53 (FPT 603) BITC

2017

BIOCHEMISTRY & 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 out of **seven**.*

1. *(a)* Define monomer. Give examples of biological macromolecule. 3

   (b) Explain the amino acid pool of the body. Illustrate how is it maintained. 5

   (c) What is meant by substrates of enzymatic reactions ? Explain that enzymes lower the activation energy of the chemical reactions they catalyze. 7

(d) What is HMP ? What is a by product of the electron transport chain ? 5

2. (a) Define cell-totipotency. What are the basic techniques of plant tissue culture ? 2+4

(b) What is ATP ? Where is the energy stored in ATP ? 3

(c) What is redox reaction ? Describe the purpose and name each electron carriers in the ETC. 7

(d) Explain in brief the chemical nature of enzymes. 4

3. (a) Define :

(i) Explant culture

(ii) Callus culture.

What are the uses of callus culture ? 6

(b) Draw the ring form of G6P. What are the key enzymes of Gluconeogenesis ? 5

(c) What are Acidic and Basic amino acids ? Give examples. 4

(d) What is Optimum pH ? Explain how enzymes are affected by pH ? 5

4. (a) What is the alternative pathway for breakdown of glucose ? What is Ribose-5-phosphate and why is it important ? 6

(b) Define the following terms : 2×5

(i) GTP

(ii) Active site

(iii) NAD

(iv) Bioelements

(v) Zwitterion

(c) What is a cellular pool ? What are its *two* phases ? 4

5. (a) What are restriction enzymes ? How do these enzymes participate in recombinant DNA technology ? 6

(b) What is Endo and Exo-peptidases ? Give examples of each. 4

(c) What is substrate level phosphorylation ? What is the purpose of oxidative phosphorylation ? 4

(d) Define cofactors ? What can cause denaturation of protein ? 4

(e) How ATP is different from GTP ? 2

6. (a) What is amide linkage ? Why amino acids are considered as amphoteric molecules ? 3

(b) What is Golden Rice ? In what way is it different from the normal rice ? 6

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

(d) Write the *two* events that occur in reaction three of citric acid cycle. 4

(e) Draw the structure of Alpha-helix. 3

7. *(a)* Write brief notes on : 3×3

(i) Digestion and Absorption of proteins

(ii) Enzyme specificity

(iii) Polysaccharides.

(b) Define Decarbonylation, Hydrolysis and Deamination. 2+2+2

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

(d) What is lipase ? What is the key issue in the digestion and absorption of fats ? 2