

# 2.7 Cellular Respiration

## Question Paper

Course	DP IB Biology
Section	2. Molecular Biology
Topic	2.7 Cellular Respiration
Difficulty	Medium

**Time allowed:** 20  
**Score:** /10  
**Percentage:** /100

**Question 1**

Which of the following statements are correct?

- I. Cellular respiration is also called ventilation.
- II. Cellular respiration is a series of chemical reactions that releases energy that is stored within the bonds of nutrient molecules.
- III. Cellular respiration is an anabolic process.
- IV. Cellular respiration produces ATP.

**A** I, II, and IV    **B** III and IV    **C** II and IV    **D** IV

[1 mark]

**Question 2**

What happens when ATP is converted to ADP?

- A** A net release of energy.
- B** A net amount of energy is destroyed.
- C** It can never be reconverted to ATP.
- D** A phosphate is added.

[1 mark]

### Question 3

Which of the following correctly describe anaerobic respiration in yeast vs. mammalian cells?

	Anaerobic respiration in mammalian cells	Anaerobic respiration in yeast cells
<b>A</b>	Only occurs in absence of oxygen.	Carbon dioxide bubbles cause bread dough to rise.
<b>B</b>	Fewer molecules of ATP per glucose are produced compared to aerobic respiration.	Wine, beer, and other alcohols including biofuels use anaerobic respiration of yeast cells.
<b>C</b>	Build up of carbon dioxide causes muscle fatigue and cramps.	Does not produce ATP molecules.
<b>D</b>	More ATP is produced than in aerobic respiration.	Lactate is produced and collected as biofuel.

[1 mark]

### Question 4

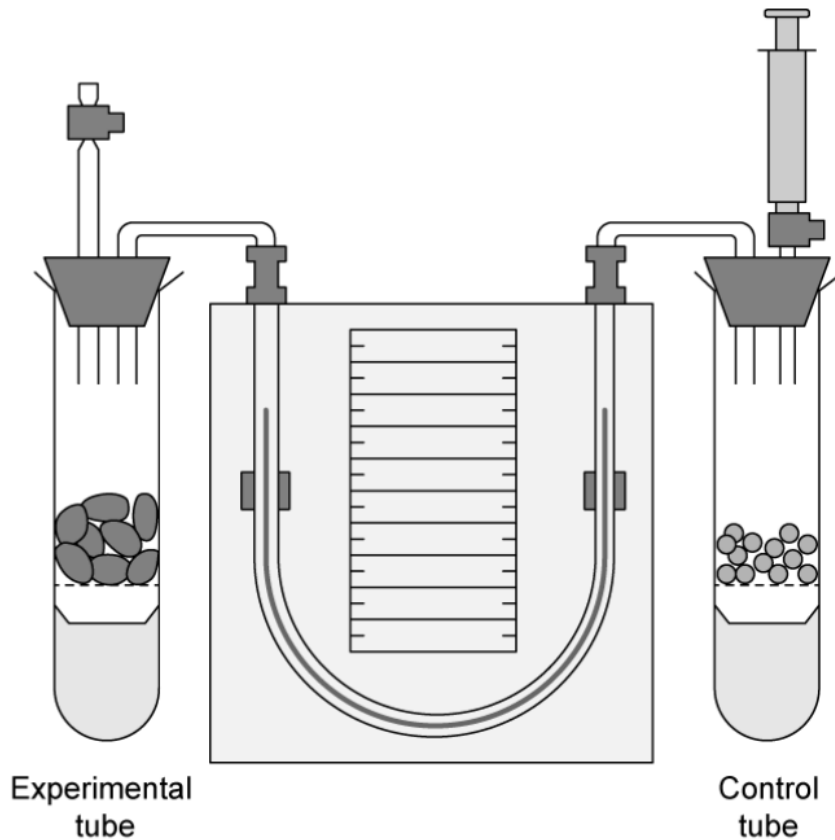
Which of the following is not considered an advantage of anaerobic respiration?

