KARNATAKA ICSE SCHOOLS ASSOCIATION

ICSE STD. X Preparatory Examination 2024

Subject: CHEMISTRY (SCIENCE PAPER 2)

Maximum Marks: 80 **Time Allowed: Two hours** **Date: _____**

ANSWER KEY

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.	(d) Only Q
ii.	(b) Nitrogen dioxide
iii.	(a) Both M and N
iv.	(c) It turns red
v.	(b) Oxidizing nature
vi.	(b) the electrolyte must contain ions of the base metal to be electroplated.
vii.	(d) Ferric hydroxide
viii.	(b) X
ix.	(a) Green
x.	(d) 19
xi.	(c) 1:3
xii.	(a) Butanal
xiii.	(b) Reduction
xiv.	(d) Mo
xv.	(d) Group 16

Question 2

i. Complete the following sentences by choosing the correct answers from the brackets: [5]

(a) Largest
(b) Phosphoric acid
(c) Chalky
(d) Alkynes
(e) Acidic

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ii. The setup shown below is that of the fountain experiment with ammonia gas in the flask. [5]

(a) Due to its high solubility in water, thereby creating a partial vacuum in the flask.

(b) The fountain will be blue in colour. Since ammonia is basic in nature and base turns red litmus blue.

(c) Yes, there will be a different observation and the red litmus will remain red since acid does not change the color of red litmus.

iii. Match the following Column A with Column B. [5]

Column A	Column B
(a) Calcium oxide	4. Electrovalent compound
(b) Ammonia	3. Haber's Process
(c) Water	1. Covalent Bond
(d) Froth Flotation	5. Sulphide ore
(e) Conc. Sulphuric Acid	2. Dehydrating agent

iv. Identify the following: [5]

(a) Electrovalency

(b) Basicity of an acid

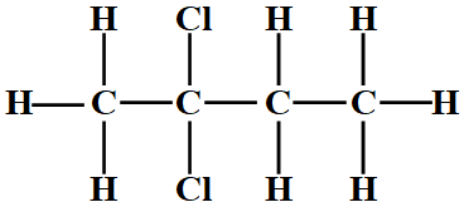
(c) Hydrocarbons

(d) Nuclear Charge

(e) Ore

v. (a) Draw the branched structural formula for the following compounds: [5]

1. 2,2-Dichloro Butane



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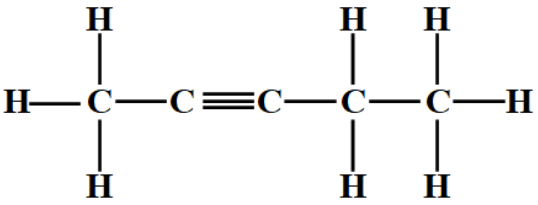
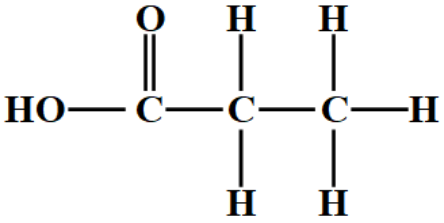
2. 2-Pentyne



3. Propanoic acid



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

1. Butan-1-al / Butanal 2. Prop-1-ene / Propene

SECTION B

(Attempt **any four** questions from this Section.)

Question 3

i. Compound Z – $MgSO_3$

$MgSO_3 + 2HCl \rightarrow MgCl_2 + H_2O + SO_2$ [2]

ii. What property of ammonia is exhibited in each of the following cases: [2]

a) Basic Nature

b) Reducing action

iii. The electronegativity of element X is greater than that of element Y. [3]

a) More

b) Less

c) Y is placed on the left of X

iv. (a) State whether the following statement are TRUE or FALSE. Justify your answer: [2]

1. False, M is non-metallic in nature.
2. False, Shared pair of electrons is two.

(b) Weight = No of Molecules

64 = 6×10^{23}

15 = $(15 \times 6 \times 10^{23}) / 64$

= 1.406×10^{23} [1]

Question 4

i. The following questions relate to the extraction of Aluminium: [2]

a) Conc. Solution of sodium hydroxide

b) Prevents burning of carbon electrodes and minimizes the heat loss by radiation.

ii. 35 g of a gas forms 15,000 cm^3 of vapours at STP. Calculate the molecular weight of the gas. [2]

35 = 15000

? = 22400

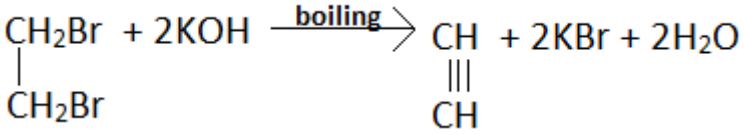
(35 x 22400) / 15000 = 52.26 g

iii. Write the balanced chemical equation for each of the following: [3]

a) $NaNO_3 + \text{Conc. } H_2SO_4 \xrightarrow{<200\,^\circ C} aHSO_4 + HCl$

b) $4NH_3 + 5O_2 \xrightarrow[800\,^\circ C]{Pt} NO + 6H_2O + \Delta$

c) Dehydrohalogenation of 1,2-Dibromo ethane with alcoholic potassium hydroxide.



