

**CARMEL COLLEGE OF ARTS, SCIENCE & COMMERCE FOR WOMEN  
NUVEM-GOA**

**B. Sc. CBCS SEMESTER V EXAMINATION, JANUARY 2022**

**Subject Code: ZOC-106      Subject Name: Biochemistry and  
Metabolic Processes**

**Total Marks: 80**

**Duration: 2 hrs**

**Total No. of pages: 02**

**Instructions:** 1. *All questions are compulsory.*  
2. *Figures to the right indicate marks allotted to the question.*  
3. *Illustrate your answers wherever necessary.*

**Q.I. Answer ANY FOUR of the following:**

**(4x4 = 16)**

1. Differentiate between Anabolism and Catabolism.
2. Discuss the significance of Malate Aspartate Shuttle.
3. State the Laws of Thermodynamics.
4. Discuss the importance of Pentose Phosphate Pathway.
5. What is the fate of the amino groups during the catabolism of amino acids?
6. Briefly explain the deamination reaction of Amino Acids.

**Q.II. Answer ANY FOUR of the following:**

**(4x4 = 16)**

1. Discuss the electron carriers in Mitochondrial Respiratory Chain.
2. Briefly explain the regulatory mechanisms of Tri-Carboxylic Acid Cycle.
3. Briefly explain the Conformational Coupling Hypothesis of Oxidative Phosphorylation.
4. With a labelled diagram explain the structure of ATP.
5. Briefly explain the complete oxidation of fatty acids to CO<sub>2</sub> and H<sub>2</sub>O.
6. How are fatty acids transported in the mitochondria?

Q.III. A) Give an account of the catabolism of Proteins leading to the release of Amino Acids. (6)

OR

A) Discuss the three main classes of membrane transporters. (6)

B) The  $K_{eq}$  for the conversion of Glucose 1-Phosphate to Glucose -6-Phosphate is  $-6.74 \times 10^{-5}$  at  $25^\circ \text{C}$ . Calculate  $\Delta G^\circ$ .  
Consider  $R = 8.314 \text{ J/mol K}$ . (6)

Q.IV. A) Discuss the function and regulation of Glycogen Phosphorylase. (6)

OR

A) Write a short note on Gluconeogenesis

B) Outline the steps involved in the pay-off phase of Glycolysis. (6)

Q.V. A) With an illustration, explain the Urea Cycle. (6)

OR

A) Explain the metabolic causes and symptoms of Alkaptonuria. (6)

B) Discuss the Chemiosmotic theory of Oxidative Phosphorylation. (6)

Q.VI. A) With examples, discuss Inhibitors and Uncouplers of Electron Transport System. (6)

OR

A) Explain Beta Oxidation with an example. (6)

B) Why are ketones produced in the body? Explain its synthesis. (6)