



CHEMISTRY

BOOKS - DISHA CHEMISTRY (HINGLISH)

COORDINATION COMPOUNDS

Mcq

1. The compounds $[PtCl_2(NH_3)_4]Br_2$ and $[PtBr_2(NH_3)_4]Cl_2$ constitutes a pair of

- A. coordination isomers
- B. linkage isomers
- C. ionization isomers
- D. optical isomers

Answer: C



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2. Which of the following species is not expected to be a ligand?

A. NO

B. NO_4^+

C. $NH_2CH_2CH_2NH_2$

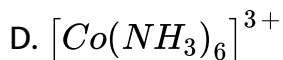
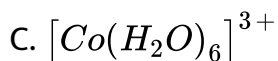
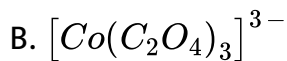
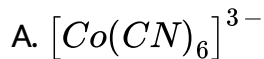
D. both (a) and (b)

Answer: B



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3. In which of the following complexes of the Co (At. no. 27), will the magnitude of Δ_a be the highest ?

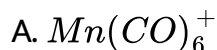


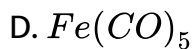
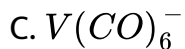
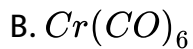
Answer: A



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4. Which of the following carbonyls will have the strongest C-O bond ?



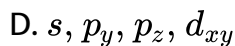
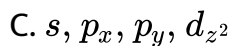
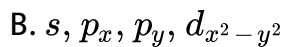
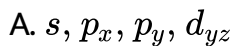


Answer: A



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5. A square planar complex is formed by hybridisation of which atomic orbitals?



Answer: B



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6. The type of isomerism present in Pentamminenitrochromium (IU) chloride is

- A. optical
- B. linkage isomers
- C. ionisation
- D. polymerisation

Answer: B



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7. In the silver plating of copper, $K[Ag(CN)_2]$ is used instead of $AgNO_3$. The reason is

- A. a thin layer of Ag is formed on Cu
- B. more voltage is required
- C. Ag^+ ions are completely removed from solution
- D. less availability of Ag^+ ions, as Cu cannot displace Ag, from $[Ag(CN)_2]^-$ ion.

Answer: D

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8. The spin only magnetic moment value (in Bohr magneton units) of $Cr(CO)_6$ is

- A. 0
- B. 2.84
- C. 4.9

D. 5.92

Answer: A



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9. Low spin complex of d^6 -cation in an octahedral field will have the following energy:

A. $\frac{-12}{5} \Delta_0 + P$

B. $\frac{-12}{5} \Delta_0 + 3P$

C. $\frac{-2}{5} \Delta_0 + 2P$

D. $\frac{-2}{5} \Delta_0 + P$

Answer: B



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10. An example of double salt is

A. Bleaching powder

B. $K_4[Fe(CN)_6]$

C. Hypo

D. Potash alum

Answer: D



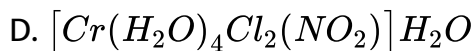
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11. The ionisation isomer of $[Cr(H_2O)_4Cl(NO_2)]Cl$ is

A. $Cr(H_2O)_4(O_2N)]Cl_2$

B. $[Cr(H_2O)_4Cl_2](NO_2)$

C. $[Cr(H_2O)_4Cl(ONO)]Cl$



Answer: B



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12. $[Co(NH_3)_4(NO_2)_2]Cl$ exhibits.

A. linkage isomerism, ionization isomerism and geometrical isomerism

B. ionization isomerism, geometrical isomerism and optical isomerism

C. linkage isomerism, geometrical isomerism and optical isomerism

D. linkage isomerism, ionization isomerism and optical isomerism

Answer: A



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13. The IUPAC name of $K_3[Ir(C_2O_4)_3]$ is

- A. potassimn trioxalatoiridium (III)
- B. potassimn trioxalatoiridate (III)
- C. potassium tris (oxalato) iridium (III)
- D. potassium tris (oxalato) iridate (III)

Answer: B



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14. Consider the following complex $[Co(NH_3)_5, CO_3]ClO_4$. The coordination number, oxidation number, number of d-electrons and number of unpaired d-electrons on the metal are respectively.

A. 6,3,6,0

B. 7,2,7,1

C. 7,1,6,4

D. 6,2,7,3

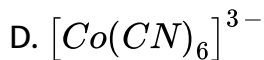
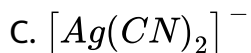
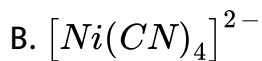
Answer: A



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15. Which of the following species represent the example of dsp^2 -hybridisation?

