This question paper contains **4** printed pages]

Roll No. | | | | | | | | | | |

S. No. of Question Paper : **6456**

Unique Paper Code : **2494001001**

Name of the Paper : **Molecules of Life (GE-1)**

Name of the Course : **B.Sc. (Hons.) Biochemistry**

Semester : **II**

Duration : **2 Hours** Maximum Marks : **60**

(Write your Roll No. on the top immediately on receipt of this question paper.)

There are six questions.

Attempt any *four* questions.

All questions carry equal marks.

Question No. **1** is compulsory.

1. (*a*) Define the following terms with suitable examples wherever applicable :

   (*i*) Zwitterion

   (*ii*) Isoelectric point

   (*iii*) Chargaff's Rule

   (*iv*) Eicosanoids

   (*v*) Mutarotation.

P.T.O.

(*b*) Match the biomolecules from List A with List B :

List A : Glyceraldehyde, Palmitic acid, Phospholipid, Linoleic acid, Reducing sugar, Adenine, Cholesterol, Cerebroside, Ribose, Glycogen

List B : Pentose, Homopolysaccharide, Fructose, Triose, PUFA, Steroid, Glycolipid, Fatty acid, Nitrogenous base, Phosphatidylethanolamine. 10,5

2. Differentiate between the following :

(*a*) Essential and non-essential amino acids

(*b*) Reducing and non-reducing disaccharide

(*c*) DNA and RNA

(*d*) Cellulose and Glycogen

(*e*) Glycerolipids and Sphingolipids. 3×5

3. (*a*) Draw the structure of the following :

(*i*) α-D glucopyranose

(*ii*) Alanine

(*iii*) Phosphatidic acid

(*iv*) Phenylalanine

(*v*) 2'-deoxyribose.

(*b*) Explain the salient features of the structure of B-DNA using a suitable diagram.

(*c*) What are non-standard amino acids ? Discuss with suitable examples (any *two*). Draw the structures and mention their significance. 5×3

4. (*a*) Name the amino acid that absorb ultraviolet light. Which of these absorbs maximum UV light ?

(*b*) Explain the effect of unsaturation on the melting point of fatty acids using suitable examples.

(*c*) Indicate whether the following pairs of sugars are epimers, anomers or enantiomers :

(*i*) α-D Glucopyranose and β-D Glucopyranose

(*ii*) D-Glucose and D-Mannose, and

(*iii*) D-Fructose and L-Fructose.

(*d*) Write an example each for the following :

Essential fatty acid, an imino acid, a purine base, a sphingolipid, an amino acid that is optically inactive, a tetrameric protein.

(*e*) Write briefly on the organization of DNA into Chromatin. 3×5

5. Mention the reasons for the following statements :

(*a*) Amino acids act as buffers.

(*b*) Lactose exists in two anomeric forms, while no anomeric form of sucrose has been reported.

(*c*) DNA is more stable than RNA.

(*d*) DNA rich in GC base pairs melts at a higher temperature than the DNA that is rich in AT base pairs.

(*e*) Protein which is abundant in basic amino acids exhibits a positive charge. 3×5

6. (*a*) Write a note explaining the levels of protein structure.

(*b*) Explain the functions of RNA briefly.

(*c*) Why are triglycerides considered as preferred choice as storage fuel compared to Glycogen ?

(*d*) What are Coenzymes ? Name any *three* Vitamins and their corresponding coenzymes. 5,4,3,3