

Answer ALL questions in the spaces provided.

1. The table below compares the features of typical plant, animal and bacterial cells. Complete the table by placing a tick (✓) in the appropriate box if the feature is usually present or a cross (✗) if the feature is usually absent.

Do not leave any boxes empty.

The first line has been done for you.

	Plant (eukaryotic) cell	Animal (eukaryotic) cell	Bacterial (prokaryotic) cell
Cell wall	✓	✗	✓
Chloroplasts			
Nuclear membrane			
Cell (unit) membrane			
Ribosomes			
Centrioles			

(Total 5 marks)

Q1



3. (a) Identify the organelles (structures inside a cell) which fit the descriptions given in the table below. The first one has been done for you.

	Description	Name of organelle
i	Where photosynthesis takes place and carbon dioxide is converted into sugar	<i>chloroplast</i>
ii	Where aerobic respiration takes place	
iii	Where amino acids are joined together to form proteins	
iv	Packages proteins into vesicles so that they can be released from the cell by exocytosis	
v	A large space inside a plant cell surrounded by a tonoplast and helping to maintain cell turgidity	
vi	Divides and organises a spindle in an animal cell as it starts to undergo mitosis	

(5)

- (b) Describe the structure of pits in plant cells and explain their function.

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(2)

- (c) Give **two** ways in which the structure of a prokaryotic cell differs from a eukaryotic cell.

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(2)

(Total 9 marks)

Q3



Answer ALL questions.

Some questions must be answered with a cross ☐. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☐.

1 A white blood cell is an example of a typical eukaryotic animal cell.

(a) Place a cross ☐ in the box next to the correct word or words to complete each of the following statements.

(i) In eukaryotic cells, two organelles with a double membrane are

(1)

- ☐ **A** the nucleus and smooth endoplasmic reticulum
- ☐ **B** a nucleus and a mitochondrion
- ☐ **C** a mitochondrion and a ribosome
- ☐ **D** a mitochondrion and smooth endoplasmic reticulum

(ii) White blood cells, plant cells and prokaryotic cells all contain

(1)

- ☐ **A** a nucleus
- ☐ **B** Golgi apparatus
- ☐ **C** ribosomes
- ☐ **D** smooth endoplasmic reticulum

(iii) A structure present in prokaryotic cells but not present in a white blood cell is

(1)

- ☐ **A** a cell wall
- ☐ **B** a centriole
- ☐ **C** a ribosome
- ☐ **D** rough endoplasmic reticulum



(b) There are several types of stem cell found in humans.

The table below shows some features of two types of stem cell. If the feature applies to the stem cell place a tick (✓) in the box and if it does not apply, place a cross (✗) in the box.

(2)

Features	Totipotent stem cell	Pluripotent stem cell
Can give rise to totipotent stem cells		
Can give rise to differentiated cells		

*(c) Human bone marrow contains stem cells that can give rise to various types of blood cell including white blood cells.
Suggest how a stem cell in the bone marrow can become a differentiated blood cell.

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(Total for Question 1 = 9 marks)



Answer ALL questions.

Some questions must be answered with a cross ☐ in a box. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☐.

1 All organisms are made up of one or more cells.

(a) For each of the descriptions below, put a cross ☐ in the box that corresponds to the correct statement about the features of animal, plant and prokaryotic cells.

(6)

(i) Genetic material is

- ☐ **A** separate strands in animal and prokaryotic cells
- ☐ **B** separate strands in animal and plant cells
- ☐ **C** circular in animal and prokaryotic cells
- ☐ **D** circular in animal and plant cells

(ii) Centrioles are present in

- ☐ **A** plant cells only
- ☐ **B** animal cells only
- ☐ **C** prokaryotic cells only
- ☐ **D** animal, plant and prokaryotic cells

(iii) The cell surface membrane is present in

- ☐ **A** plant cells only
- ☐ **B** animal cells only
- ☐ **C** prokaryotic cells only
- ☐ **D** animal, plant and prokaryotic cells

(iv) Pits are found in the cell walls of

- ☐ **A** plant cells only
- ☐ **B** prokaryotic cells only
- ☐ **C** plant and prokaryotic cells
- ☐ **D** animal, plant and prokaryotic cells



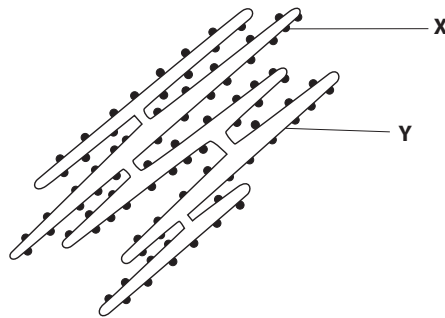
(v) The tonoplast may be present in

- ☐ A plant cells only
- ☐ B prokaryotic cells only
- ☐ C plant and prokaryotic cells
- ☐ D animal, plant and prokaryotic cells

(vi) Cell walls are found in

- ☐ A plant cells only
- ☐ B prokaryotic cells only
- ☐ C plant and prokaryotic cells
- ☐ D animal, plant and prokaryotic cells

(b) The diagram below shows a structure found in the cytoplasm of both plant and animal cells, as seen using an electron microscope.



(i) Name the structure shown in the diagram.

(1)

(ii) Name the parts labelled X and Y.

(2)

X

Y

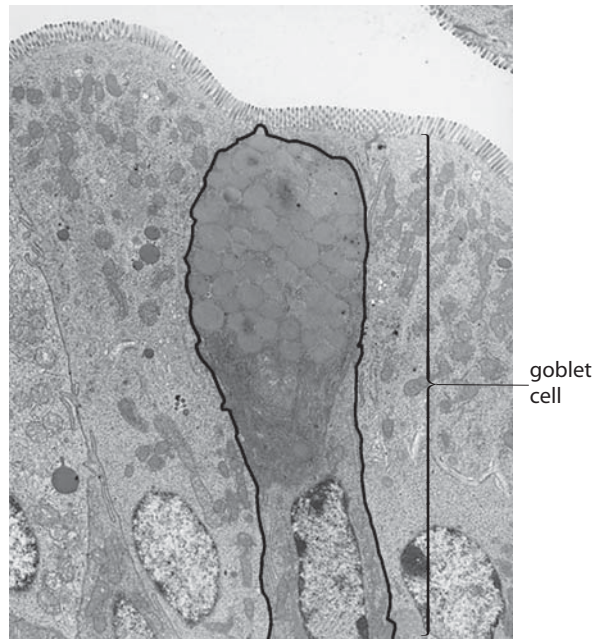
(Total for Question 1 = 9 marks)



Answer ALL questions.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

- 1 The photograph below shows some human epithelial tissue, as seen using an electron microscope. The tissue includes a goblet cell which contains a large number of Golgi apparatus.



magnification $\times 5000$

- (a) Explain the meaning of the term **tissue**.

(2)

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(b) The Golgi apparatus of a goblet cell is involved in receiving protein, modifying it and then packaging the modified protein into vesicles.

- (i) In the space below, draw a diagram of a Golgi apparatus. Add an arrow to your drawing to show the direction of movement of the protein material as it moves through the Golgi apparatus.

(3)

- (ii) Proteins in a cell can be made radioactive by supplying the cell with radioactive amino acids. The movement of the radioactive protein within the cell can be traced over time.

In an investigation, it was found that the quantity of radioactivity in the protein that entered the Golgi apparatus was less than that supplied to the cell.

Suggest **three** reasons for this difference.

(3)

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(Total for Question 1 = 8 marks)



N 3 4 4 0 9 A 0 3 2 0