US Biology Teaching
Lesson 10 Assessment
CELLULAR RESPIRATION

Fill in the Blank: 10 points
Complete each statement by filling in the blank with the best vocabulary term. Words may be used once, more than once, or not at all.

WORD BANK

GLYCOLYSIS PYRUVIC ACID COENZYME A CYTOSOL
KREBS CYCLE MITOCHONDRIAL CRISTAE ACETYL-CoA
ELECTRON TRANSPORT CHAIN MITOCHONDRIAL MATRIX
MITOCHONDRIAL MEMBRANE ATP NADPH ADP

Cellular Respiration is a complex process. It is the way that cells breakdown organic compounds to get energy in the form of 1. _____. Cellular respiration is divided into three stages. The first stage is called 2. _____ which takes place in the 3._____ and produces 2 molecules of 4. _____. This compound moves into the 5. _____, encounters the enzyme called 6._____ and forms the 2-carbon molecule called 7. _____. The second stage of cellular respiration is called the 8. _____ . The final stage is called the 9. _____ which occurs in the 10. _____.

Matching: 10 points

___1. Products of Glycolysis	A. Lactate
___2. Pyruvate is made in the	B. Four
___3.Animal by-products of pyruvate	C. Thirty-two
___4. # ATP from Krebs Cycle	D. Cytosol
___5. # ATP from ETC	E. 2 ATP + 2 NADH
___6. Acceptor Molecules	F. Oxygen
___7. Final electron acceptor of ETC	G. First Electron Acceptor
___8. # ATP from Fermentation	H. ATP Synthase
___9. NAD delivers its electrons to	I. FAD + NAD
___10. Chemiosmosis	J. Two

Multiple Choice: 10 points

1. Which organelle is the primary site of ATP synthesis in eukaryotic cells?
a. Golgi apparatus
b. lysosome
c. mitochondria
d. vacuole

2. Energy released by the electron transport chain is used to pump H+ into which location in eukaryotic cells?

a. mitochondrial inner membrane
b. mitochondrial matrix
c. mitochondrial outer membrane
d. mitochondrial intermembrane

3. The oxygen consumed during cellular respiration is involved directly in which process or event?
a. The phosphorylation of ADP to form ATP
b. glycolysis
c. the citric acid cycle
d. accepting electrons at the end of the electron transport chain

4. In the absence of oxygen, yeast cells can obtain energy by fermentation, resulting in the production of

a. ATP, CO_2, and ethanol (ethyl alcohol)
b. ATP, CO_2, and lactate
c. ATP, NADH, and pyruvate
d. ATP, pyruvate, and acetyl CoA

5. Starting with one molecule of glucose, the energy-containing products of glycolysis are

a. 6 CO_2, 30 ATP, and 2 pyruvate
b. 2 NAD^+, 2 pyruvate, and 2 ATP
c. 2 $FADH_2$, 2 pyruvate, and 4 ATP
d. 2 NADH, 2 pyruvate, and 2 ATP

6. When a molecule of NAD^+ (nicotinamide adenine dinucleotide) gains a hydrogen atom (not a proton), the molecule becomes

a. dehydrogenated
b. redoxed
c. oxidized
d. reduced

7. In chemiosmotic phosphorylation, what is the most direct source of energy that is used to convert ADP + to ATP?

a. energy released from movement of protons through ATP synthase, against the electrochemical gradient
b. energy released from movement of protons through ATP synthase, down the electrochemical gradient
c. energy released as electrons flow through the electron transport system
d. No external source of energy is required because the reaction is exergonic

8. Which of the following normally occurs regardless of the presence of oxygen?

a. fermentation
b. citric acid cycle
c. glycolysis
d. oxidation of pyruvate to acetyl CoA

9. What are the products of the Electron Transfer Chain?

a. 10 NADH make each make 3 ATP and 2 FADH2 each make 2 ATP
b. 6 NADH and 2 FADH2 make 2 ATP
c. 2 Pyruvate and 2 NADH each make 2 ATP
d. 8 NADH each make 2 ATP and 3 FADH2 each make 4 ATP

