GRADE X
Time: Two hours | Pre-board examination | M. M: 80
Chemistry

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. 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 from this Section)

Question 1: Choose one correct answer to the questions from the given options: **[15]**

(i) A particular solution contains molecules and ions of the solute so it is a:
(a) weak acid
(b) strong acid
(c) strong base
(d) salt solution.

(ii) A compound which liberates reddish brown gas around the anode during electrolysis in its molten state is:
(a) Sodium chloride
(b) Copper (11) oxide
(c) Copper (II) sulphate
(d) Lead(II) bromide

(iii) An organic compound undergoes addition reactions and gives a red colour precipitate with ammoniacal cuprous chloride. Therefore, the organic compound could be:
(a) Ethane
(b) Ethene
(c) Ethyne
(d) Ethanol

(iv) An organic weak acid is:
(a) Formic acid
(b) Sulphuric acid
(c) Nitric acid
(d) Hydrochloric acid

(v) During ionization metals lose electrons, this change can be called:
(a) Oxidation
(b) Reduction
(c) Redox
(d) Displacement

(vi) Which one of the following is not true of metals:

(a) Metals are good conductors of electricity
(b) Metals are malleable and ductile.
(c) Metals from non-polar compounds.
(d) Metal will have 1 or 2 or 3 electrons in their valence shell.

(vii) An example of a complex salt is:
(a) Zinc sulphate (b) Sodium hydrogensulphate
(c) Iron (II) ammonium sulphate (d) Tetrammine copper (II) sulphate.

(viii) Aqua regia is a mixture of:
(a) Dilute hydrochloric acid and concentrated nitric acid.
(b) Concentrated hydrochloric acid and dilute nitric acid.
(c) Concentrated hydrochloric acid [1 part] and concentrated nitric acid [3 parts]
(d) Concentrated hydrochloric acid [3 parts] and concentrated nitric acid [1 part]

(ix) The organic compound mixed with ethanol to make it spurious is:
(a) Methanol (b) Methanoic acid
(c) Methanal (d) Ethanoic acid

(x) The number of electrons present in the valence shell of a halogen is:
(a) 1 (b) 3 (c) 5 (d) 7

(xi) An element in period-3 whose electron affinity is zero
(a) Neon (b) Sulphur (c) Sodium (d) Argon

(xii) An alkaline earth metal
(a) Potassium (b) Calcium (c) Lead (d) Copper

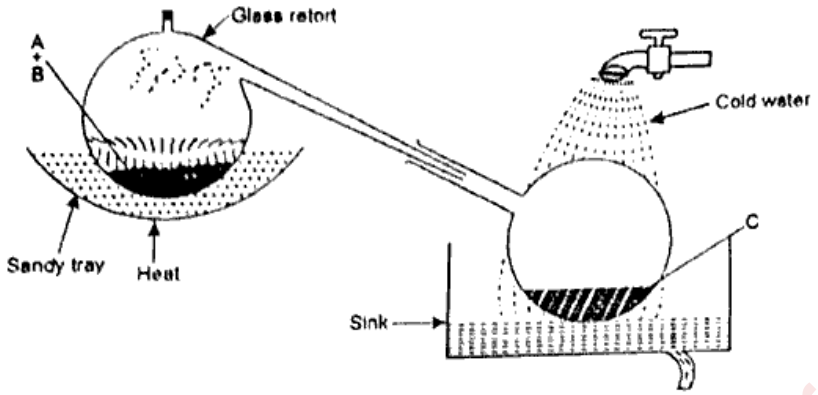
(xiii) The vapour density of carbon dioxide [C=12, O=16]
(a) 32 (b) 16 (c) 44 (d) 22

(xiv) Identify the weak electrolyte from the following:
(a) Sodium Chloride solution (b) Dilute Hydrochloric acid
(c) Dilute Sulphuric acid (d) Aqueous acetic acid

(xv) Which of the following metallic oxides cannot be reduced by normal reducing agents?
(a) Magnesium oxide (b) Copper(II) oxide
(c) Zinc oxide (d) Iron(III) oxide

Question 2

(i) The figure given below illustrates the apparatus used in the laboratory preparation of nitric acid. [5]



(a) Name A (a liquid), B (a solid) and C (a liquid). (Do not give the formulae)

(b) Write an equation to show how nitric acid undergoes decomposition.

(c) Write the equation for the reaction in which copper is oxidised by concentrated nitric acid.

