

## **Module 06: Metabolism — Study Questions**

1. What is metabolism, and how are catabolism and anabolism related?
2. How do the laws of thermodynamics apply to living organisms?
3. Why is ATP called the "energy currency" of the cell?
4. Describe the structure of ATP and explain where the energy is stored.
5. What are enzymes, and why are they essential for metabolism?
6. How do enzymes lower the activation energy of a reaction?
7. Describe the induced fit model of enzyme action.
8. How does temperature affect enzyme activity, and what happens if it gets too high?
9. Why do different enzymes work best at different pH levels?
10. What is the difference between competitive and noncompetitive enzyme inhibition?
11. Explain how feedback inhibition helps regulate metabolic pathways.
12. Write the overall equation for cellular respiration and identify the inputs and outputs.
13. What are the three main stages of cellular respiration, and where does each occur in the cell?
14. What happens during glycolysis, and how much ATP is produced?
15. How does the electron transport chain produce the majority of ATP?
16. What is the role of oxygen in cellular respiration?
17. How many ATP molecules are theoretically produced from one glucose molecule through aerobic respiration?
18. What happens in cells when oxygen is not available?

19. Compare lactic acid fermentation and alcoholic fermentation.
20. Why does fermentation produce much less ATP than aerobic respiration?