

2021

BIOCHEMISTRY — HONOURS

Paper : CC-1

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.*

1. Answer **any five** questions : 2×5
- (a) Write the name of two homopolysaccharides which are the storage forms of fuel.
 - (b) What is triacylglycerol? Name the specialized cells, which are storage of triacylglycerols in vertebrates.
 - (c) What is glycolipid? Give an example.
 - (d) What is the difference between hemoglobinopathies and thalassemias?
 - (e) What is the T_m of double-stranded DNA?
 - (f) Why sucrose is a non-reducing sugar?
 - (g) What is epimerism? Give an example.
 - (h) What is nitrogenous base present in lecithin?
 - (i) 'The absorption maxima of nucleic acid is 260 nm'.— Briefly justify.
 - (j) Why DCCD is used in SPPS method?
2. Answer **any two** questions :
- (a) (i) What are the advantages to use triacylglycerols as stored fuels, rather than polysaccharides glycogen and starch?
(ii) What are conjugated proteins? Mention two classes of conjugated proteins indicating the prosthetic groups. 2+(1+2)
 - (b) (i) Give biochemical explanation for the finding that geographical distribution of glucose-6-phosphate dehydrogenase deficiency correlates well with malarial incidence.
(ii) What is chloride shift? 3+2
 - (c) (i) What is prion protein? What does it do?
(ii) What is the role of vitamin C in the biosynthesis of collagen? (2+1)+2
 - (d) (i) How many double bonds are there in arachidonic acid? Mention their positions.
(ii) Draw the structure and biological importance of chitin. 1½+(1½+2)

Please Turn Over

3. (a) What is 'Salting out' of proteins?
(b) Describe the predominate base pairing in nucleic acid structure according to Watson-Crick model along with their structures.
(c) What is the clinical significance of HbF?
(d) The three dimensional structure of which protein has been carried out *first* from x-ray diffraction study? What are the functions of this protein? 2+3+2+(1+2)

Or,

4. (a) Classify fatty acids with examples. Which type is prevalent in human body?
(b) Name two common types of secondary structures. Mention how they are preserved.
(c) What is the difference between D⁻ and L⁻ sugars? (3+1)+(2+2)+2
5. (a) How ring structure of glucose is formed?
(b) What are deoxy sugars? Give examples.
(c) What is the special feature of sphingomyelin?
(d) Draw the structure of cholesterol. 3+3+2+2

Or,

6. (a) What are the factors responsible for holding the two strands of DNA together?
(b) What are glycosaminoglycan? Give examples with structures.
(c) State and explain Bohr effect. 2+(2+2)+(2+2)
7. (a) Describe carbohydrate as informational molecules.
(b) Discuss the role of lipid as signalling molecules with examples.
(c) What is the drawback of using carboxypeptidase in c-terminal residue determination? 3+(3+1)+3

Or,

8. (a) Name the N-terminal amino acid identification method :
(i) Which is suitable for as little as 100 picomoles of proteins.
(ii) Where after releasing the N-terminal amino acid residue, the rest of the polypeptide chain remains intact.
(b) Draw the structure of sialic acid. Name an use of it.
(c) What is glutathione? Show its sequence. What is its utility in cells?
(d) What does A₂₆₀ / A₂₈₀ indicate? 2+(2+1)+(1+1½+1)+1½
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