Scaling up – 2022 GCSE Gateway Biology A

1. June/2022/Paper_J247/03/No.3

Transpiration will occur fastest in which conditions?

A A cold and windy environment

B A dark and cold environment

C A dark and warm environment

D A warm and windy environment

Your answer ☐ **[1]**

2. June/2022/Paper_J247/03/No.4

Which adaptation of xylem helps prevent water leaving the xylem vessels?

A Lignin in the walls of the xylem

B Pits (holes) in the walls of the xylem

C The breakdown of cross walls between cells that make up the xylem

D The lack of cell contents in the cells that make up the xylem

Your answer ☐ **[1]**

3. June/2022/Paper_J247/03/No.5

Water moves into root hair cells due to differences in water potentials.

Which term describes this process?

A Active transport

B Diffusion

C Osmosis

D Translocation

Your answer ☐ **[1]**

4. June/2022/Paper_J247/03/No.7

An elephant has 56 chromosomes in a stomach cell.

How many chromosomes will there be in an elephant's ear cell?

A 23

B 28

C 56

D 112

Your answer ☐ **[1]**

5. June/2022/Paper_J247/03/No.8

Liver cells are active cells producing many protein molecules.

Which organelles are present in liver cells?

A Chloroplasts and mitochondria

B Mitochondria and plasmids

C Nuclei and ribosomes

D Ribosomes and plasmids

Your answer ☐ **[1]**

6. June/2022/Paper_J247/03/No.9

A student cuts a cube of potato to use in an experiment. Each face of the cube is 2 cm by 2 cm.

What is the surface area : volume ratio of the cube?

A 3 : 1

B 4 : 8

C 8 : 24

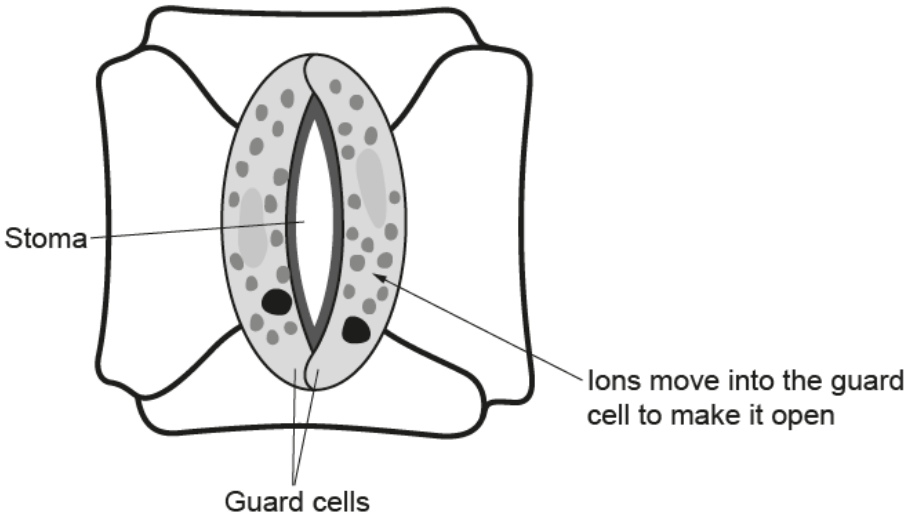
D 16 : 8

Your answer ☐ **[1]**

7. June/2022/Paper_J247/03/No.22

For gases to enter a leaf, the stomata must be open.

The diagram shows a stoma and two guard cells. When the stomata are open, the guard cells are described as being turgid (full of water).



(a) Explain how the guard cells help control the size of the stoma.
Use information from the diagram.

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..... **[4]**

(b) The diagram has a magnification of ×400.
The width of the stoma is 5 mm.

Calculate the actual size of the stoma. Give your answer in micrometres.

(1 mm = 1000 micrometres)

Width of stoma = ... micrometres **[2]**

(c) A student describes the structure and function of xylem to another student.

'Xylem vessels are made up of dead cells joined together end to end. The vessels are made of a waterproof material and transport sugars up and down the plant.'

They have made **two** mistakes in their description.

Write down the **two** mistakes they have made.

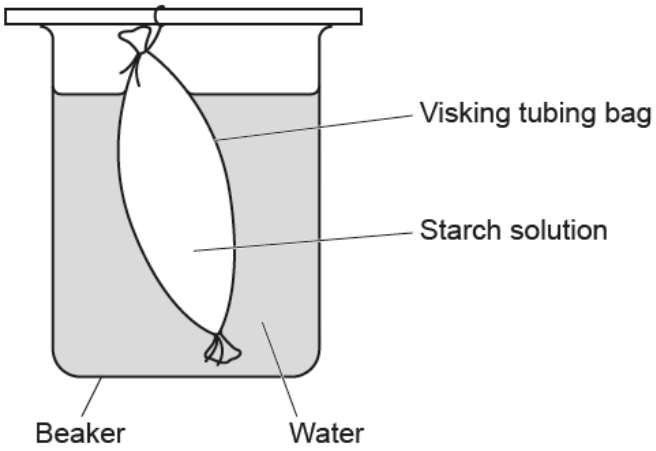
1 .....

