



**MCHT 3.4**

**III Semester M.Sc. Degree Examination, September 2016**  
**CHEMISTRY**  
**Bio-Inorganic and Bio-Physical Chemistry – III**

Time : 3 Hours

Max. Marks : 80

**Instructions :** Answer **any eight** questions from Part – I and **any four full** questions from Part – II.

**PART – I**

**(8×2=16)**

- i. What are coupled transporters ? Explain their role in ion transporting.
- ii. List the different proteins used for iron storage in cell.
- iii. What are cytochromes ? How they are classified ?
- iv. Write the various biological processes carried out by zinc enzymes.
- v. What is meant by biological nitrogen fixation ? Explain.
- vi. Write the effect of temperature on enzyme catalyzed reaction.
- vii. Explain the effect of  $\text{Cr}^{3+}$  for glucose oxidase in the oxidation of glucose.
- viii. What is meant by bioavailability of drug ?
- ix. Explain the significance of  $V_D$ .
- x. What is Donnan membrane equilibrium ?

**PART – II**

1.
  - a) What is ion pump ? Explain the revolving door mechanism of Sodium and Potassium pump.
  - b) What are passive carriers ? Give one example and explain how they transport ion.
  - c) Explain the role of calcium in the clotting of blood. Depicts its mechanism.  
**(4+6+6=16)**
2.
  - d) What are electron transfer reactions ? Discuss the structure and function of Ferredoxin.
  - e) Discuss the structure and biological function of Carboxypeptidase.
  - f) Write a note on metal cluster present in dinitrogenase ? Explain their role.  
**(6+6+4=16)**

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### MCHT 3.4



3. g) Derive the expression for effect of (substrate) on enzyme catalyzed reaction (Michalein-Menten Equation).  
h) Discuss the factors affecting the bioavailability of a drug.  
i) Discuss the kinetic and mechanistic application of glucose oxidase in the oxidation of glucose. **(6+4+6=16)**
  4. j) Discuss the process salting out of proteins and explain its application in separation of proteins.  
k) What are Micelles ? Discuss the formation of mixed micelles between bile salt and products of lipid digestion.  
l) What is osmoregulation ? Explain the osmotic behavior of cells and its biological significance. **(6+4+6=16)**
  5. m) Explain the biochemistry of sodium, potassium and chlorine.  
n) Discuss the structure and function of cytochrome P-450 enzymes.  
o) What are siderophores ? Explain the structure and iron storage method in Transferrin. **(6+4+6=16)**
  6. p) Discuss the diffusion of solution across biomembrane and mechanism of application in the respiratory exchange of O<sub>2</sub> and CO<sub>2</sub>.  
q) What is surface tension ? Explain the effect of temperature ( $\gamma$ ) and effect of solute on surface tension.  
r) How interstrand disulfide bonds in proteins can be determined using viscosity measurement ? **(4+6+6=16)**
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