

2.7 Cellular Respiration

Question Paper

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

Time allowed: 10
Score: /5
Percentage: /100

Question 1

Which of the following statements would be a perceived advantage of ATP?

- I. ATP is a stable molecule.
- II. Acts as an instant source of energy for the cell.
- III. It is a universal energy carrier and can be used in many chemical reactions.
- IV. It is a small mobile molecule which can be easily transported to other cells.

A. I, II, III, and IV.

B. I. and II.

C. II. and III.

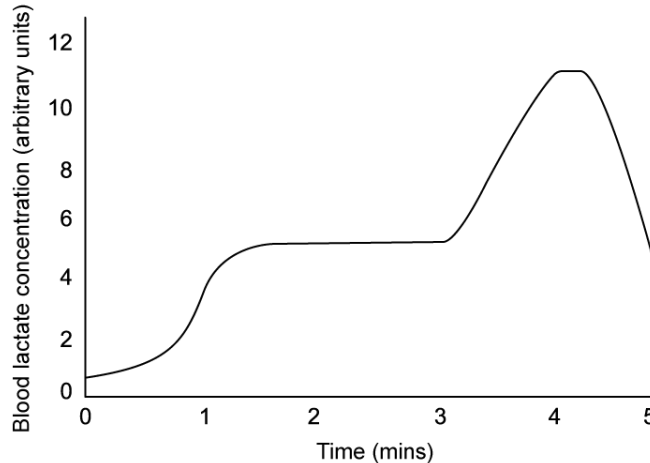
D. II, III, and IV.

[1 mark]

Question 2

An athlete ran 1600m on a treadmill and the speed intensity was varied throughout to simulate race conditions.

The athlete's blood was sampled every 60 seconds and the blood lactate concentration was measured as shown.



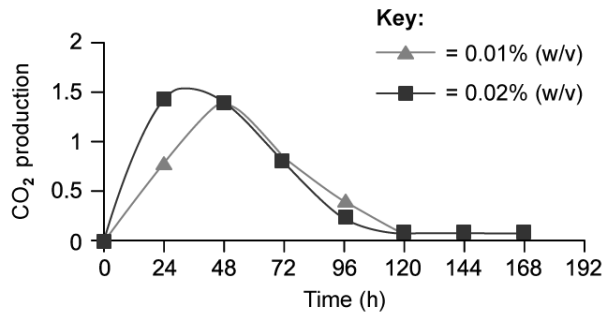
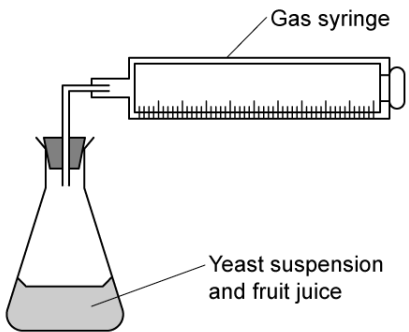
Which statement provides the most likely explanation for the blood lactate concentration between 3 to 5 minutes?

	3 to 4 minutes	4 to 5 minutes
A	The athlete increases their running intensity and their muscles resort to anaerobic respiration	The athlete has slowed down and oxygen is being used to break down the lactate
B	The athlete increases their running intensity and their muscles resort to anaerobic respiration	The athlete has stopped running and carbon dioxide is being used to break down the lactate
C	The athlete continues at the same pace but there is not sufficient oxygen to break down the lactate	The athlete is getting tired and starts to run at a slower intensity so the muscles produce less lactate.
D	The athlete increases their running intensity and the muscles continue to utilise aerobic respiration	The athlete is getting tired and starts to run at a slower intensity so the muscles produce less lactate.

[1 mark]

Question 3

The influence of volume of starter culture on the rate of anaerobic respiration of yeast was investigated using the following experimental apparatus, the data is also shown.



Which of the following statements could explain the decrease in carbon dioxide production?

