BAI AVABAI F. PETIT GIRLS' HIGH SCHOOL

FIRST PRELIMINARY EXAMINATION (2018– 2019)

SCIENCE (PAPER-2)

CHEMISTRY

STD: X
MARKS: 80

DATE : 05.12.2018
TIME: 2 Hrs. + 15 Mins. Reading Time.

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.

Attempt all questions from Section A and any four questions from Section B.
The intended marks for the questions or parts of questions are given in the brackets [ ].

Section I (40 Marks)
(Attempt all questions from this section)

Question 1

(a) From the list of substances given below, choose the appropriate answers:

CuO , MnO_2 , V_2O_5 , CaO , Al_2O_3 , CO [5]

i) A drying agent in ammonia gas preparation.
ii) A black metallic oxide which is reduced to the metal by an alkaline gas.
iii) A black oxide which releases a greenish yellow gas on reaction with concentrated HCl .
iv) An amphoteric oxide.
v) The catalyst used in the contact process.

(b) State your observation in each of the following cases : [5]

i) Ferric chloride solution is added to liquor ammonia solution.
ii) The gas formed on heating ethylene dibromide with alcoholic KOH is bubbled into ammoniacal silver nitrate solution.
iii) The gas formed on heating rock salt and concentrated sulphuric acid is passed into lead nitrate solution.
iv) Sulphur Dioxide gas is bubbled into potassium dichromate solution.
v) Observation at the anode when an article is electroplated with silver using sodium silver cyanide solution.

(c) Match the columns. [5]

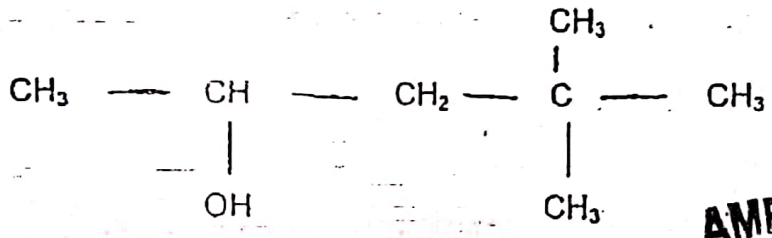
Column 'A'		Column 'B'
i) Acetic acid	a)	C_2H_4
ii) Sugar solution	b)	Have both ions and molecules
iii) Second member of the alkene series	c)	Have only ions
iv) First member of the alkene series	d)	C_2H_6
v) Molten sodium chloride	e)	Have only molecules

(d) Give the IUPAC names of the following : [3]

i) $CH_2 = CH - CH_2 - CH_3$

ii) CH_3COOH

iii)



(e) Draw structural formula for the following : [3]

e i) Formaldehyde

ii) 2 – Chloro -3- methyl pentane

iii) iso-butane

(f) Give reasons for the following : [4]

i) The ionisation potential increases across the period.

ii) Hydrocarbons are excellent fuels.

iii) Ionic compounds have high melting and boiling points.

iv) Dilute nitric acid is generally considered a typical acid except for its reaction with metals.

(g) Choose the correct answer from the options given below: [5]

i) If the empirical formula of an organic compound is CH_2O ,then its molecular formula is

a) $C_2H_2O_2$

b) $C_6H_{12}O_6$

c) C_2H_4O

d) $C_3H_6O_2$

ii) The pH of the solution which gives Ammonia gas on heating with an ammonium salt is

a) 13

b) 7

c) 2

d) 5

iii) Which of the following metallic oxides cannot be reduced by reducing agents

a) Zinc oxide

b) Copper(II)oxide

c) Iron(III)oxide

d) Magnesium oxide

iv) The equation for the electrode reaction at the anode during electrolysis of aqueous solution of sodium argentocyanide is

a) $Ag^{2+} + 2e^- \longrightarrow Ag$

b) $Ag^{+} + 1e^- \longrightarrow Ag$

c) $Ag - 1e^- \longrightarrow Ag^{+}$

d) $Ag - 2e^- \longrightarrow Ag^{2+}$

v) The number of C- H bonds in propane is

a) 6

b) 3

c) 10

d) 8

(h) Solve the following :

Phosphorus reacts with concentrated sulphuric acid according to the equation: [3]

$2P + 5H_2SO_4 \longrightarrow 2H_3PO_4 + 5SO_2 + 2H_2O$

If 196 gm of sulphuric acid is used:

1. Calculate the weight of phosphorus used.
2. Find the volume of Sulphur dioxide liberated at STP.
3. The weight of phosphoric acid formed.

