

2025

(November-December)

**Biotechnology**

Paper: BTH-C-101

**Principles of Biochemistry**

**Time: 2 Hours**

**Total Mark: 45**

**Pass Marks : 14**

*(The figures in the right margin indicate full marks of the questions)*

1. Choose the correct answer: 1×5=5
- a) Which amino acid contains a sulfur atom?
- i) Glycine
  - ii) Alanine
  - iii) Cysteine
  - iv) Proline
- b) The Henderson-Hasselbalch equation relates pH to:
- i) Buffer concentration only
  - ii) Acid strength only
  - iii) Temperature and ionic strength
  - iv) pKa and ratio of conjugate base to acid
- c) The protein part of an enzyme that is inactive without its cofactor is—
- i) Holoenzyme
  - ii) Apoenzyme
  - iii) Isoenzyme
  - iv) Allosteric enzyme
- d) The left-handed helical form of DNA is:
- i) Z-DNA
  - ii) B-DNA
  - iii) A-DNA
  - iv) C-DNA
- e) Which intermediate connects glycolysis with the TCA cycle?
- i) Fructose-1,6-bisphosphate
  - ii) Acetyl-CoA
  - iii) Glyceraldehyde-3-phosphate
  - iv) Oxaloacetate

2. Write short notes on the following (*Any three*): 3×3=9
- a) Functions of lipids
  - b) Peptide bond
  - c) Prosthetic groups
  - d) Buffer
  - e) Transamination

3. Answer any five of the following questions. 5×5=25
- a) Describe the organization and function of mitochondrial Electron transport complexes (I-IV).
  - b) Explain how proteins act as buffers in biological fluids.
  - c) With suitable diagrams, differentiate between competitive and non-competitive inhibition of enzymes.
  - d) Describe the structure of DNA according to Watson and Crick's model.
  - e) Discuss the factors affecting enzyme activity.
  - f) With suitable example, discuss the process of oxidative deamination.
  - g) Explain the structure and Biological functions of starch & glycogen.

4. Explain in detail the IUBMB system of enzyme classification. 6

Or/অথবা

Describe the glycolysis pathway, including its key steps, enzymes and energy yield. 6

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