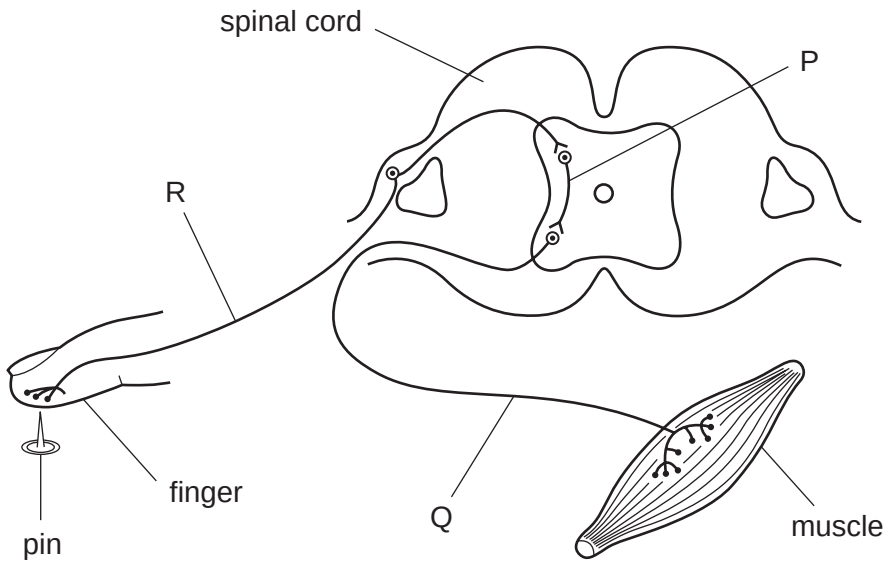
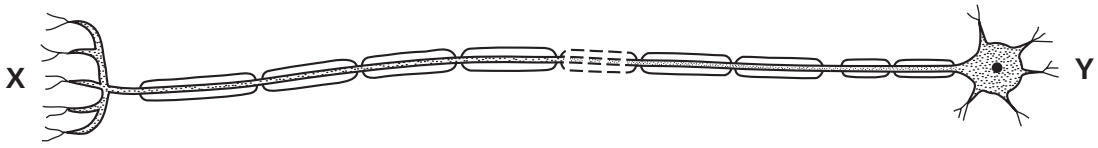
1 The diagram represents a simple reflex arc.



What is the sequence of nerve cells through which an impulse passes during a reflex action?

	first → last		
A	P	Q	R
B	Q	R	P
C	Q	P	R
D	R	P	Q

2 The diagram shows a neurone.



Which structures could be found at **X** and **Y**?

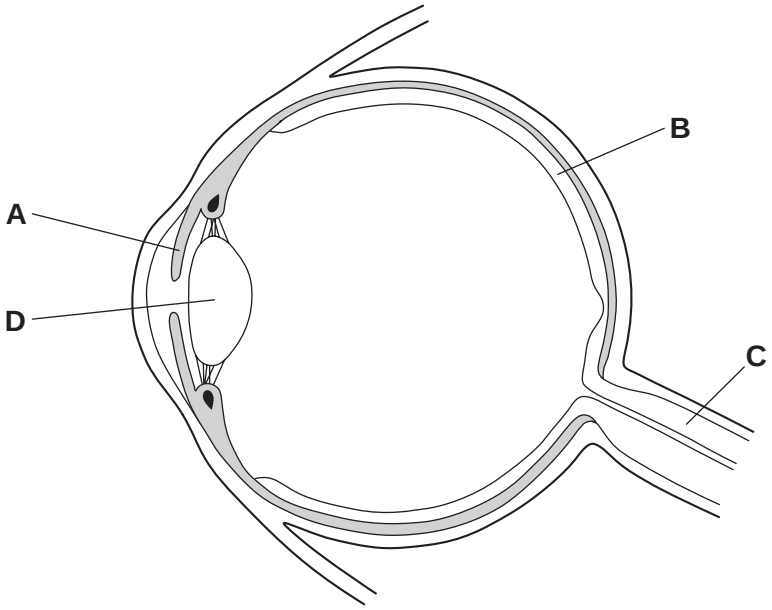
	X	Y
A	brain	intestine
B	brain	leg
C	eye	hand
D	gland	spinal cord

3 What will be the effect of strenuous exercise on the volume of water lost through the skin and the kidneys?

	volume of water lost through the skin	volume of water lost through the kidneys
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

4 The diagram shows a section through an eye.

Which structure controls how much light enters the pupil?



