

AIPMT 2006

1. Copper sulphate dissolves in excess of KCN to give
(1) $\text{Cu}(\text{CN})_2$ (2) CuCN
(3) $[\text{Cu}(\text{CN})_4]^{3-}$ (4) $[\text{Cu}(\text{CN})_4]^{2-}$
2. $[\text{Co}(\text{NH}_3)_4(\text{NO}_2)_2]\text{Cl}$ exhibits
(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

AIPMT 2007

3. Which of the following will give a pair of enantiomers
(1) $[\text{Cr}(\text{NH}_3)_6][\text{Co}(\text{CN})_6]$ (2) $[\text{Co}(\text{en})_2\text{Cl}_2]\text{Cl}$
(3) $[\text{Pt}(\text{NH}_3)_4][\text{PtCl}_6]$ (4) $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{NO}_2$
4. 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
(1) $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$ (2) $[\text{Ni}(\text{H}_2\text{O})_6]^{2+}$
(3) $[\text{Cr}(\text{H}_2\text{O})_6]^{2+}$ (4) $[\text{Mn}(\text{H}_2\text{O})_6]^{2+}$

AIPMT 2008

5. Which of the following complexes exhibits the highest paramagnetic behaviour? Where gly = glycine, en = ethylenediamine and bpy = bipyridyl (At. No. Ti = 22, V = 23, Fe = 26, Co = 27)
(1) $[\text{Co}(\text{OX})_2(\text{H}_2\text{O})_2]^-$ (2) $[\text{Ti}(\text{NH}_3)_6]^{3+}$
(3) $[\text{V}(\text{gly})_2(\text{OH})_2(\text{NH}_3)_2]^+$ (4) $[\text{Fe}(\text{en})(\text{bpy})(\text{NH}_3)_2]^{2+}$
6. In which of the following coordination entities the magnitude of Δ_o (CFSE in octahedral field) will be maximum?
(1) $[\text{Co}(\text{CN})_6]^{3-}$ (2) $[\text{Co}(\text{C}_2\text{O}_4)_3]^{3-}$
(3) $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$ (4) $[\text{Co}(\text{NH}_3)_6]^{3+}$

AIPMT 2009

7. Which of the following complex ions is expected to absorb visible light?
(1) $[\text{Zn}(\text{NH}_3)_6]^{2+}$ (2) $[\text{Sc}(\text{H}_2\text{O})_3(\text{NH}_3)_3]^{3+}$
(3) $[\text{Ti}(\text{en})_2(\text{NH}_3)_2]^{4+}$ (4) $[\text{Cr}(\text{NH}_3)_6]^{3+}$

8. Out of TiF_6^{2-} , CoF_6^{3-} , Cu_2Cl_2 and NiCl_4^{2-} colourless species are :
(1) CoF_6^{3-} and NiCl_4^{2-} (2) TiF_6^{2-} and CoF_6^{2-}
(3) Cu_2Cl_2 and NiCl_4^{2-} (4) TiF_6^{2-} and Cu_2Cl_2
9. Which of the following does not show optical isomerism?
(1) $[\text{Co}(\text{en})_3]^{3+}$ (2) $[\text{Co}(\text{en})_2\text{Cl}_2]^+$
(3) $[\text{Co}(\text{NH}_3)_3\text{Cl}_3]^0$ (4) $[\text{Co}(\text{en})\text{Cl}_2(\text{NH}_3)_2]^+$
10. Which one of the following complexes is **not** expected to exhibit isomerism :-
(1) $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$ (2) $[\text{NiCl}_4]^{2-}$
(3) $[\text{Ni}(\text{en})_3]^{2+}$ (4) $[\text{Ni}(\text{NH}_3)_4(\text{H}_2\text{O})_2]^{2+}$

AIPMT 2010

11. Which of the following complex ion is not expected to absorb visible light?
(1) $[\text{Ni}(\text{H}_2\text{O})_6]^{2+}$ (2) $[\text{Ni}(\text{CN})_4]^{2-}$
(3) $[\text{Cr}(\text{NH}_3)_6]^{3+}$ (4) $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$
12. The existence of two different coloured complexes with the composition of $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$ is due to:-
(1) Ionization isomerism
(2) Linkage isomerism
(3) Geometrical isomerism
(4) Coordination isomerism

