

(4)
GROUP—C

Answer *any four* questions.

(2 × 4 = 8)

11. (a) Write four differences between ADNA and BDNA.
- (b) RNA secondary structure can have important biological function. Explain.
- (c) Show different types of GPI anchored protein using a diagram.
- (d) rRNA of the ribosome also has an enzymatic activity. Explain briefly about the mechanism involved in the process.
- (e) Differentiate between Glycerophospholipids and Sphingophospholipids.
- (f) Spectrin is a cytoskeletal protein noncovalently associated with the cytosolic side of the red blood cell membrane. Write briefly about the structure and function of the protein.
- (g) Mention the biological significances of Cardiolipin and Lecithin.
- (h) It is a ceramide with single sugar residue at C1 hydroxyl moiety. Identify the molecule and write its function.
- (i) Write briefly about the physiological and medical significances of gangliosides.

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M. Sc. BIOTECHNOLOGY EXAMINATION, 2024

(1st Year, 1st Semester)

BIOCHEMISTRY

PAPER : PG/132T

Time : 2 Hours

Full Marks : 40

(Use a separate Answer script for each Group)

GROUP—A

(24 Marks)

Answer question number 1 and *any four* questions from
question number 2 to 8

1. Answer *any four* from the following : [1×4=4]

- (i) What are the ligands of hemoglobin?
- (ii) What is isoelectric point of an amino acid? Does protein also have an isoelectric point?
- (iii) What are the structure and function of Sanger's reagent?
- (iv) Why only a limited kind of fatty acids can take part in human cell membrane formation?

(2)

- (v) Why humans cannot digest cellulose while termites can?
- (vi) What would be the final pH of a solution of pH 6 after a hundred-fold dilution with pure water?
- (vii) Why ribose sugars are important?
2. (a) Write down the structure and function of glutathione.
- (b) How do aromatic amino acids contribute in protein estimation using spectrophotometry?
- (c) How could proteins be denatured? [2+2+1=5]
3. (a) What are the elements of life?
- (b) Write down the implications of the results obtained from the Urey- Miller experiment.
- (c) Why life cannot exist without water? [1+2+2=5]
4. (a) What are the special characteristics of peptide bonds?
- (b) Which bonds are involved in the primary, secondary, tertiary and quaternary structures of a protein? [3+2=5]
5. How proteins are degraded by (a) ubiquitin and (b) lysosomal pathway? [3+2=5]

(3)

6. How proteins could be separated based on their (a) size, (b) solubility, (c) charge, (d) absorption, (e) affinity? [1+1+1+1+1=5]
7. (a) How are chaperons involved in protein folding?
- (b) What diseases are associated with protein folding? [3+2=5]
8. (a) Write down the essential features of fluid Mosaic Model of membrane structure.
- (b) How it is similar or different with micelle and liposome? [3+2=5]

GROUP—B

Answer *any one* question. 1×8=8

9. Define covalent catalysis with example .What is the function of His57 residue in the catalytic triad for serine proteases? Name any HIV protease inhibitor. Define catalysis by approximation with example. State the cleavage position of chymotrypsinogen during activation by trypsin. Give one example of zinc protease. [2+1+1+2+1+1=8]
10. State the importance of inverted repeats in endonuclease activities of restriction enzymes. What are the target peptide bonds of thrombin? Which molecular changes do take place in haemoglobin when O₂ pressure is high in lung? Name any isomerase enzyme and mention its function. Define fibrinopeptides. What is the function of 2,3 bisphosphoglycerate? [2+1+2+1+1+1=8]