- A** ATP is still produced even in low or no Oxygen environments.
- B** Anaerobic respiration allows for short, quick bursts of energy.
- C** Lactate builds up in muscle fibres in humans.
- D** Yeast releases carbon dioxide bubbles in baking.

[1 mark]

**Question 5**

The diagram below shows a respirometer used to measure the respiration rate of germinating bean seeds.



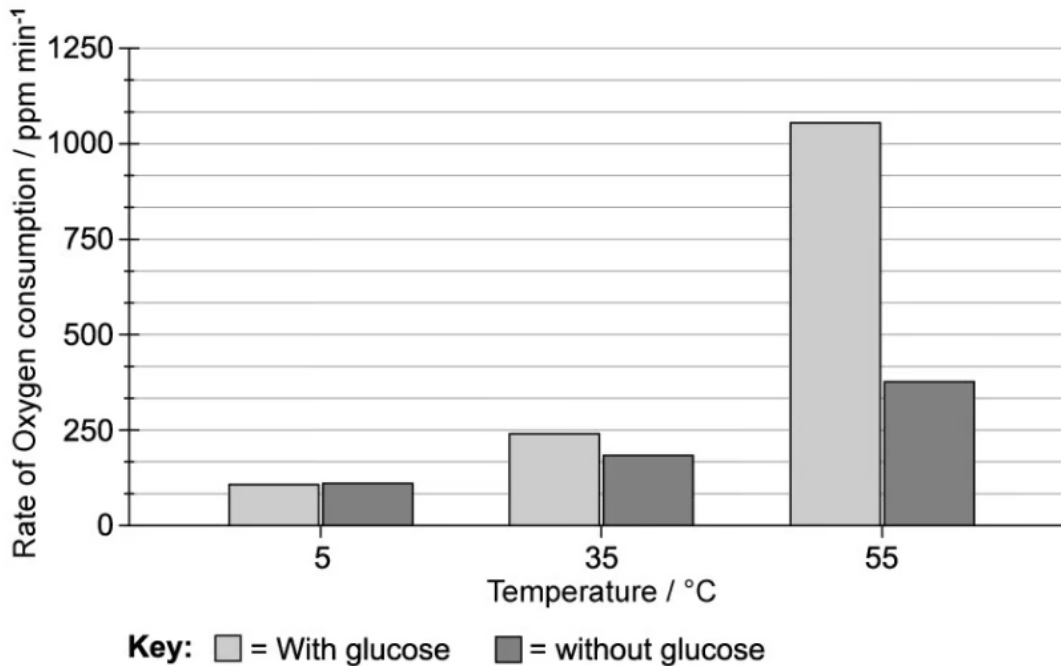
What direction will the manometer fluid move and what is the role of the liquid placed in the bottom of each tube?

	<b>Direction of movement of the manometer fluid</b>	<b>Role of liquid at the bottom of the tubes</b>
<b>A</b>	Up the left side	To release energy
<b>B</b>	Down the right side	To absorb carbon dioxide
<b>C</b>	Down the left side	It is the independent variable
<b>D</b>	Down the right side	To react with the oxygen produced

[1 mark]

### Question 6

The rate of oxygen consumption was compared in yeast cells incubated with and without glucose at three different temperatures under aerobic conditions. The yeast cells were incubated for a period of 3 minutes during which the rate of O<sub>2</sub> consumption was measured with an O<sub>2</sub> sensor.



What can be concluded from the results of this experiment?

- A Glucose affects the rate of oxygen consumption at higher temperatures less than it does at lower temperatures.
- B Rate of cell respiration increases with temperature.
- C Glucose is broken down faster at 55°C.
- D Yeast does not break down glucose at lower temperatures.

[1 mark]

**Question 7**

Which of the following is **not** an ethical consideration you should take when working on experiments that use a respirometer to measure respiration rate?

