

1 Fig. 5.1 shows a root hair cell.

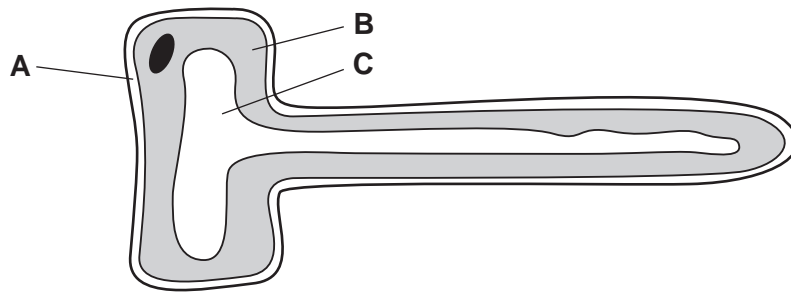


Fig. 5.1

(a) Name structures **A**, **B** and **C**.

- A .....
- B .....
- C ..... [3]

(b) Explain two ways in which root hair cells are adapted to carry out their functions.

- 1. ....  
.....  
.....
- 2. ....  
.....  
..... [4]

(c) Root hair cells need a supply of sugars to provide energy.

Explain how root hair cells obtain a supply of sugars.

- .....
- .....
- .....
- .....
- ..... [2]

[Total: 9]

2 (a) Name two structures, visible with a light microscope, which distinguish plant cells from animal cells.

1 .....

2 ..... [2]

Fig. 1.1 shows a plant cell.

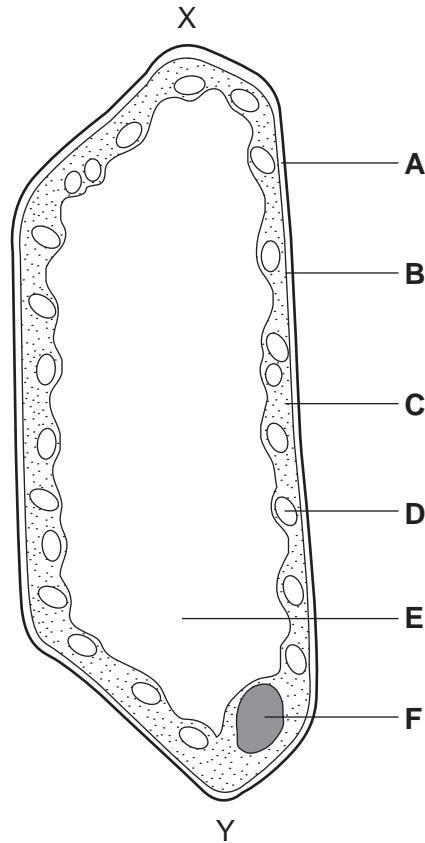


Fig. 1.1

(b) Complete the table by matching each of the described functions to **one** of the cell parts, **A – F**.

description of function	cell part
controls the passage of nutrients into the cell	
increases in volume when the cell is placed in water	
contains genetic material	
prevents the cell bursting	
produces glucose during photosynthesis	

[5]

(ii) The actual size of the cell from X to Y is 0.1 mm. Calculate the magnification of Fig. 1.1. Show your working.

magnification ..... [2]

(c) Name **one** animal cell and **one** plant cell that has no nucleus when fully developed. For each cell named, state its function.

animal cell .....

function .....

plant cell .....

function ..... [4]

[Total: 13]

