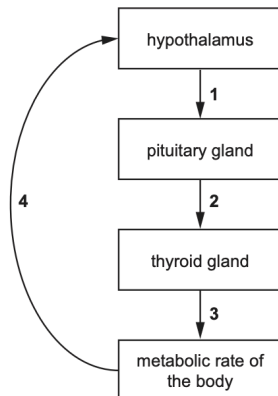


Q1. (2018)

- 9 The level of thyroxine in the body is controlled by negative feedback.

The diagram shows how this takes place.



Which numbers on the diagram represent the hormones TSH and thyroxine?

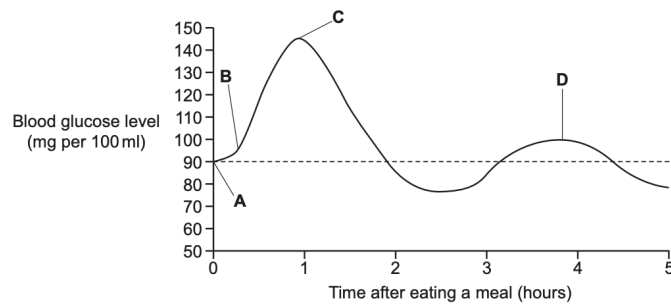
- A 2 = thyroxine 3 = TSH
 B 1 = TSH 3 = thyroxine
 C 3 = TSH 4 = thyroxine
 D 2 = TSH 3 = thyroxine

Your answer

[1]

Q2. (2018)

- 10 The graph shows blood glucose levels after eating a meal.



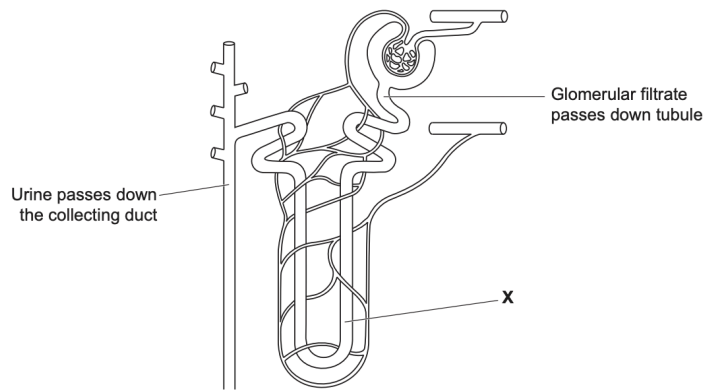
Which point A, B, C or D on the graph would the insulin level in the blood be at its highest level?

Your answer

[1]

Q3. (2018)

18 The diagram shows a kidney tubule (nephron).



A)

(a) (i) What is the name of part X?

..... [1]

B)

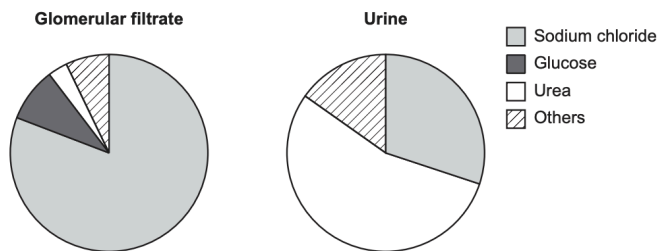
(ii) The hormone ADH affects the permeability of part of the kidney tubule.

Name the part of the tubule affected by ADH.

..... [1]

C)

(b) The diagram shows the composition of glomerular filtrate and urine.



What evidence is there to suggest that selective reabsorption occurs in the kidney tubule?

Use evidence from the diagram to support your answer.

.....

 [4]

D)

(c)* Sports drinks are usually one of three types. Look at the table of information on these types of sports drink.

Sports drink	Concentration of solutes relative to body fluids	Mass of carbohydrates (g) (mainly sugars)	Order of how quickly the drink is absorbed
Hypotonic	Less	<4	1
Isotonic	Same	4 – 8	2
Hypertonic	More	>8	3

An athlete is going to run a 10000 metre race. About an hour before the race the athlete drinks a hypertonic sports drink.

The athlete completes the 10000 metre race. After the race the athlete drinks an isotonic sports drink.

Explain how the race causes changes in water, salt and sugar levels in the athlete's body and explain the athlete's choice and timing of drinks.

[6]

.. [6]

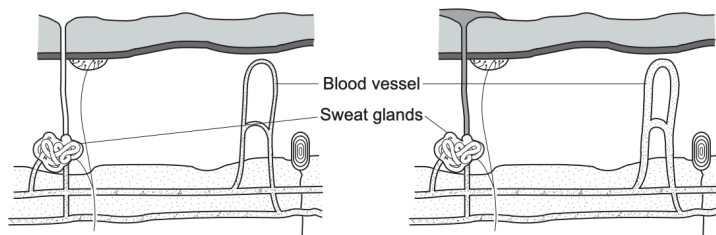
Q4. (2018)

20 (a) This question is about control and coordination.

