Name MOREAU-KEY Class 5138 Date _____

SECTION 7-1 REVIEW

GLYCOLYSIS AND FERMENTATION

VOCABULARY REVIEW Define the following terms.

1. cellular respiration BIOLOGICAL PATHWAY THAT BREAKS DOWN SUGAR TO FORM ATP
2. glycolysis BREAKS DOWN GLUCOSE TO FORM ATP AND PYRUVATE (TO BE USED IN KREBS CYCLE)
3. lactic acid fermentation CONVERSION OF PYRUVATE TO LACTIC ACID (ALLOWS CONTINUATION OF GLYCOLYSIS THROUGH NAD^+ PRODUCTION)
4. alcoholic fermentation CONVERSION OF PYRUVATE TO 2 CARBON COMPOUND THROUGH RELEASE OF CO_2 THEN CONVERSION OF 2 CARBON COMPOUND TO ETHYL ALCOHOL (ALLOWS FOR CONTINUATION OF GLYCOLYSIS THROUGH PRODUCTION OF NAD^+)

MULTIPLE CHOICE Write the correct letter in the blank.

_____ 1. Glycolysis takes place

- (a.) in the cytosol.
- b. in the mitochondria.
- c. only if oxygen is present.
- d. only if oxygen is absent.

_____ 2. During glycolysis, glucose is

- a. produced from two molecules of pyruvic acid.
- b. converted into two molecules of ATP.
- (c.) partially broken down and some of its stored energy is released.
- d. partially broken down and its stored energy is increased.

_____ 3. Both lactic acid fermentation and alcoholic fermentation produce

- a. a two-carbon molecule from a six-carbon molecule.
- b. CO_2 from a three-carbon molecule.
- c. ATP from ADP and phosphate.
- (d.) NAD^+ from NADH and H^+.

! 4. The efficiency of glycolysis is approximately

- a. 0.2%.
- (b.) 2%.
- c. 20%.
- d. 200%.

_____ 5. The anaerobic pathways provide enough energy to meet all of the energy needs of

- a. all organisms.
- b. all unicellular and most multicellular organisms.
- (c.) many unicellular and some multicellular organisms.
- d. no organisms.

Name _____ Class _____ Date _____

SHORT ANSWER Answer the questions in the space provided.

