EXERCISE-I

Basic Terms

1. According to Werner's theory
(A) Primary valency can be ionized
(B) Secondary valency can be ionized
(C) Primary and secondary valencies both cannot be ionized
(D) Only primary valency cannot be ionized

2. Which of the following is not true for ligand-metal complex
(A) Larger the ligand, the more stable is the metal-ligand bond
(B) Highly charged ligand forms strong bond
(C) Larger the permanent dipole moment of ligand, the more stable is the bond
(D) Greater the ionization potential of central metal, the stronger is the bond

3. What is the co-ordination number of the metal in $\left[Co(en)_2Cl_2\right]^+$
(A) 4 (B) 5
(C) 6 (D) 3

4. Bidentate ligand is
(A) CN^-
(B) Ethylene diammine (en)
(C) SCN^-
(D) EDTA

5. The coordination number of Pt in $\left[Pt(NH_3)_4Cl_2\right]^{++}$ ion is
(A) 2 (B) 4
(C) 6 (D) 8

6. Which is the example of hexadentate ligand
(A) 2, 2—dipyridyl
(B) Dimethyl glyoxime
(C) Aminodiacetate ion
(D) Ethylene diammine tetra acetate ion [EDTA]

7. The coordination number of a metal in coordination compounds is
(A) Same as primary valency
(B) Sum of primary and secondary valencies
(C) Same as secondary valency
(D) None of these

8. Ligand in a complex salt are
(A) Anions linked by coordinate bonds to a central metal atom or ion
(B) Cations linked by coordinate bonds to a central metal atom or ion
(C) Molecules linked by coordinate bonds to a central metal atom or ion
(D) Ions or molecules linked by coordinate bonds to a central metal atom or ion

9. A group of atoms can function as a ligand only when
(A) It is a small molecule
(B) It has an unshared electron pair
(C) It is a negatively charged ion
(D) It is a positively charged ion

10. Which of the following complexes show six coordination number
(A) $[Zn(CN)_4]^{2-}$ (B) $[Cr(H_2O)_6]^{3+}$
(C) $[Cu(CN)_4]^{2-}$ (D) $[Ni(NH_3)_4]^{2+}$

11. EDTA has coordination number
(A) 3 (B) 4
(C) 5 (D) 6

12. Among the properties (a) reducing (b) oxidising (c) complexing, the set of properties shown by CN^- ion towards metal species is
(A) c, a (B) b, c
(C) a, b (D) a, b, c

13. That ion or molecule which forms a complex compound with transitional metal ion is called
(A) Recipient (B) Ligand
(C) Coordinate ion (D) No special name

14. Coordination number of *Zn* in *ZnS* (zinc blende) is
(A) 6 (B) 4
(C) 8 (D) 12

15. Wilkinson's catalyst used as a homogeneous catalyst in the hydrogenation of alkenes contains
(A) Iron (B) Aluminium
(C) Rhodium (D) Cobalt

16. Given the molecular formula of the hexa coordinated complexes (A) $CoCl_3.6NH_3$ (B) $CoCl_3.5NH_3$ (C) $CoCl_3.4NH_3$. If the number of co-ordinated NH_3 molecules in *A*, *B* and *C* respectively are 6, 5 and 4, the primary valency in (A), (B) and (C) are:
(A) 6, 5, 4 (B) 3, 2, 1
(C) 0, 1, 2 (D) 3, 3, 3

17. Generally, a group of atoms can function as a ligand if
(A) They are positively charged ions
(B) They are free radicals
(C) They are either neutral molecules or negatively charged ions
(D) None of these

18. The ligand in potassium ferricyanide is
(A) K^+ (B) CN^-
(C) Fe^{3+} (D) $(CN)_6$

19. Co-ordination number of aluminum is
(A) 8 (B) 6
(C) 12 (D) 4

20. In $K_4Fe(CN)_6$, Fe is in the form of
(A) An atom (B) An ion
(C) Cationic complex (D) Anionic complex

21. Finely divided iron combines with *CO* to give
(A) $Fe(CO)_5$ (B) $Fe_2(CO)_9$
(C) $Fe_2(CO)_{12}$ (D) $Fe(CO)_6$

22. In a complex, the highest possible coordination number is
(A) 6 (B) 12
(C) 4 (D) 8

23. The number of neutral molecules or negative groups attached to the central metal atom in a complex ion is called
(A) Atomic number
(B) Effective atomic number
(C) Coordination number
(D) Primary valency

