

Nervous System, Receptors & Reflex Action

Question Paper

Level	O Level
Subject	Biology
Exam Board	Cambridge International Examinations
Topic	Coordination & Response
Sub Topic	Nervous System, Receptors & Reflex Action
Booklet	Question Paper

Time Allowed: 45 minutes

Score: /37

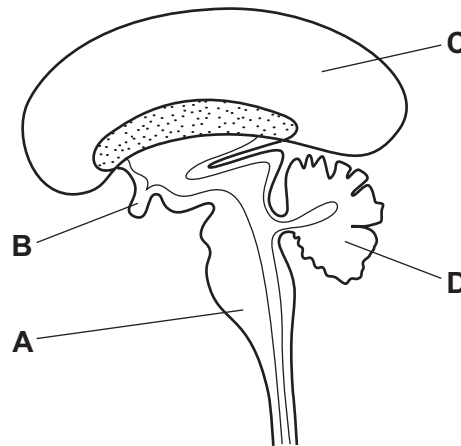
Percentage: /100

1 What is an example of a reflex arc?

- A** retina → motor neurone → relay neurone → sensory neurone → iris muscle
- B** retina → motor neurone → sensory neurone → relay neurone → iris muscle
- C** retina → sensory neurone → motor neurone → relay neurone → iris muscle
- D** retina → sensory neurone → relay neurone → motor neurone → iris muscle

2 The diagram shows a vertical section through the human brain.

Which structure controls balance and muscular coordination?



3 A motor neurone transmits impulses from

- A** muscle to spinal cord.
- B** receptor to muscle.
- C** receptor to spinal cord.
- D** spinal cord to muscle.

4 What are characteristics of all neurones?

	carry information within the brain	stimulate muscles or glands	transmit electrical impulses
A	✓	✓	x
B	✓	x	✓
C	x	✓	x
D	x	x	✓

5 Which row correctly describes the connections of the neurones in a reflex action?

	receptor to central nervous system	between neurones	central nervous system to effector
A	motor neurone	relay neurone	sensory neurone
B	motor neurone	sensory neurone	relay neurone
C	sensory neurone	motor neurone	relay neurone
D	sensory neurone	relay neurone	motor neurone

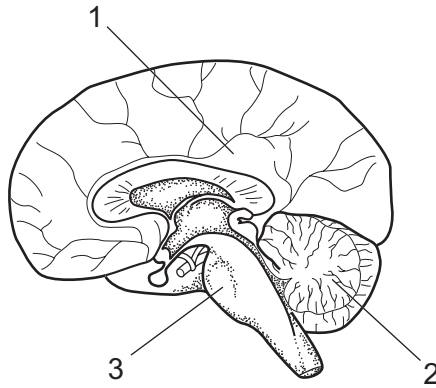
6 What does the hypothalamus control?

- A** body temperature
- B** heart rate
- C** insulin secretion
- D** rate of breathing

7 What is a function of sensory neurones?

- A** transmitting impulses from muscle to spinal cord
- B** transmitting impulses from receptor to muscle
- C** transmitting impulses from receptor to spinal cord
- D** transmitting impulses from spinal cord to muscle

8 The diagram shows a section through the brain.



What are some functions of the parts labelled 1, 2 and 3?

	1	2	3
A	centre for learning	forms visual images	controls digestion
B	controls blood pressure	centre for touch sensations	controls breathing rate
C	controls speech	controls smooth movements	controls heart rate
D	forms memory store	controls balance	determines intelligence

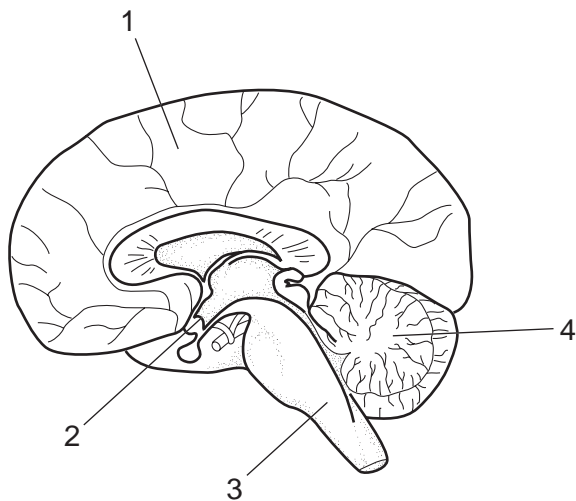
9 Which part of the brain controls body temperature?

- A** cerebellum
- B** cerebrum
- C** hypothalamus
- D** medulla

10 What is the role of motor neurones in reflex action?

- A** carrying nerve impulses from the central nervous system to an effector
- B** connecting a receptor to the central nervous system
- C** forming a synapse with a sensory neurone
- D** transferring energy from the stimulus to a nerve impulse

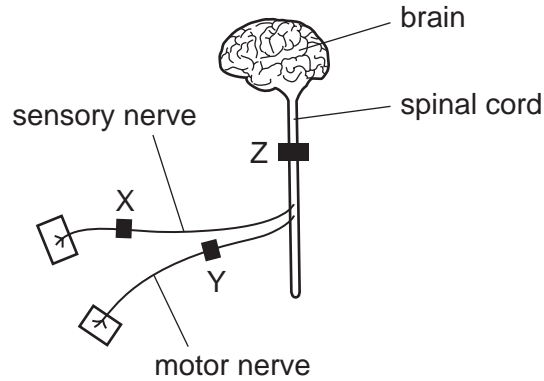
11 The diagram represents a section through the human brain.



