

Question 20 (Answer: **D**)

- Adrenaline prepares the body for vigorous action.
- It makes the liver release glucose, so blood glucose rises.
- It also speeds the heart, so the pulse rate rises.

Question 23 (Answer: **B**)

- The pancreas lies just below and behind the stomach.
- It secretes insulin and glucagon into the blood.
- Adrenaline comes from the adrenal glands on the kidneys, and the sex hormones from the gonads.

Question 24 (Answer: **B**)

- Nervous control uses electrical impulses, so it is very fast but the effect is brief.
- Hormonal control uses chemicals carried in the blood, so it is slower.
- But a hormone persists in the blood, so its effect lasts much longer.

Question 23 (Answer: **C**)

- Glands sitting on top of the kidneys are the adrenal glands.
- They release adrenaline, which prepares the body for action.
- That means a faster heart rate, wider pupils and more glucose released – not a decrease.

Question 25 (Answer: **D**)

- Glucagon is made in the pancreas, by the same islets that make insulin.
- It acts *on* the liver, making it convert glycogen back into glucose.
- So the pancreas produces it and the liver responds to it.

Question 25 (Answer: **A**)

- Glucagon makes the liver convert glycogen back into glucose, raising blood glucose.
- Adrenaline does the same thing, mobilising glucose for action.
- Insulin does the opposite – it lowers blood glucose.

3(a)	pancreas ; liver ; glycogen ; negative <u>feedback</u> / homeostasis ;
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3(b)	<i>any two from:</i> 1 monitoring blood glucose ; 2 insulin, injections / pump ; 3 artificial pancreas ; 4 counting carbohydrates (in diet) ; 5 matching, food / carbohydrate, intake to activity ; 6 keeping a healthy weight ; 7 pancreas / islet cell, transplant ; 8 AVP ;
3(c)	(–)43(%) ;;;
3(d)	<i>any three from:</i> 1 (adrenaline) causes the, breakdown / conversion, of, glycogen / stored carbohydrate ; 2 increasing (blood) glucose concentration ; 3 glucose used in respiration releasing energy ; 4 energy used for muscle contraction ; 5 AVP ;