5 What are the effects of adrenaline?

	breathing rate	pulse rate
A	decreased	decreased
B	increased	increased
C	increased	no effect
D	no effect	increased

6 A person has been sitting in a room at 35 °C for 30 minutes.

What would be the effect of then drinking several glasses of iced water?

	blood temperature	rate of sweating
A	falls	falls
B	falls	rises
C	rises	falls
D	rises	rises

7 What is an example of gravitropism?

A a chemical messenger produced by a plant

B a painful sensation in response to a stimulus

C the growth of a plant root towards the centre of the Earth

D the growth of a plant shoot towards light

8 Which organ produces a hormone?

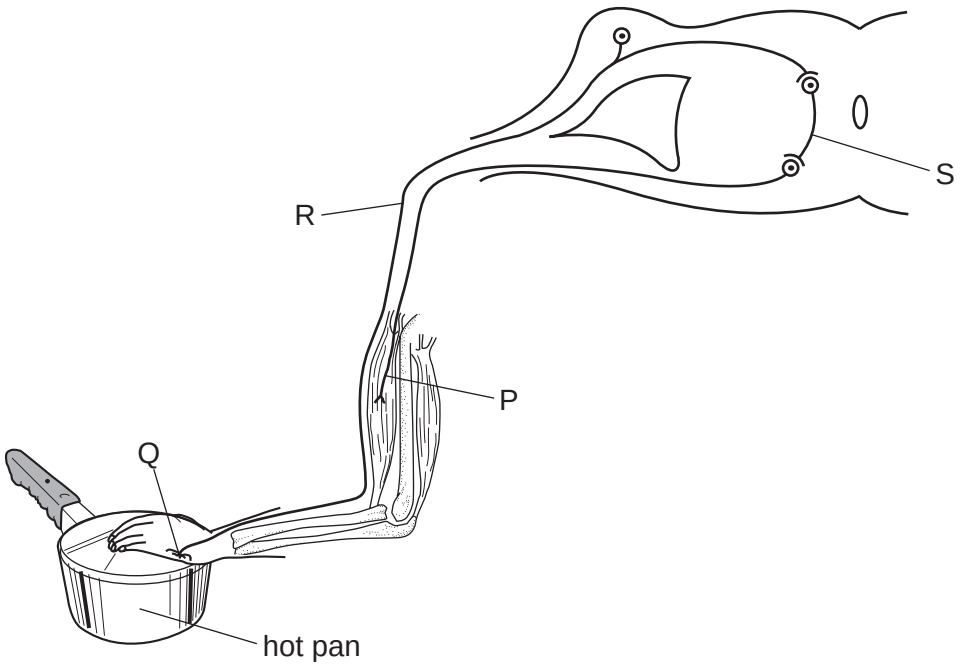
A heart

B lung

C ovary

D spinal cord

9 The diagram shows the structures involved in a reflex action.



What is the sequence in which impulses pass through these structures?

A P → S → R → Q

B Q → R → S → P

C Q → P → R → S

D S → P → Q → R

10 Which part of the human eye is sensitive to light?

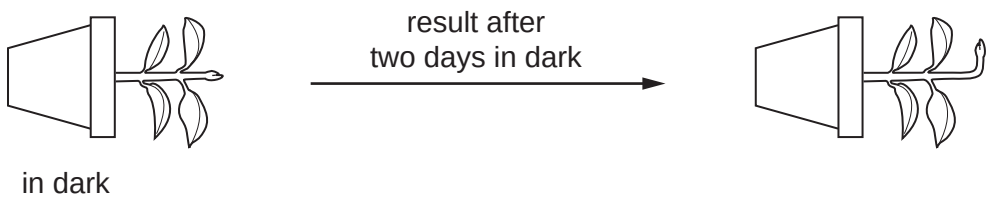
A iris

B lens

C optic nerve

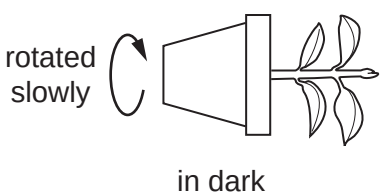
D retina

11 The diagram shows an experiment to investigate the response of a plant stem to gravity.

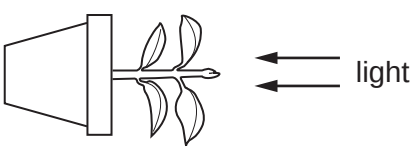


What is a suitable control for this experiment?

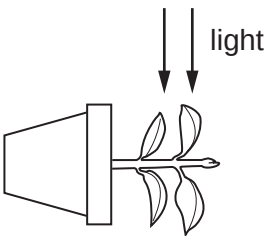
A



B



C



D

12 Why do mammals sweat?

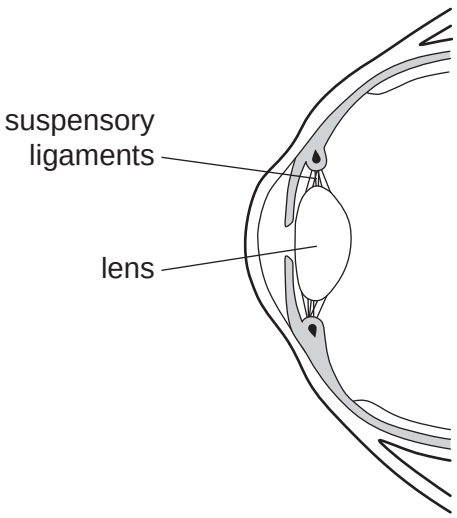
A to cool the body

B to lose water vapour through the skin surface

C to release energy through the oxidation of glucose

D to remove glucose from the blood

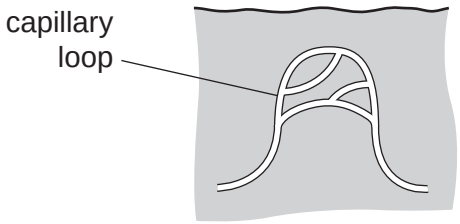
13 The diagram shows a section through part of the human eye.



