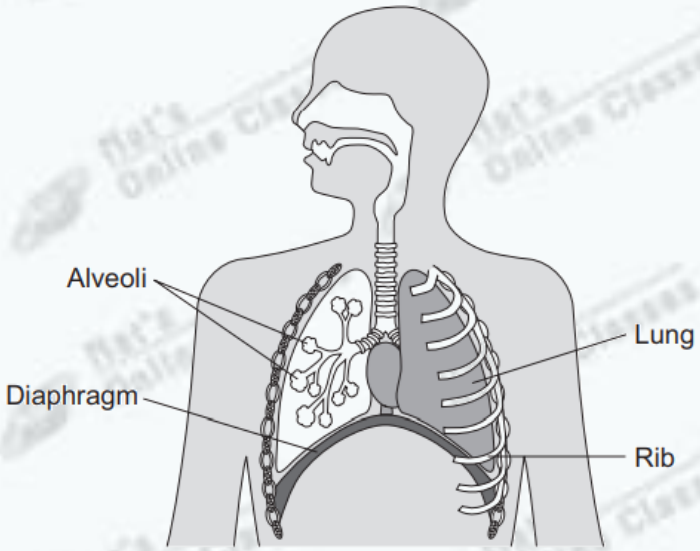
Gas exchange

Total mark – 17

Question: 1

1 (a) **Figure 1** shows the breathing system in humans.

Figure 1



Use the correct answer from the box to complete the sentence.

[1 mark]

abdomen	**air passages**	**thorax**

The lungs and ribs are found in the _____ .

1 (b) (i) What happens to the ribs when we breathe in?

[1 mark]

Tick (✓) **one** box.

The ribs move down and in. ☐

The ribs move up and in. ☐

The ribs move up and out. ☐

1 (b) (ii) Describe what happens to the muscles between the ribs when we breathe in.

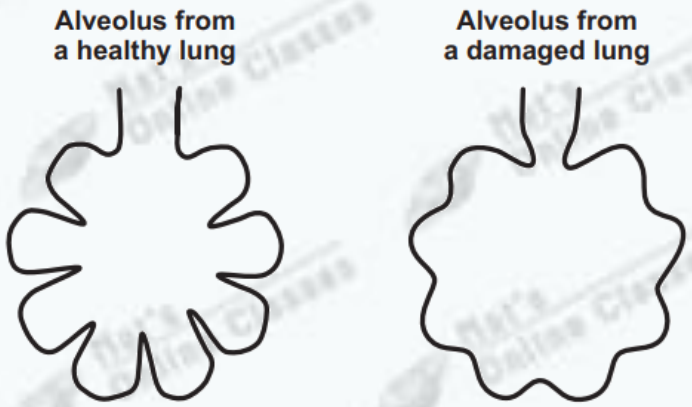
[1 mark]

_____

_____

1 (c) **Figure 2** shows an alveolus from a healthy lung and an alveolus from a damaged lung.

Figure 2



1 (c) (i) Which **one** of the following is a difference between the alveolus from the damaged lung and the alveolus from the healthy lung?

[1 mark]

Tick (✓) **one** box.

The damaged alveolus has a smaller surface area. ☐

The damaged alveolus has a shorter diffusion pathway. ☐

The damaged alveolus has a better blood supply. ☐

1 (c) (ii) A person with damaged alveoli finds exercising difficult.

Which **one** of the following is the reason why the damaged alveoli will make exercising difficult?

[1 mark]

Tick (✓) **one** box.

Less carbon dioxide is taken in. ☐

Less energy is needed for exercise. ☐

Less oxygen is taken in. ☐

Question: 2

4 Substances are transported through plants.

4 (a) Use the correct answer from the box to complete each sentence.

capillary	**guard cells**	**phloem**
stomata	**transpiration**	**xylem**

4 (a) (i) Water is transported from the roots to the stem of a plant

in the ..... .

[1 mark]

4 (a) (ii) Dissolved sugars are transported through the plant

in the ..... .

[1 mark]

4 (a) (iii) Movement of water through the plant is called the

..... stream.

