 (d) 1 and 3

(vii) Earthly impurities are removed from the ore by adding

(a) flux (b) gangue

(c) slag (d) none of these

(viii) In contact process temperature is maintained at 450°C due to

(a) oxidation of S (b) oxidation SO_2

(c) catalytic oxidation of SO_2 (d) oxidation of SO_3

(ix) Nature of liquid ammonia is

(a) basic (b) acidic

(c) amphoteric (d) neutral

(x) Fuming nitric acid is obtained by carrying out distillation .

(a) under low pressure and presence of dilute H_2SO_4

(b) under low pressure and presence of concentrated H_2SO_4

(c) under high pressure and presence of dilute H_2SO_4

(d) under high pressure and presence of

(xi) Hydrolysis of _____ with steam gives ethanol as one of the product.

(a) ethyl hydrogen sulphate (b) ethyl sulphate

(c) methyl hydrogen sulphate (d) ethyl sulphite

(xii) One mole of sulphuric acid produces how many hydronium ions.

(a) 6.023×10^{23} (b) 12.046×10^{23}

(c) 3.0115×10^{23} (d) 1.50575×10^{23}

(xiii) Electron affinity is 1 to atomic size and 2 to nuclear charge.

(a) 1. directly proportional 2. inversely proportional

(b) 1. inversely proportional 2. directly proportional

(c) 1. directly proportional 2. directly proportional

(d) 1. inversely proportional 2. inversely proportional

(xiv) Alkalis react with ammonium salts on heating to liberate

(a) NH_3 (b) NH_4

(c) NO_2 (d) NO

(xv) Ethanol is a good solvent for

(a) S but not P (b) only S

(c) only P (d) both S and P

Question 2

(i) Identify the following : [5]

(a) Alloy of Cu and Zn which can be easily cast.

(b) Preferred electrolyte during electroplating with Silver.

(c) The relative molecular mass of a substance expressed in gram.

(d) Base used in the production of bleaching powder.

(e) A cyclic compound which contain carbon along with other atom.

(ii) Complete the following by choosing the correct answers from the bracket. **[5]**

(a) Gas released when zinc sulphide reacts with dil. H_2SO_4 is _____. (H_2S / SO_2)

(b) Cation which gives pink salt is _____ (Mn^{2+} / Ni^{2+})

(c) CH_3COOH reacts with _____ $FeCl_3$.to give wine red colour. (neutral. / acidified.)

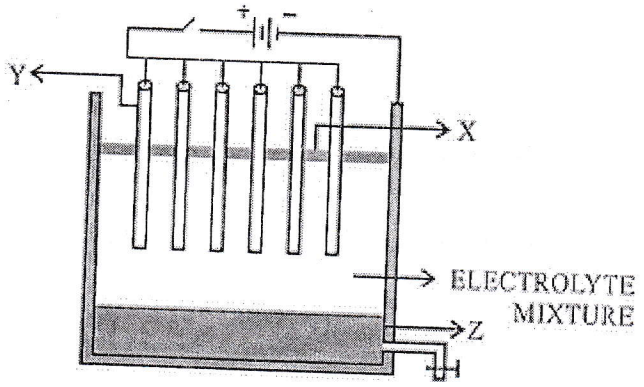
(d) Covalent compound is formed when electronegativity is _____ (high / negligible).

(e) Amalgam is obtained when an alloy of a metal is mixed with ____ (Mg / Hg)

(iii) Match the following **[5]**

(1)	Al_2O_3 to Al	a.	brilliant white flame
(2)	SO_2 to SO_3	b.	ion oxidised to atom
(3)	Anode	c.	ion reduced to atom
(4)	Cathode	d.	catalytic oxidation
(5)	acetylene	e.	electrolytic reduction

(iv) The diagram below shows the electrolytic cell for the extraction of aluminum from its ore by Hall-Heroult's process [5]



(a) Write the composition of electrolyte mixture.

(b) Give temperature and voltage to be maintained.

(c) Write the anode and cathode reaction for the process.

(d) Why anode needs to be replaced from time to time?

