**AU–31**

**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) : 2

(i) _____ is sugar present in milk.

(ii) _____ structure of an amino acid is electrically neutral.

(iii) $T_3$ and $T_4$ hormones are secreted by _____ .

(iv) All α-amino acids are optically active except _____ .

(B) Choose correct alternative (½ mark each) : 2

(i) Which one of the following is non-proteinous amino acid ?

(a) α-Alanine (b) β-Alanine

(c) α-Glycine (d) α-valine

(ii) Linolenic acid contains the number of double bonds :

(a) 2 (b) 3

(c) 4 (d) 5

(iii) Which of following hormones is concerned with regulation of blood sugar level ?

(a) Insulin (b) Vassopressin

(c) $T_3$ (d) Testosterone

(iv) Which of following is not phospholipid ?

(a) Lecithin (b) Cephalin

(c) Sphingomyelin (d) Cholesterol

(C) Write in **one** sentence about the following (**1** mark each) : 4

(i) Define iodine number of Fats.

(ii) Define RQ of foodstuffs.

(iii) Define Vitamins.

(iv) What is nucleotide ?

2. (A) Classify carbohydrates giving examples of each class. 4

(B) Describe epimerism giving examples. 4

(C) What are deoxy sugars ? Give their structures. 4

**OR**

(P) Discuss mutarotation with suitable examples. 4

(Q) Give phenyl hydrazine reaction of glucose. 4

(R) Describe structure and function of hyaluronic acid. 4

3. Describe the structure and biological functions of different phospholipids. 12

**OR**

Discuss hydrolysis, acid value, iodine number of fats and add note on rancidity of fats. 12

4. (A) Describe Zwitter ionic structure of amino acid. 4

(B) Draw structures of sulfur containing amino acids. 4

(C) Discuss salting in and salting out of proteins. 4

**OR**

(P) Discuss quaternary structure of protein. 4

(Q) What do you understand by glucogenic and ketogenic amino acids ? Give their examples. 4

(R) Describe structure of peptide bond. 4

5. Discuss nutritional importance of carbohydrates, lipids and proteins. 12

**OR**

Give sources and biochemical functions of Fe, Ca and Na. 12

6. (A) Describe Watson-Crick model of DNA. 4

(B) Describe in brief different types of RNA. 4

(C) Describe physiological role of bile pigments. 4

**OR**

(P) Describe importance of hemoglobin. 4

(Q) Define gene and explain concept of genome. 4

(R) Discuss denaturation and annealing of DNA. 4

7. (A) Describe effect of insulin on carbohydrate and lipid metabolism. 4

(B) Give deficiency effects of Vitamin-A and Vitamin-D. 4

(C) Describe mode of action of Steroid hormone. 4

**OR**

(P) Describe classification of hormones giving examples. 4

(Q) Give structure and functions of Vitamin-C. 4

(R) Discuss hypo and hyperthyroidism. 4