The diagrams show a section through the skin in two different conditions.

Diagram A

Diagram B



Which diagram shows the skin in a hot, humid environment?

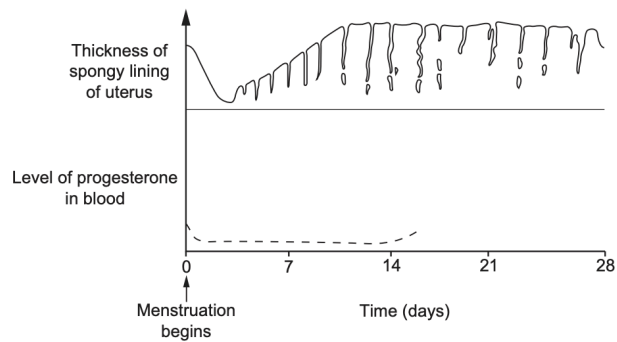
Explain your answer.

[3]

... [3]

Q5. (2018) – 20c

- (c) The graph shows how the lining of the uterus changes during the menstrual cycle and also shows the level of progesterone in the blood.



A)

- (i) Where in the ovary is progesterone produced?

..... [1]

B)

- (ii) Draw a line to continue the graph to show the levels of progesterone until day 28 (assume that an egg has not been fertilised). [2]

Q6. (2020)

- 17 Fig. 17.1 shows the mass of urea in the urine plotted against the BMI (Body Mass Index) for nine boys. BMI is a value often used to see if a person is a healthy mass for their height.

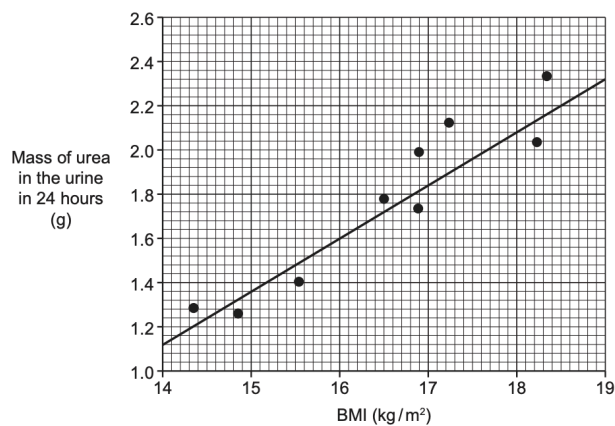


Fig. 17.1

A)

- (a) (i) What does the graph show about the relationship between BMI and the mass of urea in the urine?

..... [1]

B)

- (ii) A boy has a BMI of 16. He produces 1000 cm³ of urine in 24 hours.
Calculate the concentration of urea in the boy's urine.

Concentration = g/cm³ [2]

C)

(iii) Fig. 17.2 shows the mass of urea in the urine against the BMI for nine different boys.

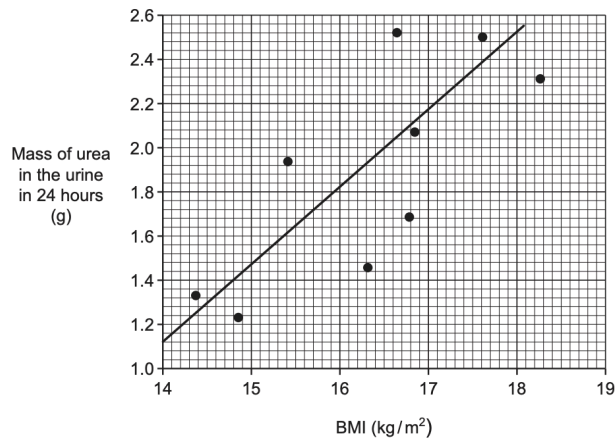


Fig. 17.2

Give **two** differences in the relationship between BMI and the mass of urea in the urine shown in Fig. 17.1 and Fig. 17.2.

- 1
- 2
- [2]

D)

(b) The kidney filters the blood. The fluid produced by filtering the blood passes through kidney tubules.

Each kidney tubule contains a number of different parts.