When a person looks at an object which is far away from their eye, which of the following happens?

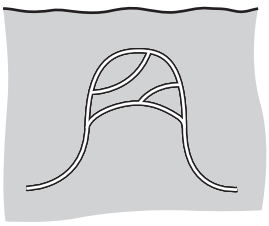
	suspensory ligaments	lens
A	slacken	becomes fatter
B	slacken	becomes thinner
C	tighten	becomes fatter
D	tighten	becomes thinner

14 The diagram shows a capillary loop in the skin of a mammal.

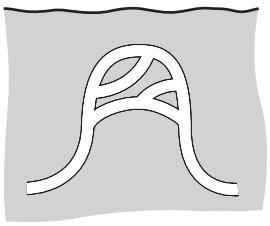


What will the capillary loop look like if the mammal becomes cold?

A



B



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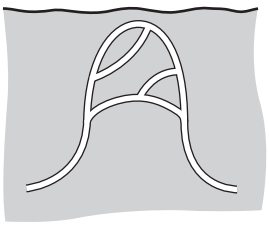
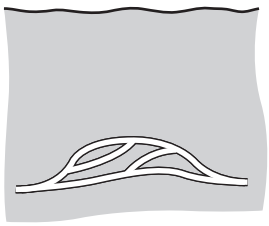
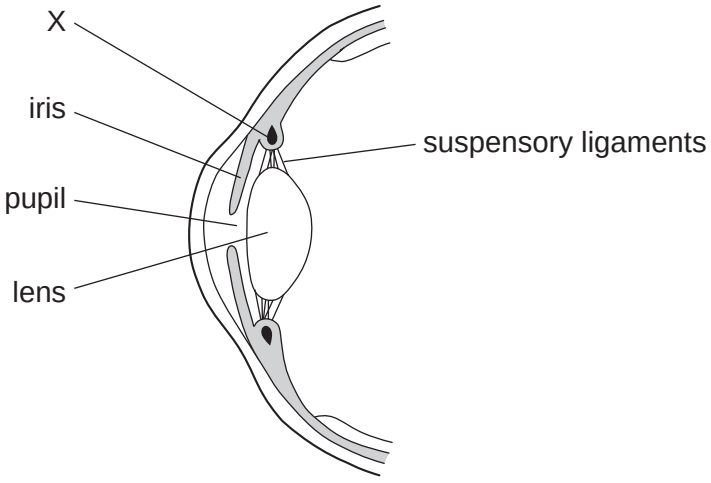


D



15 The diagram shows a section through part of the eye.



X is a contracted ciliary muscle.

What will happen when it relaxes?

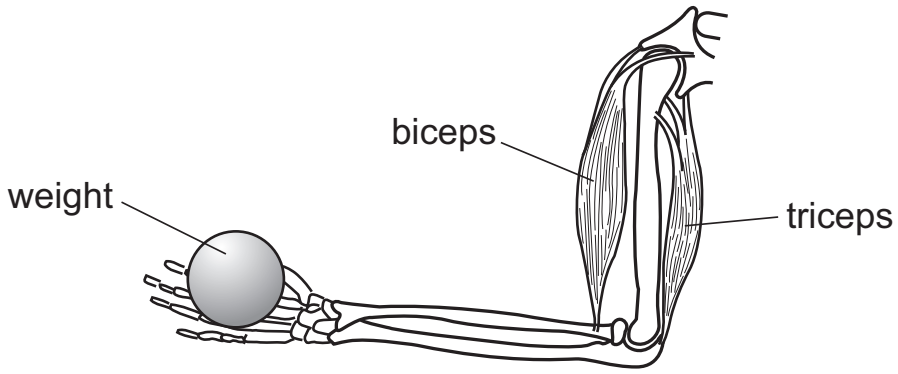
A The lens will decrease its curvature.

B The lens will increase its curvature.

C The size of the pupil will decrease.

D The size of the pupil will increase.

16 The diagram shows muscles and bones in a person's arm.



What happens to the muscles as the weight is lowered?

