

AE-763

M. Sc. (Final)
Term End Examination, 2016-17

CHEMISTRY

Group - A

Paper - IV

Bioinorganic and Analytical Chemistry

Time : Three Hours] [Maximum Marks : 100
[Minimum Pass Marks : 36

Note : Answer any **five** questions in all. The figures in the right-hand margin indicate marks.

1. (a) Write the functional group involved in ferritin and siderophores. How does it complex with metal ion? Give mechanism and structure. 10
- (b) Describe the role of Ca^{2+} ion in biological systems. 10
2. (a) Define Cytochrome P-450. How does it work as a monooxygenase? Describe the catalytic loop for the oxidation of R-H. Also explain different active forms of oxoferryl complex. 10

(2)

(b) Write notes on the following : 10

- (i) Superoxide dismutase
- (ii) Carboxypeptidase

3. (a) Describe the interaction of metal complexes with DNA. 10

(b) Discuss the use of metals for diagnosis and chemotherapy. Explain, why transplatin is not active drug for the treatment of cancer. 10

4. (a) Define supramolecular chemistry. Discuss the supramolecules for molecular recognition. 10

(b) Write notes on supramolecular devices. 10

5. (a) Throw light on supramolecular reactivity and catalysis. 10

(b) Write notes on the following : 10

- (i) Xanthine oxidase
- (ii) Coenzyme vitamin B₁₂

6. (a) Discuss the principles involved in volumetric and gravimetric techniques of analysis of sample. 15

(b) Write notes on safety measures practiced in chemistry laboratory. 5

(3)

7. (a) Define and explain the following terminology with examples : 10

- (i) Accuracy
- (ii) Precision
- (iii) Difference between Accuracy and Precision

(b) Describe the various types of error in experimental data. 10

8. (a) Discuss the application of gas chromatography for organophosphates. 10

(b) Write notes on food adulteration. 10

9. (a) Discuss different sources of water pollution. 10

(b) Describe the various analytical instruments used for the determination of heavy metals in water. 10

10. Write notes on any **four** of the following : 5×4

- (a) Flash point and fire point
- (b) LCV and HCV
- (c) Ultimate and proximate analysis of coal
- (d) Orsat apparatus
- (e) Analysis of soil.