**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. Write short notes on :
   (a) Structure of tRNA. 5
   (b) Forces stabilizing nucleic acid structure. 5

**OR**

Explain in detail the Maxam and Gilbert DNA sequencing method. 10

2. Write short notes on :
   (a) Concept of splitgenes 5
   (b) Telomere and centromere. 5

**OR**

   (c) C-value and C-value paradox. 5
   (d) 10 nm fibre and 30 nm fibre. 5

3. (a) Write the chemical structures of two acidic and two basic amino acids. 5
   (b) Write a note on C-terminal analysis reaction. 5

**OR**

   (c) Write a note on nutritional classification of amino acids. 5
   (d) Discuss the Ninhydrin reaction with amino acids. 5

4. (a) Describe the structure of myoglobin. 5
   (b) Write a note on $\alpha$-helix of protein. 5

**OR**

Discuss in detail the forces stabilizing the tertiary structure of proteins. 10

5. Solve any ***ten*** of the following :
   (i) What is base stacking ? 1
   (ii) Draw the structure of a DNA nucleotide. 1
   (iii) Name any two unusual bases found in t-RNA. 1
   (iv) How many histones are present in a nucleosome ? 1
   (v) What are linkers ? 1
   (vi) What is a scaffolding protein ? 1
   (vii) Name any two aromatic amino acids. 1
   (viii) What is a Zwitter ion ? 1
   (ix) Name any one end opeptidase used for protein sequence determination. 1
   (x) Name one $\alpha$-helix destabilizing amino acid. 1
   (xi) What are oligomeric proteins ? 1
   (xii) How many amino acids are present in a $\beta$-bend ? 1