PYQSide PYQSide.com — free PYQs with solutions Powered by PrepBlink

NEET COORDINATION COMPOUNDS — PYQS

Max. Marks: 404 **Questions:** 101

Section A (MCQ) — 101 questions

Q.1 Match **List I** with **List II** : [NEET (UG) 2026]

List I (Complex/ion)		List II (Shape/geometry)	
A.	$[PtCl_2(NH_3)_2]$	I.	Octahedral
B.	$[Co(NH_3)_6]Cl_3$	II.	Trigonal bipyramidal
C.	$[NiCl_4]^{2-}$	III.	Square planar
D.	$[Fe(CO)_5]$	IV.	Tetrahedral

(1) A-I, B-III, C-IV, D-II
(2) A-III, B-IV, C-I, D-II
(3) A-III, B-I, C-IV, D-II
(4) A-IV, B-I, C-III, D-II

Solution

Q.2 Which one of the following is an ambidentate ligand? [NEET (UG) 2026]
(1) Oxalate
(2) Ethane-1,2-diamine
(3) Thiocyanate
(4) Ethylenediaminetetraacetate ion

Solution

Q.3 The formula of tetraammineaquachloridocobalt(III) chloride is [RE-NEET (UG) 2026]
(1) $[Co(NH_3)_4(H_2O)Cl]Cl_2$
(2) $[Co(NH_3)_4Cl_2]\cdot H_2O$
(3) $[Co(NH_3)_4]Cl_3\cdot H_2O$
(4) $[Co(NH_3)_4(H_2O)Cl]Cl$

Solution

Q.4 Given below are two statements:
(Given:oxH_2 = HOOC − COOH)
In light of the above statements, choose the most appropriate answer from the options given below:
Statement-I: $[Fe(ox)_3]^{3-}$ is chiral.
Statement-II: trans–$[Cr(H_2O)_2(ox)_2]^-$ is chiral.
[RE-NEET (UG) 2026]
(1) Statement-I is incorrect but Statement-II is correct
(2) Both Statement-I and Statement-II are correct
(3) Both Statement-I and Statement-II are incorrect
(4) Statement-I is correct but Statement-II is incorrect

Scan or tap for the full solution

Q.5 The complex which has facial and meridional isomers is
(Given : py = pyridine and
en = $H_2N–CH_2–CH_2–NH_2$) [RE-NEET (UG) 2026]
(1) $[Ni(en)_2(H_2O)_2]^{2+}$ (2) $[Cr(py)_3(Cl)_3]$
(3) $[Cr(H_2O)_6]^{3+}$ (4) $[Co(NH_3)_4(H_2O)_2]^{3+}$

Scan or tap for the full solution

Q.6 A 1:3 electrolyte in an aqueous solution is [RE-NEET (UG) 2026]
(1) $[Co(NH_3)_3(NO_2)_3]$ (2) $[CoCl_2(NH_3)_4]Cl$
(3) $[CoCl(NH_3)_5]Cl_2$ (4) $[Co(NH_3)_6]Cl_3$

Scan or tap for the full solution

Q.7 According to crystal field theory, the correct order of ligands with respect to their decreasing order of field strength is [RE-NEET (UG) 2026]
(1) $Cl^- > NH_3 > H_2O > CO$
(2) $CO > NH_3 > H_2O > Cl^-$
(3) $CO > H_2O > NH_3 > Cl^-$
(4) $Cl^- > H_2O > NH_3 > CO$

Solution

Q.8 Among the species given below, the spin-only magnetic moment is highest for
(Given: Atomic number of Ti = 22, Mn = 25, Fe = 26 and Co = 27) [RE-NEET (UG) 2026]
(1) $[Ti(H_2O)_6]^{3+}$ (2) $[Mn(CN)_6]^{3-}$
(3) $[Fe(CN)_6]^{3-}$ (4) $[Co(NH_3)_6]^{3+}$

Scan or tap for the full solution

Q.9 Out of the following complex compounds, which of the compound will be having the minimum conductance solution? [NEET (UG) 2025]
(1) $[Co(NH_3)_6]Cl_3$ (2) $[Co(NH_3)_5Cl]Cl$
(3) $[Co(NH_3)_3Cl_3]$ (4) $[Co(NH_3)_4Cl_2]$

Scan or tap for the full solution

Q.10 Which of the following are paramagnetic?
A. $[NiCl_4]^{2-}$ B. $Ni(CO)_4$
C. $[Ni(CN)_4]^{2-}$ D. $[Ni(H_2O)_6]^{2+}$
E. $Ni(PPh_3)_4$
Choose the correct answer from the options given below : [NEET (UG) 2025]

(1) A and D only (2) A, D and E only
(3) A and C only (4) B and E only

Scan or tap for the full solution

Q.11 The correct order of the wavelength of light absorbed by the following complexes is,

A. $[Co(NH_3)_6]^{3+}$ B. $[Co(CN)_6]^{3-}$
C. $[Cu(H_2O)_4]^{2+}$ D. $[Ti(H_2O)_6]^{3+}$

Choose the correct answer from the options given below: [NEET (UG) 2025]

(1) C < D < A < B (2) C < A < D < B
(3) B < D < A < C (4) B < A < D < C

Scan or tap for the full solution

Q.12 Match **List I** with **List II**.

