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QUESTION BANK

Title of the Paper

INORGANIC CHEMISTRY

Course: III B.SC (CHY)

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INORGANIC CHEMISTRY

UNIT I

CHOOSE THE CORRECT ANSWER

1. The volume (in ml)o.1M Ag No 3 required for coplex precipitation of chloride ions present in 30ml of 0.01m solution of [cr(H2o) 5cl] as silver chloride is close to
    a) 3
    b) 4
    c) 5
    d) 6
2. Total number of geometrical isomers for the complex [Rhcl(Co)(pph3)(NH3) is
    a. 1
    b. 2
    c. 3
    d. 4
3. The oxidation state of iron in K4[Fe(cn)6]is
    a. a.1
    b. b.2
    c. c.3
    d. d.4
4. The pair of compounds having metals in their highest oxidation state is
    a. Mno2,Felcl3
    b. $[Mno4]^-$,Cro2 cl2
    c. $[Fe(cn6]^{3-}$,$[coccN_3]$
    d. $[Nicl4]^{2-}$, $[cocl4]^-$
5. The spin only magnetic moment value (in bohr magneton units) of $cr(co)_6$ is
    a. 0
    b. b.2.84
    c. 4.90
    d. 5.92
6. The value of the spin only magnetic moment for one of the following configuration is 2.84 Bm the correct one is.
    a. d^4(in strong ligand field)
    b. d^4(in weak ligand field)
    c. d^3(in weak as well as in strong fields)
    d. d^5(in strong ligand field)
7. When EDTA solution is added to mg^{2+}ion solution then which of the following statements is not true?
    a. Four coorccdinate sites of $mg^{2+}$are occupied by EDTA and remaining two sites are occupied by water molecules
    b. All six coordinate sites of $mg^{2+}$are occupied
    c. PH of the solution is decreased
    d. Colorless $[mg\text{-}EDTA]^{2-}$ chelate is formed
8. Which complex can not ionize in solution ?
    a. $[Pt\ (NH_3)6]cl_4$
    b. b.k2 [pt(F6)]
    c. c.k4[Fe(cn)6]
    d. d.$[co\ cl3(NH_3)3]$
9. Which compound is zero valent metal complex?
    a. $[cu\ (NH_3)]SO4$
    b. [pt (NH3)2 CL2]
    c. [Ni (co)4]
    d. k3 [Fe (cn)6]
10. which has maximum paramagnetic character?
    a. $[Fe\ (cn)6]^{4-}$

b. $[cu\ (H2O)_4]^{2+}$
c. $[cu(NH_3)_4]^{2-}$
d. $[Mn\ (H2O)_6]^{2+}$

ANSWERS:1-d,2-c,3-b,4-b,5-a,6-a,7-a,8-d,9-c,10-d

SHORT QUESTIONS

11. What is meant by co ordination?
12. What is the difference between co ordination entity and co ordination sphere?
13. What type of co ordination compounds show linkage isomerism?
14. What is co ordination compound with example?
15. What is geometrical isomerism in co ordination compounds?
16. Why tetrahedral complexes high are spin?
    (i) Write down the IUPAC name of the following complex $[pt\ (NH_3)(H_2o)cl_2$
    (II) Write the formula for the following coplex
17. Tries(ethane-1,2-diamine)chromium(lll)chloride
18. Using IUPAC norms writr the formula for the following co ordination compounds
    (i)hexaamine cobalt (III) chloride
    ii). Potassium tetrachloridonic kelate(II)
19. what type of isomerism is shown by
    i. $(co\ (NH_3)_5\ ONO)\ cl2$
    ii. write the hybridizing and shape of $(fe\ (cn)_6)^{3-}$
20. draw the geometrical isomers of complex
    iii. $(pt\ (NH_3)_2\ cl_2)$
    iv. $co(en)_2cl_2)^+$

