

A Level Biology B

H422/03 Practical skills in biology

Question Set 13

1. (a) (i) Programmed cell death is important in the growth and development of plants.

Name the process by which cells are destroyed in programmed cell death.

[1]

(a) (ii) Suggest **one** tissue type in a mature plant which is **formed** by programmed cell death.

[1]

(b) Fig. 4 is a photomicrograph of a root meristem and its root cap. A fluorescent staining technique has been used.

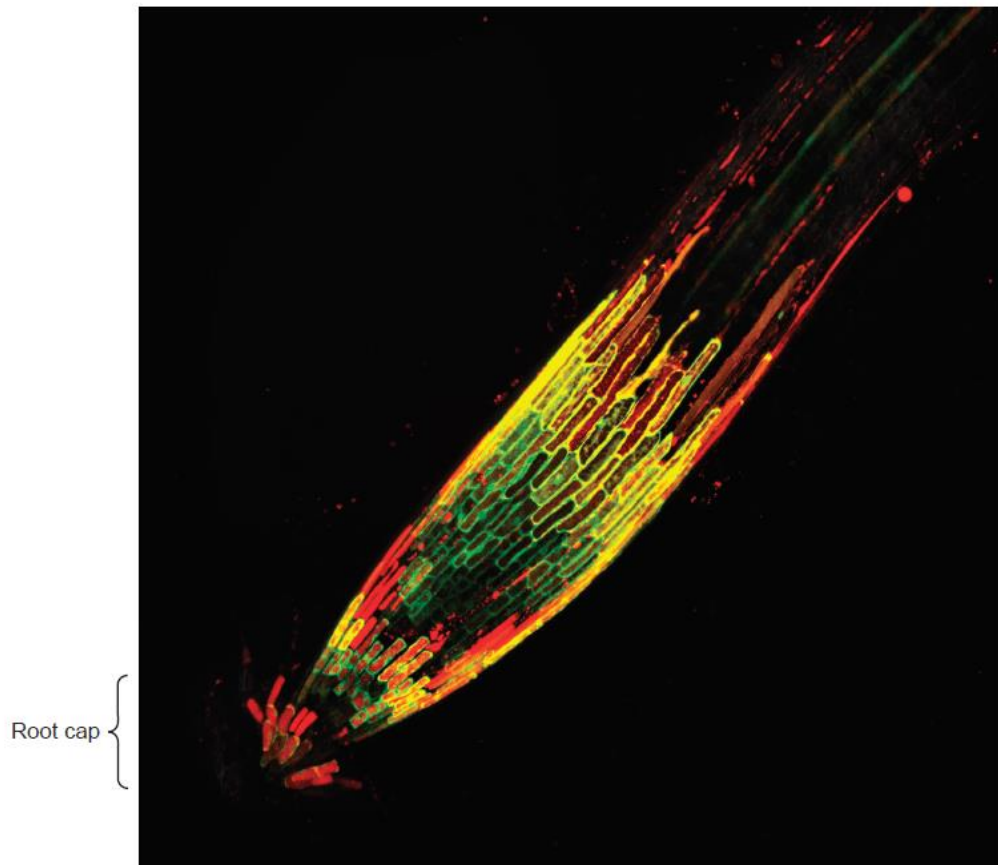


Fig. 4

- The cells in the root cap are constantly dying and being replaced by new cells.
- The cells about to die have enlarged vacuoles.
- These enlarged vacuoles appear red in Fig. 4.

Suggest the benefit for the plant of having a root cap.

[1]

- (c) A researcher examined two photomicrographs similar to that shown in Fig. 4 for seedlings of different ages. The total number of cells present in the root cap and the number of cells with an enlarged red vacuole were counted. The results are shown in Table 4.

Age of seedling (days)	Number of cells with an enlarged red vacuole	Total number of cells in root cap
5	12	40
10	85

Table 4

The researcher concluded that there was a 33% increase in the proportion of cells with an enlarged red vacuole between day 5 and day 10.

Calculate the number of cells with an enlarged red vacuole on day 10.

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

[Write your answer in Table 4]

[2]

- (d) (i) The root shown in the photomicrograph in Fig. 4 is from a plant classified in the group known as Eukaryota.

To which taxonomic rank does Eukaryota belong?

[1]

- (ii) The group Eukaryota includes both animal and plant species. There are similarities and differences in the ultrastructure of cells found in animal and plant species.

Use a tick (✓) or a cross (✗) to complete the table below to compare the features of these cells.

Feature	Present in animal cells	Present in plant cells
Mitochondria	✓	✓
Golgi apparatus		
Tonoplast		
Ribosomes		
Cell wall		

[4]

Total Marks for Question Set 13: 10

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