



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 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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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_2 and CO_2 .
q) What is surface tension ? Explain the effect of temperature (γ) 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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