

A level Biology A
H420/03 Unified biology

Question Set 14

1 Sago pondweed is an underwater plant that grows in many regions of the world.

Fig. 1.1 shows a transmission electron micrograph of a sago pondweed cell.

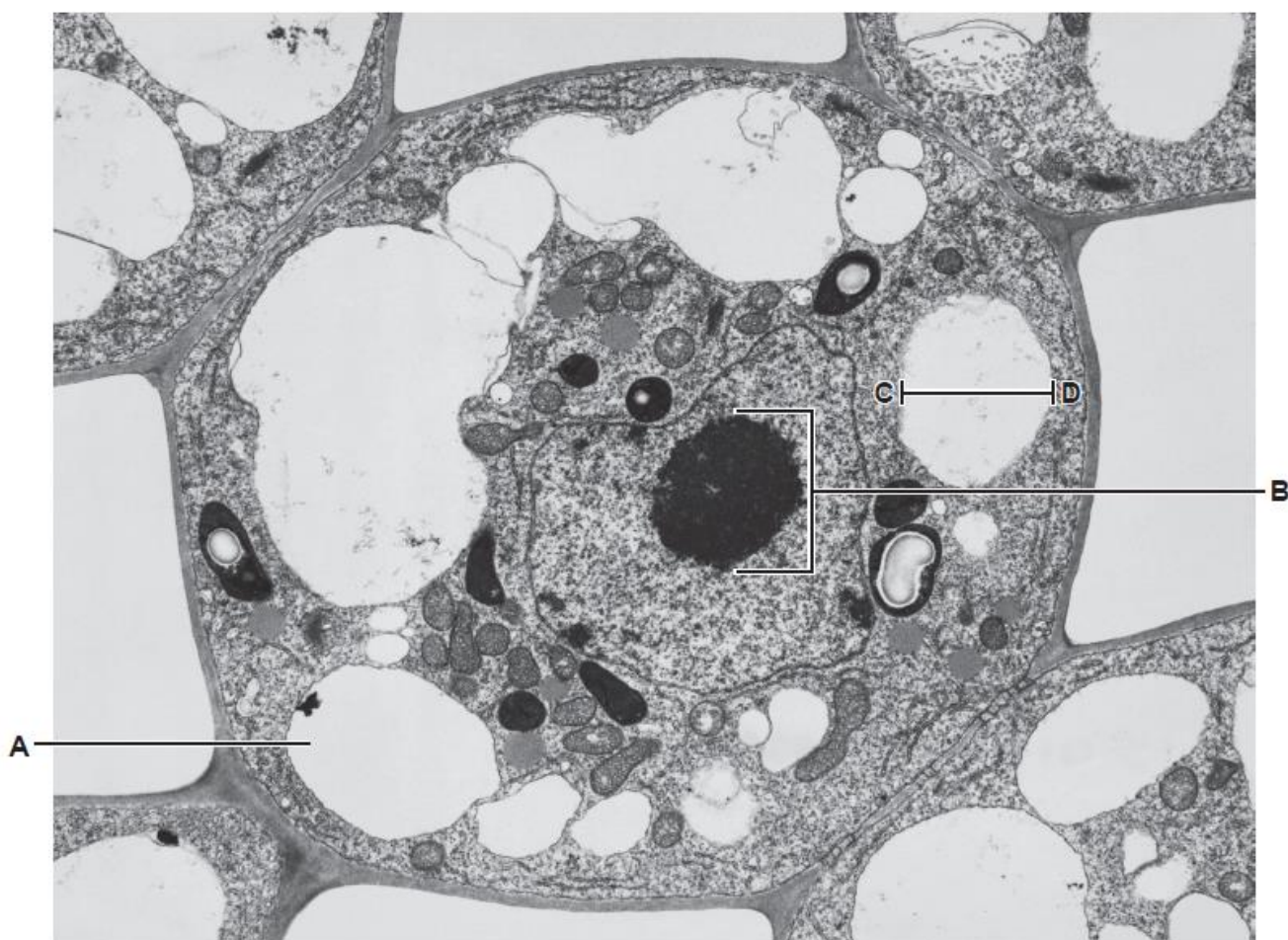


Fig. 1.1

(a) (i) Identify the **cellular components** shown at **A** and **B**.

