

HOME ASSIGNMENT →

①

1) A

$$Na_2 [Fe(CN)_5 NO] = 2 \times 1 + x + 5(-1) + 1 = 0$$

$$x = +2$$

$$Na_4 [Fe(CN)_5 NOS] = 4 \times 1 + x + 5 \times (-1) + 1 \times (+1) + (-2) = 0$$

$$\boxed{x = +2}$$

3) A

co-ordination is taken as 'no. of donors'

NO₂⁻ is bidentate ligand Hence C.N.O is six.

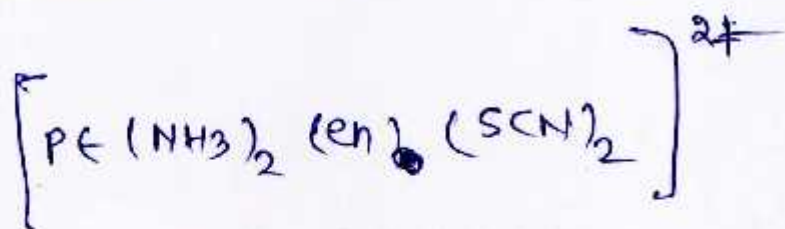
6) B
NH₂-NH₃⁺

8) B
Na₂ [Fe(CN)₅NO]

2

ANSWER - 9

(C)



$$x + 2 \times 0 + 0 + 2(-1) = +2$$

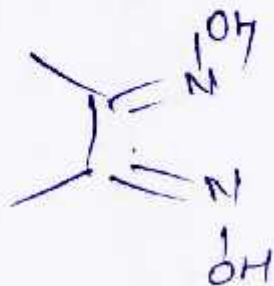
$$\underline{x = +4}$$

Option (b) and (c) seems correct but option (c) has central name ending with regular name of CIA.

Secondly, All options are showing that complex must be ion. So, we need to choose a ion only.

ANSWER 10 (A)

DMG = Dimethylglyoxime



ANSWER-11 - (C)



Carbonate (CO_3^{2-}) is tridentate ligand and if it act as bidentate ~~and~~ ligand then it will form three member cycle which is unstable.

ANSWER-12 (B)

If two moles of AgCl formed here, 2Cl^- must be outside the complex.

Hence, keeping C.N.O six the formulae of compound is $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$.

ANSWER-13 (C)

$2\text{Cl}^- = \text{pure p.v}$

$1\text{Cl}^- = \text{p.v as well as s.v}$

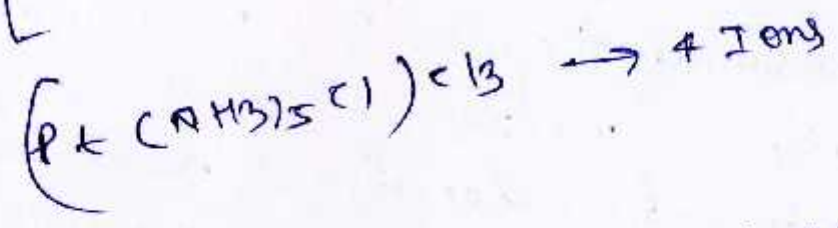
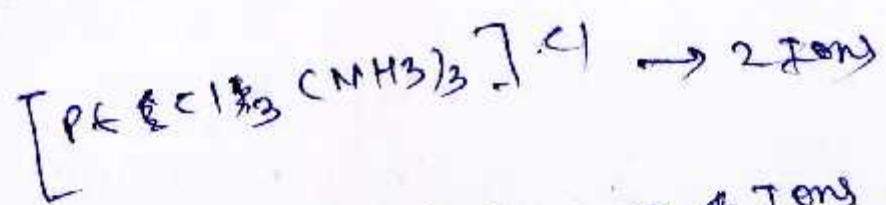
ANSWER-14 (a)

keeping six C.N.O of all complex, we can formulae

$\text{K}_2[\text{PtCl}_6] \rightarrow 3 \text{ ions as:}$

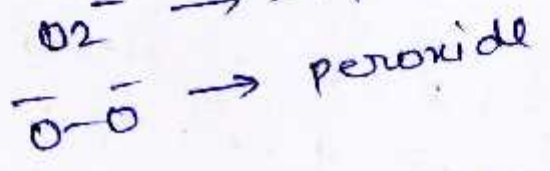
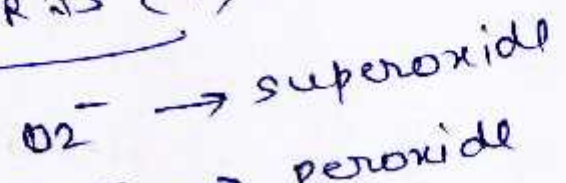
$[\text{Pt}(\text{NH}_3)_2\text{Cl}_4] \rightarrow 0 \text{ ions}$

