

(i) Printed Pages : 3

Roll No.

(ii) Questions : 9

Sub. Code :

0	4	9	0
---	---	---	---

Exam. Code :

0	1	0	3
---	---	---	---

B.A./B.Sc. (General) 3rd Year

1046

CHEMISTRY

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

Paper – IX : Inorganic Chemistry

Time Allowed : Three Hours]

[Maximum Marks : 45

Note : (i) The students are required to attempt **five** questions in all, selecting **one** question from each Unit and the compulsory question.

(ii) All questions carry equal marks.

UNIT-I

- I. (a) Define Crystal field splitting energy and discuss the splitting of d-orbitals of metal atom or ion in O_h field of ligands. 5
- (b) Which complex has larger value of Δ ? Explain why?
- (i) $[\text{Co}(\text{H}_2\text{O})_6]^{2+}$ or $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$
- (ii) $[\text{Mn}(\text{NH}_3)_6]^{3+}$ or $[\text{Mn}(\text{en})_3]^{3+}$. 4
- II. (a) Derive the relationship between Overall stability constant and step-wise stability constant. 5
- (b) What is Trans Effect ? Explain the theories for it. 4

UNIT-II

- III. (a) Discuss the preparation, properties and structure of Organolithium compounds. 4
- (b) What are Organometallic compounds? Discuss in detail the classification of the Organometallic compounds. 5
- IV. (a) What are Polyphosphazenes? Discuss the nature of bonding in Cyclic-triphosphazenes. 4
- (b) What is Homogeneous Hydrogenation reaction? Discuss the hydrogenation of Alkenes by Wilkinson's Catalyst. 5

UNIT-III

- V. (a) What is HSAB principle? Explain the applications and limitations of HSAB principle. 5
- (b) Explain Symbiosis with examples. 2
- (c) What is Bohr effect? Explain. 2
- VI. (a) What are the functions of Hemoglobin and Myoglobin? 4
- (b) What is $\text{Na}^+ - \text{K}^+$ pump? Explain its mechanism in biological systems. 3
- (c) What are Hard Acids and Bases? Give examples. 2

UNIT-IV

- VII. (a) Draw combined Orgel energy level diagram for d^1 and d^9 tetrahedral complexes. 4
- (b) Explain selection Rules for d-d transitions in transition metal complexes. 3
- (c) What is meant by term Diamagnetic Correction? 2

- VIII. (a) Discuss the phenomenon of orbital contribution to magnetic moment. Give electronic configurations in which orbital contribution is quenched in O_n field. 4
- (b) Calculate Microstates for d^2 configuration. 2
- (c) What is the relationship between Temperature and Magnetic susceptibility for antiferromagnetic and ferromagnetic substances? 3

UNIT-V

IX. Compulsory Question :

- (a) What are Inner orbital complexes?
- (b) What is Curie's Point?
- (c) Define absolute hardness.
- (d) Which of the two : Cu(I) or Cu(II) is paramagnetic?
- (e) What are Labile and Inert complexes?
- (f) Give one important use of Silicone Oils.
- (g) What are Term Symbols?
- (h) Define Chelate effect.
- (i) What is Hapticity? 1×9=9