Cell Structure

Question Paper

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Biology
Exam Board	AQA
Topic	4.1 Cell Biology
Sub-Topic	Cell Structure
Difficulty Level	Bronze Level
Booklet	Question Paper

Time Allowed: **56 minutes**

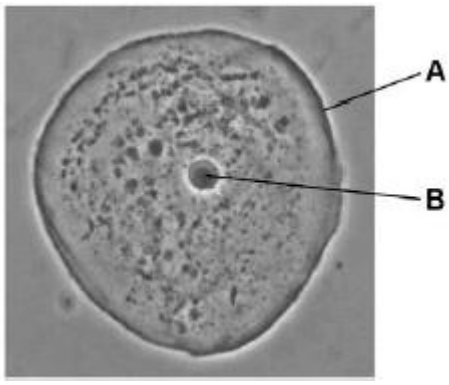
Score: **/54**

Percentage: **/100**

Grade Boundaries:

Q1.Figure 1 shows an animal cell.

Figure 1



(a) What is structure **A**?

Tick **one** box.

- Cell membrane ☐
- Cell wall ☐
- Chromosome ☐
- Cytoplasm ☐

(1)

(b) What is structure **B**?

Tick **one** box.

- Chloroplast ☐
- Mitochondria ☐

Nucleus ☐

Vacuole ☐

(1)

(c) **Figure 2** shows a sperm cell.

Figure 2

Describe how a sperm cell is adapted to carry out its function.

.....

.....

(1)

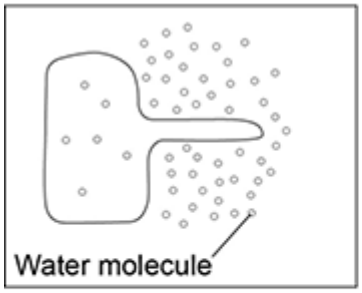
(d) Substances can move into and out of cells by three processes.

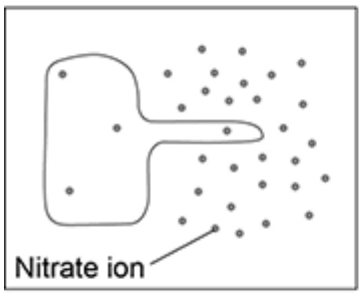
The diagrams show the concentration of different substances inside and outside a root hair cell.

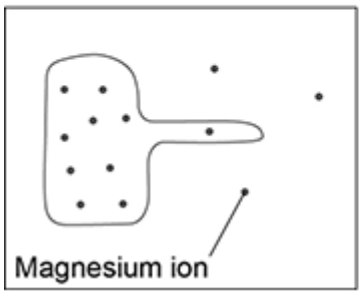
How would each substance move into the root hair cell?

Draw **one** line from each root hair cell to the correct process.

Root hair cell	**Process**







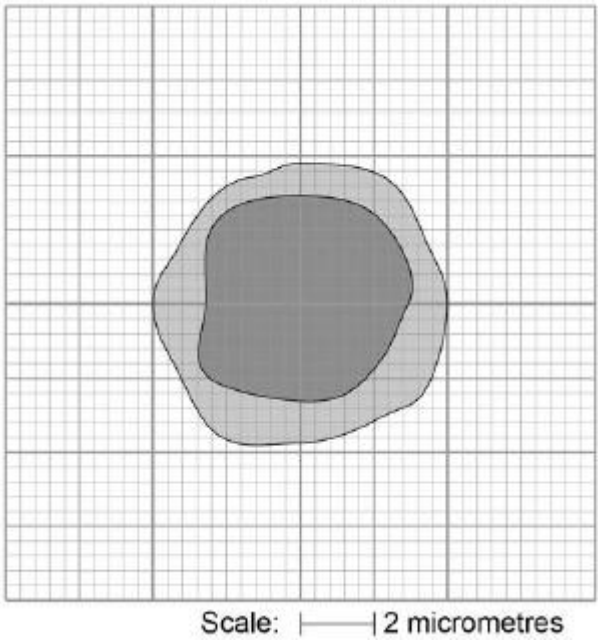
Active transport

Diffusion

Osmosis

(2)
(Total 5 marks)

Q2. The figure below shows a scale drawing of one type of cell in blood.



