Total No. of Printed Pages—10

6 SEM TDC CHM M 3 (N/O)

2017

(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. Select the correct answer : 1×5=5

(a) Hemocyanin contains

(i) magnesium

(ii) iron

(iii) copper

(iv) zinc

(b) The DNA and RNA helices are stabilized by

(i) Mg^{2+}

(ii) Fe^{2+}

(iii) Ca^{2+}

(iv) Cu^{2+}

(c) Which of the following materials is not used as binders in TLC?

(i) Plaster of Paris

(ii) Starch

(iii) Silica gel

(iv) All of the above

(d) Which of the following is used to decolourise and deodorize vegetable and mineral oils?

(i) Kaolinite

(ii) Montmorillonite

(iii) Laponite

(iv) None of the above

(e) Which of the following belongs to ceramics?

(i) Earthen ware

(ii) Porcelain

(iii) Tera cotta

(iv) All of the above

UNIT—I

2. (a) Answer any *three* questions :

(i) What is carbonic anhydrase? Discuss its activity in living organism. 4

(ii) Discuss the role of sodium and potassium in biological process. 4

(iii) What is hemoglobin? Discuss its main functions. 4

(iv) Explain how metal poisoning can be treated by chelation therapy. 4

(b) Write a note on any *one* of the following : 2

(i) *cis*-platin

(ii) Plastocyanin

UNIT—II

3. Answer any *three* questions : 3×3=9

(a) What do you mean by non-covalent interaction? Mention the name of any two types with examples. 1+2=3

(b) What are the advantages of nano-materials in modern science? Mention two applications of nano-materials. 3

(c) What do you mean by step-up and step-down syntheses of nano-materials? Name one method which follows step-down procedure. 2+1=3

(d) What do you mean by composite materials? Write a note on the application of nano-composite material. 1+2=3

UNIT—III

4. Answer any *three* questions : 3×3=9

(a) Describe the principle and application of thin-layer chromatography. 3

(b) Apply paper chromatography to separate a mixture of amino acids. How is R_f value calculated and what information is obtained from this value? 3

(c) What is FTIR? What kind of information do you get from it? 3

(d) Write the principle behind atomic absorption spectroscopy. Give its two applications. 1+2=3

(e) Write short notes on the following : 1½+1½=3

(i) Choice of solvent system in chromatography

(ii) Principles of column chromatography

UNIT—IV

5. Answer the following questions :

(a) What is Portland cement? How is it manufactured industrially? 1+3=4

(b) Discuss the health hazards which may be caused by mercury and its compounds. 4

Or

What are the hazards associated with nuclear accident? 4

(c) Write short notes on any *two* of the following : 1½×2=3

(i) Role of binder and solvent in paint industry

(ii) Ceramics

(iii) Classification of paints