N. L. Dalmia®
High School
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ICSE - ISC
ISO 9001:2015

THIRD PRELIMINARY EXAMINATION

Std- X	SCIENCE - PAPER II	Marks: 80 / Pgs 5
Date: 27.01.2020	CHEMISTRY	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.
The time given at the head of this Paper is the time allowed for writing the answers.

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

Question 1.

a. From the following list of salts, choose one substance in each case which relates to the description given below.
Iron (III) chloride, sodium sulphide, iron (II) sulphate, sodium carbonate, zinc carbonate, copper (II) chloride, potassium sulphide, lead nitrate, zinc sulphide, ammonium carbonate, lead (II) chloride. **(5)**

1. A salt whose aqueous solution reacts with sodium chloride solution to precipitate out a salt which is soluble in hot water but insoluble in cold water.
2. A metallic carbonate insoluble in water.
3. A water soluble salt which on exposure to the atmosphere absorbs moisture from the atmosphere and change into a solution.
4. A soluble salt which reacts with caustic soda to give a dirty green precipitate insoluble in excess of caustic soda solution.
5. A metallic sulphide insoluble in water.

b. Correct the following statements and rewrite them. **(5)**

1. Reaction between ammonia and chlorine results in liberation of nitrogen gas.
2. Covalent compounds are said to be polar when the shared pair of electrons are equally distributed between the two atoms.
3. During electrolysis of acidified water, the hydroxyl ions migrate towards cathode and sulphate ions towards anode, where the sulphate ions are discharged by giving up electrons.
4. Non- metallic character of alkaline earth metal increases on moving down the group.
5. A salt is a compound formed only by complete replacement of the replaceable hydrogen ion of an acid molecule by a basic radical.

Contd pg 2

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c. What do you observe when- (5)

1. The gas formed on reacting sodium propanoate and sodalime, is bubbled through a solution of bromine in an inert solvent.
2. The gas formed on heating rock salt and conc. sulphuric acid, is passed through lead nitrate solution.
3. The gas formed when calcium carbide is reacted with cold water, is passed through ammoniacal cuprous chloride solution.
4. The gas formed when sodium bisulphite reacts with dil.H_2SO_4 acid, is passed through lime water.
5. The gas formed when zinc is reacted with hot conc. HNO_3 acid, is exposed to moist potassium iodide paper.

d. Give balanced chemical equation for each of the following. (5)

1. Preparation of methane from iodo methane.
2. Action of sulphur with conc. non- volatile acid.
3. Formation of white gelatinous precipitate which is soluble in excess of liquor ammonia.
4. Preparation of insoluble salt of zinc from its soluble salt.
5. Conversion of dry aluminium hydroxide to pure alumina.

e.

1. Solve the following. (3)

i. The gram molecules in 21g of nitrogen. [N = 14]

ii. The number of moles and molecules in 294 g of sulphuric acid. [H = 1, S = 32, O = 16]

2. Emperical formula of a compound is XY_2.If the empirical formula weight is equal to its vapour density, calculate the molecular formula of the compound. (2)

f. Name the following. (5)

1. A solid basic oxide which is a dehydrating agent.
2. A catalyst used for manufacture of sulphuric acid.
3. The member of the alkaline earth metal group which has the highest electro-negativity.
4. The type of bonding in calcium oxide molecule.
5. A neutral covalent molecule which contains two lone pair of electrons.

g. Choose the correct word/phrase from the bracket to complete the following statements. (5)

1. The element _____ (calcium / sulphur / phosphorus) forms two stable chlorides.
2. Sodium potassium carbonate is a _____ (complex / double /mixed / basic)salt.
3. Elements with low electro-negativity are usually _____ (metallic / non- metallic / inert)
4. Glaubers salt has _____ (7 / 8 / 10) molecules of water of crystallisation.
5. The chemical used for separation of ore from gangue in Bayer's process of Al extraction is _____ (NaOH / NaCl / Na_2CO_3)

Contd pg 3

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h. **Give reasons for each of the following.** (5)

1. The electrolysis of acidified water is considered to be an example of catalysis.
2. Ethyne is more reactive than ethane.
3. Conc. sulphuric acid but not dil. sulphuric acid behaves as an oxidising agent.
4. Nitric acid finds application in purification of gold.
5. Aqueous solution of lead nitrate and zinc nitrate can be distinguished using an aqueous solution of ammonia .

Section II (40 Marks)
(Attempt only 4 questions from this section)

Question 2.

a. (5)

Group No.	I A 1	IIA 2	III A 13	IVA 14	V A 15	VI A 16	VII A 17	0
	Li		D			O	J	Ne
	A	Mg	E	Si		H	K	
	B	C		F	G			L

Some elements given in the above table are in their own symbol and position in the periodic table; while others are shown with a letter. With reference to the table answer the following questions.