10. Enzyme complex 1 of the ETC removed the H from NADH and is split into?

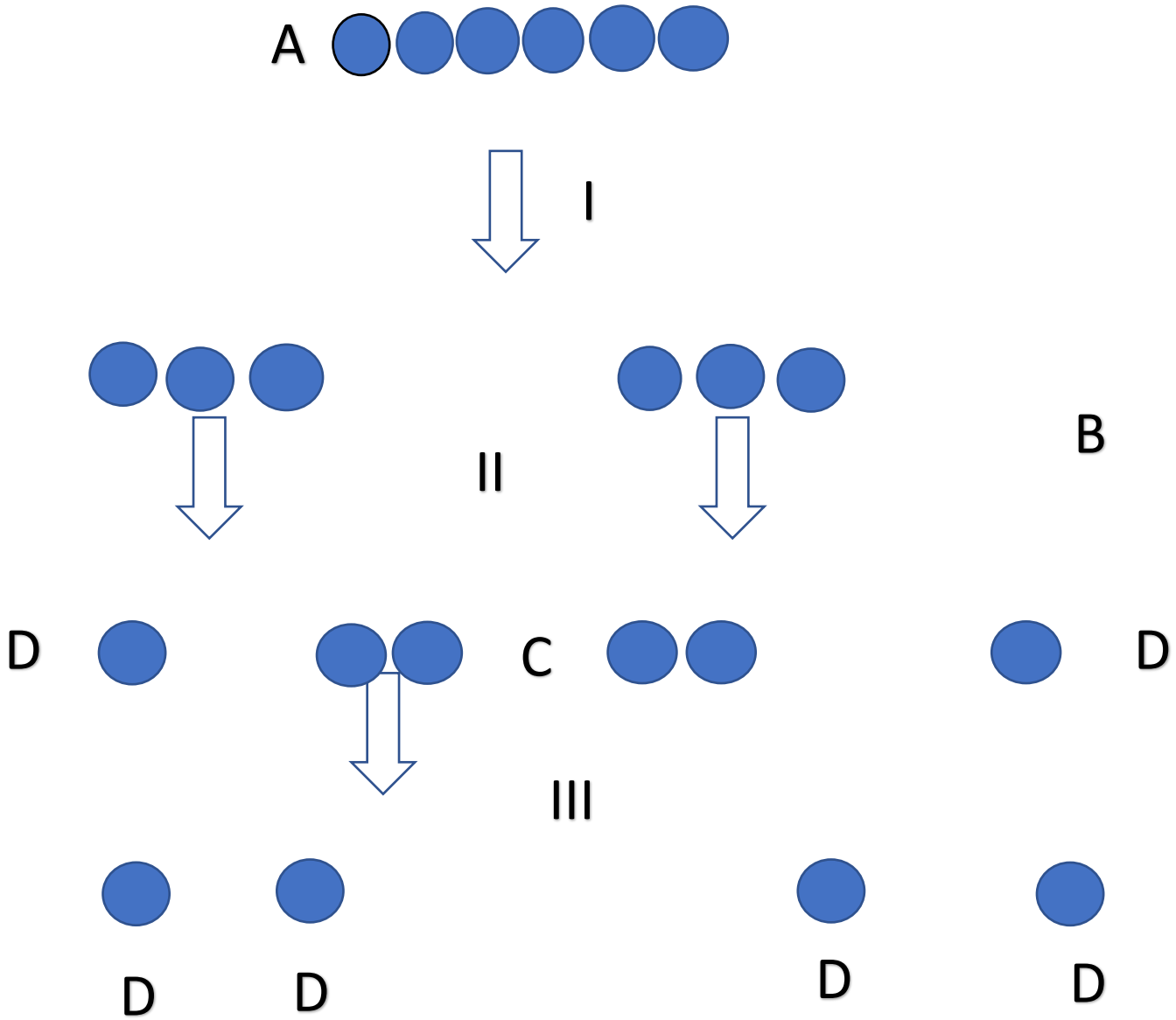
a. NAD+ and an electron (e-)
b. A proton (H+) and an electron (e-)
c. ATP and a neutron
d. NAD+ and a proton (H+)

Critical Thinking: 14 points

SECTION I: 6 POINTS

DIAGRAM ONE

The steps below represent steps of cellular respiration. Use the diagram to help you answer questions 1-3 below.



