AQA GCSE Biology | 8461

SPECIFICATION POINT 4.2.1

# Principles of organisation

## Past-paper questions

| | |
|---|---|
| Tier | **Foundation** |
| Question groups | **6** |
| Available paper years | **2009–2023** |

## Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

**Name:** _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

### 4.2.1 Principles of organisation

**Question 01**

June 2009 | BLY1F | Original Q4 | Legacy

**4** Some organisms are in danger of extinction.
The photograph shows an African elephant feeding on tree leaves.



**4** (a) Read the information about elephants and humans in Africa.

- The African elephant is the largest land animal.
- The African elephant feeds on lots of leaves.
- Adult African elephants have no natural predators.
- Elephants are killed by poachers for their ivory tusks.
- African elephants live for about 70 years.
- Most African elephants live in large herds.
- Land available to elephants is disappearing rapidly.

The African elephant is now extinct in many parts of Africa.

Use information from the list to give **three** reasons why.

1.....

.....

2.....

.....

3.....

.....

*(3 marks)*

4.2.1 Principles of organisation

Question 01 · continued



*for mark*

**4** (b) Organisms that are in danger of extinction can be cloned.

**List A** gives the names of three different cloning techniques.

**List B** gives information about these techniques.

Draw a line from each technique in **List A** to the correct information about it in **List B**.

| **List A**<br>**Technique** | **List B**<br>**Information** |
|---|---|
| | Small groups of cells from parts of a plant are grown on a special jelly. |
| Adult cell cloning | |
| | Cells from a developing animal are separated before they become specialised and then placed into host mothers. |
| Embryo transplanting | |
| | Genes are cut out from chromosomes and inserted into other organisms. |
| Tissue culture | |
| | A nucleus is removed from an unfertilised egg cell. The nucleus from a body cell is inserted into the egg cell. An electric shock causes the egg to start to divide. |

*(3 marks)*

6

### 4.2.1 Principles of organisation

**Question 02**

June 2012 | BL2FP | Original Q2 | Legacy

**2** In a living organism, the cells are organised into organs, systems and tissues.

**2 (a)** Use words from the box to complete the list of these structures in order of size.

| organs | systems | tissues |
|---|---|---|

The smallest structure is at the top of the list and the largest is at the bottom.

1 **cells** (smallest)

2 .....

3 .....

4 .....

5 **organism** (largest)

*(1 mark)*

**2 (b)** **List A** gives three tissues found in the human body.
**List B** gives four functions of tissues.

Draw a straight line from each tissue in **List A** to its correct function in **List B**.

| List A – Tissue | List B – Function |
|---|---|
| | Covers many parts of the body |
| Muscular tissue | |
| | Contracts to cause movement |
| Glandular tissue | |
| | Divides by meiosis |
| Epithelial tissue | |
| | Releases hormones or enzymes |