PARAGRAPH QUESTION

21. Explain the following terms giving a suitable example in each case
    i.ligand
    ii.Ambidentate ligand
    iii.Denticity of a ligand
    iv.crystel field spilitting in an octahedral field
22. write the structures and names of the following compounds((stereoisomers))
    i. $[co(en)_3]cl_3$
    ii. $[pt(NH_3)_2cl_2)$
    iii. $[Fe(NH_3)_4d_2]cl$
    iv. $[cr(NH_3)_4cl_2]cl$
    v.$k_2\ [ni\ (cn)_4]$
23. Describe the shape and magnetic behavior of following complexes.
    i.$[co(NH_3)_6]^{3+}$
    ii.$[Ni(CN)_4]^{2-}$
    iii.$[cr(H_2O)_2(C_2O_4)_2]^-$
    iv.$[(co(NH_3)_2(en)_2]^{3+}$
    v.$[cr\ cl_2(en)_2]cl$
24. Explain the following terms, with suitable examples.
    i.structural isomerism
    ii. Hydrate isomerism
    iii.co ordination isomerism
    iv.ionisation isomerism
    v.linkage isomerism
25. write the formalas for the following co ordination compounds
    i.tetraamine diaquacobalt(iii)chloride
    ii.potassium tetracyanonickelate(ii)
    iii.tris (ethane-1,2-diamine)chromium(iii)chloride
    iv.ammine bromidiochloridonitrito-n-platinate(ii)

v.Iron(iii)hexacyanoferrate(ii)

26. write the IUPAC names of the following co ordination compounds
    i.$[co\ (NH_3)_6]cl_3$
    ii.$k_2[pd\ cl_4]$
    iii.$[pt(NH_3)_2cl(NH_2CH_3)]cl$
    iv.$[co(NH_3)_5cl]cl_2$
    v.$k_3[Fe(c_2o_4)_3]$
27. Explain on the basis of valence bond theory that $[Ni(cN_4]^{2-}$ion with square planar structure is diamagnetic and the ion with tetrahedral geometry is paramagnetic
28. $[Fe(H_2O)_6]^{3+}$ is strongly paramagnetic where as $[Fe(CN)_6]^3$ is weakly paramagnetic explain
29. Explain $[co(NH_3)_6]^{2+}$ is an inner orbital coplex where as$[Ni(NH_3)_6]^{2+}$ is an outer orbital complex
30. Explain with two examples each of the following:co ordination entity,ligand,co ordination number,co ordinationpolyhedron homoleptic and heteroleptic

ESSAY TYPE QUESTIONS

31. Discuss about the geometrical isomerism of four and six coordinate complexes
32. Discuss about the optical isomerism of four and six coordinate complexes
33. Discuss about the sidgwick theories methods of detecting complex formation
34. Explain the following terms
    i.ligand
    ii.unidentate
    iii.bidentate
    iv.and polydentate
    v.chelating ligand
35. Explain the chelation?and chelating ligands and chelating effect with suitable examples?
36. IUPAC name of the following complex
    i.$[co(en)_3]cl_3$
    ii.$[pt(NH_3)_2cl_2]$
    iii.$[cr(NH_3)_4cl_2]cl$
    iv.$k_2[Ni(cn)_4]$
    v.$[crcl_2(en)_2]cl$
37. Discuss about the structural isomerism, ionization isomerism, linkage isomerism, coordination position isomerism
38. Explain the theoris of coordination compounds
39. i.Explain the optical isomerism of six coordinate complexes
    ii.write the formula for the following complex
40. i.hexaamine cobalt(iii)chloride
    ii.potassium tetra chloridonickelate(ii)
    iii.tris(ethane-1,2-diamine)chromium(iii)chloride