(a) Use the scale to determine the width of the cell.

Give your answer to the nearest micrometre.

.....

.....

Width of cell = ... micrometres

(1)

(b) Complete the table below.

Part of the blood	Function
	Carries oxygen around the body
	Protects the body against infection
Plasma	

(3)

(c) Platelets are fragments of cells.

Platelets help the blood to clot.

Suggest what might happen if the blood did **not** clot.

.....

.....

(1)

(Total 5 marks)

Q3. Pathogens cause infectious diseases in animals and plants.

(a) Draw **one** line from each disease to the type of pathogen that causes the disease.

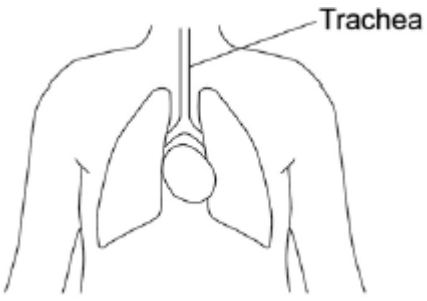
Disease	Type of pathogen
Gonorrhoea	Bacterium
Malaria	Fungus
Measles	Protist
	Virus

(3)

(b) Some parts of the human body have adaptations to reduce the entry of live pathogens.

Look at **Figure 1**.

Figure 1



Explain how the trachea is adapted to reduce the entry of live pathogens.

.....

.....

.....

.....

.....

.....

.....

.....

.....

(4)

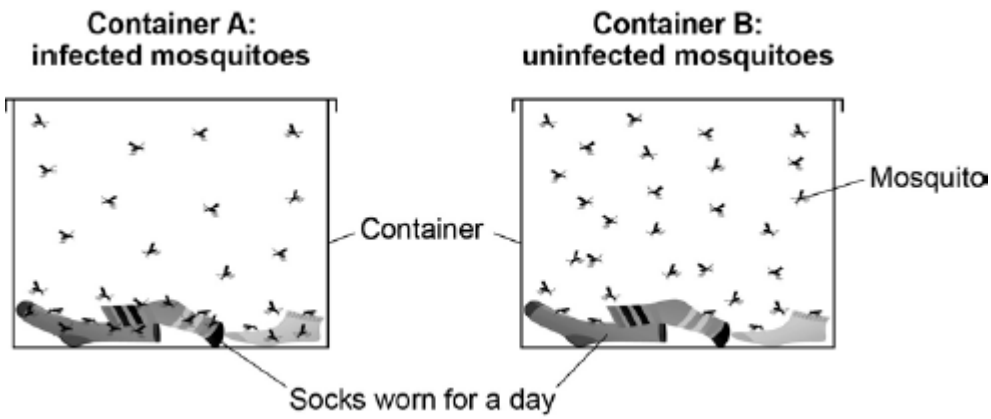
(c) Malaria is a serious disease that can be fatal.

Malaria is spread to humans by infected mosquitoes.

Scientists investigated the behaviour of mosquitoes to understand how the spread of malaria could be controlled.

Figure 2 shows the equipment the scientists used.

Figure 2



This is the method used.

1. 30 mosquitoes **infected with malaria** were placed in Container **A**.
2. 30 **uninfected** mosquitoes were placed in Container **B**.
3. The total number of times the mosquitoes landed on the socks was recorded.

Name the dependent variable and suggest **one** control variable in this investigation.

Dependent variable .....

.....

Control variable .....

.....

(2)

(d) Infected mosquitoes landed on the socks three times more often than uninfected mosquitoes.

Explain how this information can be used to reduce the spread of malaria.

.....

.....

.....

