

**SBI 4UI**

**Self-Test: How Well Do YOU Know Your Metabolism?**

**Multiple Choice Practice Questions:**

**Answer the following multiple-choice questions by selecting the best answer for each question.**

1. Which of the following processes most likely does

not involve anaerobic conditions?

a. yeast causing bread dough to rise

**b. bacteria working in an aeration tank at a**

**sewage plant**

c. bacteria in the soil help in composting

d. alcohol is produced in fermentation

e. sewage breaks down in a septic tank

2. Which of the following would you expect yeast

cells to be able to use for anaerobic respiration?

a. maltose

b. fructose

c. sucrose

d. glucose

**e. all of the above**

3. In which of the following situations would you

least expect to find anaerobic respiration

occurring?

a. a vat in which beer is being manufactured

**b. a human brain engaged in writing this test**

c. the inside of a bacterium living inside a

human intestine

d. a runner's leg muscle during a 400m dash

e. the sediments at the bottom of a pond

4. During aerobic cellular respiration, which of the

following is the most common type of reaction to

take place in the cell?

a. hydrolysis

b. condensation

c. neutralization

**d. redox**e. dehydration

5. The reactants in cellular respiration, glucose, and

oxygen are stable compounds. How do these

substances react?

a. the activation energy is reduced by a higher

pressure inside the cell

b. the activation energy is reduced by a higher

temperature inside the mitochondrion

**c. the activation energy is reduced by enzymes**

d. the activation energy is reduced by inorganic

catalysts

e. none of the above

6. Glycolysis can best be described as which of the

following kinds of pathways?

a. catabolic and synthetic   
b. glycolytic and aerobic

c. aerobic and catabolic

**d. anaerobic and catabolic**

e. anaerobic and anabolic

7. What is the function of water in oxidative

phosphorylation?

a. accept electrons during Krebs cycle

b. hydrolyze carbohydrates

c. add hydrogen ions to pyruvate at the end of

glycolysis

**d. supply hydrogen ions**

e. supply electrons for the reduction of NADP

8. Where in the electron transport chain does the

energy come from for the synthesis of ATP?

a. the combination of hydrogen ions, electrons,

and oxygen to form water

b. the breakdown of water

c. the cytochromes

**d. an electrochemical gradient across the inner mitochondrial membrane**

e. oxygen

9. At the end of the electron transport chain, the final

product is which of the following?

a. cytochrome oxidase

b. pyruvate

c. co-enzyme A

d. ATP

**e. water**

10. Proteins are to ribosomes as ATP is to which of

the following cell organelles?

a. centrioles  
**b. mitochondria**

c. Golgi apparatus

d. chromosomes

e. nucleus

11. Glucose is slightly modified at the beginning of

glycolysis. Which of the following modifications

takes place?

a. addition of an atom of oxygen   
**b. addition of a phosphate group**  
c. removal of an atom of oxygen  
d. addition of a hydrogen   
e. removal of a molecule of water

12. In which of the following forms is energy

immediately made available for use by living

cells?

**a. ATP**

b. glucose

c. ADP

d. fats

e. starch

13. The final product from the electron transport

chain that contains most of the electrons is which

of the following?

a. cytochrome oxidase

b. oxygen

c. chlorophyll

d. ATP

**e. water**

14. During aerobic cellular respiration, which of the

following molecules activates Krebs cycle?

a. citrate

b. pyruvate

c. cytochrome oxidase

**d. acetyl coenzyme A**

e. carbon dioxide

15. Anaerobic respiration is less efficient than

aerobic respiration for which of the following

reasons?

**a. less ATP is produced in anaerobic respiration**

b. aerobic respiration allows for rapid oxidation

during strenuous exercise

c. blood carries more than enough oxygen to

support aerobic respiration

d. only bacteria and yeast use anaerobic

respiration

e. most animals have to breathe air in order to

survive

16. At the end of glycolysis, most of the energy originally found in glucose is located in molecules of

a. PGAL

b. reduced NAD

**c. pyruvate**

d. ATP

e. lactate

17. When muscles cells do work under anaerobic

conditions, the muscle cells

a. use lactate to synthesize glycogen for

glycolysis

b. use the pyruvate-acetyl-CoA shunt as an

alternative energy source

c. get their energy from oxidative

phosphorylation instead

**d. produce lactate and release energy that way**

e. stop functioning, which results in cramping

18. Proteins and fats may be used in respiration if

first they are converted, respectively, into

a. pyruvate and lactate

**b. pyruvate and acetyl CoA**

c. pyruvate and citrate

d. citrate and oxaloacetate

e. oxaloacetate and acetyl CoA

19. Amino acids can enter cellular respiration, but

first they have to be…

**a. deaminated**

b. hydrolyzed

d. converted to glucose

c. phosphorylated

e. converted into protein

20. Which of the following substances acts as the

initial electron donor in the breakdown of

glucose?

**a. glucose**

b. NAD+

c. NADH

d. FADH2

e. ATP

**Metabolism Quick Terms Practice:**

1. What ATP contains besides adenine, and ribose. **\_\_\_\_\_\_\_\_\_\_phosphate**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Cell location where glycolysis occurs. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**cytoplasm**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Oxidized electron carrier derived from niacin. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**NAD+**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Number of ATP produced in ETC from 1 NADH \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**3**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

generated in Kreb’s cycle

1. The four carbon compound that combines with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**oxaloacetate**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Acetyl Co-A to begin Kreb’s cycle proper.

1. Force created as H+ ions flow back into the matrix, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**Proton Motive Force**\_\_\_\_\_\_\_\_\_\_

generating ATP.

1. Number of CO2 generated per pyruvate broken down \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**3 per pyruvate**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

in Kreb’s cycle.

(8) Location of the electron transport chain. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**mitochondrial cristae**\_\_\_\_\_\_\_\_\_\_\_

1. Source of the phosphate group that is added to ADP \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**GTP**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

in Kreb’s cycle.

1. The first 3 carbon compound produced in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**PGAL**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

breakdown of glucose.