B.Sc. (Part—I) Semester—I Examination
1S : BIOCHEMISTRY
(Biomolecules and Nutrition)

Time : Three Hours] [Maximum Marks : 80

N.B. :— All questions are compulsory and carry equal marks, except Question No. **1** carrying **8** marks.

1. (A) Fill in the blanks (½ mark each) :

   (i) Anomers are compounds which differ in the configuration only at _____ .

   (ii) Fats are esters of fatty acids with _____ _.

   (iii) The chemical name of thymine is _____.

   (iv) The simplest optically inactive amino acid is _____. 2

   (B) Choose correct alternative (½ mark each) :

   (i) Which one of the following is not a disaccharide ?

   (a) Sucrose (b) Lactose

   (c) Maltose (d) Starch

   (ii) Δ^8 indicates a double bond between carbon atoms :

   (a) 7 and 8 (b) 8 and 9

   (c) 8 and 10 (d) 6 and 8

   (iii) Linkages present in proteins are known as :

   (a) Amide (b) Ester

   (c) Peptide (d) None of the three

   (iv) Riboflavin molecule contains :

   (a) D-ribose (b) D-ribitol

   (c) D-2-deoxyribose (d) D-2-deoxyribitol 2

   (C) Answer in **one** sentence each (**1** mark each) :

   (i) Define BMR.

   (ii) Define Hormone

   (iii) Define Protein.

   (iv) Define Homopolysaccharide. 4

2. (a) What are deoxy sugars ? Explain with examples. 4

   (b) Describe the structure and function of glycogen. 4

   (c) What are reducing sugars ? Explain with examples. 4

OR

(p) What are the types of glycosidic bonds ? Explain with examples. 4

(q) What are mucopolysaccharides ? Give examples. 4

(r) Draw ring structures of α-D-glucopyranose and β-d-glucopyranose. 4

3. (a) Explain cis- and trans- isomerism with suitable examples. 4

(b) Draw the structures of ergosterol and cholesterol. 4

(c) What is acid value of fat ? Give its significance. 4

OR

(p) Give the structure and function of sphingomyelin. 4

(q) Name unsaturated fatty acids with their structures. 4

(r) What is meant by saponification ? Explain with reaction. 4

4. (a) Name glucogenic and ketogenic amino acids. 4

(b) What is meant by primary and secondary structures of protein ? 4

(c) Give the biological functions of proteins. 4

OR

(p) Describe the Zwitterionic structure of amino acid with suitable example. 4

(q) Draw the structures of aspartic acid and glutamic acid. 4

(r) Give forces stabilizing the tertiary and quaternary structure of proteins. 4

5. What is meant by balanced diet ? Describe diet during pregnancy and infancy. 12

OR

Discuss about calorie malnutrition, obesity and fatty liver. 12

6. (a) Draw the structures of purine and pyrimidine bases. 4

(b) Describe the structure and function of t-RNA. 4

(c) Give evidence that DNA is genetic material. 4

OR

(p) Draw the structure of cytochrome C giving its physiological role. 4

(q) Describe denaturation and annealing of DNA. 4

(r) Give the functions of hemoglobin and chlorophyll. 4

7. Give detail account of chemistry, sources, daily allowances, function and deficiency of Vitamin D_2 and D_3. 12

OR

Describe chemistry and functions of T_3 and T_4 hormones of Thyroid. 12