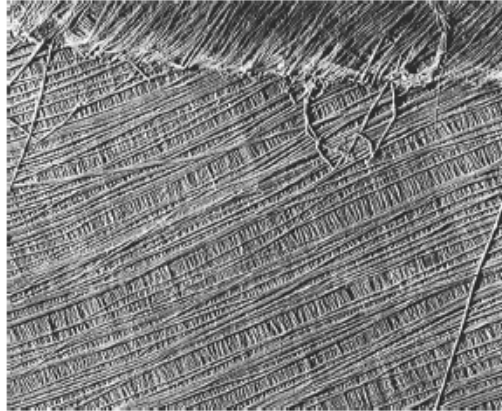


Properties of Plants - Questions by Topic

Q1.

The photograph below shows part of a cellulose cell wall, as seen using an electron microscope.



© Biophoto Associates/Science Photo Library

Magnification $\times 70\,000$

Using the information in the photograph and your own knowledge, describe the structure of a cellulose cell wall.

(3)

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Q2.

Animal cells are eukaryotic.

(a) Name **three** structures that are present in prokaryotic cells but absent in animal cells.

(3)

1

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2

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3

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(b)

Eukaryotic cells contain membrane-bound organelles.

The table below lists some organelles and the types of membrane associated with them.

Place a cross (☒) in the box that correctly relates to the type of membrane associated with each organelle.

(4)

| Organelle | Single membrane | Double membrane |
|-----------------|--------------------------|--------------------------|
| nucleus | <input type="checkbox"/> | <input type="checkbox"/> |
| Golgi apparatus | <input type="checkbox"/> | <input type="checkbox"/> |
| mitochondrion | <input type="checkbox"/> | <input type="checkbox"/> |
| lysosome | <input type="checkbox"/> | <input type="checkbox"/> |

(Total for question = 7 marks)

Q3.

Plant cell walls contain cellulose. Cellulose molecules are polymers.

(i) Name the monomer that makes up cellulose

(1)

.....

(ii) Which of the following correctly describes how these monomers are held together in a cellulose molecule?

(1)

- A by glycosidic bonds in a branched chain
- B by glycosidic bonds in an unbranched chain
- C by hydrogen bonds in a branched chain
- D by hydrogen bonds in an unbranched chain

(iii) Cellulose molecules are held together in bundles called microfibrils.

These microfibrils are embedded in a matrix containing calcium pectate.

Calcium pectate can be found in the

(1)

- A amyloplast
- B chloroplast
- C middle lamella
- D tonoplast

(Total for question = 3 marks)

Q4.

Plant cells contain structures called amyloplasts.

Amyloplasts

(1)

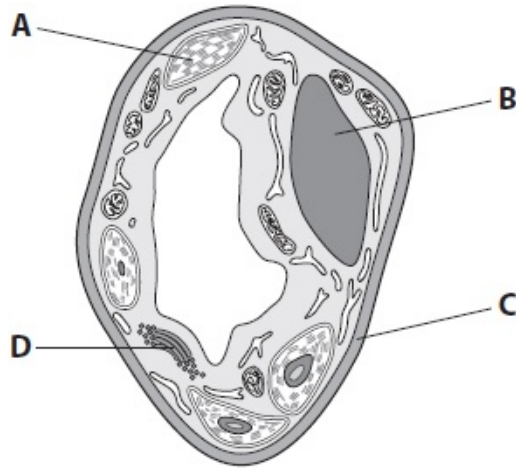
- A allow fluid exchange
- B consist mainly of pectin
- C are membranes surrounding the vacuole
- D store starch granules

(Total for question = 1 mark)

Q5.

Plant cells are organised into tissues, organs and systems.

(a) The diagram below shows a plant cell, as seen using an electron microscope.



For each of the following questions, place a cross (☒) in the box that identifies the structure.

(i) The structure that modifies protein into glycoprotein is

(1)

A ☒ B ☒ C ☒ D ☒

(ii) The structure, other than the nucleus, that contains DNA is

(1)

A ☒ B ☒ C ☒ D ☒

(iii) The structure that would **not** be present in the anaphase stage of mitosis is

A ☒ B ☒ C ☒ D ☒

(1)

(b) Plants contain xylem tis

(i) Explain what is meant by the te **tissue**.