13. Crystal field stabilization energy for high spin d^4 octahedral complex is :-
(1) $-0.6 \Delta_o$ (2) $-1.8 \Delta_o$
(3) $-1.6 \Delta_o + P$ (4) $-1.2 \Delta_o$

AIPMT Pre. 2011

14. Of the following complex ions, which is diamagnetic in nature?
(1) $[\text{NiCl}_4]^{2-}$ (2) $[\text{Ni}(\text{CN})_4]^{2-}$
(3) $[\text{CuCl}_4]^{2-}$ (4) $[\text{CoF}_6]^{3-}$
15. The complex $[\text{Co}(\text{NH}_3)_6][\text{Cr}(\text{CN})_6]$ and $[\text{Cr}(\text{NH}_3)_6][\text{Co}(\text{CN})_6]$ are the examples of which type of isomerism?
(1) Linkage isomerism
(2) Ionization isomerism
(3) Coordination isomersim
(4) Geometrical isomerism

16. The complex $[\text{Pt}(\text{Py})(\text{NH}_3)\text{BrCl}]$ will have how many geometrical isomers ?
 (1) 3 (2) 4 (3) 0 (4) 2

AIPMT Mains 2011

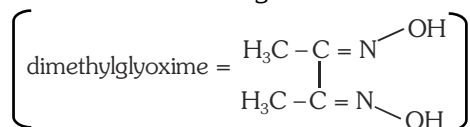
17. Which of the following carbonyls will have the strongest C–O bond ?
 (1) $[\text{Fe}(\text{CO})_5]$ (2) $[\text{Mn}(\text{CO})_6]^+$
 (3) $[\text{Cr}(\text{CO})_6]$ (4) $[\text{V}(\text{CO})_6]^-$
18. Which of the following complex compounds will exhibit highest paramagnetic behaviour :-
 (At. No. Ti = 22, Cr = 24, Co = 27, Zn = 30)
 (1) $[\text{Zn}(\text{NH}_3)_6]^{2+}$ (2) $[\text{Ti}(\text{NH}_3)_6]^{3+}$
 (3) $[\text{Cr}(\text{NH}_3)_6]^{3+}$ (4) $[\text{Co}(\text{NH}_3)_6]^{3+}$

AIPMT Pre. 2012

19. Which one of the following is an outer orbital complex and exhibits paramagnetic behaviour?
 (1) $[\text{Cr}(\text{NH}_3)_6]^{3+}$ (2) $[\text{Co}(\text{NH}_3)_6]^{3+}$
 (3) $[\text{Ni}(\text{NH}_3)_6]^{2+}$ (4) $[\text{Zn}(\text{NH}_3)_6]^{2+}$

AIPMT Mains 2012

20. Red precipitate is obtained when ethanol solution of dimethylglyoxime is added to ammoniacal Ni(II). Which of the following statements is not true ?



- (1) Red complex has a tetrahedral geometry.
 (2) Dimethylglyoxime functions as bidentate ligand.
 (3) Red complex has a square planar geometry.
 (4) Complex has symmetrical H-bonding.
21. Low spin complex of d^6 -cation in an octahedral field will have the following energy :-
 (Δ_0 = Crystal field splitting energy in an octahedral field, P = Electron pairing energy)
 (1) $\frac{-2}{5} \Delta_0 + 2P$ (2) $\frac{-2}{5} \Delta_0 + P$
 (3) $\frac{-12}{5} \Delta_0 + P$ (4) $\frac{-12}{5} \Delta_0 + 3P$

NEET-UG 2013

22. A magnetic moment of 1.73 BM will be shown by one among the following :-
 (1) $[\text{CoCl}_6]^{4-}$ (2) $[\text{Cu}(\text{NH}_3)_4]^{2+}$
 (3) $[\text{Ni}(\text{CN})_4]^{2-}$ (4) TiCl_4

