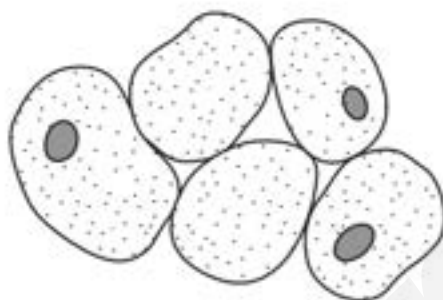


2. Organisation of the Organism

(Past Year Topical Questions 2010-2015)

May/June 2010 (11)

- 5 The diagram shows some liver cells as they appear under the microscope.



How many cell walls can be seen?

- A 0 B 2 C 3 D 5
- 6 Which row shows the structures present in plant and animal cells?

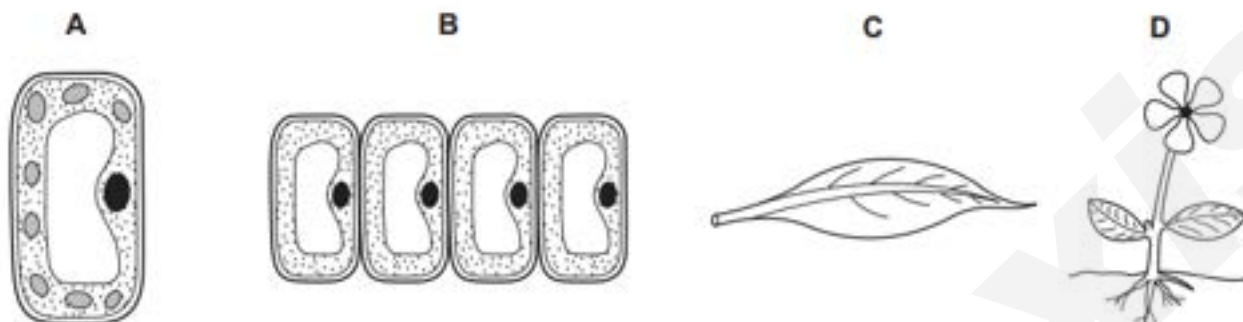
| | | cell wall | cytoplasm | nucleus | cell membrane |
|----------|-------------|-----------|-----------|---------|---------------|
| A | plant cell | x | ✓ | ✓ | ✓ |
| | animal cell | ✓ | ✓ | x | ✓ |
| B | plant cell | ✓ | ✓ | ✓ | ✓ |
| | animal cell | x | ✓ | ✓ | ✓ |
| C | plant cell | ✓ | ✓ | x | ✓ |
| | animal cell | x | ✓ | ✓ | x |
| D | plant cell | x | x | ✓ | ✓ |
| | animal cell | ✓ | ✓ | ✓ | x |

key

✓ = present

x = absent

7 Which diagram shows one organ only?



May/June 2010 (12)

2 Which row shows the most likely number of chloroplasts in three types of cell in a leaf?

| | epidermis | palisade mesophyll | guard cells |
|----------|-----------|--------------------|-------------|
| A | 0 | 6 | 17 |
| B | 0 | 17 | 6 |
| C | 6 | 17 | 0 |
| D | 17 | 0 | 6 |

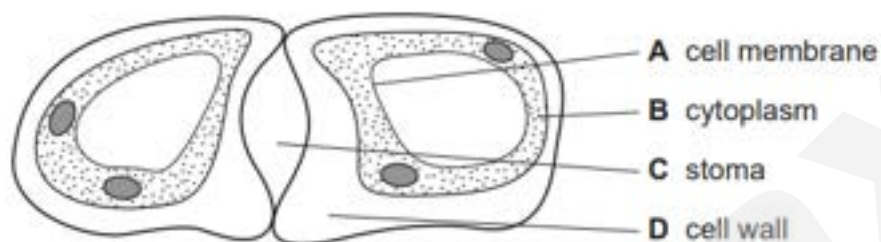
4 Which structure is at a different level of organisation from the other three?

- A kidney
- B liver
- C neurone
- D testis

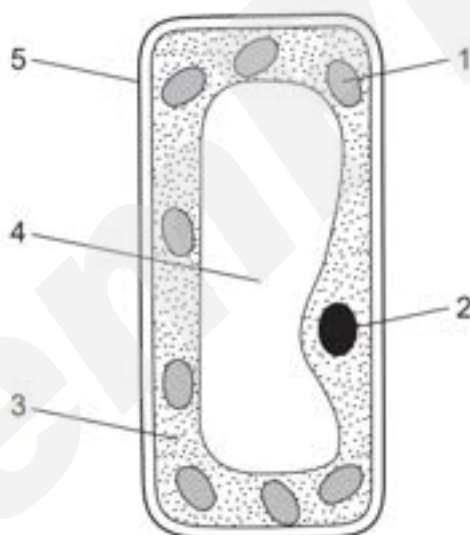
Oct/Nov 2010 (11)

4 The diagram shows a student's drawing of guard cells.

Which label line is **incorrect**?



5 The diagram shows a cell from a plant leaf.



Which parts are not found in animal cells?

- A 1 and 2 B 2 and 3 C 3 and 4 D 4 and 5

7 The diagram shows a structure found in the human body.



This is an example of

- A an organ.
- B an organism.
- C an organ system.
- D a tissue.

May/June 2011 (11)

5 The diagram shows four specialised cells.



liver cell



white blood cell



muscle cell

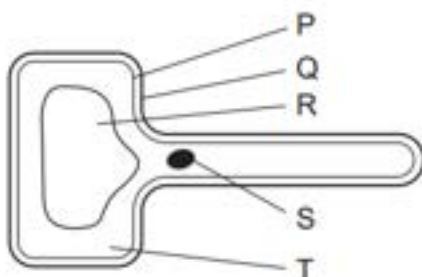


sperm cell

Which feature is **not** common to all of these cells?

