CHAPTER 9.2—9.5: Respiration Reactions

1. List two classes of prokaryotes that utilize anaerobic respiration and explain what molecules they use as electron acceptors (instead of oxygen).

a. _____

b. _____

2. **STAGE 1: Glycolysis**

a. occurs where? _____

b. starts with? _____

c. produces?_____

d. yields how much ATP?_____

e. produces ATP through what process? _____

3. Why is glycolysis thought to be one of the earliest of all biochemical processes that evolved?

_____

_____

4. **STAGE 2: Oxidation of Pyruvate**

a. occurs where? _____

b. starts with? _____

c. produces?_____

d. yields how much ATP?_____

5. **STAGE 3: The Citric Acid (Krebs) Cycle**

a. occurs where? _____

b. starts with? _____

c. produces?_____

d. yields how much ATP?_____

e. produces ATP through what process? _____

6. What is the major function of the Kreb's cycle?

_____

_____

7. **STAGE 4: The Electron Transport Chain**

a. occurs where? _____

b. starts with? _____

c. produces?_____

d. yields how much ATP?_____

e. produces ATP through what process? _____

8. What is the final electron acceptor in the Electron Transport Chain?

_____

9. Describe the role of the Electron Transport Chain. What happens to the electrons and H^+?

_____

_____

10. What is chemiosmosis and how is it generated?

_____

_____

11. Explain how ATP synthase produces ATP.

_____

_____

_____

12. Explain why respiration is considered exergonic.

_____

_____

13. Briefly distinguish between the two methods of producing ATP in respiration:

a. substrate-level phosphorylation _____

_____

b. oxidative phosphorylation_____

_____

14. What is the main reason energy is harvested in stages in respiration

_____

_____

15. What is the theoretical ATP yield of aerobic respiration? …the actual yield? Explain why they differ.

_____

_____

16. Write the summary equation for cellular respiration:

_____

a. Where did the glucose come from? Where did it go? _____

b. Where did the O_2 come from? Where did it go? _____

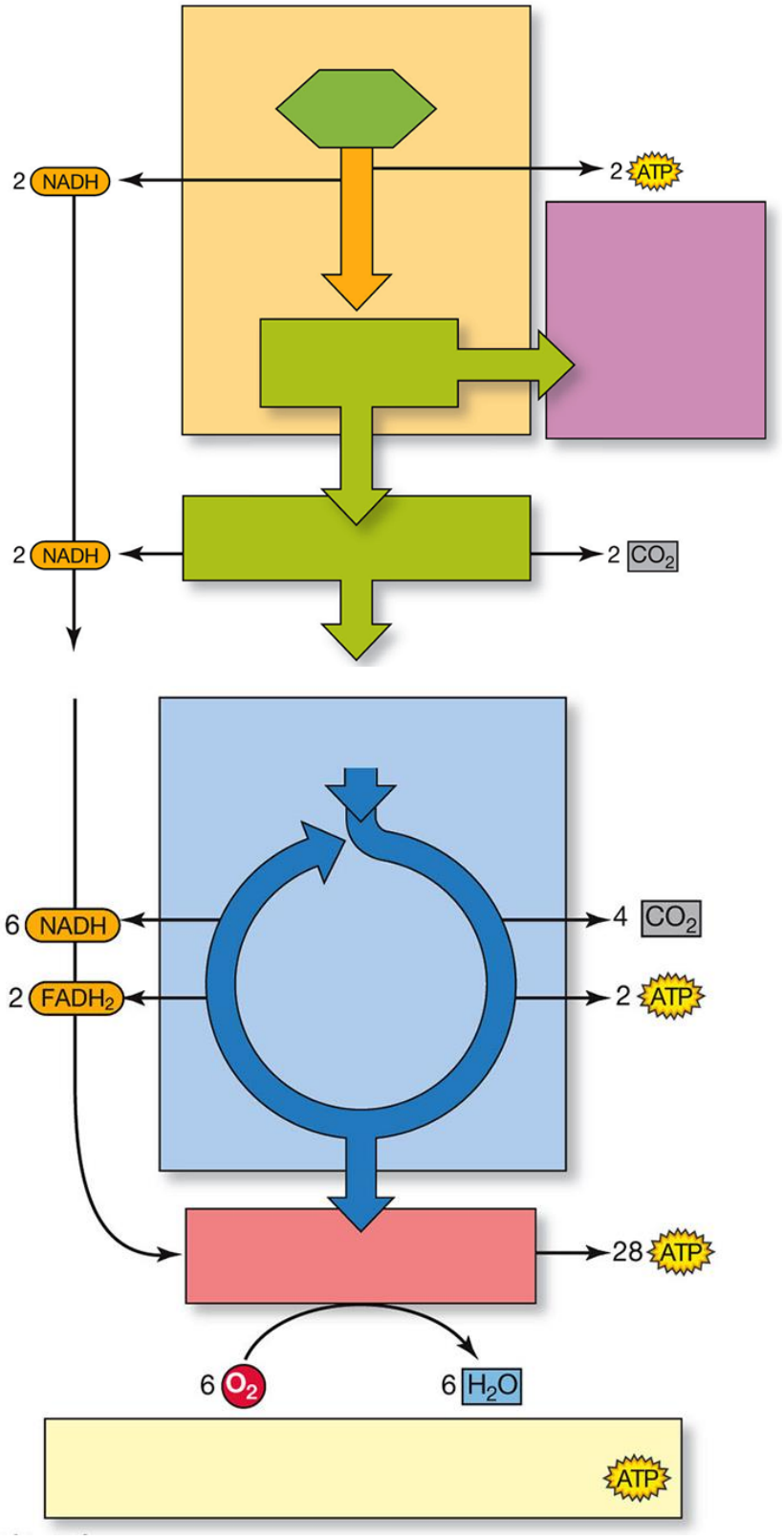
c. Where did the CO_2 come from? Where did it go? _____

d. Where did the H_2O come from? _____

e. Where did the ATP come from? _____

f. What else is produced that is not listed in this equation? _____

17. Using **Figure 9.12** from your text, label the diagram.



18. **Fermentation**

a. Alcoholic fermentation converts glucose to _____

b. Alcoholic fermentation is utilized by what organisms? _____

_____

c. Lactic acid fermentation converts glucose to _____

d. Lactic acid fermentation is utilized by what organisms? _____

_____

19. **Big Picture Thought Questions**

a. Why do we eat? _____

_____

_____

b. Why do we breathe? _____

_____

_____

20. What was the evolutionary advantage of the proto-eukaryotes that engulfed aerobic bacteria but did not digest them?

_____

_____

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