

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

2017

(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) Derive Henderson-Hasselbalch equation. 7
- (b) Calculate $[H^+]$ of an acid solution of
pH 6.0. 2
- (c) What are buffer systems? Mention their
usefulness in laboratory investigations
and biological systems. 2+3=5

(2)

2. Answer any *four* of the following giving suitable examples : $3\frac{1}{2}\times 4=14$
- (a) How do epimers differ from anomers?
 - (b) How does 'chair' form of glucopyranose differ from its 'boot' form?
 - (c) What do you mean by 'envelope' form of furanose ring?
 - (d) Draw a schematic diagram of cellulose showing its conformation.
 - (e) How does sucrose differ from lactose?
3. (a) What are amino acids? Justify that the distinctive, physical, chemical and biological properties associated with amino acids are the results of the R-groups. Classify these amino acids according to their R-groups, giving one structural formula from each group. $2+4+4=10$
- (b) Describe the chemical properties of peptide bonds. Define primary structure of proteins. $2+2=4$
4. What are fatty acids? How are they named? Briefly explain the chemical properties of fatty acids. $2+4+8=14$

(3)

5. Describe the major types of RNA. How does RNA differ from DNA? Why is RNA not a stable molecule compared to DNA? $6+3+5=14$

PART—B

6. (a) Describe the underlying principle of gel filtration chromatography. 8
- (b) State the characteristics of α , β and γ radiations. 6
7. Briefly discuss the principles and applications of any *two* of the following : $7\times 2=14$
- (a) NMR
 - (b) X-ray crystallography
 - (c) Spectrofluorimetry