- A cell membrane
- B cytoplasm
- C diploid number of chromosomes
- D nucleus

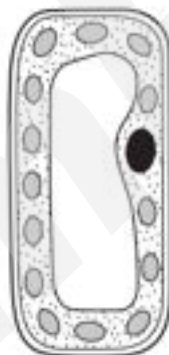
6 The diagram shows a plant cell.



Which labelled structures are found in plant cells but **not** in animal cells?

- A** P and Q **B** Q and R **C** R and S **D** S and T

7 The diagram shows another plant cell.



Which feature shows that it is a palisade cell?

- A** a large nucleus
B a large vacuole
C a thick cell wall
D many chloroplasts

Oct/Nov 2011 (11)

4 Root hair cells are found on plant roots.

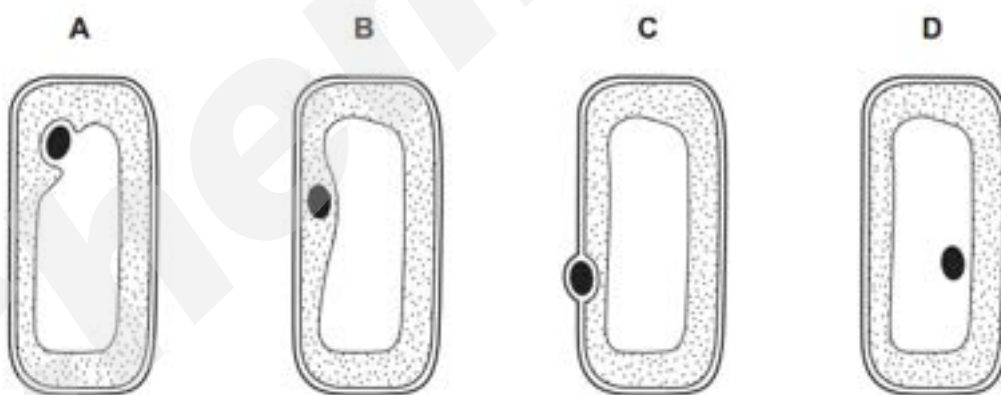
Which feature would be present in a root hair cell but **not** a sperm cell?

- A cell membrane
- B cell wall
- C chloroplasts
- D cytoplasm

5 Which structure is found in a palisade cell but **not** in a liver cell?

- A cell membrane
- B central vacuole
- C cytoplasm
- D nucleus

6 Which cell shows the position of the nucleus correctly?



7 What are the levels of organisation of

- the wall of a villus,
- the small intestine?

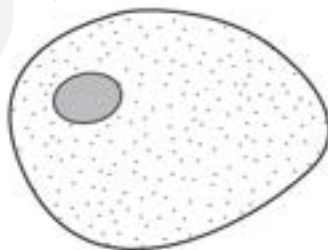
| | wall of a villus | small intestine |
|----------|------------------|-----------------|
| A | cell | organ |
| B | cell | organ system |
| C | tissue | organ |
| D | tissue | organ system |

8 Phloem is an example of

- A** a cell.
- B** a tissue.
- C** an organ.
- D** an organ system.

May/June 2012 (11)

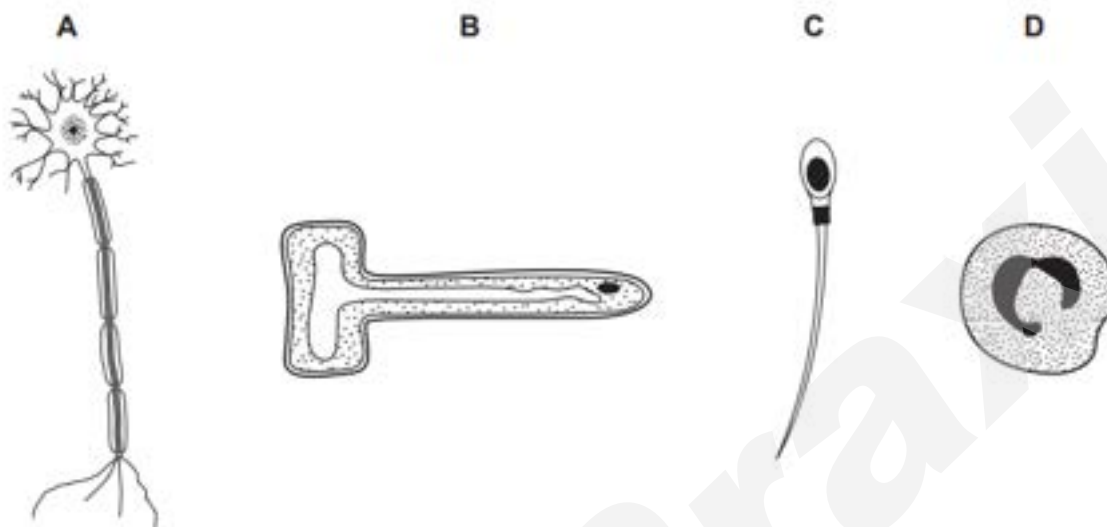
6 The diagram shows a liver cell.



Which structure is found in a palisade cell that is **not** present in this liver cell?

- A** cell membrane
- B** chloroplast
- C** cytoplasm
- D** nucleus

7 Which diagram shows a plant cell?



8 Which statement about cells or tissues, is correct?

- A Cells in the respiratory tract are long and thin.
- B Muscle cells are biconcave.
- C Red blood cells have no nucleus.
- D Xylem vessels have ciliated cells.

9 Why do some root cells have root hairs?

- A for the maintenance of the temperature of the cell sap
- B to increase the surface area of the cells
- C to increase the volume of the cell sap
- D to provide a place for cell nuclei

May/June 2012 (12)

- 4 Some cells have cell walls.

Which statements are correct for cell walls?

| | in animals | in plants |
|----------|-------------------------------|-------------------------------|
| A | absent | present inside cell membrane |
| B | absent | present outside cell membrane |
| C | present inside cell membrane | absent |
| D | present outside cell membrane | absent |

- 5 The diagram shows a specialised cell cut in half.

