Quarterly Examination 2017-2018

Std. : XI **Full Marks : 50**

Subject : CHEMISTRY **Time : 2hrs.+15mins.**

[Q1 is of 20 marks having four subparts all of which are compulsory. Q2 to 5 carry 2 marks each. Q 6 to 9 carry 3 marks each and Q 10 and 11 carry 5 marks each]

PART I [20 marks]

(Answer all questions)

Q1. a) Fill in the blanks :— **[4]**

(i) Out of 2 g-atoms of N (N=14); $3x10^{23}$ atoms of C (C=12) and 7g silver (Ag=108) the one having least weight is _____.

(ii) Electronic configuration of copper (Cu = 29) is _____ and it has _____ unpaired electrons.

(iii) The IUPAC name of  is _____

(iv) For testing halogens the filtrate is boiled with conc. HNO_3 in order to destroy _____ and _____ ions.

b) Complete the following by selecting the correct alternatives from the choices given : [4]

(i) Elements of group 1 give colour in bunsen burner due to :

(A) Low ionization potential

(B) Low melting point

(C) One electron in outer most orbit.

(ii) The IUPAC name of the hydrocarbon

$H — C \equiv C — CH = CH — CH = CH_2$ is

A) Hex – 1, 3 – diene – 5 – yne.

B) 3, 5 – hexadien – 5 – yne

C) Hex – 3,5 diene – 1 – yne.

(iii) The combination of quantum numbers which is correct for an electron in an atom is :-

A) $n = 2, \ l = 2, \ m = 1, \ s = ½$

B) $n = 3, \ l = 1, \ m = 0, \ s = -½$

C) $n = 5, \ l = 1, \ m = 2, \ s = ½$

(iv) A gaseous mixture contains oxygen and carbon dioxide in the ratio of 1:4 by weight. Therefore the ratio of their number of molecules is :

A) 1:4 B) 11:32 c) 3:16

c) Match the following : **[4]**

(i)	Strongest reducing agent	(a)	Alicyclic compound
(ii)	Cyclobutane	(b)	Hetero cyclic compound
(iii)	Number of moles of solute per 1000 g of solvent	(c)	Lithium
(iv)	Pyridine	(d)	Caesium
		(e)	molality
		(f)	molarity

d) Answer the following questions :- **[8]**

(i) Why sodium readily form Na^+ ion but never forms Na^{2+} ion ?

(ii) 0.32g of an organic compound produces 0.233 g of BaSO4 (At. wt Ba = 137, S=32). What is the percentage of sulphur in the compound ?

(iii) Two oxides of nitrogen A and B gave the following results : 4.4g of A gave 2.24 L nitrogen and 60g of B gave 22.4 L of nitrogen at NTP. Show that these results illustrates the law of multiple proportion.

(iv) Write the set of quantum numbers for and electron in 5f orbital.

How many electrons it can have in its f subshell ?

PART II

Q2. Write the electronics configuration of the following ions :—

(i) Ca^{2+} (Ca = 20) (ii) Br^- (Br = 35)

Q3. a) Concentration of glucose ($C_6H_{12}O_6$) in blood is 0.9 gL^{-1}. What will be the molarity of glucose in blood ?

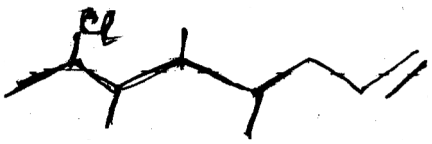
b) What gm-mole is present in 0.40 g of He gas ? (He=4)

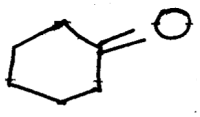
Or

a) What is the normality of 15.44 (M) H_2SO_4 solution ?

b) How many grams of acetone (CH_3COCH_3) must be dissolved in 2.5 kg of water to make 1.60 m solution ?

Q4. a) Write IUPAC names of the following compounds :—

(i) 

(ii) 

Q5. a) Two electrons occupy the same orbital together despite the repulsions of the like charge. Explain

b) What is the number of radial nodes in 2p and 3p orbitals ?

