B1- Cell Structure and Transport Exam Practice 1

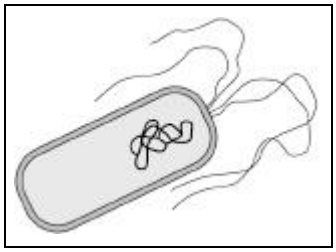
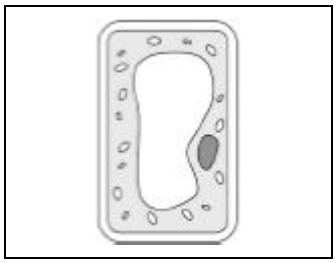
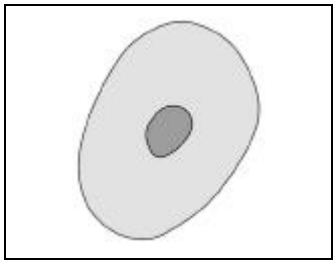
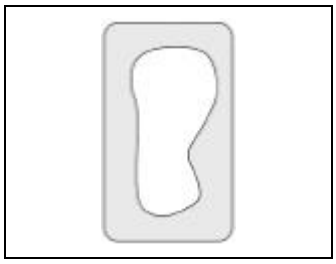
Name:

Score:

Q1.

Cells are the building blocks of life.

(a) Draw **one** line from each type of organism to the diagram of one of its cells.

Type of organism	Diagram of one cell
Animal	
Bacterium	
Plant	
	

(3)

(b) Cells contain structures. These structures have different functions.

Draw **one** line from each function to the correct structure.

Function	**Structure**
Contains genetic information	Cell membrane
Controls what enters and leaves a cell	Cell wall
Where photosynthesis happens	Chloroplast
	Nucleus

(3)

(c) Chemicals are produced in cells.

Complete the sentences.

Choose answers from the box.

cellulose	**DNA**	**glycogen**	**starch**	**urea**

A chemical excreted by animals is _____.

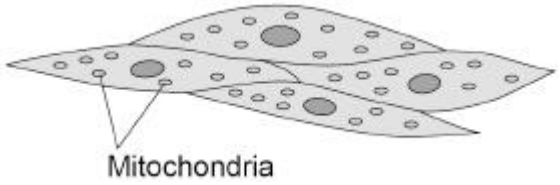
A chemical stored in animal cells is_____.

A chemical stored in plant cells is _____.

A chemical that strengthens plant cell walls is _____.

(4)

The figure below shows a diagram of muscle cells.



(d) Give **one** function of muscle cells.

_____

_____

(1)

(e) Explain how muscle cells are adapted for their function.

Use the figure above.

_____

_____

_____

_____

(2)

(f) One muscle cell was 0.05 mm wide.

When viewed using a microscope the image of the muscle cell was 2 mm wide.

Calculate the magnification used to view the cell.

Use the equation:

$$\text{magnification} = \frac{\text{width of image}}{\text{width of real cell}}$$

_____

_____

_____

Magnification = × _____

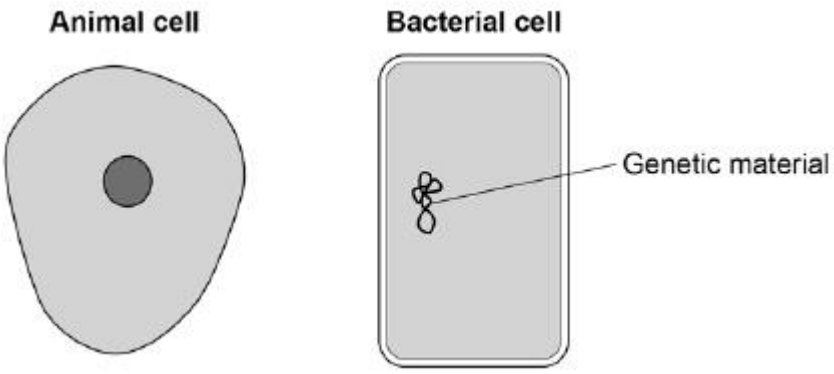
(2)

(Total 15 marks)

Q2.

Figure 1 shows an animal cell and a bacterial cell.

Figure 1



(a) Compare the structure of the cells in **Figure 1**.

Complete the sentences.