3 Fig. 1.1 shows five mammals.

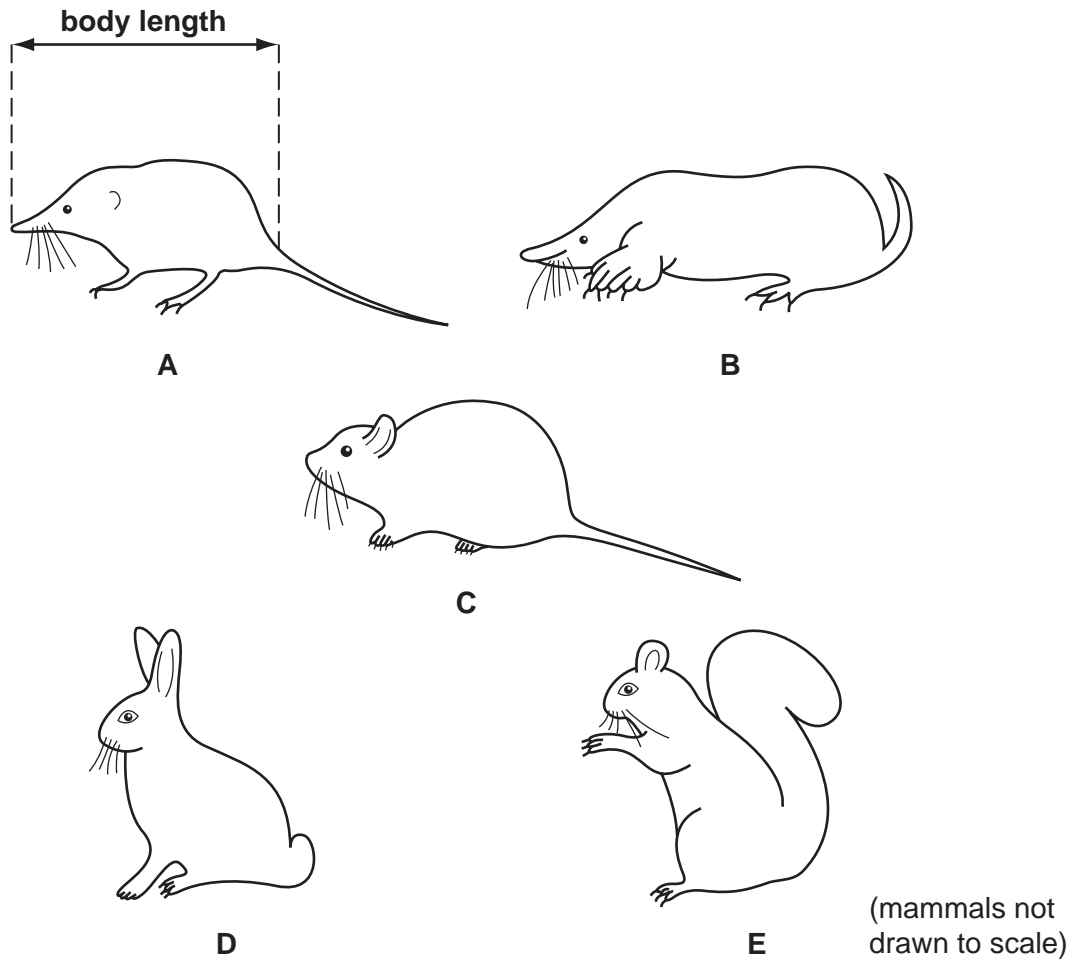


Fig. 1.1

(a) Use the key to identify each of these mammals. Write the letter for each mammal in Table 1.1.

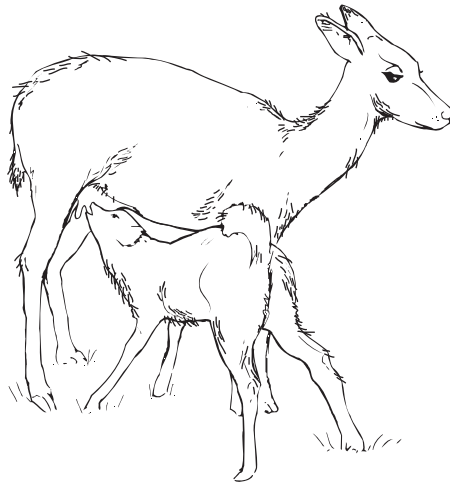
- |   |                                |
|---|--------------------------------|
| 1 tail more than half that of body length         | go to 2                        |
| tail less than half that of body length           | go to 4                        |
| 2 ears at top of head, with thick tail            | <i>Sciurus caroliniensis</i>   |
| ears at side of head, with thin tail              | go to 3                        |
| 3 nose pointed, nose length longer than its depth | <i>Sorex araneus</i>           |
| nose blunt, nose length shorter than its depth    | <i>Clethrionomys glareolus</i> |
| 4 front legs as wide or wider than long           | <i>Talpa europaea</i>          |
| front legs longer than wide                       | <i>Oryctolagus cuniculus</i>   |

**Table 1.1**

name of mammal	letter
<i>Clethrionomys glareolus</i>	.....
<i>Oryctolagus cuniculus</i>	.....
<i>Sciurus caroliniensis</i>	.....
<i>Sorex araneus</i>	.....
<i>Talpa europaea</i>	.....