[P=31 , S= 32 , O=16 , H=1]

ii) What volume of oxygen is required to burn completely 45 cm^3 of butane under the similar conditions of temperature and pressure ? [2]

Also find the volume of carbon dioxide released ,according to the equation:

$$2C_4H_{10} + 13O_2 \longrightarrow 8CO_2 + 10H_2O$$

(i) Give balanced chemical equations for the following : [5]

i) Action of concentrated nitric acid on carbon.

ii) Lead(II)oxide heated with ammonia gas,

iii) Laboratory preparation of methane from sodium acetate.

iv) Formation of a $FeCl_3$ by direct combination.

v) Action of concentrated sulphuric acid on cane sugar.

Section II (40 Marks)

(Attempt any *four* questions from this section)

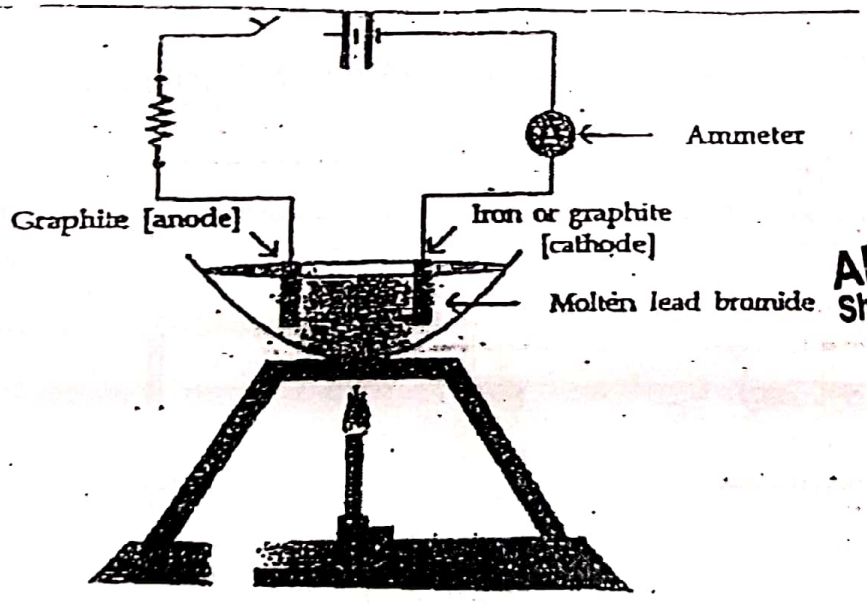
Question 2

a) An element X has atomic number 13 and an element Y has atomic number 8 [2]

i) Write a chemical equation that represents the formation of X ion. $X - 3e^- \rightarrow X^{3+}$

ii) Write a chemical equation that represents the formation of Y ion. $Y + 2e^- \rightarrow Y^{2-}$

b) Answer the following questions with reference to the electrolysis of molten lead bromide: [5]



i) Why is solid lead bromide a non-conductor of electric current? ions held together.

ii) Name the electrode where reduction takes place. Give the reaction at that electrode.

iii) Why is graphite anode preferred to other inert electrodes? unaffected by reactive Br vapour

iv) What will be your observation at the anode? reddish brown.

(c) Solve : [3]

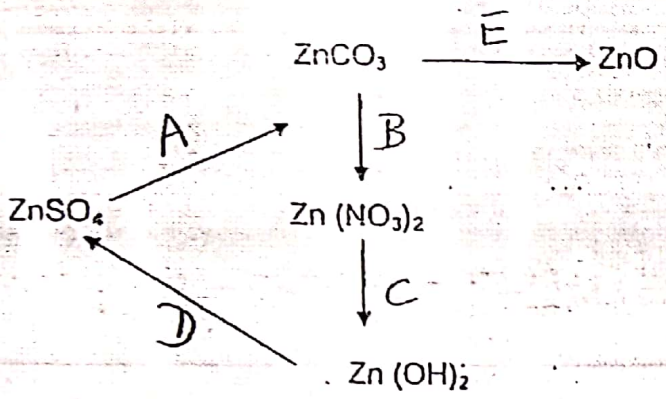
A compound is found to contain 64.80% Carbon, 13.62% Hydrogen and 21.5% Oxygen

What is the empirical formula of this compound?

[C=12 , H=1 , O= 16]

Question 3

a) Write separate balanced equations for the steps A , B , C , D and E: [5]



b) **Give the composition and uses of the following ores:** [4]

