AQA GCSE BIOLOGY (HIGHER) · 8461

BIOLOGY



EXAM QUESTION PACK

4.2.1 PRINCIPLES OF ORGANISATION

SCORE	PERCENTAGE
/62	%

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Q1.

Plants are made up of cells, tissues and organs.

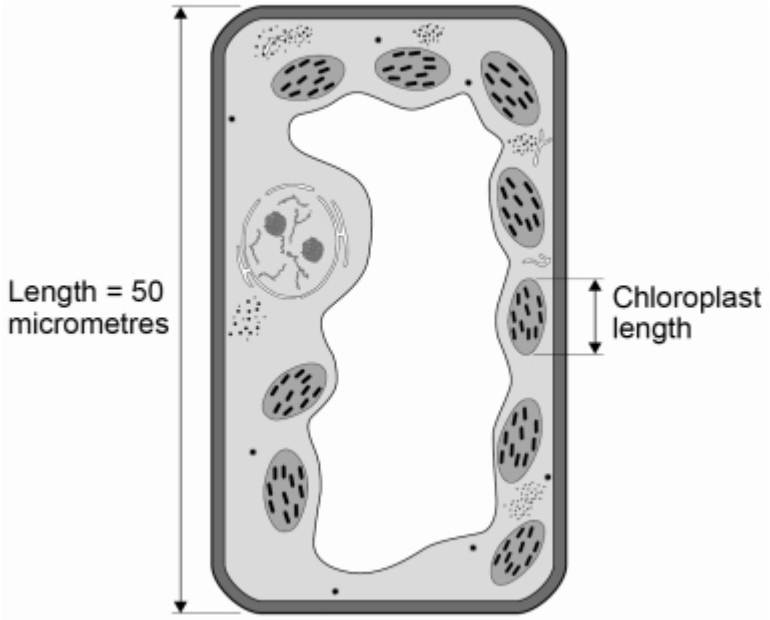
(a) Draw **one** line from each level of organisation to the correct plant part.

Level of organisation	Plant part
	Leaf
Organ	Root hair
	Spongy mesophyll
Tissue	Vacuole
	Xylem

(2)

Figure 1 shows a plant cell drawn to scale.

Figure 1



(b) Where in a plant would the cell in **Figure 1** be found?

Tick **one** box.

Epidermis ☐

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Palisade mesophyll ☐

Phloem ☐

Xylem ☐

(1)

(c) Calculate the length of the chloroplast labelled in **Figure 1**.

_____

_____

_____

_____

Length = _____ micrometres

(2)

(d) Cells in plant roots do **not** photosynthesise.

Give **one** reason why.

_____

_____

(1)

(e) As a plant grows, new root hair cells are formed from unspecialised cells.

How does an unspecialised cell become a new root hair cell?

Tick **one** box.

Differentiation ☐

Metabolism ☐

Transpiration ☐

Transport ☐

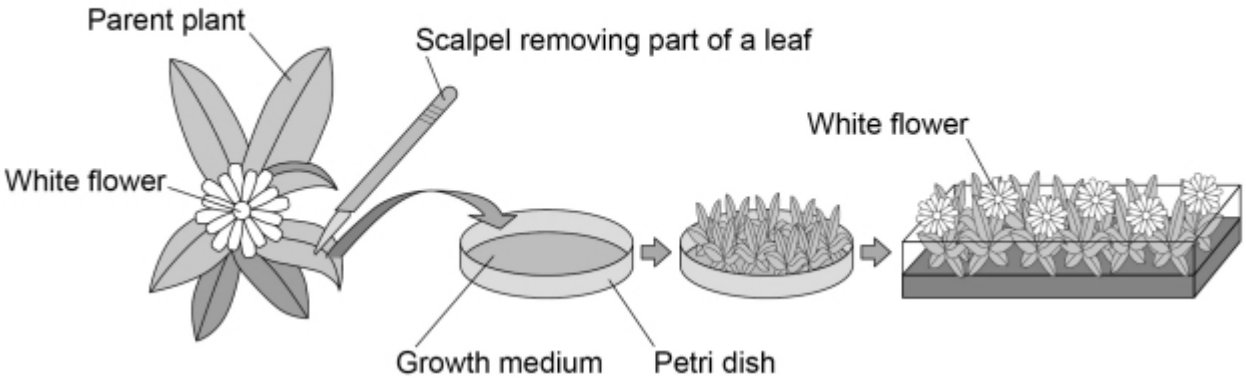
(1)

Scientists can clone plants using tissue culture.