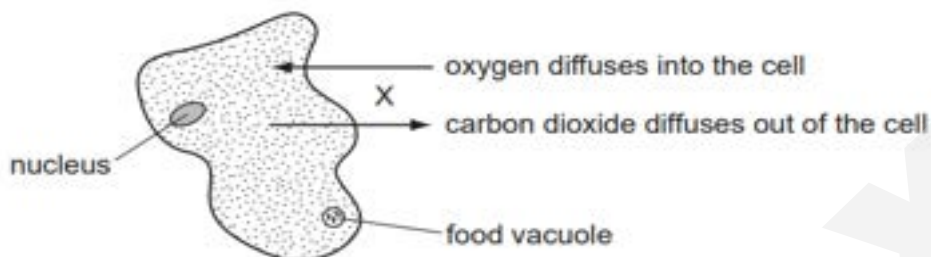


What does this diagram indicate about the structure of this cell?

- A The cell does not have a membrane.
 - B The cell is concave on each side.
 - C The cell is long and thin.
 - D The cell is red and carries oxygen.
- 7 In a plant, a group of xylem vessels form
- A a cell.
 - B a tissue.
 - C an organ.
 - D an organ system.

Oct/Nov 2012 (11)

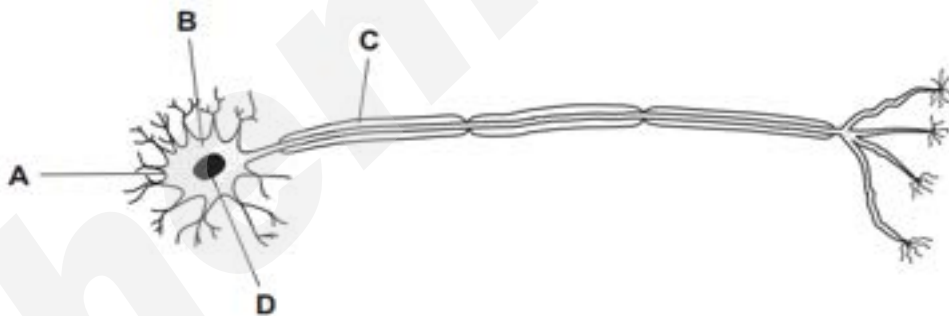
- 1 The diagram shows an amoeba, a single-celled living organism.



The movement of gases at X indicates the occurrence of which process or processes in the cell?

- A excretion and nutrition
 - B excretion and respiration
 - C nutrition and respiration
 - D respiration only
- 4 The diagram shows a motor (effector) neurone.

Which structure is also found in white blood cells, but **not** in red blood cells?



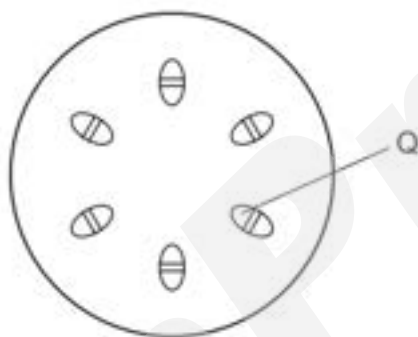
- 5 Which structures are found in a liver cell?

| | cell membrane | cell wall | chloroplast | large vacuole | cytoplasm | nucleus |
|----------|---------------|-----------|-------------|---------------|-----------|---------|
| A | ✓ | ✓ | x | x | x | x |
| B | x | x | ✓ | ✓ | x | x |
| C | ✓ | x | x | x | ✓ | ✓ |
| D | x | ✓ | x | x | x | ✓ |

7 At what level of organisation is a leaf?

- A organ
- B organism
- C organ system
- D tissue

8 The diagram shows a cross-section through a plant stem.



Q shows the part that is stained red when the stem is placed in water containing a red dye.

What is found at Q?

- A guard cells
- B palisade cells
- C phloem
- D xylem

Oct/Nov 2012 (13)

- 5 The cell shown in the diagram has been magnified 3000 times.

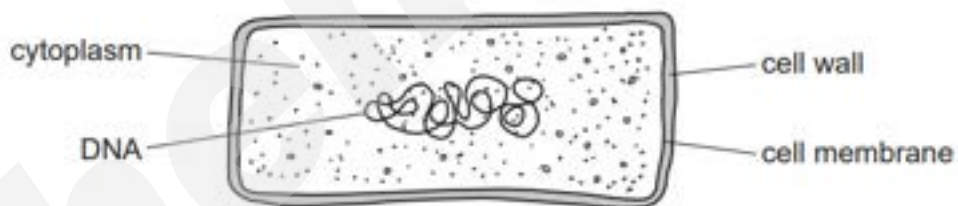


What is the actual diameter of the cell?

- A $\frac{16}{3000} = 0.005 \text{ mm}$
B $16 \times 3000 = 48000 \text{ mm}$
C $16 \times 300 = 4800 \text{ mm}$
D $\frac{16}{100} = 0.05 \text{ mm}$

May/June 2013 (11)

- 6 The diagram shows a bacterial cell.

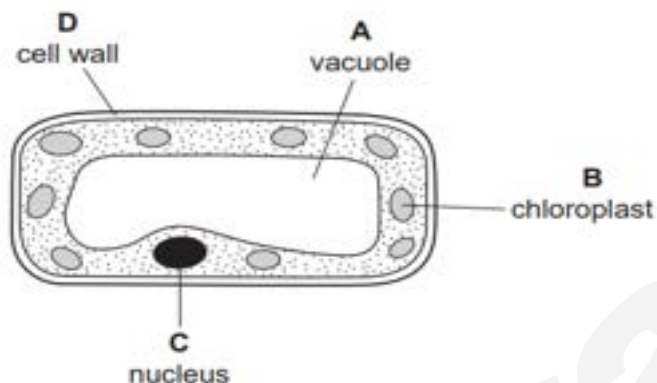


How is this cell different from a typical animal cell?

- A It has a cell membrane.
B It has cytoplasm.
C It has no chloroplasts.
D It has no nucleus.