*(3 marks)*

4

### 4.2.1 Principles of organisation

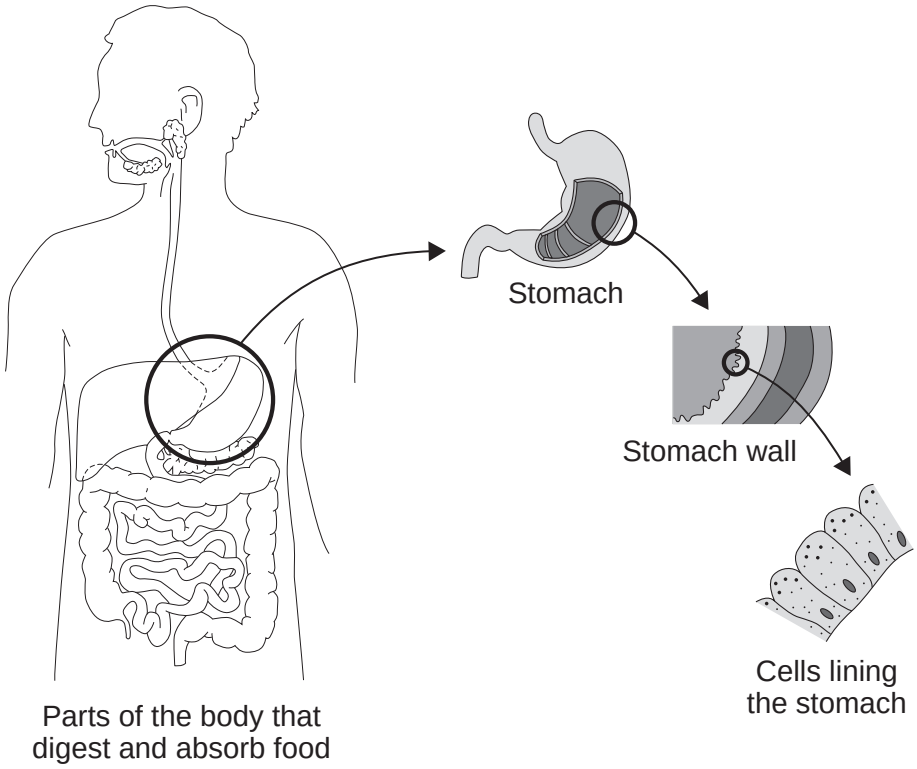
Question 03

June 2015 | BL2FP | Original Q3 | Legacy

**3** **Figure 2** shows the parts of the body that digest and absorb food.

**Figure 2** also shows some details about the structure of the stomach.

**Figure 2**




**3 (a)** Complete **Table 1** to show whether each structure is an organ, an organ system or a tissue.

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

**[2 marks]**

**Table 1**

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

4.2.1 Principles of organisation

Question 03 · continued



**3 (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.

**[1 mark]**

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

the process of ..... .

**3 (b) (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.

**[1 mark]**

**glucose** **protein** **starch**

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

Draw a ring around the correct answer.

**[1 mark]**

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

5

### 4.2.1 Principles of organisation

Question 04

June 2016 | BL3FP | Original Q7 | Legacy

**7** Cells, tissues and organs are adapted to take in different substances and get rid of different substances.

**Table 1** shows the concentration of four ions outside cells and inside cells.

**Table 1**

| Ion | Concentration outside cells in mmol per $dm^3$ | Concentration inside cells in mmol per $dm^3$ |
|---|---|---|
| Sodium | 140 | 9 |
| Potassium | 7 | 138 |
| Calcium | 2 | 27 |
| Chloride | 118 | 3 |

**7 (a)** Use information from **Table 1** to complete the following sentences.

**[2 marks]**

Sodium ions will move into cells by the process

of _____ .

Potassium ions will move into cells by the process

of _____ .

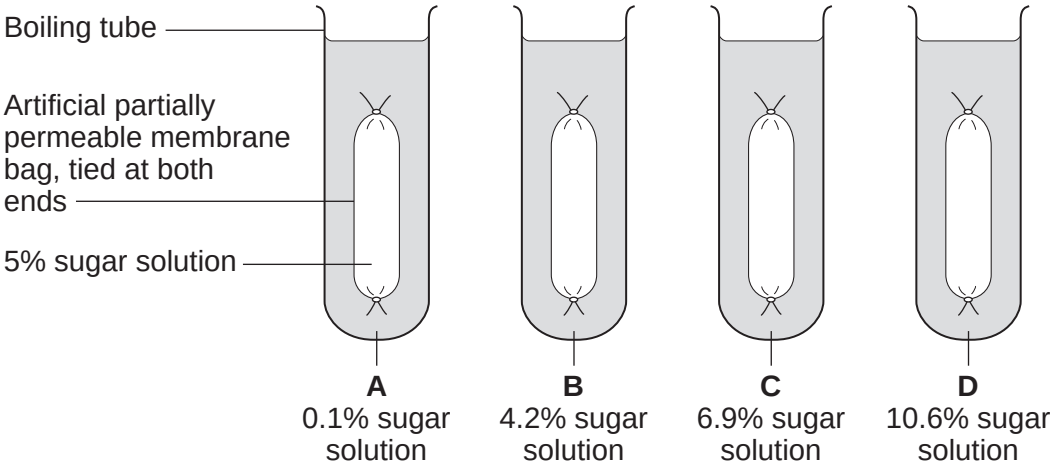
**7 (b)** Some students investigated the effect of the different concentrations of sugar in four drinks, **A**, **B**, **C** and **D**, on the movement of water across a partially permeable membrane.

The students:

- made four bags from artificial partially permeable membrane
- put equal volumes of 5% sugar solution in each bag
- weighed each bag containing the sugar solution
- placed one bag in each of the drinks, **A**, **B**, **C** and **D**
- after 20 minutes removed the bags containing the sugar solution and weighed them again.

