

M.Sc. (Final)
Term End Examination, 2017-18

Group - A (II)

Bioinorganic and Analytical Chemistry

Note : Answer any **five** questions. The figures in the right-hand margin indicate marks. Scientific Calculator may be used.

1. (a) Discuss iron chelating properties of Siderophores. Describe metal storage and transport properties of 'Ferritin'. 10
- (b) Write a detailed note on Ca^{2+} ion regulation of muscle contraction. 10

(2)

2. (a) Write the basic structure of Cytochrome P-450. Describe its catalytic cycle in the oxidation reaction of C–H bond. P-450 stands for which property of cytochrome ? 10
- (b) Write notes on Metalloenzymes of: 10
- (i) Zn containing
- (ii) Mo containing
3. (a) Give examples of metal complexes that cleave DNA through redox chemistry. 10
- (b) Write notes on the following : 10
- (i) Metals or metal complex as anti cancer drugs
- (ii) Metal deficiency and disease
4. (a) What do you mean by ‘supramolecular chemistry’ ? Describe the various supramolecular receptors based on substrate, interaction and by structure. 10
- (b) Explain supramolecular catalysis in detail. 10
5. Write notes on the following : 5×4
- (a) Self-assembly in Supramolecular Chemistry

(3)

- (b) Supramolecular photochemistry
 - (c) Superoxidase dismutase
 - (d) Co-enzyme Vitamin B12
6. (a) Describe the different types of instrumental analysis as an analytical method of chemical analysis. 15
- (b) What do you mean by sampling of analytical material? Discuss sampling of material present in different physical state. 5
7. (a) A particular analytical technique can give a precision of 1% and the sampling error is 6% ($S_s = 0.06$). What is the overall precision and is it worth considering a slower technique which can give a precision of 0.2%? 10
- (b) The percentage of constituent A in a compound AB are 22.61, 22.64, 22.54 and 22.53%. Calculate mean deviation and relative mean deviation. 10
8. (a) What do you mean by HPLC? Describe thin-layer chromatography for the identification of chlorinated pesticides in food products. 10
- (b) Write the different chemical/biochemical tests of protein, fat and carbohydrates present in food sample. 10

(4)

9. (a) Define hardness of water. Write the method of analysis of temporary and permanent hardness of water. Why Ca-EDTA complex is more stable than Mg-EDTA complex ? 10
- (b) Write notes on the following : 10
- (i) Water pollutants and their effects
- (ii) Radioactive wastes as sources of water pollution
10. (a) Describe analysis of soil (Physical and Chemical). 10
- (b) Define 'fuel'. What do you mean by calorific value of fuel. Describe ultimate and proximate analysis of solid fuel coal. 10
- _____