24. EDTA combines with cations to form
(A) Ion-exchange resins (B) Chelates
(C) Clathrates (D) Polymers

25. An example of a double salt is
(A) Bleaching powder (B) Hypo
(C) $K_4[Fe(CN)_6]$ (D) Potash alum

26. In complex compounds, metal ligand bond is
(A) Coordinate bond (B) Hydrogen bond
(C) Ionic bond (D) Covalent bond

27. Ammonia forms the complex ion $[Cu(NH_3)_4]^{2+}$ with copper ions in alkaline solutions but not in acidic solution. What is the reason for it
(A) In acidic solutions hydration protects copper ions
(B) In acidic solutions protons coordinate with ammonia molecules forming NH_4^+ ions and NH_3 molecules are not available
(C) In alkaline solutions insoluble $Cu(OH)_2$ is precipitated which is soluble in excess of any alkali
(D) Copper hydroxide is an amphoteric substance

28. Zeigler—Natta catalyst is used for which type of reaction
(A) Hydrogenation (B) Polymerization
(C) Oxidation (D) Reduction

29. Which of the following is not considered as an organometallic compound.
(A) Cis-platia (B) Ferrocene
(C) Zeise's salt (D) Gringard reagent

30. Which one is organometallic compound
(A) Lithium methoxide
(B) Lithium dimethyl amide
(C) Lithium acetate
(D) Methyl lithium

Nomenclature, Oxidation state and EAN number

31. In $K_4\left[Fe(CN)_6\right]$, the E.A.N. of Fe is

(A) 33 (B) 35
(C) 36 (D) 26

32. Which of the following pairs is not correctly matched

(A) Effective atomic number of Pt in $\left[PtCl_6\right]^{2-} = 84$

(B) Absorption peak for $\left[Cr^{III}(NH_3)_6\right]^{+3} = 21680 cm^{-1}$

(C) Crystal field stabilization energy of d^2 in weak ligand field $= (-)0.8\Delta_0$

(D) Example of weak ligand field for d^5 configuration $= \left[Mn^{II}F_6\right]^{-4}$

33. The oxidation number of chromium in sodium tetrafluoro oxochromate complex is

(A) II (B) IV
(C) VI (D) III

34. The IUPAC name of $K_4\left[Fe(CN)_6\right]$ is

(A) Potassium hexacyanoferrate (II)
(B) Potassium ferrocyanide
(C) Tetrapotassium hexacyanoferrate (II)
(D) Tetrapotassium ferroushexacyanide (II)

35. The IUPAC name of $\left[Ni(CO)_4\right]$ is

(A) Tetra carbonyl nickel (II)
(B) Tetra carbonyl nickel (0)
(C) Tetra carbonyl nickelate (II)
(D) Tetra carbonyl nickelate (0)

36. The correct nomenclature for $Fe_4[Fe(CN)_6]_3$ is

(A) Ferroso-ferric cyanide
(B) Ferric-ferrous hexacyanate
(C) Iron (III) hexacyanoferrate (II)
(D) Hexacynoferrate (III-II)

37. The IUPAC name of compound $Na_3\left[Co(ONO)_6\right]$ will be

(A) Hexanitritocobalt (III) sodium
(B) Sodium cobalt nitrite
(C) Sodium hexanitrocobaltate (III)
(D) Sodium hexanitritocobaltate (III)