[4]

(b) Fig. 1.2 shows a young deer feeding from its mother.



**Fig. 1.2**

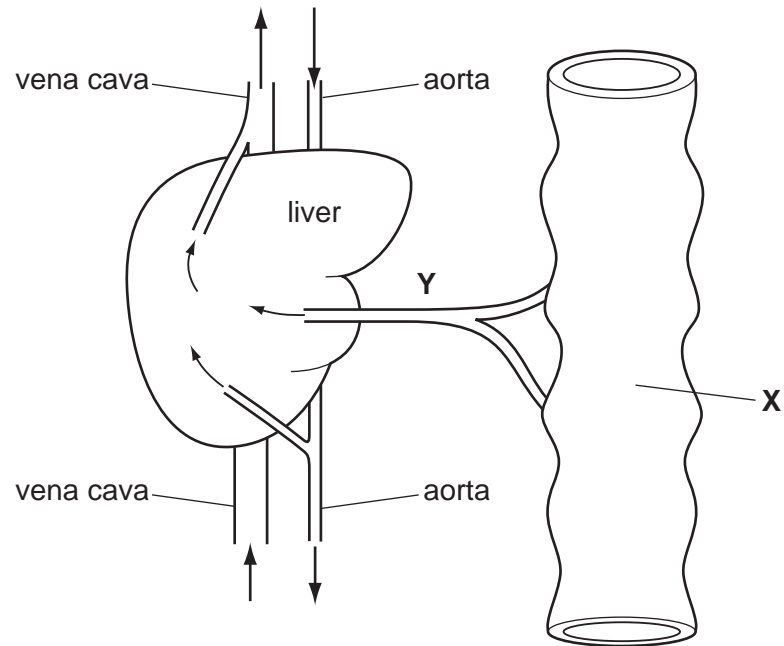
State two features of the deer, visible in Fig. 1.2, that distinguish mammals from other vertebrates.

1 .....

2 ..... [2]

[Total: 6]

4 Fig. 2.1 shows the blood supply for the liver of a mammal.



**Fig. 2.1**

**(a)** Blood from organ **X** is carried to the liver by blood vessel **Y**.

Name

**(i)** organ **X**,

..... [1]

**(ii)** blood vessel **Y**.

..... [1]

Fig. 2.2 shows some liver cells as seen with a light microscope.