2 .....

[2]

8. June/2022/Paper_J247/01/No.10

Visking tubing is made of a selectively permeable membrane.
A visking tubing bag containing starch solution is placed in a beaker of water.



What will happen?

A Nothing will happen.

B Starch will leave the visking tubing bag.

C Water will enter the visking tubing bag.

D Water will leave the visking tubing bag.

Your answer ☐ **[1]**

9. June/2022/Paper_J247/01/No.11

The diagram shows a red blood cell from a person who has sickle cell anaemia.
This condition results in red blood cells that are sickle shaped.

People with sickle cell anaemia can feel tired.
Which statement about sickle cells explains why?

A They contain a nucleus.

B They have a smaller surface area.

C They have more haemoglobin.

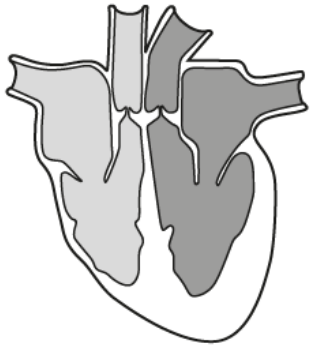
D They leave capillaries and enter tissues.

Your answer ☐ **[1]**

10. June/2022/Paper_J247/01/No.17

(a) **Fig. 17.1** shows a section through a human heart.

Fig. 17.1



(i) On **Fig. 17.1** draw an arrow to identify one valve. Label the arrow **V**. **[1]**

(ii) On **Fig. 17.1** draw a second arrow to identify one atrium. Label this arrow **A**. **[1]**

(iii) The left ventricle has more muscle than the right ventricle.

Explain why.

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..... **[2]**

(b) The heart circulates blood around the body three times every minute.

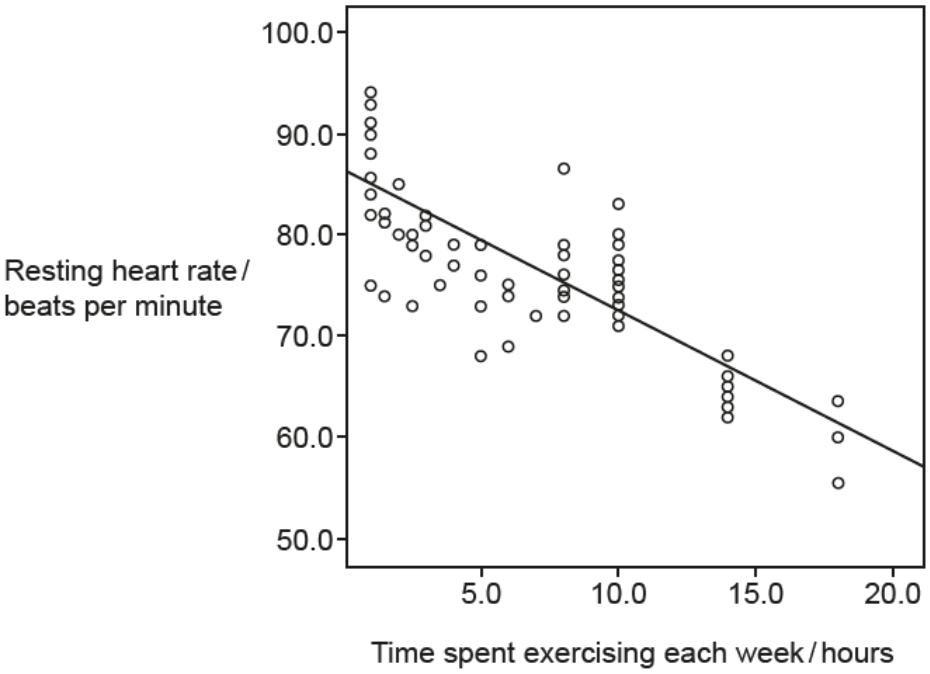
Calculate how many times blood will circulate around the body in **one** hour.

Number of times ..... **[2]**

(c) A scientist compares the time spent exercising each week with the resting heart rates of a number of individuals.

Fig. 17.2 shows their results.

Fig. 17.2



Write down **one** conclusion the scientist can make from the data.

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..... **[1]**

(d) A student writes some notes about veins:

> Veins are large blood vessels that carry blood towards the heart.
> They have a smooth lining and a narrow lumen.

The student has made **one** mistake in their notes.
Identify the mistake they have made.

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..... **[1]**

(e) The human circulatory system is described as a double circulatory system.
Explain why.

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..... **[2]**

11. June/2022/Paper_J247/02/No.5

Which sperm would fertilise an egg to produce a female baby?

A A sperm with one X chromosome.

B A sperm with one Y chromosome.

C A sperm with two X chromosomes.

D A sperm with X and Y chromosomes.

Your answer ☐ **[1]**