List I (Complex)		List II (Type of isomerism)	
A.	$[Co(NH_3)_5(NO_2)]Cl_2$	I.	Solvate isomerism
B.	$[Co(NH_3)_5(SO_4)]Br$	II.	Linkage isomerism
C.	$[Co(NH_3)_6][Cr(CN)_6]$	III.	Ionization isomerism
D.	$[Co(H_2O)_6]Cl_3$	IV.	Coordination isomerism

Choose the correct answer from the options given below: [NEET (UG) 2024]

(1) A-II, B-III, C-IV, D-I
(2) A-I, B-III, C-IV, D-II
(3) A-I, B-IV, C-III, D-II
(4) A-II, B-IV, C-III, D-I

Solution

Q.13 Given below are two statements :

Statement-I: Both $[Co(NH_3)_6]^{3+}$ and $[CoF_6]^{3-}$ complexes are octahedral but differ in their magnetic behaviour.

Statement-II: $[Co(NH_3)_6]^{3+}$ is diamagnetic whereas $[CoF_6]^{3-}$ is paramagnetic.

In the light of the above statements, choose the correct answer from the options given below: [NEET (UG) 2024]

(1) Both Statement-I and Statement-II are true
(2) Both Statement-I and Statement-II are false
(3) Statement-I is true but Statement-II is false
(4) Statement-I is false but Statement-II is true

Scan or tap for the full solution

Q.14 Given below are two statements :

Statement-I: $[Co(NH_3)_6]^{3+}$ is a homoleptic complex whereas $[Co(NH_3)_4Cl_2]^{+}$ is a heteroleptic complex.

Statement-II: Complex $[Co(NH_3)_6]^{3+}$ has only one kind of ligands but $[Co(NH_3)_4Cl_2]^{+}$ has more than one kind of ligands.

In the light of the above statements, choose the correct answer from the options given below. [NEET (UG) 2024]

(1) Both Statement-I and Statement-II are true
(2) Both Statement-I and Statement-II are false
(3) Statement-I is true but Statement-II is false
(4) Statement-I is false but Statement-II is true

Scan or tap for the full solution

Q.15 Ethylene diaminetetraacetate ion is a/an: [RE-NEET (UG) 2024]

(1) hexadentate ligand (2) ambidentate ligand
(3) monodentate ligand (4) bidentate ligand

Scan or tap for the full solution

Q.16 Which of the following is not an ambidentate ligand? [RE-NEET (UG) 2024]

(1) $C_2O_4^{2-}$ (2) SCN^- (3) NO_2^- (4) CN^-

Scan or tap for the full solution

Q.17 $[Mn_2(CO)_{10}]$ and $[Co_2(CO)_8]$ structures have

A. Metal-Metal linkage
B. Terminal CO groups
C. Bridging CO groups
D. Metal in zero oxidation state

Choose the correct answer from the options given below [RE-NEET (UG) 2024]

(1) Only A, B, C (2) Only B, C, D
(3) Only A, C, D (4) Only A, B, D

Scan or tap for the full solution

Q.18 Homoleptic complex from the following complexes is: [NEET (UG) 2023]

(1) Diamminechloridonitrito-N-platinum(II)
(2) Pentaamminecarbonatocobalt(III) chloride
(3) Triamminetriaquachromium(III) chloride
(4) Potassium trioxalatoaluminate(III)

Scan or tap for the full solution

Q.19 Which complex compound is most stable? [NEET (UG) 2023]

(1) $[Co(NH_3)_3(NO_3)_3]$
(2) $[CoCl_2(en)_2]NO_3$
(3) $[Co(NH_3)_6]_2(SO_4)_3$
(4) $[Co(NH_3)_4(H_2O)Br](NO_3)_2$

Solution

Q.20 The IUPAC name of the complex $[Ag(H_2O)_2][Ag(CN)_2]$ is: [NEET (UG) 2022]

(1) dicyanidosilver(II) diaquaargentate(II)
(2) diaquasilver(II) dicyanidoargentate(II)
(3) dicyanidosilver(I) diaquaargentate(I)
(4) diaquasilver(I) dicyanidoargentate(I)

Scan or tap for the full solution

Q.21 The order of energy absorbed which is responsible for the color of complexes
(A) $[Ni(H_2O)_2(en)_2]^{2+}$
(B) $[Ni(H_2O)_4(en)]^{2+}$ and
(C) $[Ni(en)_3]^{2+}$
is [NEET (UG) 2022]
(1) (A) > (B) > (C) (2) (C) > (B) > (A)
(3) (C) > (A) > (B) (4) (B) > (A) > (C)

Scan or tap for the full solution

Q.22 Match **List-I** with **List-II** :

List-I (Complexes)		List-II (Types)	
a.	$[Co(NH_3)_5NO_2]Cl_2$ and $[Co(NH_3)_5ONO]Cl_2$	i.	ionisation isomerism
b.	$[Cr(NH_3)_6][Co(CN)_6]$ and $[Cr(CN)_6][Co(NH_3)_6]$	ii.	coordination isomerism
c.	$[Co(NH_3)_5(SO_4)]Br$ and $[Co(NH_3)_5Br]SO_4$	iii.	linkage isomerism
d.	$[Cr(H_2O)_6]Cl_3$ and $[Cr(H_2O)_5Cl]Cl_2 \cdot H_2O$	iv.	solvate isomerism

Choose the correct answer from the options given below : [NEET (UG) 2022 (Phase 2)]
(1) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)
(2) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)
(3) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)
(4) (a)-(iii), (b)-(ii), (c)-(i), (d)-(iv)

Solution

Q.23 Given below are two statements : one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.
Assertion (A): The metal carbon bond in metal carbonyls possesses both σ and π character.
Reason (R): The ligand to metal bond is a π bond and metal to ligand bond is a σ bond.