7 The diagram shows a plant cell.

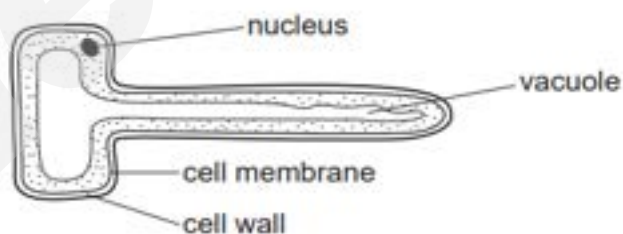
In which labelled part of the cell is sugar made?



8 Which of these tissues is **not** part of the organ with which it is paired?

| | tissue | organ containing this tissue |
|----------|----------|------------------------------|
| A | ciliated | root |
| B | muscle | intestine |
| C | nervous | brain |
| D | xylem | leaf |

9 The diagram shows a specialised cell.

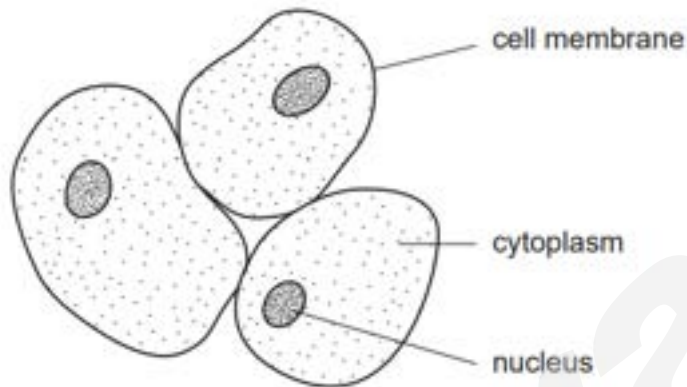


For which function is the cell adapted?

- A** absorption of water
- B** contraction of muscles
- C** movement of dust particles
- D** transport of oxygen

May/June 2013 (12)

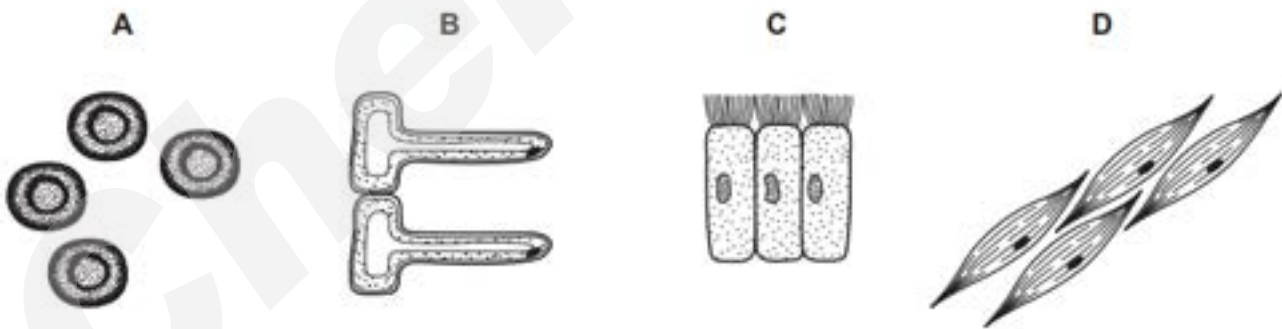
5 The diagram shows some cells.



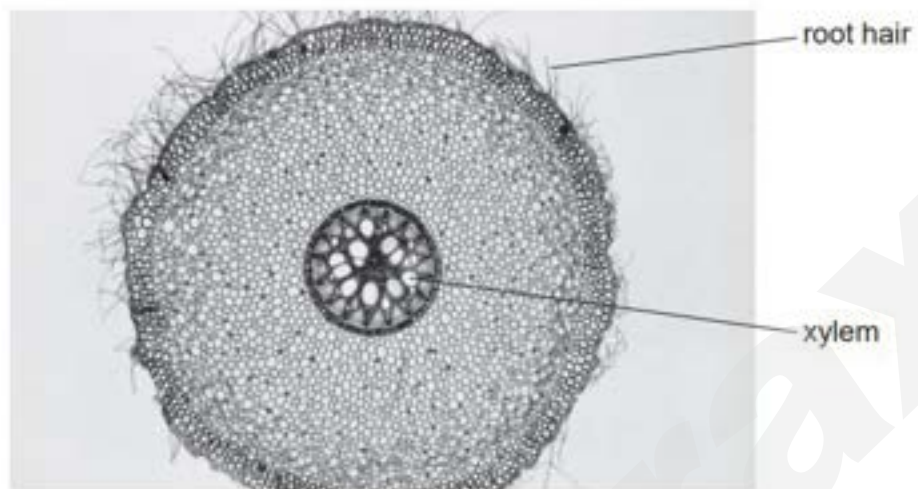
What are these cells?

- A liver cells
- B palisade cells
- C red blood cells
- D white blood cells

7 Which cells line the trachea?



8 The photograph shows a cross-section of a root.

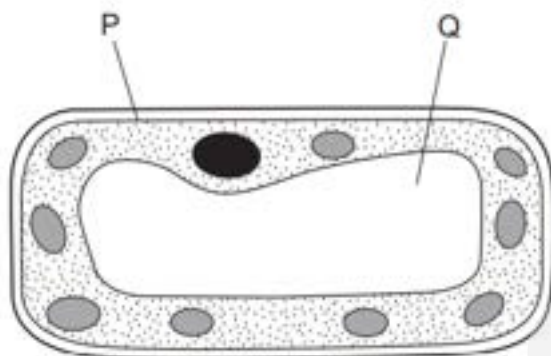


The root hair and the xylem are part of the same

- A cell and organism.
- B cell and tissue.
- C organ and organism.
- D tissue and organ.

