GREENLAWNS SCHOOL, WORLI
TERMINAL EXAMINATION: 2016-17
CHEMISTRY

Std: X   Marks: 80
Date: 03/10/2016   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** is compulsory. Attempt **any four** questions from **Section II**. The intended marks for questions or parts of questions are given in brackets [ ].

SECTION I (40 Marks)
*Attempt **all** questions from this Section*

Question 1

(a) Name the following: [5]
   i.   The gas liberated when the product of reaction of bromoethane and aqueous KOH reacts with sodium metal.
   ii.   The gas liberated when conc. HCl reacts with red lead.
   iii. The substance used for drying ammonia.
   iv. The amount of substance which contains the same number of units a the number of atoms in 12g of carbon – 12.
   v.   The molten metal in which iron sheets are dipped to prevent rusting.

(b) State the observation for each of the following: [5]
   i.   Dil. HCl is added to $AgNO_3$ acidified with dil. HNO_3.
   ii.   The gaseous product obtained by dehydration of ethyl alcohol is passed through bromine water.
   iii. Copper sulphate solution is electrolysed using a platinum electrode.
   iv. Ammonia gas is burnt in an atmosphere of excess oxygen.
   v.   Zinc carbonate is calcined.

(c) Match the ores in column A with their correct chemical name in column B: [5]

| Column A	Column B		
1. Calamine	A. Zinc sulphite	F.	Iron (III) oxide
2. Zinc Blende	B. Iron (II) carbonate	G.	Zinc carbonate
3. Magnetite	C. Zinc oxide	H.	Tri iron tetroxide
4. Haematite	D. Iron (II) oxide	I.	Aluminium oxide
5. Corundum	E. Zinc sulphide	J.	Hydrated aluminium oxide

(d) Give balanced equations for the following reactions: [5]
   i. Preparation of ethanol from ethyl chloride.
   ii. Action of warm water on AlN.
   iii. Reducing nature of ammonia.
   iv. Preparation of hydrogen chloride in laboratory.

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    v. Use of aluminium in thermite welding.

(e) i. A gas of mass 32g has a volume of 20 litres at S.T.P. Calculate the gram   [5]
      molecular weight of the gas.

    ii. How much calcium oxide is formed when 82g of calcium nitrate is heated?
      Also find the volume of nitrogen dioxide evolved:
      $2Ca(NO_3)_2 \rightarrow 2CaO + 4NO_2 + O_2$ (Ca=40, N=14, O=16)
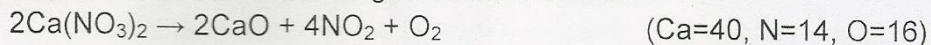
(f) Give reasons for the following: [5]
    i.   During electroplating of an article, the article is always kept at the cathode.
    ii. Ionisation potential of the element increases across a period.
    iii. Zinc oxide can be reduced to zinc by using CO, but aluminium oxide cannot
        be reduced by a reducing agent.
    iv. HCl gas forms a mist of droplets of HCl acid in moist air.
    v. Ammonium nitrate is not used to prepare ammonia in laboratory.

(g) i. Write equations for the reactions taking place at the two electrodes during   [4]
      the electrolysis of:
    1. Acidified copper sulphate solution using copper electrodes
    2. Electroplating of an article with silver

    ii. Define Atomic size   [1]

(h) i. Name the metal generally common in the following alloys: [2]
    1. Brass and bronze
    2. Duralumin and magnalium
    ii. What is esterification? Give an equation to represent esterification.   [2]
    iii. Write the equation for the reaction in the Haber's process that forms   [1]
       ammonia.

SECTION II (40 Marks)
*Attempt **any four** questions from this Section*

Question 2
(a) Use the *letters* only written in the periodic table to answer the questions that   [5]
    follow:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1																		D
2															A			
3	E	G										J			L	M		O
4																		

    i. How many valence electrons are present in A?

