**I.P.S.Sr.Sec.School**

**Max Time : 3 hr** **Class : 11th Chemistry Max Marks : 70**

**Mid Term Exam**

**Section – A**

1. Multiple choice Questions: [ 1 x 20 = 20 ]
2. The types of hybrid orbitals of nitrogen in , , respectively are expected to be :

|  |  |  |  |
| --- | --- | --- | --- |
| a) sp, sp3 & sp2 | b) sp, sp2 & sp3 | c) sp2, sp & sp3 | d) sp2, sp3 & sp |

1. Number of gram molecule of oxygen in 6.02 x 1024 CO molecule is.

|  |  |  |  |
| --- | --- | --- | --- |
| a) 10 gm molecule | b) 5 gm molecule | c) 1 gm molecule | d) 0.5 gm molecule |

1. The first ionization enthalpies 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 |

1. Which of the following species has tetrahedral geometry ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) | b) | c) | d) H3O+ |

1. Which molecule / ion out of the following does not contain unpaired electrons ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) | b) O2 | c) | d) B2 |

1. Among halogens, the correct order of amount of energy released in electron gain (electron gain enthalpy) is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) F > Cl > Br > I | b) F > Cl < Br > I | c) F < Cl > Br > I | d) F < Cl < Br < I |

1. Which of the following angle corresponds to sp2 hybridization ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) 90˚ | b) 120˚ | c) 180˚ | d) 109˚ |

1. The highly metallic element will have the configuration of

|  |  |  |  |
| --- | --- | --- | --- |
| a) 2 , 8 , 7 | b) 2 , 8 , 8 , 5 | c) 2 , 8 , 8 , 1 | d) 2 , 8 , 2 |

1. The total number of protons in 10 gm of calcium carbonate is

|  |  |  |  |
| --- | --- | --- | --- |
| a) 3.01 x 1024 | b) 4.06 x 1024 | c) 30.1 x 1024 | d) 3.01 x 1023 |

1. Which of the following options represents the correct bond order :

|  |  |  |  |
| --- | --- | --- | --- |
| a) > O2 > | b) < O2 < | c) > O2 < | d) < O2 > |

1. A metal ion M3+ loses 3 electrons, its oxidation number will be

|  |  |  |  |
| --- | --- | --- | --- |
| a) + 3 | b) + 6 | c) 0 | d) – 3 |

1. The correct order of decreasing first ionization energy is

|  |  |  |  |
| --- | --- | --- | --- |
| a) C > B > Be > Li | b) C > Be > B > Li | c) B > C > Be > Li | d) Be > Li > B > C |

1. Screening effect is not observed in

|  |  |  |  |
| --- | --- | --- | --- |
| a) He+ | b) Li2+ | c) Be3+ | d) in all the three |

1. What is the ratio between the energies of two radiations, one with a wavelength of 6000Å and other with 2000Å

|  |  |  |  |
| --- | --- | --- | --- |
| a) 3/1 | b) 2/3 | c) 1/3 | d) 3/2 |

1. The first ionization potential (eV) of Be and B respectively are

|  |  |  |  |
| --- | --- | --- | --- |
| a) 8∙29, 9∙32 | b) 9∙32, 8∙29 | c) 9∙32, 9∙32 | d) 8∙29, 8∙29 |

1. The ionic radii of isoelectronic species N3- , O2- and F - in Å are in the order :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1∙36 , 1∙40 , 1∙71 | b) 1∙36 , 1∙71 , 1∙40 | c) 1∙71 , 1∙40 , 1∙36 | d) 1∙71 , 1∙36 , 1∙40 |

1. Which pair of atomic numbers represents s-block elements ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) 7, 15 | b) 6, 12 | c) 9, 17 | d) 4, 12 |

1. Which of the following transitions will have minimum wavelength ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) n4 n1 | b) n2 n1 | c) n4 n2 | d) n3 n1 |