(ii) Match the following Column A with Column B: [5]

Column A	Column B
(a) Acid salt	1. Ferrous ammonium sulphate
(b) Double salt	2. Contains only ions
(c) Ammonium hydroxide solution	3. Sodium hydrogen sulphate
(d) Dilute hydrochloric acid	4. Contains only molecules
(e) Carbon tetrachloride	5. Contains ions and molecules

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

(a) The catalyst commonly used for conversion of ethene to ethane is _____ (nickel/iron/cobalt)

(b) When acetaldehyde is oxidised with acidified potassium dichromate, it forms _____ (ester/ethanol/acetic acid)

(c) The basicity of acetic acid is _____ (3, 1, 4)

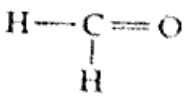
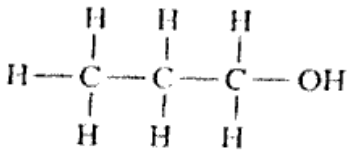
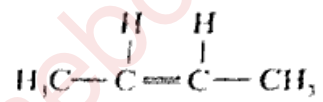
(d) Substitution reactions are characteristic reactions of _____ (alkynes/alkenes/alkanes).

(e) The product formed when ethene gas reacts with water in the presence of sulphuric acid is (Ethanol/ethanal/ethanoic acid)

(iv) Identify the following: [5]

(a) The energy released when an electron is added to a neutral gaseous isolated atom to form a negatively charged ion.
(b) Process of formation of ions from molecules which are not in ionic state.
(c) The tendency of an element to form chains of identical atoms.
(d) The property by which certain hydrated salts, when left exposed to atmosphere, lose their water of crystallization and crumble into powder.
(e) The bond formed by a shared pair of electrons with both electrons coming from the same atom.

(v) (a) Give the IUPAC name for each of the following: [5]

1. 
2. 
3. 

(b) Write the structural formula of the two isomers of butane.

Section B
(Attempt **any four** questions)

Question 3

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

(ii) Write the products and balance the equation. [2]
(a) C+ conc. H_2SO_4 $\longrightarrow$
(b) Cu+ dil. HNO_3 $\longrightarrow$

(iii) Arrange the following according to the instructions given in brackets: [3]
(a) K, Pb, Ca, Zn. (In the increasing order of the reactivity)
(b) Mg^{2+}, Cu^{2+}, Na^{+}, H^{+} (In the order of preferential discharge at the cathode)
(c) Li, K. Na, H (In the decreasing order of their ionization potential)

(iv) Complete the following by selecting the correct option from the choices given: [3]

(a) pH of acetic acid is greater than dilute sulphuric acid. So acetic acid contains _____ concentration of H^+ ions. (greater, same, low)
(b) The indicator which does not change colour on passage of HCl gas is _____ (methyl orange, moist blue litmus, phenolphthalein):
(c) The acid which cannot act as an oxidizing agent is _____. (conc. H_2SO_4 , conc. HNO_3, cone. HCl)

Question 4

(i) Give the chemical formula of: [2]
(a) Bauxite. (b) Cryolite

(ii) The solutions P, Q and R have pH value of 3.5, 5.2 and 12.2 respectively. Which one of these is a : [2]
(a) Weak acid? (b) Strong alkali?

(iii) Explain the following: [3]
(a) Graphite anode is preferred to platinum in the electrolysis of molten lead bromide.
(b) Soda lime is preferred to sodium hydroxide in the laboratory preparation of methane.
(c) Hydrated copper sulphate crystals turn white on heating.

(iv) Hydrogen chloride gas is prepared in the laboratory using concentrated sulphuric acid and sodium chloride. Answer the questions that follow based on this reaction: [3]
(a) Give the balanced chemical equation for the reaction with suitable condition(s) if any.
(b) Why is concentrated sulphuric acid used instead of concentrated nitric acid?

(c) How is the gas collected?

Question 5

(i) (a) Name a drying agent for ammonia. [2]
(b) Name a nitrate of a metal which on heating does not give nitrogen dioxide.

(ii) For the electro-refining of copper: [2]
(a) What is the cathode made up of?
(b) Write the reaction that takes place at the anode.

(iii) Write a balanced chemical equation for each of the following: [3]
(a) Reaction of sodium hydroxide solution with iron (III) chloride solution.
(b) Action of heat on aluminium hydroxide.
(c) Reaction of zinc with potassium hydroxide solution.