Figure 2 shows the process of tissue culture.

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Figure 2



(f) Why might scientists want to clone plants?

Tick **one** box.

To create new species of plants. ☐

To introduce variation into plants. ☐

To protect endangered plants from extinction. ☐

To reduce disease resistance in plants. ☐

(1)

(g) What is the advantage of cloning plants using tissue culture?

Tick **one** box.

No special equipment is needed. ☐

Plants can be produced quickly. ☐

The flowers are all different colours. ☐

The offspring are all genetically different. ☐

(1)

(h) The growth medium in **Figure 2** helps the plants to grow.

Name **one** substance in the growth medium.

_____

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_____

(1)

(Total 10 marks)

Q2.

The circulatory system is composed of the blood, blood vessels and the heart.

(a) Urea is transported in the blood plasma.

Name **two** other substances transported in the blood plasma.

1. _____

2. _____

(2)

(b) Some athletes train at high altitude.

Training at high altitude increases the number of red blood cells per cm^3 of blood.

Explain why having more red blood cells per cm^3 of blood is an advantage to an athlete.

_____

_____

_____

_____

_____

_____

(3)

(c) Which **two** blood vessels carry deoxygenated blood?

Tick **two** boxes.

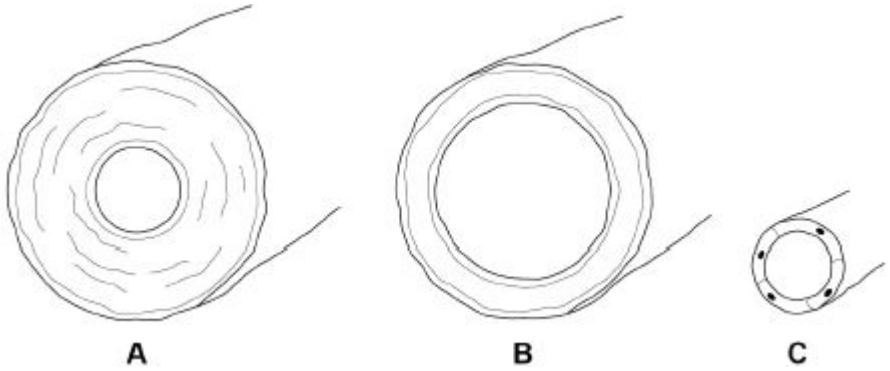
Aorta	☐
Coronary artery	☐
Pulmonary artery	☐
Pulmonary vein	☐
Vena cava	☐

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(2)

Figure 1 shows the three types of blood vessel.

Figure 1



(d) Which type of blood vessel carries blood into the right atrium?

Tick **one** box.

A		B		C	

(1)

(e) Compare the structure of an artery with the structure of a vein.

_____

_____

_____

_____

_____

_____

_____

(3)

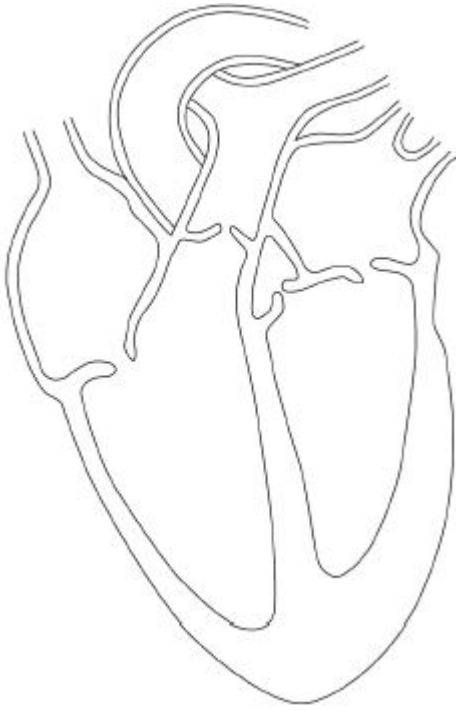
(f) Heart rate is controlled by a group of cells. This group of cells act as a pacemaker.

