T(I)-Biochemistry-H-2(Mod.-III)

2021

BIOCHEMISTRY — HONOURS

Second Paper

(Module - III)

Full Marks : 50

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer question no. 1 and any three questions, taking one each from Unit-I, Unit-II and Unit-III.

- 1. Answer *any ten* of the following :
 - (a) What is leghemoglobin?
 - (b) What is the role of vitamin C in the formation of collagen?
 - (c) What is the difference between glycoprotein and proteoglycan?
 - (d) How do you differentiate DNA and RNA using absorbance?
 - (e) What is salting out of proteins? Give one use of this process.
 - (f) Differentiate between anomers and isomers.
 - (g) Why is sucrose known as 'invert sugar'?
 - (h) What type of linkages are present in glycogen?
 - (i) How is it possible to visualise DNA?
 - (j) Draw the dipeptide formed from L-Tyrosine and L-Lysine.
 - (k) Distinguish between nucleotide and nucleoside.
 - (l) What is the role of cholesterol in membrane fluidity?
 - (m) How does Z-DNA differ from B-DNA?
 - (n) What is denaturation of protein?
 - (o) Draw the structure of one aldohexose.

Unit-I

- 2. (a) Why amino acid is called as amphoteric molecule?
 - (b) What kind of interactions hold the tertiary structure of protein together?
 - (c) Name two modified amino acids found in protein and state their biological functions.
 - (d) Draw a peptide bond showing the ϕ and Ψ angles. Label accordingly. 2+3+3+2

Please Turn Over

2×10

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- 3. (a) What is the use of dansyl chloride in protein analysis? Give reaction.
 - (b) What are the advantages of Merrifield solid-phase peptide synthesis?
 - (c) Compare and contrast the structural features of α -helix and β -sheet structures of proteins.

(1+2)+3+(2+2)

Unit-II

- 4. (a) Differentiate the following :
 - (i) Glucose and Fructose
 - (ii) Glycerophospholipids and Sphingolipids.
 - (b) Explain why certain ketoses, such as fructose, behave as reducing sugars even though they do not contain an aldehyde group.
 - (c) How glycosidic linkage is formed?
- 5. (a) What do you mean by rancidity of fats? What is iodine number?
 - (b) Draw and explain the linkage present in chitin.
 - (c) Briefly discuss the structure and function of sphingomyelins and cerebrosides.

(2+2)+2+(2+2)

2+2+3+3

(2+2)+3+3

Unit-III

- 6. (a) What are major and minor groove present in DNA double helix? How are they formed?
 - (b) Explain the structure and functions of different types of RNAs.
 - (c) What are the factors affecting melting temperature of DNA? What is hyperchromic effect? 3+3+(2+2)
- 7. (a) Write down the reaction for the acid hydrolysis of RNA.
 - (b) What is the function of cyanocobalamin?
 - (c) Differentiate between hemoglobin, leghemoglobin and chlorophyll in terms of metal centers.
 - (d) State Chargaff's rule. Explain with Example.

(2)