2.7 Cellular Respiration

Question Paper

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

Time allowed: 40

Score: /30

Percentage: /100

Question 1a

a)
State an appropriate chemical equation to represent the production of ATP in respiration.

[1 mark]

[1 mark]

Question 1b

b)
ATP is an energy source required for many processes in the human body.

Identify **two** uses of ATP in the human body.

[2 marks]

[2 marks]

Question 1c

c)
State the word equation for aerobic respiration.

[2 marks]

[2 marks]

Question 1d

d)

By filling each cell with either ✓ or ✗, complete the table below to compare and contrast anaerobic respiration in yeasts and in humans.

Feature of anaerobic respiration	Yeasts	Humans
Relatively small ATP yield		
Oxygen required		
Ethanol and CO_2 produced		
Lactate produced		

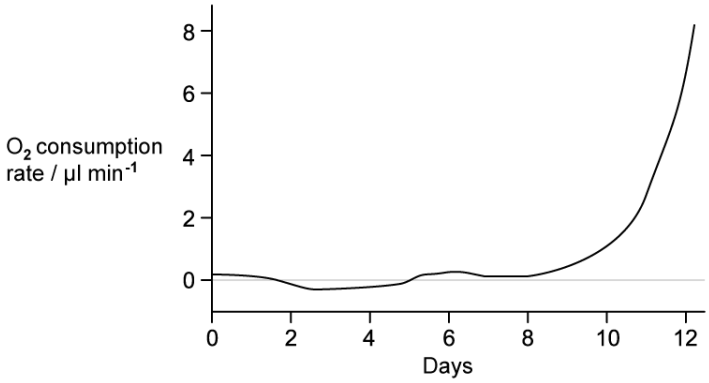
[4 marks]

[4 marks]

Question 2a

a)

When farmers store animal feed, moisture levels need to be kept as low as possible to prevent the growth of fungi. Animal feed was exposed to 10 % moisture and placed into a respirometer. O_2 consumption by fungi was monitored using a respirometer over a period of 12 days. The results are shown below.



A specific amount of soda-lime was added to the respirometer before data collection began.

State why this alkali was added.

[1 mark]

[1 mark]

Question 2b

b)

State **two** conclusions that could be drawn from the results shown in the graph in part (a).

[2 marks]

[2 marks]

Question 2c

c)

List **one** variable (other than humidity) that should be controlled in this experiment.

[1 mark]

[1 mark]

Question 3a

a)
Define cellular respiration.

[2 marks]

[2 marks]

Question 3b

b)
State the word equation for anaerobic respiration in a human striated muscle cell.

[1 mark]

[1 mark]

Question 3c

c)
Suggest why anaerobic respiration might occur in a human striated muscle cell.

[2 marks]

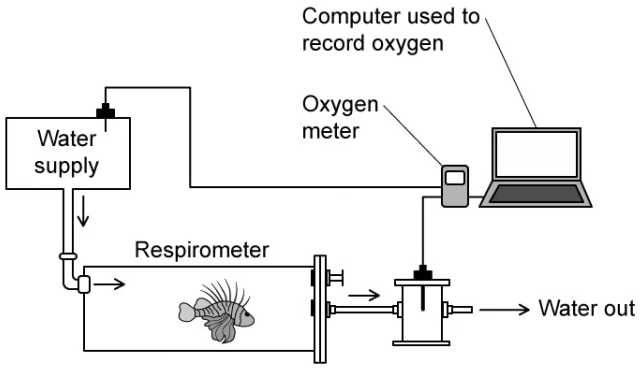
[2 marks]

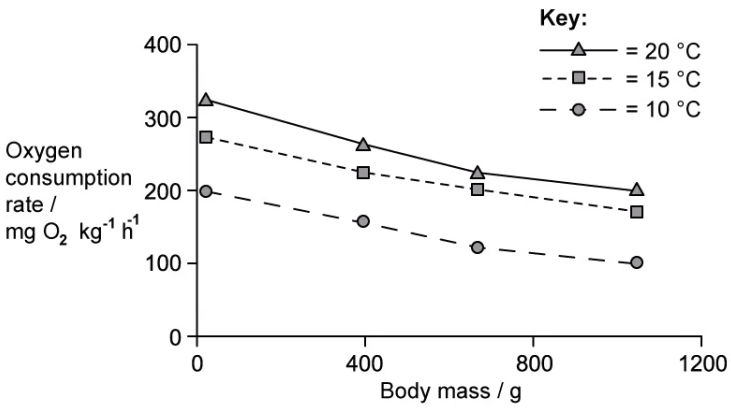
Question 4a

a)

The oxygen consumption rate of the red lionfish (*Pterois volitans*) was examined in a respirometer at three different water temperatures and at four different body masses.

The experimental set-up used and the results of the experiment are shown below.





Suggest how the oxygen consumption rate of *Pterois volitans* is determined.

[2 marks]

[2 marks]

Question 4b

b)

State the relationship between body mass and the oxygen consumption of *Pterois volitans*.

[1 mark]

[1 mark]

Question 4c

c)
Based on the data, suggest what the effects of global warming on aerobic respiration in fish might be.

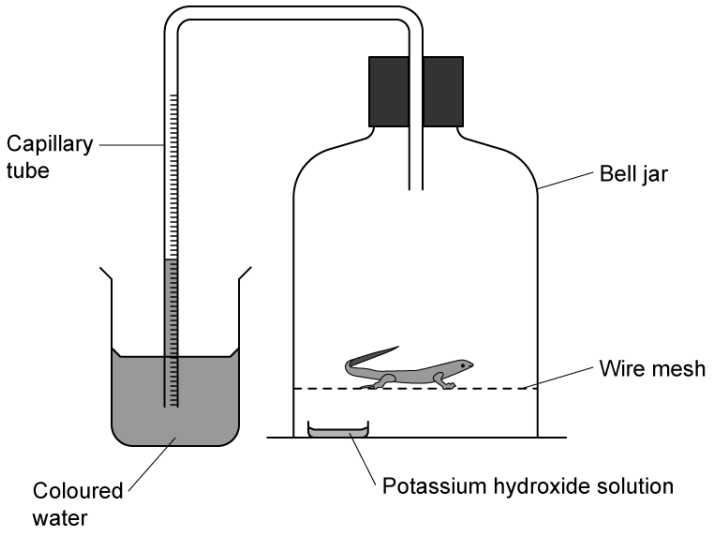
[2 marks]

[2 marks]

Question 5a

One mark is available for clarity of communication throughout this question.

a)
The apparatus shown below was used as a basic respirometer to measure the oxygen consumption of a lizard.



Describe how the experimental set-up shown above can be used to measure the oxygen consumption of the lizard.

[4 marks]

[4 marks]

Question 5b

b)
Discuss the suitability of the apparatus shown in part (a) for measuring the oxygen consumption of a green plant during respiration.

[3 marks]

[3 marks]