In the light of the above statements, choose the most appropriate answer from the options given below. [NEET (UG) 2022 (Phase 2)]
(1) (A) is not correct but (R) is correct
(2) Both (A) and (R) are correct and (R) is the correct explanation of (A)
(3) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
(4) (A) is correct but (R) is not correct

Scan or tap for the full solution

Q.24 Ethylene diaminetetraacetate (EDTA) ion is : [NEET (UG) 2021]
(1) Tridentate ligand with three "N" donor atoms
(2) Hexadentate ligand with four "O" and two "N" donor atoms
(3) Unidentate ligand
(4) Bidentate ligand with two "N" donor atoms

Scan or tap for the full solution

Q.25 Match **List-I** with **List-II** :

List-I		List-II	
a.	$[Fe(CN)_6]^{3-}$	i.	5.92 BM
b.	$[Fe(H_2O)_6]^{3+}$	ii.	0 BM
c.	$[Fe(CN)_6]^{4-}$	iii.	4.90 BM
d.	$[Fe(H_2O)_6]^{2+}$	iv.	1.73 BM

Choose the correct answer from the options given below. [NEET (UG) 2021]
(1) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)
(2) (a)-(iv), (b)-(ii), (c)-(i), (d)-(iii)
(3) (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)
(4) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)

Solution

Q.26 Which of the following is the correct order of increasing field strength of ligands to form coordination compounds? [NEET (UG) 2020]
(1) $SCN^- < F^- < CN^- < C_2O_4^{2-}$
(2) $F^- < SCN^- < C_2O_4^{2-} < CN^-$
(3) $CN^- < C_2O_4^{2-} < SCN^- < F^-$
(4) $SCN^- < F^- < C_2O_4^{2-} < CN^-$

Solution

Q.27 What is the **correct** electronic configuration of the central atom in $K_4[Fe(CN)_6]$ based on crystal field theory? [NEET (UG) 2019]
(1) $t_{2g}^4 e_g^2$ (2) $t_{2g}^6 e_g^0$ (3) $e^3 t_2^3$ (4) $e^4 t_2^2$

Scan or tap for the full solution

Q.28 Match the metal ions given in **Column I** with the spin magnetic moments of the ions given in **Column II** and assign the correct code : [NEET 2018]

Column-I		Column-II	
a.	Co^{3+}	i.	$\sqrt{8}$ B.M.
b.	Cr^{3+}	ii.	$\sqrt{35}$ B.M.
c.	Fe^{3+}	iii.	$\sqrt{3}$ B.M.
d.	Ni^{2+}	iv.	$\sqrt{24}$ B.M.
		v.	$\sqrt{15}$ B.M.

(1) (a)-(iv), (b)-(v), (c)-(ii), (d)-(i)
(2) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)
(3) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)
(4) (a)-(iii), (b)-(v), (c)-(i), (d)-(ii)

Solution

Q.29 The type of isomerism shown by the complex $[CoCl_2(en)_2]$ is [NEET 2018]
(1) geometrical isomerism
(2) coordination isomerism
(3) ionization isomerism
(4) linkage isomerism

Solution

Q.30 The geometry and magnetic behaviour of the complex $[Ni(CO)_4]$ are [NEET 2018]
(1) square planar geometry and diamagnetic
(2) tetrahedral geometry and diamagnetic
(3) square planar geometry and paramagnetic
(4) tetrahedral geometry and paramagnetic

Scan or tap for the full solution

Q.31 Iron carbonyl, $Fe(CO)_5$ is [NEET 2018]
(1) tetranuclear (2) mononuclear
(3) trinuclear (4) dinuclear

Scan or tap for the full solution

Q.32 An example of a sigma bonded organometallic compound is [NEET 2017]
(1) Grignard's reagent (2) ferrocene
(3) cobaltocene (4) ruthenocene.

Scan or tap for the full solution

Q.33 The correct order of the stoichiometries of AgCl formed when $AgNO_3$ in excess is treated with the complexes : $CoCl_3 \cdot 6NH_3$, $CoCl_3 \cdot 5NH_3$, $CoCl_3 \cdot 4NH_3$ respectively is [NEET 2017]
(1) 3AgCl, 1AgCl, 2AgCl
(2) 3AgCl, 2AgCl, 1AgCl
(3) 2AgCl, 3AgCl, 2AgCl
(4) 1AgCl, 3AgCl, 2AgCl

Solution

Q.34 Correct increasing order for the wavelengths of absorption in the visible region for the complexes of Co^{3+} is [NEET 2017]
(1) $[Co(H_2O)_6]^{3+}$, $[Co(en)_3]^{3+}$, $[Co(NH_3)_6]^{3+}$
(2) $[Co(H_2O)_6]^{3+}$, $[Co(NH_3)_6]^{3+}$, $[Co(en)_3]^{3+}$
(3) $[Co(NH_3)_6]^{3+}$, $[Co(en)_3]^{3+}$, $[Co(H_2O)_6]^{3+}$
(4) $[Co(en)_3]^{3+}$, $[Co(NH_3)_6]^{3+}$, $[Co(H_2O)_6]^{3+}$

Scan or tap for the full solution

Q.35 Pick out the correct statement with respect to $[Mn(CN)_6]^{3-}$. [NEET 2017]
(1) It is sp^3d^2 hybridised and tetrahedral.
(2) It is d^2sp^3 hybridised and octahedral.
(3) It is dsp^2 hybridised and square planar.
(4) It is sp^3d^2 hybridised and octahedral.

