

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?
- | | |
|--------------------|--------------|
| (1) oxygen | (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 | (3) 36 |
| (2) 2 | (4) 4 |

19. Which statement best describes an aerobic heterotroph?
- (1) It uses free O₂ for respiration, but it cannot make its own food.**
 - (2) It uses free O₂ for respiration, and it can make its own food.
 - (3) It does not use free O₂ for respiration, and it cannot make its own food.
 - (4) It does not use free O₂ 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?
- | | |
|--------------------------|---------------|
| (1) mitochondrion | (3) lysosome |
| (2) chloroplast | (4) nucleolus |