

Question 22 (Answer: **A**)

- When too cold the body must generate heat and lose less of it.
- Shivering makes the muscles contract rapidly, releasing heat from respiration.
- Vasoconstriction narrows the skin arterioles, so less blood flows near the surface and less heat escapes.

Question 24 (Answer: **C**)

- When too hot, the body needs to lose heat through the skin.
- The arterioles supplying the skin capillaries widen – vasodilation.
- More blood flows near the surface, so more heat is radiated away.

3(a)	pancreas ; liver ; glycogen ; negative <u>feedback</u> / homeostasis ;
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 ;

Question 22 (Answer: **D**)

- Insulin from the pancreas makes the liver convert glucose into glycogen for storage.
- Glucagon reverses that, converting glycogen back into glucose.
- So the pancreas makes the hormones and the liver does the storing – both organs are needed.

2(a)(i)	2 and °C ;
2(a)(ii)	horizontal line drawn at 37 °C ;
2(a)(iii)	<u>negative feedback</u> ;
2(a)(iv)	<i>any five from:</i> 1 brain / receptors, detect(s), low temperature / change in temperature ; 2 constriction of arterioles / vasoconstriction ; 3 less blood flow to, skin-surface / capillaries ; 4 ref to shivering / increased or rapid (skeletal) muscle contraction ; 5 increase in rate of respiration ; 6 hair erector muscles contract / hair stands on end ; 7 hair traps (insulating layer of) air ; 8 AVP ;
2(b)(i)	A ;
2(b)(ii)	C – (hair) erector muscle ; D – sensory neurone ;