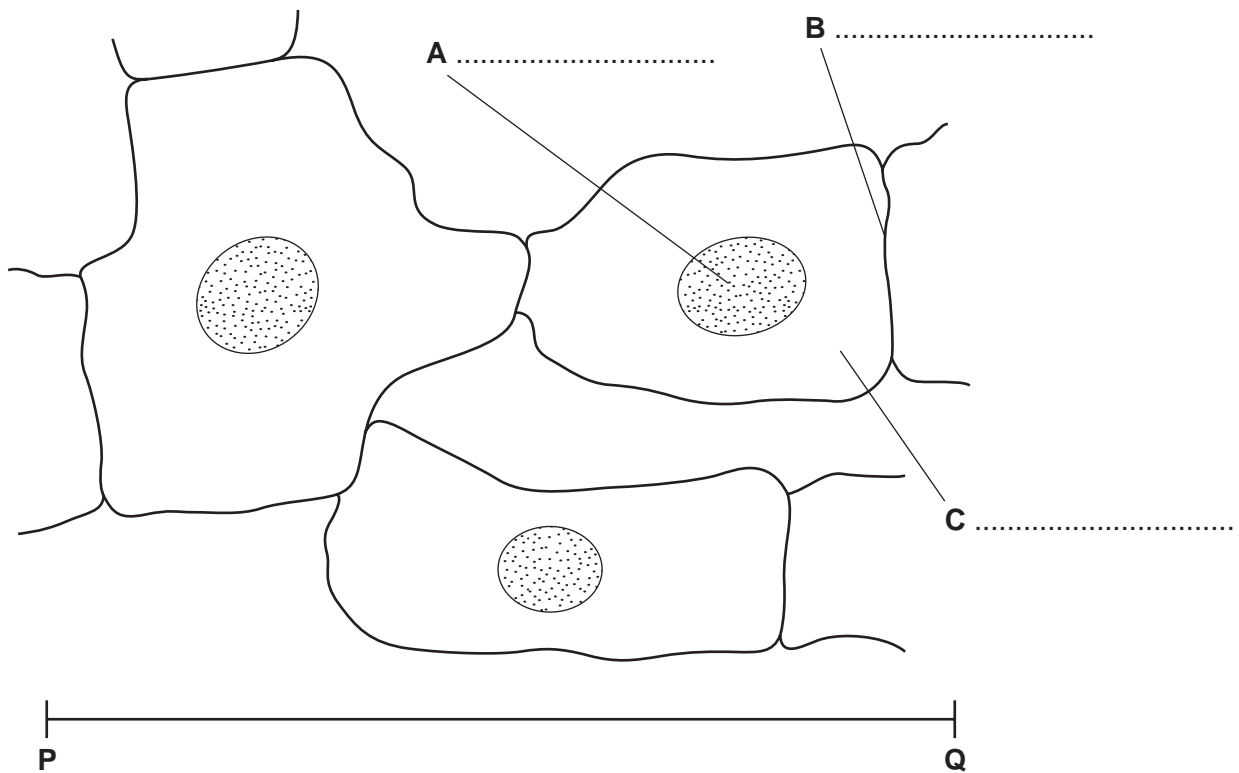


Fig. 2.2

(b) (i) Label, on Fig. 2.2, the structures **A**, **B** and **C**.

[3]

(ii) The distance **P-Q** is 0.06 mm.

Calculate the magnification of Fig. 2.2.

Show your working.

Magnification = x .....

[2]

Liver cells absorb glucose and amino acids from the blood and help to regulate the concentrations of these substances in the blood.

- (c) Explain how liver cells help to regulate the concentration of glucose in the blood in response to hormones from the pancreas in each of the following situations.

*Blood glucose concentration is higher than normal.*

.....  
.....  
.....  
.....  
.....  
.....

*Blood glucose concentration is lower than normal.*

.....  
.....  
.....  
.....  
.....  
.....

[5]

- (d) Describe what happens to amino acids inside liver cells.

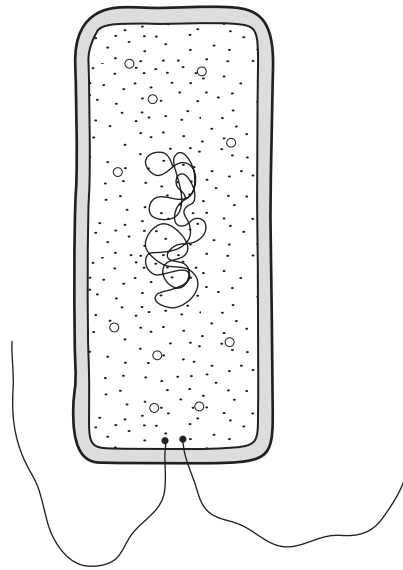
.....  
.....  
.....  
.....  
.....  
.....  
.....

[3]

[Total: 15]



5 Fig. 1.1 shows a diagram of a bacterial cell.



**Fig. 1.1**

**(a) (i)** State four structural features, present in a photosynthesising plant cell, that make it different from the bacterial cell in Fig. 1.1.

1. ....
2. ....
3. ....
4. .... [4]

**(ii)** State two structural features present in both the bacterial cell in Fig 1.1 and in an animal cell, such as a liver cell.

1. ....
2. .... [2]

**(b)** Bacteria are examples of microorganisms.

State two different types of food manufactured using microorganisms.

1. .... [2]
2. .... [2]

**(c)** Many bacterial diseases can no longer be treated with antibiotics. Outline how antibiotic-resistant strains of bacteria can develop.

.....  
.....  
.....  
..... [3]

**(d)** Explain why bacteria, in particular, are very useful organisms in the process of genetic engineering.

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

[Total: 13]