Practice Question Set For GCSE
Subject : Biology
Paper-1 Topic: B4 Bioenergetics

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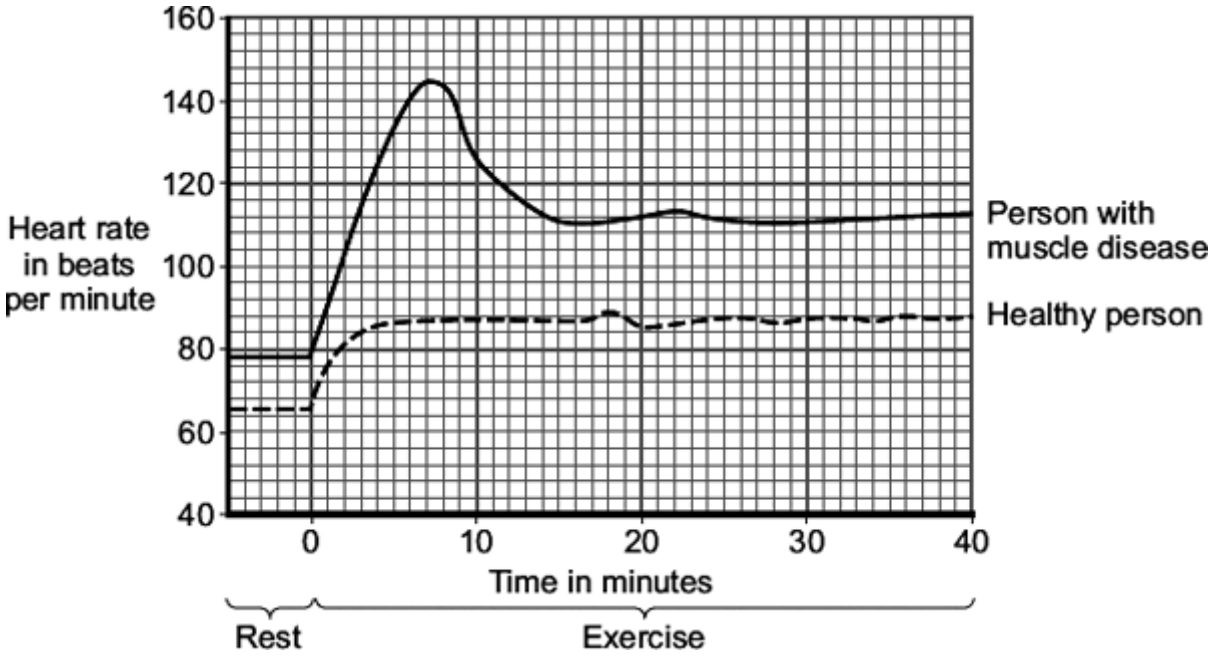
Name of the Student:_____
Max. Marks : 17 Marks **Time : 17 Minutes**

Q1.

Two people did the same amount of gentle exercise on an exercise cycle.
One person had a muscle disease and the other had healthy muscles.

The graph shows the effect of the exercise on the heart rates of these two people.



(a) Describe **three** ways in which the results for the person with the muscle disease are different from the results for the healthy person.

To gain full marks in this question you need to include data from the graph in your answer.

1. _____

_____

2. _____

_____

3. _____

_____

(3)

(b) The blood transports glucose to the muscles at a faster rate during exercise than when a person is at rest.

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(i) Name **one** other substance that the blood transports to the muscles at a faster rate during exercise.

_____

(1)

(ii) People with the muscle disease are not able to store glycogen in their muscles.

The results shown in the graph for the person with the muscle disease are different from the results for the healthy person.

Suggest an explanation for the difference in the results.

_____

_____

_____

_____

_____

_____

_____

_____

_____

(3)

(Total 7 marks)

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Q2.

(a) Use words from the box to complete the equation for aerobic respiration.

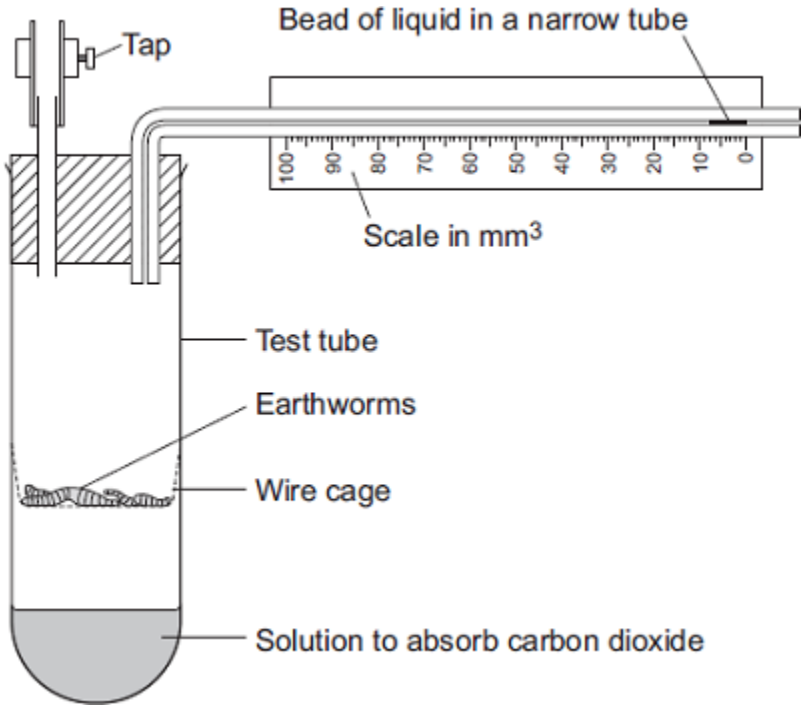
alcohol	**glucose**	**lactic acid**	**water**