**Figure 9** shows how they set up the investigation.

**Figure 9**




**7 (b) (i)** The bag in drink **A** got heavier after 20 minutes.

Explain why.

**[3 marks]**

**7 (b) (ii)** In which drink, **A**, **B**, **C** or **D**, would you expect the bag to show the smallest change in mass?

**[1 mark]**

Tick (✓) **one** box.

**A** ☐ **B** ☐ **C** ☐ **D** ☐

**7 (b) (iii)** Explain why you think the bag you chose in part **(b)(ii)** would show the smallest change.

**[2 marks]**

8

### 4.2.1 Principles of organisation

**Question 05**

June 2018 | 8461/1F | Original Q2

**0 2** Plants are made up of cells, tissues and organs.

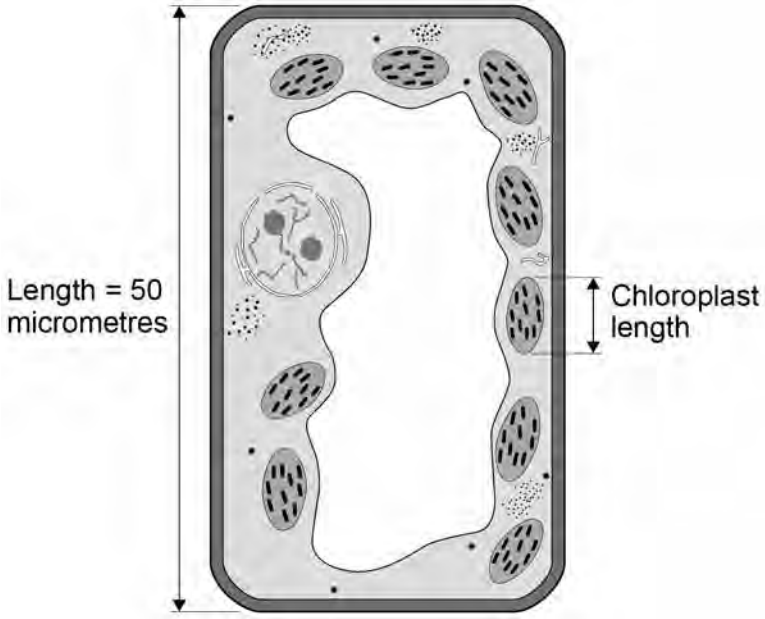
**0 2 . 1** Draw **one** line from each level of organisation to the correct plant part.

**[2 marks]**

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

**Figure 3** shows a plant cell drawn to scale.

**Figure 3**



4.2.1 Principles of organisation

Question 05 · continued



**0 2 . 2** Where in a plant would the cell in **Figure 3** be found?

**[1 mark]**

Tick **one** box.

- Epidermis ☐
- Palisade mesophyll ☐
- Phloem ☐
- Xylem ☐

**0 2 . 3** Calculate the length of the chloroplast labelled in **Figure 3**.

**[2 marks]**

Length = _____ micrometres

**0 2 . 4** Cells in plant roots do **not** photosynthesise.

Give **one** reason why.

**[1 mark]**

**0 2 . 5** As a plant grows, new root hair cells are formed from unspecialised cells.

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

**[1 mark]**

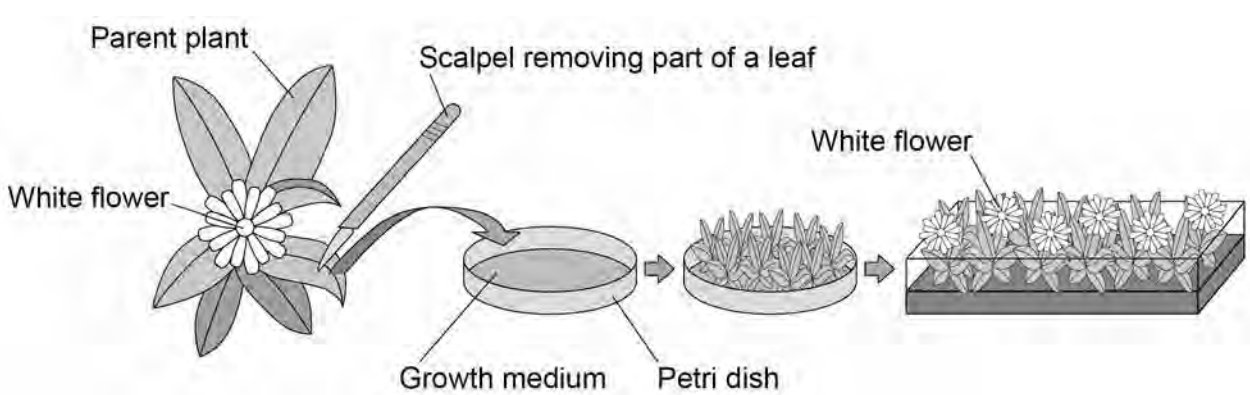
Tick **one** box.