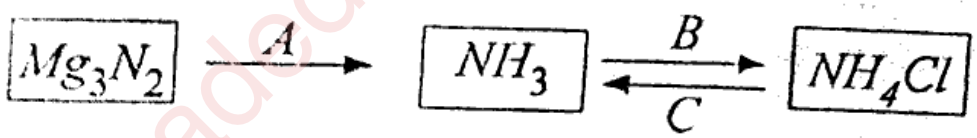
(iv) State one relevant observation for each of the following: [3]
(a) Lead nitrate solution is treated with sodium hydroxide solution drop wise till it is in excess.
(b) Lead nitrate solution is mixed with dilute hydrochloric acid and heated.
(c) Anhydrous calcium chloride is exposed to air for some time.

Question 6

(i) Give one word/words for the following statements: [2]
(a) The molecular weight of an element expressed in grams.
(b) A formula of a chemical substance which tells the actual number of atoms in one molecule of a substance.

(ii) Given: $2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6H_2O$ [2]
2000 cc of O_2 was burnt with 400 cc of ethane.
Calculate the volume of CO_2 formed and unused O_2

(iii) Study the flow chart given and give balanced equations to represent the reactions A, B and C: [3]



(iv) Some properties of sulphuric acid are listed below. Choose the role played by sulphuric acid as A, B or C which is responsible for the reactions (a) to (c). [3]
(A) Dehydrating agent (B) Non-volatile acid (C) Oxidising agent

(a) $CuSO_4.5H_2O \xrightarrow{conc.\ H_2SO_4} CuSO_4 + 5H_2O$

(b) $S + H_2SO_4\ (conc.) \rightarrow 3SO_2 + 2H_2O$

(c) $NaCl + H_2SO_4\ (conc.) \xrightarrow{<200^\circ C} NaHSO_4 + HCl$

Question 7

(i) A gaseous hydrocarbon of vapour density 29, contains 82.76% of carbon. Calculate its empirical formula and molecular formula. [C=12, H=1] [2]

(ii) Write equations for: [2]

(a) Preparation of ethanol by hydration of C_2H_4

(b) Preparation of acetic acid from ethanol.

(iii) Write equations for the **reactions taking place at the two electrodes** (mentioning clearly the name of the electrode) during the electrolysis of: [3]

(a) Acidified copper sulphate solution with copper electrodes.

(b) Molten lead bromide with inert electrodes.

(iv) Fill in the blank spaces: [3]

A base is substance which reacts with _____ ions of an acid to form a _____ and _____ as the only products. The process by which an acid reacts with a base is called _____.

Question 8

(i) Draw the electron dot diagram for the compounds given below. Represent the electrons by (.) and (x) in the diagram. Atomic No.: O=8, CI =17. H=1] [2]

(a) Chlorine molecule (b) Water molecule

(ii) Distinguish between the following pairs of compounds using the reagent given in the bracket. [2]

(a) Ferrous sulphate solution and ferric sulphate solution. (using sodium hydroxide solution)

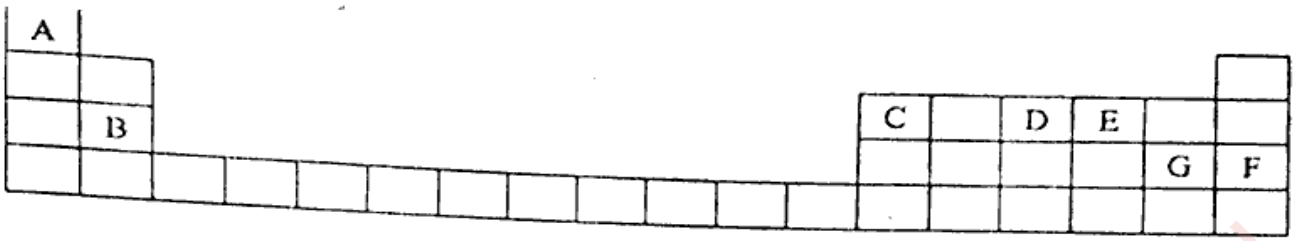
(b) Dilute hydrochloric acid and dilute sulphuric acid. (using lead nitrate solution)

(iii) State the observations at the anode and at the cathode during the electrolysis of: [3]

(a) fused lead bromide using graphite electrodes.

(b) copper sulphate solution using copper electrodes.

(iv) Study the extract of the Periodic Table given below and answer the questions that follow. Give the alphabet corresponding to the element in question. DO NOT repeat an element. [3]



(a) Which element forms electrovalent compound with G?
(b) The ion of which element will migrate towards the cathode during electrolysis?
(c) Which non-metallic element has the valency of 2?