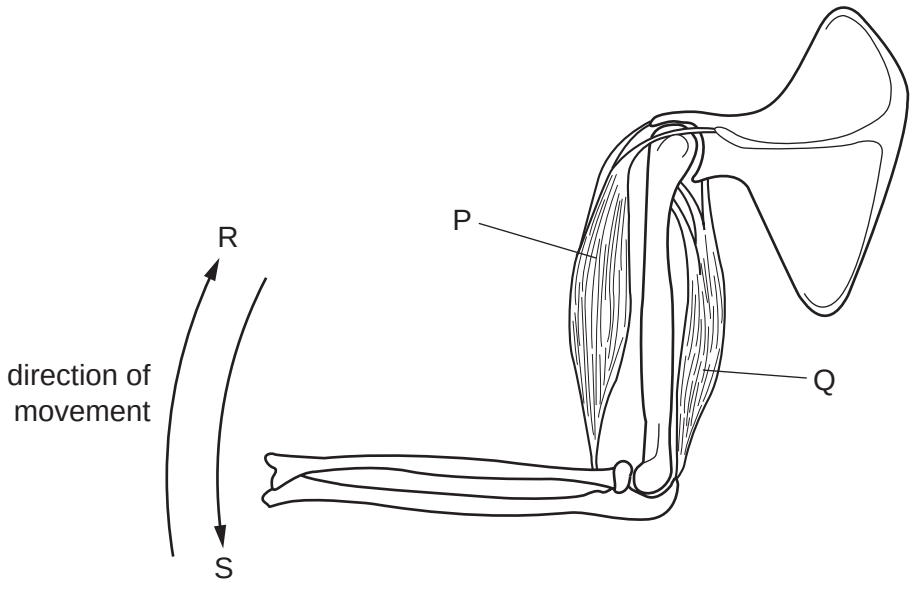
	biceps	triceps
A	lengthens	lengthens
B	lengthens	shortens
C	shortens	lengthens
D	shortens	shortens

17 In an experiment to investigate phototropism, a plant shoot is grown with light coming from one side only.

After two days, in which region has the greatest rate of growth occurred?

start of experiment after two days

18 The diagram shows two antagonistic muscles and the directions of movement that they produce.



Which row correctly identifies these muscles and the directions of movement they produce on contraction?

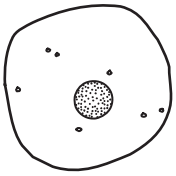
	muscle P		muscle Q	
	name	movement	name	movement
A	biceps	R	triceps	S
B	biceps	S	triceps	R
C	triceps	R	biceps	S
D	triceps	S	biceps	R

19 How does the skin react when the body becomes very warm?

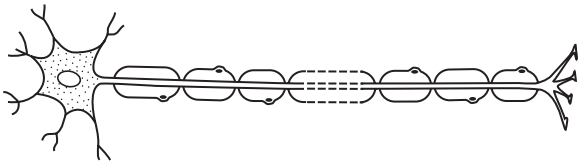
	blood vessels	sweat production
A	dilate	almost stops
B	dilate	increases
C	move towards skin surface	almost stops
D	move towards skin surface	increases

20 Which diagram shows a sensory neurone?

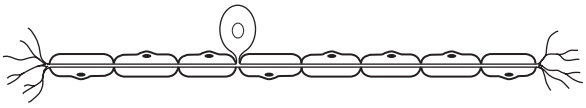
A



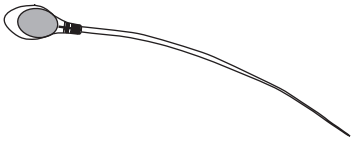
B



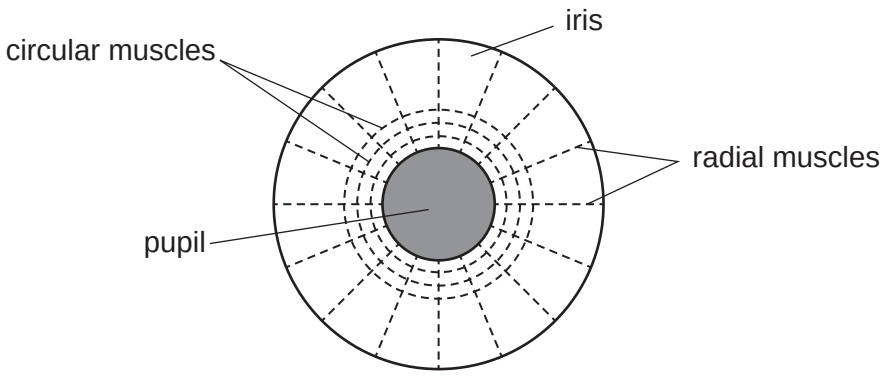
C



D



21 The diagram shows the muscles that control the size of the pupil in an eye.



How do the muscles make the pupil smaller?

	circular muscles	radial muscles
A	contract	contract
B	contract	relax
C	relax	contract
D	relax	relax

22 What would be the effects of vasodilation and sweating on the body temperature and on the amount of moisture on the surface of the skin?

	body temperature	moisture on skin surface
A	decreased	decreased
B	decreased	increased
C	increased	decreased
D	increased	increased

23 What would be the pupil size and lens shape of a person reading a mobile phone text message in a brightly-lit room?

	pupil size	lens shape
A	large	fat
B	large	thin
C	small	fat
D	small	thin

24 The table shows a student's water losses on a cool day.

	water loss / cm^3
in urine	1500
in faeces	100
in expired air	400
in sweat	800
total	2800

On a hot day the student's water intake was the same as on the cool day.

