RBRAIN INTERNATIONAL SCHOOL

SESSION 2024-25

CLASS: XI **TERM 1 REVISION SHEET** **SUBJECT: Chemistry**

Chapter 1– Some basic concept of chemistry

Q1.**Read the given passage and answer the questions 1 to 4 that follow:**

Atoms and molecules cules are so small in size that it is neither possible to count them individually nor possible to determine their mass. These are counted collectively in terms of Avogadro's number of atoms and molecules is known as gram atomic mass and gram molecular mass respectively. The volume occupied by Avogadro's number of molecules of a gas or vapours is known as molar volume.

Questions 2 to 5 are MCQ type (only one correct option)

Q2. If N_A is Avogadro's number then the number of valance electrons in 4.2 g of nitride ion(N^{3-}) is:

(a) $4.2N_A$ (b) $2.4N_A$ (c) $1.6N_A$ (d) $3.2\ N_A$

Q3. The vapour density of a gas is 11.2.The volume occupied by 11.2g of gas at NTP will be

(a) 22.2L (b) 11.2L (c) 1L (d) 44.8L

Q4. The number of molecules in 16g of methane is:

(a) 3.0×10^{23} (b) $\frac{16}{6.022} \times 10^{23}$ (c) 6.022×10^{23} (d) $\frac{16}{3.0} \times 10^{23}$

Q5. If 3.01 x1020 molecules are removed from 98mg of H_2SO_4, then the number of molecules of H_2SO_4 left will be

(a) 0.1×10^{-3} (b) 1.66×10^{-3} (c) 9.95×10^{-2} (d) 0.5×10^{-3}

Q 6 to 8 are Assertion and reason type questions:

a)If assertion and reason both are correct and assertion is correct explanation for assertion

b) If assertion and reason both are correct and assertion is not correct explanation for assertion

c)If assertion is correct and reason is incorrect

d)If assertion and reason both are incorrect

Q6.Assertion: Both 32gof SO_2 and 8g of CH_4 have same number of molecules.

Reason: Equal moles of substances have equal number of molecules.

Q7. Assertion: One mole of NaCl contains $6.022x10^{23}$ formula units of NaCl.

Reason: 58.5g of NaCl also contains $6.022x10^{23}$ formula units of NaCl.

Q8. Assertion: Molarity of a solution does not depend upon temperature whereas molality depends.

Reason: Molarity and molality both depends upon only number of moles of solute.

Q9. Assertion:1mole of N and one mole of N_2 contain equal number of particles.

Reason: 1mole of molecules is always double than 1mole of atoms in all the diatomic molecules.

Questions 10 to 10 are MCQ type (only one correct option)

Q10. If 1.5 moles of oxygen combines with Al to form Al_2O_3. The mass of Al in grams[atomic mass of Al = 27] used in the reaction is:

(a)2.7g (b)54g (c) 40.5g (d) 81g (e)27g

Q11. A solution contains 4g of NaOH and 16.2g of water the mole fraction of solute and solvent are respectively.

(a)0.1, 0.9 (b) 0.2, 0.8 (c) 0.5, 0.5 (d) 2.5, 0.6 (e) 0.3, 0.

Chapter -2: Structure of Atom

Read the given passage and answer the questions 1 to 3 that follow:

The hydrogen like species Li^{2+} is in spherically symmetric state $S_1$with one radial node. Upon absorbing light the ion undergoes transition to state S_2.The state S_2 has one radial and its energy is equal to ground state energy of the hydrogen atom.

Questions 1to3 are MCQ type (only one correct option)

Q1.The state $S_1$is

(a) 1S (b) 2S (c) 2P (d) 3S

Q2. Energy of stat S_1in units of hydrogen ground state energy is

(a)0.75 (b) 1.50 (c) 2.25 (d) 4.50

Q3.The orbital angular momentum of the state $S_2$is

(a) 0 (b) 1 (c) 2 (d) 3

Question 4 to 8 are MCQ Type (only one correct option)

Q4. The number of unpaired electrons in Ni[Z= 28]

(a) 0 (b) 2 (c) 4 (d) 8

Q5.Which of the following corresponds to a photon of highest energy?

(a) λ = 300nm (b) v = $3x10^8$ S^{-1} (c) V= $4x10^9S^{-1}$ (d) λ= 30nm

Q6. What is the atomic number of the element with symbol UUS

(a)115 (b) 117 (c) 114 (d) 112

Q7. Which has the non-spherical orbital for the electron?

(a) He (b) B (c) Be (d) Li

Q8. Which set of quantum numbers is not applicable

(a)1,1,1,+1/2 (b) 1.0.0,+1/2 (c)1,0,0,- ½ (d) 2,0,0,+1/2

Questions 9 to 10 are assertion and reason type

a) If assertion and reason both are correct and reason is correct explanation for assertion

b) If assertion and reason both are correct and reason is not correct explanation for assertion

c) If Assertion is correct but reason is incorrect

d) If Assertion and reason both are incorrect

Q9. Assertion: An orbital cannot have more than two electrons and their spin must be opposite **.**

Reason: No two electrons in an atom can have same set of all quantum numbers.

Q10.Assertion: The 19^{th} electron in potassium atom enters 4s orbital and not 3d orbital.

Reason: The energies of orbitals can be compared with the help of (n+l) rules.

Chapter -3 : Classification of elements and periodicity in properties

Read the given passage and answer the questions 1 to 4 that follow:

Atomic number forms the basis of classification of the elements in the long form of periodic table. The elements have been classified into four blocks depending upon the subshell in which the last electron is filled. The number of elements in any period depends upon the number of electron in the corresponding shells. For example fourth shell has 18 electrons(4s, 3d, 4p)There for the fourth period has 18 elements.