Q6. a) Why sodium catches fire when dropped in water ?

b) Name the following :

(i) Alkaline earth metal which is least reactive.

(ii) Alkaline earth metal which forms strongest base.

(iii) Alkali metal is liquid at temperature above $30^{O}C$.

(iv) Alkali metal which is strongest reducing agent.

Q7. Find out the equivalent weight of

i) HNO_3 when it changes to NO_2 in a reaction.

ii) H_3PO_4 in the reaction.

$Ca(OH)_2 + H_3PO_4 \longrightarrow CaHPO_4 + 2H_2O$.

(H=1, N=14, O=16, P=31)

Or

(i) Aluminium oxide contains 52.90% Al and CO2 contains 27.27% carbon. Calculate the percentage of aluminium in aluminium carbide assuming that law of reciprocal proportion is true.

(ii) State the Law.

Q8. (a) In carius determination of halogens 0.15g an organic compound gave 0.12g of AgBr. Find the percentage of bromine in the compound. [Ag = 108, Br = 80].

(b) 0.356 g of an organic compound gave on combustion 1.222g of carbondioxide and 0.200g of water. What is the percentage composition of carbon and hydrogen ?

Q9. (a) Write the electronic configuration of Cr atom (Cr=24). How many unpaired electrons are there? What is its magnetic behaviour ?

(b) What will be the designation of the following orbitals ?

A) n = 3, l = 0, (ii) n = 5, l = 2

Q10. (a) Draw the structural formulae of the following compounds :—

(i) 6-Ethyl — 2,2 dimethyl 5 (2 — methyl propyl) octane

(ii) 1,3 dimethyl cyclobutane.

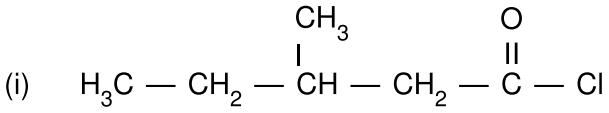
(iii) Pent — 2 — enamide.

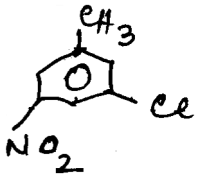
(iv) Ethony ethane

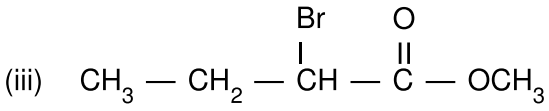
(v) 4 Ethxl - 5 - methyl hex - 2 - ene.

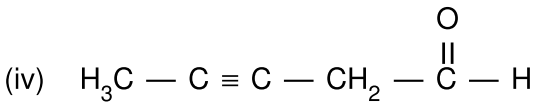
OR

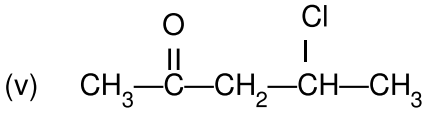
Write IUPAC names of the following compounds :—

(i) 

(ii) 

(iii) 

(iv) 

(v) 

Q11. (a) Arrange the following orbitals according to increasing energy : 3p, 6s, 4d, 5s.

(b) What is the maximum number of electrons that can be accommodated in an atom with highest principal quantum number 4 ?

(c) 0.25g of a dibasic organic acid were dissolved in water and the volume made to 100 ml. 10 ml of this solution required 12.5 ml of $^{N}/_{30}$ sodium hydroxide for complete neutralisation. Find the molecular mass of acid.

(d) What is the number of water molecules in a drop of water weighing 0.018g ? (H=1, 0=16)

Or

a) Electrons will first enter into the set of quantum numbers (i) n = 3, l = 0

(ii) n = 3, l = 2 ? Explain.

b) What is the maximum number of orbitals is an atom having n = 4 l = 2 ?

c) How many gram of concentrated nitric acid solution should be used to prepare 250ml of 2 (M) HNO_3 ? The concentrated acid is 70% HNO_3.

d) What is the number of oxygen atoms present in 0.5 mol of sulphur dioxide ?