



## CHEMISTRY

### JEE MAIN AND ADVANCED

#### Mock test 27

#### Example

1. The coordination number of a metal in coordination compound is

A. Same as primary valency

B. Sum of primary and secondary valencies

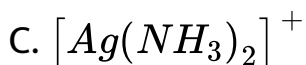
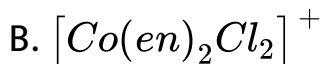
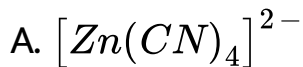
C. Same as secondary valency

D. Twice the primary valency

**Answer: C**

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2. Which of the following complexes has six coordination number?



**Answer: B**



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**3.** Which of the following ligands forms chelate with metal ion?

A. Acetate

B. Oxalate

C. Cyanide

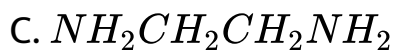
D. Ammonia

**Answer: B**



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4. An example of ambidentate ligand is



**Answer: B**



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5. When two moles of  $[Co(NH_3)_5Cl]Cl_2$  is treated with excess silver nitrate solution, the number of moles of

silver chloride formed is

A. 3

B. 6

C. 4

D. 2

**Answer: C**



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6. In solution, the complex,  $[Pt(NH_3)_6]Cl_4$  gives

A. 4 ions

B. 3 ions

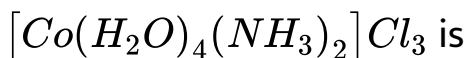
C. 2 ions

D. 5 ions

**Answer: D**

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7. As per IUPAC nomenclature, the name of the complex,



A. Tetraaquadiaminecobalt (III) chloride

B. Tetraaquadiammincobalt (III) chloride

C. Diaminetetraaquacobalt (III) chloride

D. Diamminetetraaquacobalt (III) chloride

**Answer: D**

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8. The IUPAC name of  $[Ni(NH_3)_4][NiCl_4]$  is

- A. Tetrachloridonickel (II) tetraamminenickel (II)
- B. tetraamminenickel (II) Tetrachloridonickel (II)
- C. tetraamminenickel (II) Tetrachloridonickelate (II)
- D. tetraamminenickel (IV) Tetrachloridonickelate (IV)

**Answer: C**

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9. The ionization isomer of  $[Cr(H_2O)_4Cl(NO_2)]Cl$  is

- A.  $[Cr(H_2O)_4(NO_2)]Cl_2$
- B.  $[Cr(H_2O)_4Cl_2]NO_2$
- C.  $[Cr(H_2O)_4Cl(ONO)]Cl$
- D.  $[Cr(H_2O)_3Cl_2(NO_2)]H_2O$

**Answer: B**



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10. The primary valence of the metal ion in the coordination compound  $K_2[Ni(CN)_4]$  is

- A. Four



B. Zero

C. Two

D. Six

**Answer: C**



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**11.** Which among the following is a polydentate ligand?

A. Oxalate

B. Ethane-1, 2-diamine

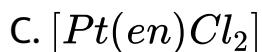
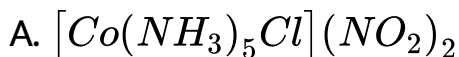
C.  $EDTA^{4-}$

D.  $SCN^-$

**Answer: C**

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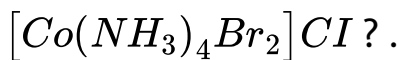
12. Which one of the following will give a white precipitate with  $AgNO_3$  in aqueous medium



**Answer: D**

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13. Which kind of isomerism is exhibited by octahedral



A. Geometrical and ionization

B. Geometrical and optical

C. Optical and ionization

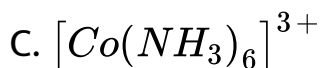
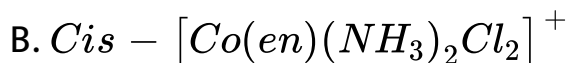
D. Only geometrical

**Answer: A**



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14. The optically active co-ordination complex ion among the following is



**Answer: B**



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15. The number of possible isomers of a square planar complex,  $[mabcd]$  is/are

A. 4

B. 3

C. 2

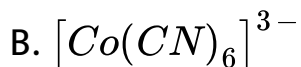
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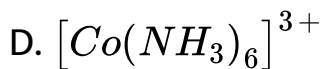
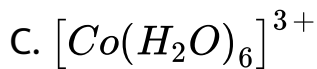
**Answer: B**



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**16.** The complex ion having minimum magnitude of  $\Delta_o$  (CFSE) in octahedral field is





**Answer: A**

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17. The number of unpaired electrons in central metal of cobalt ferrocyanide,  $Co_2[Fe(CN)_6]$  is

