

# CHEMISTRY MODEL QUESTION PAPER

## CHEMISTRY GENERAL

### SEMESTER-IV

#### COURSE NAME - CHEMGT-4

#### Each question carry two marks

1. What is Ostwald dilution law?
2. Draw the structure of Ni-(DMG)<sub>2</sub> complex.
3. Draw space and orientation of all d-orbital?
4. Why trans [Co(en)<sub>2</sub>Cl<sub>2</sub>]<sup>+</sup> is optically inactive?
5. Write IUPAC NAME  
[CoCl<sub>2</sub>(en)<sub>2</sub>]<sub>2</sub>SO<sub>4</sub>, [PtCl(NO<sub>2</sub>)(NH<sub>3</sub>)<sub>4</sub>]<sub>2</sub>SO<sub>4</sub>
6. What is meant by equivalent conductance and molar conductance?
7. Give example of Linkage and coordination isomerism?
8. Give the structural formula of an optically active inorganic compound and give reason?
9. Aqueous solution of KMnO<sub>4</sub> is intensely violet explain?
10. What are ideal and non-ideal solutions?

#### Each question carry five marks

1. How many isomer possible for [Pt(en)<sub>2</sub>(NCS)Cl]<sup>+</sup>. Draw all structures.
2. What is chelate complex? Give example? Why a chelate complex is more stable than an analogous nonchelate complex explain?
3. Write Werner's theory? Find out primary and secondary valency of [CoCl<sub>2</sub>(NH<sub>3</sub>)<sub>4</sub>]<sub>2</sub>Cl ?
4. How can you distinguish [Co(NH<sub>3</sub>)<sub>5</sub>SO<sub>4</sub>]<sub>2</sub>Br and [Co(NH<sub>3</sub>)<sub>5</sub>Br]<sub>2</sub>SO<sub>4</sub> ? Give equation.
5. A complex with molecular formula CoCl<sub>3</sub>.6NH<sub>3</sub> gives 3 mol AgCl precipitate on treatment with excess AgNO<sub>3</sub> Write the structure and IUPAC name of the complex?
6. Why NiCl<sub>4</sub><sup>2-</sup> is tetrahedral [Ni(CN)<sub>4</sub>]<sup>2-</sup> is square planar? Calculate magnetic moment in both case?
7. State and explain Roul't's law.
8. CuSO<sub>4</sub>.5H<sub>2</sub>O as blue colour but anhydrous CuSO<sub>4</sub> is colourless, Why? What is difference between double salt and complex salt? Give example.
9. [Co(NH<sub>3</sub>)<sub>6</sub>]<sup>3+</sup> is diamagnetic but [CoF<sub>6</sub>]<sup>3-</sup> is strongly paramagnetic why? Draw all stereoisomer of [Co(en)<sub>2</sub>Cl<sub>2</sub>]<sup>+</sup> .
10. Derive the relation between step wise stability and overall stability constant?

**Each question carry ten marks**

1. Explain why  $[\text{Co}(\text{NH}_3)_6]^{3+}$  ion form low spin complex  $\text{CoF}_6^{3-}$  ion form high spin complex? Determine magnetic moment in both case?  $\text{Ce}^{3+}$  is more basic than  $\text{Ce}^{4+}$ ?
2. Give the labelled phase diagram of water system and discuss the importance of various points, line and areas.
3. Explain the colour of transition metal complexes on the basis of crystals field theory?
4. Derive Nernst equation for measuring EMF of a cell.