38. In which of the following complexes oxidation state of metal is zero

(A) $\left[Pt(NH_3)_2Cl_2\right]$

(B) $\left[Cr(CO)_6\right]$

(C) $\left[Cr(NH_3)_3Cl_3\right]$

(D) $\left[Cr(en)_2Cl_2\right]$

39. The oxidation number of *Cr* in $[Cr(NH_3)_6]Cl_3$ is

(A) 8 (B) 6
(C) 4 (D) 3

40. In $\left[Ni(NH_3)_4\right]SO_4$, the E.A.N. of Ni is

(A) 34 (B) 35
(C) 36 (D) 37

41. IUPAC name of $K_3Fe(CN)_6$ is

(A) Potassium ferrocyanide (II)
(B) Potassium hexaferrocyanate (III)
(C) Potassium ferrohexacyanate (II)
(D) Potassium hexacyanoferrate (III)

42. The EAN of iron in potassium ferricyanide is

(A) 18 (B) 54
(C) 35 (D) 23

43. In the coordination compound, $K_4[Ni(CN)_4]$ oxidation state of nickel is

(A) –1 (B) 0
(C) +1 (D) +2

44. According to IUPAC nomenclature sodium nitroprussied is named is

(A) Sodium pentacyanonitrosyl ferrate (III)
(B) Sodium nitroferricyanide
(C) Sodium nitroferrocyanide
(D) Sodium pentacyanonitrosyl ferrate (II)

45. Pick out the complex compound in which the central metal atom obeys EAN rule strictly
(A) $K_4[Fe(CN)_6]$ (B) $K_3[Fe(CN)_6]$
(C) $[Cr(H_2O)_6]Cl_3$ (D) $[Cu(NH_3)_4]SO_4$

46. The formula of potassiumdicyano *bis* (oxalato) nickelate (II) is
(A) $K_4\left[Ni(CN)_2(Ox)_2\right]$
(B) $K_3\left[Ni_2[Ni_2(CN)_2(Ox)_2\right]$
(C) $K\left[Ni(CN)(Ox)_2\right]$
(D) $K_2\left[Ni(CN)_2(Ox)_2\right]$

47. The value of *x* which appears in the complex $\left[Ni(CN)_4\right]^x$ is
(A) + 2 (B) – 2
(C) 0 (D) 4

48. Pick the correct name of $[Co(NH_3)_5Cl]Cl_2$
(A) Chloropentammine cobalt (III)
(B) Pentammine cobalt (III) chloride
(C) Chloropentammine cobalt (III) chloride
(D) Chloropentammine cobalt (II) chloride

49. The valency of cuprammonium ion is
(A) + 4 (B) + 2
(C) – 2 (D) – 4

50. In which of the following compounds transition metal has zero oxidation state
(A) CrO_5 (B) $NH_2.NH_2$
(C) $NOClO_4$ (D) $\left[Fe(CO)_5\right]$

51. The complex chlorocompound diaquatriammine cobalt (III) chloride is represented as
(A) $[Co(NH_3)_3(H_2O)_3]Cl_2$
(B) $[Co(NH_2)_3(H_2O)_2]Cl_2$
(C) $[CoCl(NH_3)_3(H_2O)_2]Cl_3$
(D) $[CoCl(NH_3)_3(H_2O)_2]Cl_2$

52. The complex compound $\left[Co(NH_3)_3NO_2ClCN\right]$ is named as
(A) Chlorocyanonitrotriammine cobalt (III)
(B) Nitrochlorocyanotriammine cobalt (III)
(C) Cyanonitrochlorotriammine cobalt (III)
(D) Triamminenitrochlorocyano cobalt (III)

53. The oxidation number of *Pt* in $[Pt(C_2H_4)Cl_3]^-$ is
(A) +1 (B) +2
(C) +3 (D) +4

54. What is the structural formula of lithium tetrahydridoaluminate
(A) $Al[LiH_4]$ (B) $Al_2[LiH_4]_3$
(C) $Li[AlH_4]$ (D) $Li[AlH_4]_2$

55. IUPAC name for $K\left[Ag(CN)_2\right]$ is
(A) Potassium argentocyanide
(B) Potassium silver cyanide
(C) Potassium dicyanoargentate (I)
(D) Potassium dicyanosilver (II)

Isomerism and magnetic properties

56. Paramagnetic co-ordination compounds contain ..... electrons
(A) No
(B) Both paired and unpaired
(C) Paired
(D) Unpaired

