

(b) Mention the properties of water that make it an ideal solvent.

(c) Discuss the Watson and Crick model of DNA structure. (5, 5, 5)

6. (a) Explain why?

(i) Amino acids act as buffers.

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

(iii) pKa of glycine is lower than pKa of acetic acid.

(iv) DNA absorbs UV light.

(v) DNA rich in GC base pairs melts at a higher temperature than the DNA which is rich in AT base pairs.

(vi) Chondroitin Sulfate acts as a lubricant in skeletal joints.

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

(i)  $\alpha$ -D glucose and  $\beta$ -D glucose.

(ii) D-glucose and D-galactose.

(iii) D-fructose and L-fructose. (12, 3)  
(100)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 4600

J

Unique Paper Code : 2494001001

Name of the Paper : Molecules of Life (GE)

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

Semester : II

Duration : 2 Hours

Maximum Marks : 60

### Instructions for Candidates

1. Write your Roll. No. on the top immediately on receipt of this question paper.
2. There are 6 questions.
3. Attempt **any 4** questions.
4. **All questions** carry equal marks.
5. **Question no. 1** is compulsory

1. Give one example for the following:

(i) A nitrogenous base found only in RNA.

(ii) A non-reducing disaccharide.

P.T.O.

- (iii) A storage polysaccharide of plants.
- (iv) An amino acid that absorbs UV light strongly.
- (v) An amino acid having sulfur atom.
- (vi) A saturated fatty acid with 18 carbons.
- (vii) An unusual base found in tRNA.
- (viii) An imino acid.
- (ix) A polysaccharide found in cotton.
- (x) An epimer of glucose.
- (xi) An anomer of  $\alpha$ -D mannose.
- (xii) A polysaccharide present in fungal cell wall with N-acetylglucosamine monomers.
- (xiii) An amino acid that is optically inactive.
- (xiv) Stored form of carbohydrates in plants.
- (xv) A hormone derived from cholesterol.

(1x15=15)

2. (a) What are the major classes of membrane lipids? How are they different from storage lipids?
- (b) Why is DNA resistant to base hydrolysis whereas RNA is rapidly hydrolyzed?
- (c) How do we classify amino acids? Explain with examples from each class. (5, 4, 6)

3. Differentiate between the following: (3x5=15)
- (i) Anomers and Epimers.
  - (ii) A-DNA and B-DNA.
  - (iii) Essential and nonessential amino acid.
  - (iv) Starch and Glycogen.
  - (v) Phospholipids and sphingolipids.
4. (a) Draw the structure of the following:
- (i) D-Glucose
  - (ii) Maltose
  - (iii) Glycine
  - (iv) Uracil
  - (v) Palmitic acid
  - (vi) Ribose
- (b) Explain the role of biologically important nucleotides.
- (c) Discuss the role of lipids as hormones with examples. (6, 5, 4)
5. (a) What are buffers? Discuss the role of biological buffers present in blood.