(2)

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(ii) Describe the functions of xylem.

(2)

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* (c) Plant cells may contain cellulose.

Describe the structure of a cellulose microfibril.

(4)

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(Total for question = 11 marks)

Q6.

The concentration of magnesium ions in the soil was found to be very low.

Explain the effects of a shortage of magnesium ions on a plant.

(3)

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(Total for question = 3 marks)

Q7.

Svalbard Global Seed Vault (SGSV) is a seed bank. It keeps seeds from almost 4000 species of plants, focussing on food crops such as wheat, rice and maize.

Many seeds in SGSV store food in the form of starch.

(i) Why does the food store in seeds contain starch rather than cellulose?

(1)

- A** starch can be stored for longer because it has 1-4 bonds
- B** starch has more mineral ions than cellulose
- C** starch is branched and supplies energy more quickly than cellulose
- D** starch is more compact than cellulose because it has 1-6 bonds

(ii) Explain why starch must be broken down before it can be used by the cells of the gro plant.

(2)

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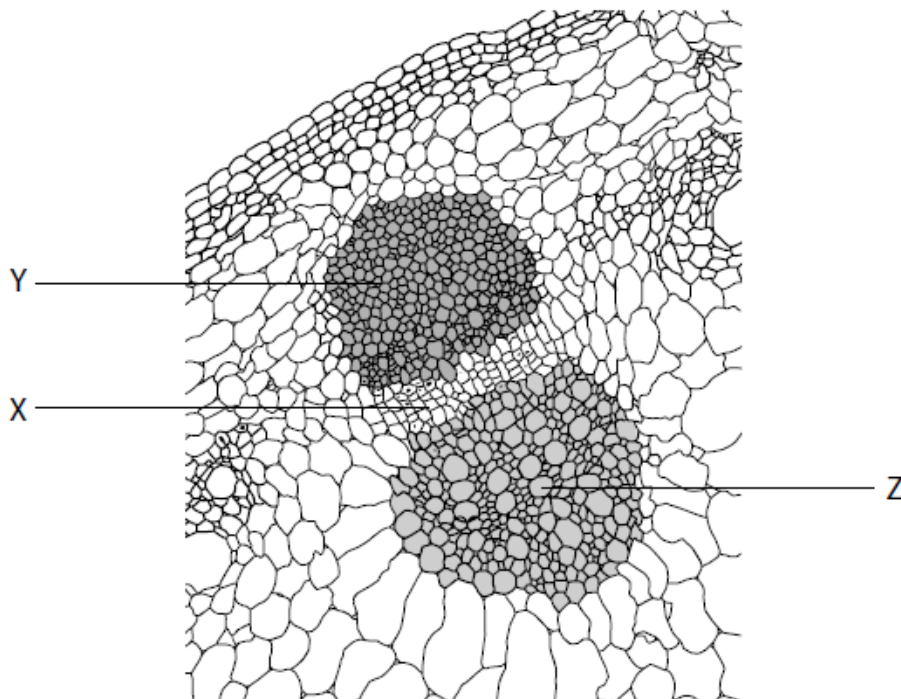
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(Total for question = 3 marks)

Q8.

The diagram below shows a cross section through part of a sunflower stem.



(i) Which row shows the correct names for tissues X, Y and Z?

(1)

| | Tissue X | Tissue Y | Tissue Z |
|----------------------------|--------------|--------------|--------------|
| <input type="checkbox"/> A | sclerenchyma | xylem | phloem |
| <input type="checkbox"/> B | phloem | sclerenchyma | xylem |
| <input type="checkbox"/> C | phloem | xylem | sclerenchyma |
| <input type="checkbox"/> D | xylem | sclerenchyma | phloem |

(ii) Which row shows the correct function for tissues X, Y and Z?

(1)

| | Tissue X | Tissue Y | Tissue Z |
|----------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| <input type="checkbox"/> A | transports water and mineral ions | provides mechanical support | translocates organic solutes |
| <input type="checkbox"/> B | provides mechanical support | translocates organic solutes | transports water and mineral ions |
| <input type="checkbox"/> C | translocates organic solutes | provides mechanical support | transports water and mineral ions |
| <input type="checkbox"/> D | translocates organic solutes | transports water and mineral ions | provides mechanical support |

(Total for question = 2 marks)