

1. The greatest number of molecules of ATP is produced as a result of
  - (1) **aerobic respiration**
  - (2) anaerobic respiration
  - (3) fermentation of lactic acid
  - (4) fermentation by yeast cells
  
2. Which statement concerning the process of aerobic respiration is true?
  - (1) It is identical to the process of burning.
  - (2) **It is quite similar in all organisms.**
  - (3) It usually does not involve organic catalysts.
  - (4) It usually does not involve carbon dioxide production.
  
3. During which process is oxygen used by green plants?
  - (1) photosynthesis
  - (2) hydrolysis
  - (3) osmosis
  - (4) **respiration**
  
4. To start the oxidation of one molecule of glucose, two molecules of ATP must be used because
  - (1) **certain chemical reactions in a living cell require activation energy**
  - (2) this is a spontaneous reaction which does not require energy input
  - (3) the glucose molecule does not contain potential energy
  - (4) all chemical reactions release energy
  
5. The aerobic respiration of a molecule of glucose releases more energy than the anaerobic respiration of a molecule of glucose because, in aerobic respiration,
  - (1) carbon dioxide is used
  - (2) **more chemical bonds are broken**
  - (3) oxygen is released
  - (4) lactic acid is formed
  
6. In a green plant cell, oxygen is used primarily for the process of
  - (1) dehydration synthesis
  - (2) photosynthesis
  - (3) **respiration**
  - (4) capillary action
  
7. In animals, the organelles in which aerobic cellular respiration occurs are known as
  - (1) ribosomes
  - (2) chloroplasts
  - (3) nuclear membranes
  - (4) **mitochondria**
  
8. Within a plant cell, the glucose formed as a result of photosynthesis may be used directly as
  - (1) **an energy source during cellular respiration**
  - (2) an enzyme for intracellular digestion
  - (3) an absorber of radiant energy
  - (4) a source of molecular oxygen
  
9. Most animals make energy available for cell activity by transferring the potential energy of glucose to ATP. This process occurs during
  - (1) aerobic respiration, only
  - (2) anaerobic respiration, only
  - (3) **both aerobic and anaerobic respiration**
  - (4) neither aerobic and anaerobic respiration
  
10. Which of the following processes releases the greatest amount of energy?
  - (1) the oxidation of one glucose molecule to lactic acid molecules
  - (2) **the oxidation of one glucose molecule to carbon dioxide and water molecules**
  - (3) the conversion of two glucose molecules to a maltose molecule
  - (4) the conversion of one glucose molecule to alcohol and carbon dioxide molecules
  
11. The oxidation of a glucose molecule results in the synthesis of ATP, water, and carbon dioxide. This process is known as
  - (1) Anaerobic respiration
  - (2) **Aerobic respiration**
  - (3) Photochemical reactions of photosynthesis
  - (4) Carbon-fixation reactions of photosynthesis
  
12. A similarity in the aerobic respiratory activity of animals is the
  - (1) **gases used and produced**
  - (2) net gain of four ATP molecules
  - (3) type of alcohol produced
  - (4) temperature of the respiratory organs

13. The products of aerobic respiration in green plants are ATP and
- (1) lactic acid and oxygen
  - (2) glucose and oxygen
  - (3) carbon dioxide and water**
  - (4) carbon dioxide and ethyl alcohol
14. The main result of aerobic respiration is the
- (1) conversion of radiant energy into chemical energy
  - (2) production of lactic acid as an end product
  - (3) storage of energy in a polysaccharide
  - (4) production of ATP from the breakdown of glucose**
15. In the process of respiration, aerobic organisms generally use
- (1) carbon dioxide and give off molecular oxygen
  - (2) molecular nitrogen and give off carbon dioxide
  - (3) carbon dioxide and give off molecular nitrogen
  - (4) molecular oxygen and give off carbon dioxide**
16. Which substance is needed for aerobic cellular respiration to occur?
- |                    |              |
|--------------------|--------------|
| <b>(1) oxygen</b>  | (3) nitrogen |
| (2) carbon dioxide | (4) methane  |
17. In plant and animal cells, most enzymes involved in aerobic cellular respiration are located
- (1) throughout the cytoplasm
  - (2) within the ribosomes
  - (3) on the endoplasmic reticulum
  - (4) within the mitochondria**
18. What is the net gain in ATP following completion of aerobic cellular respiration of one molecule of glucose in a brain cell?
- |        |               |
|--------|---------------|
| (1) 30 | <b>(3) 36</b> |
| (2) 2  | (4) 4         |

19. Which statement best describes an aerobic heterotroph?
- (1) It uses free O<sub>2</sub> for respiration, but it cannot make its own food.**
  - (2) It uses free O<sub>2</sub> for respiration, and it can make its own food.
  - (3) It does not use free O<sub>2</sub> for respiration, and it cannot make its own food.
  - (4) It does not use free O<sub>2</sub> for respiration, but it can make its own food.
20. The potential energy of organic molecules is most readily available to cells in the form of
- (1) adenosine triphosphate**
  - (2) water
  - (3) minerals
  - (4) ribonucleic acid
21. Which statement best describes one of the events taking place in the chemical reaction represented below?
- $$\text{H}^2\text{O} + \text{ATP} \xrightarrow{\text{ATPase}} \text{ADP} + \text{P} + \text{energy}$$
- (1) Energy is being stored as a result of aerobic respiration.
  - (2) Fermentation is taking place, resulting in the synthesis of ATP.
  - (3) Energy is being released for metabolic activities.**
  - (4) Photosynthesis is taking place, resulting in the storage of energy.
22. In a bean plant, which reaction will release the greatest amount of energy?
- (1) aerobic respiration of a glucose molecule**
  - (2) anaerobic respiration of a glucose molecule
  - (3) synthesis of a chlorophyll molecule
  - (4) hydrolysis of a cellulose molecule
23. In plant cells, which organelle is most closely associated with aerobic respiration?
- |                          |               |
|--------------------------|---------------|
| <b>(1) mitochondrion</b> | (3) lysosome  |
| (2) chloroplast          | (4) nucleolus |