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(May)

CHEMISTRY

(Major)

Course : 603

(Inorganic Chemistry—III)

*The figures in the margin indicate full marks
for the questions*

(New Course)

Full Marks : 48

Pass Marks : 14

Time : 2 hours

1. Choose the correct answer :

1×5=5

(a) Non-heme iron protein is

(i) hemoglobin

(ii) myoglobin

(iii) hemerythrin

(iv) cytochrome P-450

(b) The function of plastocyanin is

(i) oxidation of L-ascorbic acid

(ii) electron transfer in plants

(iii) oxidation of primary amine

(iv) oxygen transport

- (c) The formula of kaolinite clay is
 (i) $\text{Al}_2\text{O}_3 \cdot \text{K}_2\text{SO}_4 \cdot 2\text{H}_2\text{O}$
 (ii) $\text{Al}_2\text{O}_3 \cdot \text{Na}_2\text{SO}_4 \cdot 2\text{H}_2\text{O}$
 (iii) $\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2 \cdot 2\text{H}_2\text{O}$
 (iv) $\text{Al}(\text{OH})_3 \cdot \text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
- (d) Paper chromatography is more suited to
 (i) partition
 (ii) molecular sieving
 (iii) ion exchange
 (iv) adsorption
- (e) In 1952, the 'Minamata' disease in Japan was caused by poisoning effect of
 (i) Pb
 (ii) Cd
 (iii) Hg
 (iv) As

UNIT—I

2. (a) Answer any *three* questions : $4 \times 3 = 12$
- (i) Describe the role of copper in biological system.
- (ii) What are the functions of hemoglobin and myoglobin? What are the principal similarities in their structures? $3 \times 1 = 3$
- (iii) What is carboplatin? Give one of its uses. What are its advantages over those of cis-platin? $1 + 1 + 2 = 4$

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(Continued

- (iv) Explain one function of each of the following metals in biological system : $2 \times 2 = 4$
 (1) Molybdenum
 (2) Magnesium
- (b) Write a note on any *one* of the following : 2
 (i) Nitrogenase
 (ii) Chelation therapy

UNIT—II

3. (a) Answer any *three* questions : $3 \times 3 = 9$
- (i) Discuss about the advantages of solid-state reaction with the help of two examples. 3
- (ii) What are the supramolecular interactions? Give two examples. 3
- (iii) Mention the two basic approaches for synthesis of nanomaterials. Name the two characterization techniques for nanomaterials. $1\frac{1}{2} + 1\frac{1}{2} = 3$
- (iv) What are clay minerals? Give the formula and uses of montmorillonite clay. $1 + 2 = 3$
- (b) Mention two applications of nanomaterials. 2

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(Turn Over)

UNIT—III

4. (a) Describe the principle and application of paper chromatography.

Or

Define the terms 'stationary phase' and 'mobile phase' in chromatographic process. Name the phases used in TLC.

2+1=

- (b) Write a short note on any one of the following :

- (i) Principles of gas chromatography
- (ii) Advantages of TLC over paper chromatography

UNIT—IV

5. (a) Answer any three questions : 3×3=

- (i) What do you mean by setting of cement? Write down the reactions involved in it. 1+2=

- (ii) What are paints? Mention the names of essential parts of a paint. What is the role of a binder? 1+1+1=

- (iii) What is demineralized water? Describe a method of demineralization of water. 1+2=

- (iv) Discuss the poisoning effect of mercury (Hg) on human body.

- (b) Write short notes on any two of the following : 2×2=4

- (i) Glazing compounds of ceramics
- (ii) Role of thinner in paint industry
- (iii) Hazard from radioactive fallout
- (iv) Composition of cement

(Old Course)

Full Marks : 48

Pass Marks : 19

Time : 3 hours

1. Choose the correct answer : 1×5=5

- (a) Which of the following enzymes do not have heme group?

- (i) Hemoglobin
- (ii) Ferredoxin
- (iii) Cytochrome oxidase
- (iv) Catalase

- (b) Which vitamin is known as cyanocobalamin?

- (i) B₆
- (ii) B₁₂
- (iii) K
- (iv) C