On the hot day, which water losses would increase and which would decrease?

	increase	decrease
A	in sweat	in expired air
B	in sweat	in urine
C	in urine	in faeces
D	in urine	in sweat

25 After a meal containing carbohydrates, which row shows the changes in concentration of glucose and urea in the blood as it passes through the liver?

	glucose	urea
A	less	less
B	less	more
C	more	less
D	more	more

26 Which actions straighten the arm at the elbow joint?

	biceps	triceps
A	contracts	contracts
B	contracts	relaxes
C	relaxes	contracts
D	relaxes	relaxes

27 Which response is a result of geotropism?

A flowers being produced

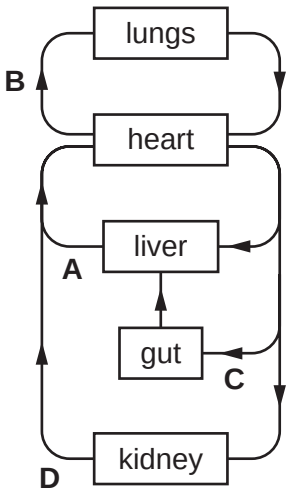
B growing bigger leaves

C roots growing downwards

D seeds germinating

28 The diagram shows part of the human circulatory system.

In which vessel do the break-down products of hormones first appear?



29 Which target organ releases glucose into the blood-stream as a result of the action of adrenaline?

A adrenal gland

B kidney

C liver

D pancreas

30 Which responses are shown by the shoot of a plant?

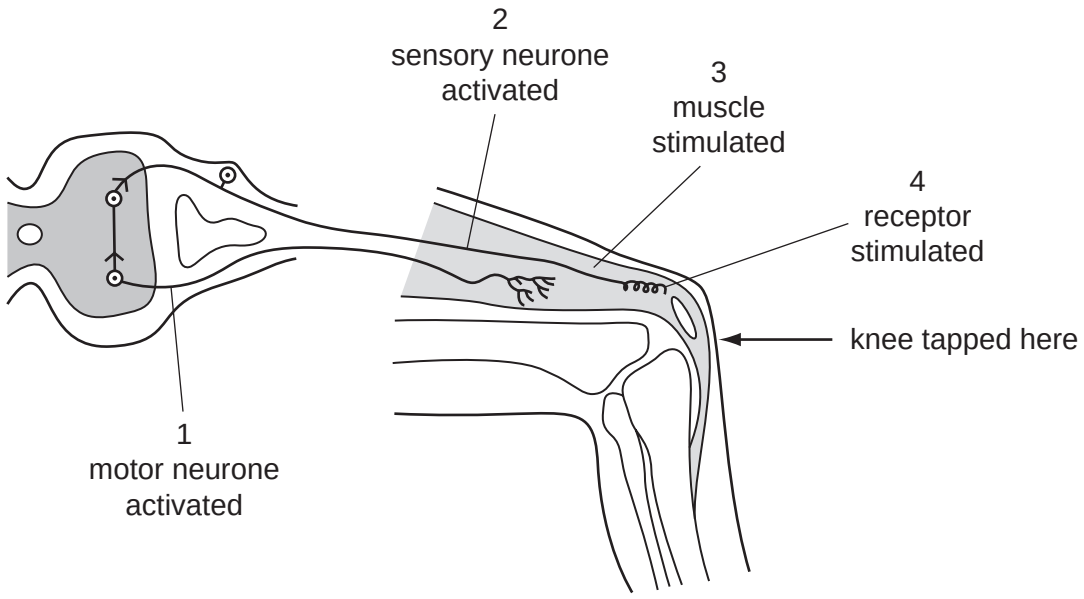
	geotropism	phototropism
A	–	–
B	–	+
C	+	–
D	+	+

key

+ grows towards the stimulus

– grows away from the stimulus

31 The diagram shows a simple reflex arc.



What is the correct order of events after the knee is tapped?

A 1 → 2 → 3 → 4

B 1 → 4 → 2 → 3

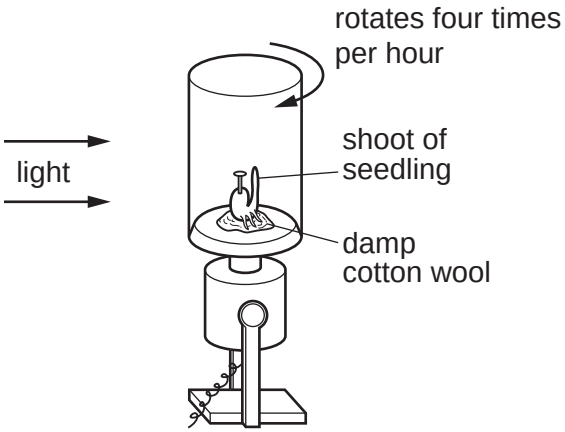
C 4 → 2 → 1 → 3

D 4 → 3 → 2 → 1

32 Which responses occur when a person is too hot?

	sweat produced	shivering	blood vessels supplying skin capillaries
A	no	yes	constricted
B	no	yes	dilated
C	yes	no	constricted
D	yes	no	dilated

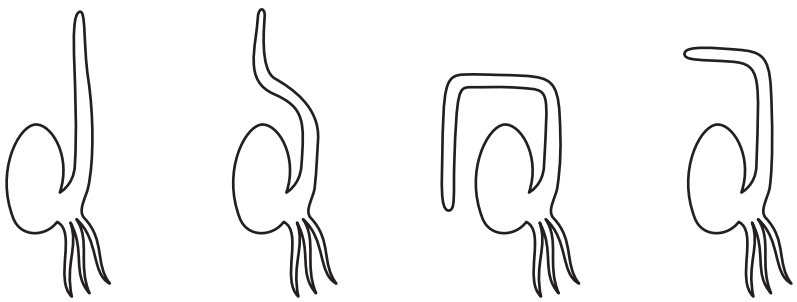
33 The diagram shows the shoot of a seedling, fixed to a rotating platform that is being lit from one side only.