UNIT-2

CHOOSE THE CORRECT ANSWERS

1. which hybridization is possible in the below complex$[co(NH_3)_6]^{+3}$
    a.d^3sp^3
    b.d^2sp^2
    c.d^2sp^3
    d.d^3sp^4
2. which shape of the following complex$[Ni(co)_4]$
    a.octa hedral
    b.tetra hedral
    c.Ring shape
    d.pentagonal
3. atomic number of nickel in the complex$[Ni(cn)_4]^{2-}$
    a.28

b.26
c.25
d.24

4. $[cocl_2]^-$shape of the complex
   a.octa hedral
   b.tetra hedral
   c.square planer
   d.trigonal
5. consider the following statements according the werners theory
   a.ligands are connected to the metal ions by covalent bonds
   b.secondary valencies have directional properties
   c.secondary valencies are non ionisable of these statement
   d.none of these above
   a.1,2and 3are corrct
   b.2and3 are correct
   c.1and 3 are correct
   d.1 and2 are correct
6. Name the metal M which extracted on the basis of following reactions
   $4m+8cn+2h_2o+o_2.4[m(cn)_2]^-+4oh-$
   $2[m(cn)_2]^-+zn-[zn(cn)_4]^{2-}+2m$
   a.nickel
   b.silver
   c.copper
   d.mercury
7. (crystal field theory)strong field ligands such as CN;
   a.usually produce high spin complexes and small crystal field splitting
   b.usually produce low spin complexes and small crystal field splitting
   c.usually produce low spin complexes and high crystal field splitting
   d.cannot form low spin complexes.
8. In VBT, the co-ordination complex $[Cu(OH_2)_6]^{2+}$ has one unpaired electron, which of the following statements are true?
   (a) The complex is an octahedral
   (b) the complex is an outer orbital complexes
   (c) the coordination number is 6
   (d) all the above
9. In which one of the following species does the transition metal ion have d^3 electronic configuration?
   a. $[cr(NH_3)^6]^{3+}$
   b. $[Co(OH_2)_6]^{2+}$
   c. $[CoF_6]^{3-}$
   d. $[Fe(CN)_6]^{3-}$
10. Following sidgwick's rule of EAN, [Co(CO)x] will be
    a. $Co_2(CO)_4$
    b. $Co_2\ (CO)_3$
    c. $Co_2(CO)_8$
    d. none of the above

Answers:1.c, 2 b, 3. a, 4. d, 5.a, 6.a, 7 c, 8 d, 9 a, 10 c.

SHORT QUESTIONS (2 MARKS)

11. Why tetrahedral complexes high are spin?
12. Which of the following is more stable complexes and why?
    $[Co(NH_3)_6]^{3+}$ and $[Co(en)_3]^{3+}$
13. What is meant by crystal field energy on the basis CFT, write the electronic configuration of d^4 in terms of t_2g and eg in an octahedral t_2g and e is called Crystal field splitting energy (ΔQ).
14. Explain the following

(i) Nickel (II) does not form low spin octahedral complexes
(ii) $[Fe(CN)_6]^{4-}$ and $[Fe(H2O)_6]^{2+}$ are of different colours in dilute solutions.

15. Explain the following terms giving a suitable examples
    (i) Crystal field splitting in an octahedral field.
16. Describe the shape and magnetic behavior of following complexes
    (i) $[Co(NH_3)_6]^{3+}$ (ii) $[Ni(CN)_4]^{2-}$
17. What is spectral chemical series.
18. Explain the limitations of VBT.
19. Explain the MOT with suitable examples.
20. What is the magnetic properties of coordination compounds?

PARAGRAPH QUESTIONS (5 MARKS)

21. Discuss about the VBT with suitable examples.
22. What are CFT? Splitting of d orbitals in octahedral compounds?
23. Explain the molecular orbital diagram for the $[Co(NH_3)_6]^{3+}$
24. Discuss the ligand field theory. An elementary treatment only.
25. What is the difference between valence bond and crystal field theory?
26. What are the postulates of CFT?
27. What are applications of CFT?
28. How do you determine a strong field ligand?
29. How does splitting of d orbitals in an octahedral field and tetrahedral field diff?
30. Why octahedral complexes are more stable than tetrahedral complexes? Explain with suitable example.