AIPMT 2014

23. Which of the following complexes is used to be as an anticancer agent?
 (1) $\text{mer-}[\text{Co}(\text{NH}_3)_3\text{Cl}_3]$ (2) $\text{cis-}[\text{PtCl}_2(\text{NH}_3)_2]$
 (3) $\text{cis-K}_2[\text{PtCl}_2\text{Br}_2]$ (4) Na_2CoCl_4

AIPMT 2015

24. Cobalt (III) chloride forms several octahedral complexes with ammonia. Which of the following will not give test of chloride ions with silver nitrate at 25°C ?
 (1) $\text{CoCl}_3 \cdot 4\text{NH}_3$ (2) $\text{CoCl}_3 \cdot 5\text{NH}_3$
 (3) $\text{CoCl}_3 \cdot 6\text{NH}_3$ (4) $\text{CoCl}_3 \cdot 3\text{NH}_3$
25. Which of these statements about $[\text{Co}(\text{CN})_6]^{3-}$ is true:-
 (1) $[\text{Co}(\text{CN})_6]^{3-}$ has four unpaired electrons and will be in a low-spin configuration.
 (2) $[\text{Co}(\text{CN})_6]^{3-}$ has four unpaired electrons and will be in a high spin configuration.
 (3) $[\text{Co}(\text{CN})_6]^{3-}$ has no unpaired electrons and will be in a high-spin configuration.
 (4) $[\text{Co}(\text{CN})_6]^{3-}$ has no unpaired electrons and will be in a low-spin configuration.

Re-AIPMT 2015

26. The name of complex ion, $[\text{Fe}(\text{CN})_6]^{3-}$ is :-
 (1) Tricyanoferrate (III) ion
 (2) Hexacyanidoferrate (III) ion
 (3) Hexacyanoiron (III) ion
 (4) Hexacyanitoferrate (III) ion
27. The hybridization involved in complex $[\text{Ni}(\text{CN})_4]^{2-}$ is (At.No. Ni = 28)
 (1) d^2sp^2 (2) d^2sp^3 (3) dsp^2 (4) sp^3
28. The sum of coordination number and oxidation number of the metal M in the complex $[\text{M}(\text{en})_2(\text{C}_2\text{O}_4)]\text{Cl}$ (where en is ethylenediamine) is:-
 (1) 7 (2) 8 (3) 9 (4) 6
29. Number of possible isomers for the complex $[\text{Co}(\text{en})_2\text{Cl}_2]\text{Cl}$ will be : (en = ethylenediamine)
 (1) 3 (2) 4 (3) 2 (4) 1

NEET-I 2016

30. Which of the following has longest C–O bond length? (Free C–O bond length in CO is 1.128\AA).
 (1) $\text{Ni}(\text{CO})_4$ (2) $[\text{Co}(\text{CO})_4]^\ominus$
 (3) $[\text{Fe}(\text{CO})_4]^{2-}$ (4) $[\text{Mn}(\text{CO})_6]^+$

NEET-II 2016

31. The correct increasing order of trans-effect of the following species is :
- (1) $\text{Br}^- > \text{CN}^- > \text{NH}_3 > \text{C}_6\text{H}_5^-$
 - (2) $\text{CN}^- > \text{Br}^- > \text{C}_6\text{H}_5^- > \text{NH}_3$
 - (3) $\text{NH}_3 > \text{CN}^- > \text{Br}^- > \text{C}_6\text{H}_5^-$
 - (4) $\text{CN}^- > \text{C}_6\text{H}_5^- > \text{Br}^- > \text{NH}_3$
32. Jahn-Teller effect **not** observed in high spin complexes of :-
- (1) d^4
 - (2) d^9
 - (3) d^7
 - (4) d^8

NEET(UG) 2017

33. An example of a sigma bonded organometallic compound is :
- (1) Grignard's reagent
 - (2) Ferrocene
 - (3) Cobaltocene
 - (4) Ruthenocene
34. Pick out the correct statement with respect to $[\text{Mn}(\text{CN})_6]^{3-}$:-
- (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

35.

