

M.Sc. Chemistry 3rd Semester

INORGANIC CHEMISTRY

Paper—Course—XVI

Time Allowed—3 Hours]

[Maximum Marks—50

Note :— Attempt **FIVE** questions in all, selecting at least **ONE** question from each section. The **fifth** question may be attempted from any section. Each question carries **10** marks.

SECTION—A

1. (a) $\text{Na}^+ - \text{K}^+$ pump is electrogenic in nature. Explain. 3
(b) Write brief note on iron nutrition and toxicity. 3
(c) Antibiotics are important for the treatment of various diseases but they also pose toxic effects to biological systems. Comment with suitable explanation. 2
(d) Transferrin plays important role in sequestering the excess of iron in the body. Justify with suitable rationalization. 2
2. (a) Give the role of following elements in the biological systems :
(i) Chromium (III)
(ii) Iodine
(iii) Copper 3

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- (b) Write brief note on chelate therapy. 3
- (c) What do you understand by siderophores ? Give two examples. Also discuss their mechanism of action in the iron transport. 4

SECTION—B

3. (a) Illustrate the structure of myoglobin and hemoglobin. Describe in detail the importance of their role systems. 6
(b) What do you understand by iron-sulfur proteins ? Give their classification. Also briefly discuss their role in biological systems. 4
4. (a) Briefly describe the role of hemerythrin and hemocyanine as oxygen carriers. 4
(b) What are cytochromes ? Also explain their main functions and mechanism of action. 3
(c) Give three iron containing proteins. Also give their functions. http://www.gnduonline.com 3

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SECTION—C

5. (a) Briefly describe the importance of :
(i) ATP-cycle and
(ii) DNA polymerase in biological systems. 6
(b) What is the difference between nitrogen fixation and nitrogen assimilation ? 4

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6. (a) Draw and briefly discuss "Z-Scheme" for electron flow in Photosystem I and Photosystem II. 4
- (b) What is nitrogen fixation ? Discuss in detail in-vivo and in-vitro nitrogen fixation. 6

SECTION—D

7. (a) Calcium is essential for living organisms, including humans. Explain. 4
- (b) Name two zinc containing enzymes in the biological systems. Also metabolic role. 6
8. (a) Draw and discuss the structure of vitamin B₁₂. Describe the important role played by it in biological systems. 6
- (b) Structure of the enzyme plays an important role for performing a particular function. Justify this statement by giving suitable example. 4

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