ESSAY QUESTIONS (10 MARKS)

31. Discuss about the John- teller distortion of coordination compounds?
32. Briefly discuss about the MOT diagram for $[Co(NH_3)_6]^{3+}$ compounds?
33. Discuss about the ligand field theory with suitable examples.
34. Explain the limitations of VBT and factors affecting the CFS of coordination compounds.
35. Discuss about the CFT and splitting of d orbitals in tetrahedral and square planer complexes.
36. Discuss about the CFSE theory is used to following terms
    (i) Colour (ii) geometry and magnetic properties of coordination compounds

37. Explain the VBT with suitable examples.
38. Limitations of VBT and CFT?
39. Explain the comparison of MOT and CFSE?
40. Explain the splitting of d orbitals in octahedral, tetrahedral and square planar complexes with basis of CFSE?

UNIT-III

CHOOSE THE CORRECT ANSWERS

1. Which of the following complexes formed by Cu^{2+} ions is most stable?
    a. $Cu^{2+} + 4NH_3 - [Cu(NH_3)_4]^{2+}$ log k =11.6
    b. $Cu^{2+} + 4CN^- - [Cu(CN)_4]^{2-}$ log k =27.3
    c. $Cu^{2+} + 2en^- - [Cu(en)_2]^{2+}$ log k =15.4
    d. $Cu^{2+} + 4H_2O - [Cu(H_2O)_4]^{2+}$ log k =8.9
2. When 0.1 mol $CoCl_3$ $(NH_3)_5$ is treated with excess of $AgNo_3$,0.2 mol of AgCl are obtained .The conductivity of solution will correspond to
    a. 1:3 electrolyte
    b. 1:2 electrolyte
    c. 1:1 electrolyte
    d. 3:1 electrolyte
3. When 1 mol CrCl3.6H2O is treated with excess of AgNO3. 3mol of AgCl are obtained. The formula of the complex is
    a. $[CrCl_3(H_2O)_3].3H_2O$
    b. $[CrCl_2(H_2O)_4]Cl.2H_2O$
    c. $[CrCl\ (H_2O)_5]Cl_2.\ H_2O$

d. $[Cr(H2O)_6]Cl_3$

4. Which of the following options are correct for the following complex [Fe(CN)6]
   a. d2sp3 hybridization, dia magnetic
   b. sp3 d2 hybridization, para magnetic
   c. all the above
   d. none of the above
5. Which of the following complexes are homolytic?
   a. $[Co(NH_3)_6]^{3+}$, $[Ni(CN)_4]^{2-}$
   b. $[Co(NH3)_4Cl_2]^{+}$, $[Ni(NH3)_4Cl_2]$
   c. $[Ni(CN)_4]^{2-}$, $[Ni(NH_3)4Cl_2]$
   d. $[Ni(NH_3)4Cl_2]$, $[Co(NH3)_4Cl_2]^{+}$,
6. Which of the following complexes are hetrolytic?
   a. $[Cr(NH_3)_6]^{3+}$, $[Co(NH_3)_4Cl_2]$
   b. $[Fe(NH_3)_4Cl_2]^{+}$, $[Co(NH_3)_4Cl_2]$
   c. $[Mn(CN)_6]^{4-}$, $[Cr(NH_3)_6]^{3+}$
   d. $[Co(NH_3)_4Cl_2]$, $[Cr(NH_3)_6]^{3+}$
7. Which of the following compounds are most increasing order of conductivity
   a. $[Co(NH_3)_3Cl_3]$
   b. $[Co(NH_3)_4Cl_2]Cl$
   c. $[Co(NH_3)_6]Cl_3$
   d. $[Cr(NH_3)_5Cl]Cl_2$
8. Chlorophyll contains
   a. Co
   b. Ca
   c. Fe
   d. Mg
9. Vitamin B12 contains
   a. Rh
   b. Ca
   c. Fe
   d. Co
10. Haemoglobin contains
   a. Fe
   b. Ca
   c. Co
   d. Ba

Answers: 1(b), 2 (b), 3 (d), 4 (a), 5 (a), 6 (b), 7 (d), 8 (d), 9 (d), 10 (a).

