Avinashilingam Institute for Home Science and Higher Education for Women

(Deemed to be University under Category 'A' by MHRD, Estd. u/s 3 of UGC Act 1956)
Re-accredited with 'A+' Grade by NAAC. Recognised by UGC Under Section 12B
Coimbatore - 641 043, Tamil Nadu, India

Bachelor's Degree Examination - January 2021
V Semester

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

18BCHC13 Coordination Chemistry

Part A **10 x 1 = 10**
Choose the Correct Answer

1. Choose the one which is a type of bonding of ions and molecules to metal ions.
   a. complexion b. aggregation
   c. creation d. chelation

2. Find out the one in coordination chemistry which is an ion or molecule that binds to a central metal atom to form a coordination complex.
   a. complex b. ligand c. chelate d. aggregate

3. Find out the theory which is responsible for the formation of structures of various cobalt amines.
   a. Balmer's Theory b. Brownie's theory
   c. Werner's theory d. Arrhenius theory

4. What is formed according to VB theory between two atoms by the overlap of half filled valence atomic orbitals of each atom containing one unpaired electron.
   a. a covalent bond b. ionic bond
   c. salt linkage d. hydrogen bond

5. Group I (Ag+, Pb2+, Hg2+) cations produce insoluble chlorides so they can be precipitated with _____ while all other cations remain in solution.
   a. dilute H_2SO_4 b. con. CH_3COOH c. dilute HCl d. con. HCOOH

6. Ethylenediaminetetraacetic acid (EDTA) is a well known
   a. Metal-chelating agent b. Oxidising agent
   c. Reducing agent d. Exhaustive agent

7. The partially filled subshells of *d*-block elements incorporate _____ subshell
   a. (m-n)d b. (n+1)d c. (n+2)d d. (n-1) d

8. Potassium ferricyanide reacts with ferrous iron in acidic solution to produce the insoluble blue pigment, commonly referred to as
   a. American blue b. Prussian blue c. Indian blue d. Navy blue

9. All the lanthanide elements have one valence electron in the
   a. 5f shell b. 5g shell c. 5d shell. d. 4d shell

10. Identify the one which is a weakly radioactive metallic chemical element with the atomic number 90.
   a. Thorium b. Uranium c. Indium d. Plutonium

Part B **5 x 6 = 30**

Answer ALL questions

Each answer should not exceed 400 words or two pages

11.a. Write in brief about the classification of ligands.

(or)

11.b. State about the factors affecting the stability of complexes.

12.a. Give a brief description about the Werner's coordination theory.

(or)

12.b. Write about the magnetic properties of octahedral complexes.

13.a. What are the applications of coordination compounds in the qualitative analysis.

(or)

13.b. Write the principle and applications of EDTA complexes.

14.a. Give a brief description about the properties and uses of titanium.

(or)

14.b. Give a brief description about the properties and uses of potassium ferri cyanide.

15.a. Discuss the occurrence and extraction of actinides.

(or)

15.b. Compare the properties of lanthanides and the actinides.

Part C **5 x 12 = 60**

Answer ALL questions

Each answer should not exceed 800 words or four pages

16.a. Explain about the optical and geometric isomerism in 4 and 6 coordination compounds.

(or)

16.b. Discuss hydrate, coordination position and polymerization isomerism.

17.a. Explain the important aspects involved in the valence bond theory.

(or)

17.b. Give a detailed description on crystal field stabilization energy

18.a. Explain the process and procedure involved for the separation of mercury and silver ions.

(or)

18.b. Give a detailed description about the quantitative estimation of nickel using DMG.

19.a. Explain the important chemistry aspects associated with vanadium penta oxide

(or)

19.b. Explain the important chemistry aspects associated with nickel ammonium sulphate cobaltous nitrate and nickel (II) chloride.

20.a. Give a specific description about the lanthanide contraction and its consequences.

(or)

20.b. Explain the important chemistry aspects involved in uranium and thorium.

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