4



conductance & no. of ions

ANSWER 15 (9)

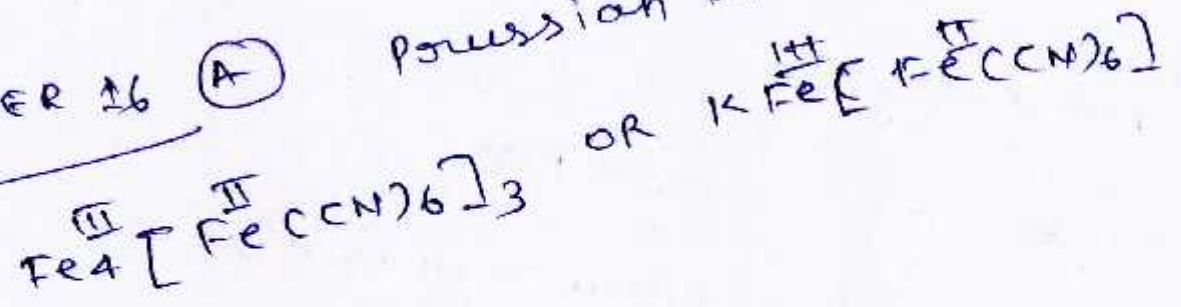


$Cn + 6 \times 0 + (-1) + (-2) + x + 6 \times 0 = +3$

$x = +3$

ANSWER 16 (A)

Prussian Blue is



Home Assignment - 2ANSWER - 1 (B)

$$(a) \text{ EAN} = Z - X + Y$$

$$24 - \cancel{4} + 6 = 26 + 6 = 32$$

$\times 2$

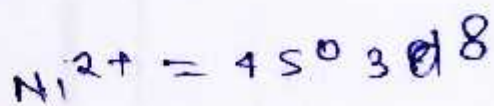
$$(b) \text{ EAN} = \cancel{27} - \cancel{3} + 3 =$$

$$27 - 3 + 3 \times 2 = 36$$

$\times 2$

$$(c) \text{ EAN} = 26 - 3 + 3 \times 2 \times 2 = 35$$

$$(d) \text{ EAN} = 28 - 2 + 4 \times 2 = 34$$

ANSWER - 4 (d)

and (en) is strong field ligand so all electrons gets paired.

Hence $(\text{Ni(en)}_2)^{2+}$ must be diamagnetic

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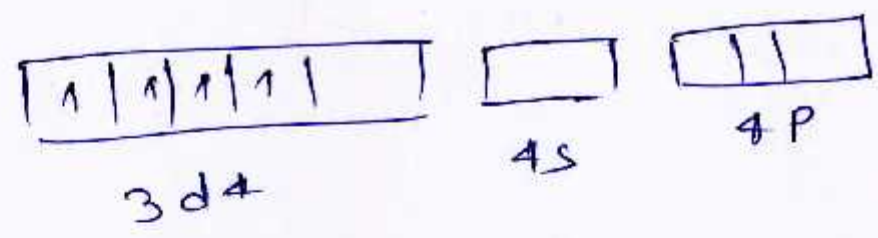
ANSWER 7 (A)

$[\text{Co}(\text{NH}_3)_5\text{NO}_2]^{2+} \rightarrow$ shows colour due to CTs

$[\text{Co}(\text{NH}_3)_5(\text{ONO})]^{2+} \rightarrow$ shows colour mainly due to d-d.

ANSWER 8 (A)

$\text{Cr}^{2+} = 4s^0 3d^4$



only one e- gets paired as it will vacant two ~~or~~ degenerate orbital
Hence, two e- are unpaired.