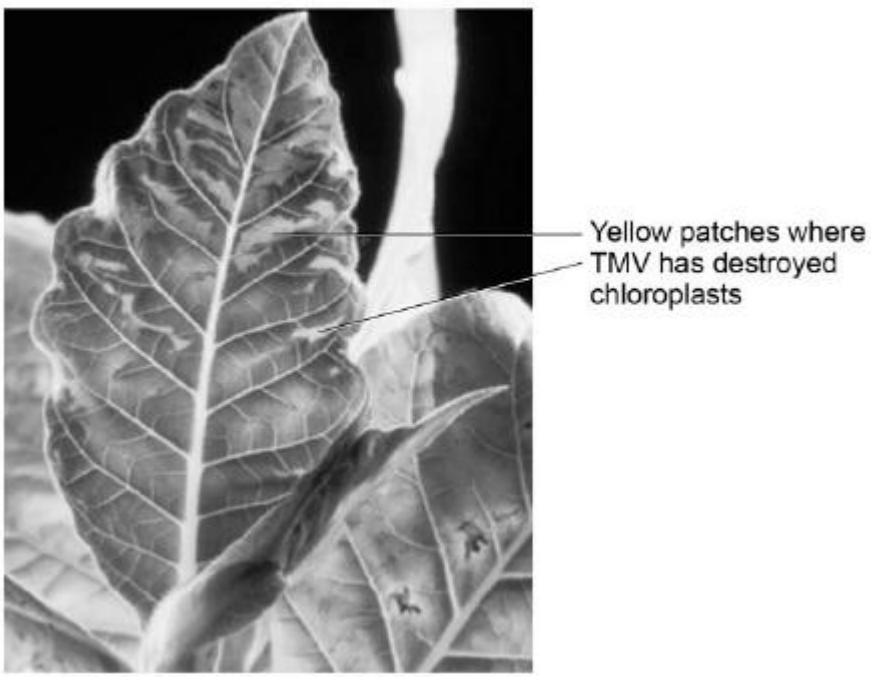
.....

(2)

(e) Tobacco mosaic virus (TMV) affects many species of plant.

Figure 3 shows a leaf infected with TMV.

Figure 3



TMV destroys chloroplasts in the leaf.

Explain how this could affect the growth of the plant.

.....

.....

.....

.....

.....

.....

(3)
(Total 14 marks)

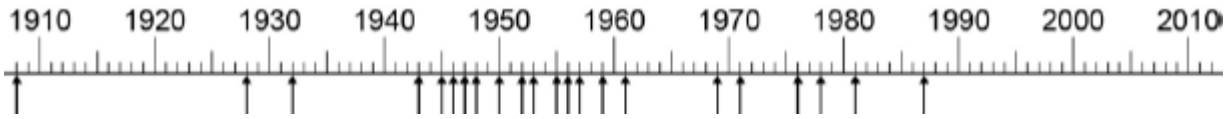
Q4.(a) Some antibiotics work by destroying the cell membranes of bacteria.

Suggest why these antibiotics may have side effects in the animals that are given these antibiotics.

.....

(1)

(b) Each arrow on the figure below shows the date of discovery of each new type of antibiotic.



In which 10 year period were most new types of antibiotic discovered?

.....

(1)

(c) The figure above shows 22 new types of antibiotic. These were discovered before 2010.

Determine the percentage of types of antibiotic that have been discovered between 1980 and 2010.

Use information from the figure above.

Give your answer to 2 significant figures.

.....

.....

..... %

(2)

(d) Bacteria can evolve rapidly.

Many bacteria can develop into new strains which are resistant to antibiotics.

Complete the table below to show if each action is **more likely** or **less likely** to help bacteria to become antibiotic resistant.

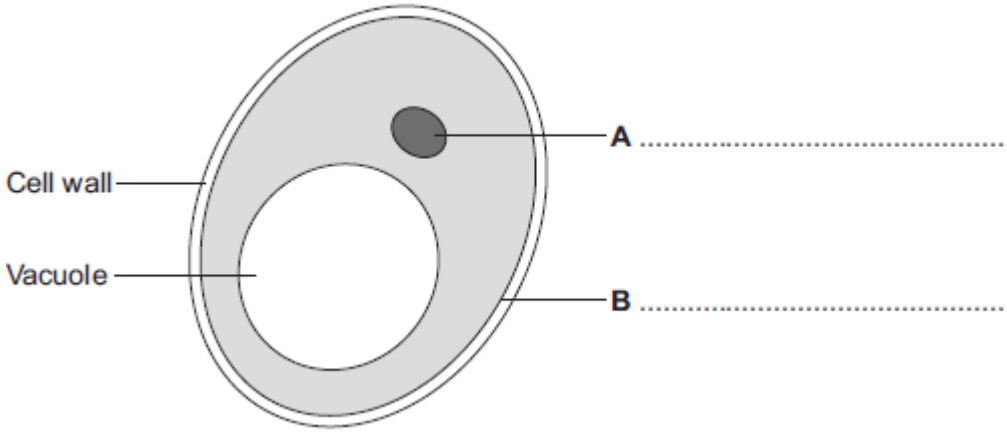
Put a tick in each row.