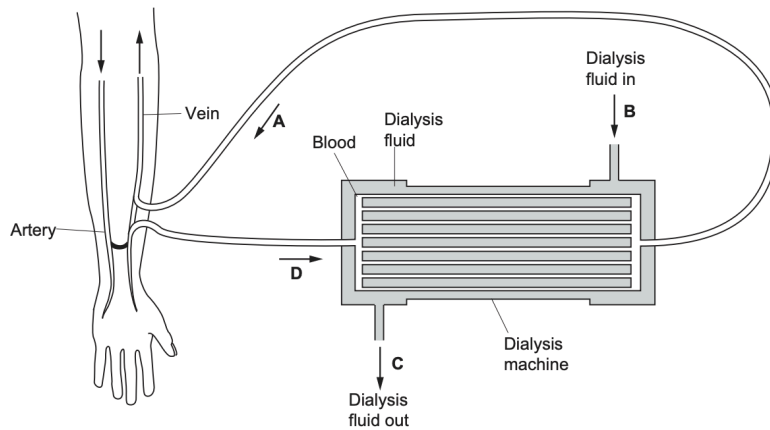
Put a number (1 to 5) in the boxes to show the order of the parts that the liquid passes through.

The first one has been done for you.

Bowman's capsule	1
Collecting duct	
Proximal convoluted tubule	
Loop of Henlé	
Second coiled region	

[3]

- 10 A dialysis machine is shown in the diagram. The dialysis machine functions in a similar way to the kidney tubule (nephron).



Which letter shows the part of the dialysis machine that represents the collecting duct of the kidney tubule?

Your answer

[1]

Q8. (2021)

- 11 Which description identifies the effect of ADH on the collecting duct of the kidney tubule?

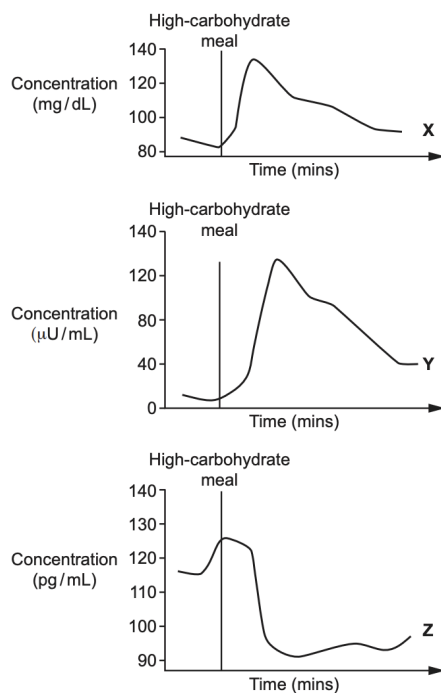
- A ADH decreases permeability to water, decreasing reabsorption.
- B ADH decreases permeability to water, increasing reabsorption.
- C ADH increases permeability to water, decreasing reabsorption.
- D ADH increases permeability to water, increasing reabsorption.

Your answer

[1]

Q9. (2021)

- 12 The graphs show the concentrations of three substances X, Y and Z in the blood after a high carbohydrate meal. One of the substances is glucose and the other two are hormones.



Which row of the table identifies substances **X**, **Y** and **Z**?

	Substance X	Substance Y	Substance Z
A	glucagon	insulin	glucose
B	glucose	glucagon	insulin
C	insulin	glucose	glucagon
D	glucose	insulin	glucagon

Your answer

[1]

Q10. (2021)

A)

19 This question is about homeostasis.

(a) Explain why homeostasis is important for metabolism in humans.

.....

.....

.....

..... [2]

B)

(b) (i) In humans, the skin is involved in homeostasis.

Changes of blood flow in the skin occur in colder environments.

Describe **two** other changes that occur in the skin in colder environments.

1

.....

2

..... [2]

C)

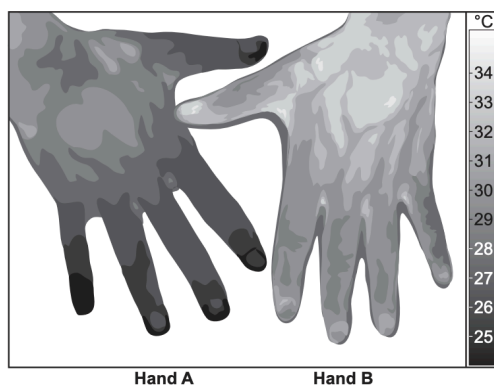
(ii) Give **one** way that the structure of blood vessels allows them to change blood flow in the skin.

.....

..... [1]

D)

(iii) Raynaud's disease produces a poor flow of blood to the skin.
The thermograph image shows changes in temperature at the skin surface.



Explain which hand is from a person with Raynaud's disease.

.....

.....

..... [2]

E)

- (c) Thyroxine hormone levels in the body are maintained about a fixed point.

Explain how variables in the body are maintained about a fixed point.

.....

.....

.....

