**Half-yearly Examination - 2016-2017**

**CHEMISTRY**

Time : 2 Hrs. 15 min

Std. : X

F. M. : 80

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SECTION A: 40 Marks

(Attempt all questions)

Question 1

a) Fill in the blanks with appropriate terms : [5]

i) A saturated hydrocarbon will undergo _____(addition/substitution) reaction, whereas unsaturated hydrocarbons undergo _____ (addition/substitution) reactions.

ii) Moving across a _____ (period/group) of the periodic table, the elements show increasing _____ (metallic/ non- metallic) character.

iii) Zinc metal is used in the _____ (electroplating/ galvanizing) of iron sheets.

b) Write balanced chemical equations for the following reactions : (5)

(i) Silver nitrate solution is added to dilute hydrochloric acid.

(ii) Ethylene is passed through dilute bromine water.

(iii) Iron (II) sulphide and dilute hydrochloric acid

(iv) Preparation of ethane from sodium propionate

(v) Sodium bisulphite and dilute sulphuric acid.

c) What do you observe when : (5)

i) Potassium hydroxide is added to phenolphthalein.

ii) Sodium hydroxide is added to Ferrous chloride solution.

iii) Copper sulphate crystals are heated.

iv) Zinc sulphate solution reacts with barium nitrate solution.

v) Ammonia is passed through Nessler's reagent.

d) Match the column A with Column B and rewrite the correct pairs : [5]

| Column A | Column B |
|---|---|
| (i) Sodium Chloride | decreases |
| (ii) Ammonium ion | Covalent bond |
| (iii) Electronegativity in a period | increases |
| (iv) Carbon tetra chloride | Ionic bond |
| (v) Atomic radii in a group | Covalent and coordinate bond |

e) (i) A compound contain 87.5% by mass of nitrogen and 12.5% by mass of hydrogen. Determine the empirical formula of the compound. [H = 1, N = 14] [3]

(ii) Calculate the percentage of phosphorus in calcium phosphate. [ Ca=40, P=31, 0=16] [2]

f) Answer the following questions about electroplating of a copper wire with silver : (5)

(i) What ions must be present in the electrolyte?

(ii) Why is the electrolyte acidulated?

(iii) Name the material of anode.

(iv) Write the ionic reaction taking place at anode.

(v) Write the ionic reaction taking place at cathode.

g) Identify the following substances which are underlined: (5)

(i) An alkaline gas which produces dense white fumes when reacted with hydrogen chloride gas

(ii) An acid which is present in vinegar.

(iii) A gas which does not conduct electricity in the liquid state but conducts electricity when dissolved in water.

(iv) The element which has the highest ionization potential.

(v) An acidic gas which turns acidified orange potassium dichromate to green.

h) Questions given below are regarding the preparation of sulphuric acid: (5)

i) Name the industrial method of preparation of sulphuric acid

ii) Write balanced equation for the oxidation of Sulphur dioxide

iii) Name the catalyst used in the above case.

iv) Name the product formed when Sulphur trioxide is dissolved in concentrated sulphuric acid.

v) Why sulphuric acid is not obtained by directly reacting Sulphur trioxide with water?

## Section B

Attempt any Four

Question 2 : (3)

a) Ammonia gas is prepared industrially from the elements hydrogen and nitrogen:

i) Name the process used for the industrial method of preparation of ammonia

ii) State the conditions required for the process in a(i) above.

iii) Write a balanced chemical equation for the preparation of ammonia from magnesium nitride.

b) State your observations when : (2)

i) Ammonia is burnt in excess of air

ii) Ammonia is treated with excess chlorine.

c) With reference to the metallurgy of Aluminium : (3)

i) Name the method used for refining of Aluminium

ii) What is the electrolyte in the tank?

iii) What material is used for the cathode?

d) Give the chemical formula and one large scale use of Cryolite. (2)

Question 3

a) Give balanced chemical equation for the preparation of the following salts : (5)

i) Copper sulphate from copper (II) oxide

ii) Iron (III) chloride from Iron

iii) Potassium sulphate from potassium hydroxide solution

iv) Lead chloride from lead carbonate (write two equations)

b) What property of sulphuric acid is observed in the following : (3)

(i) Charring of sugar with hot concentrated acid

(ii) Production of nitric acid on treating concentrated acid with potassium nitrate

(iii) As a source of hydrogen when treated in dilute form with reactive metals.

c) Write the structures of the following compounds : (2)

i) Prop-1-ene ii) 2,3-dimethyl butane.

Question 4

a) Acid dissolve in water to produce positively charged ions. Draw the structure of these positive ions. Name the bond present in it. (3)

b) Name two acids that can be prepared using concentrated sulphuric acid. (2)

c) What would you observe when concentrated sulphuric acid is added to : (2)

(i) sugar crystals (ii) copper sulphate crystals

d) (3)

| Element | A | B | C | D |
|---|---|---|---|---|
| Electronic configuration | 2,8,1 | 2,8,7 | 2,5 | 1 |

i) What type of bond is formed between

a) A & B b) C & D

ii) What is the formula of the compound formed between C & D

Question 5

a) To electroplate an article with nickel requires an (i) _____ which must be a solution containing (ii) _____ ions and a small amount of (iii) _____The article to be plated is placed at the (iv) _____ of the cell in which the plating is carried out. The (v)_____ of the cell is made from pure nickel. The ions that are attracted to the negative electrode and discharged are called (vi) ___(6)

b) Vapour density of a gas Z is 23. Calculate : (4)

(i) number of moles (ii) weight in grams

(iii) number of molecules, in 6.72 litres of gas as S.T.P.

Question 6

a) An element M belongs to 2nd period and Group 2 of the Periodic Table. State : (4)

i) the number of valence electrons of the element M,

ii) the valency of the element,

iii) whether it is a metal or a non metal,

(iv) The formula of the compound it forms with Phosphate ion

b) Write one chemical test to distinguish between the following pairs : (3)

i) Calcium nitrate solution and zinc nitrate solution

ii) Sodium chloride solution and sodium sulphate solution

iii) Copper sulphate solution and Ferrous sulphate solution

c) With reference to hydrocarbon Ethene, answer the following : (3)

i) Write balanced equation for its preparation

ii) Draw its structural formula

iii) Write the products formed when it undergoes hydrogenation. [Two steps]

Question 7

a) Give one example of each of the following : (3)

i) A molecule containing a single covalent bond

ii) A molecule containing a double covalent bond

iii) A molecule containing a triple covalent bond

b) i) Write a balanced chemical equation for the laboratory preparation of ammonia. (1)

ii) How is ammonia dried and collected in the laboratory? (2)

c) What do you observe when ammonia gas is passed over heated copper(II) oxide in a hard glass tube? Write a balanced equation for the same. (2)

d) i) Name the industrial method by which nitric acid is prepared.

ii) Name the source of reactant used in the method mentioned by you in d (i). (2)