Oct/Nov 2013 (11)

6 The diagram shows a cell seen under the light microscope.



Which labels are correct?

| | P | Q |
|----------|---------------|-----------|
| A | cell membrane | cytoplasm |
| B | cell membrane | vacuole |
| C | cell wall | cytoplasm |
| D | cell wall | vacuole |

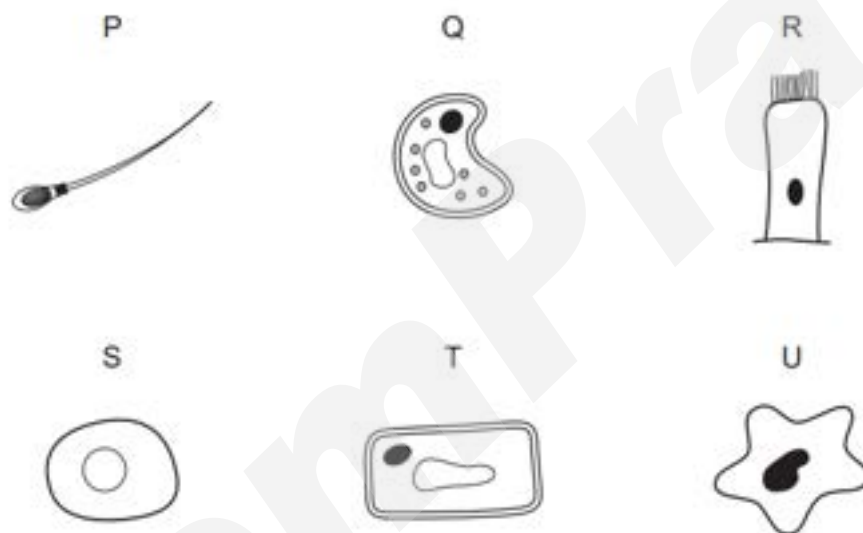
7 Which is a tissue and which is an organ?

| | tissue | organ |
|----------|---------------------------|-------------|
| A | a group of liver cells | xylem |
| B | a group of palisade cells | the stomach |
| C | the brain | a root |
| D | the reproductive system | the liver |

8 Which series of terms is listed in order of increasing level of organisation?

- A cell → organ → tissue → organ system
- B cell → tissue → organ → organ system
- C tissue → cell → organ → organ system
- D tissue → organ → organ system → cell

9 The diagram shows six cells.

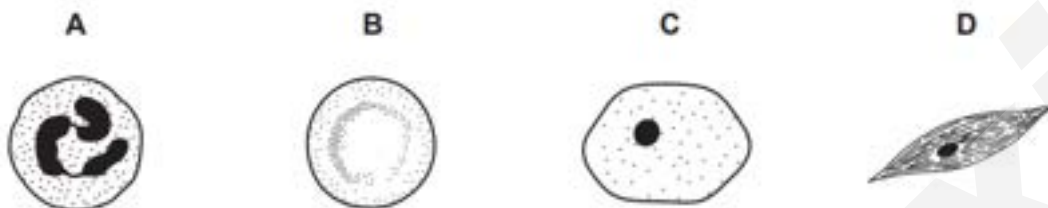


Which are plant cells and which are animal cells?

| | plant cells | animal cells |
|----------|---------------|---------------|
| A | P, Q and U | R, S and T |
| B | P, R, S and T | Q and U |
| C | Q and T | P, R, S and U |
| D | R, S and U | P, Q and T |

Oct/Nov 2013 (13)

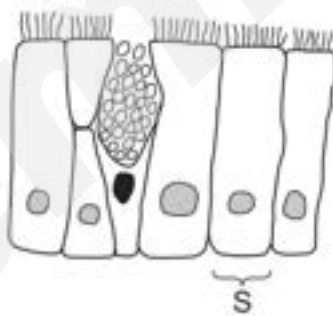
5 Which diagram shows a liver cell?



6 What is a feature of both plant and animal cells?

- A a cell membrane
- B a cell wall
- C a large vacuole
- D chloroplasts

8 The diagram shows structures that form the surface of the trachea.



Which level of organisation is the structure labelled S?

- A cell
- B organ
- C organ system
- D tissue

9 What is a correct description of red blood cells?

| | thin region in the cell centre | large nucleus |
|----------|--------------------------------|---------------|
| A | ✓ | ✓ |
| B | ✓ | x |
| C | x | ✓ |
| D | x | x |

May/June 2014 (11)

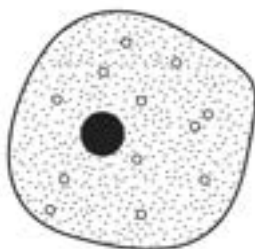
3 Which features do animal cells share with plant cells?

| | chloroplast | cytoplasm | nucleus |
|----------|-------------|-----------|---------|
| A | ✓ | ✓ | ✓ |
| B | ✓ | x | ✓ |
| C | x | ✓ | ✓ |
| D | x | x | x |

5 Which pair of statements about a plant cell is correct?

| | outer surface of the cell | position of sap vacuole |
|----------|---------------------------|-----------------------------|
| A | cell membrane | outside the cytoplasm |
| B | cell membrane | surrounded by the cytoplasm |
| C | cell wall | outside the cytoplasm |
| D | cell wall | surrounded by the cytoplasm |

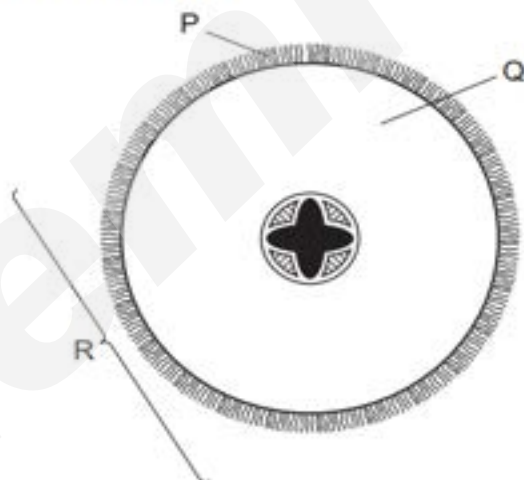
6 The diagram shows a cell.