iv. With respect to Contact Process answer the following: [3]
   a) Vanadium pentoxide / Platinum
   b) 450 – 500 ° C
   c) $SO_3 + H_2SO_4 \rightarrow H_2S_2O_7$

Question 5

i. Ethan wants to differentiate between sulphur dioxide gas and hydrogen sulphide gas in the laboratory. He has been given moist lead acetate paper. [2]
   a)

Sulphur dioxide	Hydrogen sulphide
Gas is exposed to moist lead acetate paper No characteristic reaction	Gas is exposed to moist lead acetate paper Paper turns silvery black / black

   b) Rotten Egg odour.

ii. Name the alloy which is having the following metals as its main component: [2]
   a) Duralumin
   b) Stainless steel

iii. Dany takes a white powdered salt W in a test tube. On heating it produces a buff yellow residue. W is dissolved in water. Magnesium is added to one part of the solution and to the other part sodium sulphate solution is added. [3]
   a) Compound W – Lead nitrate
   b) Magnesium nitrate.
   c) $PbSO_4$

iv. State scientific reasons for each of the following statements: [3]
   a) They have the tendency to make oily products on treatment with halogens.
   b) Since there is an elimination of carbon dioxide molecule from a carboxylic acid.
   c) Since the reaction is exothermic.

Question 6

i. Name the following: [2]
   a) The main ore of iron - haematite
   b) The ore of aluminium containing sodium – Cryolite / Sodium aluminium fluorine.

ii. State one observation in each of the following: [2]
   a) Greenish yellow chlorine gas evolved.
   b) Curdy white ppt of Silver chloride.

iii. Acidified water is electrolysed using platinum electrode. [3]
   a) Cathode
   b) For accurate comparison and saturation of gases.
   c) $OH^{1-} - 1e^- \rightarrow OH \times 4$
      $4OH \rightarrow 2H_2O + O_2$

iv. X [2, 8, 5] and Y [2, 8, 3] are two elements. Using the information complete the following: [3]
   a) Lose
   b) X
   c) X

Question 7

i. The empirical formula of an organic compound is $CHCl_2$ and its molecular weight is 168. Find the molecular formula. [3]
   [Atomic weights; C-12; H-1; Cl-35.5]

   EF = $CHCl_2$
   EFW = 84

   n = 168 / 84 = 2

   MF = $C_2H_2Cl_4$

ii. Joel prepared a solution R that has a pH 7. [2]
   What will be the effect on the pH on addition of the following?
   a) pH will increase
   b) pH will decrease

iii. Fluorine [1]

iv. 12.6g of Copper oxide is obtained on thermal decomposition of copper carbonate. [4]
   $CuCO_3 \rightarrow CuO + CO_2$
   Calculate the following:
   a) Mass of copper carbonate initially taken.
      Copper oxide = Copper carbonate
      79 = 123

      12.6 = (12.6 x 123) / 79 = 19.617

b) Volume of carbon dioxide at STP.

Weight	=	Volume
79	=	22.4L
12.6	=	(12.6 x 22.4) / 79 = 3.527 L

Question 8

i. Differentiate between the following on the basis of the parameters given in the brackets: [2]

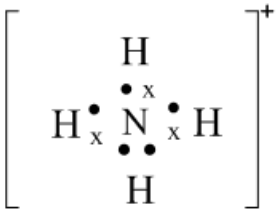
a) Ferrous sulphate and ferric chloride (Sodium hydroxide solution)

Ferrous sulphate	Ferric Chloride
On addition of sodium hydroxide solution Dirty green ppt, Insoluble in excess	On addition of sodium hydroxide solution Reddish brown ppt, insoluble in excess

b) Acidic and alkaline solutions (addition of sodium carbonate)

Acidic solutions	Alkaline solution
Addition of Sodium carbonate Carbon dioxide not evolved	Addition of Sodium carbonate Carbon dioxide not evolved

ii. Draw the electron dot structure for ammonium ion. [2]



Ammonium ion

iii. Write the balanced chemical equation for the following: [3]

a) $Mg_3N_2 + 6H_2O \rightarrow 3Mg(OH)_2 + 2NH_3$

b) $C_2H_5OH + CH_3COOH \rightarrow CH_3COOC_2H_5 + H_2O$ [Conc Sulphuric acid – mention above the arrow]

c) $2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6H_2O + \Delta$

iv. Identify the following: [3]

a) Anode

b) Hydrogen sulphide

c) Monobasic acid