

This question paper contains 3 printed pages]

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S. No. of Question Paper : 5809

Unique Paper Code : 2232011202

Name of the Paper : DSC : Fundamentals of Biomolecules

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

Semester : II (NEP-UGCF)

Duration : 2 Hours

Maximum Marks : 60

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

Attempt four questions in all.

Q. No. 1 is compulsory.

1. (a) Define the following (any four) :

4×1=4

(i) Enantiomer

(ii) Mutarotation

(iii) Plasmalogens

(iv) Holoenzyme

(v) Amphipathy

(b) Distinguish between (any four) :

4×2=8

(i) Reducing and Non-reducing sugar

(ii) O-glycosidic linkage and N-glycosidic linkage

P.T.O.

- (iii) Syn and anti-conformations
- (iv) Essential and Non-essential amino acids
- (v) Saturated and Unsaturated fatty acids.
- (c) Draw the chemical structures (any *three*) : 3×1=3
  - (i) Lactose
  - (ii) Hyaluronic acid
  - (iii) Adenine
  - (iv) Cholesterol
  - (v) Leucine.
- 2. (a) Describe Watson and Crick model of double helical structure of DNA using a well-labelled diagram. 10  
(b) Describe *two* previous studies that formed the basis of double helical structure of DNA proposed by Watson and Crick. 5
- 3. (a) Derive the Michaelis-Menten equation of enzyme kinetics. 9  
(b) What are bi-substrate reactions ? Give their types with example. 6
- 4. (a) What are structural lipids ? What are different types of structural lipids ? 9  
(b) A structural biologist is analyzing the polysaccharide starch, which is composed of amylose and amylopectin.
  - (i) Draw the structure of amylose and amylopectin and explain how they differ from each other. 3

- (ii) How do the differences in the glycosidic linkages between glucose units in starch and cellulose affect their functions in living organisms ? 3
5. (a) What are the various levels of organization of protein structures ? Describe in detail. 10
- (b) Describe the forces responsible for maintaining the tertiary structure of proteins. 5
6. Write short notes on the following (any *three*) : 3×5=15
- (a) Structural polysaccharides
  - (b) Enzyme inhibition
  - (c) Structure of *t*-RNA
  - (d) Ramachandran plot
  - (e) Classification of amino acids.