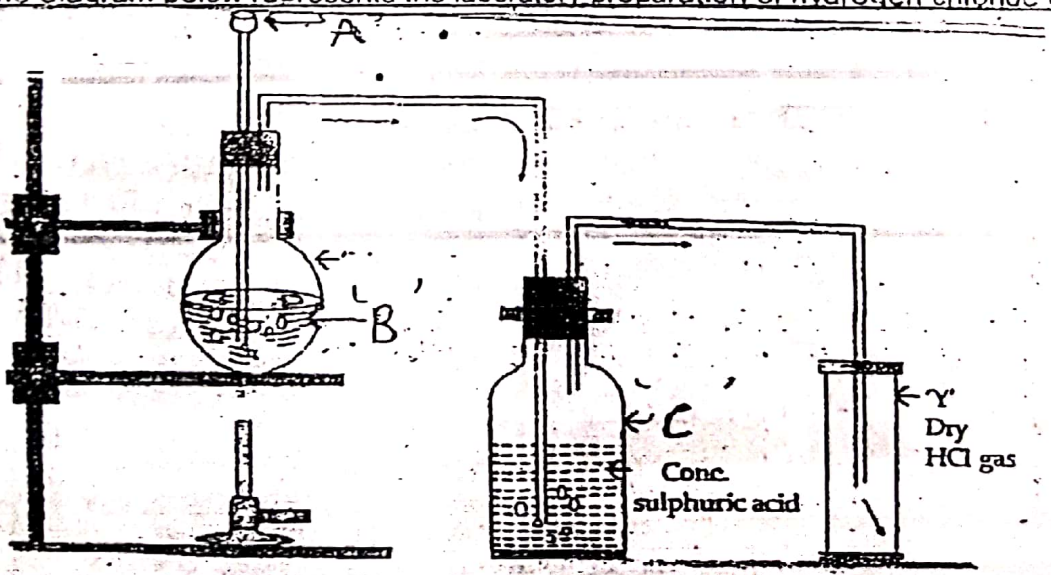
i) Duralumin

ii) Solder

c) What do you understand my the term , Glacial acetic acid. [1]

Question 4

a) The diagram below represents the laboratory preparation of hydrogen chloride gas: [5]



i) Name the acid A and the salt B used in the preparation of HCl gas.

ii) Identify the drying agent kept in bottle C.

iii) How is the gas collected in the laboratory?

iv) The gas fumes in moist air. Why ?

v) What will you observe when an aqueous solution of the above gas is added to silver nitrate solution?

b) The gases chlorine, nitrogen and ammonia are collected under the same conditions of temperature and pressure. If 40 litres of ammonia contains X number of molecules, state the number of molecules in 10 litres of chlorine and 20 litres of ammonia. [2]

c) Draw an **electron dot** diagram of ammonium ion and **state** the type of bonding that exists in it. [3]

Question 5

a) Give balanced chemical equations for the following organic reactions : [4]

i) Preparation of ethyne from calcium carbide

ii) Reaction of ethene and chlorine.

iii) Preparation of Methane from methyl iodide.

iv) Esterification of ethanol.

b) Complete the following table which relates to the Industrial processes: [4]

Industrial process	catalyst	equation for the catalytic reaction
Ostwald's process	i)	ii)
Haber's process	iii)	iv)

c) Find the total percentage of oxygen in , Magnesium nitrate crystals. [2]

$Mg(NO_3)_2.6H_2O$

(Mg=24 , O= 16 ,N=14 , H=1)

Question 6

a) **With reference to the periodic table given below, answer the following questions . [All symbols do not represent the elements] :** [6]

	Group number							
	1	2	13	14	15	16	17	18
2nd period	Li			U		O	Z	Ne
3rd period		Mg	A			Y	M	
4th period	X	V					R	D

i) Compare the ionisation potential of Mg and V.

ii) The most electronegative element.

iii) The element with the largest atomic size in period 2.

iv) The type of bonding between U and hydrogen.

v) The formula of the compound between A and M.

vi) The type of oxide X forms.

b) Some word / words are missing in the following statements .You are required to rewrite the statements in the correct form adding the appropriate word /words: [4]

i) Aluminium nitride liberates ammonia gas on heating with water.

ii) Nitric acid renders the metals, aluminium and iron passive.

iii) Covalent compounds have low melting and boiling points due to weak forces between molecules.

iv) Alcohol containing 5% methyl alcohol is termed as methylated spirit.

Question 7

a) Give the differences between the following with reference to the points given in brackets: [5]

i) Froth floatation and Gravity separation (principle)

ii) CuO and MnO_2 (concentrated HCl)

iii) Ethane and ethene (cold alkaline $KMnO_4$ solution)

iv) Sodium and chlorine (Oxidizing /reducing nature)

v) Ionization potential and electron affinity (definition)

b) Identify the complete salt from the following observations:

i) One part of solution of salt forms a dirty green precipitate with NaOH solution ,another part of the salt solution gives a white precipitate with silver nitrate solution. [5]

ii) A salt gives a lilac flame while performing the flame test ,the salt solution on adding $FeSO_4$ solution and conc H_2SO_4 slowly along the sides forms a brown ring at the junction.

iii) A salt sublimes on heating evolves both a basic gas and an acidic gas.

iv) One part of salt solution give the gelatinous white ppt with ammonium hydroxide solution soluble in excess NH_4OH .The salt on heating evolves a gas which turns limewater milky but has no effect on $KMnO_4$ solution.

v) One part of salt solution gives pale blue precipitate with NaOH solution, another part of the salt solution gives white ppt with barium chloride solution which is insoluble in dilute acid.