

1/H-64 (i) (Syllabus-2015)

2016

( October )

BIOCHEMISTRY

( Honours )

( Biomolecules and Biophysical Techniques )

( BCHEM-101 )

Marks : 56

Time : 3 hours

*The figures in the margin indicate full marks  
for the questions*

Answer **four** questions, taking at least **one**  
from each Part

PART—A

1. (a) Using a buffer system of your choice, explain how it would resist a change in pH when—

(i) an acid is added;

(ii) a base is added.

4+4=8

( 2 )

- (b) Discuss the physical properties of water and their relevance in maintaining native biomolecular structures. 6
2. (a) With the help of suitable organic compounds, explain the following terms :  $2 \times 4 = 8$
- (i) Epimers
  - (ii) Anomers
  - (iii) Enantiomers
  - (iv) Mutarotation
- (b) Using the structures of lactose, sucrose and maltose, indicate glycosidic bonds. 6
3. (a) What are sphingolipids? Describe the types of sphingolipid found in the cell and define their functions.  $2 + 8 = 10$
- (b) What are the differences between waxes and terpenes? 4
4. What are the various structural elements found in proteins? How are such structures maintained? Discuss the details of secondary structures found in proteins.  $3 + 3 + 8 = 14$
5. (a) What are deoxyribonucleotides? Draw the structures of four different deoxyribonucleotides that make up DNA.  $2 + 4 = 6$

( 3 )

- (b) Describe Watson and Crick's DNA double-helix model using suitable diagrams. 8

PART—B

6. Discuss the principles of Native PAGE and SDS-PAGE. How are these two techniques different from each other? Discuss the application of SDS-PAGE in the determination of molecular weight.  $6 + 3 + 5 = 14$
7. Write brief account on any *two* of the following :  $7 \times 2 = 14$
- (a) Electron microscopy
  - (b) Autoradiography
  - (c) Centrifugation in the separation of biomolecules

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