Quarterly Examination - 2018-19

CHEMISTRY

Class : X

Time : 1½ hrs + 15 min **Full Marks : 80**

[Attempt all questions]

Q1 a) (i) to (v) refer to changes in properties of elements on moving left to right across a period of the Periodic Table. For each property, choose the letter corresponding to the correct answer from A,B~C & D. [5]

i. Non-metallic character of elements A: decreases. B: increases. C : remains same. D : depends on period.

ii. (ii) The electronegativity A : depends on the number of valence electrons. B: remains the same. C: decreases. D: increases.

lll. (iii) The ionization potential A: goes up and down. B: decreases C: increases. D: remains the same.

iv. Atomic size A: decreases. B: increases. C: remains the same. D : sometimes increases or decreases.

v. The electron affinity of the elements in group 1 to17 A: goes up and down. B: decreases and then increases. C: increases. D: decreases

b) Some bacteria obtain their energy by oxidizing Sulphur, producing sulphuric acid as a by product. In the laboratory or industrially, the first step in the conversion of Sulphur to sulphuric acid is to produce Sulphur dioxide. Then Sulphur dioxide is converted to Sulphur trioxide, which reacts with water producing sulphuric acid. [5]

(i) Name the industrial method for the preparation of sulphuric acid

(ii) Name one catalyst used industrially which speeds up the conversion of Sulphur dioxide to Sulphur trioxide

(iii) Write the equation for the conversion of Sulphur dioxide to Sulphur trioxide

(iv) What is the name of the compound formed between Sulphur trioxide and sulphuric acid

(v) Suggest a method for diluting concentrated sulphuric acid.

c) Draw different isomers having the following molecular formula : [5]

(i) C_5H_{12} (ii) C_4H_{10}

(i) 80 cm^3 of methane is mixed with 200 cm^3 of pure oxygen at room temperature and pressure. The mixture is then ignited when it burns as shown by the equation:

$$CH_4 + 2O_2 \text{ ----> } CO_2 + 2H_20$$

Calculate the composition of the resulting mixture if it is cooled to initial room temperature and pressure. [3]

(ii) Find the percentage composition of oxygen in Magnesium sulphate. [2]

[Mg=24, 0=16, S=32]

e) i) What would you observe when concentrated sulphuric acid is added to sugar crystals and copper sulphate crystals separately. [4]

Write balanced chemical equation for both.

ii) State one use of concentrated sulphuric acid. [1]

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

(iv) Find out the mass of $Ca(NO_3)_2$, required to produce 5 moles of gaseous products.

(v) Find out the mass of $Ca(NO_3)_2$ required to produce 44.8 L of NO_2 at S.T.P.

(Relative molecular mass of Ca $(NO_3)_2$ = 164 and of CaO = 56)

Question 7

a) Choose the word/phrase from the brackets which correctly completes each of the following statements: [4]

(i) The element below sodium in the same group would be expected to have a ____ [lower/higher] electro negativity than sodium and the element above chlorine would be expected to have a ____ [lower/higher] ionization potential than chlorine.

(ii) From the left to right in a given period, the number of shells ____ [remains the same / increases / decreases].

(iii) Down a group, the number of valence electrons ____ [remains the same / increases decreases].

b) An organic compound of vapour density 29 contains C= 62.07% , H = 10.34% and 0 = 27.59% . Deduce the molecular formula of the compound. [4]

c) Define Gay Lussac's Law. (1)

d) Name an oxide which is yellow when hot and white when cold. (1)

Find the Empirical and Molecular formula of the compound. (H = 1; C == 12; 0 = 16)

b) Compare the properties of covalent and electrovalent compounds on the following points: [2]

(i) Solubility – (ii) Nature –

c) State your observations when the following salts are heated. (Equations not needed) [4]

i) Lead nitrate

ii) Calcium carbonate

iii) Zinc carbonate

iv) Copper sulphate crystals (on very strong heating)

Question 6 (5)

(a) The following questions refer to the periodic table:

(i) Name the second last element of the period 3

(ii) How many elements are in the second period?

(iii) Name the element which has the highest electron affinity.

(iv) Name the element which has the highest electro negativity.