_____ + oxygen ⟶ carbon dioxide + _____ (+ energy)

(2)

(b) Some students investigated the effect of temperature on the rate of aerobic respiration in earthworms.

The diagram shows the apparatus the students used.
When the tap is closed, the bead of liquid moves to the left as the earthworms take in oxygen.



The students put the test tube into a water bath at 20°C for 10 minutes.
They left the tap open during this time.

Why did the students put the test tube in the water bath at 20°C for 10 minutes?

Tick (✓) **one** box.

Because the air contains more oxygen at 20°C. ☐

Because the air contains less carbon dioxide at 20°C. ☐

So the earthworms' body temperature would change to 20°C. ☐

(1)

(c) The students then:

- closed the tap

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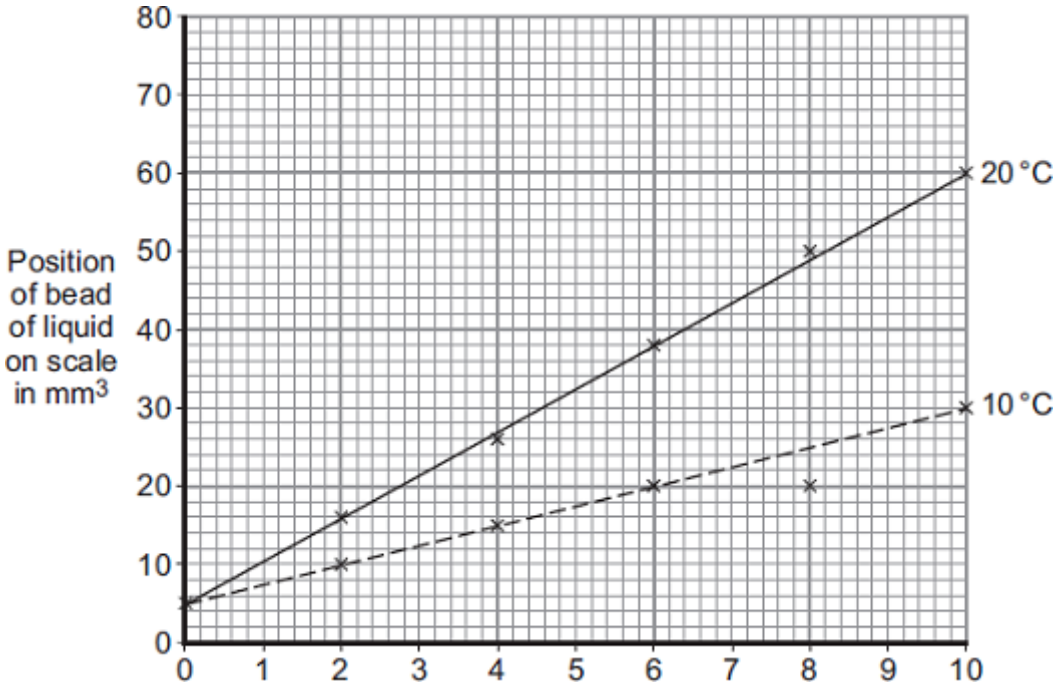
- started a stopwatch
- recorded the position of the bead of liquid every 2 minutes for 10 minutes
- repeated the experiment at 10°C.

The graph shows the students' results.



(i) How much oxygen did the earthworms take in during the 10 minutes at 20°C?

Use information from the graph to work out your answer.

_____

_____

_____

Volume of oxygen taken in = _____ mm^3

(2)

(ii) The earthworms took in this volume of oxygen in 10 minutes.

Use your answer from part (c)(i) to calculate how much oxygen the earthworms took in each minute.

_____

_____

Volume of oxygen taken in = _____ mm^3 per minute

(1)

(iii) The earthworms took in less oxygen each minute at 10°C than they took in at 20°C.

Explain why.

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_____

_____

_____

_____

(2)

(d) When drawing the line on the graph for the experiment at 10°C, the students ignored the reading at 8 minutes.

(i) Suggest why they ignored the reading at 8 minutes.

_____

_____

(1)

(ii) One student suggested they should repeat the experiment twice more at each temperature.

How would repeating the experiment improve the investigation?

_____

_____

(1)

(Total 10 marks)

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