GREENLAWNS SCHOOL, WORLI

PRELIMINARY EXAMINATION: 2025-26

CHEMISTRY

Std: X | Marks: 80

Date: 14/01/2026 | Time: 2 hrs

Answers to this paper must be written on the paper provided separately. You will **not** be allowed to write during the first **15** minutes. This time is to be spent in reading the Question paper.

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

SECTION A

*(Attempt **all** questions from this Section)*

Question 1

Choose the correct answers to the questions from the given options. [15]

(Do not copy the question, write the correct answers only.)

(i) Which one of the following oxides reacts with HCl as well as NaOH to form corresponding salt and water?

(a) CaO
(b) Al_2O_3
(c) Fe_3O_4
(d) K_2O

(ii) Kavish has to arrange the following in the increasing order of their pH values. In which correct order will Kavish arrange?

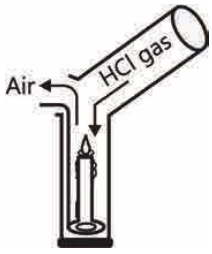
A – Distilled water , B – Caustic potash solution
C – Dilute Hydrochloric acid, D – Concentrated formic acid

(a) D > C > A > B
(b) C < D < A < B
(c) D < C < A < B
(d) B > A > C > D

(iii) Among the following pairs of ions, identify the pair of ions whose hydroxides dissolves in excess NaOH solution:

(a) Fe^{2+}, Pb^{2+}
(b) Pb^{2+}, Zn^{2+}
(c) Zn^{2+}, Fe^{2+}
(d) Fe^{3+}, Zn^{2+}

(iv) Lata carries out an experiment as shown below. What is the aim of this experiment?



(a) HCl gas is highly soluble in water
(b) Both (a) and (b)
(c) HCl gas is heavier than air
(d) None of these

(v) When sulphur is added to hot and conc nitric acid, 'A' is produced. When sulphur is added to hot and conc sulphuric acid, 'B' is produced. Identify 'A' and 'B'

(a) A is H_2SO_4, B is SO_2
(b) A is SO_2, B is H_2SO_4
(c) Both A and B are SO_2
(d) Both A and B are H_2SO_4

(vi) Which of the following properties makes aluminium suitable for making aircraft bodies?

(a) High density and brittleness
(b) Heavy and malleable
(c) Light weight and corrosion resistance
(d) High melting point and magnetic nature

(vii) An element X has atomic number 19. Which property best describes X?

(a) High electronegativity
(b) Exists as a diatomic gas
(c) Tends to gain electrons
(d) Forms basic oxide

(viii) **Assertion (A)**: The ionisation energy of Mg is more than sodium.
Reason (R): The ionisation energy decreases in a period from left to right.

(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

(ix) A student tested an unknown colourless solution X as follows:

- On adding dilute HCl, no gas was evolved.
- On adding barium chloride solution to the acidified solution, a white precipitate insoluble in acid appeared.

The anion present in solution X is:

(a) Sulphite (SO_3^{2-})
(b) Sulphate (SO_4^{2-})
(c) Chloride (Cl^-)
(d) Carbonate (CO_3^{2-})

(x) Which of the following pairs are structural isomers?

(a) Butene and butane
(b) Pentane and 2-methyl propane
(c) 1-butene and 2-methyl propane
(d) Butane and 2-methyl propane

(xi) A student sets up an electrolytic cell using copper electrodes and copper sulphate solution. The solution remains blue after 15 minutes of electrolysis. The mass of the cathode increases, while that of the anode decreases.
Which statement explains the unchanged blue colour of the solution?