57. Which of the following isomeric pairs shows ionization isomerism
(A) $\left[Co(NH_3)_6\right]\left[Cr(CN)_6\right]$ and $\left[Cr(NH_3)_6\right]\left[Co(CN)_6\right]$
(B) $\left[Cr(H_2O)_6\right]Cl_3$ and $\left[Cr(H_2O)_5Cl\right]Cl_2.H_2O$
(C) $\left[Pt(NH_3)_2Cl_2\right]$ and $\left[Pt(NH_3)_4\right]\left[PtCl_4\right]$
(D) $\left[Co(NH_3)_5Br\right]SO_4$ and $\left[Co(NH_3)_5SO_4\right]Br$

58. Among the following ions which one has the highest paramagnetism
(A) $\left[Cr(H_2O)_6\right]^{3+}$ (B) $\left[Fe(H_2O)_6\right]^{2+}$
(C) $\left[Cu(H_2O)_6\right]^{2+}$ (D) $\left[Zn(H_2O)_6\right]^{2+}$

59. Amongst $Ni(CO)_4$, $[Ni(CN)_4]^{2-}$ and $[NiCl_4]^{2-}$

(A) $Ni(CO)_4$ and $[NiCl_4]^{2-}$ are diamagnetic and $[Ni(CN)_4]^{2-}$ is paramagnetic

(B) $[NiCl_4]^{2-}$ and $[Ni(CN)_4]^{2-}$ are diamagnetic and $Ni(CO)_4$ is paramagnetic

(C) $Ni(CO)_4$ and $[Ni(CN)_4]^{2-}$ are diamagnetic and $[NiCl_4]^{2-}$ is paramagnetic

(D) $Ni(CO)_4$ is diamagnetic and $[NiCl_4]^{2-}$ and $[Ni(CN)_4]^{2-}$ are paramagnetic

