Respiration

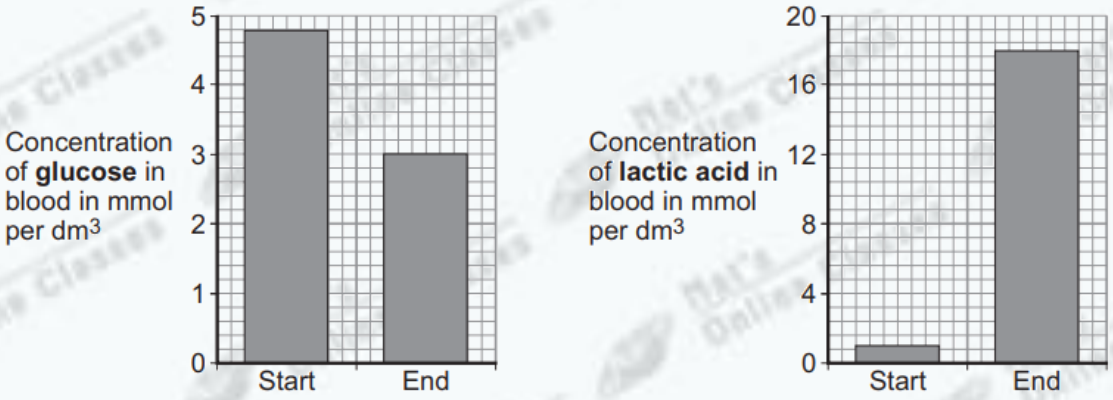
Total mark – 14

Question: 1

7 An athlete ran as fast as he could until he was exhausted.

7 (a) **Figure 7** shows the concentrations of glucose and of lactic acid in the athlete's blood at the start and at the end of the run.

Figure 7



7 (a) (i) Lactic acid is made during anaerobic respiration.

What does anaerobic mean?

[1 mark]

_____

_____

7 (a) (ii) Give evidence from **Figure 7** that the athlete respired anaerobically during the run.

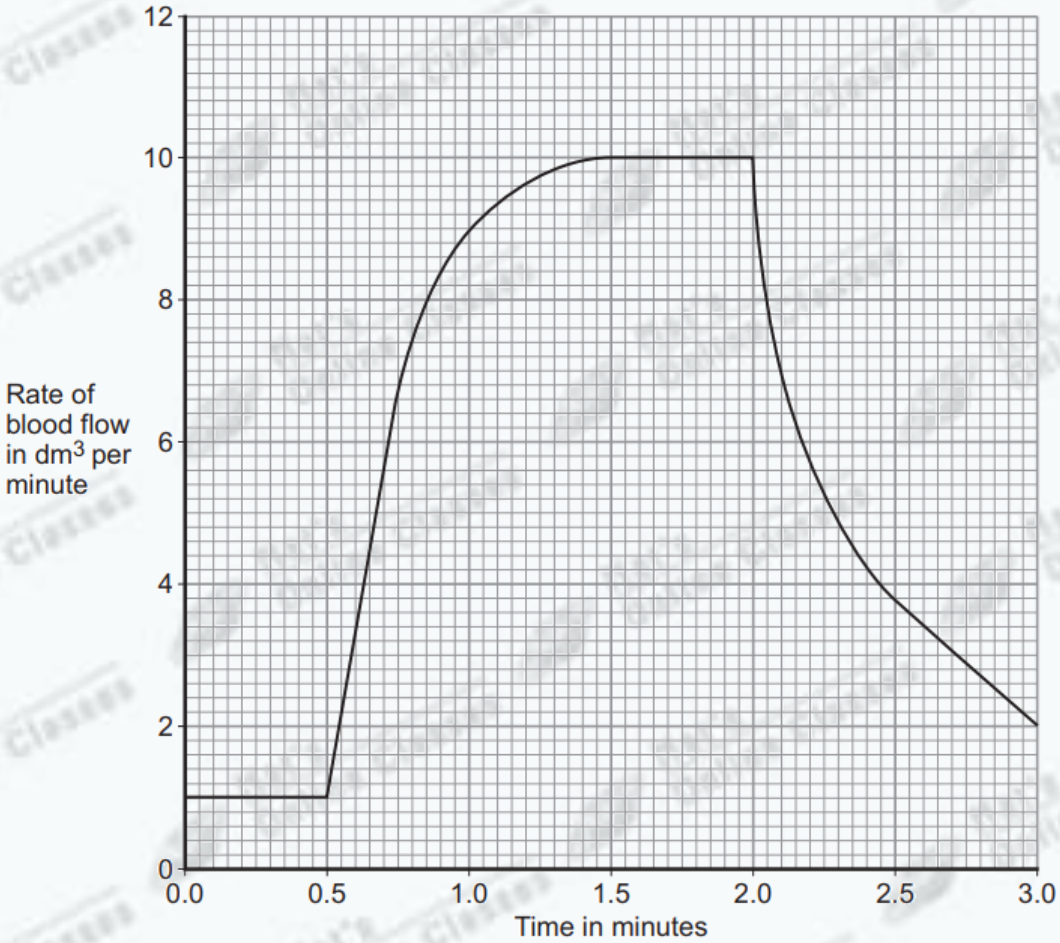
[1 mark]

_____

_____

7 (b) **Figure 8** shows the effect of running on the rate of blood flow through the athlete's muscles.

