ALBERTA BIOLOGY 20 · UNIT 3 · 25 QUESTIONS

Photosynthesis and Cellular Respiration — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **The overall process of photosynthesis is best represented by the equation**

- **A** $C_6H_{12}O_6 + 6\ O_2 \rightarrow 6\ CO_2 + 6\ H_2O + \text{energy}$
- **B** $6\ CO_2 + 6\ H_2O + \text{light energy} \rightarrow C_6H_{12}O_6 + 6\ O_2$
- **C** $6\ CO_2 + 6\ O_2 + \text{light energy} \rightarrow C_6H_{12}O_6 + 6\ H_2O$
- **D** $C_6H_{12}O_6 + 6\ H_2O \rightarrow 6\ CO_2 + 6\ O_2$

Understand It with Pulse | Flag a mistake

2 **In a plant cell, photosynthesis takes place in the**

- A chloroplast
- B mitochondrion
- C nucleus
- D vacuole

Understand It with Pulse | Flag a mistake

3 **The main purpose of cellular respiration is to**

- A produce glucose for storage
- B release oxygen into the air
- C transfer energy from glucose to ATP
- D remove carbon dioxide from cells

Understand It with Pulse | Flag a mistake

4 **The oxygen released during photosynthesis comes directly from**

A carbon dioxide

B chlorophyll

C glucose

D water

Understand It with Pulse | Flag a mistake

5 **During glycolysis, each glucose molecule that is broken down produces a net gain of 2 ATP. The net gain of ATP when 4 glucose molecules are broken down by glycolysis is ____**

ANSWER _____

Understand It with Pulse | Flag a mistake

6 **The light-dependent reactions of photosynthesis occur in the**

A stroma of the chloroplast

B thylakoid membranes of the chloroplast

C cytoplasm of the cell

D matrix of the mitochondrion

Understand It with Pulse | Flag a mistake

7 **In the light-independent reactions (the Calvin cycle), ATP and NADPH are used to**

A build sugars from carbon dioxide

B split water molecules

C release oxygen gas

D break down glucose

Understand It with Pulse | Flag a mistake

8 **Glycolysis, the first stage of cellular respiration, takes place in the**

A matrix of the mitochondrion

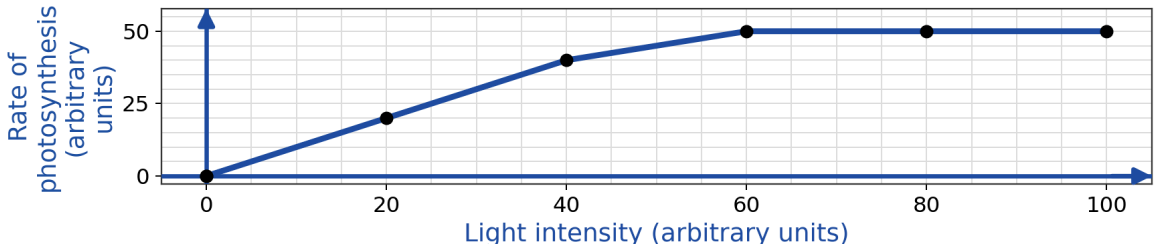
B inner membrane of the mitochondrion

C cytoplasm of the cell

D stroma of the chloroplast

Understand It with Pulse | Flag a mistake

9 **The graph shows the rate of photosynthesis of an aquatic plant at different light intensities. The light intensity above which the rate of photosynthesis stops increasing is**



A 20

B 40

C 60

D 80

Understand It with Pulse | Flag a mistake

10 **In alcoholic fermentation, each glucose molecule produces 2 molecules of carbon dioxide. The number of carbon dioxide molecules produced when yeast ferment 7 glucose molecules is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

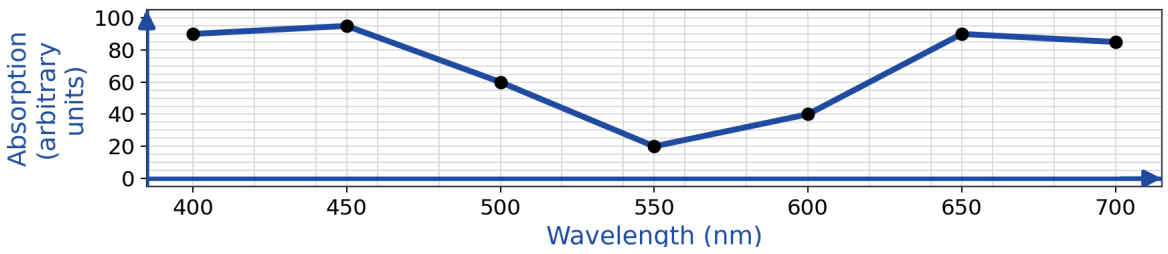
11 **In an experiment, a respirometer shows that germinating seeds take up oxygen, while boiled seeds in an identical setup take up no oxygen. This result shows that**

- **A** oxygen uptake is caused by heat released from the seeds
- **B** oxygen uptake depends on living cells carrying out cellular respiration
- **C** boiled seeds carry out more photosynthesis than living seeds
- **D** germinating seeds produce oxygen as they grow

Understand It with Pulse | Flag a mistake

12 **The graph shows how strongly chlorophyll absorbs light at each wavelength. The wavelength at which absorption is lowest, in nm, is**

_____



ANSWER _____

Understand It with Pulse | Flag a mistake

13 **During the light-dependent reactions, water molecules are split. Besides oxygen, this splitting of water provides the chloroplast with**