Scan or tap for the full solution

Q.36 Which of the following has longest C − O bond length? (Free C − O bond length in CO is 1.128 Å.) [NEET 2016 (Phase 1)]
(1) $[Fe(CO)_4]^{2-}$ (2) $[Mn(CO)_6]^{+}$
(3) $Ni(CO)_4$ (4) $[Co(CO)_4]^{-}$

Scan or tap for the full solution

Q.37 The correct increasing order of trans-effect of the following species is [NEET 2016 (Phase 2)]
(1) $NH_3 > CN^- > Br^- > C_6H_5^-$
(2) $CN^- > C_6H_5^- > Br^- > NH_3$
(3) $Br^- > CN^- > NH_3 > C_6H_5^-$
(4) $CN^- > Br^- > C_6H_5^- > NH_3$

Solution

Q.38 Jahn-Teller effect is not observed in high spin complexes of [NEET 2016 (Phase 2)]
(1) d^7 (2) d^8 (3) d^4 (4) d^9

Scan or tap for the full solution

Q.39 The hybridization involved in complex $[Ni(CN)_4]^{2-}$ is (At. No. Ni = 28) [AIPMT 2015]
(1) sp^3 (2) d^2sp^2 (3) d^2sp^3 (4) dsp^2

Scan or tap for the full solution

Q.40 The name of complex ion, $[Fe(CN)_6]^{3-}$ is [AIPMT 2015]
(1) hexacyanitoferrate (III) ion
(2) tricyanoferrate (III) ion
(3) hexacyanidoferrate (III) ion
(4) hexacyanoiron (III) ion.

Solution

Q.41 The sum of coordination number and oxidation number of the metal M in the complex $[M(en)_2(C_2O_4)]Cl$ (where en is ethylenediamine) is [AIPMT 2015]
(1) 6 (2) 7 (3) 8 (4) 9

Scan or tap for the full solution

Q.42 Number of possible isomers for the complex $[Co(en)_2Cl_2]Cl$ will be (en = ethylenediamine) [AIPMT 2015]
(1) 1 (2) 3 (3) 4 (4) 2

Scan or tap for the full solution

Q.43 Cobalt (III) chloride forms several octahedral complexes with ammonia. Which of the following will not give test for chloride ions with silver nitrate at 25°C? [AIPMT 2015 (Cancelled)]

(1) $CoCl_3 \cdot 5NH_3$ (2) $CoCl_3 \cdot 6NH_3$
(3) $CoCl_3 \cdot 3NH_3$ (4) $CoCl_3 \cdot 4NH_3$

Scan or tap for the full solution

Q.44 Which of these statements about $[Co(CN)_6]^{3-}$ is true? [AIPMT 2015 (Cancelled)]

(1) $[Co(CN)_6]^{3-}$ has four unpaired electrons and will be in a high-spin configuration.
(2) $[Co(CN)_6]^{3-}$ has no unpaired electrons and will be in a high-spin configuration.
(3) $[Co(CN)_6]^{3-}$ has no unpaired electrons and will be in a low-spin configuration.
(4) $[Co(CN)_6]^{3-}$ has four unpaired electrons and will be in a low-spin configuration.

Scan or tap for the full solution

Q.45 Among the following complexes the one which shows zero crystal field stabilization energy (CFSE) is [AIPMT 2014]

(1) $[Mn(H_2O)_6]^{3+}$ (2) $[Fe(H_2O)_6]^{3+}$
(3) $[Co(H_2O)_6]^{2+}$ (4) $[Co(H_2O)_6]^{3+}$

Scan or tap for the full solution

Q.46 Which of the following complexes is used as an anticancer agent? [AIPMT 2014]

(1) mer-$[Co(NH_3)_3Cl_3]$ (2) cis-$[PtCl_2(NH_3)_2]$
(3) cis-$K_2[PtCl_2Br_2]$ (4) Na_2CoCl_4

Scan or tap for the full solution

Q.47 A magnetic moment of 1.73 BM will be shown by one among the following [NEET 2013]

(1) $TiCl_4$ (2) $[CoCl_6]^{4-}$
(3) $[Cu(NH_3)_4]^{2+}$ (4) $[Ni(CN)_4]^{2-}$

Scan or tap for the full solution

Q.48 Crystal field splitting energy for high spin d^4 octahedral complex is [NEET 2013 (Karnataka)]

(1) $-1.2\ \Delta_o$ (2) $-0.6\ \Delta_o$ (3) $-0.8\ \Delta_o$ (4) $-1.6\ \Delta_o$

Scan or tap for the full solution

Q.49 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 [NEET 2013]

(1) 0.003 (2) 0.01 (3) 0.001 (4) 0.002

Scan or tap for the full solution

Q.50 In a particular isomer of $[Co(NH_3)_4Cl_2]^+$, the Cl − Co − Cl angle is 90°, this isomer is known as [NEET 2013 (Karnataka)]

(1) optical isomer (2) cis-isomer
(3) position isomer (4) linkage isomer.

Scan or tap for the full solution

Q.51 The anion of acetylacetone (acac) forms Co $(acac)_3$ chelate with Co^{3+}. The rings of the chelate are [NEET 2013 (Karnataka)]

(1) five membered (2) four membered
(3) six membered (4) three membered.