A. 0

B. 2

C. 1

D. 3

**Answer: A**

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**18.** Geometrical shapes of the complexes formed by the reaction of  $Ni^{2+}$  with  $Cl^-$ , and  $CN^-$ , respectively are

- A. Octahedral, tetrahegral and square planar
- B. Tetrahegral, Octahedral and square planar
- C. Square planar, tetrahegral and octahedral
- D. Octahedral, square planar and tetrahegral

**Answer: B**

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19. The compound which does not show paramagnetism is



**Answer: B**



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20. The shape of  $[Cu(NH_3)_4]^{2+}$  is  planar,  $Cu^{(2+)}$  in this complex is

- A.  $sp^3$  hybridised
- B.  $dsp^2$  hybridised
- C.  $sp^3d$  hybridised
- D.  $sp^3d^2$  hybridised

**Answer: B**

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21. What is the geometrical shape of complex and hybridisation of central metal in  $[Fe(CO)_5]$  ?

A. Tetrahedral,  $sp^3$

B. Square planar,  $dsp^2$

C. Trigonal bipyramidal,  $dsp^3$

D. Trigonal bipyramidal,  $sp^3d$

**Answer: C**



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**22.** Out of the following, choose a correct statement.

A.  $[\text{Cu}(\text{NH}_3)_6]^{2+}$  is a colourless ion

B.  $[\text{Zn}(\text{H}_2\text{O})_6]^{2+}$  ion is blue coloured

C.  $[\text{Ni}(\text{CO})_4]$  ion has a square planar shape

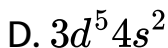
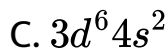
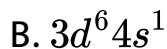
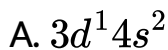
D. If  $[CoCl(NH_3)_5]^{2+}$  absorbs yellow colour of light,

then the colour of this coordination entity is violet.

**Answer: D**

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**23.** The magnetic moment of a transition metal of 3d series is  $\sqrt{48}$  B.M. Its electronic configuration is



**Answer: B**

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24. Crystal field stabilization energy for high spin  $d^4$  octahedral complex is

A.  $-0.6 \Delta_o$

B.  $-1.8 \Delta_o$

C.  $-1.6 \Delta_o$

D.  $-1.2 \Delta_o$

**Answer: A**

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25. High spin complex of  $d^6$  configuration in an octahedral field will have the CFSE equal to

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

B.  $\frac{-14}{5} \Delta_0$

C.  $\frac{-41}{5} \Delta_0$

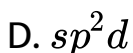
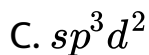
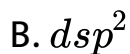
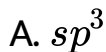
D.  $\frac{-2}{5} \Delta_0$

**Answer: D**



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26. The hybridized state of  $Al^{3+}$  in the complex ion formed when  $AlCl_3$  is treated with aqueous acid is

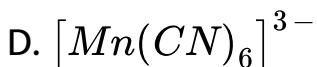
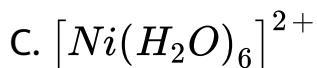
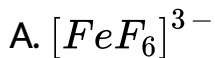


**Answer: C**



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27. Which of the following complexes is an inner orbital complex ?

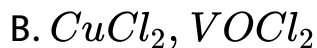
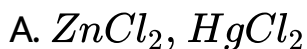


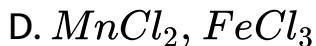
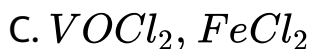
**Answer: D**



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**28.** Which of the following pairs does not exhibit colour in solution ?

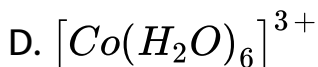
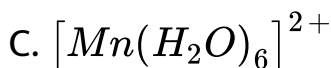
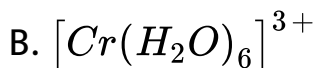
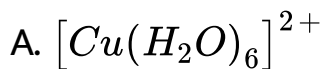




**Answer: A**

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**29.** Which of the following complexes will show jahn-Teller distortion?





**Answer: A**



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**30.** Out of the following, choose a correct expression for finding out the crystal field stabilization energy in tetrahedral coordination entities.

A.  $\frac{4}{9} \Delta_{tet}$

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B.  $\frac{3}{5} \Delta_{tet}$

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C.  $\frac{2}{5} \Delta_{tet}$

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D. (## AAK\_MCP\_27\_NEET\_CHE\_E27\_030\_A004 .png"

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**Answer: C**



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**31. The homoleptic complex is**

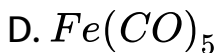
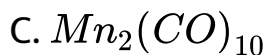
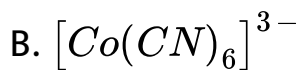
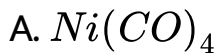


**Answer: B**



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32. Which of the following is not a metal carbonyl?