Choose the answers from the box.

cell membrane	**cell wall**	**chloroplast**
cytoplasm		**nucleus**

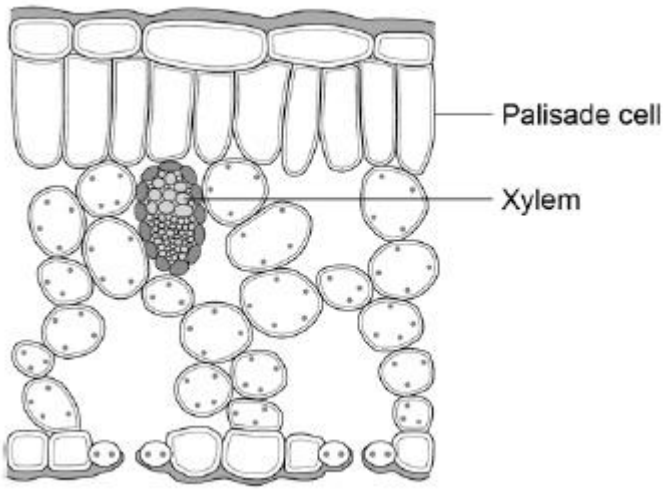
Only the animal cell contains a _____ .

Only the bacterial cell contains a _____ .

(2)

Figure 2 shows a section through a leaf.

Figure 2



(b) The function of palisade cells is to photosynthesise.

Describe **one** way palisade cells are adapted to carry out their function.

_____

_____

(1)

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

Tick **one** box for each structure.

Table 1

Structure	Tissue	Organ	Organ system
Leaf			
Xylem			
Roots, stem and leaves			

(2)

A student observed palisade cells using a microscope.

The microscope had four objective lenses, each with a different magnification.

(d) Which objective lens should the student use first?

Tick **one** box.

Give a reason for your answer.

×4 magnification ☐

×10 magnification ☐

×40 magnification ☐

×100 magnification ☐

Reason _____

_____

(2)

The student measured the width of 5 different palisade cells at a total magnification of ×400

(e) Eyepiece lenses are usually ×5 or ×10 magnification.

What combination of eyepiece and objective lenses would give a total magnification of ×400?

Eyepiece lens _____

Objective lens _____

(1)

(f) **Table 2** shows the student's results.

Table 2

Cell	Width of cell image in mm
1	12
2	13
3	16
4	10
5	11

(f) Calculate the mean width of the palisade cell images.

_____

_____

Mean width = _____ mm

(1)

(g) Calculate the real width of a palisade cell.

Use the mean width you calculated in part (f).

Use the equation:

$$\text{real width} = \frac{\text{image width}}{\text{magnification}}$$

_____

_____

Real width = _____ mm

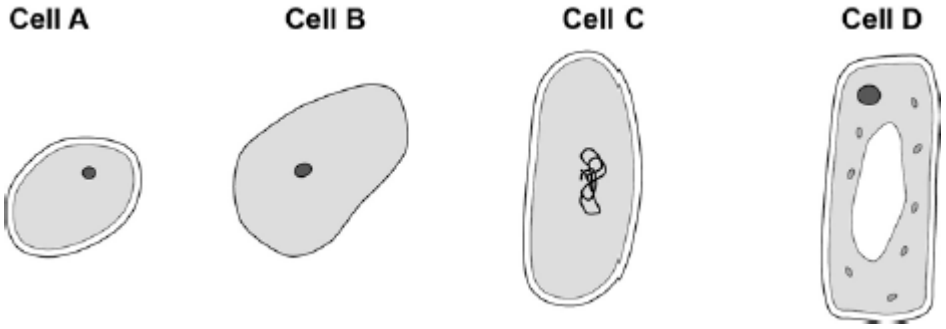
(2)

(Total 11 marks)

Combined Higher Question:

Q1.

The figure below shows four different types of cell.



(a) Which cell is a plant cell?

Give **one** reason for your answer.

Cell _____

Reason _____

(2)

(b) Which cell is an animal cell?

Give **one** reason for your answer.

Cell _____

Reason _____

(2)

(c) Which cell is a prokaryotic cell?

Give **one** reason for your answer.

Cell _____

Reason _____

(2)

(d) A scientist observed a cell using an electron microscope.

The size of the image was 25 mm.

The magnification was × 100 000

Calculate the real size of the cell.

Use the equation:

$$\text{magnification} = \frac{\text{image size}}{\text{real size}}$$

Give your answer in micrometres.