Figure 2 shows a section through the heart.

Draw an **X** on **Figure 2** to show the position of the pacemaker.

Figure 2

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(1)

(g) A patient may be fitted with an artificial pacemaker.

What condition may be treated using an artificial pacemaker?

_____

_____

(1)

(Total 13 marks)

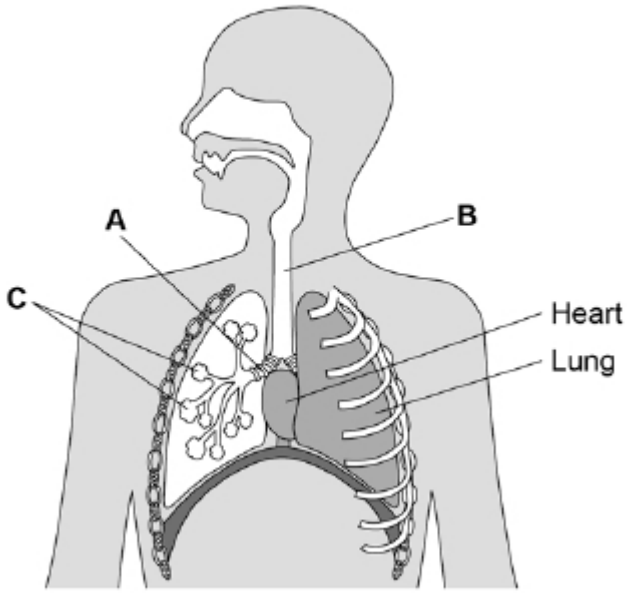
Q3.

Animals and plants contain organs and tissues.

Figure 1 shows some organs in the human thorax.

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Figure 1



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

A _____

B _____

C _____

(3)

(b) Which organ system is the heart part of?

Tick **one** box.

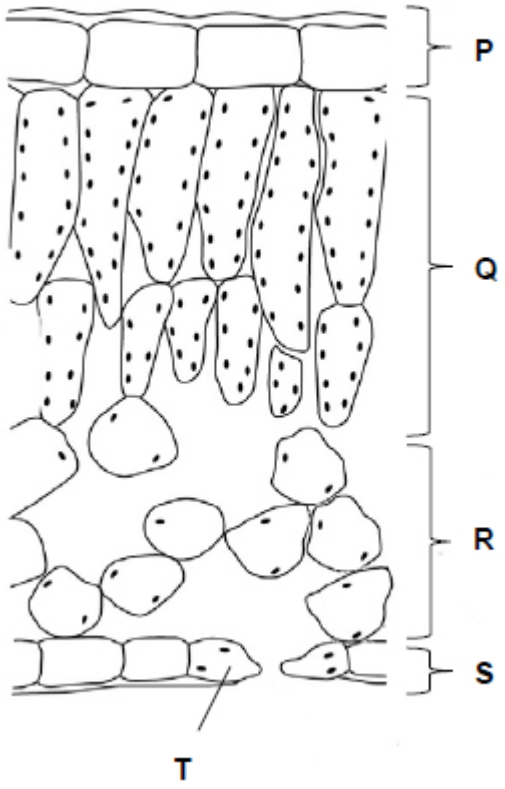
- Breathing system ☐
- Circulatory system ☐
- Digestive system ☐
- Excretory system ☐

(1)

Figure 2 shows a cross section of a leaf.

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Figure 2



(c) In which part of the leaf does most photosynthesis take place?

Tick **one** box.

P ☐ **Q** ☐ **R** ☐ **S** ☐

(1)

(d) What is part **T**?

Tick **one** box.

Guard cell ☐

Phloem ☐

Stoma ☐

Xylem ☐

(1)

(e) A leaf is an organ made of tissues.

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What is a tissue?

_____

_____

(1)

(f) Draw **one** line from each tissue to its function.

Tissue	Function
	Allows diffusion of gases through the leaf
Epidermis	Allows light through to the photosynthesising parts of the leaf
Phloem	Allows water into the leaf
Spongy mesophyll	Transport sugars around the plant
	Transports water around the plant

(3)

(Total 10 marks)

Q4.

