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**Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET UNIVERSITY)**

M.Sc. (Fourth Semester – Regular/ Supplementary) Examinations, April – 2026
24MCYPE24001 – Bio-inorganic and Supra Molecular Chemistry
(Chemistry)

Time: 3 hrs

Maximum: 60 Marks

(The figures in the right hand margin indicate marks)

PART – A**(2 x 5 = 10 Marks)**Q.1. Answer **ALL** questions

- | | CO # | Blooms
Level |
|---|------|-----------------|
| a. Explain active and passive diffusion. | CO1 | K1 |
| b. How Peroxo linkage and hematin form? | CO2 | K2 |
| c. Write note on Ferritin. | CO3 | K1 |
| d. Explain the deficiency symptoms of iron, zinc, copper, and iodine. | CO4 | K1 |
| e. What do you mean by self-assembly and self-organisation? | CO5 | K2 |

PART – B**(10 x 5 = 50 Marks)**Answer **ALL** the questions

- | | Mark
s | CO # | Blooms
Level |
|---|-----------|------|-----------------|
| 2. a. Explain the structure and working mechanism of the Sodium-potassium pump. | 5 | CO1 | K4 |
| b. Explain the role of trace elements in enzyme function and metabolism with suitable examples. | 5 | CO1 | K5 |
| (OR) | | | |
| c. Explain the light reactions of photosynthesis with reference to Photosystem I and Photosystem II. | 5 | CO1 | K3 |
| d. Explain the role of calcium ions in muscle contraction. | 5 | CO1 | K4 |
| 3.a. Discuss the structure and function of Myoglobin. | 5 | CO2 | K4 |
| b. Describe the structure and role of Rubredoxin. | 5 | CO2 | K3 |
| (OR) | | | |
| c. Describe the structure of the active site of nitrogenase (Fe–Mo cofactor). | 5 | CO2 | K5 |
| d. Explain the role and structure of Hemerythrin in oxygen transport. | 5 | CO2 | K4 |
| 4.a. Explain the role of zinc ion in the activity of Carbonic anhydrase. | 5 | CO3 | K3 |
| b. Describe the structure and function of Cytochrome c oxidase. | 5 | CO3 | K4 |
| (OR) | | | |
| c. Describe the structure and function of Plastocyanin and Azurins. | 5 | CO3 | K5 |
| d. Discuss the mechanism of action of catalase in hydrogen peroxide decomposition. | 5 | CO3 | K6 |
| 5.a. Discuss the structure, mechanism of action, and clinical applications of Cisplatin. | 5 | CO4 | K5 |
| b. What is Wilson's disease? Explain its causes, symptoms, and treatment. | 5 | CO5 | K3 |
| (OR) | | | |
| c. What is Hypercalcemia? Explain its causes, symptoms, and treatment. | 5 | CO4 | K3 |
| d. Discuss the role of chelating agents in the treatment of metal poisoning (Lead, Cadmium, Mercury). | 5 | CO5 | K4 |
| 6.a. What do you mean by Host-Guest complex? Describe spherical recognition? | 5 | CO6 | K4 |
| b. Discuss the concept of spherical recognition with suitable examples. | 5 | CO6 | K5 |
| (OR) | | | |
| c. Explain the concept of selective binding in supramolecular systems. | 5 | CO6 | K3 |
| d. Discuss the importance of cavity size and shape in supramolecular catalysis. | 5 | CO6 | K2 |

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