60. $[Co(NH_3)_4Cl_2]^+$ exhibits

(A) Geometrical isomerism

(B) Optical isomerism

(C) Bonding isomerism

(D) Ionisation isomerism

61. Which of the following compounds exhibits linkage isomerism

(A) $[Co(en)_3]Cl_3$

(B) $[Co(NH_3)_6[Cr(CN)_6]$

(C) $[Co(en)_2NO_2Cl]Br$

(D) $[Co(NH_3)_5Cl]Br_2$

62. Pick out from the following complex compounds, a poor electrolytic conductor in solution

(A) $K_2[PtCl_6]$

(B) $[Co(NH_3)_3(NO_2)_3]$

(C) $K_4[Fe(CN)_6]$

(D) $[Cu(NH_3)_4]SO_4$

63. The possible number of optical isomers in $[Co(en)_2Cl_2]^+$ are

(A) 2 (B) 3

(C) 4 (D) 6

64. Magnetic moment of $[Cu(NH_3)_4]^{2+}$ ion is

(A) 1.414 (B) 1.73

(C) 2.23 (D) 2.38

65. What is true for $[Fe(CN)_6]^{3-}$ and $[FeF_6]^{3-}$

(A) Both are paramagnetic

(B) Only $[Fe(CN)_6]^{3-}$ is paramagnetic

(C) Only $[FeF_6]^{3-}$ is paramagnetic

(D) Both are diamagnetic

66. Which of the following is paramagnetic

(A) $[Ni(CO)_4]$ (B) $[Co(NH_3)_6]^{3+}$

(C) $[Ni(CN)_4]^{2-}$ (D) $[NiCl_4]^{2-}$

67. The total number of possible isomers for the complex compound $[Cu^{II}(NH_3)_4][Pt^{II}Cl_4]$ are

(A) 3 (B) 4

(C) 5 (D) 6

68. Which one of the following shows maximum paramagnetic character

(A) $[Cr(H_2O)_6]^{3+}$ (B) $[Fe(CN)_6]^{4-}$

(C) $[Fe(CN)_6]^{3-}$ (D) $[Cu(H_2O)_6]^{2+}$

69. The complexes $[Co(NH_3)_6][Cr(C_2O_4)_3]$ and $[Cr(NH_3)_6][Co(C_2O_4)_3]$

(A) Linkage isomerism

(B) Geometrical isomerism

(C) Coordination isomerism

(D) Ionisation isomerism

70. Which of the following exhibits highest molar conductivity

(A) $[Co(NH_3)_6]Cl_3$

(B) $[Co(NH_3)_5Cl]Cl_2$

(C) $[Co(NH_3)_4Cl_2]Cl$

(D) $[Co(NH_3)_3Cl_3]$

71. Which of the following does not have optical isomer

(A) $[Co(NH_3)_3Cl_3]$

(B) $[Co(en)_3]Cl_3$

(C) $[Co(en)_2Cl_2]Cl$

(D) $[Co(en)(NH_3)_2Cl_2]Cl$

72. Change in composition of co-ordination sphere yields which types of isomers

(A) Optical (B) Geometrical

(C) Ionisation (D) None of these

73. Types of isomerism shown by $[Cr(NH_3)_5NO_2]Cl_2$ is

(A) Optical (B) Ionisation

(C) Geometrical (D) Linkage

74. Which of the following will not give a precipitate with $AgNO_3$

(A) $\left[Co(NH_3)_3Cl_3\right]$

(B) $\left[Co\left(NH_3\right)_4Cl_2\right]Cl$

(C) $\left[Co(NH_3)_5Cl\right]Cl_2$

(D) $\left[Co\left(NH_3\right)_6\right]Cl_3$

75. How many ions are produced from $[Co\left(NH_3\right)_6]Cl_3$ in solution

(A) 6 (B) 4

(C) 3 (D) 2

76. Which one of the following is expected to be a paramagnetic complex

(A) $\left[Ni\left(H_2O\right)_6\right]^{2+}$ (B) $\left[Ni\left(CO\right)_4\right]$

(C) $\left[Zn\left(NH_3\right)_4\right]^{2+}$ (D) $\left[Co\left(NH_3\right)_6\right]^{+3}$

77. Which one of the following will give a white precipitate with $AgNO_3$ in aqueous mediun

(A) $\left[Co\left(NH_3\right)_5Cl\right]\left(NO_2\right)_2$

(B) $\left[Pt\left(NH_3\right)_2Cl_2\right]$

(C) $\left[Pt(en)Cl_2\right]$

(D) $\left[Pt\left(NH_3\right)_4\right]Cl_2$

78. How many ions will be produced in solution from one molecule of chloropentammine cobalt (III) chloride

(A) 1 (B) 2

(C) 3 (D) 4

79. Which of the following complex will give white precipitate with $BaCl_2$ (aq.)

(A) $[Co(NH_3)_4SO_4]NO_2$

(B) $[Cr\left(NH_3\right)_5SO_4]Cl$

(C) $[Cr(NH_3)_5Cl]SO_4$

(D) Both (B) and (C)

80. The number of precipitable halide ions in the sample $[Pt\left(NH_3\right)Cl_2Br]Cl$ will be

(a) 2 (b) 3

(c) 4 (d) 1

Hybridisation and Geometry

81. Which of the following complexes has a square planar geometry

(A) $Ag\left(NH_3\right)_2^+$ (B) $Cu\left(en\right)_2^{2+}$

(C) $\left[MnCl_4\right]^{2-}$ (D) $Ni\left(CO\right)_4$

82. The shape of $\left[Fe(CN)_6\right]^{4-}$ ion is

(A) Hexagonal (B) Pyrimidal

(C) Octahedral (D) Octagonal

83. What is the shape of $Fe(CO)_5$

(A) Linear

(B) Tetrahedral

(C) Square planar

(D) Trigonal bipyramidal

84. What type of hybridization is involved in $[Fe(CN)_6]^{3-}$

(A) d^2sp^3 (B) dsp^2

(C) sp^3d^2 (D) dsp^3

85. The example of dsp^2 hybridisation is

(A) $Fe(CN)_6^{3-}$ (B) $Ni\left(CN\right)_4^{2-}$

(C) $Zn\left(NH_3\right)_4^{2+}$ (D) FeF_6^{3-}

86. The shape of $\left[Cu\left(NH_3\right)_4\right]^{2+}$ is square planar, Cu^{2+} in this complex is

(A) sp^3 hybridised (B) dsp^2 hybridised

(C) sp^3d hybridised (D) sp^3d^2 hybridised

87. The geometry of $Ni(CO)_4$ and $Ni(PPh_3)_2Cl_2$ are
(A) Both square planar
(B) Tetrahedral and square planar respectively
(C) Both tetrahedral
(D) Square planar and tetrahedral respectively

