Alternative No:

Index No: | 0 | 1 | 0 | 0 | 7 | | | | | | |

Supervising Examiner's/Invigilator's initial:

Paper 2 (Chemistry) **Writing Time: $1\frac{1}{2}$ Hours**

Total Marks : 80

READ THE FOLLOWING DIRECTIONS CAREFULLY:

1. Do **not** write for the first **fifteen minutes**. This time is to be spent reading the questions. After having read the questions, you will be given **one and a half hours** to answer all questions.
2. Write your **index number** in the space provided on the **top right hand corner of this cover page only**.
3. In this paper, there are **two** sections: A and B. Section **A** is compulsory. You are expected to attempt **any four** questions from Section **B.**
4. The intended marks for questions or parts of questions, are given in brackets [ ].
5. Read the directions to each question carefully and write **all** your answers in the space provided in the **question booklet** itself.
6. Remember to write **quickly** but **neatly**.
7. **Do not** remove or tear off any pages from the question booklet.
8. **Do not** draw lines or pictures **on** or **in** the question booklet to beautify it.
9. **Do not** leave the examination hall before you have made sure that you have answered all the questions.

For Chief Marker's and Markers' Use Only

Question Number															**Total**	**Chief Marker's Signature ↓**
Award																
Markers' initial →																

This booklet contains 20 pages.

SECTION A (40 Marks)

Compulsory: To be attempted by all candidates.

Question 1

(a) Directions: Each question in this part is followed by four possible choices of answers. Choose the correct answer and write it in the space provided in the question booklet. **[15]**

(i) The law which states that 'Equal volumes of all gases under similar conditions of temperature and pressure contain the same number of molecules' is

A Avogadro's law.
B Boyles law.
C Charles law.
D Gay Lussac's law.

Answer:…….

(ii) The metal extracted by the process of electrolysis is

A aluminium.
B copper.
C iron.
D lead.

Answer:…….

(iii) The reaction between concentrated sulphuric acid and sugar produces carbon and water. In this reaction sulphuric acid acts as a

A dehydrating agent.
B oxidising agent.
C reducing agent.
D drying agent.

Answer:…….

(iv) The process by which covalent compounds are converted to ions in water solution is called

A ionization.
B hydrolysis.
C calcination.
D dissociation.

Answer:…….

(v) In the periodic table, elements of Group II A are called

A earth metals.
B alkali metals.
C transition metals.
D alkaline earth metals.

Answer:…….

(vi) In the periodic table, fluorine, chlorine, bromine and iodine belong to the family

A alkaline earth metals.
B alkali metals.
C noble gases.
D halogen.

Answer:…….

(vii) A nitrate which produces dinitrogen oxide on heating is

A KNO_3.
B NH_4NO_3.
C $Ca(NO_3)_2$.
D $Mg(NO_3)_2$.

Answer:…….

(viii) The vessel in which electrolysis is carried out is called the

A electrolytic chemical cell.
B electrolytic cell.
C electrodes.
D electrolyte.

Answer:…….

(ix) Which of the organic compounds given below contains a triple bond between two carbon atoms?

A methane
B ethane
C ethyne
D ethene

Answer:…….

(x) An alloy of zinc and copper is

A brass.
B bronze.
C duralumin.
D magnalium.

Answer:…….

(xi) The relative molecular weight of CH_3COOH is

A 63.
B 62.
C 61.
D 60.

Answer:…….

(xii) The chemical formula of bauxite is

A AlF_6.
B Al_2O_3.
C $AlSi_3O_8$.
D $Al_2O_3.2H_2O$.

Answer:…….

(xiii) In the diagram given below, the gas '*X*' produced is

A hydrogen chloride.
B nitrogen dioxide.
C chlorine.
D oxygen**.**

Answer:…….

(xiv) The compounds which have same molecular formula but different structural formula are called

A isotherms.
B isotopes.
C isomers.
D isobars.

