

2016

CHEMISTRY



(Inorganic Chemistry—III)

Full Marks : 48
Pass Marks : 19

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Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Select the correct answer :

$$1 \times 5 = 5$$

(a) The variation of oxygen affinity of hemoglobin and myoglobin with pH of medium is known as

- (i) cooperativity
- (ii) Halden effect
- (iii) Bohr effect
- (iv) trigger mechanism

(2)

(3)

- (b) The function of plastocyanin is
- (i) electron transfer in plants
 - (ii) oxygen transport
 - (iii) oxidation of L-ascorbic acid
 - (iv) oxidation of amine
- (c) Paper chromatography may be regarded as
- (i) solid-liquid partition chromatography
 - (ii) liquid-liquid partition chromatography
 - (iii) solid-liquid adsorption chromatography
 - (iv) None of the above
- (d) In the manufacture of cement, cement clinker is mixed with 2-3% gypsum because gypsum
- (i) helps quick setting
 - (ii) slows down setting of cement
 - (iii) removes impurity
 - (iv) increases the amount of cement

- (e) Which of the following is a secondary interaction?

- (i) Ionic bond
- (ii) Covalent bond
- (iii) Dative bond
- (iv) Hydrogen bond



UNIT—I

2. (a) What are vitamin B₁₂ and vitamin B₁₂ coenzyme? What metal is present there? What are the oxidation states of the metal in vitamin B₁₂? 2+1+1=4

Or

What is an enzyme? Write a note on copper enzymes. 4

- (b) Write a short note on the role of iron in oxygen storage and transport in biological system. 4
- (c) What is carboplatin? What are its advantages over those of cis-platin? 1+2=3
- (d) Discuss the role of metal ions in biological nitrogen fixation. 3

(4)

Or

What metal is present in carboxypeptidase? What is its function? What will you get if the metal is removed and will it show enzyme activity as earlier?

UNIT—II

3. Answer any *three* questions :

- (a) What do you mean by secondary interaction? Mention two types of such interactions.
- (b) What are the basic approaches used to prepare nanomaterials? Give one advantage and one disadvantage for each synthesis.
- (c) Discuss about the advantages of solid state reaction with the help of two examples.
- (d) Give the formula of kaolinite and montmorillonite and mention their uses.

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(Continue

(5)

UNIT—III

Answer any *three* questions :

- (a) What is atomic absorption spectroscopy? What kind of information do you get from atomic absorption spectroscopy? 3
- (b) Describe the technique adopted in paper chromatography. What are ascending and descending paper chromatography? 3
- (c) Write notes on : $1\frac{1}{2}+1\frac{1}{2}=3$
 - (i) Advantages of TLC over paper chromatography
 - (ii) Preparation of plate in TLC
- (d) What is chromatography? Explain the elution method of recovery of pure constituents from the chromatogram in a column chromatography. 3
- (e) Write short notes on (any *two*) : $1\frac{1}{2}\times 2=3$
 - (i) Chromophores and auxochromes
 - (ii) Molecular fluorescence spectroscopy
 - (iii) R_f values

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(Turn Over)

UNIT—IV

5. (a) What are hydrolysis and hydration in setting of cement?
- (b) What are the constituents of paints? State the three types of pigments used in paint manufacture.

Or

What is lithopone? How is it prepared? Give its advantage over white lead.

- (c) Write short notes on (any two) : 2½
- (i) Poisoning effect of cadmium on human body
 - (ii) Purification of industrial waste water
 - (iii) Manufacture of ceramics
 - (iv) Principles of green chemistry

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