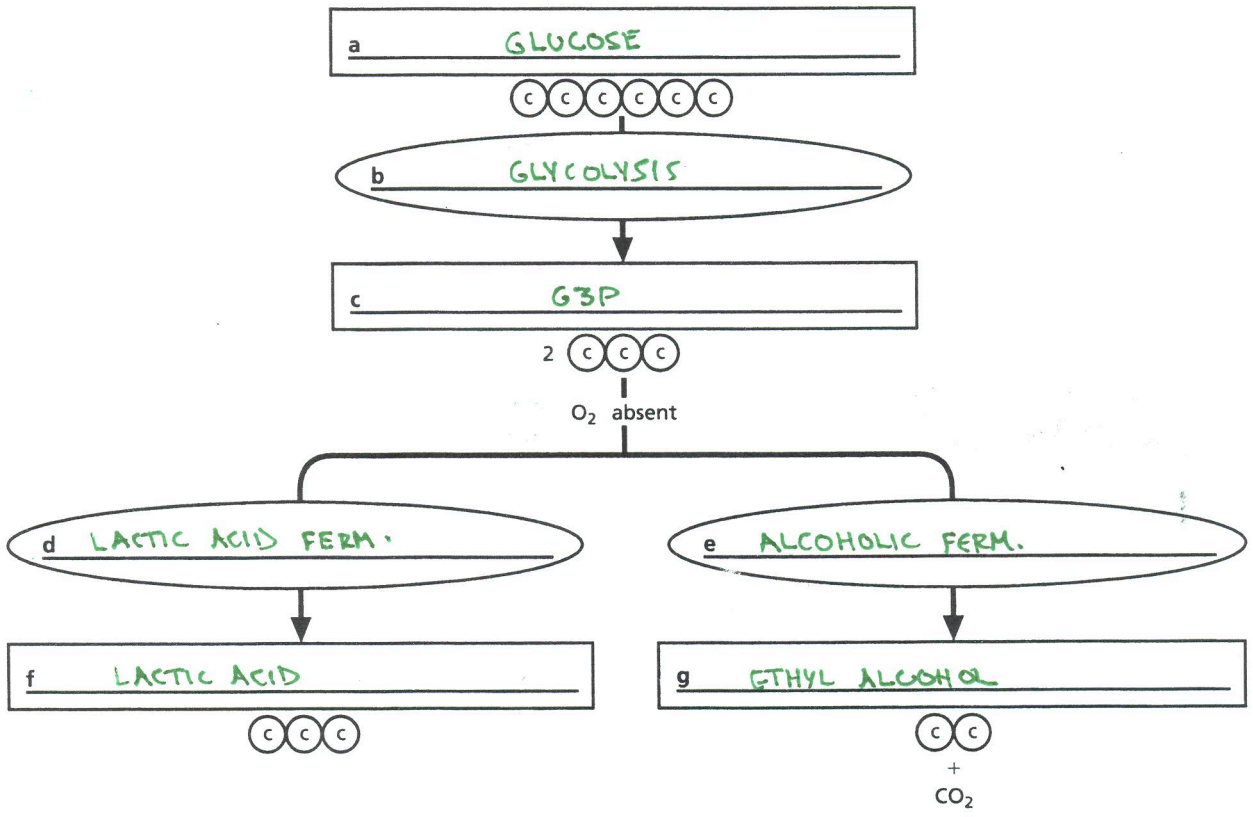
1. Why are the fermentation pathways referred to as "anaerobic" pathways? THEY HAPPEN IN THE ABSENCE OF O_2

2. What are the energy-containing products of glycolysis? NADH, ATP

3. Of what importance are lactic acid fermentation and alcoholic fermentation to the cells that use these pathways? THEY ALLOW GLYCOLYSIS TO CONTINUE WITH THE REGENERATION OF NAD^+

4. **Critical Thinking** The vitamin niacin is an essential component of NAD^+. Niacin can be consumed in food or manufactured in the body from tryptophan, an amino acid. How would a person's ability to break down glucose through glycolysis be affected if the person's diet were deficient in both niacin and tryptophan? Explain your answer. THIS WOULD DECREASE THE ABUNDANCE OF NAD^+, HINDERING GLYCOLYSIS; NAD^+ IS REQUIRED FOR GLYCOLYSIS

STRUCTURES AND FUNCTIONS The diagram below depicts the stages of fermentation. Complete the diagram by writing the names of the pathways in the ovals and the names of the molecules in the boxes.



Name _____ Class _____ Date _____

SECTION 7-2 REVIEW

AEROBIC RESPIRATION

VOCABULARY REVIEW Define the following terms.

1. aerobic respiration BIOLOGICAL PATHWAY PRODUCING ATP IN THE PRESENCE OF OXYGEN
2. mitochondrial matrix SPACE INSIDE THE INNER MITOCHONDRIAL MEMBRANE – ALSO THE SITE OF THE KREBS CYCLE
3. Krebs cycle PATHWAY BREAKING DOWN ACETYL CoA TO PRODUCE CO_2, HYDROGEN ATOMS (CARRIED BY NADH and $FADH_2$) AND ATP
4. FAD CARRIER MOLECULE FROM KREBS TO ELECTRON TRANSPORT CHAIN (ETC)

MULTIPLE CHOICE Write the correct letter in the blank.

_____ 1. The breakdown product of glucose that diffuses into the mitochondrial matrix for further breakdown is

a. acetyl CoA. **b.** pyruvic acid. **c.** oxaloacetic acid. **d.** citric acid.

_____ 2. The starting substance of the Krebs cycle, which is regenerated at the end of the cycle, is

a. acetyl CoA. **b.** pyruvic acid. **c.** oxaloacetic acid. **d.** citric acid.