1. The element with atomic number 113 has recently been discovered. Its electronic configuration is similar to that of

|  |  |  |  |
| --- | --- | --- | --- |
| a) Si | b) Ga | c) Bi | d) At |

1. Atoms of the elements belonging to the same group of periodic table will have

|  |  |
| --- | --- |
| a) same number of protons | b) same number of electrons in the valence shell |
| c) same number of neutrons | d) same number of electrons |

**Section – B [ 2 X 7 = 14 ]**

1. Why axial bond of PCl5 are longer than equatorial bonds?
2. What would be the IUPAC name and symbol for the element with atomic number : (a) 120 (b) 116
3. The first and second ionization potential of helium atom are 24.58 eV and 54.4 eV respectively. Calculate the energy in KJ required to produce 1 mole of He2+ ions. [ 1 eV = 96.49 KJ/mol]
4. A golf ball has mass of 40 g and a speed of 45 m/s. If the speed can be measured within accuracy of 2 %, Calculate the uncertainty in position.

Or

The density of 3 M solution of NaCl is 1.25 g/mL. calculate its molality of the solution.

1. Calculate the number of oxalic acid molecules in 100 mL of 0.02 N oxalic acid solution.
2. Define Molarity and Normality.
3. Explain open and isolated system with example.

**Section – C [ 3 X 7 = 21 ]**

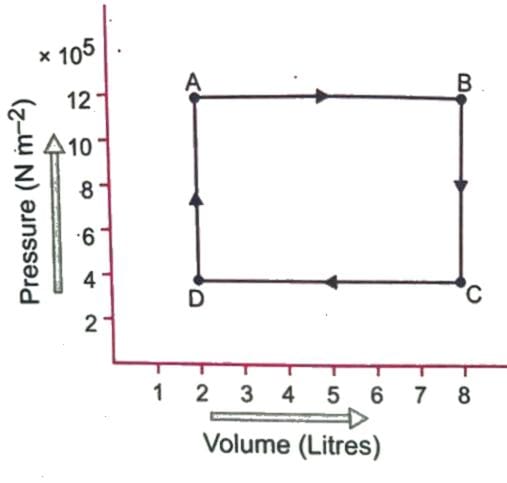
1. Explain electronegativity and write two factors on which it depends.
2. Give the electronic configuration of the following elements :

(a) Cu2+ (b) Cr3+ (c) Fe2+ (d) H –  (e) Fe3+ (f) S 2 –

1. Compare bond order of the following :

(a) O2 , , (b) N2 , , (c) F2 , ,

1. Calculate Q , W , U and H for the isothermal reversible expansion of one mole of an ideal gas from an initial pressure of 1 bar to a final pressure of a 0.1 bar at a constant temperature of 273 K.
2. The fig. given below represents P – V diagram of different stages of a thermodynamic process. Calculate the work done in each stage and also the net work done in the complete cyclic process.



1. Calculate the wavelength of a photon in Angstrom units having energy of one electron volt.

Or

Two elements X and Y combine to form two compounds XY2 and X3Y2. 0.1 mol of XY2 weighs 10 g and 0.05 mol of X3Y2 weighs 9 g. Calculate the atomic masses of X and Y.

1. Explain Aufbau principle and Pauli Exclusion principle.

**Section – D [ 5 X 3 = 15 ]**

1. (a) The iodine molecule dissociates into atoms after absorbing light of 4500 Å. If one quantum of radiation is absorbed

by each molecule, Calculate the kinetic energy of iodine atoms (Bond energy of I2 = 240 KJ/mol).

(b) Cortisone is a molecular substance which contains 21 carbon atom per molecule. If carbon atoms is

69.98% by weight. What is molecular weight of cortisone?

1. Draw the M.O. diagram of NO and find bond order of NO and NO +. Write electronic configuration of NO +.
2. Draw the shape and write the hybridization of the following :

(a) SO3 (b) XeO3F2 (c) SF4

Or

1. Two particles A and B are in motion. If the wavelength associated with particle a is 5 x 10 – 8 m, calculate the wavelength associated with particle B if its momentum if half of A.
2. Explain 1st law of thermodynamics.