Anaerobic Respiration

Question Paper

Level	A Level
Subject	Biology
Exam Board	Edexcel
Topic	Energy of Biological Processes
Sub Topic	Anaerobic Respiration
Booklet	Question Paper

Time Allowed: **26 minutes**

Score: **/21**

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

1 Florence (Flo-Jo) Griffith-Joyner's world record of 10.49 seconds for the 100 m women's sprint in 1988 is unbeaten.

In this short time, a sprinter such as Flo-Jo could not deliver enough oxygen to her muscles to maintain aerobic respiration.

* (a Describe how a sprinter is able to release sufficient energy for the 100 m sprint without having enough oxygen available for her muscles.

(6)

(b) (i) Lactate (lactic acid) can build up in the muscles of a sprinter.
Suggest why the build-up of lactate may prevent any further increase in speed.

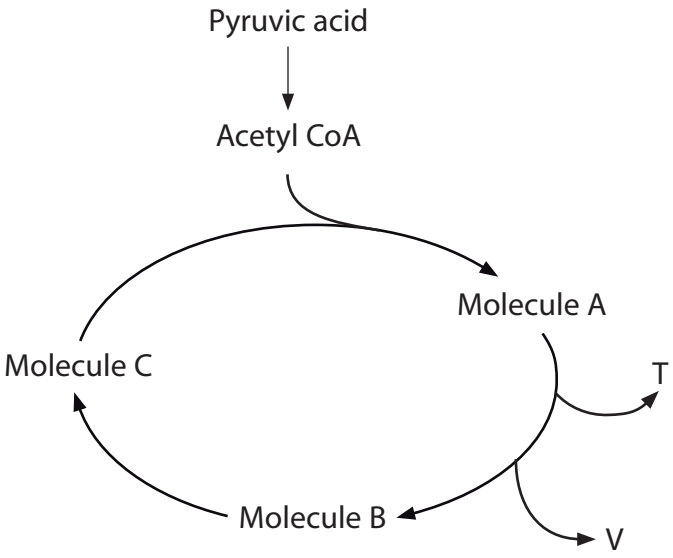
(2)

(ii) Explain the fate of lactate following a sprint.

(4)

(Total for Question 1 = 12 marks)

2 The diagram below summarises some of the reactions in aerobic respiration.



(a) Name the process that produces pyruvic acid.

(1)

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(b) Place a cross ☒ in the box that correctly identifies each of the following.

(i) The waste product V

(1)

☒ **A** ATP

☒ **B** Carbon dioxide

☒ **C** Lactic acid

☒ **D** Water

(ii) The molecule T that becomes reduced during the process

(1)

☒ **A** ADP

☒ **B** Oxygen

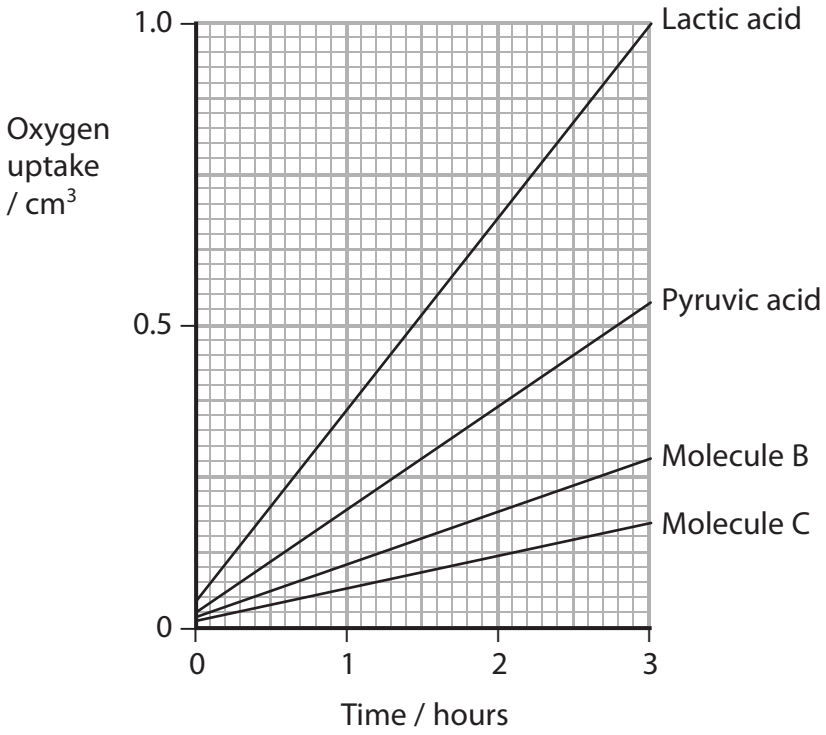
☒ **C** NAD

☒ **D** Water

(c) An investigation was carried out into the ability of bacteria to use different substances as substrates for aerobic respiration.

Cultures of bacteria were grown separately in media containing lactic acid or one of the substances shown in the diagram (pyruvic acid, molecule B or molecule C). The initial concentration of each of these substances in the media was the same. The oxygen uptake of each culture was measured over a period of time.

The results are shown in the graph below.



(i) Using the information in the diagram and the graph, suggest an explanation for the differences in oxygen uptake between bacteria using pyruvic acid, molecule B and molecule C as a substrate.

(4)

(ii) Suggest **one** reason for the rapid oxygen uptake by bacteria in a medium containing lactic acid. Give an explanation for your answer.

(2)

(Total for Question 2 = 9 marks)