(a) No ions are produced in the electrolyte
(b) Cu^{2+} ions are being removed and replaced at the same rate
(c) Cu^{2+} ions are precipitated as $Cu(OH)_2$
(d) The reaction stops after some time

(xii) The law that equates the number of molecules of a gas with its volume is:

(a) Avogadro's law
(b) Gay Lussac's law
(c) Boyle's law
(d) Charles law

(xiii) A teacher gives three unlabelled solutions – X, Y and Z. The results of the indicator tests are as follows:

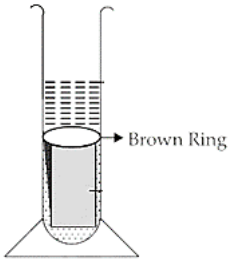
Indicator	X	Y	Z
Phenolphthalein	Pink	Colourless	Colourless
Methyl Orange	Yellow	Orange	Pink

Which solution is acidic?

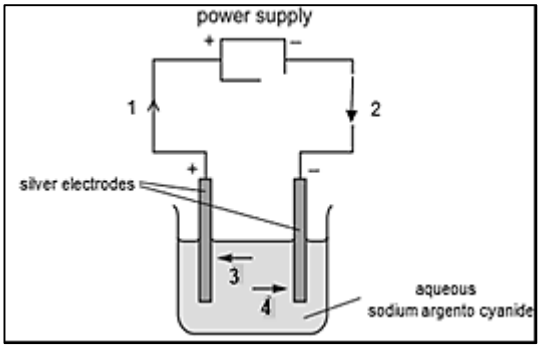
(a) X
(b) Y
(c) Z
(d) Both X and Y

(xiv) What is the chemical name of the brown ring?

(a) Aqua regia
(b) Nitroso sulphuric acid
(c) Ferroso nitric sulphate
(d) Nitroso iron (II) sulphate



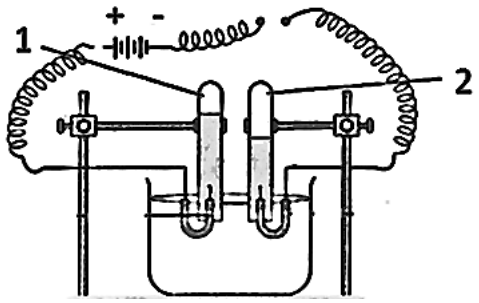
(xv) The diagram below shows a circuit used to electrolyse aqueous sodium argento cyanide. Which arrow indicates the movement of the silver ions in the electrolyte and of the electrons in the external circuit?



Silver ions	Electrons
(a) 3	1
(b) 3	2
(c) 2	4
(d) 4	1

Question 2

(i) The setup shown below is that of electrolysis of acidified water. [5]



(a) Identify the gases 1 and 2.
(b) Give the reaction taking place at cathode.
(c) What are the electrodes made of?
(d) Why is dilute sulphuric acid preferred to dilute nitric acid for acidification?
(e) Why is current passed for a prolonged period of time before collection of the gases?

(ii) Identify the following: [5]

(a) A base which ionizes in aqueous solution to produce two hydroxyl ions per molecule of the base.
(b) Method of neutralisation of an alkali.
(c) Volume occupied by 1 gram molecular weight of a gas at s.t.p.
(d) Preferential discharge of ions present in an electrolyte at the respective electrodes.
(e) Reaction which involves elimination of hydrogen halide from a substrate to form an alkene.

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

(a) Complete chlorination of methane yields _____ (chloroform / carbon tetrachloride).
(b) The anion discharged at the anode with most difficulty is _____ (SO_4^{2-} / OH^-)
(c) An insoluble salt prepared by direct combination is_____ ($FeCl_3$ / FeS).
(d) _____ (lower / higher) the value of ionisation potential of a metallic atom, greater is the ease of formation of the cation.
(e) Pure conc. Nitric acid or fuming nitric acid renders the metal _____ (zinc / aluminium) passive or inactive.