_____

_____

_____

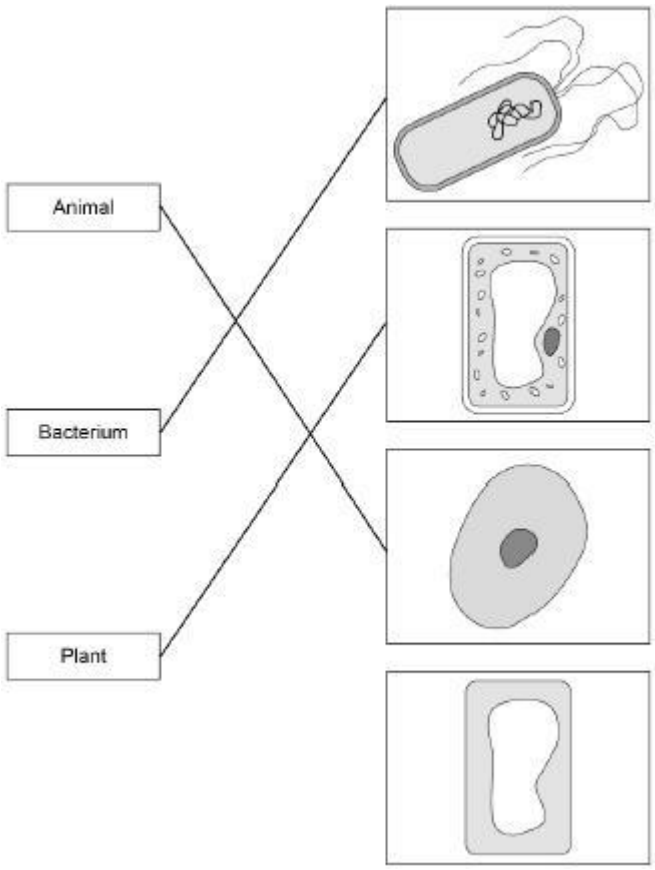
Real size = _____ micrometres

(3)

(Total 9 marks)

Q1.

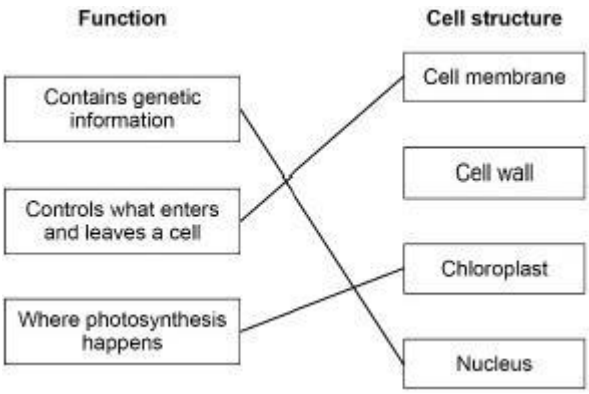
(a)



do **not** accept more than one line from a box on the left

1
1
1

(b)



do **not** accept more than one line from a box on the left

1
1
1

(c) urea

must be in this order

1

glycogen

1

starch

1

cellulose

1

(d) any **one** from:

- (to cause) movement
- to contract / shorten

allow example of movement

ignore to relax / expand

ignore references to strength / energy / power

1

(e) (many) mitochondria

1

to transfer / release (a lot of) energy

allow (mitochondria) for respiration

*do **not** accept to produce / make / create energy*

ignore reference to the shape / strength of the cells

1

(f) $\frac{2}{0.05}$

1

(×) 40

*do **not** accept if a unit is given*

1

[15]

Q2.

(a) nucleus

1

cell wall

1

(b) any **one** from:

- contain (many) chloroplasts
- positioned near the top surface of the leaf
- packed closely together

1

(c)

Structure	Tissue	Organ	Organ system
Leaf		✔	
Xylem	✔		
Roots, stem and leaves			✔

additional tick in a row negates the credit for that row

allow **1** mark for two correct rows

2

(d) ×4

1

reason: any **one** from:

- gives the largest field of view
- easier to focus

1

(e) eyepiece lens: ×10
and
objective lens: ×40

or

eyepiece lens: ×5
and
objective lens: ×80

allow sensible suggestions that give a magnification of ×400

1

(f) 12.4 (mm)

allow 12 (mm)

1

(e) real width = $\frac{12.4}{400}$

1

0.031 (mm)

*an answer of 0.031 (mm) scores **2** marks*
allow ecf from part (f)

1

[11]

Combined Higher Question:

Q1.

(a) **D**

1

any **one** from:

- has chloroplasts
- has a (large) vacuole

ignore has a (cell) wall

1

(b) **B**

1

does **not** have a (cell) wall

*allow has <u>only</u> a nucleus, (cell) membrane **and** cytoplasm*

1

(c) **C**

1

any **one** from:

- genetic material is not in a nucleus

allow no nucleus

- has a single loop of DNA

1

(d) real size = 25 / 100 000

1

0.00025

1

(conversion to) 0.25 (µm)

*allow 0.25 (µm) with no working shown for **3** marks*

1

[9]