1. Which is the most electro- negative element?
2. How many valence electrons are present in G?
3. Write the formula of the compound formed between B and H.
4. In the compound formed between A and J, what type of bond will be formed?
5. Draw the electron dot structure for the compound formed between C and K.

b. Identify the following reactions as either oxidation or reduction. (3)

1. $O + 2e^- \rightarrow O^{2-}$
2. $K - e^- \rightarrow K^+$
3. $Fe^{3+} \rightarrow Fe^{2+} - e^-$

c. Show orbit structure diagram for formation of ammonia molecule. (2)

Question 3.

a. A solution of common salt when added to silver nitrate solution yields a precipitate of silver chloride (0.28g). Find the mass of sodium chloride in the solution and also the mass of sodium nitrate formed. [Na = 23, Cl = 35.5, N = 14, Ag = 108, O = 16] (3)

b. Compare between electrolytic dissociation and ionisation.(any 2 points) (2)

Contd pg 4

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c. With respect to electro-refining of copper answer the following questions. (3)

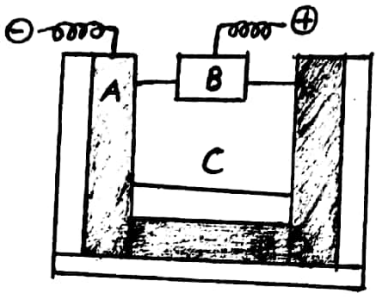
1. Define the term electro-refining.
2. Write reaction at cathode and anode.
3. Write your observation at anode.

d. During electroplating an article with nickel- (2)

1. Name the electrolyte used.
2. Give the reaction of electrolysis at cathode.

Question 4.

a. The following is a sketch of an electrolytic cell used in the extraction of aluminium. (4)



1. What is the substance of which the electrodes A and B are made?
2. At which electrode (A or B) is the aluminium formed?
3. What are the two aluminium compounds present in the electrolyte C?
4. Why is it necessary for electrode B to be continuously replaced?

Electrolyte Fluorospar Cryolite

b. From the gases – ammonia, hydrogen chloride, hydrogen sulphide, sulphur dioxide, select the following. (3)

1. The gas which gives a white precipitate when reacted with silver nitrate solution.
2. The gas evolved when metal sulphide reacts with dil. HCl acid.
3. The gas evolved when metal sulphite reacts with dil. H_2SO_4 acid.

c. Write a balanced chemical equation for- (2)

1. Preparation of nitric acid using chile salt petre.
2. Preparation of ammonia gas using ammonium chloride and slaked lime.

d. Ammonia gas is not collected over water. Give reason. **(1)**

Question 5.

a. Draw branched structural formula of- (3)

1. 2- methyl prop-1- ene
2. Methoxy ethane
3. 3- methyl but-1- yne

Contd pg 5

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b. Give IUPAC names of following compounds. (2)
1. n- propyl alcohol
2. Ethyl methyl ketone

c. Give balanced equations for the reaction of ethyne with- (3)
1. Hydrogen in presence of a catalyst.
2. Chlorine in presence of an inert solvent.

d. Name the following. (2)
1. The type of reaction involved in preparation of potassium nitrate from KOH and HNO_3 acid.
2. The property of conc. H_2SO_4 used in the action when sugar turns black in its presence.

Question 6.

a. A compound has the following percentage composition by mass: carbon 14.4%, hydrogen 1.2% and chlorine 84.5%. (Cl=35.5, H=1, C=12) (4)
i. Determine the empirical formula of this compound.
ii. The relative molecular mass of this compound is 168, so what is its molecular formula?

b. Give a chemical test to distinguish between the following. (4)
1. Sodium carbonate and sodium sulphate.
2. Lead chloride and lead sulphide.
3. Dil.HCl acid and dil. HNO_3 acid.
4. Manganese dioxide and copper (II) oxide.

c. Name an alloy which contains- (2)
1. Copper, aluminium, magnesium and manganese.
2. Copper, zinc and tin.

Question 7.

a. Arrange the following elements as per the guidelines in brackets. (3)
1. Li, F, C, O (increasing order of electron affinity)
2. Ar, He, Ne (increasing order of number of electron shell)
3. Cl, Al, Na, S (increasing order of ionisation potential)

b. In the laboratory preparation of HCl acid, hydrogen chloride gas is dissolved in water. (4)
1. Name the arrangement used for the absorption of HCl gas in water.
2. State why such an arrangement is necessary? Give two reasons for the same.
3. The solution of HCl in toluene does not exhibit acidic property.Explain.

c. The preparation of lead sulphate from lead carbonate is a two step process. (3)
1. Write balanced chemical equations for both the steps.
2. Why is the direct addition of dil. H_2SO_4 to $PbCO_3$ an impractical method of preparing lead sulphate?

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Li B C O F
He
Ne Na Al S Cl
Ar

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