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ii. Arrange E, G, J, L, M in the:
1. increasing order of ionisation energy
2. decreasing order of electronegativity
3. increasing order of electron affinity
4. decreasing order of atomic size

(b) i. Name the solution used to react with Bauxite as a first step in obtaining pure aluminium oxide, in the Baeyer's process. [5]
ii. Write the equation for the reaction where the aluminium oxide for the electrolytic extraction of aluminium is obtained by heating aluminium hydroxide.
iii. Name the compound added to pure alumina to lower the fusion temperature during the electrolytic reduction of alumina.
iv. Write the equation for the reaction that occurs at the cathode during the extraction of aluminium by electrolysis.
v. Explain why it is preferable to use a number of graphite electrodes as anode instead of a single electrode, during the above electrolysis.

Question 3
(a) A gas cylinder contains 12×10^{24} molecules of oxygen gas. [2]
If Avogadro's number is 6×10^{23}; calculate:
i. The mass of oxygen present in the cylinder.
ii. The volume of oxygen at S.T.P. present in the cylinder. [O=16]

(b) A compound having empirical formula X_2Y is made of two elements X and Y. [2] Find its molecular formula if the atomic weight of X is 10 and that of Y is 5.. The compound has a vapour density 25.

(c) A gaseous hydrocarbon contains 82.76% of carbon. Given that its vapour density is 29, find its molecular formula. [C=12, H=1] [3]

(d) The equation $4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$, represents the catalytic oxidation of ammonia. If 100 cm^3 of ammonia is used, calculate the volume of oxygen required to oxidise the ammonia completely. [3]
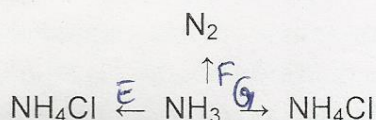
Question 4
(a) Write a balanced equation for each of the following: [5]
i. Action of water on calcium carbide.
ii. Laboratory preparation of ethane from sodium propanoate.
iii. Catalytic hydrogenation of ethylene.
iv. Conversion of ethylene dibromide to acetylene.
v. Preparation of carbon tetrachloride from methane

(b) Complete the following statements: [5]
    i. The catalyst used for the conversion of ethene to ethane is _____
    ii. When acetaldehyde is oxidized with acidified potassium dichromate, it forms _____
    iii. Ethanoic acid reacts with ethanol in presence of conc. Sulphuric acid, so as to form a compound called _____
    iv. The product formed when ethene gas reacts with water in the presence of sulphuric acid is _____
    v. Pure acetic acid is called _____

Question 5

(a) Give balanced equations for the reaction of aluminium with: [5]
    i. Dil. HCl   iv. Conc. H_2SO_4
    ii. Chlorine   v. Conc. Caustic alkali soln
    iii. Sulphur

(b) Give balanced equations for the following when E, F and G are different [3]
    gases:

$$N_2$$
$$\uparrow F, G$$
$$NH_4Cl \overset{E}{\leftarrow} NH_3 \xrightarrow{\ G\ } NH_4Cl$$

(c) Starting from hydrochloric acid, how would you obtain: [2]
    i. A foul smelling acidic gas which turns lead acetate paper silvery black.
    ii. A neutral gas using an active metal.

Question 6

(a) State your observation when ammonium hydroxide solution is added drop by [2] drop and then in excess to each of the following solutions:
    i. Zinc sulphate solution
    ii. Copper sulphate solution
(b) Rewrite the following sentences by using the correct symbol > (greater than) [2] or < (less than) in the blanks given:
    i. The electronegativity of Iodine is _____ that of Chlorine.
    ii. The ionisation potential of Potassium is _____ that of sodium.
(c) Give the electrode reactions for electrolysis of acidified water using platinum [3] electrodes. What do you observe at the anode?
(d) During the electroplating of silver over copper spoon, the electrolyte used [3] must contain (1) _____ ions. The (2) _____ is the cathode and (3) _____ is the anode. The anode is (4) _____ in nature. The electrolyte preferred is (5) _____ which is a (6) _____ salt solution.

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