PHYSICAL / INORGANIC CHEMISTRY

DPP

DAILY PRACTICE PROBLEMS

DPP No. 5

Total Marks : 28

Max. Time : 32 min.

Topic : Coordination Compounds

Type of Questions		M.M., Min.
Single choice Objective ('–1' negative marking) Q.1 to Q.4	(3 marks, 3 min.)	[12, 12]
Subjective Questions ('–1' negative marking) Q.5 to Q.6	(4 marks, 5 min.)	[8, 10]
Match the Following (no negative marking) Q.7	(8 marks, 10 min.)	[8, 10]

1. The IUPAC name for the complex compound $Li[AlH_4]$ is :

(A) lithium aluminium hydride (B) hydrido - aluminiumlithium (III)

(C) lithium tetrahydridoaluminate (III) (D) lithium tetrahydridoaluminate (I)

2. The IUPAC name for $K_2[Cr^{VI}NH_3(CN)_2O_2(O_2)]$ is

(A) potassium amminedicyanido-C-dioxidoperoxidochromate(VI)

(B) potassium amminedicyanatotetraoxochromium(III)

(C) potassium amminedicyanochromate (IV)

(D) potassium amminocyanodiperoxochromate (VI)

3. The IUPAC name for $K_2[OsCl_5N]$ is

(A) potassium pentachloroazidoosmate (VIII) (B) potassium pentachloroazoosmate (VI)

(C) potassium pentachloridonitridoosmate (VI) (D) potassium nitroosmate (III)

4. The formula of the complex sodium hydridotrimethoxoborate (III) is

(A) $Na_4[B_4H_2(OCH_3)_3]$ (B) $Na_2[BH(OCH_3)_3]$ (C) $Na[BH_2(OCH_3)_3]$ (D) $Na[BH(OCH_3)_3]$

5. Write IUPAC names of the following

(a) $Na_2[Fe(CN)_5NO]$ (b) $[Ni(DMG)_2]$

(c) $NH_4[Cr(SCN)_4(NO)_2]$ (NO is nitrosyl) (d) $[Pd(H_2O)_2I_2(ONO)_2]$

(e) $[Co(NH_3)_4Cl(NCS)]^+$ (f) $K_4[FeO_4]$

(g) $K_2[Co(N_3)_4]$ (h) $[Ni(PPh_3)_2Cl_2]$

(i) $[Cr(acac)_3]$ (j) $[Pt(C_5H_5N)_4][PtCl_4]$

6. Write the structural formula corresponding to each of the following IUPAC names :

(a) hexaaquairon (II) chloride

(b) potassium tetrafluoridoargentate (III)

(c) pentachloridotitanate (II) ion

(d) tetraamminedichloridocobalt (III) chloride

(e) dicyanido-C-argentate (I) ion

(f) diamminetetrachloridonickelate (II) ion

(g) tris(ethylenediamine)copper(II) sulphate

(h) sodium diaquatetrahydroxidoaluminate (III)

(i) amminechloridobis(ethylene diamine)chromium(III) sulphate

(j) potassium tetracyanido-C-zincate (II)

7. Match the ligands listed in column – I with the characteristic(s)/type of ligands listed in column – II.

Column – I	**Column – II**
(A) Acetyl acetonato	(p) Resonance stabilization
(B) Oxalato	(q) Monoanion
(C) Dimethyl glyoximato	(r) Chelating ligand
(D) Nitrito	(s) Ambidentate ligand
	(t) Monodentate

NOTE : For resonance stabilization consider the ligands as only free ions.

Answer Key

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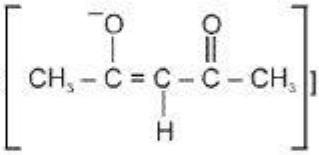
1. C **2.** A **3.** C **4.** D

5. (a) Sodium pentacyanido-C-nitrosoniumferrate(II) (Sodium nitroprusside-diamagnetic)
(b) Bis (dimethylglyoximato) nickel (II)
(c) Ammonium dinitrosyltetrathiocyanato-S chromate (III)
(d) Diaquadiiodidodinitrito-O palladium (IV)
(e) Tetraamminechloridothiocyanato-N cobalt (III) ion
(f) Potassium tetraoxidoferrate (IV)
(g) Potassium tetraazidocobaltate (II) [N_3^- is azide]
(h) Dichloridobis(triphenylphosphine) nickel (II)
(i) Tris(acetylacetonato)chromium (III) [$(acac)^-$ is ]
(j) Tetrakis(pyridine)platinum(II) tetrachloridoplatinate (II)

6. (a) $Fe^{2+} + 6H_2O + Cl^- \longrightarrow [Fe(H_2O)_6]^{2+} Cl^-$
Cation is a complex ion and carries + 2 charge, hence its structure is
$[Fe^{II}(H_2O)_6]Cl_2$
Oxidation state of the metal ion has been given in the structure. Students may omit it.

(b) $K^+ + Ag^{3+} + 4F^- \longrightarrow K^+ [AgF_4]^-$
cation
anion is a complex $K^+ [Ag^{III}F_4]^-$

(c) $[Ti^{II}Cl_5]^{3-}$ (d) $[Co^{III}(NH_3)_4Cl_2]Cl$
(e) $[Ag^{I}(CN)_2]^-$ (f) $[Ni(NH_3)_2Cl_4]^{2-}$

(g) $[Cu^{II}(en)_3]SO_4$ (h) $Na[Al^{III}(H_2O)_2(OH)_4]$
(i) $[Cr^{III}(NH_3)Cl(en)_2]SO_4$ (j) $K_2[Zn^{II}(CN)_4]$

7. (A – p,q,r) ; (B – p,r) ; (C – p,q,r) ; (D – p,q,s,t)

Hints & Solutions

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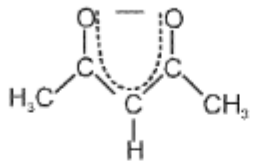
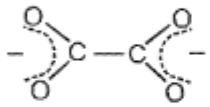
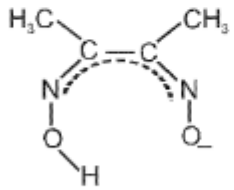
7. (A) Acetyl acetonato ($CH_3COCHCOCH_3^-$)



(B) Oxalato ($C_2O_4^{2-}$)



(C) Dimethylglyoximato ($HONCC(CH_3)C(CH_3)NO^-$)



(D) Nitrito (NO_2^-)

It may link to central metal ion either through nitrogen or oxygen ; so it is ambidentate ligand.