

## CELLULAR RESPIRATION QUESTIONS

1. Write the balanced word and chemical equation for aerobic respiration.
2. What is the purpose of cellular respiration?
3. Why is NADH called an electron shuttle bus?
4. What are the two mechanisms in which ATP is generated? Briefly describe each mechanism.
5. Make a comparison chart to show how much ATP is produced from substrate level phosphorylation versus oxidative phosphorylation (use the equivalent amount of ATP for coenzymes).
6. Define the following terms:
  - a. Aerobic cellular respiration
  - b. Anaerobic cellular respiration
  - c. Substrate level phosphorylation
  - d. Oxidative phosphorylation
  - e. Chemiosmosis
  - f. Carboxylation
7. Identify two instances where carboxylation occurs during cellular respiration.
8. What role do the following molecules have in cellular respiration:
  - a. NADH & FADH<sub>2</sub>
  - b. Hydrogen ions
  - c. Acetyl-CoA
  - d. electrons
  - e. oxygen
9. a. What is the purpose of glycolysis? b. What are the products of glycolysis? c. What gets oxidized? Reduced?
10. a. What are the products of one turn of Krebs cycle?  
b. How many turns of the Krebs cycle are required to metabolize one molecule of glucose?
11. Draw a diagram of a mitochondria and label its parts.
12. What happens to pyruvic acid before it enters the Krebs cycle?
13. What happens to the substance entering the Krebs cycle?
14. During Krebs, what products are formed? How many for one molecule of glucose?
15. How is the electron transport chain organized, and what is its purpose? Draw a labeled sketch that shows all of the protein complexes, energy molecules, electron movement, protons and location.
16. Where is the H<sup>+</sup> reservoir located in the mitochondria? Indicate where each part of cellular respiration occurs.
17. What happens to the electrons as they are passed along the electron chain?
18. Explain how ATP is made by chemiosmosis.
19. At what point on the ETC do the electrons stop from getting passed on?
20. What happens to these electrons after that point?
21. What happens to the NAD<sup>+</sup> and FAD after it gives electrons to the ETC?
22. What is the significance of the inner membrane and intramembrane space in the mitochondria?
23. Compare alcoholic fermentation and lactic acid fermentation in terms of where it occurs, starting substrate, end products, and amount of energy produced.
24. When does fermentation occur?
25. What is being oxidized and reduced in fermentation? Contrast this to pyruvate oxidation and Krebs cycle phase.
26. What are the differences between alcoholic fermentation and lactic acid fermentation?