A. $[Fe(CN)_6]^{3-}$



Answer: B



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16. When $AgNO_3$ is added to a solution of $Co(NH_3)_5Cl_3$, the precipitate of $AgCl$ shows two ionisable chloride ions. This means:

A. Two chlorine atoms satisfy primary valency and one secondary valency

B. One chlorine atom satisfies primary as well as secondary valency

C. Three chlorine atoms satisfy primary valency

D. Three chlorine atoms satisfy secondary valency

Answer: A



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17. The value of the 'spin only' magnetic moment for one of the following configurations is 2.82 B.M. The correct one is

A. d^5 (in strong ligand field)

B. d^3 (in weak as well as in strong fields)

C. d^4 (in weak ligand fields)

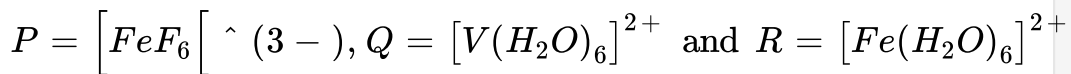
D. d^4 (in strong ligand fields)

Answer: D



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18. Consider the following complex ions, P, Q and R.



The correct order of the complex ions, according to their spin-only magnetic moment values (in B.M.) is

A. $R < Q < P$

B. $Q < R < P$

C. $R < P < Q$

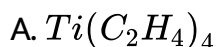
D. $Q < P < R$

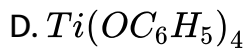
Answer: B



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19. Which of the following is organo-metallic compound?





Answer: A



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20. Which of the following statements is correct ? (Atomic number of Ni = 28)

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

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

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

$[Ni(CN)_4]^{2-}$ is paramagnetic

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

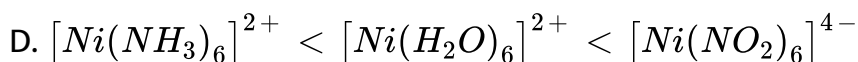
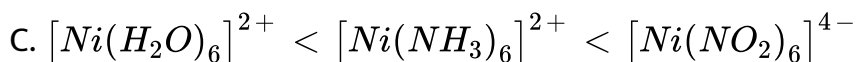
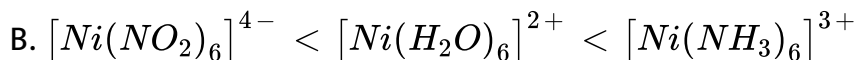
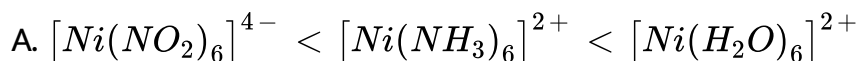
$Ni(CO)_4$ is paramagnetic.

Answer: B



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21. The correct order for the wavelength of absorption in the visible region is :

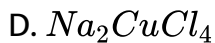
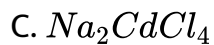
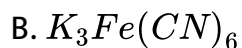
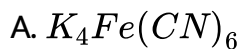


Answer: A



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22. The compounds which is not coloured is



Answer: C



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23. Which is not π -bonded complex?

- A. Zeisc's salt
- B. Ferrocene
- C. Dibenzene chromium
- D. Tetraethyl lead

Answer: D

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24. Which of the following are inner orbital complex (i.e., involving d^2sp^3 hybridisation) and is paramagnetic in nature?

- A. $[Mn(CN)_6]^{3-}$, $[Fe(CN)_6]^{3-}$, $[Co(C_2O_4)_3]^{3-}$
- B. $[MnCl_6]^{3-}$, $[FeF_6]^{3-}$, $[CoF_6]^{3-}$
- C. $[Mn(CN)_6]^{3-}$, $[Fe(CN)_6]^{3-}$
- D. $[MnCl_6]^{3-}$, $[Fe(CN)_6]^{3-}$, $[Co(C_2O_4)_3]^{3-}$

Answer: C

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25. Give name of the complex, name should specify the position of ligands.



- A. bistransphosphinecarbonylchloroiridium (II)
- B. carbonylchlorobistransphosphineiridium (III)
- C. carbonylchlorobistransphosphineiridium (I)
- D. chlorocarbonylbistransphosphineiridium (I)

Answer: C

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26. Which of the following coordination compounds would exhibit optical isomerism?

- A. pentamminenitrocobalt(III) iodide
- B. diamminedichloroplatinum(II)
- C. trans-dicyanobis (ethylenediamine) chromium (III) chloride
- D. tris-(ethylenediamine) cobalt (III) bromide

Answer: D



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27. 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

- A. 0.002

B. 0.003

C. 0.01

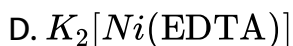
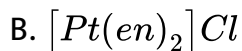
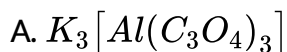
D. 0.01

Answer: D



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28. The most stable complex among the following

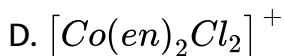
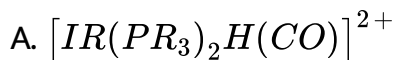


Answer: D



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29. Which one of the following has largest number of isomers ?