..... [2]

Q11. (2021) – 20c

- (c) Desert marathons take place in extreme heat. High external temperatures can cause dehydration.

Fig. 20.1 and Fig. 20.2 show some of the effects of dehydration on the body during a race.

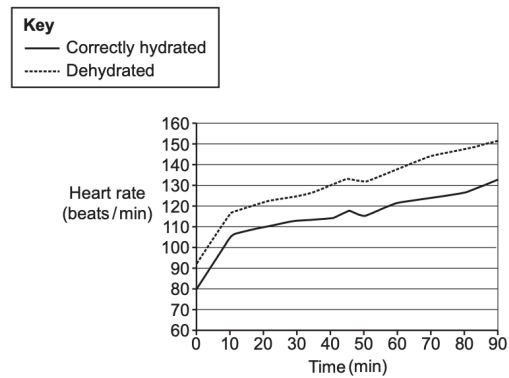


Fig. 20.1

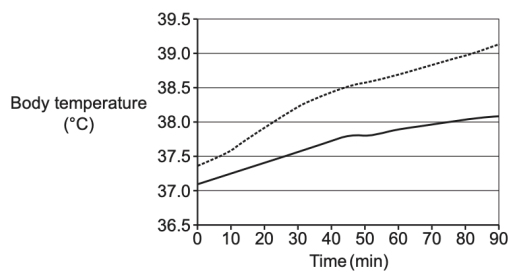


Fig. 20.2

A)

- (i) Explain the changes shown by the graphs in Fig. 20.1 and Fig. 20.2.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

B)

- (ii) Suggest what an athlete could do in advance to minimise the effect of these challenges during a desert marathon.

.....
.....
.....
..... [2]

Q12. (2022)

A)

20 Hypothyroidism occurs when the body has an underactive thyroid gland.

- (a) Explain why people with hypothyroidism can have less tolerance to cold conditions.

.....
.....
..... [2]

B)

- (b) Hypothyroidism can also change the way the body processes fat.

- This can cause high cholesterol levels that lead to deposits of cholesterol in the coronary artery.
- The coronary artery supplies blood to the cardiac muscle.

Suggest why cholesterol deposits could affect the correct functioning of the heart.

.....
.....
.....
..... [2]

C)

- (c) In rare cases, hypothyroidism can lead to a condition called myxoedema coma. In this condition, the body's temperature falls below 35 °C and the person becomes hypothermic.

Explain why hypothermia is harmful to the body.

.....
.....
.....
..... [3]

D)

- (d) The UK population is 68 million.
It is estimated that 2% of the UK population has hypothyroidism.

Calculate how many million people in the UK have hypothyroidism.

Number of people = million [2]

Q13. (2023)

A)

- 18 (a) The colour of a person's urine changes depending on the concentration of their blood.

Complete the sentences below to describe why a person will have urine that is dark in colour.

Use the words in the list.

ADH	FSH	glucagon	hypothalamus
medulla	pituitary gland		

If a person has not consumed enough water, the concentration of the blood increases.

This is detected by receptors in the

These receptors send a message to the

This causes more to be released into the bloodstream.

[3]

B)

- (b) Give **one** factor, other than lack of water intake, that could cause a person to have concentrated urine.

..... [1]

C)

- (c) Nephritis is a condition where part of the kidney tubule becomes inflamed. The result of this is that proteins can enter the tubule and pass out in the urine.

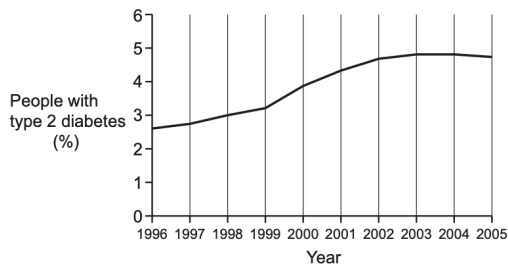
Describe a test that could be used to determine if a patient has nephritis.

.....

 [2]

Q14. (2023)

- (c) The graph shows the percentage of people with type 2 diabetes between 1996 and 2005.



Suggest reasons for the changes in the percentage of people with type 2 diabetes shown in the graph.

.....

 [3]

Q15. (2024)

4 Which statement describes how the body responds to cold temperatures?

- A Shivering and vasoconstriction
- B Shivering and vasodilation
- C Sweating and vasoconstriction
- D Sweating and vasodilation

Your answer

☐

[1]

Q16. (2024)

12 Alcohol reduces the release of ADH.

Which statement describes the effect on urine from drinking alcohol?

- A Concentrated urine with a higher volume
- B Concentrated urine with a lower volume
- C Diluted urine with a higher volume
- D Diluted urine with a lower volume

Your answer

☐

[1]