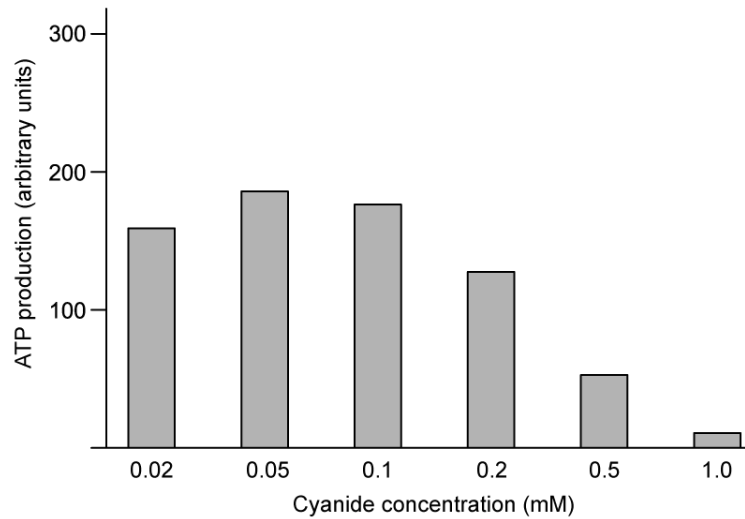
- I. Oxygen is still present so the yeast respire aerobically.
- II. The glucose source is depleted.
- III. Accumulation of ethanol is toxic to the yeast.
- IV. The starting cultures were different concentrations.

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

[1 mark]

Question 4

An investigation was carried out to study the effect of cyanide on ATP synthesis in a suspension of intact mitochondria. The graph below shows the results of the investigation.



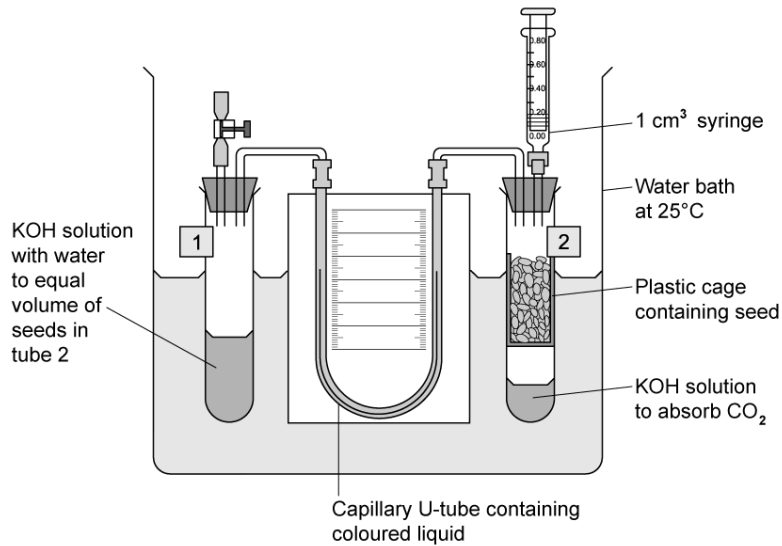
Which statement best explains the trends shown in the data?

- A. Cyanide interferes with ATP synthesis through aerobic respiration.
- B. Cyanide interferes with ATP synthesis through both aerobic and anaerobic respiration.
- C. Cyanide splits ATP molecules to yield ADP and phosphate.
- D. At high concentrations of cyanide, only anaerobic respiration occurs.

[1 mark]

Question 5

A respirometer was used to investigate the rate of oxygen consumption in aerobic respiration by germinating seeds. The apparatus used in the investigation are shown.



Which of the following statements about the use of respirometers are correct?

- I. There are ethical concerns with using any live organism.
 - II. The water bath is maintained at 25°C because slight variations in temperature can affect air pressure.
 - III. The temperature of the water bath can be altered to investigate how temperature affects the rate of respiration.
 - IV. As CO₂ is absorbed by the KOH, the air pressure is reduced inside the sealed chamber (labelled 2).
- A. I, II, and IV.
 B. II, III, and IV.
 C. I, III, and IV.
 D. I, II, III, and IV.

[1 mark]