Scan or tap for the full solution

Q.52 The correct IUPAC name for $[CrF_2(en)_2]Cl$ is [NEET 2013 (Karnataka)]

(1) chloro difluorido ethylene diaminechromium (III) chloride
(2) difluoridobis (ethylene diamine) chromium (III) chloride
(3) difluorobis-(ethylene diamine) chromium (III) chloride
(4) chloro difluoridobis (ethylene diamine) chromium (III)

Scan or tap for the full solution

Q.53 Which among the following is a paramagnetic complex? [NEET 2013 (Karnataka)]

(1) $[Co(NH_3)_6]^{3+}$ (2) $[Pt(en)Cl_2]$
(3) $[CoBr_4]^{2-}$ (4) $Mo(CO)_6$

Scan or tap for the full solution

Q.54 Which is diamagnetic? [NEET 2013 (Karnataka)]

(1) $[Co(F)_6]^{3-}$ (2) $[Ni(CN)_4]^{2-}$
(3) $[NiCl_4]^{2-}$ (4) $[Fe(CN)_6]^{3-}$

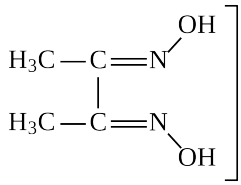
Scan or tap for the full solution

Q.55 Low spin complex of d^6-cation in an octahedral field will have the following energy [AIPMT 2012 (Mains)]

(1) $\frac{-12}{5}\Delta_o + P$ (2) $\frac{-12}{5}\Delta_o + 3P$
(3) $\frac{-2}{5}\Delta_o + 2P$ (4) $\frac{-2}{5}\Delta_o + P$

Scan or tap for the full solution

Q.56 Red precipitate is obtained when ethanol solution of dimethylglyoxime is added to ammoniacal Ni(II). Which of the following statements is not true? [AIPMT 2012 (Mains)]

dimethylglyoxime = 

(1) Red complex has a square planar geometry.
(2) Complex has symmetrical H-bonding.
(3) Red complex has a tetrahedral geometry.
(4) Dimethylglyoxime functions as bidentate ligand.

Scan or tap for the full solution

Q.57 Which one of the following is an outer orbital complex and exhibits paramagnetic behaviour? [AIPMT 2012 (Prelims)]

(1) $[Ni(NH_3)_6]^{2+}$ (2) $[Zn(NH_3)_6]^{2+}$
(3) $[Cr(NH_3)_6]^{3+}$ (4) $[Co(NH_3)_6]^{3+}$

Scan or tap for the full solution

Q.58 Which of the following carbonyls will have the strongest C–O bond? [AIPMT 2011 (Mains)]

(1) $Cr(CO)_6$ (2) $Fe(CO)_5$
(3) $[Mn(CO)_6]^+$ (4) $[V(CO)_6]^-$

Scan or tap for the full solution

Q.59 Which of the following complex compounds will exhibit highest paramagnetic behaviour?
(At. No. Ti = 22, Cr = 24, Co = 27, Zn = 30) [AIPMT 2011 (Mains)]

(1) $[Cr(NH_3)_6]^{3+}$ (2) $[Co(NH_3)_6]^{3+}$
(3) $[Zn(NH_3)_6]^{2+}$ (4) $[Ti(NH_3)_6]^{3+}$

Scan or tap for the full solution

Q.60 Of the following complex ions, which is diamagnetic in nature? [AIPMT 2011 (Prelims)]

(1) $[NiCl_4]^{2-}$ (2) $[Ni(CN)_4]^{2-}$
(3) $[CuCl_4]^{2-}$ (4) $[CoF_6]^{3-}$

Scan or tap for the full solution

Q.61 The complexes $[Co(NH_3)_6][Cr(CN)_6]$ and $[Cr(NH_3)_6][Co(CN)_6]$ are the examples of which type of isomerism? [AIPMT 2011 (Prelims)]

(1) Linkage isomerism
(2) Ionization isomerism
(3) Coordination isomerism
(4) Geometrical isomerism

Solution

Q.62 The complex, $[Pt(Py)(NH_3)BrCl]$ will have how many geometrical isomers? [AIPMT 2011 (Prelims)]

(1) 3 (2) 4 (3) 0 (4) 2

Scan or tap for the full solution

Q.63 The d-electron configurations of Cr^{2+}, Mn^{2+}, Fe^{2+} and Co^{2+} are d^4, d^5, d^6 and d^7 respectively. Which one of the following will exhibit minimum paramagnetic behaviour?
(At. Nos. Cr = 24, Mn = 25, Fe = 26, Co = 27) [AIPMT 2011 (Prelims)]

(1) $[Mn(H_2O)_6]^{2+}$ (2) $[Fe(H_2O)_6]^{2+}$
(3) $[Co(H_2O)_6]^{2+}$ (4) $[Cr(H_2O)_6]^{2+}$

Scan or tap for the full solution

Q.64 Which of the following carbonyls will have the strongest C–O bond? [AIPMT 2011 (Prelims)]

(1) $Mn(CO)_6^+$ (2) $Cr(CO)_6$
(3) $V(CO)_6^-$ (4) $Fe(CO)_5$

Scan or tap for the full solution

Q.65 Which of the following complex compounds will exhibit highest paramagnetic behaviour? [AIPMT 2011 (Prelims)]

