G-4/413/21

Roll No. .....

M.Sc. IV Semester Examination, 2021

CHEMISTRY

Paper I

(Photo Inorganic and Bioinorganic Chemistry)

Time : 3 Hours] [Max. Marks : 80

Note : *All questions are compulsory. Question Paper comprises of 3 sections. Section A is objective type/multiple choice questions with no internal choice. Section B is short answer type with internal choice. Section C is long answer type with internal choice.*

SECTION A **1×8=8**

(Objective Type Questions)

1. Haemoglobin, Myoglobin, Cytochrome and Ferrodoxins ..... compound.

2. Only sketch the active site of carbonic anhydrase.

3. Name of ligands coordinate with iron in Transferrin.

4. Name the compound present in Ferritin core.

5. Define Flash photolysis.

6. Write formulae of Lambert–Beer Law.

7. Give one example of photo oxidation–reduction reaction.

8. Define Adamson's Rule.

SECTION B **4 × 6 = 24**

(Short Answer Type Questions)

Note : *Attempt one question for each unit.*

Unit I

1. (a) What is the role of Vitamin *K* in blood cloting ? 3

(b) What do you mean by eversion in the activity of $Na^+ - K^+$ pump ? 3

Or

(a) Explain crucial role of CO_3^{2-} of HCO_3^- bound with transterritin to stabilise the complex. 3

(b) DNA cisplatin interactions introduces a distortion in the double helix structure of DNA. Comment on this statement. 3

Unit II

2. (a) Discuss the different interactions among the globin protein chains to provide the 'T' form and 'R' form of Haemoglobin. 3

(b) What is ferrodoxin ? Discuss its structural features. 3

Or

(a) Discuss structure of cytochrome C.

(b) Give only schematic diagram of photosystem I and II. 3

Unit III

3. (a) Give brief account of Stark-Einstien law of photochemistry. 3

(b) Give short notes on Absorption and Absorption spectra. 3

Or

(a) Describe primary and secondary processes of photo-chemical reaction. 3

(b) Explain acid-base strength and reactivity of excited state. 3

Unit IV

4. (a) Give two examples of photosubstitution reaction. 3

(b) Discuss some important photo–chemical reaction of manganese complexes. 3

Or

What do you mean by energy conversion ? Explain it.

SECTION C **12×4=48**

(Long Answer Type Questions)

Note : *Attmept one questions from each unit.*

Unit I

1. What is the role of calcitrol on uptake of calcium from food ? Explain hypocalcemia and hypercalcemia.

Or

Comment on the selectivity of $Na^+ - K^-$ pump in transporting the Na^+ and K^+ ions.

Unit II

2. What is cytochrome P-450 ? How do you justify the name ? Discuss its structural properties.

Or

(a) Discuss the role of proximal histidene and distal histidene in controlling the property of heamoglobin. 6

(b) Explain the function of SOD. 6

Unit III

3. What is quantum yield ? Give the reason of high and low quantum yield. Explain experimental determination of quantum yield. 12

Or

What is dipole moment ? How dipole moment are measured ? Explain dipole moment and molecular structure and application of dipole moment. 12

Unit IV

4. What is photosensitized reaction ? Explain three different photosensitized reaction. How it leads to polymerization ? 12

Or

Write short notes on (any three) : 3 × 4

(a) Photo exchange reaction,

(b) Photo aration reaction,

(c) Photolysis mechanism,

(d) Photochemistry of chromium complexes,

(e) Photochemical decomposition of water.

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