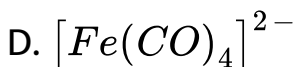
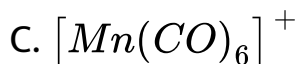
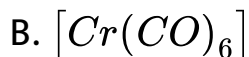
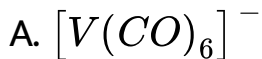


**Answer: B**



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33. In which of the following carbonyls, the bond length of CO is the highest ?



**Answer: D**



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34. The number of bridging CO groups in  $[Co_2(CO)_8]$  and  $[Fe(CO)_5]$  are respectively

A. 2, 0

B. 1, 1

C. 1, 0

D. 2, 1

**Answer: A**



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**35.** The addition of four amine groups to a metal ion ( $X^{2+}$ ) shows a stability constants of  $2 \cdot 10^4$ ,  $1.5 \cdot 10^3$ ,  $1.2 \cdot 10^2$  and  $1.4 \cdot 10^1$  respectively. Then, the overall complex dissociation equilibrium constant for  $[X(NH_3)_4]^{2+}$  ion is

A.  $5.04 \times 10^{-10}$

B.  $19.8 \times 10^{-10}$

C.  $1.98 \times 10^{-11}$

D.  $50.4 \times 10^{-9}$

**Answer: C**



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**36.** Excess of copper and iron are removed mainly by which of the following chelating ligands via formation of coordination compounds?

A. Desferrioxime-B and EDTA respectively

B. EDTA and D-penicillamine respectively

C. Desferrioxime-B and D-penicillamine respectively

D. D-penicillamine and Desferrioxime B-respectively

**Answer: D**

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**37.** Ethylidene chloride is a/an

A. Gem-dihalide

B. Allylic halide

C. Vinylic halide

D. Vic-dihalide

**Answer: A**

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**38.** Which of the following will not lead to the formation of an alkyl halide?

A. 

B. 

C. 

D. 

**Answer: D**

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39.  $\text{F}_3\text{C}-\text{CH}=\text{CH}_2$   $\xrightarrow{\text{HBr}}$  (A)  $\xrightarrow{\text{NaI}}$

$\xrightarrow{\text{dry acetone}}$  (B) `

A.  $\text{F}_3\text{C}-\text{CH}(\text{Br})-\text{CH}_3$  and  $\text{F}_3\text{C}-\text{CH}(\text{I})-\text{CH}_3$

B.  $\text{F}_3\text{C}-\text{CH}_2-\text{CH}_2\text{Br}$  and  $\text{F}_3\text{C}-\text{CH}_2-\text{CH}_2\text{I}$

C.  $\text{BrF}_2\text{C}-\text{CH}=\text{CH}_2$  and  $\text{IF}_2\text{C}-\text{CH}=\text{CH}_2$

D.

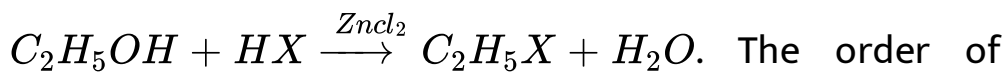
$\text{BrF}_2\text{C}-\text{CH}_2-\text{CH}_2\text{Br}$  and  $\text{IF}_2\text{C}-\text{CH}_2-\text{CH}_2\text{I}$

**Answer: B**



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40. In the reaction



The order of reactivity of HX is

A.  $I > HBr > HCl$

B.  $HCl > HBr > HI$

C.  $HCl > HI > HBr$

D.  $HBr > HI > HCl$

**Answer: A**



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41.  $\text{CH}_3\text{-C}=\text{CH} + \text{Br}_2 \xrightarrow{\text{Ccl}_4}$  (A) The product (A) is

A.  .png"

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B.  .png"

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C.  .png"

width="30%">

D.  $\text{CH}_3 - \text{CH}_2 - \text{CHBr}_2$

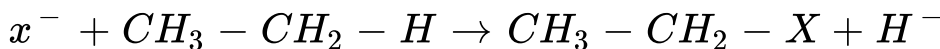
**Answer: B**



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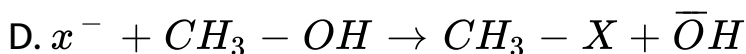
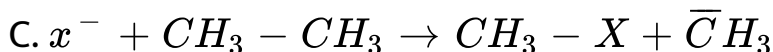
42. Among the following halide ions ( $X^-$ ) reaction, which is feasible is?

A.



B. (## AAK\_MCP\_27\_NEET\_CHE\_E27\_044\_A002 .png"

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**Answer: B**



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43. The number of all possible products excluding stereoisomers obtained on monochlorination of n-butane and iso-butane are respectively

A. 2 and 3

B. 3 and 2

C. 2 and 1

D. 2 and 2

**Answer: D**



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