Co-ordination Compounds:

Q.1. An example of double salt is

a) Bleaching powder
b) $K_4[Fe(CN)_6]$
c) Hypo
d) Potash alum

Q.2. The complex, $[Pt(Py)(NH_3)BrCl]$ will have how many geometrical isomers ?

a) 3
b) 4
c) 0
d) 2

Q.3. In which of the following coordinate compounds the central metal atom obeys the EAN rule

a) $K_3[Fe(CN)_6]$
b) $K_4[Fe(CN)_6]$
c) $[Cu(NH_3)_4]SO_4$
d) All of these

Q.4. The number of geometrical isomers from $[Co(NH_3)_3(NO_2)_3]$ is

a) 2
b) 3
c) 4
d) 1

Q.4. IUPAC name of $Na_3[Co(NO_2)_6]$ is

a) sodium cobaltinitrite
b) sodium hexanitritocobaltate (III)
c) sodium hexanitrocobalt (III)
d) sodium hexanitrocobaltate (III)

Q.5. Which statement is incorrect ?

a) $[Ni(CO)_4]$ – Tetrahedral, paramagnetic
b) $[Ni(CO)_4]$ – Tetrahedral, diamagnetic
c) $[Ni(CN)_4]^{2-}$ – Square planar, diamagnetic
d) $[NiCl_4]^{2-}$ Tetrahedral, paramagnetic

Q.6. Which of the following will exhibit maximum ionic conductivity ?

a) $K_4[Fe(CN)_6]$
b) $[Co(NH_3)_6]Cl_3$
c) $[Cu(NH_3)_4Cl_2]$
d) $[Ni(CO)_4]$

Q.7. Which of the following carbonyls will have the strongest C – O bond ?

a) $[Mn(CO)_6]^+$
b) $[Cr(CO)_6]$
c) $[V(CO)_6]^-$
d) $[Fe(CO)_5]$

Q.8. Crystal field stabilization energy for high spin d^4 octahedral complex is:

a) $1.8\Delta_0$
b) $-1.6\Delta_0+p$
c) $-1.2\Delta_0$
d) $-0.6\Delta_0$

Q.9. An excess of $AgNO_3$ is added to 100 mL of a 0.01 M solution of dichlorotetraaquachromium(iii) chloride. The number of moles of AgCl precipitated would be :

a) 0.002
b) 0.003
c) 0.01
d) 0.001

Q.10. Among the ligands NH_3 , en, CN^- and CO the correct order of their increasing field strength, is :

a) $NH_3 < en < CN^- < CO$
b) $CN^- < NH_3 < CO < en$
c) $en < CN^- < NH_3 < CO$
d) $CO < NH_3 < en < CN^-$

Q.11.The correct IUPAC name of the coordination compound $K_3[Fe(CN)_5NO]$ is

a) potassium pentacyanidonitrosylferrate(II)
b) potassium pentacyanidonitroferrate(III)
c) potassium nitritopentacyanidoferrate(IV)
d) potassium nitritepentacyanidoiron(II)

Q.12. Which of the following ligands form a chelate?

a) Acetate
b) Oxalate
c) Cyanide
d) Ammonia

Q.13.$Fe(CN)_6]^{4-}$ and $[Fe(H_2O)_6]^{2+}$ show different colours in dilute solution because

a) CN– is a strong field ligand and H_2O is a weak field ligand hence magnitude of CFSE is different
b) both CN– and H_2O absorb same wavelength of energy
c) complexes of weak field ligands are generally colourless
d) the sizes of CN– and H_2O are different hence their colours are also different.

Q.14. The magnitude of magnetic moment (spin only) of $[NiCl_4]^{2-}$ will be

a) 2.82 B.M
b) 0
c) 1.23 B.M
d) 5.64 B.M

Q.15.The denticity of ethylenediaminetetra-acetate ion is

a) 4
b) 5
c) 6
d) none of these.

Q.16. Which of the following statements is correct about $[Co(H_2O)_6]^{2+}$ complex?

a) Electronic configuration = $3d^7 \rightarrow t^5 2g\ e^2 g$, no. of unpaired electrons = 3, m = 3.87 B.M.
b) Electronic configuration = $3d^6 \rightarrow t^4 2g\ e^2 g$, no. of unpaired electrons = 2, m =2.87 B.M.
c) Electronic configuration = $3d^7 \rightarrow t^6 2g\ e^1 g$, no. of unpaired electrons = 1, m =2.87 B.M.
d) Electronic configuration = $3d^7 \rightarrow t^3 2g\ e^4 g$, no. of unpaired electrons = 3, m =3.87 B.M.

Q.17. Among the following, which are ambidentate ligands?

(i) SCN^- (ii) NO_3^- (iii)NO_2^- (iv) $C_2O_4^{2-}$

a) (i) and (iii)
b) (i) and (iv)
c) (ii) and (iii)
d) (ii) and (iv)

Q.18. According to Werner's theory of coordination compounds

a) primary valency is ionisable
b) secondary valency is ionisable
c) primary and secondary valencies are ionisable
d) neither primary nor secondary valency is ionisable.

Q.19. Which of the following descriptions about $[FeCl_6]^{4-}$ is correct?

a) sp^3d, inner orbital complex, diamagnetic
b) sp^3d^2, outer orbital complex, paramagnetic
c) d^2sp^3, inner orbital complex, paramagnetic
d) d^2sp^3, outer orbital complex, diamagnetic

Q.20.The one that is not expected to show isomerism is

a) $[Ni(NH_3)_4(H_2O)_2]^{2+}$
b) $[Ni(NH_3)_2Cl_2]$
c) $[Ni(en)_3]^{2+}$
d) $[Pt(NH_3)_2Cl_2]$

Q.21.Which of the following statements is true?

a) If Δ_0> P, strong field ligands and low spin complexes.
b) If Δ_0 < P, strong field ligands and high spin complexes.
c) If Δ_0> P, weak field ligands and low spin complexes.
d) If Δ_0 < P, weak field ligands and low spin complexes.

Q.22.The IUPAC name of $[Co(NH_3)_4Cl(NO_2)]Cl$ is

a) tetraamminechloridonitrito-N-cobalt(III) chloride
b) tetraamminechloridonitrocobalt(II) chloride
c) tetraamminechloridonitrocobalt(I) chloride
d) tetraamminechloridonitrocobalt(III) chloride

Q.23. In $Fe(CO)_5$, the Fe – C bond possesses

a) π-character only
b) both σ and π characters
c) ionic character
d) σ-character only.

24. $[Co(NH_3)_4Cl_2]NO_2$ and $[Co(NH_3)_4Cl(NO_2)]Cl$ exhibit which type of isomerism?

a) Geometrical
b) Optical
c) Linkage
d) Ionization

Q.25. Which of the following systems has maximum number of unpaired electrons?

a) d^6 (tetrahedral, high spin)
b) d^9 (octahedral)
c) d^4 (octahedral, low spin)
d) d^7 (octahedral, high spin)