Reg. No. : | | | | | | | | | | | |

# S 4016

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Second Semester

Biotechnology

BT 1151 — BIOCHEMISTRY — I

(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the working principle of any one biological buffer system.

2. List the important properties of water which make it suitable as ideal solvent for biological molecules and briefly describe their characteristics.

3. Write the structure of glucose and lactose.

4. Write the structure of purine nucleotides.

5. Sketch the titration curve of histidine.

6. Explain why enzymes are the major versatile biological catalysts?

7. Write the structure of phosphoacyl glycerol and indicate the hydrophobic and hydrophilic components in it.

8. Outline the difference between oxidative phosphorylation and substrate level phosphorylation.

9. What role do transamination reactions play in amino acid metabolism?

10. Calculate the yield of ATP production from oxidation of glucose to pyruvate.

PART B — (5 × 16 = 80 marks)

11. (a) (i) List the three kinds of noncovalent bonds that mediate interaction of biomolecules and briefly describe their characteristics. (6)

(ii) Compare and contrast between the following on the basis of structure and function

(1) Homopoly saccharide and heteropolysaccharide

(2) Glyerolipid and sphingolipid. (10)

Or

(b) Explain the important features of Watson-Crick DNA double helix and describe the structural differences between A-DNA. B- DNA and Z-DNA (16)

12. (a) Explain the characteristics of peptide bond. Outline the structural organization of proteins. (16)

Or

(b) (i) Differentiate the structure and functions of glycoproteins and lipoproteins. (8)

(ii) Describe the fluid mosaic model of biological membranes. (8)

13. (a) Explain the regulation of metabolic pathways by giving suitable examples. (16)

Or

(b) Outline the reactions involved in glycolysis and gluconeogenesis. Explain the reciprocal regulation of glycolysis and gluconeogenesis. (16)

14. (a) Outline the steps involved in fatty acid activation and oxidation. (16)

Or

(b) Describe Urea cycle and its importance. What are the compounds that link the citric acid and urea cycle? State the significance of interlinking. (16)

15. (a) (i) Describe the mitochondrial electron transport complexes and their arrangements. (8)

(ii) Explain the role of uncouplers in electron transport with special reference to uncoupling in Brown adipose tissue. (8)

Or

(b) (i) What are high energy compounds? Give two examples. (8)

(ii) Explain the de novo synthesis of pyrimidine nucleotide and mention about its regulation. (8)