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

**Class : 11th**

**Max Time : 3 hr Subject : Chemistry Max Marks : 70**

1. 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. In ion, the formal charge on the oxygen atom of P – O bond is

|  |  |  |  |
| --- | --- | --- | --- |
| a) +1 | b) -1 | c) - 0.75 | d) + 0.75 |

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. Calculate number of water molecule in a drop of H2O. If 1 mL of H2O has 20 drops. (No is the Avogadro no.)

|  |  |  |  |
| --- | --- | --- | --- |
| a) 0.5 No /18 | b) 0.005 No | c) 0.5 No | d) 0.05 No /18 |

1. Which of the following species has tetrahedral geometry ?

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

1. Number of bonds and bonds in the following structure is

|  |  |  |  |
| --- | --- | --- | --- |
| a) 6, 19 | b) 4, 20 | c) 5, 19 | d) 5, 20 |

1. Which of the following relates to light as wave motion

|  |  |  |  |
| --- | --- | --- | --- |
| a) Diffraction | b) Interference | c) Both (a) & (b) | d) None of these |

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. Identify the pair which are not of isotopes

|  |  |  |  |
| --- | --- | --- | --- |
| a) 6X12 ,6Y13 | b) 17X35 ,17Y37 | c) 6X14 ,7Y14 | d) 4X8 ,4Y9 |

1. Element with valence shell electronic configuration as (n-1)d5 ns1 is placed

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1 , s-block | b) 16 , s-block | c) 7 , s-block | d) 6 , d-block |

1. Oxidation state of Cl in CaOCl2 is/are

|  |  |  |  |
| --- | --- | --- | --- |
| a) 0 | b) + 1 | c) – 1 | d) + 1 , – 1 |

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 arrangements represent increasing oxidation number of the central atom

|  |  |
| --- | --- |
| a) , , , | b) , , , |
| c) , , , | d) , , , |

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. The oxidation number of chromium in CrO5 is

|  |  |  |  |
| --- | --- | --- | --- |
| a) 4 | b) 5 | c) 6 | d) 10 |

1. A gaseous mixture contains O2 and N2 in the ratio 1 : 4 by weight. Then the ratio of their number of molecules in the mixture is:

|  |  |  |  |
| --- | --- | --- | --- |
| a) 3 : 32 | b) 7 : 32 | c) 1 : 4 | d) 3 : 16 |

1. Screening effect is not observed in

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

1. Threshold energy is also called

|  |  |  |  |
| --- | --- | --- | --- |
| a) Work function | b) potential energy (PE) | c) kinetic energy (KE) | d) Sum of (PE) and (KE) |

1. At STP the density of CCl4 vapour in g/L will be nearest to

|  |  |  |  |
| --- | --- | --- | --- |
| a) 8.67 | b) 6.87 | c) 5.67 | d) 4.26 |

1. As s-character increases in hybridized orbitals, bond angle

|  |  |  |  |
| --- | --- | --- | --- |
| a) increases | b) decreases | c) becomes zero | d) does not change |

1. Electronic configurations of four elements A, B, C and D are given below :

|  |  |  |  |
| --- | --- | --- | --- |
| A: 1s2 2s2 2p6 | B: 1s2 2s2 2p4 | C: 1s2 2s2 2p6 3s1 | D: 1s2 2s2 2p5 |

Which of the following is the correct order of increasing tendency to gain electron :

|  |  |  |  |
| --- | --- | --- | --- |
| a) A <C <B < D | b) A < B < C < D | c) D < B < C < A | d) D < A < B < C |

1. In the given reaction, K2Cr2O7 + X H2SO4 + Y SO2 → K2SO4 + Cr2(SO4)3 + Z H2O ; X , Y , Z are

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1 , 3 , 1 | b) 4 , 1 , 4 | c) 3 , 2 , 3 | d) 2 , 1 , 2 |

1. The first, second, third, fourth and fifth ionization potentials of an element are 7.1 , 14.3 , 34.5 , 46.8 and 162.2 eV respectively. The element is

|  |  |  |  |
| --- | --- | --- | --- |
| a) Ca | b) Si | c) F | d) Al |

1. The oxidation state of S atoms in S4 from left to right respectively are



|  |  |  |  |
| --- | --- | --- | --- |
| a) + 6 , 0 , 0 , + 6 | b) + 3 , + 1 , + 1 , +3 | c) + 5 , 0 , 0 , + 5 | d) + 4 , + 1 , + 1 , +4 |