[1 mark]

4 (a) (iv) Water vapour moves out of the plant through pores

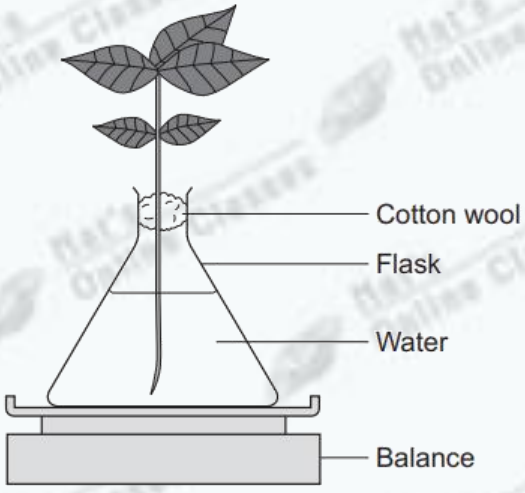
called ..... .

[1 mark]

4 (b) Students investigated the effect of different conditions on water loss from leaves.

The apparatus is shown in **Figure 6**.

Figure 6



The students set up four flasks, **A**, **B**, **C** and **D**.

The students:

- used the same size plant shoot in each flask
- recorded the mass of the flask and plant shoot at the start of each experiment
- left each flask and plant shoot in different conditions
- recorded the mass of each flask and plant shoot after 2 hours.

Table 2 shows the conditions that flasks **A**, **B**, **C** and **D** were left in for 2 hours.

Table 2

Flask	Temperature in °C	Fan or no fan
A	20	No fan
B	20	Fan
C	35	No fan
D	35	Fan

4 (b) (i) Suggest why the students used cotton wool in each flask.

[1 mark]

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4 (b) (ii) The use of the same size of plant shoot made the investigation a fair test.

Explain why.

[2 marks]

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4 (b) (iii) **Table 3** shows the students' results.

Table 3

Flask	Conditions		Mass at the start in grams	Mass after 2 hours in grams	Mass of water lost in 2 hours in grams
	Temperature in °C	Fan or no fan			
A	20	No fan	150.0	148.1	1.9
B	20	Fan	152.0	148.5	3.5
C	35	No fan	149.0	145.9	3.1
D	35	Fan	150.0	145.5	

What mass of water was lost by the plant shoot in flask **D**?

[1 mark]

.....

.....

..... grams

4 (b) (iv) Suggest what conclusion can be made about the effect of temperature on water loss from the plant shoot.

[1 mark]

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.....

4 (b) (v) Suggest what conclusion can be made about the effect of the fan on water loss from the plant shoot.

[1 mark]

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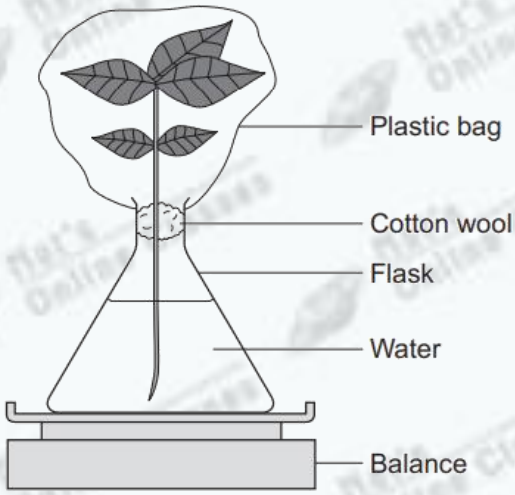
4 (c) The students carried out another experiment at 20 °C, with no fan.

The students used the apparatus in **Figure 7**.

Figure 7



In this experiment, the students:

- recorded the mass of the flask and plant shoot before tying the plastic bag around the plant shoot
- removed the bag after 2 hours and recorded the mass again.

4 (c) (i) What mass of water would be lost from the plant shoot in 2 hours?

Draw a ring around the correct answer.

[1 mark]

4 (c) (ii) Give a reason for your answer to part **(c)(i)**.

[1 mark]

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