Answer: D



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30. Which of the following statements related to crystal field splitting in octahedral coordination entities is incorrect?

- A. The $d_x^2 - d_y^2$ and d_z^2 orbitals has more energy is compared to d_{xy} , d_{yz} and d_{xz} orbitals.
- B. Crystal field splitting energy (Δ_o) depends directly on the charge of the metal ion and on the field produced by the ligand.
- C. In the presence of Br^- as a ligand the distribution of electrons for d^4 configuration will be t_2^3g, e_g^1 ,
- D. In the presence of CN^- as a ligand $\Delta_o < P$.

Answer: D



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31. Calculate the value of $\log K_3$ when \log values of K_2 , K_1 , K_4 and K_4 respectively are 2.0, 3.20, 4.0 and 11.9 ?

A. 2.0

B. 2.7

C. 3

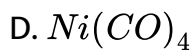
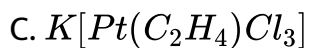
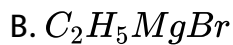
D. 2.5

Answer: B



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32. Which of the following does not have a metal-carbon bond?



Answer: A



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33. In $Fe(CO)_5$, the Fe-C bond possesses

- A. ionic character
- B. σ -character only
- C. π -character
- D. both σ and π character

Answer: D



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34. The geometry of $Ni(CO)_4$ and $Ni(PPh_3)_2Cl_2$ are

- A. both squar eplanar
- B. tetrahedral and square planar
- C. both tetrahedral
- D. none of these

Answer: C



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35. The crystal field splitting energy for octahedral (Δ_0) and tetrahedral (Δ_1) complexes is related as

A. $\Delta_t = -\frac{1}{2}\Delta_0$

B. $\Delta_t = -\frac{4}{9}\Delta_0$

C. $\Delta_t = -\frac{3}{5}\Delta_0$

D. $\Delta_t = -\frac{2}{5}\Delta_0$

Answer: B



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36. Match the columns



- A. A-VI, B-VI, C-I : D-II, E-III
- B. A-II, B-IV, C-I, D-VI, E-III
- C. A-II: B-IV, C-I, D-VI, E-V
- D. A-VI, B-IV, C-I, D-II, E-V

Answer: A



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37. If magnetic moment of $[MnBr_4]^{2-}$ is 5.9 BM. Predict the number of electrons?

A. 2

B. 3

C. 6

D. 5

Answer: D



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38. The correct structure of ethylenediaminetetraacetic acid (EDTA) is

A. 

B. 

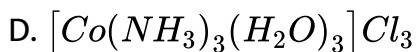
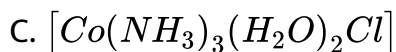
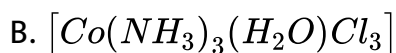
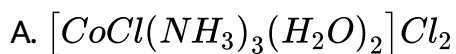
C. 

D. 

Answer: C

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39. The hypothetical complex chloro-diaquatrimmincobalt (III) chloride can be represented as

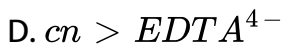
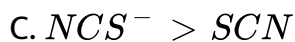
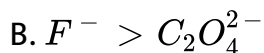
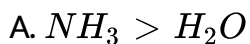


Answer: A



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40. Which of the following is incorrect regarding spectrochemical series?



Answer: B



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41. Which of the following is the limitation of crystal field theory?

(i) Ligands are assumed as point charges. (ii) It does not accounts

for the covalent character of bonding between the ligand and the central atom. (iii) It does not explain how colour of coordination compounds depends on ligand attached to central metal atom/ion

- A. (i) and (ii)
- B. (ii) and (iii)
- C. (ii) only
- D. (i), (ii) and (iii)

Answer: A



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42. For $[Co_2(CO)_8]$, what is the total number of metal-carbon bonds and number of metal-metal bonds.

- A. 10,1

B. 8,2

C. 8,1

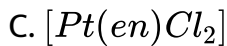
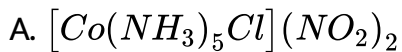
D. 10,0

Answer: A



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43. Which will give a white precipitate with AgNO_3 in aqueous solution



Answer: B



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44. $[NiCl_2\{P(C_2H_5)_2(C_6H_5)\}_2]$ exhibits temperature dependent magnetic behaviour (paramagnetic/diamagnetic). The coordination geometries of Ni^{2+} in the paramagnetic and diamagnetic states are respectively

- A. tetrahedral and tetrahedral
- B. square planar and square planar
- C. tetrahedral and square planar
- D. square planar and tetrahedral

Answer: C



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45. Which one of the following coordination compounds is used to inhibit the growth of tumours?

- A. Trans-platin
- B. EDTA complex of calcium
- C. $[(Ph_3P)_3RbCl]$
- D. Cis-platin

Answer: D



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