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**Max Time : 1 hr** **Competition Test Chemistry Max Marks : 45**

**Some basic concepts of Chemistry , Periodic Classification , Chemical Bonding , Redox**

1. How many moles of e- weight 1 kg (wt. of e- = 9.1 x 10-31 kg).

|  |  |  |  |
| --- | --- | --- | --- |
| a) 6.022 x 1023 | b) 1031 | c) 1054 | d) 108 |

1. Which of the following will contain same number of atoms as in 20 g of Ca?

|  |  |  |  |
| --- | --- | --- | --- |
| a) 24 mg Mg | b) 12 gm C | c) 8 gm oxygen gas | d) 16 gm oxygen atom |

1. In a glass tube, there is 18 g of glucose, 0.08 mole of glucose is taken out, glucose left in glass tube is.

|  |  |  |  |
| --- | --- | --- | --- |
| a) 0.1 gm | b) 0.02 gm | c) 0.1 mole | d) 3.6 gm |

1. What is total number of atoms in 25 mg in camphor (C10H16O).

|  |  |  |  |
| --- | --- | --- | --- |
| a) 9.89 x 1019 | b) 6.02 x 1020 | c) 9.89 x 1020 | d) 2.67 x 1021 |

1. How many water molecules are there in one drop of water (Volume = 0.0018 mL) at room temperature?

|  |  |  |  |
| --- | --- | --- | --- |
| a) 4.86 x 1017 | b) 6.023 x 1024 | c) 2.584 x 1019 | d) 6.023 x 1019 |

1. 500 mL of NH3 contains 6 x 1023 molecules at STP. How many molecules are present in 100 mL of CO2 at STP?

|  |  |  |  |
| --- | --- | --- | --- |
| a) 6 x 1023 | b) 1.5 x 1023 | c) 1.2 x 1023 | d) none of these |

1. Number of atoms of oxygen present in 10.6 gm of Na2CO3.

|  |  |  |  |
| --- | --- | --- | --- |
| a) 6.02 x 1022 | b) 12.04 x 1022 | c) 1.806 x 1023 | d) 6.35 x 1020 |

1. Which of the following has maximum mass?

|  |  |
| --- | --- |
| a) 0.1 gm atom of carbon | b) 0.1 mole NH3 |
| c) 6.022 x 1022 molecule of H2 | d) 1120 cm3 of CO2 |

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 molecules |

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| --- | --- | --- | --- |
| a) 0.1 gm | b) 0.02 gm | c) 0.1 mole | d) 3.6 gm |

1. The number of and bonds in allyl isocyanide are

|  |  |  |  |
| --- | --- | --- | --- |
| a) 9 , 3 | b) 9 , 9 | c) 3 , 4 | d) 5 , 7 |

1. In which of the following ionization processes, the bond order has increased and the magnetic behavior has changed ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) N2 → | b) C2 → | c) NO → NO+ | d) O2 → |

1. The species having bond order different from that in CO is

|  |  |  |  |
| --- | --- | --- | --- |
| a) NO – | b) NO+ | c) CN – | d) N2 |

1. The percentage of p-character in the orbitals forming P – P bonds in P4 is

|  |  |  |  |
| --- | --- | --- | --- |
| a) 25 | b) 33 | c) 50 | d) 75 |

1. In TeCl4 , the central atom, tellurium, involves the hybridization

|  |  |  |  |
| --- | --- | --- | --- |
| a) sp3 | b) sp3d | c) sp3d2 | d) dsp2 |

1. The bond lengths and bond angles in the molecules of methane, ammonia and water are given below :

  

This variation in bond angle is a result of :

1. The increasing repulsion between hydrogen atoms as the bond length decreases.

2. The number of non-bonding electrons pairs in the molecule.

3. A non-bonding electron pair having a greater repulsive force than a bonding electron pair.

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1,2 & 3 are correct | b) 1 & 2 only are correct | c) 2 & 3 only are correct | d) 1 only is correct |

1. The values of electronegativity of atom A and B are 1.2 and 4.0 respectively. The % ionic character of the A-B bond is

|  |  |  |  |
| --- | --- | --- | --- |
| a) 50 % | b) 72.24 % | c) 55.3 % | d) 43 % |