Which structure is **not** present?

- A cell membrane
- B cell wall
- C cytoplasm
- D nucleus

7 The diagram shows a section through a root.



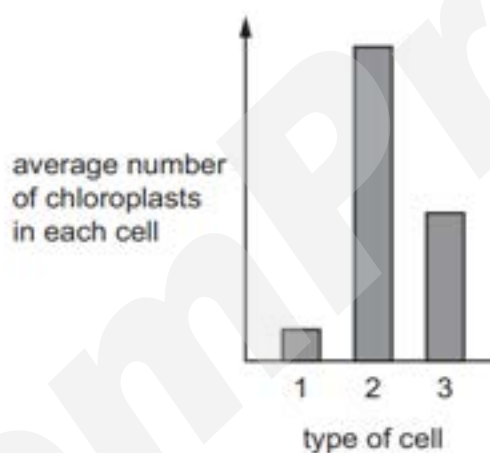
What are the levels of organisation of the labelled structures?

| | cell | organ | tissue |
|----------|------|-------|--------|
| A | P | Q | R |
| B | P | R | Q |
| C | Q | R | P |
| D | R | Q | P |

8 Which structures contain a cell nucleus?

| | red blood cell | root hair cell | xylem vessel | |
|----------|----------------|----------------|--------------|--------------------------------------|
| A | ✓ | ✓ | ✓ | key ✓ = nucleus X = no nucleus |
| B | ✓ | X | X | |
| C | X | ✓ | X | |
| D | X | X | ✓ | |

12 The bar chart shows the average number of chloroplasts in each of three different types of leaf cell.

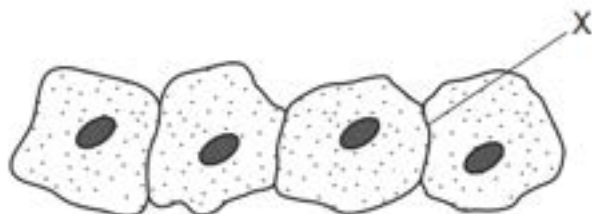


What are the three types of cell?

| | 1 | 2 | 3 |
|----------|-------------------------|-------------------------|-------------------------|
| A | guard cell | palisade mesophyll cell | spongy mesophyll cell |
| B | palisade mesophyll cell | spongy mesophyll cell | guard cell |
| C | spongy mesophyll cell | guard cell | palisade mesophyll cell |
| D | spongy mesophyll cell | palisade mesophyll cell | guard cell |

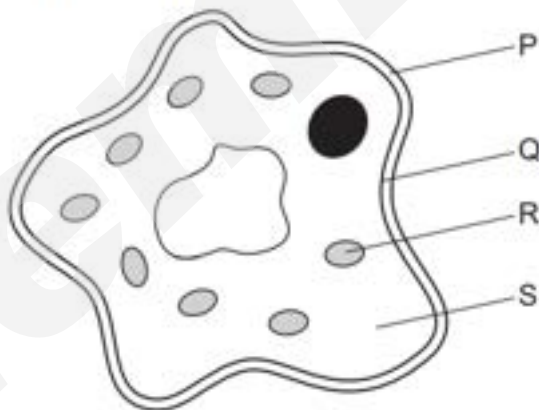
May/June 2014 (12)

- 3 The diagram shows some animal cells, as seen under the microscope.



What will be present at X?

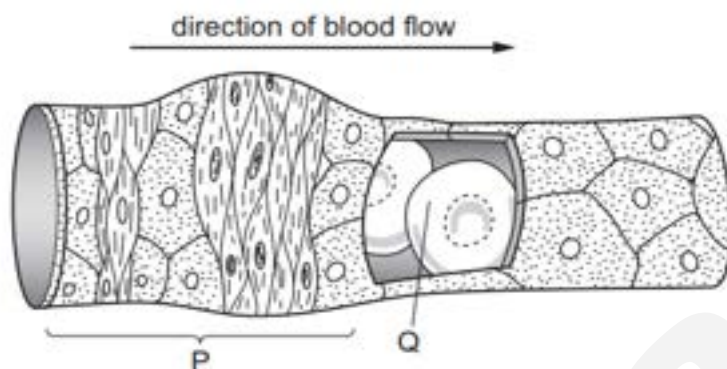
- A one cell membrane
 - B one cell wall
 - C two cell membranes
 - D two cell walls
- 5 The diagram shows a spongy mesophyll cell.



Which structures indicate that this is a plant cell?

- A P and S
- B Q and R
- C R and P
- D S and Q

- 7 The diagram shows blood passing through an arteriole into a capillary. Part of the capillary wall has been cut away to show the blood.

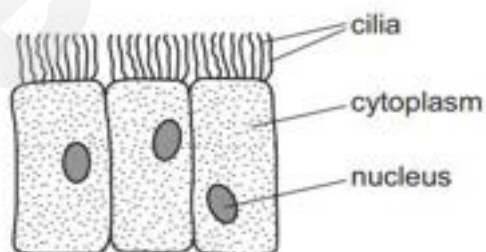


What is the level of organisation of the structures labelled P and Q?

| | P | Q |
|----------|--------|--------|
| A | organ | cell |
| B | organ | tissue |
| C | tissue | cell |
| D | tissue | tissue |

Oct/Nov 2014 (11)

- 4 The diagram shows some cells.



Where are these cells found?

- A** alimentary canal
- B** blood
- C** bronchial wall
- D** plant roots

5 Which features are possessed by **all** plant cells?

| | a cell wall | chloroplasts |
|----------|-------------|--------------|
| A | ✓ | ✓ |
| B | ✓ | x |
| C | x | ✓ |
| D | x | x |

6 For which process is a root hair cell adapted?

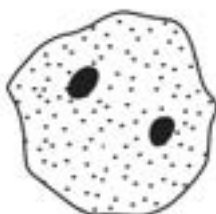
- A** absorption of mineral ions
- B** support of stem
- C** translocation of sucrose
- D** transport of oxygen

7 Which processes produce a continuous space for the flow of water in xylem vessels?

| | break down of the cell walls between adjacent cells | removal of the cytoplasm in each cell |
|----------|-----------------------------------------------------|---------------------------------------|
| A | yes | yes |
| B | yes | no |
| C | no | yes |
| D | no | no |

Oct/Nov 2014 (13)

5 The diagram shows a liver cell.



In which way does this cell differ from a typical animal cell?

