

- (b) Figure 2 shows the equipment used in a school laboratory to measure the energy content of a food sample.

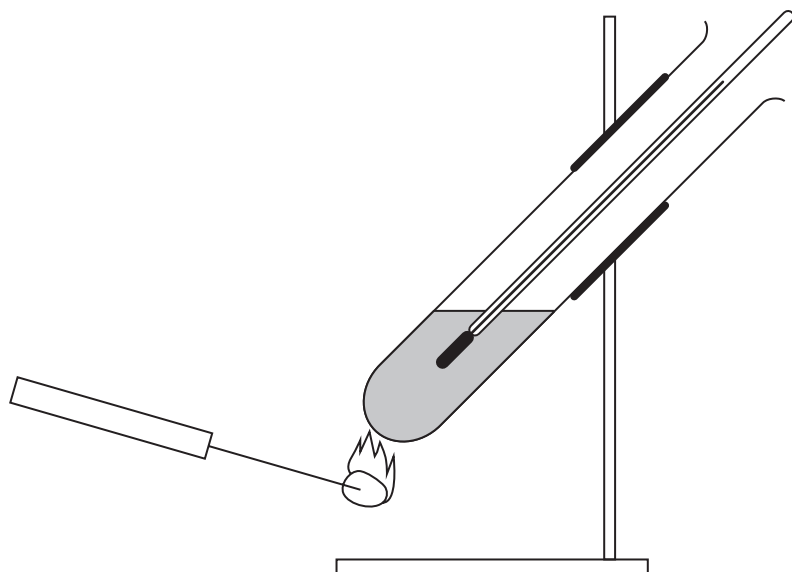


Figure 2

Explain why a bomb calorimeter gives a more accurate value than this equipment for the energy content of a food sample.

(3)

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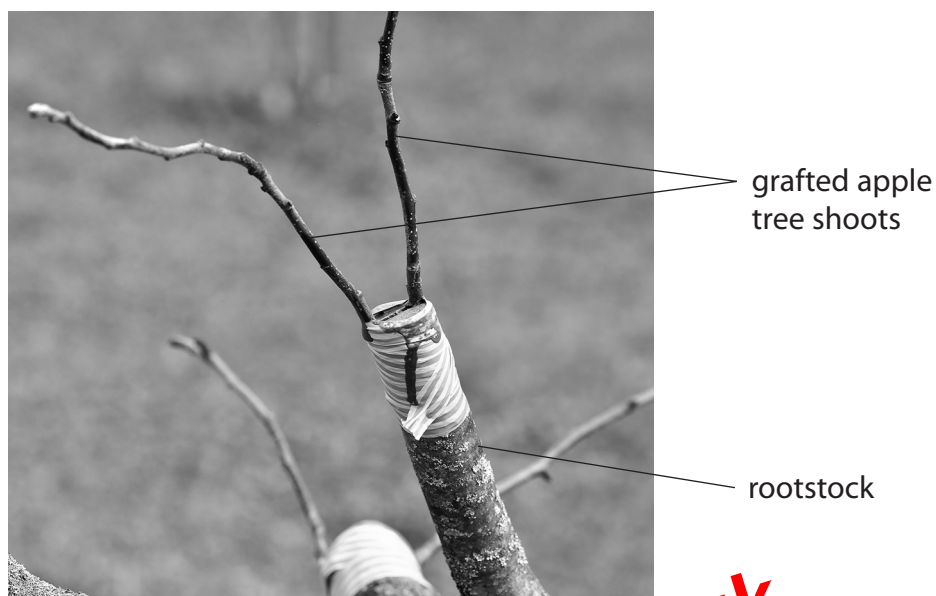
(Total for Question 1 = 7 marks)

- 2 (a) Name the type of reproduction that produces genetically identical organisms.

(1)

- (b) Grafting is a technique used to grow some varieties of apple tree.

Figure 3 shows apple tree shoots grafted on to a rootstock.



(Source: © ATTILA BARANY/Shutterstock)

Figure 3

Grafting can be used to produce apple trees that are genetically identical.

Give **one** advantage and **one** disadvantage of growing genetically identical apple trees.

(2)

advantage

disadvantage



(b) After a mouse egg cell is fertilised, cell division produces a ball of genetically identical stem cells.

(i) Which is the correct order for the stages of one cell division?

(1)

- ☐ **A** metaphase → prophase → anaphase → telophase
- ☐ **B** prophase → metaphase → anaphase → telophase
- ☐ **C** anaphase → prophase → metaphase → telophase
- ☐ **D** prophase → anaphase → metaphase → telophase

(ii) The genetically identical stem cells produce the cells that develop into an embryo.

Describe how stem cells produce the cells of an embryo.

(2)

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- (iii) There is some concern that the bitterns in the UK are all closely related.
This could make them susceptible to extinction.

Explain, using your knowledge of natural selection, why being closely related could make the bitterns susceptible to extinction.

(3)

- (b) Describe how selective breeding can be used to produce a large population of animals that are not closely related.

(2)

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