What are the numbered parts?

	cerebrum	cerebellum	medulla	hypothalamus
A	1	2	4	3
B	1	4	3	2
C	4	1	3	2
D	4	1	2	3

- 12 A local anaesthetic is a drug used to block nerve impulses. The diagram represents part of the nervous system. X, Y, and Z show sites where the anaesthetic can be injected.



In an experiment, one person can feel a pin prick their leg but cannot move their leg.

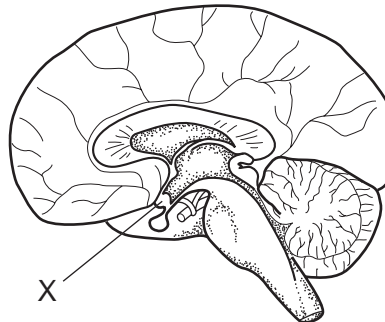
Where was the anaesthetic injected in this person?

- A at X
 - B at Y
 - C at Z
 - D at X and at Y
- 13 Which structure in the brain registers changes in the blood concentration?
- A cerebellum
 - B hypothalamus
 - C medulla
 - D pituitary gland
- 14 A child is frightened by a loud noise and shouts for help.

In which order are the different types of neurone involved in this response?

	involved first	—————→	involved last
A	motor neurone	relay neurone	sensory neurone
B	motor neurone	sensory neurone	relay neurone
C	sensory neurone	motor neurone	relay neurone
D	sensory neurone	relay neurone	motor neurone

15 The diagram shows a section of the brain.



What could be a result of damage to the part labelled X?

- A difficulty in breathing
- B inability to control body temperature
- C may cause rickets
- D raised insulin levels

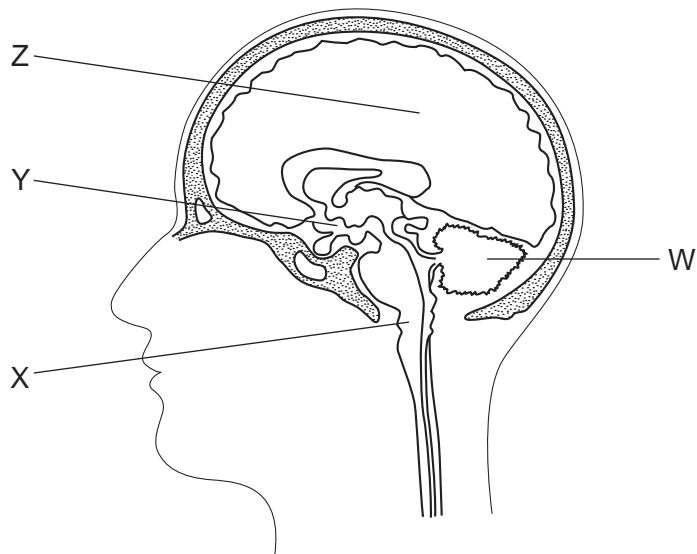
16 Three directions in which nerve impulses in neurones can travel in the nervous system are listed.

- 1 away from the central nervous system
- 2 towards the central nervous system
- 3 within the central nervous system

In which direction do impulses in sensory and relay (intermediate) neurones travel?

	sensory neurone	relay neurone
A	1	2
B	1	3
C	2	1
D	2	3

17 The diagram shows a section through the brain.

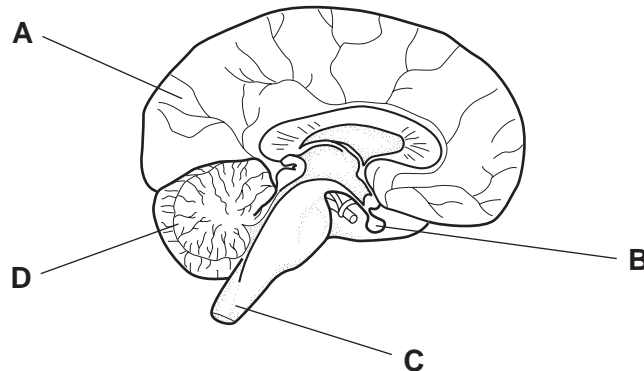


Which regions control balance, breathing and memory?

	balance	breathing rate	memory
A	W	X	Z
B	X	Y	Z
C	Y	Z	W
D	Z	W	Y

18 The diagram represents a section through the brain and part of the spinal cord.

Which part of the brain controls balance?



