2017

(April)

BIOTECHNOLOGY

(Honours)

(Biological Chemistry)

Marks : 56

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer Question No. **1**, which is compulsory and *any* **four** from the rest

1. *(a)* How are pH and pKa related? 2

(b) What are buffer systems? 2

(c) Why is sucrose called a non-reducing sugar? 2

(d) Why are α-amino acids so called? 2

(e) What general properties do fatty acids have? 2

(f) What are Mitchell's postulates for chemiosmotic theory? 2

2. How is membrane potential utilised by the cell for transport activities? 11

3. What are levels of organization for protein structure? Explain the secondary structure with context to α-helix. 4+7=11

4. Explain and illustrate Paul Boyer's rotational catalysis for ATP synthesis. 11

5. "TCA cycle is a hub in metabolism since it controls both anabolic as well as catabolic reactions, yet the level of intermediates remains almost constant." Explain and enumerate the steps with enzymes involved. 11

6. Where does β-oxidation of fatty acids occur? Enumerate the steps with the enzymes involved. 2+9=11

7. Derive the Michaelis-Menten equation at steady state assumption for enzyme catalysis. 11

8. What are the models of allosteric regulation of enzymes? 11

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