A

B

[2]

(ii) The real size of the line between **C** and **D** on Fig. 1.1 is 1.4×10^{-6} m.

Calculate the magnification that was used to produce the image in Fig. 1.1.

Give your answer to **2 significant figures**.

magnification = [2]

- (iii) Fig. 1.2 shows a student's drawing of another sago pondweed cell, which was observed under a light microscope. The student used a sharp pencil but did not label the drawing.

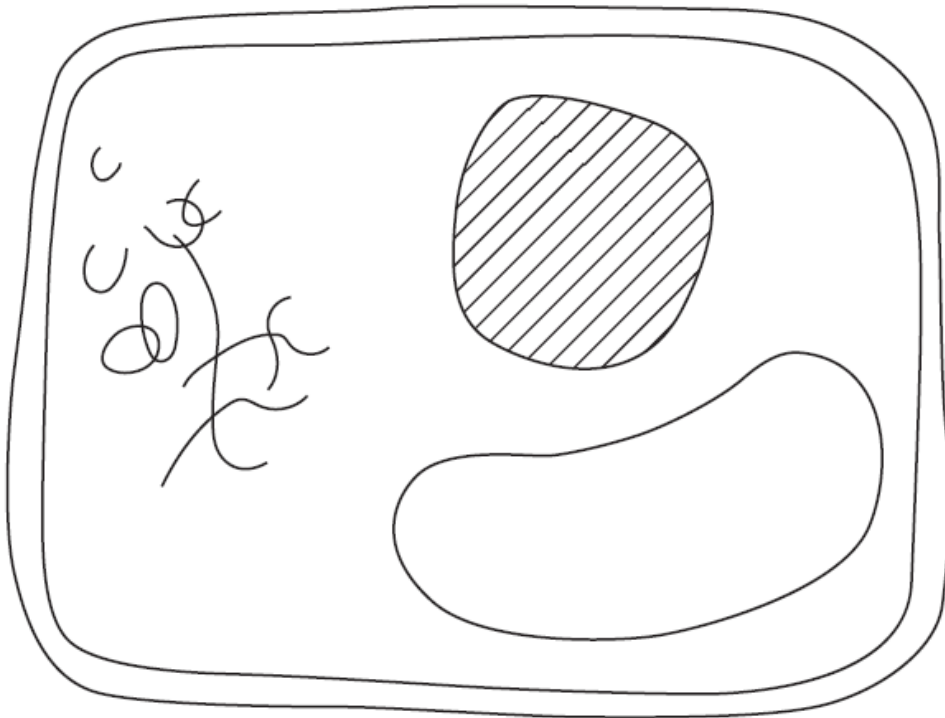


Fig. 1.2

Describe **two other** ways in which the drawing could be improved.

[2]

- (iv) The student stained a sago pondweed sample to improve the contrast between cellular components when viewed under a microscope.

The student used the following procedure to stain the sample:

- Use forceps to place the sample on a glass slide.
- Use a pipette to place two drops of the stain in the centre of the sample.
- Carefully lower a cover slip onto the sample, ensuring that the cover slip is parallel with the slide as it is lowered.

Describe **two** improvements the student should make to their staining procedure.

1

2

[2]

(b) Sago pondweed has evolved many adaptations to its aquatic environment. Three such adaptations are described below.

Explain the advantage of each adaptation.

Adaptation 1: No waxy cuticle

Advantage

Adaptation 2: Stem tissue that contains air spaces

Advantage

Adaptation 3: A thin, flexible stem

Advantage **[3]**

Total Marks for Question Set 14: 11



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