(iv) Match Column A with Column B: [5]

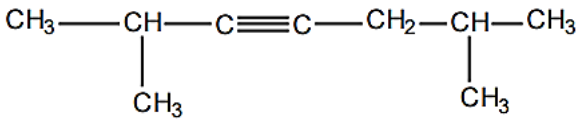
Column A	**Column B**
(a) Ostwald's process	1. Sulphuric acid
(b) Hall Heroult's process	2. Iron pyrites
(c) Contact process	3. Ammonia
(d) Haber's process	4. Nitric acid
(e) Roasting	5. Aluminium

(v) (a) Draw the structural diagram for the following compounds: [5]

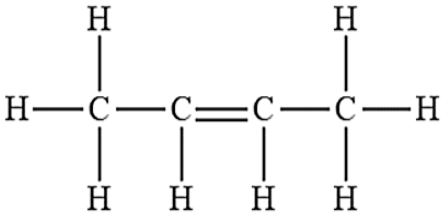
1. 2-pentyne
2. 3,3 – dimethyl pentane
3. Propionic acid

(b) Give the IUPAC name of the following organic compounds:

1.



2.

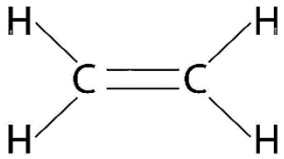


SECTION B

*(Attempt **any four** questions)*

Question 3

(i) Given below is the structure of a hydrocarbon: [4]



(a) Give equation for the laboratory preparation of this hydrocarbon.
(b) How is this hydrocarbon prepared by dehydrohalogenation?
(c) What is the product of halogenation of this hydrocarbon?
(d) Mention one use of the given hydrocarbon.

(ii) Identify the cation and anion in each of the following salts: [2]

(a) Salt 1:

Flame test ⟶ Green coloured flame.

Salt 1 + conc. Sulphuric acid + Cu turnings + Δ ⟶ Reddish brown fumes

(b) Salt 2:

Solution of Salt 2 + NH_4OH solution ⟶ Dirty green ppt

Solution of Salt 2 + conc. Sulphuric acid + Δ ⟶ Gas which gives dense white fumes with NH_3

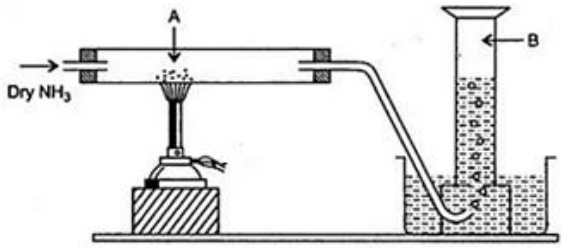
(iii) In the decomposition of potassium chlorate using manganese dioxide as a catalyst, calculate the mass of potassium chlorate required to produce 6.72 litres of oxygen at STP. (K=39, Cl =35.5, O=16) [2]

$2KClO_3 \rightarrow 2KCl + 3O_2$

(iv) Concentrated sulphuric acid is both an oxidising agent and non-volatile acid. Write an equation for each to illustrate the above properties of sulphuric acid. [2]

Question 4

(i) Sarthak entered the laboratory and saw a set-up made by the teacher as shown below: [5]



(a) Name the black substance A.
(b) Name the gas evolved B.
(c) Write a balanced equation for the reaction of ammonia with A.
(d) What is observed in this experiment?
(e) What property of ammonia is illustrated in this experiment?

(ii) Jessica wants to electroplate a spoon with nickel. [3]
(a) To which electrode should she connect the spoon?
(b) Write the equation for the reaction that will occur at the anode.
(c) What type of current should be passed through the electrolyte and why?

(iii) Given below is the representation of the conversion of ethene to a saturated hydrocarbon X, where 'a' stands for a catalyst: [2]

$$C_2H_4 \xrightarrow[a]{200^\circ} X$$

(a) Identify 'a'.
(b) Give the complete chemical equation for the conversion of C_2H_4 to X.

Question 5

(i) A compound contains 40% S and 60% O by mass. If its molecular mass is 80, find its molecular formula. [S=32, O=16] [3]

(ii) Read the passage carefully and answer the questions that follow: [3]

The modern periodic table is based on atomic number and shows periodicity in physical and chemical properties. Elements in the same group have similar properties because they have the same number of valence electrons. The periodic trends such as atomic radius, ionisation energy, metallic character and electronegativity can be explained based on nuclear charge and electron shielding effects.