1. Which of the following species can function both as oxidizing agent as well as reducing agent ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Cl – | b) | c) ClO – | d) |

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. Which of the following order of energies of molecular orbitals of N2 is correct ?

|  |  |
| --- | --- |
| a) ( 2pY ) < ( 2pZ ) < ( 2pX ) ( 2pY ) | b) ( 2pY ) > ( 2pZ ) > ( 2pX ) ( 2pY ) |
| c) ( 2pY ) < ( 2pZ ) > ( 2pX ) ( 2pY ) | d) ( 2pY ) > ( 2pZ ) < ( 2pX ) ( 2pY ) |

1. Two atoms are said to be isobars if

a) They have same atomic number but different mass number

b) They have same number of electrons but different number of neutrons

c) They have same number of neutrons but different number of electrons

d) Sum of the number of protons and neutrons is same but the number of protons is different

1. Which of the following are non-polar molecules ? (I) NCl3 (II) SO3 (III) PCl5

|  |  |  |  |
| --- | --- | --- | --- |
| a) I only | b) II only | c) I and II only | d) II and III only |

**(More than one option)**

1. Which of the following statements is/are not true about the following decomposition reaction :

2 KClO3 → 2 KCl + 3 O2

a) Potassium is undergoing oxidation

b) Chlorine is undergoing oxidation

c) Oxygen is reduced

d) None of the species are undergoing oxidation or reduction

1. Which of the following have no unit ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Electronegativity | b) Electron gain enthalpy | c) Ionization enthalpy | d) Metallic character |

1. Which of the following species has the same shape ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) CO2 | b) CCl4 | c) O3 | d) |

1. Consider the following ionization steps :

M (g) → M+ (g) + e - ; H = 100 eV

M (g) → M2+ (g) +2 e - ; H = 250 eV

Select the correct statements :

|  |  |
| --- | --- |
| a) H­1 of M (g) is 100 eV | b) H­1 of M+ (g) is 150 eV |
| c) H­2 of M (g) is 250 eV | d) H­2 of M (g) is 150 eV |

1. The exhibition of various oxidation states by an element is also related to the outer orbitals electronic configuration of its atom. Atom having which of the following outermost electronic configurations will exhibit more than one oxidation state in its compounds.

|  |  |  |  |
| --- | --- | --- | --- |
| a) 3s1 | b) 3d1 4s2 | c) 3d2 4s2 | d) 3s2 3p3 |

**Two Marks Questions : [ 2 X 6 = 12 ]**

1. Write electronic configuration of : (i) Mg (ii) Fe2+
2. Write the value of n , l and m for 4dz2 .
3. Find bond order of NO and .
4. Find oxidation number of Carbon atom in carbon suboxide.
5. Define isobar with example ?
6. The heat of combustion of benzene in a bomb calorimeter (i.e. constant volume) was found to be 3263.9 KJ mol – 1 at 25˚C. Calculate the heat of combustion of benzene at constant pressure.

**Three Marks Questions : [ 3 X 6 = 18 ]**

1. Among the second period elements, the actual ionization energies are in the order :

Li < B < Be < C < O < N < F < Ne. Explain why :

a) Be has higher H than B b) O has lower H than N and F ?

1. Balance the following equations : Cu2S + + H+ → Cu2+ +
2. Write three properties of Ionic compounds ?
3. Write three difference between Sigma and Pi bond ?
4. A sample of (NH4)3PO4 contains 3.18 mole of hydrogen atoms. Calculate number of moles of oxygen atom in the sample .
5. The equilibrium constant at 278 K for :

Cu (s) + 2 Ag+ (aq) Cu2++ 2 Ag (s)

is 2 x 1015. In a solution in which copper has displaced some silver ions from the solution, the concentration of Cu2+ ions is 1.8 x 10 – 2 mol/L and the concentration of Ag+ ions is 3 x 10 – 9 mol/L. Is this system at equilibrium ?