Figure 8



7 (b) (i) For how many minutes did the athlete run?

[1 mark]

Time = _____ minutes

7 (b) (ii) Describe what happens to the rate of blood flow through the athlete's muscles during the run.

Use data from **Figure 8** in your answer.

[2 marks]

_____

_____

_____

_____

7 (b) (iii) Explain how the change in blood flow to the athlete's muscles helps him to run.

[4 marks]

Question	Answers	Extra information	Mark	AO / Spec. Ref.
7(a)(i)	without <u>oxygen</u>	allow not enough oxygen ignore air ignore production of CO_2 ignore energy	1	AO1 2.6, 2.6.2a
7(a)(ii)	more/high/increased lactic acid (at end)	allow approximate figures (to show increase) ignore reference to glucose	1	AO3 2.6, 2.6.2b
7(b)(i)	1.5	allow only 1.5 / 1½ / one and a half	1	AO3 2.6, 2.6.1g/h
7(b)(ii)	increases at first **and** levels off suitable use of numbers eg rises to 10 / by 9 (dm^3 per min) **or** increases up to 1.5 (min) / levels off after 1.5 (min) (of x axis timescale) **or** after the first minute (of the run)	ignore subsequent decrease allow answer in range 1.4 to 1.5	1 1	AO2 2.6, 2.6.1g/h
7(b)(iii)	supplies (more) oxygen supplies (more) glucose for (more) respiration releases (more) energy (for muscle contraction)	need 'more/faster' once only for full marks allow removes (more) CO_2 /lactic acid / heat as an alternative for either marking point one **or** two, **once** only do **not** allow energy production or **for** respiration	1 1 1 1	AO1 2.6.1b/e/f/g/h 2.6.2d
Total			**9**	

Question: 2

7 The world population is increasing and the need for food is increasing.

Mycoprotein is a high-protein food made in fermenters using the organism *Fusarium*.

The process takes only a few weeks to produce a large amount of food.

7 (a) (i) What type of organism is *Fusarium*?

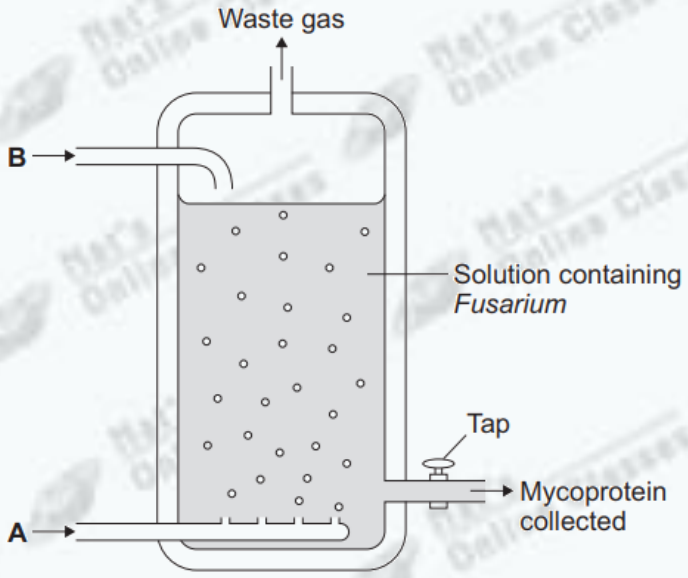
Draw a ring around the correct answer.

[1 mark]

bacterium **fungus** **virus**

Figure 8 shows a fermenter used in mycoprotein production.

Figure 8



7 (a) (ii) *Fusarium* makes mycoprotein. *Fusarium* respires aerobically.

Suggest which gas is added to the fermenter at point **A**.

[1 mark]

.....

7 (a) (iii) Another substance is added to the fermenter at point **B**. This substance is used in aerobic respiration.

Name this substance.

[1 mark]

.....

7 (b) People need to eat protein to grow and to be healthy.

Some people think that it would be an advantage to get more food from mycoprotein and less from farming animals.

Suggest **two** possible advantages of getting more food from mycoprotein.

[2 marks]

1 .....

.....

2 .....

.....

Question	Answers	Extra information	Mark	AO / Spec. Ref.
7(a)(i)	fungus		1	AO1 344d
7(a)(ii)	oxygen / O_2	accept air accept O_2 do **not** allow O^2/ O / O2	1	AO2 344d
7(a)(iii)	glucose (syrup)	allow carbohydrate / sugar ignore food / starch allow oxygen if oxygen / air not given in (a)(ii)	1	AO1 344d
7(b)	any **two** from: • quicker • suitable for vegetarians • cheaper • more efficient **or** less land / methane	ignore high in protein ignore sustainability unqualified ignore less pollution unqualified allow less animals harmed / killed allow food chain is shorter **or** has less trophic levels allow less energy lost (from the food chain) do **not** allow no energy lost allow low(er) in calories (than some meat) allow low(er) in fat / healthier (than some meat) allow source of fibre / prevent constipation	2	AO3 344a/d
Total			**5**	