Refer to the above diagram to answer the next three questions:

Question 1: 2 points

Which of the following is represented by the process labelled I?

a. Aerobic respiration in the mitochondria.
b. The splitting of glucose into two ATP and two pyruvate.
c. The conversion of glucose into two lactate molecules by fermentation.
d. A series of enzyme-mediated reactions that occur in the cytosol.

Question 2: 2 points

Which of the following is not required by process II?

a. Transport of a metabolic intermediate into the mitochondria
b. The direct participation of oxygen
c. The transfer of hydrogen atoms from one of the carbons to a coenzyme
d. Enzymes

Question 3: 2 points

Which of the following is the identity of molecule D?

a. CO2
b. Glucose
c. Pyruvic acid
d. ATP

SECTION II: 6 points

1. How is carbon dioxide released by animals?

   _____

2. Write the chemical equation below for cellular respiration:

   _____ + _____ → _____ + _____ + _____

3. What process produces ATP?_____

4. What are the starting materials of cellular respiration? _____

5. What are the products of cellular respiration?

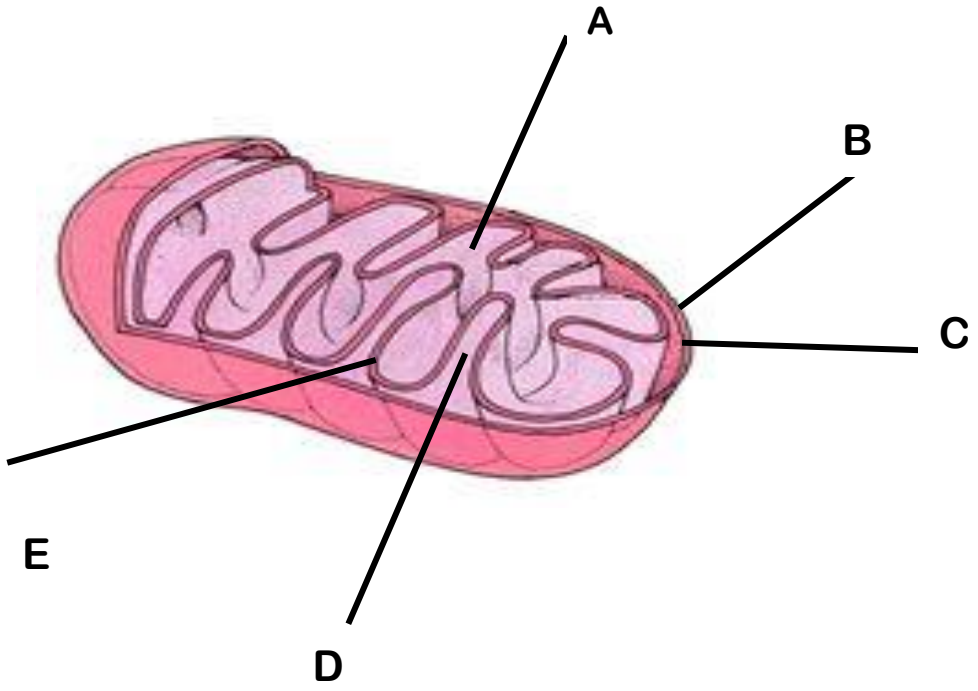
   _____

6. How are animals and plants connected to one another? You may write out your answer or diagram your answer.

   _____
   _____
   _____

SECTION III: 5 POINTS

LABEL THE DIAGRAM



A. _____

B. _____

C. _____

D. _____

E. _____