

Roll No.

Total Pages : 03

LMDQ/M-24

7518

INORGANIC CHEMISTRY SPECIAL-V

CHEM-403

Time : Three Hours]

[Maximum Marks : 60

Note : Attempt *Five* questions in all, selecting at least *one* question from each Section. All questions carry equal marks.

Section A

1. (a) Discuss the structural characteristics of vitamin B₁₂. Explain, how vitamin B₁₂ is important for the normal functioning of the brain and nervous system. **5**
- (b) What are Siderophores ? How are they classified ? Discuss their role in the transport of iron in biological systems. **7**
2. (a) What is transferrin ? How does it differ from ferritin ? How ferritin and transferrin interrelate with each other in the human body ? Explain. **6**
- (b) Discuss transport and regulation of Ca²⁺ in living cells. **6**

Section B

3. (a) Discuss the probable differences in pockets present in carboxypeptidase and carbonic anhydrase. 5
- (b) What are the basic components of enzyme Xanthine oxidase ? Depict the mechanism for the conversion of Xanthine to uric acid using this enzyme. 7
4. (a) What are Oxotransfer enzymes ? Enlist them and give the reaction catalyzed by these enzymes. 6
- (b) Explain the mechanism involved in the removal of toxic superoxide ion by copper enzyme superoxide dismutase. 6

Section C

5. (a) Differentiate between endo and exo receptors ? 4
- (b) Distinguish between co-system and cascade system. 3
- (c) What are the major steps in supramolecular catalysis ? 5
6. (a) What are the three main classes of electron transfer processes ? Explain photo-induced electron transfer in detail. 7
- (b) Give an account on supramolecular electronic devices. 5

Section D

7. (a) Explain the role of Cis-platin in cancer therapy. Why is Cis-platin used by oncologist in preference to the trans-isomer ? 7
- (b) Account for the biological effect of Arsenic and Mercury. 5
8. (a) What are the major sources of Hg-toxicity ? Why is CH_3Hg^+ more toxic than inorganic Hg^{2+} . Name the chelating antidotes used in detoxification of CH_3Hg^+ . 6
- (b) Discuss the serious limitation of chelation therapy used in metal ion detoxification. 6