- A It has a cell membrane.
- B It has no vacuole.
- C It has no cell wall.
- D It has two nuclei.

6 Which row shows the main tissue and organ involved in the process?

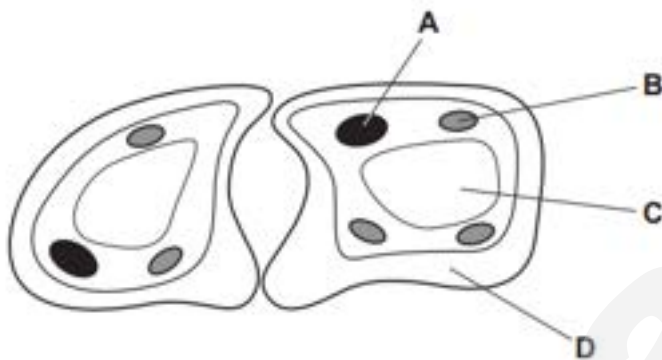
| | process | tissue | organ |
|----------|--------------------------|-----------|-------|
| A | excretion in humans | nerve | brain |
| B | nutrition in humans | platelets | veins |
| C | photosynthesis in plants | mesophyll | leaf |
| D | translocation in plants | epidermis | stem |

7 Which structure is **not** an organ?

- A artery
- B flower
- C spinal cord
- D xylem

5 The diagram shows two guard cells from a leaf.

Which labelled part would also be found in liver cells?



6 The diagram shows part of a leaf in cross-section.



Structures X and Y are both part of the same

- A cell.
- B organ.
- C tissue.
- D vessel.

7 The diagram shows a plant cell.



Which features show that it is a plant cell?

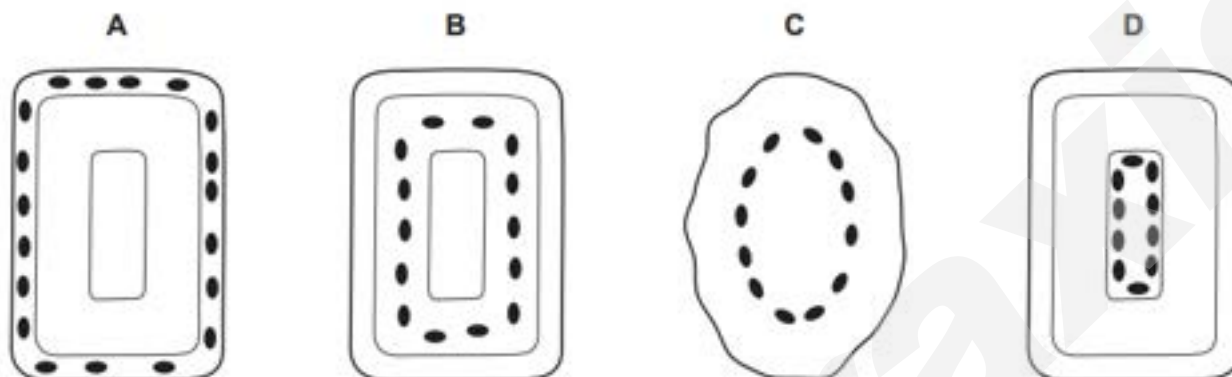
- A It has a cell wall and a vacuole.
 - B It has a nucleus and cytoplasm.
 - C It has a nucleus but no chloroplasts.
 - D It has chloroplasts but no vacuole.
- 8 In a section through a plant, a student found a group of long, microscopic structures. The structures lacked end walls, cytoplasm and nuclei.

Which identification and reason best matches the student's observations?

| | identification | reason |
|----------|-----------------|-----------------------------------------------------|
| A | root hair cells | they do not contain a nucleus when mature |
| B | root hair cells | they do not contain cytoplasm to absorb water |
| C | xylem vessels | they can support the plant better without cytoplasm |
| D | xylem vessels | they need to be hollow to carry water efficiently |

May/June 2015 (12)

5 Which diagram shows chloroplasts in their correct position in a plant cell?



7 Which is **not** an organ?

- A blood
- B heart
- C tooth
- D vein

8 What results from the destruction of cilia in the trachea due to smoking?

- A Cilia cannot filter bacteria.
- B Cilia cannot trap dust.
- C Mucus cannot be manufactured.
- D Mucus cannot be carried towards the throat.

May/June 2015 (13)

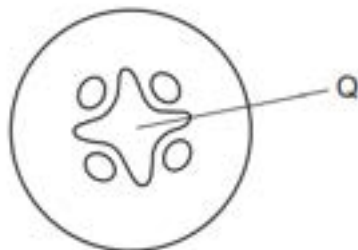
- 6 The cell shown in the diagram has been magnified 3000 times. The diagram is 21 mm wide.



What is the actual diameter of the cell?

- A 21 mm
- B $\frac{21}{3000}$ mm
- C 21 x 3000 mm
- D $\frac{3000}{21}$ mm
- 7 Xylem is an example of
- A a cell.
- B a tissue.
- C an organ.
- D an organ system.

8 The diagram shows a cross-section through a plant root.



Q shows the part that is stained red when the root is placed in water containing a red dye.

What is found at Q?

- A guard cells
- B palisade cells
- C phloem
- D xylem

Oct/Nov 2015 (11)

5 Three cell structures are listed.

- 1 cell wall
- 2 cytoplasm
- 3 nucleus

Which structures are found in palisade cells **and** in liver cells?

- A 1 and 2 B 1 only C 2 and 3 D 3 only

6 The diagram shows two plant cells, P and Q.



How does cell P differ from cell Q?