A carbon dioxide for the Calvin cycle

B glucose for cellular respiration

C electrons and hydrogen ions used to form NADPH

D ADP for the stroma

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14 **The Krebs cycle turns once for each pyruvate molecule. Because each glucose molecule produces 2 pyruvate molecules, the cycle turns twice for every glucose molecule. The total number of turns of the Krebs cycle when 6 glucose molecules are respired is ____**

ANSWER _____

Understand It with Pulse | Flag a mistake

15 **Most of the ATP produced during aerobic cellular respiration is made during**

- **A** glycolysis in the cytoplasm
- **B** the Krebs cycle in the matrix
- **C** the electron transport chain in the inner mitochondrial membrane
- **D** fermentation in the cytoplasm

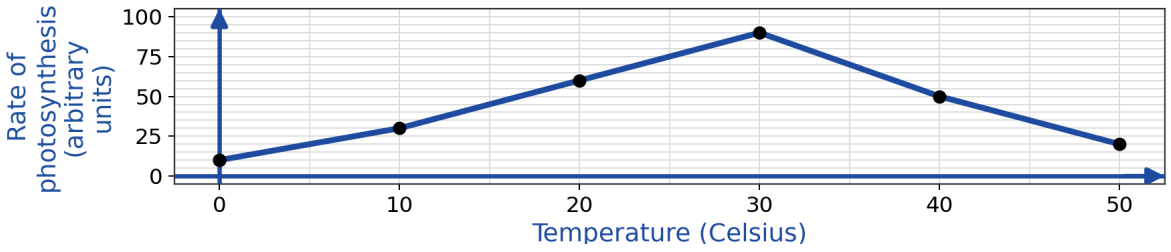
Understand It with Pulse | Flag a mistake

16 **A plant is at its compensation point when**

- **A** photosynthesis stops completely
- **B** cellular respiration stops completely
- **C** the plant releases oxygen all day
- **D** the rate of photosynthesis equals the rate of respiration, so there is no net gas exchange

Understand It with Pulse | Flag a mistake

17 **The graph shows the rate of photosynthesis at different temperatures. The fall in rate above the peak temperature is best explained by the fact that**



- **A** the enzymes that catalyze the reactions begin to denature
- **B** less carbon dioxide enters the air
- **C** the plant runs out of glucose
- **D** the plant produces less chlorophyll in hot weather

Understand It with Pulse | Flag a mistake

18 **An aquatic plant releases 36 mL of oxygen during 12 minutes of photosynthesis. The average rate of oxygen release, in mL per minute, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

19 **Which statement best describes how photosynthesis and cellular respiration are connected?**

A Respiration stores light energy in glucose, and photosynthesis releases it

B The products of photosynthesis, glucose and oxygen, are the reactants of cellular respiration

C Both processes occur only in the chloroplast

D Both processes produce oxygen gas

Understand It with Pulse | Flag a mistake

20 **Aerobic respiration releases far more ATP from each glucose molecule than fermentation does, because aerobic respiration**

A breaks glucose down completely to carbon dioxide and water

B takes place only in mitochondria

C does not require any enzymes

D produces glucose as an end product

Understand It with Pulse | Flag a mistake

21 **In chemiosmosis, ATP is produced when hydrogen ions**

- **A** are pumped into the matrix of the mitochondrion
- **B** combine with oxygen to form water
- **C** flow through ATP synthase from an area of high concentration to an area of low concentration
- **D** split a glucose molecule in the cytoplasm

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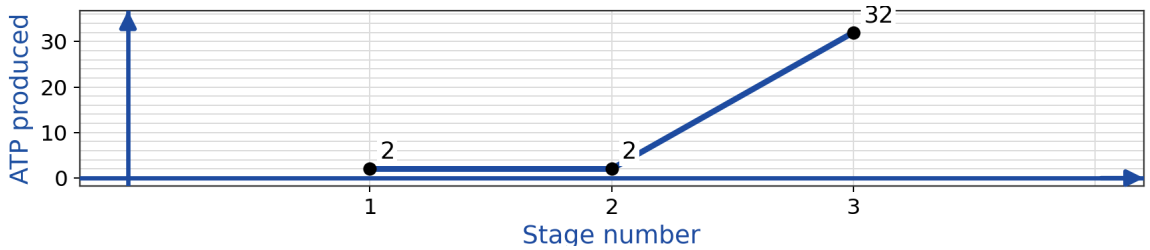
22 **The graph shows the ATP produced at each stage of aerobic cellular respiration, in order: stage 1 is glycolysis, stage 2 is the Krebs cycle, and stage 3 is the electron transport chain. The number of ATP produced by the electron transport chain is _____**



ANSWER _____

Understand It with Pulse | Flag a mistake

23 **Muscle cells contain far more mitochondria than skin cells. The best explanation is that muscle cells**

- **A** carry out photosynthesis to store energy
- **B** store large amounts of glucose in mitochondria
- **C** use mitochondria to remove lactic acid from the blood
- **D** require large amounts of ATP for contraction

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24 **A healthy green plant is kept in complete darkness overnight. During the night, the plant**

- **A** carries out cellular respiration, taking in oxygen and releasing carbon dioxide
- **B** carries out photosynthesis, taking in carbon dioxide
- **C** stops both photosynthesis and cellular respiration
- **D** releases oxygen produced by the Calvin cycle

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25 **The complete aerobic respiration of one glucose molecule requires 6 molecules of oxygen. The number of oxygen molecules required to completely respire 9 glucose molecules is ____**

ANSWER

Understand It with Pulse | Flag a mistake

ANSWER KEY

1. B
2. A
3. C
4. D
5. 8
6. B
7. A
8. C
9. C
10. 14
11. B
12. 550
13. C
14. 12
15. C
16. D
17. A
18. 3
19. B
20. A
21. C
22. 32
23. D
24. A
25. 54

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