This question paper contains 2 printed pages. *Your Roll No.* .....

Sl. No. of Ques. Paper : **2037** **GC-3**
Unique Paper Code : **32581301**
Name of Paper : **Biochemistry**
Name of Course : **B.Sc. (Hons.) Biomedical Sciences (CBCS)**
Semester : **III**
Duration : **3 hours**
Maximum Marks : **75**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Answer five questions in all.
Question No. 1 is compulsory.

1. (a) Define the following:
   (i) Levinthal paradox
   (ii) Substrate-level phosphorylation
   (iii) Oligosaccharides
   (iv) Chaotropic agents
   (v) Saturated fatty acids. 1×5

   (b) Give *two* important differences between the following:
   (i) Tertiary and Quaternary structures
   (ii) Transamination and Deamination
   (iii) Lactic acid fermentation and Ethanolic fermentation
   (iv) Glucose-alanine cycle and Cori cycle
   (v) FAD and NAD^+. 2×5

2. Give justifications for the following statements (any *five*):
   (a) People with untreated diabetes have a fruity smell in their breath.
   (b) More energy is available from oxidation of fats, than from the oxidation of an equivalent weight of glycogen.
   (c) Higher level of ammonia affects normal functioning of brain.
   (d) Acetyl CoA is a common metabolite for most biomolecules.
   (e) NADH and ATP are mostly negative regulators of enzymes that participate in catabolic reactions.

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(f) Proton gradient in mitochondrion is 'electro-chemical' in nature. 3×5

3. (a) Give the complete biochemical reactions for the following (give chemical structures and also mention the cofactors/prosthetic groups):

(i) Conversion of phenylalanine to DOPA

(ii) One round of beta-oxidation

(iii) Steps of Urea cycle that occur in mitochondrion. 4×3

(b) Why is Citric acid cycle described as 'amphibolic' in nature? 3

4. Write short notes on the following:

(a) Protein folding

(b) Synthesis of ketone bodies

(c) Glycogenolysis. 5×3

5. Give the significance of the following:

(a) HMP pathway in adipose tissue

(b) Ampholytes in IEF

(c) Uncouplers of ETC and Oxidative Phosphorylation

(d) Carnithine Cycle

(e) Aminotransferases in amino acid metabolism. 3×5

6. Give the principle, methodology and application of the following techniques (Give diagram):

(a) Affinity Chromatography

(b) SDS-PAGE

(c) Gel filtration chromatography. 5×3

7. (a) What is the total ATP yield from the complete oxidation of a Glucose molecule? Mention briefly the reactions which yield ATP. 6

(b) Give a brief account of the theory of hydrophobic collapse in protein folding. 4

(c) Briefly explain and graphically show the activity of an allosteric enzyme in the presence of a positive and a negative modulator. 5