



Sambath

Avinashilingam Institute for Home Science and Higher Education for Women
Deemed to be University Estd. u/s 3 of UGC Act 1956, Category A by MHRD (now MoE)
Re-accredited with A++ Grade by NAAC. CGPA 3.65/4, Category I by UGC
Coimbatore - 641 043, Tamil Nadu, India.

Continuous Internal Assessment Test I – February 2026
IV Semester

23BBCC04 Metabolism and Bioenergetics

Class: II UG
Major: Biochemistry and Biotechnology

Time: 2 hours
Max. Marks: 60

Course Outcomes:

At the end of the course, students will:

1. Understand the structure and functions of biomolecules in a cell.
2. Relate the properties of biomolecules and their significant role in living systems.
3. Understand the role of enzymes in the metabolic pathway and their deficiency problems.
4. Relate the role distinct metabolic pathways used by cells to harvest the energy.
5. Recognize the role of vitamins and coenzymes in intermediary metabolism

Part - A

6 x 1 = 6

Choose the Correct Answer

1. The glycolytic pathway is described as
a. amphibolic, b. catabolic c. anabolic d. anaplerotic CO1 K3
2. Anaplerotic reactions are required to
a. inhibit TCA cycle b. remove Intermediates
c. replenish TCA Cycle d. produce ATP directly CO2 K3
3. In red blood cells, NADPH produced by the HMP shunt is required for the
a. ATP synthesis c. Hemoglobin synthesis CO3 K2
b. Maintaining reduced glutathione d. Oxygen transport
4. Complete β -oxidation of palmitic acid yields
a. 106 ATP b. 108 ATP c. 112 ATP d. 129 ATP CO1 K3
5. The acetyl-CoA used for fatty acid synthesis is derived mainly from
a. Amino acids b. β -oxidation c. Glucose metabolism d. Ketone bodies CO2 K1
6. The rate-limiting enzyme of cholesterol biosynthesis is
a. Thiolase b. HMG-CoA synthase CO3 K2
c. HMG-CoA reductase d. Squalene synthase

Part - B

3 x 6 = 18

Answer ALL Questions

Each answer should not exceed 400 words or two pages

7. a. Write the compartmentalization of metabolic pathways in eukaryotic cells. CO3 K2
(or)
7. b. Explain the conversion of pyruvate to acetyl-CoA. CO2 K3
8. a. Analyse the amphibolic nature of the TCA cycle. CO1 K3
(or)
8. b. Write the significance of pentose phosphate pathway CO5 K4
9. a. Describe the synthesis of glycogen CO4 K3
(or)
9. b. Illustrate fatty acid synthase complex CO3K3

Part - C

3 x 12 = 36

Answer ALL questions

Each answer should not exceed 800 words or four pages

10. a. Write the reactions of glycolytic pathway. CO2 K3
(or)
10. b. Describe TCA cycle CO3 K3
11. a. Illustrate the biosynthesis of glucose from alanine CO4 K4
(or)
11. b. Discuss the process of HMP shunt pathway CO4 K3
12. a. Illustrate Fatty acid Biosynthesis CO1 K4
(or)
12. b. Explain the process of β -oxidation CO2 K3