(1) $[Ti(NH_3)_6]^{3+}$ (2) $[Cr(NH_3)_6]^{3+}$
(3) $[Co(NH_3)_6]^{3+}$ (4) $[Zn(NH_3)_6]^{2+}$

Scan or tap for the full solution

Q.66 Which of the following complex ions is not expected to absorb visible light? [AIPMT 2010 (Prelims)]

(1) $[Ni(CN)_4]^{2-}$ (2) $[Cr(NH_3)_6]^{3+}$
(3) $[Fe(H_2O)_6]^{2+}$ (4) $[Ni(H_2O)_6]^{2+}$

Scan or tap for the full solution

Q.67 Crystal field stabilization energy for high spin d^4 octahedral complex is [AIPMT 2010 (Prelims)]

(1) $-1.8\ \Delta_0$ (2) $-1.6\ \Delta_0 + P$
(3) $-1.2\ \Delta_0$ (4) $-0.6\ \Delta_0$

Scan or tap for the full solution

Q.68 The existence of two different coloured complexes with the composition of $[Co(NH_3)_4Cl_2]^+$ is due to [AIPMT 2010 (Prelims)]

(1) linkage isomerism
(2) geometrical isomerism
(3) coordination isomerism
(4) ionization isomerism.

Solution

Q.69 Which one of the following complexes is not expected to exhibit isomerism? [AIPMT 2010 (Prelims)]

(1) $[Ni(NH_3)_4(H_2O)_2]^{2+}$ (2) $[Pt(NH_3)_2Cl_2]$
(3) $[Ni(NH_3)_2Cl_2]$ (4) $[Ni(en)_3]^{2+}$

Scan or tap for the full solution

Q.70 Which of the following does not show optical isomerism?
(en = ethylenediamine) [AIPMT 2009]
(1) $[Co(NH_3)_3Cl_3]^0$ (2) $[Co(en)Cl_2(NH_3)_2]^+$
(3) $[Co(en)_3]^{3+}$ (4) $[Co(en)_2Cl_2]^+$

Scan or tap for the full solution

Q.71 Which of the following complex ions is expected to absorb visible light?
(At. nos. Zn = 30, Sc = 21, Ti = 22, Cr = 24)
[AIPMT 2009]
(1) $[Ti(en)_2(NH_3)_2]^{4+}$ (2) $[Cr(NH_3)_6]^{3+}$
(3) $[Zn(NH_3)_6]^{2+}$ (4) $[Sc(H_2O)_3(NH_3)_3]^{3+}$

Scan or tap for the full solution

Q.72 Which of the following complexes exhibits the highest paramagnetic behaviour?
where gly = glycine, en = ethylenediamine and bpy = bipyridyl moieties.
(At. nos. Ti = 22, V = 23, Fe = 26, Co = 27)
[AIPMT 2008]
(1) $[Co(ox)_2(OH)_2]^-$
(2) $[Ti(NH_3)_6]^{3+}$
(3) $[V(gly)_2(OH)_2(NH_3)_2]^+$
(4) $[Fe(en)(bpy)(NH_3)_2]^{2+}$

Solution

Q.73 In which of the following coordination entities the magnitude of Δ_o (CFSE in octahedral field) will be maximum?
(At. No. Co = 27) [AIPMT 2008]
(1) $[Co(CN)_6]^{3-}$ (2) $[Co(C_2O_4)_3]^{3-}$
(3) $[Co(H_2O)_6]^{3+}$ (4) $[Co(NH_3)_6]^{3+}$

Scan or tap for the full solution

Q.74 Which of the following will give a pair of enantiomorphs?
(en = $NH_2CH_2CH_2NH_2$) [AIPMT 2007]
(1) $[Cr(NH_3)_6][Co(CN)_6]$
(2) $[Co(en)_2Cl_2]Cl$
(3) $[Pt(NH_3)_4][PtCl_6]$
(4) $[Co(NH_3)_4Cl_2]NO_2$

Solution

Q.75 The d electron configurations of Cr^{2+}, Mn^{2+}, Fe^{2+} and Ni^{2+} are $3d^4$, $3d^5$, $3d^6$ and $3d^8$ respectively. Which one of the following aqua complexes will exhibit the minimum paramagnetic behaviour?
(At. No. Cr = 24, Mn = 25, Fe = 26, Ni = 28)
[AIPMT 2007]
(1) $[Fe(H_2O)_6]^{2+}$ (2) $[Ni(H_2O)_6]^{2+}$
(3) $[Cr(H_2O)_6]^{2+}$ (4) $[Mn(H_2O)_6]^{2+}$

Scan or tap for the full solution

Q.76 $[Cr(H_2O)_6]Cl_3$ (At. no. of Cr = 24) has a magnetic moment of 3.83 B.M. The correct distribution of 3d electrons in the chromium of the complex is
[AIPMT 2006]
(1) $3d^1_{xy}$, $3d^1_{yz}$, $3d^1_{z^2}$
(2) $3d^1_{(x^2-y^2)}$, $3d^1_{z^2}$, $3d^1_{xz}$
(3) $3d^1_{xy}$, $3d^1_{(x^2-y^2)}$, $3d^1_{yz}$
(4) $3d^1_{xy}$, $3d^1_{yz}$, $3d^1_{xz}$

Scan or tap for the full solution

Q.77 $[Co(NH_3)_4(NO_2)_2]Cl$ exhibits [AIPMT 2006]
(1) linkage isomerism, geometrical isomerism and optical isomerism
(2) linkage isomerism, ionization isomerism and optical isomerism
(3) linkage isomerism, ionization isomerism and geometrical isomerism
(4) ionization isomerism, geometrical isomerism and optical isomerism.