Action	More likely	Less likely
Take painkillers for headache		
Washing with antiseptic hand gel		
Adding antibiotics to food for cows		
Giving antibiotics for colds and flu		
Stopping antibiotics as soon as you feel better		

(4)
(Total 8 marks)

Q5. Human cells and yeast cells have some parts that are the same.

(a) The diagram shows a yeast cell.



Parts **A** and **B** are found in human cells and in yeast cells. On the diagram, label parts **A** and **B**.

(2)

(b) Many types of cell can divide to form new cells.

Some cells in human skin can divide to make new skin cells.

Why do human skin cells need to divide?

.....

.....

(1)

(c) Human stem cells can develop into many different types of human cell.

(i) Use the correct answer from the box to complete the sentence.

embryos	**hair**	**nerve cells**

Human stem cells may come from

.....

(1)

(ii) Use the correct answer from the box to complete the sentence.

cystic fibrosis	**paralysis**	**polydactyly**

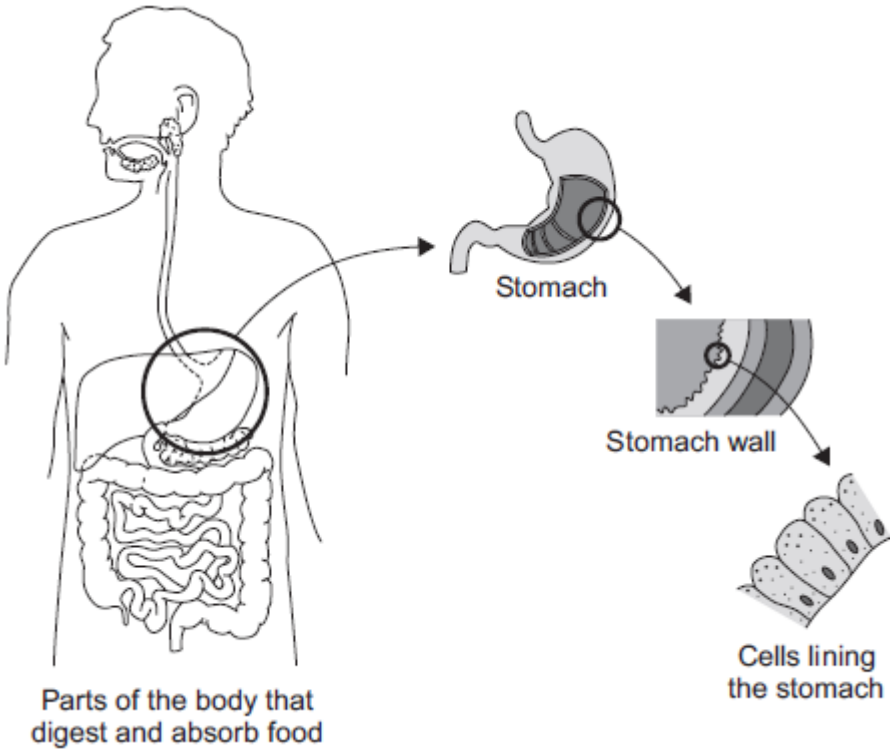
Human stem cells can be used to treat

.....

(1)
(Total 5 marks)

Q6. The diagram below shows the parts of the body that digest and absorb food.

It also shows some details about the structure of the stomach.



(a) Complete the table to show whether each structure is an organ, an organ system or a tissue.

For each structure, tick (✓) **one** box.

Structure	Organ	Organ system	Tissue
Stomach			
Cells lining the stomach			
Mouth, oesophagus, stomach, liver, pancreas, small and large intestine			

(2)

(b) (i) The blood going to the stomach has a high concentration of oxygen. The cells lining the stomach have a low concentration of oxygen.

Complete the following sentence.

Oxygen moves from the blood to the cells lining the stomach by

the process of ..... .

(1)

(ii) What other substance must move from the blood to the cells lining the stomach so that respiration can take place?

