(i) Printed Pages: 2 Roll No. .....

(ii) Questions : 9 Sub. Code : 0 4 5 1

Exam. Code : 0 0 0 5

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

(2122)

CHEMISTRY (Same for B.Sc. Microbiology & Food Technology)

Paper : XVII (Inorganic Chemistry-A)

Time Allowed : Three Hours] [Maximum Marks : 22

Note :— Attempt **FIVE** questions in all, selecting **ONE** question each from Units-I-IV and **Question-9** is compulsory.

UNIT—I

1. (a) Discuss splitting of d-orbitals in tetrahedral crystal field.

   (b) Calculate number of unpaired electrons and crystal field stabilization energy in $[Rh(NH_3)_6]^{3+}$ and $[CoCl_4]^{2-}$. 2,2

2. (a) Discuss the effect of ligands and geometry of complex on the crystal field splitting.

   (b) What is nephlauxetic effect ? Discuss its importance. 2,2

UNIT—II

3. (a) State trans effect. Explain π bonding theory of trans effect.

   (b) Write a note on the intermediates formed in substitution of square planar complexes via SN^2 mechanism. 2,2

4. (a) Derive expression for step-wise and overall stability constants with the help of an example.

(b) Discuss the effect of chelation on the stability of a metal complex by taking two examples. 2,2

UNIT—III

5. (a) Write a note on organometallic compounds of Al. Draw the structure of $[Al(CH_3)_2Ph]_2$.

(b) What is synergic effect ? Discuss with the help of a suitable example. 2,2

6. (a) What are metal-alkynyl complexes ? Discuss bonding in metal alkynyls by taking a suitable example.

(b) Draw the structures of trimethyltin fluoride and $Fe(CO)_5$. Give various modes of M-CO bonding. 2,2

UNIT—IV

7. (a) Draw the structure of myoglobin. Discuss its role in biological systems.

(b) What is cooperativity effect ? Give explanation for cooperativity effect in haemoglobin. 2,2

8. (a) What is nitrogen fixation ? Discuss in detail.

(b) Discuss biological role of Na and K. 2,2

(Compulsory Question)

9. (a) Draw the shapes of d_z^2 and $d_{x^2-y^2}$ orbitals.

(b) What is spectrochemical series ?

(c) Calculate EAN in $[V(CO)_6]^-$ and $[Mn(CO)_5Cl]$.

(d) Draw the structure of Ziese salt.

(e) What is the role of Zn in biological systems ?

(f) What is homogenous hydrogenation ? 1×6