ANSWER 13 (B)

$Ni^{+2} [CdCl_2]$ has no unpaired electrons so there will be no d-d transition.

ANSWER 14 (C)

$FeCO_5 = \text{Trigonal bipyramidal}$

ANSWER 15 (d)

$[RhCl(PPh_3)_3]$ is Wilkinson's catalyst

O.N.O = +1

Shape = square planar

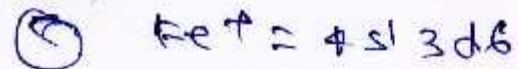
ANSWER 17

(a) $[Fe(H_2O)_5NO]^{2+}$ shows colour due to charge transfer spectra

(b) $Fe + 2xS + 1 = +2$

$x = +1$

8



due to (NO), one e⁻ will pair up
and no. of unpaired e⁻ = 3

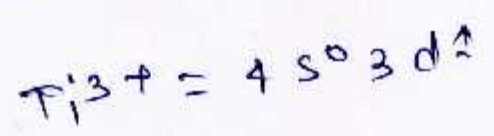
$$\mu = \sqrt{3(3+2)} \text{ Bm}$$

$$= \sqrt{15} \text{ Bm}$$

$$= 3.87 \text{ Bm}$$

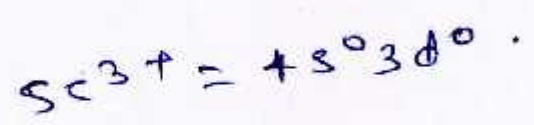
Hence All options are correct

Answer 18 - a



due to one unpaired e⁻ in (Ti(H₂O)₆)³⁺

it shows purple colour



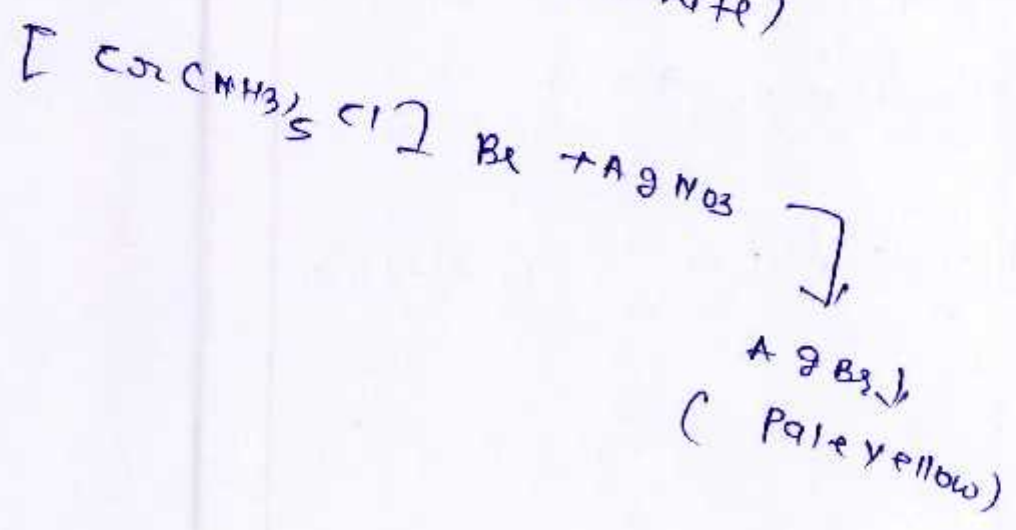
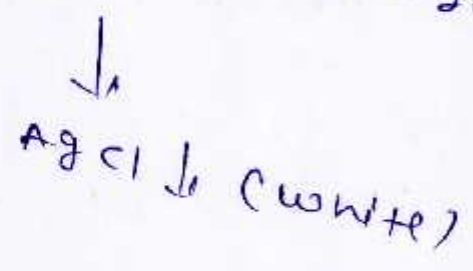
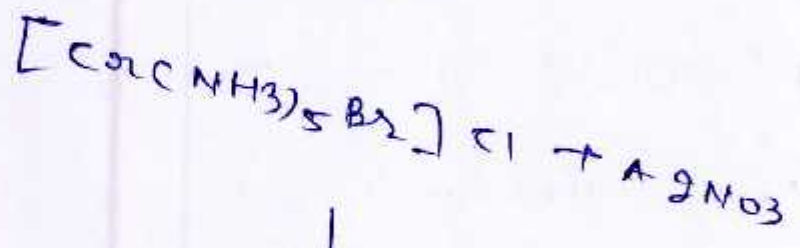
colourless due to no. d⁰ e⁻.