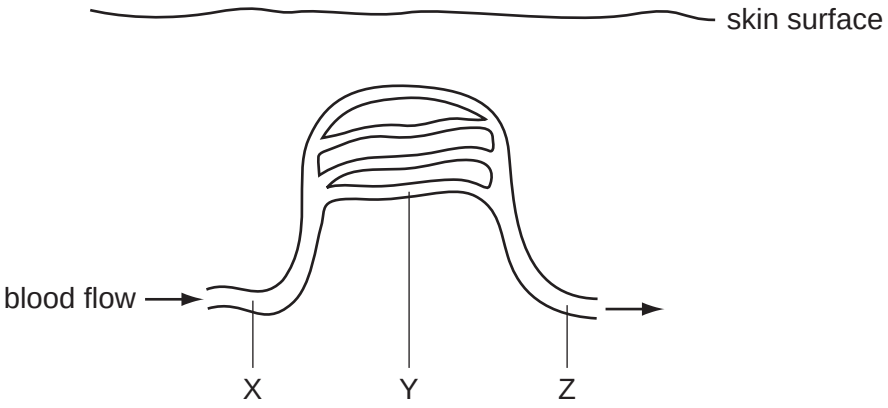
The platform was allowed to rotate for two days, then it was left stationary for a further two days.

Which diagram shows the appearance of the seedling after this four-day period?

A **B** **C** **D**



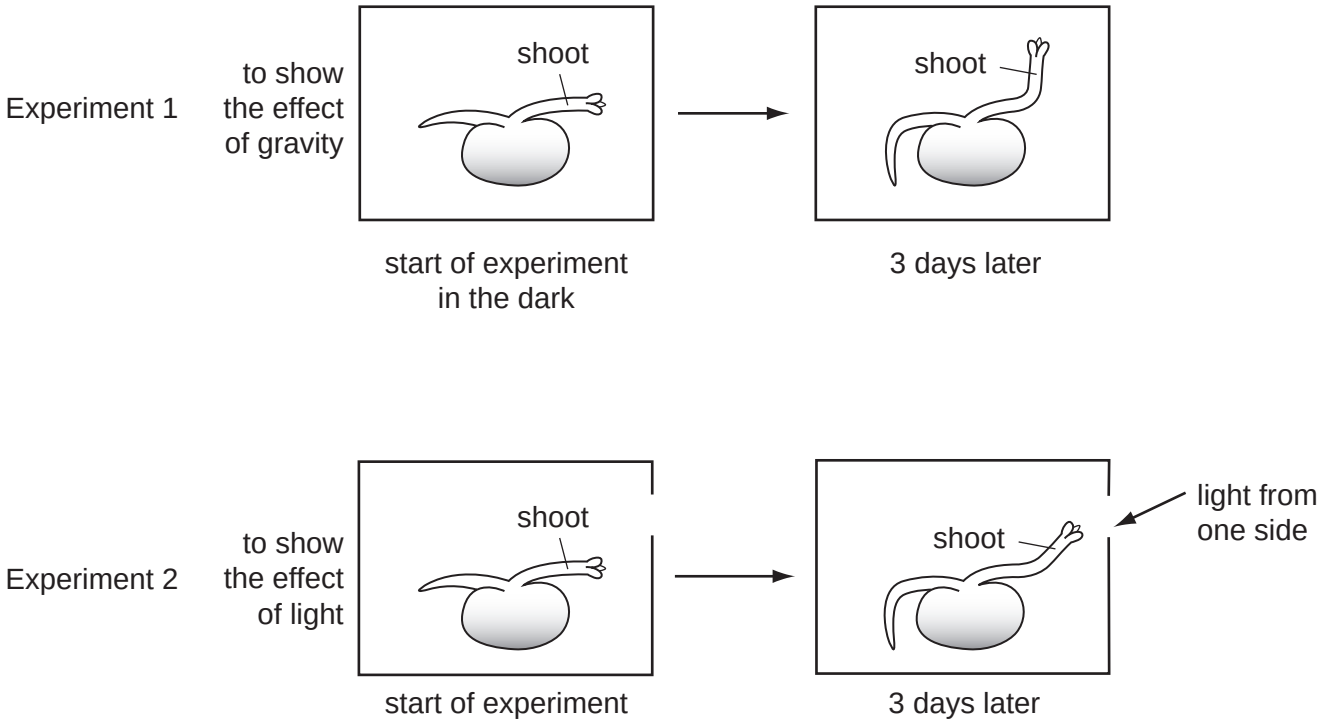
34 The diagram shows some blood vessels near the surface of the skin.