SHORT QUESTIONS

11. Which of the following is more stable complexes and why?
    $[Co(NH_3)_6]^{3+}$ and $[Co(en)_3]^{3+}$
12. How is the stability of co-ordination compounds in solution decided?
13. How is the disassociation constant of a complex defined?
14. Factors affecting the stability of complxes ion give one example.
15. Explain why $[Co(NH_3)_6]^{2+}$ is an inner orbital complex where as $[Ni(NH_3)_6]^{2+}$ is an outer orbital complex.
16. Explain how $[Pt(NH_3)_2Cl_2]$ and $[Pt(NH_3)_4]Cl_4$ will differ in their electrolyte conductances.
17. Explain the biological importance of haemoglobin.
18. Explain the biological importance of chlorophyll.
19. The spin only magnetic moment of $[MnBr_4]^{2-}$ is 5.9 B.M. predict the geometry of the complex ion.
20. What is meant by stability of coordination compounds in solution? State the factors which govern stability of complexes.

PARAGRAPH QUESTIONS (5MARKS)

21. What are the labile and inert complexes?
22. Explain the stability of complex? And the thermodynamic stability of coordination complex?
23. Explain the relationships between stepwise formation constant and overall formation constant.
24. Describe the factors affecting the stability of complexes.
25. Discuss about the bi-molecular nucleophilic substitution reaction in octahedral complexes?
26. Explain the uni-molecular substitution reaction in square planer complexes with suitable examples?
27. Discuss about the trans effect? And explain with two examples.
28. Explain the theories of trans effect.
29. Discuss about any two application of trans effect?
30. Explain the coordination compounds of chlorophyll and vitamin B_{12}.

ESSAY QUESTIONS (10 MARKS)

31. Define trans effect and explain with their application with examples.
32. Discuss about the biological importance of Haemoglobin and vitamin B_{12}.
33. Explain the term chlorophyll and kinetic stability of coordination compounds.
34. Discuss about the uni and biomolecular nucleophilic substitution reaction in octahedral and square planer complexes?
35. Explain the theories and limitation of trans effect.
36. Discuss about the relationship between stepwise formation constant and overall formation constant.
37. Discuss about the labile and inert complexes with suitable examples.
38. Explain the term thermodynamic stability of coordination complexes and kinetic stability of coordination compounds.
39. Explain the factors affecting the stability of complexes.
40. What is Trans effect? Explain with square planer complexes.

UNIT-IV

CHOOSE THE CORRECT ANSWERS.

1. Metals carbonyls means
   a. M(X)
   b. $M_X(CO)_Y$
   c. Co(M)
   d. Co
2. What are the oxidation state of the metal carbonyls
   a. Zero
   b. One
   c. Two
   d. Four
3. Which is not true about metal carbonyls?
   a. Here Co act as a lewis base as well as lewis acid
   b. Here metal act as a lewis base as well as lewis acid
   c. Here d$\pi - P\pi$ back bonding takes place
   d. Here p$\pi - P\pi$ back bonding takes place
4. The degeneracy of d orbitals is last under
   a. Strong field ligand
   b. Weak field ligand
   c. Mixed field ligand and chelate ligand
   d. All the above
5. What are the physical state and boiling point of $Ni(CO)_4$
   a. Liquid, 43

