2024
M.Sc.
Fourth Semester
CORE – 11
CHEMISTRY
Course Code: MCHC 4.11
(Inorganic Chemistry - IV)

Total Mark: 70 *Pass Mark: 28*
Time: 3 hours

Answer five *questions, taking* one *from each unit.*

UNIT–I

1. (a) Mention the biological role of iodine in biosystems. 3
   (b) Discuss the structure and function of biological membranes. 5
   (c) Discuss the Na^+ - K^+ pump, its mechanism and functions in biosystems. 6

2. (a) What are ionophores? 4
   (b) Discuss the crown ether complexes of Na^+ and K^+. 5
   (c) Explain the PS I and PS II mechanisms in photosynthesis. 5

UNIT–II

3. (a) What are hemeproteins? Draw the structure of heme group and discuss how iron is bonded to different types of ligands in hemeproteins. 1+2+3 =6
   (b) Discuss the optical spectra of haemoglobin under different PO_2 levels. 5
   (c) Write short notes on the synthetic oxygen carrier with reference to Vaska's Ir complex. 3

4. (a) Discuss the magnetic susceptibility of hemeprotein. 5
   (b) With the help of diagram, explain the EPR spectrum of isolated ferric alpha chains in the hydroxide form and the high field portion of dihistidyl form. 6
   (c) Discuss the evidence of Fe(III) in myoglobin. 3

UNIT–III

5. (a) Explain the role of carbonic anhydrase in Zn enzymes. 5
   (b) Write notes on blue copper proteins. 4
   (c) Discuss the importance of iron metallo-enzymes with reference to its storage and transport. 5

6. (a) Write short notes on the following: 3×2=6
      (i) Ferrichrome
      (ii) Sederophores
   (b) Define epoenzyme and coenzyme. 1+1=2
   (c) Mention two metalloenzymes of each of the following metals: 1×3=3
      (i) Fe
      (ii) Cu
      (iii) Zn
   (d) Write notes on cytochrome oxidase. 3

UNIT–IV

7. (a) Explain platinum-DNA binding with diagram. 4
   (b) Write notes on the following: 3×2=6
      (i) Iron deficiency
      (ii) Minamata disease
   (c) What are the symptoms of Hg poisoning? 4

8. (a) Discuss the uses of cisplatin in medical field. 4
   (b) Discuss arsenic poisoning in rural areas in India. 5
   (c) Explain the symptoms and prevention of Be toxicity. 5

UNIT–V

9. (a) Discuss the photosubstitution reactions of Cr (III) complexes. 4
   (b) Give the differences between fluorescence and phosphorescence. 4
   (c) Write short notes on the following: 3×2=6
      (i) Ligand field states
      (ii) Thexi states

10. (a) Discuss the photoredox reactions of Cr (III) complexes. 4

(b) How many major structural types are observed for dinuclear metal clusters containing M-M multiple bonds? Explain edge sharing bio-octahedra. 1+3=4

(c) Write short notes on the following: 3×2=6

(i) Photochromism

(ii) Charge transfer states

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