

6 SEM TDC CHM M 3

2015

(May)

CHEMISTRY

(Major)

Course : 603

(Inorganic)

Full Marks : 48

Pass Marks : 19

Time : 3 hours

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

1. Choose the correct option :

1×5=5

(a) Which of the following techniques is used for the characterization of nanoparticle?

(i) AAS

(ii) NMR

(iii) SEM

(iv) None of the above

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(Turn Over)

(2)

(b) The stationary phase in adsorption chromatography is

- (i) liquid
- (ii) solid
- (iii) gas
- (iv) colloid

(c) Japanese itai-itai disease is caused by the poisoning of

- (i) Pb
- (ii) Hg
- (iii) Cd
- (iv) As

(d) The electron configuration of Fe in deoxy Mb is

- (i) $t_{2g}^6 e_g^0$
- (ii) $t_{2g}^4 e_g^2$
- (iii) $t_{2g}^5 e_g^0$
- (iv) $t_{2g}^3 e_g^2$

(e) Which of the following is not an oxygen carrier?

- (i) Haemoglobin
- (ii) Myoglobin
- (iii) Hemocyanin
- (iv) Hemerythrin

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(Continued)

(3)

UNIT—I

2. (a) Define cooperativity effect and trigger mechanism in haemoglobin. 3

(b) Explain the role of Na and K in biological system. 3

(c) Discuss the activity of carbonic anhydrase in living organism. 2

Or

Write a note on the function of nitrogenase.

(d) Mention the function of the following metal in biological system : 2

Zn and Co

(e) Write short notes on (any two) : $2 \times 2 = 4$

- (i) Plastocyanin
- (ii) Chelation therapy
- (iii) Metalloenzyme

UNIT—II

3. (a) How are nanomaterials classified on the basis of dimension? Give example for each of them. 4

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(Turn Over)

(4)

- (b) What is isomorphous substitution in clay minerals? Give example and write the formula for kaolinite clay. $1+1+1=3$

Or

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

- (c) Write a note on the application of polymer nanocomposite materials. 2

UNIT—III

4. Answer any three questions : $3 \times 3 = 9$

- (a) Define the terms 'stationary phase' and 'mobile phase' in chromatographic process. Name the phases used in TLC. $2+1=3$
- (b) What is the basic principle used to separate a mixture of two components with the help of column chromatography? Write the names of two eluting agents. $2+1=3$
- (c) Write the principle behind AAS. Give its two applications. $1+2=3$

(Continued)

(5)

- (d) What kind of information do you get from FTIR? How does it differ from infrared spectroscopy? $2+1=3$
- (e) How can a real sample be analyzed with the help of spectrochemical methods? Give one example only. 3

UNIT—IV

5. (a) What are the basic raw materials used for the manufacture of cement? Write the composition of Portland cement. $1+1=2$
- (b) Discuss about the hazards associated with radioactive fallout. 2
- (c) How do Pb and Hg behave as toxicants? Explain with examples. $1\frac{1}{2}+1\frac{1}{2}=3$
- (d) Write short notes on (any two) : $2 \times 2 = 4$
- (i) Classification of paint
 - (ii) Principle of Green chemistry
 - (iii) Ceramics

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