UNIT IV

4. (a) Discuss the photosubstitution reactions in ruthenium complexes. 6

(b) What is trans effect ? Discuss the polarization theory of trans effect. 5

(c) Write the mechanism of substitution reaction in square planar complexes w.r.t. entering ligand as nucleophile. 5

OR

(p) Explain the bridge activated complex mechanism for one electron transfer reaction. 6

(q) What are isopoly acids and heteropoly acids ? Explain with suitable examples. 5

(r) Describe the fluxinality of π – allyl metal complexes. 5

UNIT V

5. (a) Describe the mechanism involved in hydro-formylation of $CH_3 - CH = CH_2$ catalysed by cobalt carbonyls. 5

AQ – 867

First Semester M. Sc. – I Examination

PHARMACEUTICAL CHEMISTRY

Paper – 1 1 SA 1

(Inorganic Chemistry)

P. Pages : 5

Time : Three Hours] [Max. Marks : 80

Note : All questions are compulsory and carry equal marks.

UNIT I

1. (a) What are the conditions that are to be fulfilled for a set of operation to form a group ? 6

(b) On the basis of matrix representation show that

(i) $C_2 \cdot C_2 = E$ (ii) $C_2 \cdot \sigma = S_2 = i$ 4

(c) Discuss high spin and low spin crossover phenomenon in complexes with suitable examples. 6

OR

(p) Find out possible symmetry elements present in

(i) BF_3 (ii) NH_3 (iii) H_2O 6

(q) Construct a multiplication table for C_{2v} point group by taking H_2O as an example. 4

(r) On the basis of magnetic moment measurements explain $[NiCl_4]^{2-}$ is tetrahedral and $[PtCl_4]^{2-}$ is square planar. 6

UNIT II

2. (a) Explain with suitable examples :

(i) SP^3d hybridization.

(ii) SP^3d^2 hybridization. 5

(b) On the basis of MO diagrams explain why O_2 is paramagnetic while F_2 is diamagnetic. 6

(c) Explain why $[Fe(CN)_6]^{4-}$ is inner orbital while $[Fe(H_2O)_6]^{2+}$ is outer orbital octahedral complex. 5

OR

(p) Mention the hybridization state of central atom in the following molecules :—

(i) BeF_2 (ii) BF_3 (iii) H_2O (iv) IF_5 (v) XeF_4 5

(q) Draw MO diagram of $[CO(NH_3)_6]^{3+}$ w.r.t. σ bonding only. 6

(r) On the basis of VB theory predict why $[FeF_6]^{4-}$ is paramagnetic and $[Fe(CN)_6]^{4-}$ is diamagnetic. 5

UNIT III

3. (a) Explain the crystal field splitting in octahedral complexes. 5

(b) What is spectrochemical series ? Why is it so called ? Arrange the following ligands in increasing order of their strength :—

Br^-, H_2O, NH_3, CN^-, F^-, CO 5

(c) What are the factors affecting crystal field stabilization energy of the complexes ? 6

OR

(p) Deduce the ground term symbol for d^2 configuration. 5

(q) What are the selection rules for electronic transitions in metal complexes ? Explain why d–d transitions are usually weak. 5

(r) Explain the variation of crystal field splitting energy and heat of ligation for divalent metal ion of first transition series. 6

(b) What is the role of alkali and alkaline earth metals in biological systems ? 6

(c) Write note on 2Fe–2S ferredoxins. 5

OR

(p) What is Willkinson's catalyst ? Give the cyclic catalytic mechanism of hydrogenation of olefins using it. 5

(q) Explain the molecular mechanism of ion transport across the membrane. 6

(r) Discuss the role of myoglobin and hemoglobin in oxygen transport phenomenon. 5