

JEE Main 2026 Coordination Compounds Solved Questions

1. Which of the following is the correct IUPAC name for $[\text{Cr}(\text{NH}_3)_3\text{Cl}_3][\text{Cr}(\text{NH}_3)_3\text{Cl}_3]$?

- A. Triamminetrichlorochromium(III)
- B. Amminechloro chromium(III) chloride
- C. Trichlorotriammine chromium(III)
- D. Triammine trichloride chromium(III)

Solution: According to IUPAC naming, ligands are named alphabetically: "ammine" then "chloro". Correct answer: Triammine trichlorochromium(III)

Answer: A

2. The complex $[\text{Fe}(\text{CN})_6]^{4-}-[\text{Fe}(\text{CN})_6]^{4-}$ has:

- A. d^2sp^3 hybridisation
- B. sp^3d^2 hybridisation
- C. sp^2d^4 hybridisation
- D. sp^3d^3 hybridisation

Solution: It is an inner orbital complex.

Answer: A

3. Which type of isomerism is shown by $[\text{Co}(\text{NH}_3)_5\text{Br}]\text{SO}_4$ and $[\text{Co}(\text{NH}_3)_5\text{SO}_4]\text{Br}$?

- A. Linkage isomerism
- B. Ionisation isomerism
- C. Coordination isomerism
- D. Geometrical isomerism

Solution: Exchange of counter ion and ligand.

Answer: B

4. The oxidation state of manganese in $[\text{MnO}_4]^-$ – $[\text{MnO}_4]^-$ is:

- A. +4
- B. +7
- C. +6
- D. +2

Solution: $\text{O} = -2$, so $\text{Mn} + x - 8 = -1 \Rightarrow x = +7$.

Answer: B

5. The effective atomic number (EAN) of Fe in $[\text{Fe}(\text{CN})_6]^{4-}$ – $[\text{Fe}(\text{CN})_6]^{4-}$ is:

- A. 34
- B. 36
- C. 38
- D. 35

Solution: Fe(II) : $26 - 2 = 24$, CN is a -1 ligand, six times = 12 e. $\text{EAN} = 24 + 12 = 36$.

Answer: B

6. Which of the following does NOT show optical isomerism?

- A. $[\text{Co}(\text{en})_3]^{3+}$ – $[\text{Co}(\text{en})_3]^{3+}$
- B. $[\text{Cr}(\text{ox})_3]^{3-}$ – $[\text{Cr}(\text{ox})_3]^{3-}$
- C. $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$ – $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$ (cis-form)
- D. $[\text{Co}(\text{NH}_3)_5\text{Cl}]^{2+}$ – $[\text{Co}(\text{NH}_3)_5\text{Cl}]^{2+}$

Solution: Only symmetrical complexes lacking chiral centers won't show optical isomerism.

Answer: D

7. Calculate the number of unpaired electrons in $[\text{Ni}(\text{CN})_4]^{2-}$.

Solution: Ni^{2+} is $3d^8$, CN^- is a strong field ligand, pairing occurs $\rightarrow$ 0 unpaired.

Answer: 0

8. $[\text{Cu}(\text{NH}_3)_4]^{2+}$ is colored because:

- A. It has unpaired electrons
- B. d-d transitions occur
- C. Charge transfer transitions
- D. Crystal field splitting

Solution: d-d transition is responsible for color.

Answer: B

9. Which will show the highest paramagnetism?

- A. $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$
- B. $[\text{Fe}(\text{CN})_6]^{3-}$
- C. $[\text{Co}(\text{NH}_3)_6]^{2+}$
- D. $[\text{Ni}(\text{CO})_4]$

Solution: Highest number of unpaired electrons: $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$

Answer: A

10. The geometry of $[\text{Ni}(\text{CO})_4]$ is:

- A. Tetrahedral
- B. Square planar
- C. Octahedral
- D. Trigonal bipyramidal



Solution: $[\text{Ni}(\text{CO})_4][\text{Ni}(\text{CO})_4]$ is a tetrahedral complex.

Answer: A