If vasoconstriction occurs at X, what happens to the blood flow at Y and Z?

	Y	Z
A	decreases	decreases
B	decreases	stays constant
C	increases	increases
D	increases	stays constant

35 The diagram shows seedlings in two experiments on the tropic response of seedlings to gravity and light.



How have the seedlings responded?

	to gravity	to light
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = tropic response shown

✗ = no tropic response shown

36 How does sweating cool the body?

A Sweating causes vasodilation.

B Sweating decreases the water content of the blood.

C Urea and salt are lost from the body in sweat.

D Water in sweat evaporates from the skin.

37 At night, a man looks at the stars and then begins to read a map using a bright lamp.

How do the shape of his lenses and the size of his pupils change?

	lenses	pupils
A	fatter	larger
B	fatter	smaller
C	thinner	larger
D	thinner	smaller

38 What is the main function of sweating?

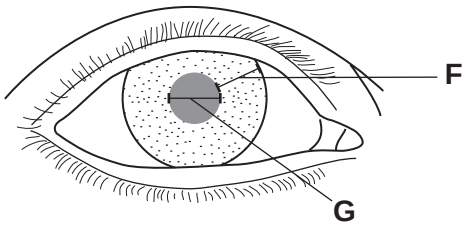
A to excrete urea

B to remove excess salts

C to clean the pores

D to cool the body

39 The diagram shows the eye of a person in a brightly-lit room.



What happens to distance **F** and distance **G** when this person moves into a dimly-lit room?

	distance **F**	distance **G**
A	becomes larger	becomes smaller
B	becomes smaller	stays the same
C	becomes smaller	becomes larger
D	stays the same	becomes smaller

40 A boy accidentally touches a very hot object and immediately takes his hand away.

In this reflex action, what is the effector?

A a heat receptor in his hand

B a motor neurone

C a muscle in his arm

D the spinal cord

41 A man injures his arm in an accident. Afterwards, he can feel objects touching his hand, but he cannot move his hand away from them.

What could cause this?

A Receptors in his hand are damaged.

B The nerve connection is cut only between the receptors in his hand and his central nervous system.

C The nerve connection is cut only between his central nervous system and the effectors in his arm.

D Both of these nerve connections are cut.

42 During a long race, an athlete's skin temperature rises.

What causes this?

A increased sweating

B opening of the pores in the skin

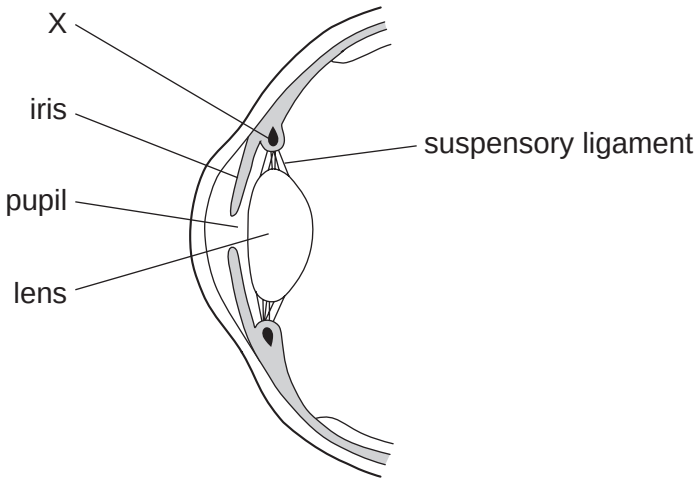
C vasoconstriction of the blood vessels in the skin

D vasodilation of the blood vessels in the skin

43 When the body temperature rises above 37 °C, which changes help to return the temperature to normal?

	activity of sweat glands	blood vessels near skin surface
A	decreased	constricted
B	decreased	dilated
C	increased	constricted
D	increased	dilated

44 The diagram shows a section through part of the eye.



X is a circular muscle.

What effect does it have when it contracts?

A decreases the size of the pupil

B increases the size of the pupil

C pulls on the lens, decreasing its curvature

D reduces the pull on the lens, increasing its curvature

45 Read the following sentence.

> In order to prevent the human body from losing heat, the arterioles supplying the skin become narrow.

Which process does this sentence describe?

A constriction

B shivering

C sweating

D vasodilation

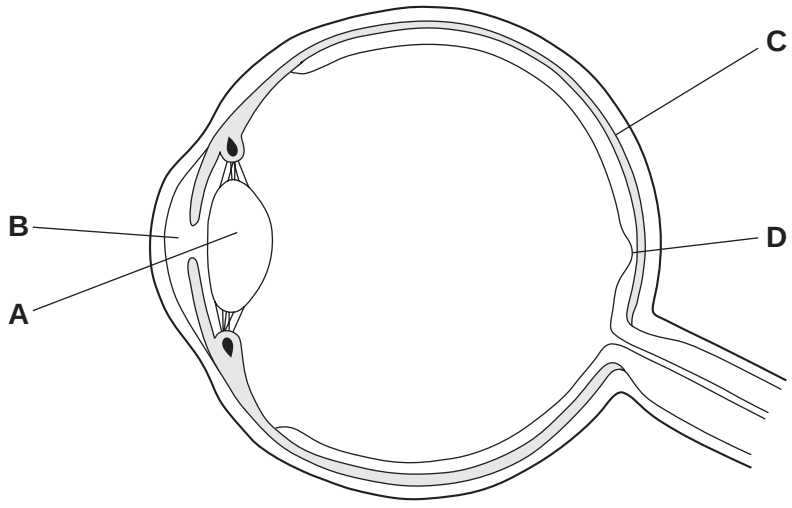
46 During a long-distance race, the body temperature of an athlete begins to rise.