88. Which complex has square planar structure
(A) $Ni(CO)_4$ (B) $[NiCl_4)^{2-}$
(C) $[Ni(H_2O)_6]^{2+}$ (D) $[Cu(NH_3)_4]^{2+}$

89. $[Pt(NH_3)_4]Cl_2$ is
(A) Square planar (B) Tetrahedral
(C) Pyramidal (D) Pentagonal

90. A complex involving dsp^2 hybridization has
(A) A square planar geometry
(B) A tetrahedral geometry
(C) An octahedral geometry
(D) Trigonal planar geometry

91. The species havoing tetrahedral shape is
(A) $[PdCl_4]^{2-}$ (B) $[Ni(CN)_4]^{2-}$
(C) $[Pd(CN)_4]^{2-}$ (D) $[NiCl_4]^{2-}$

92. Among $[Ni(CO)_4], [Ni(CN)_4]^{2-}, [NiCl_4]^{2-}$ species, the hybridization states at the *Ni* atom are, respectively
(A) sp^3, sp^3, dsp^2 (D) dsp^2, sp^3, sp^3
(C) sp^3, dsp^2, dsp^2 (D) sp^3, dsp^2, sp^3
(At. no. of *Ni* = 28)

93. The bond in $K_4[Fe(CN)_6]$ are:
(A) All ionic
(B) All covalent
(C) Ionic and covalent
(D) Ionic, covalent and co-ordiante covalent

94. Hybridization of *Fe* in $K_3Fe(CN)_6$ is
(A) sp^3 (B) dsp^3
(C) sp^3d^2 (D) d^2sp^3

95. The complex ion which has no '*d* ' electrons in the central metal atom is
(A) $[MnO_4]^-$ (B) $[Co(NH_3)_6]^{3+}$
(C) $[Fe(CN)_6]^{3-}$ (D) $[Cr(H_2O)_6]^{3+}$

96. Which of the following statement is correct
(A) $[Cu(NH_3)_6]^{2+}$ is a colourless ion
(B) $[Zn(H_2O)_6]^{2+}$ ion is blue coloured
(C) $[Ni(CN)_4]^{2-}$ ion has a tetrahedral shape
(D) Nickel dimethyl glyoxides is red in colour

97. Which of the following shall form an octahedral complex
(A) d^4 (low spin) (B) d^8 (high spin)
(C) d^6 (low spin) (D) None of these

98. Which one of the following is a strong field ligand
(A) CN^- (B) NO_2^-
(C) en (D) NH_3

99. The strongest ligand in the following is
(A) CN^- (B) Br^-
(C) HO^- (D) F^-

100. The neutral ligand is
(A) Chloro (B) Hydroxo
(C) Ammine (D) Oxalato

Complexes and complex stability

101. A co-ordination complex compound of cobalt has the molecular formulae containing five ammonia molecules, one nitro group and two chlorine atoms for one cobalt atom. One mole of this compound produces three mole ions in an aqueous solution on reacting with excess of $AgNO_3$, AgCl precipitate. The ionic formula for this complex would be:
(A) $[Co(NH_3)_5(NO_2)]Cl_2$
(B) $[Co(NH_3)_5Cl][Cl(NO_2)]$
(C) $[Co(NH_3)_4(No_2)Cl][(NH_3)Cl]$
(D) $[Co(NH_3)_5][(NO_2)_2Cl_2]$

102. In any ferric salt, on adding potassium ferrocyanide, a prussian blue colour is obtained, which is
(A) $K_3Fe(CN)_6$ (B) $KFe[Fe(CN)_6]$
(D) $FeSO_4.Fe(CN)_6$ (D) $Fe_4[Fe(CN)_6]_3$