HOME ASSIGNMENT - 3

ANSWER 2 (B)

[MABCD] type shows 3 G.I

ANSWER 9 (B)



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ANSWER 1 - (a)

$(Co(CN)_3)^{3+}$ shows s.o.d and s.o.f.e

ANSWER 2 (d)

(1) $[Co(NH_3)_6] [Co(CN)_6]$

$[Co(NH_3)_4(CN)_2] [Co(NH_3)_3(CN)_3]$

shows ~~coordination~~ coordination & isomerism

(3) $[Pt(NH_3)_4 Br_2] Cl_2$ and $[Pt(NH_3)_4 Cl_2] Br_2$

shows Ionisation & isomerism.

(4) cis-platin $[Pt(NH_3)_2 Cl_2]$ shows G.I

ANSWERS (C)

$[M(AA)_2B_2]$ ^{xt}_N type shows 2 G.I

$[M(A)B_5]$ ^{xt}_N type shows 0 G.I

$[M(AA)_3]$ ^{xt}_N type shows 0 G.I

$[M(AA)B_2CB]$ ^{xt}_N type shows 2 G.I

ANSWER 16 (d)

cis $[Co(en)_2Cl_2]Cl$ shows optical

~~is~~ isomerism due to its unsymmetry.

ANSWER 17 (d)

$[MA_3BCD]$ shows 4 G.I

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ANSWER 18 (b)

$[M(AA)_2B_2]^{x+}$ shows 2 G.I and one G.I

shows optical activity so total S.I

$= 2 + 1 = \underline{\underline{3}}$

ANSWER 19 (c)

$[M(AA)B_2Cl_2]^{x+}$ shows 2 G.I and both

G.I shows optical activity.

Hence S.I = 2 + 2 = 4

ANSWER 20 (b)

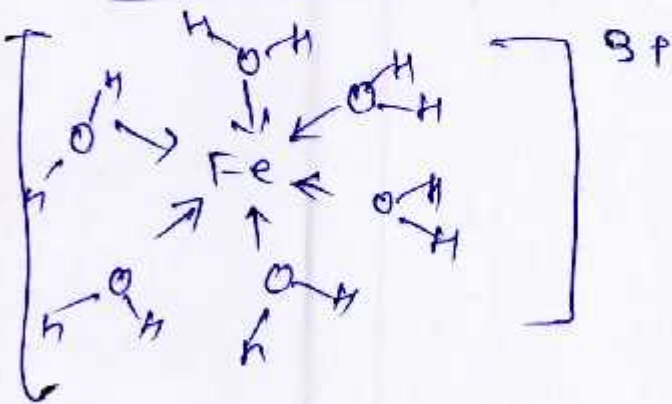
III and IV compound shows Chirality due to non symmetry.

Home Assignment - 4

Answer - 4 (b)

$[Cu(NH_3)_4]^{2+}$ hybridisation is dsp^2
and one electron excited from
 $3d$ orbital to $4p$ orbitals.

Answer - 7 (c)



due to interaction of Fe^{3+} and O of H_2O
 (H^+) can be displaced
from H_2O which
increases conc of H^+
ion.

Answer 8 (d)

Higher the stability of complex, larger the
Kf value Hence $[Co(en)_3]^{3+}$ due to chelation

14)

ANSWER 10 (b)

Stability of complex increases with increase in strength of ligand.

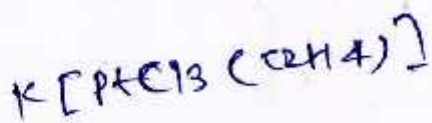
ANSWER 11 (d)

Higher the CFSE value of $4d/5d/6d$ transition elements.

ANSWER 12 - (b)

Haemoglobin contains complex of Fe.