- A It has no cell wall.
 - B It has no chloroplasts.
 - C It has no nucleus.
 - D It has no vacuole.
- 7 The diagram shows different types of cells.



Which structure do all these cells have?

- A cell membrane
- B cell wall
- C chloroplast
- D nucleus

8 The diagram shows a male gamete.

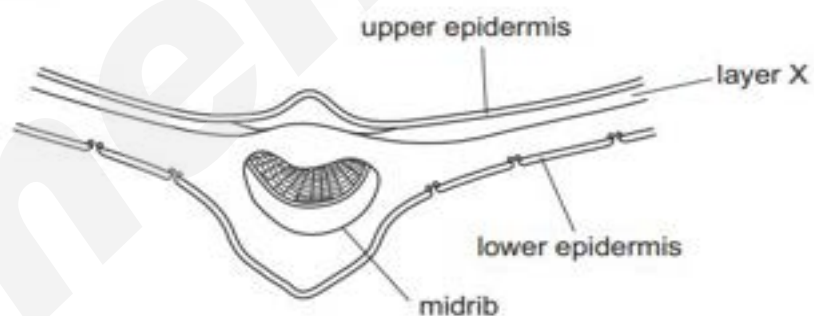


Which term describes the level of organisation of this gamete?

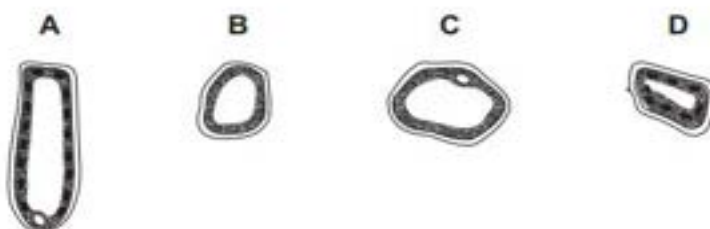
- A cell
 - B organ
 - C organism
 - D tissue
- 9 Which description of xylem is correct?
- A a cell used for absorption
 - B a tissue used for support
 - C an organ system used for conduction
 - D an organ used for transport

Oct/Nov 2015 (12)

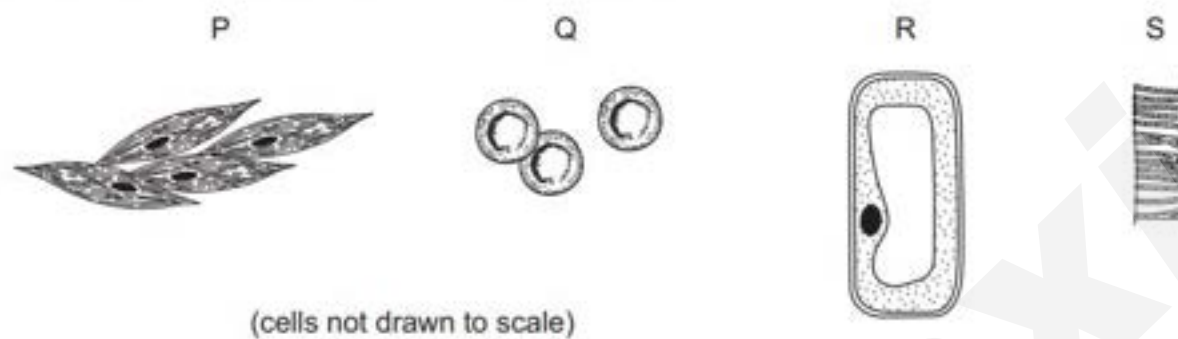
4 The diagram shows a cross-section of part of a leaf.



Which type of cell is found in layer X?



7 The diagram shows structures taken from two different organisms.



Which structures have the main function of transport?

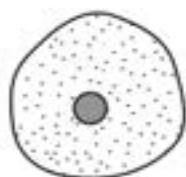
- A P and R B P and S C Q and R D Q and S

8 At which level of organisation is a root?

- A organ
B organ system
C organism
D tissue

Oct/Nov 2015 (13)

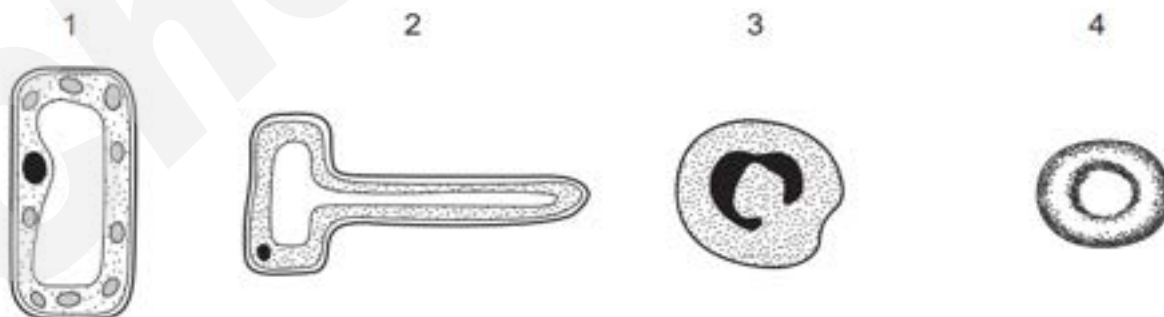
5 The diagram shows a liver cell.



Which features are present in this cell and also in most plant cells?

- A cell membrane and cytoplasm
 - B cell membrane and sap vacuole
 - C cell wall and cytoplasm
 - D cell wall and sap vacuole
- 7 Which description of the heart is correct?
- A The heart is an organ, containing several systems, which forms part of the circulatory tissue.
 - B The heart is an organ, containing several tissues, which forms part of the circulatory system.
 - C The heart is a system, containing several organs, which forms part of the circulatory tissue.
 - D The heart is a system, containing several tissues, which forms part of the circulatory organ.

8 The diagram shows four cells.



Which two cells contain cellulose and a vacuole?

- A 1 and 2
- B 1 and 4
- C 2 and 3
- D 2 and 4