

Cell biology

Practice questions

For teacher's use	
Question	Mark
1	
2	
3	
4	
5	
Total	

Name _____ Class _____ Date _____

Instructions

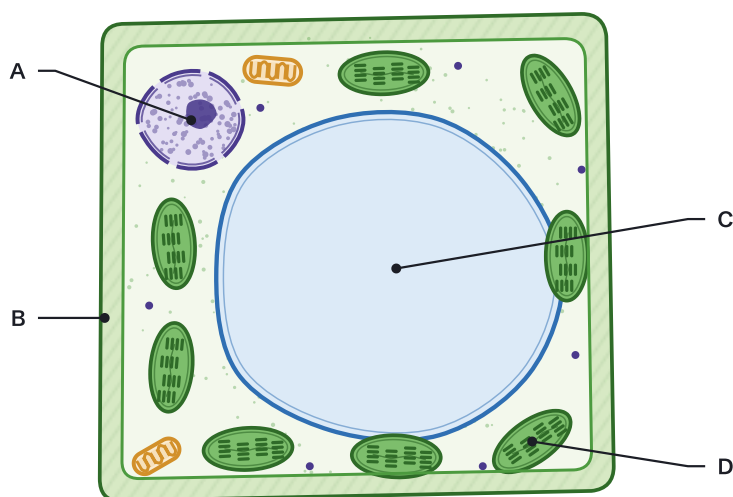
Answer all questions in the spaces provided.

Show your working in calculations. You may use a calculator.

Total marks: **27**

Time allowed: **30 minutes**

01 The diagram shows a plant cell.



01 . **1** Name structures **A**, **B** and **C**.

[3 marks]

A

B

C

01 . **2** Structure **D** contains a green substance. What is the function of structure **D**?

[1 mark]

.....

01 . **3** Which structure is found in a bacterial cell but **not** in a plant cell? Tick (✓) **one** box.

[1 mark]

Cell wall ☐

Chloroplast ☐

Plasmid ☐

Ribosome ☐

02 A student uses a light microscope to look at cells from the inside of their cheek.

02.1 The student cannot see any ribosomes. Give **one** reason why.

[1 mark]

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02.2 The image of one cheek cell is 6 mm wide. The magnification is $\times 400$. Calculate the real width of the cell in micrometres (μm).

[3 marks]

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.....

.....

Real width = μm

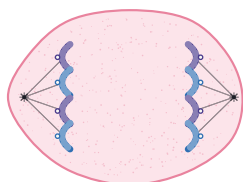
02.3 Give **one** advantage of using an electron microscope instead of a light microscope.

[1 mark]

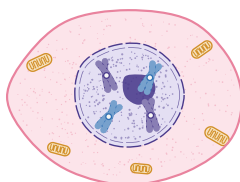
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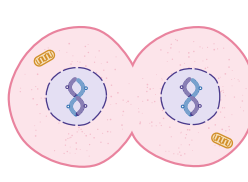
03 The diagrams show four stages of the cell cycle. They are not in the correct order.



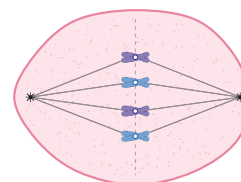
W



X



Y



Z

03.1 Write the letters in the correct order. Stage **X** has been done for you.

[1 mark]



03.2 Describe **two** things that happen during stage **X**.

[2 marks]

.....

.....

.....

03.3 Give **one** reason why organisms need cells to divide by mitosis.

[1 mark]

.....

- 04** A student investigated osmosis. They put cylinders of potato into salt solutions of different concentrations for 24 hours. The table shows the results.

Concentration in mol/dm ³	Mass at start in g	Mass at end in g	Change in mass in %
0.0	2.40	2.69	+12.1
0.2	2.52	2.61	+3.6
0.4	2.50	2.35	X
0.6	2.46	2.18	-11.4
0.8	2.55	2.12	-16.9

- 04.1** Calculate value **X**.

[2 marks]

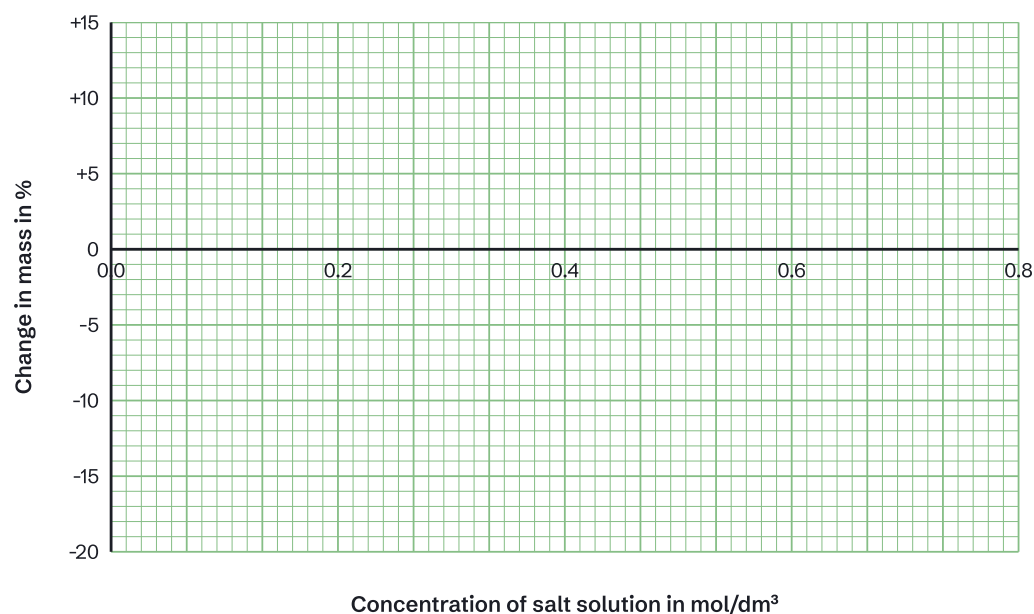
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X = %

- 04.2** Plot the results on the graph. Draw a line of best fit.

