



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

# CHEMISTRY

Group - A (II)

## Paper - IV

Bioinorganic and Analytical Chemistry

*Time : Three Hours]            [Maximum Marks : 100*

*[Minimum Pass Marks : 36*

**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  $\text{Ca}^{2+}$  ion regulation of muscle contraction. 10

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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

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- (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

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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
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