Bachelor of Science (B.Sc.) Semester–I Examination

BIO-TECHNOLOGY

(Macromolecules)

Optional Paper–2

Time : Three Hours] [Maximum Marks : 50

N.B. :– (1) All questions are compulsory and carry equal marks.
(2) Draw diagrams wherever necessary.

1. Give a detailed account of Maxam-Gilbert method of DNA sequencing. 10

OR

Describe in detail Watson and Crick model of DNA. Add a note on A and Z forms of DNA. 10

2. Write short notes on :
   (a) Concept of split genes 2½
   (b) Prokaryotic genes 2½
   (c) Structure of nucleosome 2½
   (d) Arrangement of histones in the octamer. 2½

OR

   (e) Telomere 2½
   (f) Cot curves 2½
   (g) C-value and C-value paradox 2½
   (h) Centromere 2½

3. Describe the primary structure of proteins with respect to :
   (a) End group analysis 5
   (b) Cleavage of disulfide bond. 5

OR

What are amino acids ? Describe the reactions of amino acids with :
   (i) Edman's reagent
   (ii) Ninhydrin. 10

4. Describe in detail the α-helical and β-pleated sheet structure of proteins. 10

OR

   (a) Describe the forces that stabilize the tertiary structure of proteins. 5
   (b) Describe the titration curve of amino acid. 5

5. Answer any **ten** of the following :
   (i) Name the pentose sugar present in RNA. 1
   (ii) Name one unusual base found in tRNA. 1
   (iii) Chargaff's rules are applicable to nucleic acids. (True or False) 1
   (iv) What are exons ? 1
   (v) What is the role of linker DNA ? 1
   (vi) What are spacers ? 1
   (vii) Name any one acidic amino acid. 1
   (viii) What is meant by an essential amino acid ? 1
   (ix) Write the chemical structure of alanine. 1
   (x) What is meant by denaturation of proteins ? 1
   (xi) What are domains ? 1
   (xii) Name the metal ion present in myoglobin. 1