ANSWER 17: (b) (b)



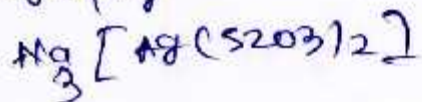
ANSWER 20: (d)



during leaching



during photography



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ANSWERS (b)

$$\text{Mol. wt of } \text{CrCl}_3 \cdot 6\text{H}_2\text{O} = 52 + 3 \times 35.5 + 6 \times 18$$

$$= 176.5$$

$$\text{no. of moles of } \text{CrCl}_3 \cdot 6\text{H}_2\text{O} = \frac{31.9}{176.5} = 0.0018 \text{ moles}$$

$$\text{Meq. of NaOH} = 28.5 \times 125 = 3.56$$

$$\text{no. of moles of NaOH} = \frac{3.56}{1000} = 3.56 \times 10^{-3} \text{ moles}$$

$$= 0.00356 \text{ moles of OH}^- \text{ ions}$$

Hence two moles of H⁺ ions are exchanged from 1 mole of complex.

So, M.F of complex must be



will come out of the complex and 2 Cl⁻ will replace them.

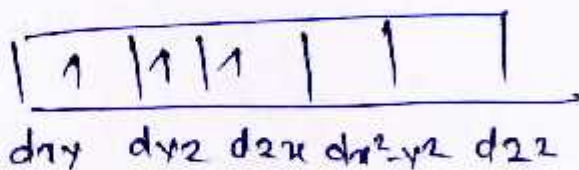
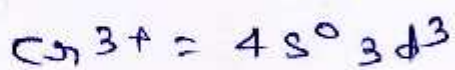
⑥
ANSWER 7: (d)

E_0 is a donor and a acceptor ligand.

ANSWER 8: (a)

$$\sqrt{N(N+2)} = 3 \cdot 83$$

$$\underline{N=3}$$



ANSWER 9: (b)

~~For~~ Higher the CFSE value more will be the absorption and lesser will be the λ_{max} .

ANSWER 13! (d)

According to EAN Rule, when EAN attains 36 then ~~it~~ ~~be~~ complex becomes stable which can be achieved by dimerisation or accepting one e⁻ ~~which~~.

ANSWER 15! (c)

In $[Pt(NH_3)_5Cl]^{2+}$; only 3 Cl⁻ ions are present outside co-ordination entity

ANS. ~~16~~ 17 (c)

To achieve 36 (26 + x × 2)
(5) co must be present.

⑧
ANSWER 28 (b)

$$2 \times x + 4(-2) + 2 \times 0 + 2 \times 0 = -2$$

$$2x = +6$$

$$\underline{x = +3}$$

Multiple correct.

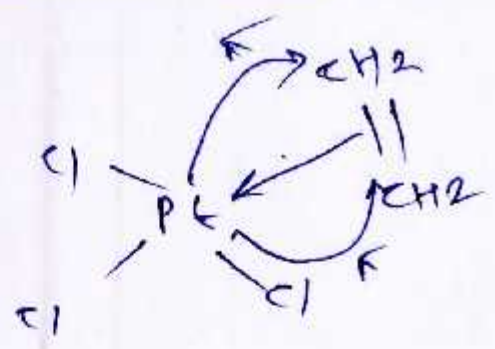
ANSWER 3 (A B C D)

(a) due to synergic bonding, C-O bond length increases with complex

(b) B_2H_6 , $Al_2(CH_3)_6$ both shows similar st.

(c) due to symmetry in MA_3B_3 , they are O.I.

ANSWERS (ABD)



~~ANSWER~~

WINDOW TO JEE ADVANCED

ANS (A) → (A)

In Brown Ring complex, NO is present as NO⁺ SO, O.N.O on Fe is 4

ANSWERS! (d) CH₃OLi (Interaction btw ~~M and O~~ Metal and O)

In oxyanion metallic compound, interaction must be between (e) and Metal.
Hence CH₃[⊖]Li⁺.

ANSWER 7! (r)

No. of unpaired e⁻ are different
Hence μ_s also gets differ.

ANSWER 14 (a)

Due to synergic bonding, bond length
of C-O increases but not very much.

ANSWER 15

Higher the electron density
on metal, more will be the
bonding between M-e and
lesser the bonding in C-O
Hence correct option is



Answer 2A (a)

CuSO_4 in aq. solution gives colour. Its complementary colour must be absorbed. So, colour absorbed is orange-red.