The human body is organised to carry out many different functions.

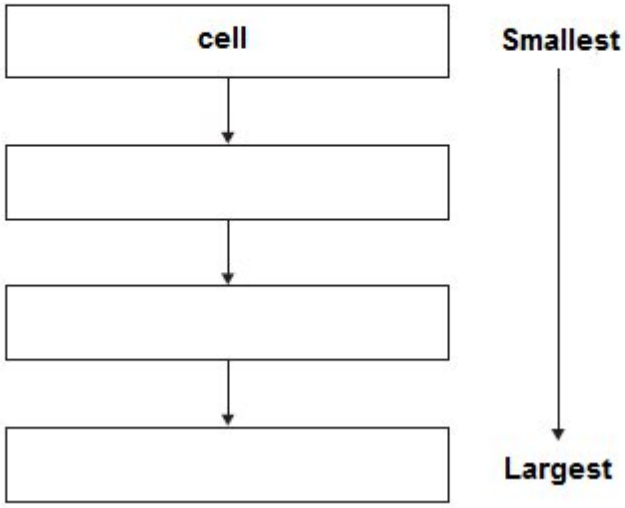
(a) Use words from the box to complete **Figure 1** by putting the parts of the body in order of size from smallest to largest.

The smallest one has been done for you.

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cell	organ system	organ	tissue

Figure 1



(2)

(b) The stomach is made of different types of tissue.

Draw **one** line from each type of stomach tissue to the correct description.

Epithelial tissue	Allows food to be churned around the stomach
Glandular tissue	Covers the outside and the inside of the stomach
Muscular tissue	Produces digestive juices
	Coordinates nerve impulses

(3)

(c) Animals can react to their surroundings because they have nervous systems.

A student investigated the behaviour of small animals called woodlice.

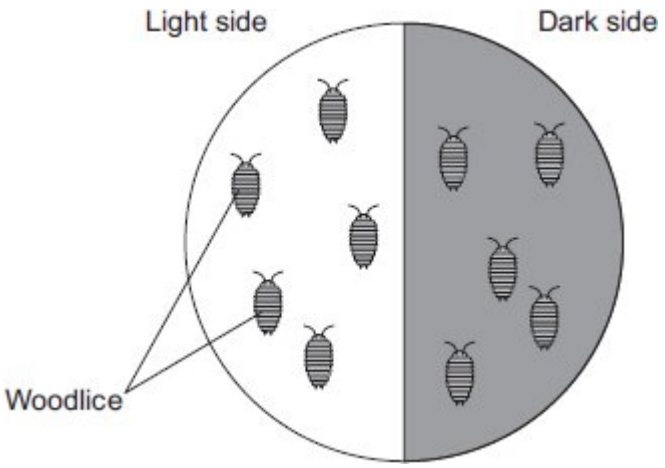
The student set up the investigation as shown in **Figure 2.**

- The student covered one half of a Petri dish with black paper to make that side of the Petri dish dark.
- The other side had no cover.

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- The student put five woodlice into each side of the dish and then put the clear Petri dish lid back on the dish.

Figure 2



After 30 minutes, all the woodlice had moved to the dark side of the Petri dish.

(i) In this investigation, what is the **stimulus** that the woodlice responded to?

_____

(1)

(ii) In this investigation, what is the **response** that the woodlice made?

_____

(1)

(iii) The student concluded that woodlice prefer dark conditions.

Give **two** ways in which the student could improve the investigation to be sure that his conclusion was correct.