Answer:…….

(xv) An allotrope of sulphur which is stable between 96°C and 114°C is

A monoclinic.
B colloidal.
C rhombic.
D plastic.

Answer:…….

(b) Fill in the blanks by choosing suitable words given below. **[6]**

(hydroxyl, chlorine, slag, electrovalent, hydrogen chloride, gangue, acetic acid, covalent bond, citric acid)

(i) A gas that is a covalent compound but becomes electrovalent when dissolved in water is …….

(ii) A base is a compound which when dissolved in water gives…… ions.

(iii) The acid used in cooking is…….

(iv) The bond formed by sharing of electrons is ……..

(v) Tear gas is prepared from ……..

(vi) The earthly impurities present in an ore is called……

(c) ***Correct the following statements by changing only the underlined words. Rewrite the correct statements.*** **[6]**

For example: Acetylene is <u>a saturated</u> hydrocarbon.
Acetylene is an unsaturated hydrocarbon.

(i) One mole of gaseous oxygen contains 6.023×10^{23} molecules and occupies a volume

of 32 litres at STP.

……

……

……

(ii) A molecule can exist by itself and can never break up except while taking part in a physical reaction.

……

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……

(iii) The ionization energy decreases as we move along the period from left to right.

……

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(iv) When chlorine gas is mixed with ammonia gas, it will give dense brown fumes of ammonium chloride.

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……

(v) Rhombic sulphur changes to monoclinic sulphur at 86°C.

……

……

(vi) The modern periodic law is based on atomic weight.

……

……

(d) ***Match each item under column A with that which is most appropriate in Column B. You must rewrite the correct matching pairs in the space provided.***

Column A	Column B
1. sodium hydroxide	a) elements of group IIA and IIIA
2. transition metals	b) example of alkyne
3. chlorine	c) used in making plastics
4. C_nH_{2n}	d) manufacture of soap
5. ethane	e) greenish yellow in colour
6. C_2H_2	f) reddish brown in colour
	g) elements of group VIIA
	h) general formula of alkene

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(e) ***Answer the following questions***.

(i) Name the compound which in either aqueous solution or molten state allows an electric current to pass through it. **[1]**

……

……

(ii) Which is the most electronegative element in the periodic table? **[1]**

……

……

(iii) Which of the following would weigh the most? **[1]**

(At. Wt.: N = 14, H = 1, O = 16, C = 12)

1. one mole of carbon dioxide
2. one mole of water
3. one mole of ammonia

---

4. one mole of carbon monoxide

……

……

(iv) From the equation: $CaCO_3 + 2HCl \rightarrow CaCl_2 + H_2O + CO_2$, calculate the weight of calcium chloride obtained from 10 gm of calcium carbonate. **[3]**

(At. Wt.: Ca = 40, C = 12, O = 16, Cl = 35.35)

(v) Name the catalyst used in the laboratory preparation of nitric acid by Ostwald's process. **[1]**

……

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SECTION B (40 Marks)

Attempt any four questions

Question 2

(a) An element *X* has atomic number 17 and mass number 35.5. **[4]**

(i) Name the element and give its valency.

……

(ii) To which group does it belong?

……

(iii) What is the general name of the elements of this group?

……

(iv) Is it a metal or a non-metal? Why?

……

……

(b) A compound on analysis has the following percentage composition:
H = 9.09%, O = 36.26%, C = 54.55%. Its vapour density is 44.
(At. Wt.: C = 12, H = 1, O = 16) **[4]**

(i) Calculate its empirical formula.

(ii) Calculate its molecular formula.

(c) Arrange the following elements in increasing order of their atomic size. **[2]**
$_{13}Al^{27}$, $_{12}Mg^{24}$, $_{14}Si^{28}$, $_{15}P^{31}$

……

Question 3

(a) In order to electroplate a car key with silver,

(i) what ions must be present in the electrolyte? **[1]**

……

(ii) what will be the anode?