- Differentiation ☐
- Metabolism ☐
- Transpiration ☐
- Transport ☐

Scientists can clone plants using tissue culture.

**Figure 4** shows the process of tissue culture.

**Figure 4**



4.2.1 Principles of organisation

Question 05 · continued



**0 2 . 6** Why might scientists want to clone plants?

**[1 mark]**

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. ☐

**0 2 . 7** What is the advantage of cloning plants using tissue culture?

**[1 mark]**

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. ☐

**0 2 . 8** The growth medium in **Figure 4** helps the plants to grow.

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

**[1 mark]**

_____

_____

10

4.2.1 Principles of organisation

Question 06

June 2023 | 8461/1F | Original Q1

**0 1** Plants are made of cells, tissues and organs.

**0 1 . 1** Which part of a plant is the largest?

**[1 mark]**

Tick (✓) **one** box.

A guard cell ☐

A leaf ☐

A root hair ☐

Students investigated the effect of concentration of salt solution on the mass of pieces of potato.

This is the method used.

1. Cut two pieces of potato to the same size.
2. Record the mass of each piece of potato.
3. Place one piece of potato into a beaker containing a dilute salt solution.
4. Place the other piece of potato into a beaker containing a concentrated salt solution.
5. After 20 minutes, remove each piece of potato from its solution.
6. Record the change in mass of each piece of potato.
7. Repeat steps 1 to 6 two more times.

**Table 1** shows the results.

**Table 1**

| Solution | Change in mass of piece of potato in grams | | | |
|---|---|---|---|---|
| | Test 1 | Test 2 | Test 3 | Mean |
| Dilute salt solution | 1.1 | 1.1 | 1.4 | **X** |
| Concentrated salt solution | –7.2 | –6.8 | –32.4 | –7.0 |

4.2.1 Principles of organisation

Question 06 · continued



**0 1 . 2** Calculate mean value **X** in **Table 1**.

**[2 marks]**

**X** = _____ grams

There is an anomalous result for the concentrated salt solution in **Table 1**.

**0 1 . 3** Draw a ring around the anomalous result in **Table 1**.

**[1 mark]**

**0 1 . 4** What did the students do with the anomalous result when calculating the mean in **Table 1**?

**[1 mark]**

**0 1 . 5** What name is given to a variable that is kept the same during an investigation?

**[1 mark]**

Tick (✓) **one** box.

- Control variable ☐
- Dependent variable ☐
- Independent variable ☐

**Question 1 continues on the next page**

4.2.1 Principles of organisation

Question 06 · continued



**0 1 . 6** One variable the students kept the same during the investigation was the size of the pieces of potato.

Which other variable did the students keep the same?

**[1 mark]**

Tick (✓) **one** box.

Change in mass of pieces of potato ☐

Concentration of salt solution ☐

Time in the salt solution ☐

**0 1 . 7** The pieces of potato in the concentrated salt solution decreased in mass.

Complete the sentence.

Choose the answer from the box.

**[1 mark]**

| | | |
|---|---|---|
| **excretion** | **osmosis** | **respiration** |

Water moved out of the potato by the process of _____.

4.2.1 Principles of organisation

Question 06 · continued



**0 1 . 8** The potato cells have a partially permeable membrane.

Which particles can pass through a partially permeable membrane?

**[1 mark]**

Tick (✓) **one** box.

No particles ☐

Some particles ☐

All particles ☐

**0 1 . 9** How could the students improve their investigation?

**[1 mark]**

Tick (✓) **one** box.

Boil the pieces of potato at the start. ☐

Leave the skin on some pieces of potato. ☐

Use more concentrations of salt solution. ☐

**10**