- A** All hazards should be minimized. The animal should not suffer pain, be harmed, or be put at risk in any way.
- B** Animals should be returned to their natural habitat as soon as data is collected.
- C** If an alternative method exists that uses animals instead of plants, it should be used as it provides more accurate data.
- D** It is important to carefully weigh the benefit of learning with the potential harm and choose the most appropriate and ethical method.

[1 mark]

**Question 8**

Which of the following require ATP?

- I. Making DNA, RNA and proteins.
- II. Active transport of ions across membranes.
- III. Osmosis.
- IV. Muscle contractions.

- A** I, II, and IV    **B** III and IV    **C** II and IV    **D** IV

[1 mark]

**Question 9**

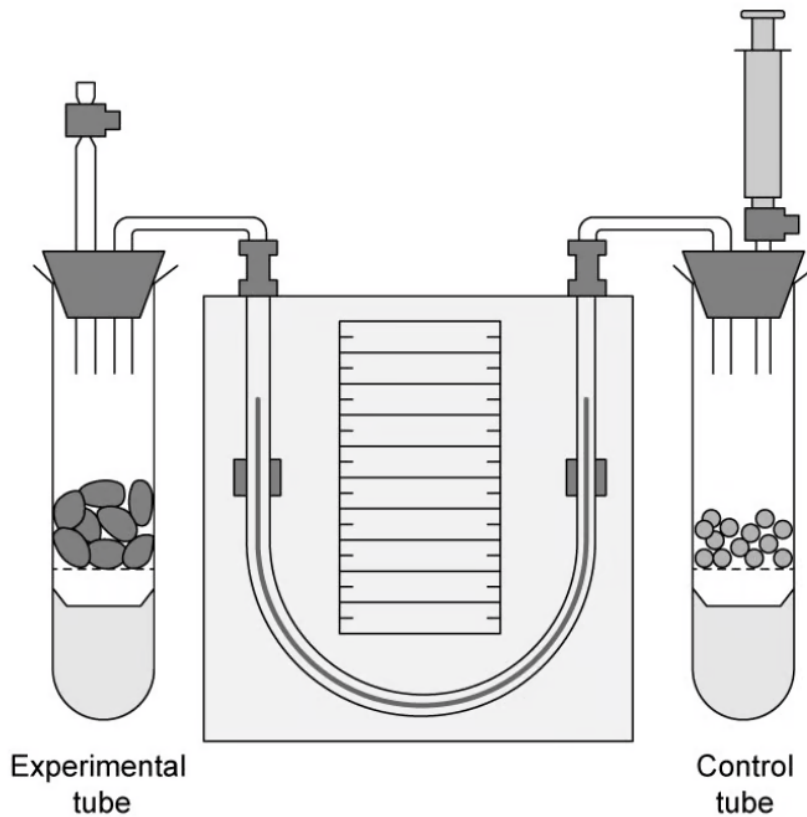
Which of the following statements correctly describe aerobic and anaerobic cell respiration in some organisms?

	<b>Aerobic cell respiration</b>	<b>Anaerobic cell respiration</b>
<b>A</b>	Products are carbon dioxide and water	Does not produce ATP
<b>B</b>	Much higher number of ATP molecules produced	Completely oxidizes glucose
<b>C</b>	Lipids and proteins can also be used as substrates	Products are lactate and ATP
<b>D</b>	Occurs in the cytoplasm	Occurs in the mitochondria

[1 mark]

**Question 10**

The diagram shows a typical respirometer set-up.



What is the solution at the bottom of the tubes and what is its function?

	<b>Solution</b>	<b>Function</b>
<b>A</b>	Acid	To ensure equal volumes of air in both tubes.
<b>B</b>	Acid	To accurately measure the amount of carbon dioxide consumed.
<b>C</b>	Alkali	To protect the organism.
<b>D</b>	Alkali	To absorb carbon dioxide.

[1 mark]