

Blood glucose and diabetes: practice questions

5 questions • 16 marks • mark scheme at the back

For Edexcel GCSE Biology 1BI0 and Combined Science 1SC0. **Triple only** is not in Combined Science. **Higher tier** is only on the Higher paper.

Name

Total / 16

- 1** Explain how insulin controls blood glucose concentration after a meal. **[3 marks]**

- 2** **Higher tier** Explain how glucagon increases blood glucose concentration. **[3 marks]**

- 3** Describe the causes of type 1 diabetes and type 2 diabetes and how each is controlled. **[4 marks]**

- 4** A woman has a mass of 72 kg and a height of 1.60 m. Her waist is 88 cm and her hips are 100 cm. (a) Calculate her BMI. Give your answer to 1 decimal place. (2) (b) Calculate her waist:hip ratio. (1) **[3 marks]**

Answer =

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- 5** The table shows practice figures for the percentage of adults with type 2 diabetes in three BMI groups. Evaluate the evidence that a higher BMI causes type 2 diabetes. **[3 marks]**

Type 2 diabetes in three BMI groups (practice figures)

BMI group	Adults with type 2 diabetes (%)
Below 25	2
25 to 29.9	6
30 and above	15

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Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [3]

- the pancreas secretes insulin into the blood (1)
- insulin causes cells to take up glucose from the blood (1)
- the liver converts glucose into glycogen for storage (1)
- so blood glucose concentration falls to normal (1)
- Max 3

2. [3] **Higher tier**

- glucagon is secreted by the pancreas when blood glucose is low (1)
- glucagon acts on the liver (1)
- the liver changes glycogen into glucose (1)
- glucose is released into the blood (1)
- Max 3

3. [4]

- type 1: the pancreas does not produce enough insulin (1)
- type 1 is controlled by insulin injections (1) allow monitoring blood glucose and controlling carbohydrate in the diet
- type 2: body cells no longer respond to insulin (1)
- type 2 is controlled by diet and exercise / weight loss (1) allow medication

4. [3]

- (a) height squared = $1.60 \times 1.60 = 2.56$ (1)
- BMI = $72 \div 2.56 = 28.1$ (1) allow 28.125
- (b) $88 \div 100 = 0.88$ (1)

5. [3]

- as BMI increases the percentage with type 2 diabetes increases / positive correlation (1) allow use of figures
- a correlation does not prove that high BMI causes diabetes (1)
- other factors, such as diet, exercise or age, may be involved / BMI does not show fat compared with muscle (1)