

**D-6341**

**M.Sc. (IV<sup>th</sup> Semester) Examination, 2020**

**CHEMISTRY**

**(Bioinorganic Chemistry)**

***Time Allowed : Three Hours***

***Maximum Marks : 70***

**Note :** Section A : Attempt any ten questions. Each question carries one mark. Objective type. **10**

Section B : Attempt any five questions. Each question carries two marks. Very short answer type (25-30 words). **10**

Section C : Attempt any five questions. Each question carries 4 marks. Short answer type (250 words). **20**

Section D : Attempt any three questions. Each question carries 10 marks. Essay type (more than 500 words). **30**

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**SECTION - A**

**Q. 1. Objective Type : 1×10=10**

Q.No. (1-5) fill in the blanks type, (6-12) multiple choice type. Attempt any ten questions. Each question carries one mark.

- (1) \_\_\_\_\_ is an example of free living aerobic nitrogen fixing bacteria.
- (2) The anti cancer activity of 'cisplatin' was first studied by \_\_\_\_\_ in the year \_\_\_\_\_.
- (3) Metal present in cyanocobalamin is \_\_\_\_\_.
- (4) Molecular weight of myoglobin is \_\_\_\_\_.
- (5) Ammonia or Ammonium is oxidised to nitrite followed by oxidation of nitrite to nitrate is called \_\_\_\_\_.
- (6) Number of Heme units present in Hemoglobin are :
  - (a) 2
  - (b) 4
  - (c) 6
  - (d) 1

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(7) The metal ions present in the active site of nitrogenase enzyme cofactor are :

- (a) Fe, W
- (b) Fe, Mo
- (c) Fe, Cu
- (d) Fe, Ni

(8) The biological function of the cytochrome P<sub>450</sub> and myoglobin are respectively :

- (a) Oxygen transport and oxygen storage
- (b) Oxygen storage and electron carrier
- (c) Electron carrier and oxygen transport
- (d) Oxidation of alkene and oxygen storage

(9) The ligand system present in Vitamin B<sub>12</sub> is :

- (a) Porphyrin
- (b) Corrin
- (c) Crown ether
- (d) Phthalocyanine

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(10) Protein involved in Iron transport is :

- (a) Metalloprotein
- (b) Peroxidase
- (c) Transferrin
- (d) Catalyse

(11) Fe-S protein cluster has a type :

- (a) 1 Fe – 0 S cluster
- (b) 2 Fe – 2 S cluster
- (c) 3 Fe – 3 S cluster
- (d) 4 Fe – 4 S cluster

(12) Oxidation state of Fe in rubredoxin iron sulphur protein is :

- (a) +3
- (b) +2
- (c) +6
- (d) +2 and +3

**SECTION - B**

**Q. 2.** Very short answer type (25-30 words) : **2×5=10**  
Attempt any five questions. Each question carries 2 marks.

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- (1) What is Bohr effect ?
- (2) Give the biological role of calcium.
- (3) What are non-heme oxygen carriers ?
- (4) What is chelation therapy ?
- (5) Give the role of Nitrogenase enzyme in  $N_2$  fixation.
- (6) What do you mean by metal ion toxicity ?
- (7) What is Blue copper ?

**SECTION - C**

**Q. 3.** Short answer type (250 words) : **4×5=20**

Attempt any five questions. Each question carries 4 marks.

- (1) Discuss  $Na^+ - K^+$  pump.
- (2) Discuss structural characteristics and functions of haemoglobin.

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- (3) Describe the importance of Gold containing drugs as antirheumatic agents and their mode of action.
- (4) Write a short note on Carboxypeptidase and carbonic anhydrase.
- (5) Discuss Cobalt Schiff base and Vaska's complexes.
- (6) Write a note on Dinitrogen complexes.
- (7) Discuss the function of metal ion in genetic regulation.

**SECTION - D**

**Q. 4.** Essay type (more than 500 words) : **10×3=30**

Attempt any three questions. Each question carries 10 marks.

- (1) What is cisplatin? Discuss its mode of action. Also discuss the cytotoxic compounds of other metals.

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