Correct increasing order for the wavelengths of absorption in the visible region the complexes of Co^{3+} is :-

- (1) $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$, $[\text{Co}(\text{en})_3]^{3+}$, $[\text{Co}(\text{NH}_3)_6]^{3+}$
- (2) $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$, $[\text{Co}(\text{NH}_3)_6]^{3+}$, $[\text{Co}(\text{en})_3]^{3+}$
- (3) $[\text{Co}(\text{NH}_3)_6]^{3+}$, $[\text{Co}(\text{en})_3]^{3+}$, $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$
- (4) $[\text{Co}(\text{en})_3]^{3+}$, $[\text{Co}(\text{NH}_3)_6]^{3+}$, $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$

NEET(UG) 2018

36. The type of isomerism shown by the complex $[\text{CoCl}_2(\text{en})_2]$ is
- (1) Geometrical isomerism
 - (2) Coordination isomerism
 - (3) Ionization isomerism
 - (4) Linkage isomerism

37. The geometry and magnetic behaviour of the complex $[\text{Ni}(\text{CO})_4]$ are
- (1) square planar geometry and diamagnetic
 - (2) tetrahedral geometry and diamagnetic
 - (3) square planar geometry and paramagnetic
 - (4) tetrahedral geometry and paramagnetic
38. Iron carbonyl, $\text{Fe}(\text{CO})_5$ is
- (1) tetranuclear
 - (2) mononuclear
 - (3) trinuclear
 - (4) dinuclear

NEET(UG) 2019

39. What is the **correct** electronic configuration of the central atom in $\text{K}_4[\text{Fe}(\text{CN})_6]$ based on crystal field theory ?
- (1) $t_{2g}^4 e_g^2$
 - (2) $t_{2g}^6 e_g^0$
 - (3) $e^3 t_2^3$
 - (4) $e^4 t_2^2$

NEET(UG) 2019 (ODISHA)

40. The Crystal Field Stabilisation Energy (CFSE) for $[\text{CoCl}_6]^{4-}$ is 18000 cm^{-1} . The CFSE for $[\text{CoCl}_4]^{2-}$ will be-
- (1) 6000 cm^{-1}
 - (2) 16000 cm^{-1}
 - (3) 18000 cm^{-1}
 - (4) 8000 cm^{-1}

NEET(UG) 2020

41. Which of the following is the correct order of increasing field strength of ligands to form coordination compounds ?
- (1) $\text{CN}^- < \text{C}_2\text{O}_4^{2-} < \text{SCN}^- < \text{F}^-$
 - (2) $\text{SCN}^- < \text{F}^- < \text{C}_2\text{O}_4^{2-} < \text{CN}^-$
 - (3) $\text{SCN}^- < \text{F}^- < \text{CN}^- < \text{C}_2\text{O}_4^{2-}$
 - (4) $\text{F}^- < \text{SCN}^- < \text{C}_2\text{O}_4^{2-} < \text{CN}^-$
42. Urea reacts with water to form A which will decompose to form B. B when passed through $\text{Cu}^{2+}(\text{aq})$, deep blue colour solution C is formed. What is the formula of C from the following ?
- (1) $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$
 - (2) CuSO_4
 - (3) $[\text{Cu}(\text{NH}_3)_4]^{2+}$
 - (4) $\text{Cu}(\text{OH})_2$

NEET(UG) 2021

- 43.** Ethylene diaminetetraacetate (EDTA) ion is:
- (1) Hexadentate ligand with four "O" and two "N" donor atoms
 - (2) Unidentate ligand
 - (3) Bidentate ligand with two "N" donor atoms
 - (4) Tridentate ligand with three "N" donor atoms

- 44.** Match List-I with List-II

List-I		List-II	
(a)	$[\text{Fe}(\text{CN})_6]^{3-}$	(i)	5.92 BM
(b)	$[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$	(ii)	0 BM
(c)	$[\text{Fe}(\text{CN})_6]^{4-}$	(iii)	4.90 BM
(d)	$[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$	(iv)	1.73 BM

Choose the **correct** answer from the options given below

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

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	3	3	2	2	2	1	4	4	3	2	2	3	1	2	3
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	1	2	3	3	1	4	2	2	4	4	2	3	3	1	3
Que.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	
Ans.	4	4	1	2	4	1	2	2	2	4	2	3	1	4	