53 (FPT 603) BCBT

2014

BIOCHEMISTRY & BIOTECHNOLOGY

Paper : FPT 603

Full Marks : 100

Pass Marks : 30

Time : Three hours

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

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

1. *(a)* Define Biomolecules. What type of molecules do Biochemists study ? What is Biochemistry used for ? 1+3+2

   (b) What are acidic and basic amino acids ? Why amino acids are described as amphoteric molecules ? 3+2

   (c) What are the *two* events that occur in reaction three of citric acid cycle ? 3

   (d) Explain how enzymes are affected by *pH* ? 3

(e) Explain amino acid pool. 3

2. (a) Explain the following terms : 2×5

(i) Keto acid

(ii) GTP

(iii) Redox reactions

(iv) Oxidases

(v) Growth regulators.

(b) Differentiate between active site and Allosteric site. Explain the effect of substrate concentration on the velocity of enzymatic reaction. 1+3

(c) Why some amino acids are termed as Essential amino acids ? Give *two* examples of Essential amino acid. 2+2

(d) What is Ionic and hydrophobic bond ? 2

3. (a) Which part of the plant is used for culturing ? What is the basic technique in plant tissue culture ? 1+3

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

(c) What is macro peptide ? Explain the secondary structure of protein. 1+6

(d) Differentiate between ATP and ADP. 2

4. (a) Define cell-totipotency. Distinguish between callus and suspension culture. 1+3

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

(c) Differentiate between : 3×3

(i) Competitive and non-competitive inhibitors.

(ii) Sugar and non-sugar.

(iii) Primary and tertiary structure.

(d) What is Absolute specificity ? Give examples. 2

5. (a) Explain the oxidative reactions of pentose phosphate pathway. 6

(b) Which is the most commonly used culture medium for plant cells and what are the various applications of plant tissue culture ? 1+4

(c) Explain in brief the non-protein component of enzyme. 4

(d) What is protein turnover ? 2

(e) What is stereoisomerism ? Draw the structure of D and L-amino acid. 3

6. (a) What is Genetic engineering ? What are the various applications of genetic engineering ? 3+4

(b) What is Glycolysis ? Discuss the different events that take place in the formation of pyruvic acid from glucose. 2+6

(c) What is Induced-Fit hypothesis ? 3

(d) Show the formation of peptide bond. 2

7. (a) Write short notes on : 4×4

(i) ETC

(ii) Group specificity

(iii) Gluconeogenesis

(iv) Protein metabolism.

(b) What kind of reaction does the transferases and hydrolases enzymes catalyse ? 3

(c) What is N-equilibrium ? 1