1. If I2 is dissolved in aqueous KI, the intense yellow species, , is formed. The structure of ion is

|  |  |
| --- | --- |
| a) Square pyramidal | b) Trigonal bipyramidal |
| c) Octahedral | d) Pentagonal bipyramidal |

1. In the change of NO+ to NO, the electron is added to

|  |  |  |  |
| --- | --- | --- | --- |
| a) orbital | b) l | c) | d) |

1. Which one of the following pairs consist of only paramagnetic species ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) [O2 , NO] | b) [ , ] | c) [CO , NO] | d) [NO , NO+] |

1. The hybridization of oxygen atom in H2O2 is

|  |  |  |  |
| --- | --- | --- | --- |
| a) sp3d | b) sp | c) sp2 | d) sp3 |

1. The magnetic moment of KO2 at room temperature is ……………. BM.

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1.41 | b) 1.73 | c) 2.23 | d) 2.64 |

1. The pair of species having identical shape is

|  |  |  |  |
| --- | --- | --- | --- |
| a) CF4 , SF4 | b) PCl3 , BF3 | c) XeF2 , CO2 | d) PF5 , IF5 |

1. Shape of is

|  |  |  |  |
| --- | --- | --- | --- |
| a) Trigonal | b) Linear | c) Octahedral | d) Square planar |

1. The species having octahedral shape is

|  |  |  |  |
| --- | --- | --- | --- |
| a) SF6 | b) | c) PCl5 | d) |

1. Which of the following has fractional bond order?

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

1. Amongst the following compounds, which has the maximum number of sp– hybridized C atoms?

|  |  |
| --- | --- |
| a) (CN)2 | b) CH2 C CN |
| c) HC C CH2 CH CH2 | d) HC C CN |

1. The ‘d’ orbital involved in dsp2 & sp3d hybridization is

|  |  |  |  |
| --- | --- | --- | --- |
| a) dx2-y2, dz2 | b) dz2, dxy | c) dx2-y2, dxy | d) dx2-y2, dxz |

1. In which of the following electronegativity of ‘c’ is maximum

|  |  |  |  |
| --- | --- | --- | --- |
| a) sp | b) sp2 | c) sp3 | d) sp4 |

1. The dipole element of o, p, m dichlorobenzene is in the order

|  |  |  |  |
| --- | --- | --- | --- |
| a) o > p > m | b) p > o > m | c) m > o > p | d) o > m > p |

1. Increasing order A (lowest first) size of hybrid orbital

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

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. In ion, the number of bond pairs and lone pairs of electrons on nitrogen atom are

|  |  |  |  |
| --- | --- | --- | --- |
| a) 2, 2 | b) 3, 1 | c) 1, 3 | d) 4, 0 |

1. Eka-aluminium and Eka-silicon are known as

|  |  |
| --- | --- |
| a) Gallium and germanium | b) Aluminium and silicon |
| c) Iron and sulphur | d) Proton and silicon |

1. The general outer electronic configuration of transition metal is:

|  |  |  |  |
| --- | --- | --- | --- |
| a) ns2 nd1-10 | b) ns2 np1 (n-1)d1-10 | c) ns2 np6 (n-1)d1-10 | d) ns0-2 (n-1)d1-10 |

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, s-block |

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. An element with atomic number 106 has been discovered recently. Which of the following electronic configurations will it possess ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) [Rn] 5f 14 6d4 7s2 | b) [Rn] 5f 14 6d4 7s1 | c) [Rn] 5f 14 6d4 7s0 | d) [Rn] 5f 14 6d4 7s2 7p3 |

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 |

1. Which of the following remains unchanged on descending a group in the periodic table

|  |  |  |  |
| --- | --- | --- | --- |
| a) Valence electrons | b) Atomic size | c) Density | d) Metallic character |

1. Point out the wrong statement, in a given period of the periodic table, the s-block elements has, in general, a lower value of

|  |  |  |  |
| --- | --- | --- | --- |
| a) Electronegativity | b) atomic radius | c) Ionization energy | d) Electron affinity |

1. Of the following pairs, the one containing examples of metalloid elements in the periodic table is

|  |  |  |  |
| --- | --- | --- | --- |
| a) Na & K | b) F & Cl | c) Cu & Hg | d) Si & Ge |

1. Identify the least stable ion amongst the following :

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