Scan or tap for the full solution

Q.78 Which one of the following is an inner orbital complex as well as diamagnetic in behaviour?
[AIPMT 2005]
(1) $[Zn(NH_3)_6]^{2+}$ (2) $[Cr(NH_3)_6]^{3+}$
(3) $[Co(NH_3)_6]^{3+}$ (4) $[Ni(NH_3)_6]^{2+}$

Scan or tap for the full solution

Q.79 Vitamin B_{12} contains [AIPMT 2003]
(1) Fe(II) (2) Co(III) (3) Zn(II) (4) Ca(II)

Scan or tap for the full solution

Q.80 Which one of the following is expected to exhibit optical isomerism? (en = ethylenediamine)
[AIPMT 2005]
(1) cis-$[Pt(NH_3)_2Cl_2]$ (2) trans-$[Pt(NH_3)_2Cl_2]$
(3) cis-$[Co(en)_2Cl_2]^+$ (4) trans-$[Co(en)_2Cl_2]^+$

Scan or tap for the full solution

Q.81 Which of the following coordination compounds would exhibit optical isomerism? [AIPMT 2004]
(1) Pentaamminenitrocobalt (III) iodide
(2) Diamminedichloroplatinum (II)
(3) trans-Dicyanobis (ethylenediamine) chromium (III) chloride

(4) tris-(Ethylenediamine) cobalt (III) bromide.

Scan or tap for the full solution

Q.82 Among $[Ni(CO)_4]$, $[Ni(CN)_4]^{2-}$, $[NiCl_4]^{2-}$ species, the hybridisation states at the Ni atom are, respectively
[Atomic number of Ni = 28] [AIPMT 2004]
(1) sp^3, dsp^2, dsp^2 (2) sp^3, dsp^2, sp^3
(3) sp^3, sp^3, dsp^2 (4) dsp^2, sp^3, sp^3

Scan or tap for the full solution

Q.83 CN^- is a strong field ligand. This is due to the fact that [AIPMT 2004]
(1) it carries negative charge
(2) it is a pseudohalide
(3) it can accept electrons from metal species
(4) it forms high spin complexes with metal species.

Scan or tap for the full solution

Q.84 Considering H_2O as a weak field ligand, the number of unpaired electrons in $[Mn(H_2O)_6]^{2+}$ will be (atomic number of Mn = 25) [AIPMT 2004]
(1) three (2) five (3) two (4) four

Scan or tap for the full solution

Q.85 Which of the following does not have a metal carbon bond? [AIPMT 2004]
(1) $Al(OC_2H_5)_3$ (2) C_2H_5MgBr
(3) $K[Pt(C_2H_4)Cl_3]$ (4) $Ni(CO)_4$

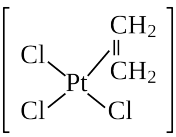
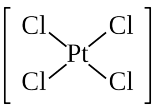
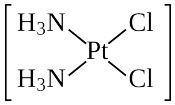
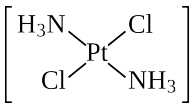
Scan or tap for the full solution

Q.86 Coordination number of Ni in $[Ni(C_2O_4)_3]^{4-}$ is [AIPMT 2001]
(1) 3 (2) 6 (3) 4 (4) 2

Scan or tap for the full solution

Q.87 In an octahedral structure, the pair of d orbitals involved in d^2sp^3 hybridisation is [AIPMT 2004]
(1) $d_{x^2-y^2}$, d_{z^2} (2) d_{xz}, $d_{x^2-y^2}$
(3) d_{z^2}, d_{xz} (4) d_{xy}, d_{yz}

Scan or tap for the full solution

Q.88 Which of the following is considered to be an anticancer species? [AIPMT 2004]
(1) 
(2) 
(3) 
(4) 

Scan or tap for the full solution

Q.89 The number of unpaired electrons in the complex ion $[CoF_6]^{3-}$ is
(Atomic no. : Co = 27) [AIPMT 2003]
(1) 2 (2) 3 (3) 4 (4) zero

Scan or tap for the full solution

Q.90 Among the following which is not the π-bonded organometallic compound? [AIPMT 2003]
(1) $K[PtCl_3(\eta^2-C_2H_4)]$ (2) $Fe(\eta^5-C_5H_5)_2$
(3) $Cr(\eta^6-C_6H_6)_2$ (4) $(CH_3)_4Sn$

Scan or tap for the full solution

Q.91 Atomic number of Cr and Fe are respectively 24 and 26, which of the following is paramagnetic with the spin of electron? [AIPMT 2002]
(1) $[Cr(CO)_6]$ (2) $[Fe(CO)_5]$
(3) $[Fe(CN)_6]^{4-}$ (4) $[Cr(NH_3)_6]^{3+}$

Scan or tap for the full solution

Q.92 The hypothetical complex chloro diaquatriammine cobalt(III) chloride can be represented as [AIPMT 2002]
(1) $[CoCl(NH_3)_3(H_2O)_2]Cl_2$
(2) $[Co(NH_3)_3(H_2O)Cl_3]$
(3) $[Co(NH_2)_3(H_2O)_2Cl]$
(4) $[Co(NH_3)_3(H_2O)_3]Cl_3$

Solution

Q.93 In the silver plating of copper, $K[Ag(CN)_2]$ is used instead of $AgNO_3$. The reason is [AIPMT 2002]
(1) a thin layer of Ag is formed on Cu
(2) more voltage is required
(3) Ag^+ ions are completely removed from solution
(4) less availability of Ag^+ ions, as Cu cannot displace Ag from $[Ag(CN)_2]^-$ ion.

