53 (FPT 603) BITC

2017

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. Which atom is a major part of biomolecule ? 3

   (b) What is saturated and unsaturated fatty acid ? Give *one* example of each. 4

   (c) Explain the differences between competitive and non-competitive inhibition, with reference to *one* example of each. 5

   (d) What is N–equilibrium ? Explain amino acid pool. 4

   (e) What is peptide bond ? Write the Zwitterionic form of amino acids. 4

2. (a) What is Substrate level phosphorylation ? What is the purpose of oxidative phosphorylation ? 5

(b) Differentiate between reducing and non-reducing sugar. 5

(c) Explain that enzymes lower the activation energy of the chemical reactions that they catalyze. 5

(d) What is C and N–terminal ? Draw the structure of simplest amino acid. 3

(e) What is D and L–isomer ? 2

3. (a) What is ATP ? Which process produce the most ATP ? How ATP is different from ADP ? 5

(b) Describe the induced-fit model in enzymes. 5

(c) What is Gluconeogenesis ? What are the key enzymes of Gluconeogenesis ? 5

(d) Draw the ring form of G6P. What is the name of enzyme that catalyze phosphoenolpyruvate to pyruvate ? 2

(e) Define anabolism and catabolism. 3

4. *(a)* What is the alternative pathway for breakdown of Glucose ? What is Ribose-5-phosphate and why is it important ? 4

(b) Explain the chemical nature of enzymes. 5

(c) What is DNA technology ? Explain the tools used in genetic engineering. 2+4

(d) Write the various steps involved in fat absorption with suitable diagram. 5

5. *(a)* Define the following terms : 2×5

(i) Aldose

(ii) GTP

(iii) Alpha-helix

(iv) Disulphide bond

(v) Substrate.

(b) What is a cellular pool ? What are its two phases ? 5

(c) Define Explant Culture. What are the basic techniques of plant tissue culture ? 5

6. *(a)* Define ETC. What is a byproduct of ETC ? 5

(b) Differentiate between : 3×3

(i) Callus and Suspension Culture

(ii) Homopolysaccharide and Heteropolysaccharide

(iii) Sugar and Non-sugar.

(c) Define Hydrolases, transferases and isomerases. 2+2+2

7. *(a)* Write brief notes on : ***(any four)*** 4×4

(i) Tertiary structure of protein

(ii) Golden rice

(iii) Polypeptide

(iv) Enzyme specificity

(v) Essential amino acid.

(b) What are acidic and basic amino acids ? Give examples. 4