(v) (a) Draw the branched structural formula for each of the following : [5]

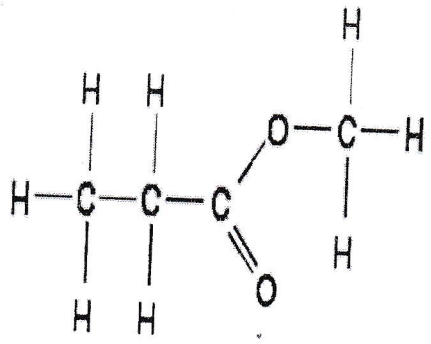
1. 3 – methyl pent – 2 – ene

2. 2 – butyne

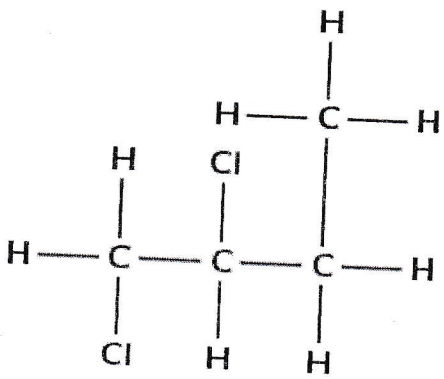
3. 2 – iodo – 2 – methyl propane

(b) Write the IUPAC name for the following compounds :

1.



2.



SECTION B

(Attempt any four questions)

Question 3

(i) Give one significant observation when:. [2]

(a) When manganese dioxide is heated with conc. HCl.

(b) Dry ammonia gas is burnt in excess of oxygen gas.

(ii) Give reasons: [2]

(a) Liquid ammonia is evaporated in ice plants to form ice from water.

(b) Conc. HNO_3 cannot be used in preparation of HCl gas in laboratory.

(iii) Two elements X [2,4] and Y [2,8,7] combines to form a compound [3]

(a) Formula of the compound formed.

(b) Type of bond formed between X and Y.

(c) Compound formed is polar or non-polar.

(iv) Write balanced chemical equations for the following reactions: [3]

(a) Copper oxide reacts with ammonia.

(b) Sulphur is treated with hot conc. HNO_3.

(c) Hydrogen iodide is reacted with conc. H_2SO_4

Question 4

(i) Name the main metal present in the following alloys: [2]

(a) Duralium (b) Solder

(ii) Write the balanced chemical equations for the following: .[2]

(a) Reaction of phosphorus pentoxide with hydrogen chloride gas.

(b) Pyrolysis of methane.

(iii) Peter has passed gases A and B through freshly prepared lime water. [3]
Both the gases turned lime water milky. Gas B causes suffocation.

(a) Identify the gases A and B.

(b) Name the white insoluble ppt formed by reaction of gas B with lime water.

(c) Name the soluble compound formed when excess of gas A is passed through lime water.

(iv) Ethyl alcohol is treated with excess of acidified $K_2Cr_2O_7$ [3]

(a) What does $K_2Cr_2O_7$ provides in this reaction.

(b) Name the product formed when ethanol is oxidised.

(c) Write the formula of the product formed when product formed in Q.4.(iv).(b) is further oxidised.

Question 5

(i) Identify the reactant X and write the balanced chemical equation for the following .[2]

(a) Dilute nitric acid and X reacts to give calcium nitrate, water and sulphur dioxide gas

(b) Dilute Hydrochloric acid and X reacts to give Sodium chloride and unstable Carbonic acid.

(ii) Oxidation of carbon monoxide is carried out to give carbon dioxide [2]

Find the volume of reactant gases required to produce 900 ml of CO_2.

[C = 12, O = 16]

(iii) State the property exhibited by sulphuric acid in each of the following reactions: .[3]

(a) Reaction of glucose with conc. H_2SO_4

(b) Reaction of potassium bicarbonate with conc. H_2SO_4

(c) Reaction of sodium hydroxide with conc. H_2SO_4 to form two types of salts.

(iv) Give balanced equations, for the following: [3]

(a) Decomposition of nitric acid.

(b) Oxidation of ethene

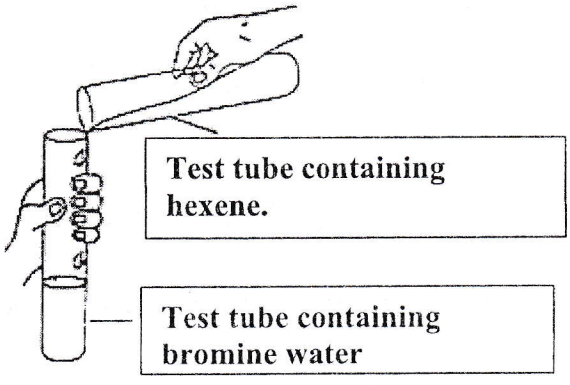
(c) Iodination of ethyne.