[3 marks]



- 04.3** Use your graph to estimate the concentration of the solution inside the potato cells. Give a reason.

[1 mark]

.....

.....

- 04.4** Why did the student dry the potato cylinders with paper towels before weighing them?

[1 mark]

.....

05 Cells can move substances across their membranes by diffusion, osmosis and active transport.

05.1 Compare diffusion, osmosis and active transport.

[6 marks]

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

END OF QUESTIONS

Mark scheme

mark in red pen!

Question	Answers	Extra information	Mark
01.1	A nucleus ✓ B cell wall ✓ C (permanent) vacuole ✓	Ignore 'cell' before vacuole	3
01.2	It absorbs light for photosynthesis ✓	Allow 'where photosynthesis happens'	1
01.3	Plasmid ✓		1
02.1	Ribosomes are too small / the light microscope's resolution is too low ✓	Allow magnification too low	1
02.2	$6 \div 400$ ✓ $= 0.015 \text{ mm}$ ✓ $= 15 \mu\text{m}$ ✓	Correct answer of $15 \mu\text{m}$ with no working gets 3 marks	3
02.3	Higher resolution or higher magnification, so it shows more detail ✓		1
03.1	X Z W Y ✓		1
03.2	Any two from: the cell grows ✓ the DNA is copied / replicated ✓ more organelles are made, e.g. ribosomes or mitochondria	Allow 'chromosomes are copied'	2
03.3	Growth, repair, or asexual reproduction ✓		1
04.1	$(2.35 - 2.50) \div 2.50 \times 100$ ✓ $= -6.0$ ✓	Allow -6. Missing minus sign loses the second mark	2
04.2	All points plotted correctly ✓ ✓ Smooth line of best fit ✓	One mark for 3 or 4 points correct ($\pm \frac{1}{2}$ small square)	3
04.3	About 0.27 mol/dm^3 , where the line crosses 0 % (no net movement of water) ✓	Accept 0.25 to 0.30 if consistent with candidate's line	1
04.4	To remove excess solution, so only the potato's mass is measured ✓		1

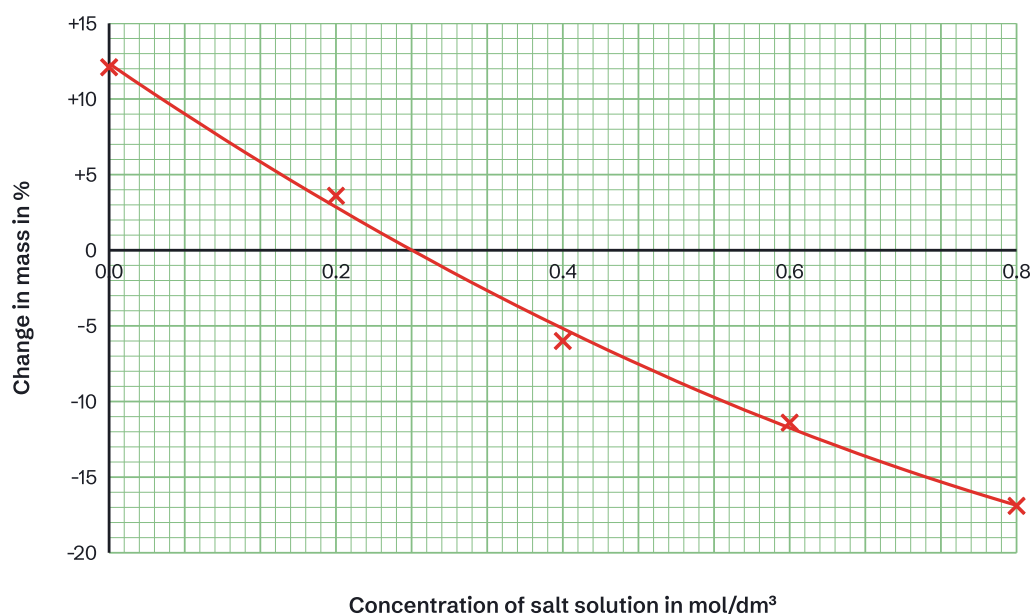
05.1 Levels of response

Level	Description	Marks
3	A detailed comparison of all three processes, covering what moves, the direction of movement and whether energy is needed. Uses scientific terms correctly.	5-6
2	Some comparison of at least two processes, with some correct use of scientific terms. May describe rather than compare.	3-4
1	Simple statements about one or more processes. Little or no comparison.	1-2
	No relevant content	0

Indicative content

- Diffusion and osmosis are passive: they do not need energy
- Active transport needs energy from respiration
- Diffusion: net movement of particles from high to low concentration
- Osmosis: movement of water only
- Osmosis is from a dilute to a more concentrated solution
- Osmosis needs a partially permeable membrane
- Active transport moves substances against a concentration gradient
- Active transport: from low to high concentration
- Examples: oxygen diffusing into cells; mineral ions into root hair cells by active transport
- All three move substances across cell membranes

04.2 Expected graph



Line crosses zero at about 0.27 mol/dm³: no net movement of water here.