(v) Name the element which may be placed on group 1 but is not a metal.

b) The equation for the action of heat on calcium nitrate is

$2Ca(NO_3)_2 \longrightarrow 2CaO + 4\ NO_2 + O_2$ (5)

(i) How many moles of NO_2 are produced when 1 mole of $Ca(NO_3)_2$ decomposes?

(ii) What volume of O_2 at S.T.P. will be produced on heating 65.6 g of $Ca(NO_3)_2$?

(iii) Find out the mass of CaO formed when 65.6 g of $Ca(NO_3)_2$ is heated.

(i) When dilute hydrochloric acid is added to sodium carbonate crystals

(ii) When excess sodium hydroxide is added to calcium nitrate solution

(iii) Ammonium hydroxide is first added in a small quantity and then in excess to a solution of copper sulphate

(iv) Calcium carbonate is heated

(v) A solution of Barium chloride is treated with dilute sulphuric acid.

g) Identify the following substances which are underlined: [5]

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

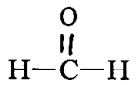
(ii) An acid which is present in vinegar.

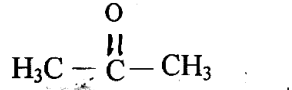
(iii) A gas which does not conduct electricity in the liquid state but conducts electricity when dissolved in water.

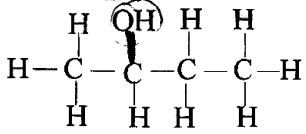
(iv) The element which has the highest ionization potential.

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

h) Write the I.U.P.A.C. names of the following compounds (5)

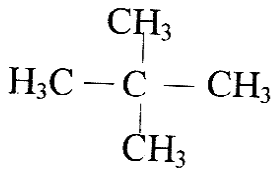
(i) 

(ii) 

(iii) 

(iv) $C_2H_5 - O - C_2H_5$

(v)



Section B

Attempt any four

Question 2

a) Give the structural formula of the following: [4]

(i) ethanol (ii) 1- propanol (iii) ethanoic acid

(iv) 1,2, dichloroethane

b) An element Z has atomic number 16. Answer the following question on Z: [4]

(i) State the period and group to which Z belongs.

(ii) Is Z a metal or a non metal?

(iii) State the formula between Z and Hydrogen.

(iv) What kind of a compound is this?

c) Calculate the volume occupied by 0.01 mole of carbon dioxide at S.T.P. [2]

Question 3

a) An element 'A' has atomic number 20.

(i) Give an equation to show the formation of ion of 'A'

(ii) Give the formula of the sulphate of 'A'.

iii) State the position of 'A' in the periodic table.

iv) On heating ion of 'A', what will you observe [4]

b. What type of bonding exists in each of the following: [3]

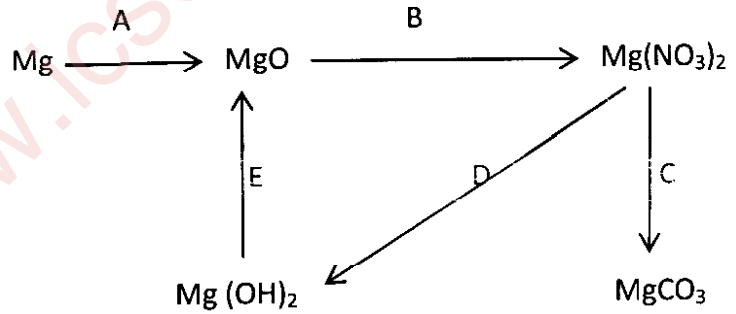
(i) Oxygen molecule (ii) Zinc chloride (iii) Methane

c. (i) With the help of electron dot diagram, show the formation of ammonium ion from ammonia molecule.

(ii) What kind of bond exists between nitrogen atom and hydrogen ion in the formation of ammonium ion? [3]

Question 4

a. Give balanced equation for the conversion A-E (5)



b) Identify the following:

i) Gas that turn lead acetate paper black

ii) Gas that has no effect on acidified potassium dichromate solution

iii) Gas that burns with pop sound

iv) Gas that is reddish brown in colour

v) Gas that turns moist starch iodide paper blue black

Question 5 (4)

(a) A compound has the following percentage composition by mass :

Carbon - 54.55%, Hydrogen - 9.09% and Oxygen - 36.26%. Its vapour density is 44.