QJ-5246

M. Sc. (Sem. III) Examination, December, 2023

CHEMISTRY

PAPER - 3.3

CHEM-633

Bio-inorganic Chemistry

(Inorganic Chemistry Specilization)

Time Allowed : **Three Hours**

Maximum Marks : **70**

Minimum Marks : **28**

Note : *This question paper will be divided into three sections as under :*

SECTION - A **Max. Marks 10**

Will carry 10 marks with 01 compulsory question comprising 10 short answer type questions (maximum 20 words answer) taking two questions from each unit. Each question shall be of one mark.

SECTION - B **Max. Marks 25**

Will carry 25 marks with equally divided into five long answer type questions (answer about in 250 words). Students are instructed to attempt five questions by selecting one question from each unit.

SECTION - C **Max. Marks 35**

Will carry 35 marks with five long answer type question comprising one compulsory question (question no. 07) of 15 marks and four questions of 10 marks each. Students are instructed to attempt total three questions with one compulsory question (answer about in 500 words) and any two more questions (answer about in 400 words) out of remaining four questions.

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SECTION - A

1 (i) What is nitrogen fixation ?
(ii) Discuss trace elements with examples.
(iii) Write function of haemocyanin.
(iv) What is synthetic model ?
(v) Define transferrin.
(vi) What is metal complex nucleic acid ?
(vii) Draw structure of carboxypeptidase.
(viii) Write function of peroxidase.
(ix) Explain toxicity in metals.
(x) What is chemo therapy ?

$1 \times 10 = 10$

SECTION - B

UNIT - I

2 Write short note on :

$2\frac{1}{2} + 2\frac{1}{2} = 5$

(a) K^+ / Na^+ pump
(b) Chemical nitrogen fixation

OR

(a) Storage of glucose.
(b) Photosystem I and II in cleavage of water.

$2\frac{1}{2} + 2\frac{1}{2} = 5$

UNIT - II

3 Discuss model synthetic complexes of iron and copper. 5

OR

Explain :
(i) Cytochrome
(ii) Myoglobin

$2\frac{1}{2} + 2\frac{1}{2} = 5$

UNIT - III

4 Discuss :
(i) Siderophores
(ii) Extracellular binding proteins.

$2\frac{1}{2} + 2\frac{1}{2} = 5$

OR

Explain :
(i) Ferritin
(ii) Metal complex in interactions.

UNIT - IV

5 Write functions of :
(i) Cytochrome P-450
(ii) Carbonic anhydrase

$2\frac{1}{2} + 2\frac{1}{2} = 5$

OR

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Draw structure, properties and function of coenzyme vit B_{12}.

5

UNIT - V

6 Discuss metal deficiency diseases.

5

OR

Explain metals used in diagnosis of diseases.

5

SECTION - C

7 Write short note on the following :

(i) Haemoglobin

(ii) DNA polymerization

(iii) Role of calcium

5×3=15

8 Write the structure, properties and function of superoxide dismutase. Also mention its importance.

10

9 Discuss :

(i) Iron Surplus Proteins

(ii) Function of metal of proteins in electron transport.

4+6=10

10 Explain : Molecular aspects of intamolecular processes.

10

11 Discuss the role of chemotherapy as anticancer drug.

10

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