(a) What is ionisation energy?
(b) Arrange the following elements in the increasing order of metallic character – Ca, Be, Sr, Mg
(c) Why is the electron affinity of noble gas elements zero?

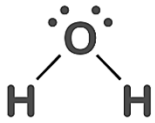
(iii) Give suitable observation for each of the following: [2]
(a) Sulphide ore is added to a tank containing oil and water, and then agitated with air.
(b) A few drops of HCl acid are added to silver nitrate solution, followed by addition of ammonium hydroxide solution.

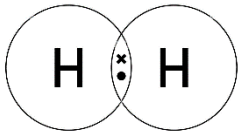
(iv) Give reasons: [2]
(a) Solid Sodium chloride is a non-conductor of electricity.
(b) In the laboratory preparation of HCl, the temperature is maintained below 200^0C.

Question 6

(i) A student wants to prepare lead sulphate from lead carbonate. But lead sulphate cannot be prepared by adding dilute sulphuric acid to lead carbonate. [4]
(a) What is the first step, the student does to prepare lead sulphate from lead carbonate?
(b) Why is direct addition of dilute sulphuric acid to lead carbonate an impractical method?
(c) Give equations for the reactions by which the student prepares the salt.

(ii) Classify the given structures into polar and non-polar and give two points of difference between them: [2]





(iii) Give balanced equation for each of the following: [2]
(a) Action of heat on a mixture of copper and concentrated nitric acid.
(b) Conversion of ethanoic acid to ethyl ethanoate.

(iv) Calculate the percentage of carbon in a 55% pure sample of Calcium carbonate. [2] (Ca = 40, C = 12, O = 16)

Question 7

(i) Give one point of difference between the following: [3]

(a) Copper and Copper sulphate (flow of electricity by)

(b) Acid and normal salt (meaning)

(c) Strong and weak electrolyte (particles present)

(ii) Acetylene burns in air forming carbon dioxide and water vapour. Calculate the volume of air required to completely burn 50 cm^3 of acetylene. [Assume air contains 20% oxygen]. [3]

(iii) Draw the electron dot diagram for ammonium ion. [2]

(iv) Raashi found a hard crystalline solid ML_2. This solid substance could conduct electricity in both molten and aqueous state and has high melting and boiling point. [2]

(a) On carrying out electrolysis of aqueous ML_2, the cathode size increased and anode became thinner. The anode is made of _____ (metal M, Carbon)

(b) ML_2 is a conductor due to presence of free_____ (ions, electrons)

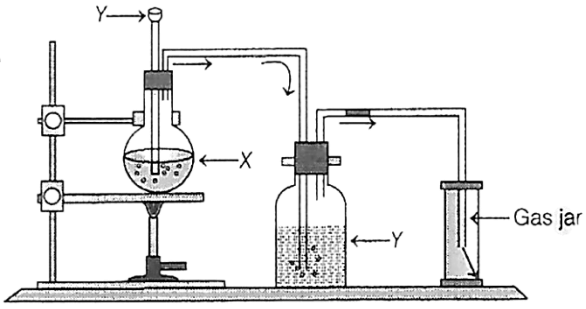
Question 8

(i) Disha sees an experimental set-up for the preparation of pungent choking gas in her school laboratory: [3]

(a) Write a balanced chemical equation for the above preparation.

(b) What is the role of Y?

(c) Why is the gas collected by the method as shown in the set-up?



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

(a) Laboratory preparation of ethyne.

(b) Conversion of bauxite to sodium aluminate.

(c) Reaction of ammonia with excess of chlorine.

(iii) Explain the following terms: [2]

(a) Glacial acetic acid (b) Gay Lussac's law

(iv) Draw electron dot diagram of the following: [2]

(a) The salt formed by the reaction between Magnesium and dil. hydrochloric acid.

(b) The gas which turns moist starch iodide paper blue black.

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