Total marks	14
Time allowed	Approximately 25 minutes
Instructions	Answer ALL questions. Write answers in the spaces provided.

Question 1

Potato cylinders of 3 cm length were placed in different sucrose solutions for 30 minutes. Initial and final masses were recorded.

Sucrose conc. (mol/dm³)	Initial mass (g)	Final mass (g)	% change in mass
0.0	2.50	2.73	+9.2
0.2	2.48	2.55	+2.8
0.4	2.51	2.51	0.0
0.6	2.49	2.34	-6.0
0.8	2.52	2.18	-13.5

A student investigates the effect of sucrose concentration on potato tissue. The table shows the results.

[0 marks]

Question 2

Calculate the percentage change in mass for the potato cylinder placed in 0.6 mol/dm³ sucrose. Use the formula: % change = (final – initial) ÷ initial × 100. Show your working.

[2 marks]

Question 3

Explain why the student calculates percentage change in mass rather than the raw change in mass.

[2 marks]

Question 4

Using the data in the table, determine the water potential of the potato cells. Explain your answer.

[3 marks]

Question 5

The potato cylinder placed in 0.0 mol/dm³ (distilled water) gained mass. Explain this result in terms of osmosis.

[3 marks]

★ **Higher Tier**

Question 6

Explain, using the term water potential, what happens to a potato cell placed in 0.8 mol/dm³ sucrose solution.

[4 marks]

END OF QUESTIONS — Total: 14 marks