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# [4923]-37 M.Sc. II

#### **INORGANIC CHEMISTRY**

# CH-330: Coordination Chemistry Magnetism and Reaction Mechanism (2008 Pattern) (Semester - III)

Time: 3 Hours] [Max. Marks: 80

Instructions to the candidates:

- 1) All questions are compulsory and carry equal marks.
- 2) Neat diagrams must be drawn wherever necessary
- 3) Use of logarithimic tables and calculator is allowed.

#### **Q1)** Attempt Any Four of the following:

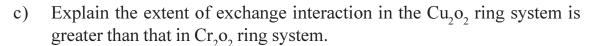
[20]

- a) Explain why certain Ni (II) complexes show anomalous magnetic moments.
- b) What are magnetically diluted and concentrated systems.
- c) Explain the experimental magnetic moment of the following ions.
  - i)  $Ti^{3+} \mu B$  . m. expt = 1.7 to 1.8 B.m.
  - ii)  $Co^{2+} \mu B.m. \text{ expt} = 4.1 \text{ to } 5.2 \text{ B.m.}$  [Given:- atomic no. of Ti=22 and Co=27]
- d) Explain the terms.
  - i) Magnetic domain.
  - ii) Canting.
- e) Draw the crystal field splitting of d orbitals of a central metal ion in symmetric octahedral, tetrahedral and tetragonal complexes.

# **Q2)** Attempt Any Four of the following:

[20]

- a) Write about super exchange model for an antiferromagnetic interaction.
- b) Write a note on 'High spin-Low spin' equilibria.



- d) What are mixed valence compounds? How they are classified?
- e) Explain the terms:
  - i) Spin pairing.
  - ii) Antiferromagnetic material.

## *Q3*) Attempt Any Four of the following:

[20]

- a) Explain the main reaction types with suitable examples.
- b) Give in brief an account of  $\pi$  -bonding theory of trans effect.
- c) Write a note on anation reaction.
- d) Explain conjugate Base mechanism with reference to octahedral cobalt (III) complexes.
- e) Differentiate between Associative and Dissociative mechanism.

## **Q4)** Attempt Any Four of the following:

[20]

- a) Discuss the mechanism of electron transfer with reference to outer-sphere reactions.
- b) Write a note on oxidative addition reactions.
- c) Discuss in brief recemization of trischelate complexes.
- d) Explain the various steps involved in photographic process.
- e) Complete the following chemical equations.

i) 
$$(CH_3)_3B + N(CH_3)_3 \rightleftharpoons$$

ii) 
$$BF_3 + \overline{F} \rightarrow$$

iii) 
$$CH_3Mn (Co)_5 + PPh_3 \rightarrow \square$$

iv) 
$$[Fe(CN)_6]^{4-}+[Ircl_6]^{2-} \rightarrow \square$$

v) 
$$[PtCl_4]^{2-} \xrightarrow{?} \boxed{}$$

