(a) Octahedral, tetrahedral and square planar
(b) Tetrahedral, square planar and octahedral
(c) Square planar, tetrahedral and octahedral
(d) Octahedral, square planar and octahedral

(IIT 2011)

49. Among the following complexes (K–P)
$K_3[Fe(CN)_6]$ (K), $[Co(NH_3)_6]Cl_3$ (L), $Na_3[Co(oxalate)_3]$ (M), $[Ni(H_2O)_6]Cl_2$ (N), $K_2[Pt(CN)_4]$ (O) and $[Zn(H_2O)_6](NO_3)_2$ (P) the diamagnetic complexes are
(a) K, L, M, N (b) K, M, O, P
(c) L, M, O, P (d) L, M, N, O

(IIT 2011)

50. Which of the following facts about the complex $[Cr(NH_3)_6]Cl_3$ is wrong ?
(a) The complex is paramagnetic
(b) The complex is an outer orbital complex
(c) The complex gives white precipitate with silver nitrate solution
(d) The complex involves $d^2sp^3$ hybridization and is octahedral in shape. (AIEEE 2011)

51. Which of these statements about $[Co(CN)_6]^{3-}$ is true ?
(a) $[Co(CN)_6]^{3-}$ has four unpaired electrons and will be in a high-spin configuration
(b) $[Co(CN)_6]^{3-}$ has no unpaired electrons and will be in a high-spin configuration
(c) $[Co(CN)_6]^{3-}$ has no unpaired electrons and will be in a low-spin configuration
(d) $[Co(CN)_6]^{3-}$ has four unpaired electrons and will be in a low-spin configuration

(AIPMT 2015)

52. Which of the following complex has minimum magnitude of $\Delta_0$ ?
(a) $[Cr(CN)_6]^{3-}$ (b) $[Co(NH_3)_6]^{3+}$
(c) $[CoCl_6]^{3-}$ (d) $[Cr(H_2O)_6]^{3+}$

(DPMT 2010, Karnataka CET 2015)

53. Crystal field stabilization energy for high spin $d^4$ octahedral complex is
(a) $-0.6\,\Delta_0$ (b) $-1.8\,\Delta_0$
(c) $-1.6\,\Delta_0 + P$ (d) $-1.2\,\Delta_0$

(AIPMT Prelim 2010)

54. Low spin complex of $d^6$-cation in an octahedral field will have the following energy :
(a) $-\frac{2}{5}\Delta_0 + 2P$ (b) $-\frac{2}{5}\Delta_0 + P$
(c) $-\frac{12}{5}\Delta_0 + P$ (d) $-\frac{12}{5}\Delta_0 + 3P$

(AIPMT Main 2012)

55. Which of the following is diamagnetic in nature ?
(a) $Co^{3+}$, octahedral complex with weak field ligands
(b) $Co^{3+}$, octahedral complex with strong field ligand
(c) $Co^{2+}$ in tetrahedral complex
(d) $Co^{2+}$ in square planar complex (DPMT 2010)

56. In spectrochemical series, chlorine is above water *i.e.*, $Cl > H_2O$, this is due to
(a) Good π-acceptor properties of Cl
(b) Strong σ-donor and good π-acceptor properties of Cl
(c) Good π-donor properties of Cl
(d) Larger size of Cl than $H_2O$ (DCE 2009)

57. The magnitude of crystal field stabilization energy (CFSE or $\Delta_t$) in tetrahedral complexes is considerably less than in the octahedral field. Because
(a) There are only four ligands instead of six so the ligand field is only 2/3 the size hence the $\Delta_t$ is only 2/3 the size
(b) The direction of the orbitals does not coincide with the direction of the ligands. This reduces the crystal field stabilization energy ($\Delta_t$) by further 2/3.
(c) Both points (a) and (b) are correct.
(d) Both points (a) and (b) are wrong.

(DPMT 2009)

58. Which of the following complex ions is expected to absorb visible light ?
(a) $[Ti(en)_2(NH_3)_2]^{4+}$ (b) $[Cr(NH_3)_6]^{3+}$
(c) $[Zn(NH_3)_6]^{2+}$
(d) $[Sc(H_2O)_3(NH_3)_3]^{3+}$
[At. No. Zn = 30, Sc = 21, Ti = 22, Cr = 24]

(AIPMT 2009)

59. Which of the following compounds is not yellow coloured ?
(a) $(NH_4)_3[As(Mo_3O_{10})_4]$
(b) $BaCrO_4$ (c) $Zn_2[Fe(CN)_6]$
(d) $K_3[Co(NO_2)_6]$ (JEE Main 2015)

60. Which of the following is high spin complex ?
(a) $[CoCl_6]^{3-}$ (b) $[FeF_6]^{3-}$
(c) $[Co(NH_3)_6]^{2+}$ (d) All of these