Q1. Long form of periodic table is based on the properties of the elements as function of:

(a) atomic size (b) atomic mass

(c) electronegativity (d) atomic number

Q2.The maximum number of elements in third period is:

(a) 8 (b) 18

(c) 32 (d) between 8 and 18

Q3. The fourth period of the p- block elements contains

(a) 6 elements (b) 8 elements

(c) 10 elements (d) 18 elements

Q4.The transition metals have general electronic configuration

(a) ns^2nd^{1-10} (b)$ns^2np^1(n-1)d^{1-10}$

(c) $ns^{1-2}(n-1)d^{1-10}$ (d)$ns^2np^6(n-1)d^{1-10}$

Questions 5 to 8 are Assertion and reason Type

a) If both assertion and reason are correct and reason is correct explanation for assertion

b) If both assertion and reason are correct and reason is not correct explanation for assertion

c)If assertion is correct but reason is incorrect

d) If assertion and reason both are incorrect

Q5**.** Assertion: The ionization of s- electrons require more enthalpy than that for ionization of p- electrons of the same shell.

Reason: s-electrons are closer to the nucleous than p- electrons and hence are more strongly attracted.

Q6.Assertion:When transition metals ionize, the 4s- orbital electrons are removed before the 3d- orbital electrons.

Reason: The energy of 3d- orbital electron is lower than that of 4s- orbital electrons.

Q7. Assertion: Helium and beryllium have similar outer electronic configuration of the type ns^2.

Reason: Both are chemically inert.

Q8.Assertion: The first ionization enthalpy of aluminum is lower than that of magnesium.

Reason: Ionic radius of aluminum is smaller than that of magnesium.

Questions 9 to 12 are MCQ type:

Q9. The first ionization energy of Na, Mg ,Al and Si are in the order:

(a)Na< Mg > Al < Si (b) Na > Mg > Al > Si

(c)Na < Mg < Al > Si (d) Na> Mg > Al < Si

Q10. The electronegativity of the elements increase in the order

(a) C,N, Si, P (b) N, Si, C,P

(c) Si, P, C, N (d) P, Si, N, C

Q11.The element with maximum electronegativity belong to

(a) period 2 , group 17 (b) period1, group 18

(c) period3, group 17 (d) period 2, group 16

Q12. Which of the following has smallest size

(a) N^{3-} (b) O^{2-}

(c) F^{-} (d) Na^{+}

Chapter 4: Chemical bonding and molecular structures

Read the given passage and answer the questions 1 to 4 that follow:

L.C.A.O. principle is involved in the formation of linear orbitals according to molecular theory. The energy of the bonding molecular is less than that of the combining atomic orbitals while that of the antibonding molecular orbitals is more. The bond order helps in predicting stability, bond length, bond energy and formation of molecular orbitals. Only molecules with positive B.O. can be formed these may be diamagnetic or paramagnetic.

Q1.Bond order is:

(a) directly related to bond length (b) inversely related to bond length

(c) inversely related to bond strength (b) never fractional

Q2. In the formation of N_2^+ from N_2 the electron removed from

(a) sigma- orbital (b) pie- orbital

(c) anti binding sigma orbital (d) anti bonding pie-orbital

Q3. The bond order in B2 molecule is

(a) 0 (b) 1

(c) 2 (d) 3

Q4.In the homo nuclear molecules which of the following sets of M.O. orbitals are degenerate

(a) sigma1s and antibonding sigma 1s (b) pie-2px and pie-2py

(c) pie 2px and pie 2py (d) sigma 2pz and pie antibonding 2px

Questions 5 to 8 are assertion and reason type

a) If assertion and reason both are correct and reason is correct explanation for assertion

b) If assertion and reason both are correct and reason is not correct explanation for assertion

c) If assertion is correct and reason is wrong

d) If assertion and reason both are wrong

Q5.Asserton:ClF_3 has T-shape structure

Reason: It has two lone pair arranged at angle 180^0

Q6.Assertion: All molecules with polar bonds may not have dipole moments

Reason: Dipole moment is a vector quantity and bond dipoles may cancel out

Q7.Assertion: Molecular nitrogen is less reactive than molecular oxygen.

Reason: The bond length of N_2 is less as compared to that of O_2.

Q8. Assertion: $SeCl_4$ does not have a tetrahedral structure.

Reason: Se in $SeCl_4$ has two lone pair of electrons.

Questions 9 to 10 are MCQ type (only one correct option)

Q9. Carbon tetrachloride has not net dipole moment because of:

(a) its planar structure (b) its regular tetrahedral structure

(c) similar size of carbon and chlorine (d) similar electron affinity of C and Cl

Q10.Which of the following does not have any hydrogen bonding

(a) phenol (C_6H_5OH) (b) Liquid NH_3

(c) water (d) HCl

Chapter 5- Thermodynamics

Q1. Explain Born haber cycle taking example for $CaCl_2$ formation..

Q2. Explain Hasse's law with example.

Q3. What is enthalpy of neutralization explain with example?

Q4. Why boiling point decrease at high altitude?

Q5. A system absorbs energy equivalent to 415 J and performs work equivalent to

205.15 J. Calculate the change in internal energy of the system.

Q6. What are limitations of first law of thermodynamics?

Multiple choice questions only one correct answer:

Q7. When liquid boils, there is

(a) an increase in entropy (b) a decrease in entropy

(c) an increase in heat of vaporization (d) an increase in free energy

Q8. Which of the following is extensive property

(a) volume and enthalpy (b) volume and temperature

(c) volume and specific heat (d)pressure and temperature