Draw a ring around the correct answer.

glucose **protein** **starch**

(1)

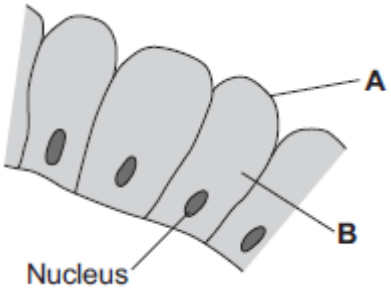
(iii) In which part of a cell does aerobic respiration take place?

Draw a ring around the correct answer.

cell membrane **mitochondria** **nucleus**

(1)
(Total 5 marks)

Q7. The image below shows some cells in the lining of the stomach.



(a) (i) Use words from the box to name structures **A** and **B**.

cell membrane	**chloroplast**	**cytoplasm**	**vacuole**

A .....

B .....

(2)

(ii) What is the function of the nucleus?

Tick (✓) **one** box.

To control the activities of the cell ☐

To control movement of substances into and out of the cell ☐

To release energy in respiration ☐

(1)

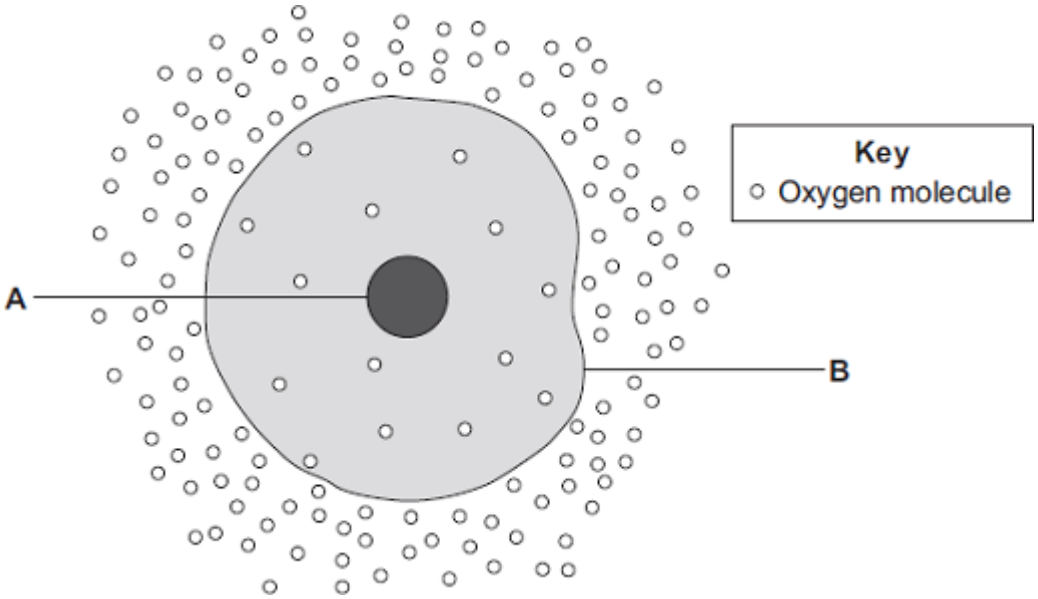
(b) Draw **one** line from each part of the human body to its correct scientific name.

Part of human body	**Scientific name**
	An organ
Layer of cells lining the stomach	
	An organism
Stomach	

Mouth, stomach, intestines, liver and pancreas	An organ system
	A tissue

(3)
(Total 6 marks)

Q8. The diagram shows a cell.



(a) (i) Use words from the box to name the structures labelled **A** and **B** .

cell membrane	chloroplast	cytoplasm	nucleus

A .....

B .....

(2)

(ii) The cell in the diagram is an animal cell.

How can you tell it is an animal cell and **not** a plant cell?

Give **two** reasons.

1 .....

.....

2 .....

.....

(2)

(b) Oxygen will diffuse into the cell in the diagram.

Why?

Use information from the diagram.

.....

.....

(1)

(c) The cell shown in the diagram is usually found with similar cells.

Draw a ring around the correct answer to complete the sentence.

Scientists call a group of similar cells

an organ.

a system.

a tissue.

(1)
(Total 6 marks)