Which changes occur to help return the body temperature to normal?

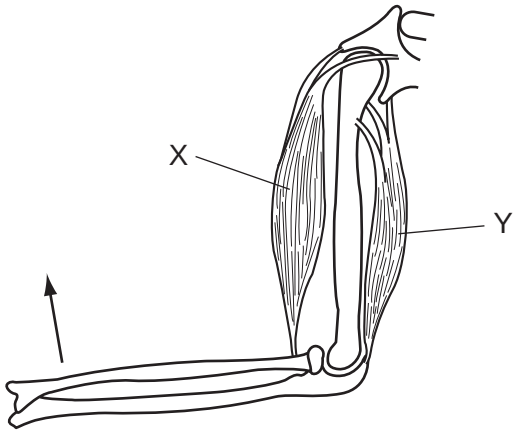
	sweating	blood vessels in the skin
A	decreases	constrict
B	decreases	dilate
C	increases	constrict
D	increases	dilate

47 The diagram shows a section through the human eye.

Which labelled part prevents the internal reflection of light in the eye?



48 The diagram shows the bones and muscles of the upper arm.



What must happen for the bones in the lower arm to move in the direction of the arrow?

A Muscle X contracts and muscle Y contracts.

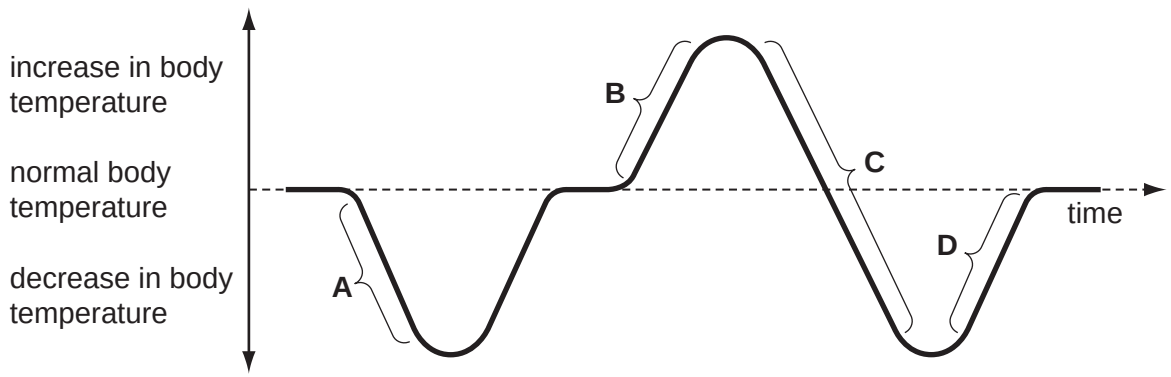
B Muscle X contracts and muscle Y relaxes.

C Muscle X relaxes and muscle Y contracts.

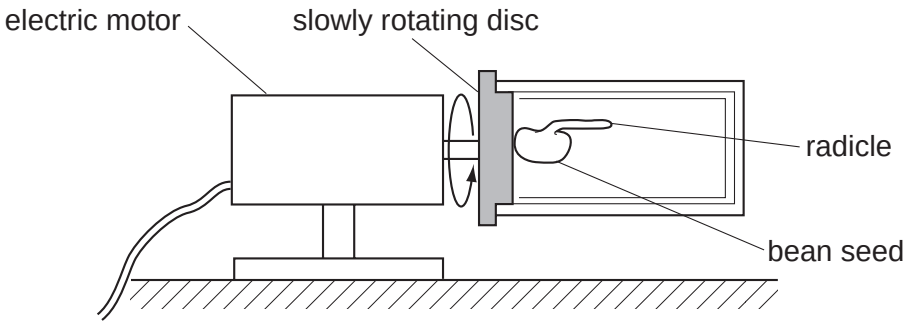
D Muscle X relaxes and muscle Y relaxes.

49 The graph shows the variation in a person's body temperature over a period of time.

Which temperature change is likely to cause most sweating?

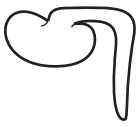


50 The diagram shows a germinated bean seed with a horizontal radicle. This is placed on a slowly rotating disc and is left for three days.



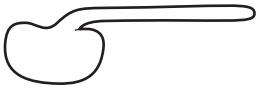
Which diagram shows the appearance of the radicle after three days?

A



B

C



D