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ACH 501

Third Semester M.Sc. Examination, December 2018

Applied Chemistry

(CBCS : 2016-17 Syllabus)

BIOINORGANIC CHEMISTRY

Time : 3 Hours

Max. Marks : 70

- Note :** i) Answer Part **A** and **any four** questions from Part **B**.
ii) Figures to the **right** indicate marks.

PART – A

1. Answer **all** the following sub-divisions : **(9×2=18)**
- Give two examples of radio pharmaceuticals used for imaging purposes.
 - Write the structures of solagonol and salvarasan.
 - What are the diseases caused due to deficiency of zinc ? Suggest the remedy.
 - List the essential and trace metals present in the biological system.
 - Which ring is present in chlorophyll ? How is it different from porphyrin ring ?
 - Why valinomycin binds K^+ more strongly than Na^+ ?
 - Why is cytochrome P-450 called 'Body's detoxification mechanism' ?
 - Give the structural features of rubredoxin.
 - Give two examples of blue copper oxidases. Mention their functions.

PART – B

Answer **any four full** questions : **(4×13=52)**

2. a) Describe the mechanism of anticancer activity of cis-platin. Why is transplatin not an effective anticancer drug ?
- b) Discuss briefly on the utility of gold compounds in the treatment of rheumatoid arthritis.
- c) What are the physiological effects of cyanide poisoning ? How is it treated ? **(5+4+4)**

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3. a) What are the biochemical effects of mercury and lead poisoning ? Suggest the antidotes for their removal.
- b) Write briefly on the metal complexes used as antimicrobial agents.
- c) Why are essential metals in excess, toxic to the living systems ? What are the physiological effects caused due to deficiency and excess of copper and iron ? Suggest the remedy for there effects. **(4+4+5)**
4. a) Why is fixation of nitrogen difficult ? Describe the structural features of nitrogenase. Discuss the mechanism of nitrogen fixation by this enzyme.
- b) Write the Z-scheme of photosynthesis. Enumerate the importance of magnesium in chlorophyll. **(7+6)**
5. a) How are ionophores classified ? Give one example for each type.
- b) Describe the transport of Na^+/K^+ ions across biological membrane by Na^+/K^+ ATPase.
- c) Write briefly on invitro nitrogen fixation by metal dinitrogen complexes. What are its demerits ? **(5+4+4)**
6. a) With a neat sketch, describe the structural features and function of carboxypeptidase.
- b) Why are O_2^{2-} and O_2^- toxic to biological system ? Name the enzymes responsible for their removal.
- c) Discuss the structural features of $2\text{Fe} - 2\text{S}$ and $4\text{Fe} - 4\text{S}$ in oxidised and reduced form. Comment on their magnetic properties. **(5+4+4)**
7. a) Write the structure of vitamin B_{12} coenzyme. Explain briefly on any four reactions that are catalyzed by it.
- b) Describe the mechanism of iron storage and transport in biological system. **(7+6)**
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