0 9 Homeostasis controls the internal conditions of the body.

0 9 . 1 Explain how blood glucose levels are controlled in the body of someone who does **not** have diabetes.

[4 marks]

0 9 . 2 Compare how each type of diabetes is caused.

Suggest how each type of diabetes can be treated.

[4 marks]

0 9 . 3 Look at **Table 5**.

Table 5

Population of UK in 2015	6.5×10^7
Number of people diagnosed with diabetes	3.45×10^6
Estimated number of people with undiagnosed diabetes	5.49×10^5

Calculate the percentage (%) of the UK population estimated to have diabetes.

You should include both diagnosed and undiagnosed people in your calculation.

Give your answer to 2 significant figures.

[3 marks]

Estimated percentage of population with diabetes = _____ %

Question 9 continues on the next page

0 9 . 4 A urine test can be used to check for the presence of glucose in the urine.

Diabetes can also be diagnosed with a blood test to measure the concentration of blood glucose.

Suggest why a blood test is more reliable than a urine test.

[1 mark]

0 9 . 5 A blood test called the glucose tolerance test checks how well the body processes glucose.

Concentrations of glucose in the blood are measured before and after drinking a glucose drink.

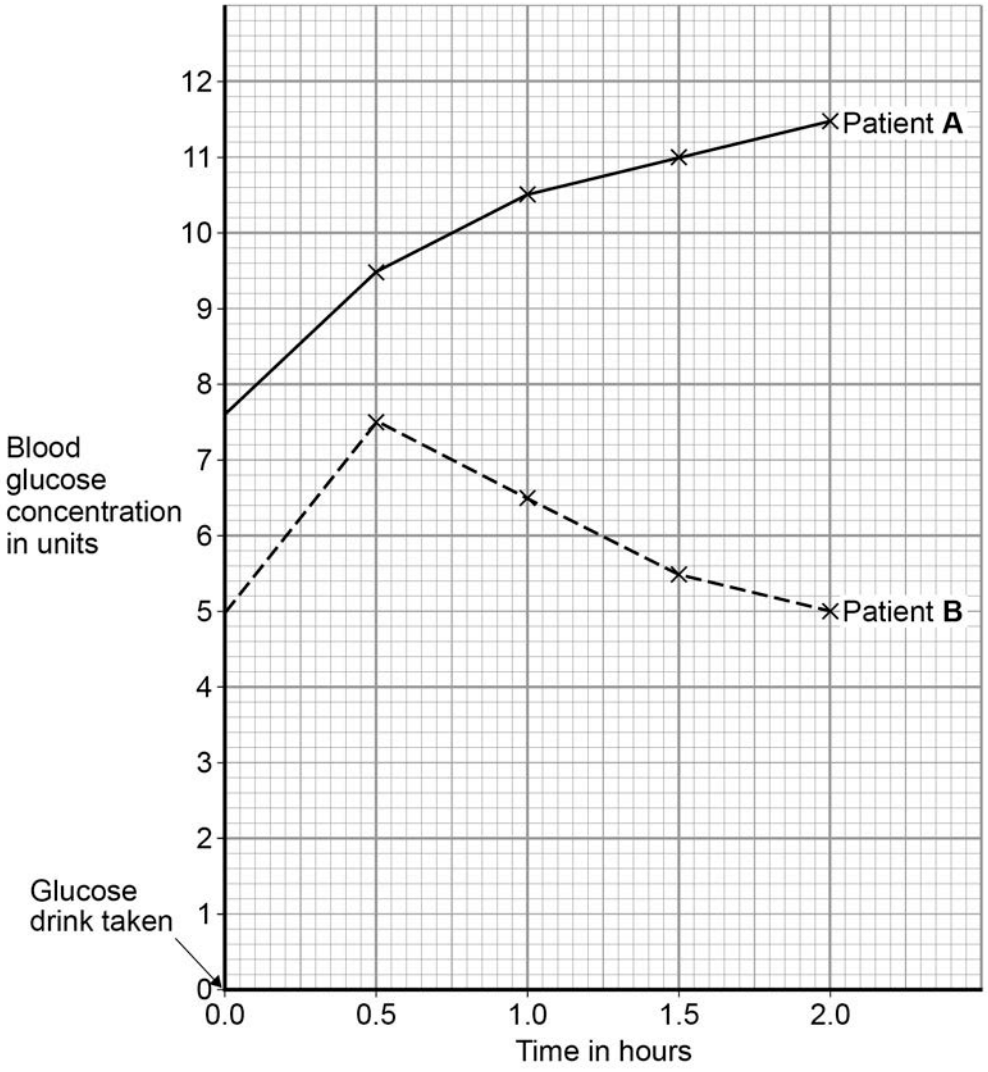
Patients are not allowed to eat food for 8 hours before the glucose tolerance test.

Suggest why patients are **not** allowed to eat for 8 hours before the test.

[1 mark]

0 9 . 6 **Figure 11** shows the results of a glucose tolerance test for two patients, **A** and **B**.

Figure 11



Which patient has diabetes?

Justify your answer.

[2 marks]

Patient _____

Justification _____

_____

_____

_____

Question 9

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.1	if too high <u>insulin</u> released from pancreas		1	AO1/1 4.5.3.2
	so glucose is moved into cells	allow glucose is stored	1	AO1/1 4.5.3.2
	if too low, <u>glucagon</u> is released (from pancreas)		1	AO1/1 4.5.3.2
	causes glycogen to be converted to glucose <u>and</u> released into the blood		1	AO1/1 4.5.3.2
09.2	type 1 not enough / no insulin produced		1	AO1/1 4.5.3.2
	whereas type 2 cells do not respond to insulin		1	AO1/1 4.5.3.2
	type 1 is treated with injections of insulin		1	AO1/1 4.5.3.2
	whereas type 2 is treated with diet and exercise **or** loss of weight **or** drugs		1	AO1/1 4.5.3.2

Question 9 continues on the next page

Question 9 continued

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.3	$(3.45 \times 10^6) + (5.49 \times 10^5) = 3.999 \times 10^6$ **or** 3 450 000 + 549 000 = 3 999 000	allow 3.999×10^6 **or** 3 999 000 with no working shown for **1** mark	1	AO2/2 4.5.3.2
	$\frac{3.999 \times 10^6}{6.5 \times 10^7} \times 100$ **or** $\frac{3\ 999\ 000}{65\ 000\ 000} \times 100$ = 6.15	allow 6.15 with no working shown for **2** marks allow for **1** mark for a calculation using either: $\frac{3.45 \times 10^6}{6.5 \times 10^7}$ **or** $\frac{3\ 450\ 000}{65\ 000\ 000}$ **or** $\frac{5.49 \times 10^5}{6.5 \times 10^7}$ **or** $\frac{549\ 000}{65\ 000\ 000}$	1	AO2/2 4.5.3.2
	6.2	allow 6.2 with no working shown for **3** marks allow ecf from second step correctly rounded for **1** mark	1	AO2/2 4.5.3.2

Question 9 continues on the next page

Question 9 continued

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.4	could be other reasons for glucose in urine **or** blood test gives current / immediate result, urine levels might be several hours old **or** not always glucose in urine		1	AO3/1a 4.5.3.2
09.5	results not affected by glucose from food **or** 8 hours is sufficient time for insulin to have acted on any glucose from food eaten **or** so that there is a low starting point to show the effect		1	AO2/1 4.5.3.2
09.6	(patient **A**) glucose level much higher (than **B**) and remains high / does not fall	no mark for identifying **A**	 1 1	 AO3/2a 4.5.3.2 AO3/2a 4.5.3.2
Total			**14**	