Avinashilingam Institute for Home Science and Higher Education for Women
(Deemed to be University) Coimbatore-641 043
Bachelor's Degree Examination – November - 2018
V Semester

Class : III UG **Time: 3 hours**
Major : Chemistry **Max. Marks: 100**

11/15BCHC 13 – Coordination Chemistry

Part-A **10 x 1=10**

Choose the correct answer

1. Which one is a positive ligand?
   a. en b. Hydrazonium c. amino d. OXO

2. The Complex that Violates EAN rule is
   a. Potassium ferrocyanide b. Nickel carbonyl c. Cobalt hexammine
   d. Chloride.

3. Which of the following is a ligand which causes maximum Crystal field splitting?
   a. NH_3 b. F^- c. CO d. Ox^{-2}

4. Nickel tetracyanide complex has
   a. Linear structure b. Square planar structure c.tetrahedral structure
   d. Octahedral structure.

5. The symmetry point group of NH_3 is
   a. D_6h b. C_2V c. C_4V d. C_3V

6. Hardness of Water is determined by complex metric titration with
   a. Cupron b. Aluminon c.DMG d. EDTA

7. Ammonium Molyb date is used to test
   a.C_2O_4 b.PO_4^{3-} c. CH_3COO^- d. Cro_4^{2-}

8. The important ore of Titanium is
   a. Rutile b. Zircon c. Patronite d. Wolframite

9. Actinides
   a. are all synthetic elements b include element 104 c. have only short lived isotopes.
   d. have variable valency.

10. Which acid makes Thorium became passive?
    a. Conc HCl b.Conc H_2SO_4 c.CH_3COOH d. Conc. HNO_3

Part B

5 X 6=30

Answer the following

Answer should not exceed 400 words or two pages

11.a. What are the Salient features Werners of Co – ordination theory?

(or)

11.b. Define stability of complex. What are the factors which affecting stability of Complexes, Explain the stepwise formation constant.

12.a. Compare VBT and CFT.

(or)

12.b. Cyting typical examples distinguish between low spin Complexes and high spin complexes. Explain the spectro chemical series of Co – ordination complexes.

13.a.What are symmetry elements and symmetry operations? Describe the symmetry operations of NH_3 molecule.

(or)

13.b. How hardness of water is determined by complex metric titration by using EDTA?.

14.a. How potassium ferri cyanide, cobaltous nitrate and Nickel ammonium sulphate are prepared? Explain their properties and uses.

(or)

14.b.What are transition elements? Discuss their position in Modern periodic table. Listout the important Characteristics of d – block elements.

15.a. What are inner transition elements? Discuss their position in modern periodic table. Listout the important properties of actinides.

(or)

15. b. What are trans Uranium elements? How are they synthesized?.

Part C

5 x 12=60

Answer the following

Answer should not exceed 800 words or four pages

16.a. (i) What are ligands? How are they classified? Give any three example for each type. (6)

(ii) Explain the geometrical isomerism exhibited in 4 and 6 Co–ordination compounds. (6)

(or)

16.b. (i) What is EAN rule for the Co – ordination Compounds? (6)

(ii) Explain the following terms with suitable examples Co – ordination number, labile and Intert Complexes. (6)

17.a. (i) Explain the Salient features of CFT. Mention the limitations of VBT. (7)

(ii) Write down the d – orbital splitting in Octahedral Complexes. (6)

(or)

17. b. (i) Indicate the d – orbital splitting in Squar planar and tetrahedral Complexes. (9)

(ii) Define CFSE (3)

18.a. (i) How can you estimate Ni by using DMG? (6)

(ii) Describe the separation of copper and Cadmium ions. (6)

(or)

18.b . Briefly explain the various applications of Co – ordination compounds in qualitative and quantitative analysis with suitable examples.

19. a. (i) How is pure Titatinium and Tungsten extracted from their ores? (7)
(ii) Write the chemistry of Molybdenum blue and ammonium meta vanadate (5).

19. b. (i) Describe the group study of Ti, V and Cr. (8)
(ii) Pointout the properties and uses of vanadium, hexamine cobalt (III) chloride. (4)

20.a. Compare the properties of d and f – block elements.

(or)

20.b.(i) What is mean by lanthanide contraction and What are its causes and Consequences ? (4)
(i) How are the lanthanide ions separated from each other? (4)
(iii) Write a short note on chemistry of thorium. (4).