Question 6

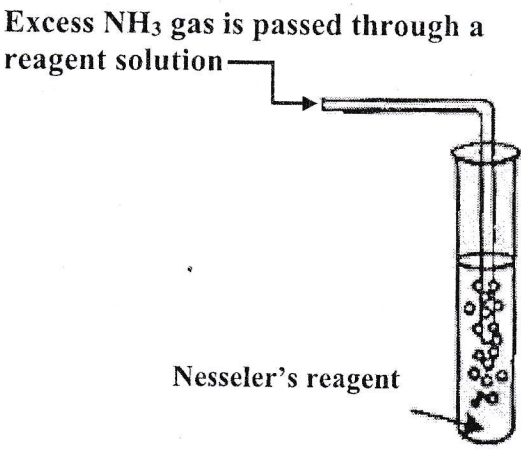
(i) Rajeev performed experiment 1 and experiment 2 as instructed. [2]

Observe the pictures given below and write one observation

Experiment 1



Experiment 2



(ii) You are provided with the list of chemicals mentioned below in the box: **[2]**

sodium hydroxide solution, zinc carbonate, dil. sulphuric acid, lead nitrate, sodium sulphate, zinc, dil. hydrochloric acid, dil. nitric acid

Using suitable chemical from the list given, write balanced chemical equation for the preparation of the salts mentioned below:

(a) Zinc nitrate (b) Lead sulphate

(iii) 374.5g of ammonium chloride reacts with calcium hydroxide at STP. **[3]**

$2NH_4Cl + Ca(OH)_2 \rightarrow CaCl_2 + 2NH_3 + 2H_2O$

[$NH_4Cl = 53.5$, $Ca(OH)_2$, $= 74$, $H_2O = 18$]

(a) Find the volume of ammonia formed.

(b) Calculate the weight of calcium hydroxide used.

(iv) Identify the reactants P, Q and R in the following reactions:- **[3]**

(a) Zinc blende + P $\rightarrow$ zinc oxide + sulphur dioxide

(b) Lead oxide + Q $\rightarrow$ Lead + Carbon dioxide

(c) Haematite + R → Iron + carbon dioxide

Question 7

(i) Give reasons for the following: **[2]**

(a) Aqua regia dissolves noble metals.

(b) Only D.C. current is used during electroplating.

(ii) The following questions relate to the dressing of bauxite ore **[2]**

(a) Why caustic alkali is added to bauxite.

(b) Write the balanced equation for conversion of sodium aluminated to aluminium hydroxide.

(iii) Give balanced equations for each of the following:. **[3]**

(a) Action of conc. sulphuric acid on potassium nitrate. (temp.<200°C)

(b) Thermal decomposition of aluminium hydroxide.

(c) Hydrolysis of ethyl acetate.

(iv) Shifa has 3 oxides U, T and S which are acidic oxide, basic oxide and neutral oxide respectively. Which oxide: **[3]**

(a) can be used as laughing gas.

(b) will react with dil. H_2SO_4 to give corresponding metal sulphate salt.

(c) will decolourise $KMnO_4$ solution.

Question 8

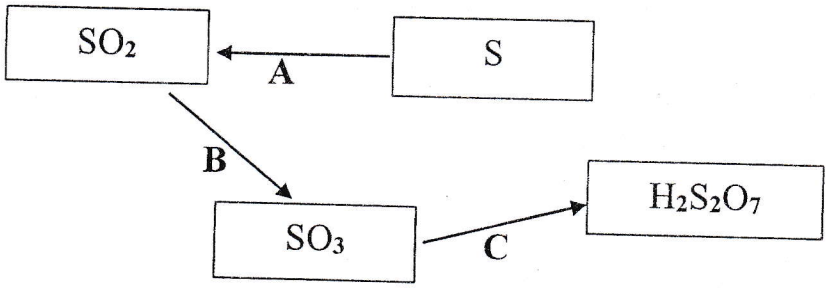
(i) Draw dot and cross diagram of hydronium ion. **[2]**
[H=1, O=8]
(show the formation)

(ii) State giving reasons if: [2]

(a) Ferric nitrate and Ferrous nitrate can be distinguished using sodium hydroxide solution.

(b) Sodium sulphide and Zinc sulphide can be distinguished using dilute sulphuric acid.

(iii) Write balanced chemical equation for the conversions (A to C) [3]



Why the named metal is rendered passive by HNO_3?

Suggest a method to overcome the passivity of the metal.

(iv) L, M, N & O are first 4 elements belonging to group14 of the periodic table. Answer the following questions using the alphabet given. Do not identify the elements. .[3]

(a) Metalloid with 4 electronic orbitals.

(b) Element with least ionization potential.

(c) Element with least electron affinity.