b. Solid, 160
c. Solid, 76
d. Liquid, 45

6. Complete the following reactions FeCO5 + H2SO4 →
   a. C_5Cl_6 +$FeCl_2$ +5 CO
   b. $FeSO_4$ + 5CO+ H_2
   c. $Fe_2(CO)_9$ + Co
   d. $H_2[Fe(CO)_4]$ + $BaCo_3$
7. What are the electronic configuration of iron, Fe 26 is
   a. $3p^6\ 3d^5$
   b. $3s^2\ 3p^6$
   c. $3s^2\ 3p^7$
   d. $2p^6\ 3s^2$
8. Following the $Mn_2\ (CO)_{10}$ complexes is
   a. Mono nuclear
   b. Bi nuclear
   c. Poly nuclear
   d. None of above
9. Complete the following equation Fe $(CO)_5$ + 2Na
   (a) $Na_2[Fe(CO)_4]$ + CO
   (b) $Na[Fe(CO)_4]$ + CO
   (c) $Na[Fe(CO)_3]$ + 2CO
   (d) $Na[Fe(CO)_2]$ + 3CO
10. Complete the following equation Co2(CO)8 +Hg
    a. $(CO)_3$Co- Hg-Co$(CO)_3$
    b. $(CO)_2$Co- Hg-Co$(CO)_2$
    c. $(CO)_2$Co- Hg-Co$(CO)_4$
    d. $(CO)_4$Co- Hg-Co$(CO)_4$

Answers: 1(b), 2 (a), 3 (d), 4 (c), 5 (a), 6 (b), 7 (a), 8 (b), 9 (a), 10 (d).

SHORT QUESTIONS (2 MARKS)

11. What are metal carbonyls?
12. Give the short notes on the structure of nickel carbonyls.
13. How chromium carbonyls prepared?
14. What are properties of metal carbonyls?
15. Which metal carbonyl has the strongest Co bond?
16. What are binary metallic compounds? How are they classified?
17. What are preparations of borides?
18. Explain the any two properties of nitrides?
19. Why are metal carbonyls stable complex compounds?
20. What is polynuclear carbonyl?

PARAGRAPH QUESTIONS (5 MARKS)

21. Explain the binuclear carbonyls of iron and its preparation, properties, structure, bonding and uses.
22. Explain the structure and bonding in bimetal alkenyl and bimetal alkynyl complexex of ferrocene.
23. Explain the mononuclear carbonyls of nickel.
24. Discuss about the structure, properties, preparation and uses of hydrides.
25. Explain the mononuclear carbonyls of chromium carbonyls.
26. Explain the structure and bonding in πmetal alkenyl complexes of [Co(CO)6(RC≡ CR)].
27. Discuss about the binary metallic compounds of nitrides.
28. Explain the reactivity of CO group in the formation of carbonyls.
29. Write the structure, preparation and properties of cobalt carbonyls.

30. Explain the formula, preparation, structure and reaction of manganese carbonyls.

ESSAY QUESTIONS (10 MARKS)

31. Explain the structure of $Fe_2(CO)_9$
32. Explain the methods of preparation, their properties and uses of hydrides.
33. Discuss the methods of preparation, chemical properties and structure of ferrocene.
34. Write note on
    a. Carbides
    b. Borides
35. Discuss the methods of preparation, properties and uses of nitrides.
36. Describe the methods of preparation, properties and uses of cobalt carbonyls.
37. Explain the mono and bionuclaer carbonyls of manganese.
38. Explain the structure and bonding in π metal alkenyl and π metal alkynyl complexes of [PtCl3(C2H4)] and [Co(CO)6(RC≡CR)].
39. Explain the following binary metallic compounds of nitrides, borides.
40. Discuss about the method of preparation, properties and uses of chromium carbonyls.

