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**Max Time : 1 hr** **Class = 12th Chemistry Test Max Marks : 30**

**D & F Block Elements**

1. Identify the incorrect statement from the following :

a) All the five 4d-orbitals have shapes similar to the respective 3d-orbitals.

b) In an atom, all the five 3d-orbitals are equal in energy in free state.

c) The shape of dxy , dyz and dzx orbitals are similar to each other and and are similar to each other.

d) All the five 5d-orbitals are different in size when compared to the respective 4d-orbitals.

1. The calculated spin only magnetic moment of Cr2+ ion is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 4.90 BM | b) 5.92 BM | c) 2.84 BM | d) 3.87 BM |

1. When neutral or faintly alkaline KMnO4 is treated with potassium iodide, iodide ion is converted into:

|  |  |  |  |
| --- | --- | --- | --- |
| a) I2 | b) | c) | d) IO – |

1. Which one of the following ions exhibits d-d transition and paramagnetism as well?

|  |  |  |  |
| --- | --- | --- | --- |
| a) | b) Cr2 | c) | d) |

1. Which one of the following ions has electronic configuration [Ar] 3d6?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Ni3+ | b) Mn3+ | c) Fe3+ | d) Co3+ |

1. Which one of the following pairs has same size?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Fe2+ , Ni2+ | b) Zr4+ , Ti4+ | c) Zr4+ , Hf4+ | d) Zn2+ , Hf4+ |

1. In which of the following pairs are both the ions coloured in aqueous solution?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Ni2+ , Ti3+ | b) Sc3+ , Ti3+ | c) Sc3+ , Co2+ | d) Ni2+ , Cu+ |

1. The aqueous solution containing which one of the following ions will be colourless?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Sc3+ | b) Fe2+ | c) Ti3+ | d) Mn2+ |

1. Which one of the following forms a colourless solution in aqueous medium?

|  |  |  |  |
| --- | --- | --- | --- |
| a) V2+ | b) Cr3+ | c) Ti3+ | d) Sc3+ |

1. Bell-metal is an alloy of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Cu + Pb | b) Cu + Sn | c) Cu + Zn | d) Cu + Ni |

1. Which of the following has more unpaired d-electrons?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Zn2+ | b) Fe2+ | c) N3+ | d) Cu+ |

1. Which one of the following ionic species will impart colour to an aqueous solution?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Ti4+ | b) Cu+ | c) Zn2+ | d) Cr3+ |

1. Which of the following metals corrodes readily in moist air?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Gold | b) Silver | c) Nickel | d) Iron |

1. In the neutral or faintly alkaline medium, KMnO4 oxidizes iodide into iodate. The change in oxidation state of manganese in this reaction is from:

|  |  |  |  |
| --- | --- | --- | --- |
| a) + 6 to + 4 | b) + 7 to + 3 | c) + 6 to + 5 | d) + 7 to + 4 |

1. The number of hydrogen bonded water molecules associated with CuSO4.5H2O is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 3 | b) 1 | c) 2 | d) 5 |

1. The manganate and permanganate ions are tetrahedral, due to:

a) There is no -bonding

b) The -bonding involves overlap of p-orbitals of oxygen with p-orbitals of manganese

c) The -bonding involves overlap of d-orbitals of oxygen with d-orbitals of manganese

d) The -bonding involves overlap of p-orbitals of oxygen with d-orbitals of manganese

1. HgCl2 and I2 both when dissolved in water containing I – ions the pair of species formed is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) HgI2 , | b) HgI2 , I – | c) , | d) Hg2I2 , I – |

1. The pair of compounds that can exist together is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) FeCl3.SnCl2 | b) HgCl2.SnCl2 | c) FeCl2.SnCl2 | d) FeCl3.KI |

1. The reaction of aqueous KMnO4 with H2O2 in acidic conditions gives :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Mn4+ and O2 | b) Mn2+ and O2 | c) Mn2+ and O3 | d) Mn4+ and MnO2 |

1. Identify the alloy containing a non-metal as a constituent in it.

|  |  |  |  |
| --- | --- | --- | --- |
| a) Invar | b) Steel | c) Bell-metal | d) Bronze |

1. In which of the following compounds, transition metal has zero oxidation state?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Fe(CO)5 | b) NH2.NH2 | c) NOClO4 | d) CrO5 |

1. K2Cr2O7 on heating with aqueous NaOH gives:

|  |  |  |  |
| --- | --- | --- | --- |
| a) | b) Cr(OH)3 | c) Cr2 | d) Cr(OH)2 |

1. By passing H2S gas in acidified KMnO4 solution, we get:

|  |  |  |  |
| --- | --- | --- | --- |
| a) S | b) K2S | c) MnO2 | d) K2SO3 |

1. The most durable metal plating on iron to protect against corrosion is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Nickel plating | b) Tin plating | c) Copper plating | d) Zinc plating |

1. Zr (Z = 40) and Hf (Z = 72) have similar atomic and ionic radii because of :

|  |  |
| --- | --- |
| a) Belonging to same group | b) Diagonal relationship |
| c) Lanthanoid contraction | d) Having similar chemical properties |

1. Gadolinium belongs to 4f series. Its atomic number is 64.Which of the following is the correct electronic configuration of gadolinium?

|  |  |  |  |
| --- | --- | --- | --- |
| a) [Xe] 4f 8 6d2 | b) [Xe] 4f 9 5s1 | c) [Xe] 4f 7 5d1 6s2 | d) [Xe] 4f 6 5d2 6s2 |

1. Reason of lanthanoid contraction is :

|  |  |
| --- | --- |
| a) Negligible screening effect of f-orbitals | b) Increasing nuclear charge |
| c) Decreasing nuclear charge | d) Decreasing screening effect |

1. Which of the following lanthanoid ions is diamagnetic? (At no. Ce = 58 , Sm = 62 , Eu = 63 , Yb = 70)

|  |  |  |  |
| --- | --- | --- | --- |
| a) Ce2+ | b) Sm2+ | c) Eu2+ | d) Yb2+ |

1. The correct order of ionic radii of Y3+ , La3+, Eu3+ and Lu3+ is ; (At no. Y = 39 , La = 57 , Eu = 63 , Lu = 71)

|  |  |
| --- | --- |
| a) Lu3+ < Eu3+ < La3+ < Y3+ | b) La3+ < Eu3+ < Lu3+ < Y3+ |
| c) Y3+ < La3+ < Eu3+ < Lu3+ | d) Y3+ < Lu3+ < Eu3+ < La3+ |

1. General electronic configurations of lanthanoids are :

|  |  |
| --- | --- |
| a) (n-2)f 1-14 (n-1) d0-1 ns2 | b) (n-2)f 10-14 (n-1) d0-1 ns2 |
| c) (n-2)f 0-14 (n-1) d10 ns2 | d) (n-2)d 0-1 (n-1) f 1-14 ns2 |

**Answers [CLASS = 12th ]**

**D & F Block Elements**

|  |
| --- |
| 1. c |
| 1. a |
| 1. c |
| 1. d |
| 1. d |
| 1. c |
| 1. a |
| 1. a |
| 1. d |
| 1. b |
| 1. b |
| 1. d |
| 1. d |
| 1. d |
| 1. b |
| 1. d |
| 1. c |
| 1. c |
| 1. b |
| 1. b |
| 1. a |
| 1. a |
| 1. a |
| 1. d |
| 1. c |
| 1. c |
| 1. a |
| 1. d |
| 1. d |
| 1. a |