

Chemistry (P.G.)**[CBCS]****M.Sc. Third Semester End Examination-2024****(Regular & Supplementary Paper)****PAPER-CEM-303****[Advanced Inorganic Chemistry – II]****Full Marks: 40****Time: 02 Hrs***The figures in the right hand margin indicate marks**Candidates are required to give their answers in their own words as far as practicable**Illustrate the answers wherever necessary***Group A****1. Answer the following questions (*Any four*): 4x2 = 8**

- a) What is oxidative stress? How that can be reduced?
- b) What are the two main processes involved in photochemistry?
Define them.
- c) Write the difference between DNA and RNA.
- d) Explain the differences between singlet and triplet excited states.
- e) What is '450' in Cyt P450?
- f) What is Photochromism?

(2)

Group B

Answer the following questions (Any four):

8x4=32

2. (a) Draw the Jablonski diagram and explain all the processes involved.
(b) What is quantum yield? A certain system absorbs 5×10^{16} quanta of light per second. On radiation for 25 minutes, 0.003 moles of reactant was found to have reacted. Calculate the quantum yield of the process. ($N = 6.023 \times 10^{23}$) 5+3
3. (a) What is ROS? Give example.
(b) How isomerase and transferase activities are important in case of Vit B12?
(c) Discuss the mechanistic aspect of catalase enzyme. 2+2+4
4. (a) What is fluorescence quenching? Explain its types and applications.
(b) Derive Stern Volmer equation. 5+3
5. (a) Draw the basic structure of Catalase enzyme. Write the biofunction of this enzyme.
(b) What is Gout? What type of food promotes this disease?
(c) Which metal centres are present in OEC? (2+2)+2+2

(3)

6. (a) The fluorescence intensity of a solution without a quencher is 500 units. When a quencher is added at a concentration of $[Q] = 0.02 \text{ M}$, the fluorescence intensity decreases to 400 units. Calculate the Stern-Volmer quenching constant.
(b) Explain delayed fluorescence.
(c) What is photosensitization and its applications? Explain the mechanism involved. 2+3+3
 7. (a) What is DNA replication? Name the enzymes involved in this process
(b) Write the mechanism of action for Sulphite oxidase and SOD? (2+2)+4
-