_____ 3. The Krebs cycle

a. produces two molecules of CO_2. — in one turn around the cycle
b. produces a six-carbon molecule from six molecules of CO_2.
c. produces NAD^+ from NADH and H^+.
d. generates most of the ATP produced in aerobic respiration.

_____ 4. The electron transport chain of aerobic respiration

a. generates O_2 from H_2O.
b. produces NADH by chemiosmosis.
c. pumps electrons into the mitochondrial matrix.
d. pumps protons into the space between the inner and outer mitochondrial membranes.

— does this to establish concentration gradient so H^+ gets pumped through ATP synthase during chemiosmosis for ATP production.

_____ 5. The maximum efficiency of aerobic respiration is approximately

a. 0.39%. **b.** 3.9%. **c.** 39%. **d.** 390%.

Way better than the 2% of Glycolysis!

Name _____ Class _____ Date _____

SHORT ANSWER Answer the questions in the space provided.

1. In the Krebs cycle, what molecule acquires most of the energy that is released by the oxidation of acetyl CoA, and how many of these molecules are produced during each turn of the cycle? (breaks down)

NADH — 3 per turn ... 6 per molecule of glucose

2. Which reactions of aerobic respiration occur in the inner mitochondrial membrane?

E.T.C.

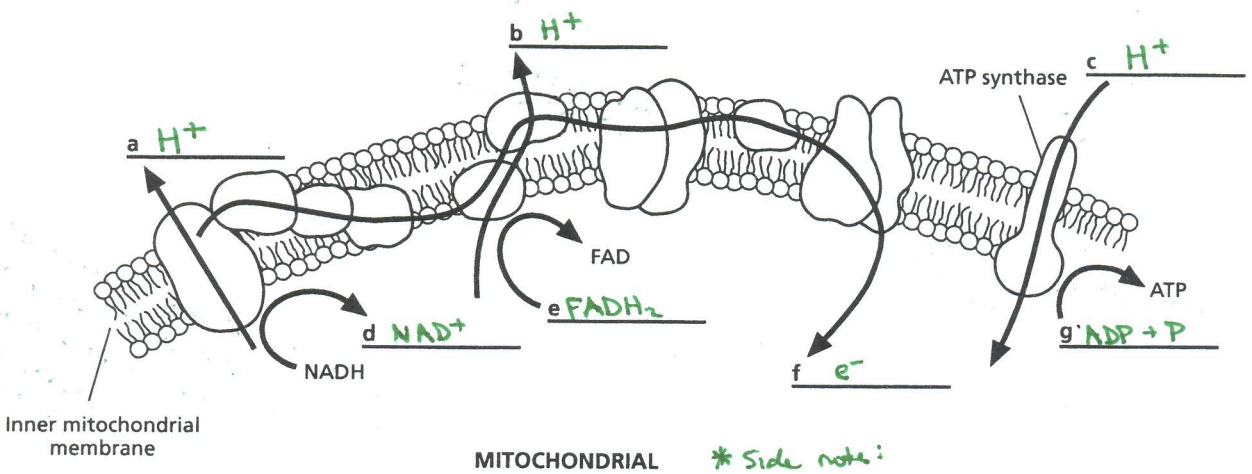
3. Write the equation for the complete oxidation of glucose in aerobic respiration.

$C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O + ATP$

4. **Critical Thinking** How is the structure of a mitochondrion well adapted for the activities it carries out? Highly folded inner membrane (cristae) maximizes surface area. More surface area means more space for E.T.C. which means more ATP.

STRUCTURES AND FUNCTIONS Use the diagram to answer the following questions.

The diagram below summarizes the electron transport chain and chemiosmosis in aerobic respiration. Label the substances that are transported along the arrows labeled *a–d* in the spaces provided. Label the reactants or products that are represented by *e–g* in the spaces provided.



* Side note:

$O_2 + e^- + H^+ \Rightarrow H_2O$