UNIT-V

CHOOSE THE CORRECT ANSWERS

1. What are the molecular formula for the sodium nitroprusside
   a. $[Na_2Fe(CN)_5NO^+]$
   b. $[Na_2Fe^{3+}(CN)_6NO_2]$
   c. $[Na_2[Fe(CN)_4NO^+]$
   d. $[Na_2(Fe(CN)_4NO_2]$
2. Write the general forumula for the nitrosyl compounds
   a. NO
   b. NO^+
   c. NO^-
   d. None of the above
3. Complete the following reactions
   $NOCl + 2NaOH \rightarrow$
   a. $NaNO_2 + NaCl + H_2O$
   b. $2NO + Cl_2 + 2H_2O$
   c. $2NaCl + NO_2$
   d. $HNO_3 + HCl$
4. Write molecular formula for the nitrosyl chloride
   a. NOCl
   b. NO2Cl
   c. NOCl2
   d. NO2Cl2
5. The general formula for the nitrosyl fluoborate
   a. (NO^+) $(ClO4^-)$
   b. (NO^+) $(BF4^-)$
   c. $(NO^+)^-$ (HSO4)
   d. None of the above
6. The dipole moment of HCl molecule is
   a. 1.05D
   b. 1.03D
   c. 1.004D
   d. 1.02D
7. The dipole moment of H_2O molecule is
   a. 1.74D

b. 1.84D
c. 1.94D
d. 1.99D

8. Which one is non polar molecules
   a. CCl_4
   b. HF
   c. HCl
   d. Cl_2
9. Which one is polar molecules
   a. O_2
   b. BF_3
   c. H_2S
   d. CH_4
10. Calculate the ionic character of HCl. The bond length and dipole moment are is 2.29 X 10^{-10} M; 3.436 X 10^{-30} Coulomb meter.
    a. $20.67X10^{-30}$ cm
    b. $20.56X10^{-30}$ cm
    c. $21.50X10^{-30}$ cm
    d. 21.51 X 10^{-30} cm

Answers:1 (a), 2 (a), 3 (a), 4 (a), 5 (b), 6 (b), 7 (b), 8 (d), 9 (c), 10 (a).

SHORT QUESTIONS (2 MARKS)

11. What are nitrosyl compounds with an examples.
12. Explain the classification of nitrosyl compounds.
13. Write the any one prepration of nitrosyl chloride.
14. Complete the following equation
    (i) $2Hg + 2NOCl \rightarrow$
    (ii) $2NOCl + 2\ CuCl_2 \rightarrow$
15. Write the structure of Nitrosyl chloride with bond angle?
16. Write the preparation of sodium nitroprusside.
17. Explain the EAN rule for the $[Na_2Fe(CN)_5\ (NO^+)]_2$
18. What is the meaning of magnetic susceptibility
19. What is meant by magnetic moment?
20. What is meant by dipole moment?

PARAGRAPH QUESTIONS (5 MARKS)

21. Explain the properties of sodium nitroprusside?
22. Explain the structure and uses of sodium nitroprusside?
23. How will you prepared Nitrosyl chloride.
24. Explain the term dipole moment. How will you determined the dipole moment with simple inorganic molecules.
25. Explain the gouy balance application of magnetic properties.
26. Explain the term magnetic susceptibility.
27. Explain the term magnetic moment with example.
28. What is meant by magnetism and explain the types of magnetism.
29. What is the classification of nitrosyl chloride.
30. Explain the properties and structure of nitrosyl chloride.

ESSAY QUESTIONS (10 MARKS)

31. Discuss about the prepration, properties and structure of sodium nitroprusside?
32. Discuss about the dipolemoment of HCl, BF_3 and NH_3 molecules
33. Explain the dipole moment of carbondioxide and H_2O molecule.
34. What is magnetic susceptibility of Para magentic material?
35. How do you calculate magnetic moment from magnetic susceptibility?

36. Discuss about the gouy balance application of magnetic moment.
37. Discuss about the isolation, properties, structure and uses of nitrosyl chloride.
38. How will you measure magnetic susceptibility? And How is of Para magentism with in a sample measured?
39. Describe the dipole moment – determination with suitable inorganic molecules.
40. Complete the following equation
    (i) $NOCl + H_2O$
    (ii) $2HNO_2 + 2HCl$
    (iii) $NOCl + 2NaOH$
    (iv) $2Hg + 2NOCl$
    (v) $2NOCl + 2CuCl_2$

**********@@@@@@@@@@@@@@@@@@@@**********