……

(iii) what will be the cathode? **[1]**

……

(iv) Write the equations for the reactions taking place at the cathode and the anode. **[2]**

……

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……

(v) Define the term electrolysis. **[1]**

……

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……

(b) Complete the following chemical equations: **[2]**

(i) $Zn + 2HCl \rightarrow$ ……. + ……..

……

(ii) $CaO + 2HNO_3 \rightarrow$ ……. + ……

……

(c) (i) Define the term valency. **[1]**

……

……

……

(ii) Give an example of the following substances: **[1]**

1. deliquescent

……

2. efflorescent

……

Question 4

(a) Zinc sulphate when heated in air reacts according to the following equation:

$2ZnS + 3O_2 \rightarrow 2ZnO + 2SO_2$ (At. Wt.: Zn = 65, S = 32, O = 16)

(i) Calculate the weight of zinc oxide formed if 388 gm of zinc sulphide is heated. **[2½]**

(ii) Calculate the number of moles of oxygen required at the same time. **[2]**

(iii) Calculate the weight of zinc sulphide required to produce 5.6 litres of sulphur dioxi
at STP.

(b) Explain the following: **[2]**

(i) Chlorine can bleach only moist articles.

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(ii) Chlorine water is stored in dark coloured bottles.

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(c) (i) In the preparation of chlorine from concentrated hydrochloric acid, what is the role of manganese dioxide? **[1]**

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(ii) Give a simple test to identify chlorine gas. **[1]**

……

……

Question 5

(a) (i) Distinguish between an acid salt and a normal salt in the table given below.

Acid salt	**Normal salt**

(ii) Name an acid salt formed by the reaction of sulphuric acid and sodium hydroxide. **[1]**

……

(b) (i) What weight of magnesium oxide would be obtained by burning 96 gm of magnesium in air? **[3]**

(ii) 1. Name a metal which is stored in kerosene. **[1]**

……

2. Name a metal which is liquid at room temperature. **[1]**

……

(c) With reference to the extraction of aluminium by electrolytic process answer the following questions:

(i) Name the chief ore of aluminium. **[1]**

……

(ii) Why is aluminium extracted by electrolytic process? **[1]**

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(iii) Name the substance used as the electrode in this process. **[1]**

……

Question 6

(a) Name the following cations A, B and C by studying the descriptions given against each of them. **[3]**

(i) Solution *A* gives gelatinous white precipitate when mixed with a solution of NaOH and NH_4OH. It dissolves in excess NaOH and NH_4OH solution.

(ii) Solution *B* on addition of NaOH and NH_4OH solutions gives chalky white precipitate which is soluble in excess NaOH solution.

(iii) Solution *C* gives white precipitate with NaOH and NH_4OH solutions and is soluble only in excess of NH_4OH.

A……

B……

C……

(b) (i) How are electrovalent and covalent compounds formed? **[2]**

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(ii) What is homologous series? **[1]**

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(c) The diagram given below represents the Industrial preparation of ammonia.
Study the diagram and answer the following questions. **[4]**

(i) Name the process.

……

(ii) State *three* conditions required for the process to occur.

……

……

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(iii) What is the ratio by volume of nitrogen and hydrogen used as the reactants?

……

(iv) Give the balanced chemical equation for the process.

……

……

Question 7

(a) (i) 'All bases are not alkali and all alkali are bases'. Justify this statement with *two* examples. **[2]**

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(ii) State *two* uses of ethyl alcohol. **[2]**

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(b) (i) What is empirical formula? **[1]**

……

……

……

(ii) If the molecular formula of a compound is $C_6H_{12}O_6$, find the empirical formula of the compound.

……

……

(c) What happens when hot concentrated sulphuric acid reacts with the following substances? **[4]**

(i) Hydrated copper sulphate

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(ii) Formic acid

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(iii) Cane sugar

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(iv) Oxalic acid

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for Rough Work

for Rough Work