Scan or tap for the full solution

Q.94 $CuSO_4$ when reacts with KCN forms CuCN, which is insoluble in water. It is soluble in excess of KCN, due to formation of the following complex [AIPMT 2002]
(1) $K_2[Cu(CN)_4]$ (2) $K_3[Cu(CN)_4]$
(3) $CuCN_2$ (4) $Cu[KCu(CN)_4]$

Scan or tap for the full solution

Q.95 Which of the following will give maximum number of isomers? [AIPMT 2001]

(1) $[Co(NH_3)_4Cl_2]$ (2) $[Ni(en)(NH_3)_4]^{2+}$
(3) $[Ni(C_2O_4)(en)_2]$ (4) $[Cr(SCN)_2(NH_3)_4]^+$

Scan or tap for the full solution

Q.96 Which of the following organometallic compounds is σ and π bonded? [AIPMT 2001]
(1) $[Fe(\eta^5 - C_5H_5)_2]$ (2) $K[PtCl_3(\eta^2 - C_2H_4)]$
(3) $[Co(CO)_5NH_3]^{2+}$ (4) $Fe(CH_3)_3$

Scan or tap for the full solution

Q.97 Which statement is incorrect? [AIPMT 2001]
(1) $Ni(CO)_4$ – tetrahedral, paramagnetic
(2) $[Ni(CN)_4]^{2-}$ – square planar, diamagnetic
(3) $Ni(CO)_4$ – tetrahedral, diamagnetic
(4) $[NiCl_4]^{2-}$ – tetrahedral, paramagnetic.

Scan or tap for the full solution

Q.98 Which of the following will exhibit maximum ionic conductivity? [AIPMT 2001]
(1) $K_4[Fe(CN)_6]$ (2) $[Co(NH_3)_6]Cl_3$
(3) $[Cu(NH_3)_4]Cl_2$ (4) $[Ni(CO)_4]$

Scan or tap for the full solution

Q.99 In qualitative analysis of second group in laboratory, H_2S gas is passed in acidic medium for precipitation. When Cu^{2+} and Cd^{2+} react with KCN, then for product, true statement is [AIPMT 2000]
(1) $K_2[Cu(CN)_4]$ – more stable; $K_2[Cd(CN)_4]$ – less stable
(2) $K_2[Cu(CN)_4]$ – less stable; $K_2[Cd(CN)_4]$ – more stable
(3) $K_3[Cu(CN)_4]$ – more stable; $K_2[Cd(CN)_4]$ – less stable
(4) $K_3[Cu(CN)_4]$ – less stable; $K_3[Cd(CN)_4]$ – more stable

Scan or tap for the full solution

Q.100 Shape of $Fe(CO)_5$ is [AIPMT 2000]
(1) octahedral (2) square planar
(3) trigonal bipyramidal (4) square pyramidal

Scan or tap for the full solution

Q.101 Which complex compound will give four isomers? [AIPMT 2000]
(1) $[Fe(en)_3]Cl_3$
(2) $[Co(en)(NH_3)_2Cl_2]Cl$
(3) $[Fe(PPh_3)_3NH_3ClBr]Cl$
(4) $[Co(PPh_3)_3Cl]Cl_3$

Solution

ANSWER KEY

Ques.	1	2	3	4	5	6	7
Ans.	**3**	**3**	**1**	**4**	**2**	**4**	**2**
Ques.	8	9	10	11	12	13	14
Ans.	**2**	**3, 4**	**1**	**4**	**1**	**1**	**1**
Ques.	15	16	17	18	19	20	21
Ans.	**1**	**1**	**4**	**4**	**2**	**4**	**3**
Ques.	22	23	24	25	26	27	28
Ans.	**4**	**4**	**2**	**1**	**4**	**2**	**1**
Ques.	29	30	31	32	33	34	35
Ans.	**1**	**2**	**2**	**1**	**2**	**4**	**2**
Ques.	36	37	38	39	40	41	42
Ans.	**1**	**2**	**2**	**4**	**3**	**4**	**2**
Ques.	43	44	45	46	47	48	49
Ans.	**3**	**3**	**2**	**2**	**3**	**2**	**3**
Ques.	50	51	52	53	54	55	56
Ans.	**2**	**3**	**2**	**3**	**2**	**2**	**3**
Ques.	57	58	59	60	61	62	63
Ans.	**1**	**3**	**1**	**2**	**3**	**1**	**3**
Ques.	64	65	66	67	68	69	70
Ans.	**1**	**2**	**1**	**4**	**2**	**3**	**1**
Ques.	71	72	73	74	75	76	77
Ans.	**2**	**1**	**1**	**2**	**2**	**4**	**3**
Ques.	78	79	80	81	82	83	84
Ans.	**3**	**2**	**3**	**4**	**2**	**2**	**2**
Ques.	85	86	87	88	89	90	91
Ans.	**1**	**2**	**1**	**3**	**3**	**4**	**4**
Ques.	92	93	94	95	96	97	98
Ans.	**1**	**4**	**2**	**4**	**3**	**1**	**1**
Ques.	99	100	101				
Ans.	**3**	**3**	**2**				