

(i) Printed Pages : 3

Roll No.

(ii) Questions : 9

Sub. Code :

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Exam. Code :

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B.A./B.Sc. (General) 5th Semester

(2123)

CHEMISTRY

(Same for B.Sc. Microbial and Food Technology)

Paper—XVII : Inorganic Chemistry-A

Time Allowed : Three Hours]

[Maximum Marks : 22

Note :— Attempt five questions in all, selecting at least **one** question from each Unit (1-4). Q.No. 9 (Unit-5) is compulsory.

UNIT-1

1. (a) Discuss Crystal Field Splitting of d orbital in case of octahedral complex with the help of labelled diagram.
- (b) Why the magnitude of Δ_t is smaller than Δ_o ? Calculate the CFSE value of Mn^{2+} in low spin and high spin. 2+2

OR

2. (a) Give the limitations of VBT.
- (b) What are the salient features of Crystal Field Theory ? 2+2

UNIT-2

3. (a) What are the possible pathways in which a ligand may replace another ligand in square planar complexes ?

- (b) Suggest the synthesis of two isomers of $[\text{PtCl}_2\text{NH}_3\text{NO}_2]$ starting from $[\text{PtCl}_4]^{2-}$ on the basis of Trans effect and bond strength. 2+2

OR

4. (a) What is meant by the term inert and labile complexes ? Show the inertness of complex is different from its thermodynamics stability.
- (b) What do you understand by trans effect ? Arrange the following in increasing order of trans effect :
 $\text{Br}, \text{NH}_3, \text{OH}, \text{H}_2\text{O}, \text{Cl}.$ 2+2

UNIT-3

5. (a) What is Zeise salt ? Draw its structure and discuss the main feature of its bonding.
- (b) Calculate EAN for the following :
- (i) $\text{Fe} (\pi - \text{C}_5\text{H}_5)_2$
- (ii) $[\text{Pt} (\text{NH}_3)_5\text{Cl}]^{3+}$ 2+2

OR

6. (a) What do you understand by β elimination in transition metal alkyls ? How can it be avoided ? Give example.
- (b) Discuss the structure of $\text{Fe}_2(\text{CO})_9$. 2+2

UNIT-4

7. (a) What is a Porphyrin ? Draw the structure of Heme.
- (b) Sodium pump is electrogenic in nature. Explain. 2+2

OR

8. (a) What is Behr's effect ? Discuss Hb-O₂ binding curve at different pH.
- (b) Write a short note on Biological Fixation of N₂. 2+2

UNIT-5

9. (a) What are nitrogenase ?
- (b) What is IUPAC name of Ni (π -C₅H₅)₂ ?
- (c) What is Wilkinson catalyst ? Give its geometry.
- (d) Define Chelate Effect.
- (e) What is Spectrochemical Series ?
- (f) What is Kurnakov Test for the complex of type PtA₂X₂ ?
6×1=6