1. _____

_____

2. _____

_____

(2)

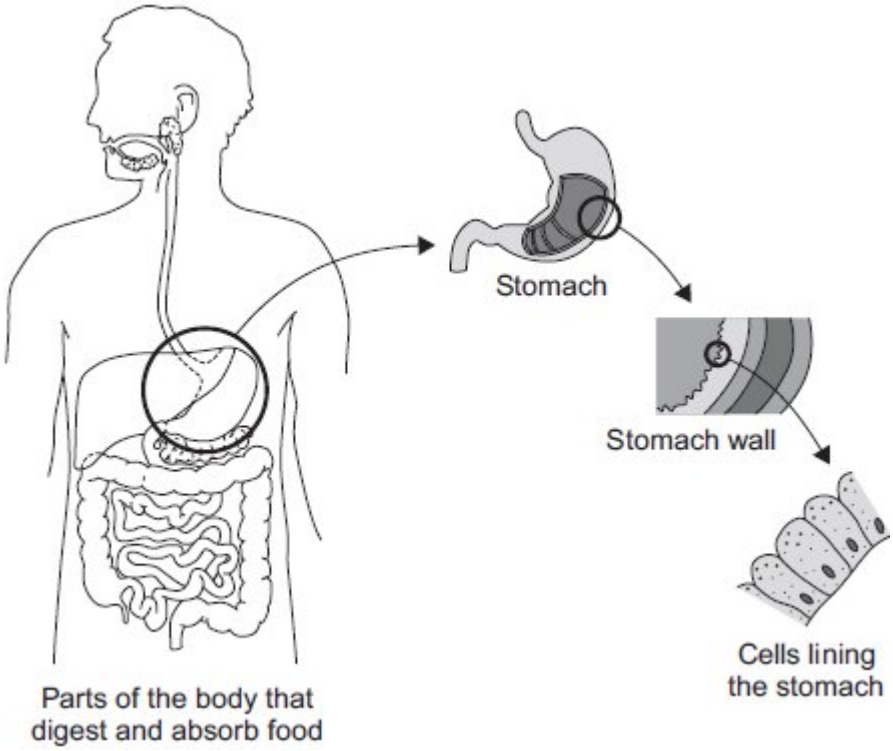
(Total 9 marks)

Q5.

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.

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(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**

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(1)

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

Draw a ring around the correct answer.

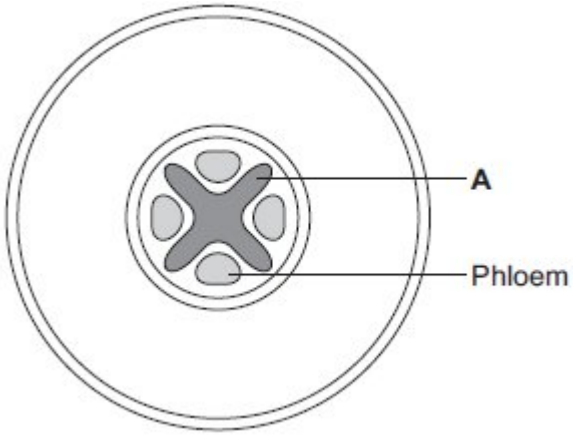
cell membrane **mitochondria** **nucleus**

(1)

(Total 5 marks)

Q6.

The diagram below shows a cross-section of a plant root. The transport tissues are labelled.



(a) (i) What is tissue **A**?

Draw a ring around the correct answer.

cuticle **epidermis** **xylem**

(1)

(ii) Name **two** substances transported by tissue **A**.

1. _____

2. _____

(2)

(b) Phloem is involved in a process called translocation.

(i) What is translocation?

_____

_____

_____

(1)

(ii) Explain why translocation is important to plants.

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_____

_____

_____

_____

(2)

(c) Plants must use active transport to move some substances from the soil into root hair cells.

(i) Active transport needs energy.

Which part of the cell releases most of this energy?

Tick (✓) **one** box.

mitochondria ☐

nucleus ☐

ribosome ☐

(1)

(ii) Explain why active transport is necessary in root hair cells.

_____

_____

_____

_____

_____

_____

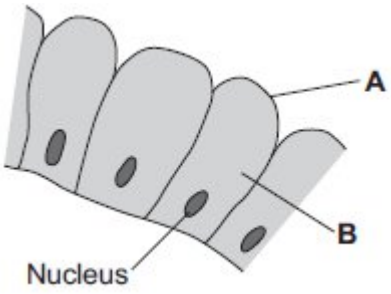
(2)

(Total 9 marks)

Q7.

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

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(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**
Layer of cells lining the stomach	An organ
Stomach	An organism
Mouth, stomach, intestines, liver and pancreas	An organ system
	A tissue

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(3)
(Total 6 marks)

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