53 (FPT 603) BCBT

2014

BIOCHEMISTRY AND BIOTECHNOLOGY

Paper : FPT 603

Full Marks : 100

Time : Three hours

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

*Answer **any five** questions from **seven**.*

1. *(a)* Define Biomolecules. What are the major classes of biomolecules that serve as building blocks for larger macromolecules ? 1+4

   (b) What is amino acid pool ? 3

   (c) What is N-terminal and C-terminal ? 3

   (d) Explain how enzymes are affected by temperature. 4

   (e) Explain secondary structure of protein. 5

2. *(a)* Outline the difference between fibrous and globular proteins, with reference to *two* examples of *each* protein type. 4

(b) What is Enzyme specificity ? Differentiate between endo and exo-peptidase giving examples. 6

(c) What is Genetic engineering ? Write the various applications of genetic engineering. 3+4

(d) Give *three* examples of *each* essential and non essential amino acid. 3

3. *(a)* Write short notes on : 2×5

(i) Active Site

(ii) GTP

(iii) Redox reactions

(iv) R-group

(v) Substrate

(b) Explain the oxidative reactions of pentose-phosphate pathway. 6

(c) What is amide linkage ? What holds a protein into its tertiary structure ? 4

4. (a) Differentiate between : 3×3

(i) Primary and Quaternary structure.

(ii) ATP and ADP

(iii) Acidic and Basic amino acids.

(b) What are biological catalyst ? Prove that enzymes only change reaction rates but have no effect on K_{eq}. 2+5

(c) What is Explant ? What is the basic technique in plant tissue culture ? 1+3

5. (a) Define hydrophobic and hydrophilic bond. 2

(b) Differentiate between competitive and non-competitive inhibitors. 4

(c) Write a brief note on protein metabolism. 5

(d) What is Toti-potency ? What are the various applications of Plant tissue culture ? 1+4

(e) Explain the effect of substrate concentration on the velocity of enzymatic reaction. 4

6. (a) What is N-balance ? Explain enzyme-substrate complex. 1+2

(b) Explain the glycolytic pathway. 6

(c) What is peptide bond ? Show the formation of dipeptide bond. 4

(d) Explain oxidative phosphorylation with a suitable diagram. 5

(e) Differentiate between sugar and non-sugar. 2

7. (a) Write short notes on : 4×4

(i) Gluconeogenesis

(ii) ETC

(iii) Citric acid cycle

(iv) Nomenclature of Enzymes

(b) What is protein turnover ? 2

(c) Why amino acids are described as amphoteric molecules ? 2