103. Prussian blue is formed when

(A) Ferrous sulphate reacts with $FeCl_3$

(B) Ferric sulphate reacts with $K_4[Fe(CN)_6]$

(C) Ferrous ammonium sulphate reacts with $FeCl_3$

(D) Ammonium sulphate reacts with $FeCl_3$

104. Complex salt can be made by the combination of $[Co^{III}(NH_3)_5Cl]^X$ with

(A) PO_4^{3-} (B) Cl^-

(C) $2Cl^-$ (D) $2K^+$

105. Which reagent can be used to identify nickel ion

(A) Resorcinol

(B) Dimethyl glyoxime [DMG]

(C) Diphenyl benzidine

(D) Potassium ferrocyanide

106. Dimethyl glyoxime forms a coloured complex with

(A) Ag (B) Ni

(C) Cr (D) Zn

107. Silver chloride dissolves in excess of NH_4OH. The cation present in this solution is

(A) Ag^+ (B) $\left[Ag(NH_3)_2\right]^+$

(C) $\left[Ag(NH_3)_4\right]^+$ (D) $\left[Ag(NH_3)_6\right]^+$

108. Silver sulphide dissolved in a solution of sodium cynamide to form the complex

(A) $Na[Ag(CN)_2]$ (B) $Na_3[Ag(CN)_4]$

(C) $Na_5[Ag(CN)_6]$ (D) $Na_2[Ag(CN)_2]$

109. Which one will give Fe^{3+} ions in solution

(A) $\left[Fe(CN)_6\right]^{3-}$

(B) $Fe_2(SO_4)_3$

(C) $\left[Fe(CN)_6\right]^{4-}$

(D) $NH_4(SO_4)_2.FeSO_4.6H_2O$

110. The cation that does not form an amine complex with excess of ammonia is

(A) Cd^{2+} (B) Al^{3+}

(C) Cu^{2+} (D) Ag^+

Application of organometallics

111. Which one is not an organometallic compound

(A) RMgX (B) C_2H_5ONa

(C) $(CH_3)_4Sn$ (D) KC_4H_9

112. The complex used as an anticancer agent is

(A) *trans* –$[Co(NH_3)_3Cl_3]$

(B) *cis* –$[PtCl_2(NH_3)_2]$

(C) *cis* –$K_2[PtCl_2Br_2]$

(D) Na_2CO_3

113. The compound that is not olefinic organometallic is

(A) $K[C_2H_4PtCl_3].3H_2O$

(B) $Be(CH_2)_2$

(C) $(C_2H_4PtCl_3)_2$

(D) $C_4H_4Fe(CO)_3$

114. Among the following, which is not the π-bonded organometallic compound

(A) $(CH_3)_4Sn$

(B) $K[PtCl_3(\eta^2 - C_2H_4)]$

(C) $Fe(\eta^5 - C_5H_5)_2$

(D) $Cr(\eta^6 - C_6H_6)_2$

115. Wilkinson's catalyst is used in

(A) Polymerization (B) Condensation

(C) Halogenation (D) Hydrogenation

116. What is the use of tetraethyl lead

(A) As a catalyst in addition reaction of alkenes

(B) As a catalyst in polymerization reaction of alkenes

(C) For reducing knocking

(D) For creating knocking

117. Which of the following is an organo-metallic compound

(A) Lithium ethoxide (B) Ethyl lithium

(C) Lithium acetate (D) Lithium carbide

118. Which of the following is an organometallic compound

(A) $Ti(C_2H_5)_4$ (B) $Ti(OC_2H_5)_4$

(C) $Ti(OCOCH_3)_4$ (D) $Ti(OC_6H_5)_4$

119. Which of the following is not an organometallic compound
(A) Ethyl magnesium bromide
(B) Tetraethyl lead
(C) Sodium ethoxide
(D) Trimethyl aluminium

120. An organometallic compound amongst the following is
(A) Ferrocene
(B) CaC_2
(C) Tetraethyl lead (TEL)
(D) All of these