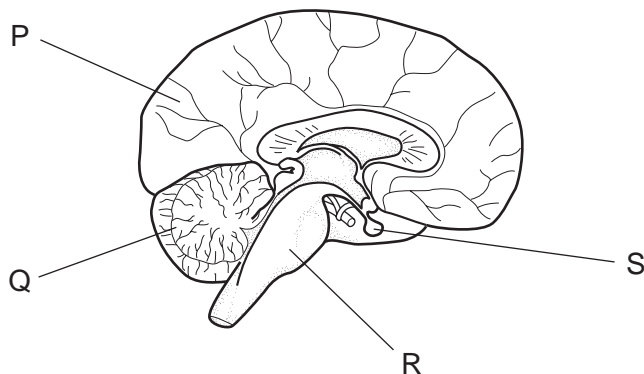
19 What are the functions of the relay, motor and sensory neurones in a reflex response?

	relay neurone	motor neurone	sensory neurone
A	to connect neurones within the central nervous system	to conduct impulses to the effector from the central nervous system	to conduct impulses from the receptor to the central nervous system
B	to conduct impulses to the effector	to connect neurones within the central nervous system	to receive the stimulus
C	to conduct impulses from the central nervous system to the effector	to conduct impulses from the receptor to the central nervous system	to connect neurones within the central nervous system
D	to conduct impulses from the receptor to the central nervous system	to conduct impulses from the receptor to the central nervous system	to conduct impulses to the effector

20 Which part of the central nervous system controls the body's water balance?

- A cerebellum
- B cerebrum
- C hypothalamus
- D medulla

21 The diagram shows a section through the brain and part of the spinal cord.



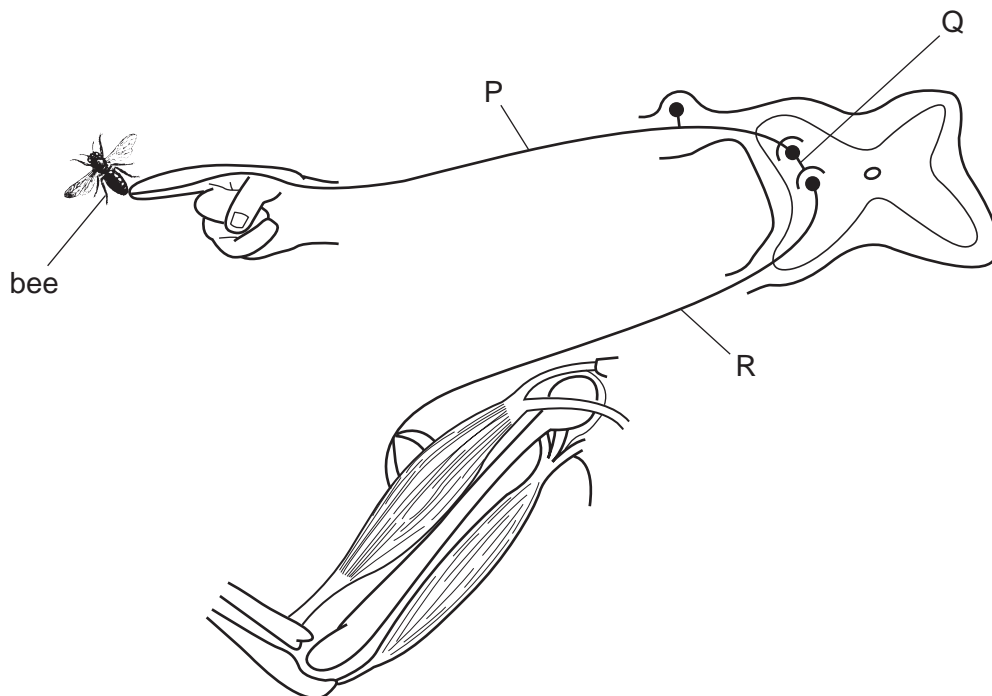
Which row correctly identifies the cerebral hemisphere, cerebellum, medulla and pituitary gland?

	cerebral hemisphere	cerebellum	medulla	pituitary gland
A	P	Q	R	S
B	P	R	Q	S
C	Q	R	S	P
D	S	P	R	Q

22 Which is **not** controlled directly by the nervous system?

- A blood glucose concentration
- B dilation of the blood vessels
- C heart rate
- D pupil diameter in the eye

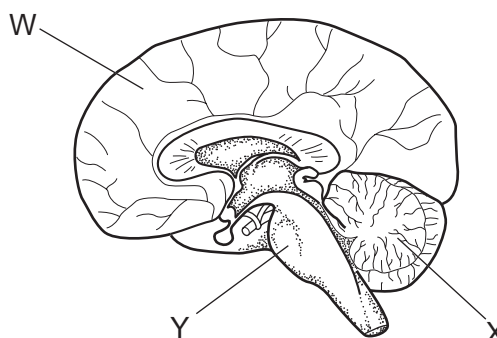
23 The diagram shows a reflex arc in which a bee sting causes the arm to be moved quickly.



If the relay neurone at Q is damaged, how will the transmission of nerve impulses in the reflex arc be affected?

- A They cannot pass from P to Q.
- B They cannot pass from P to R.
- C They cannot pass from Q to P.
- D They cannot pass from R to Q.

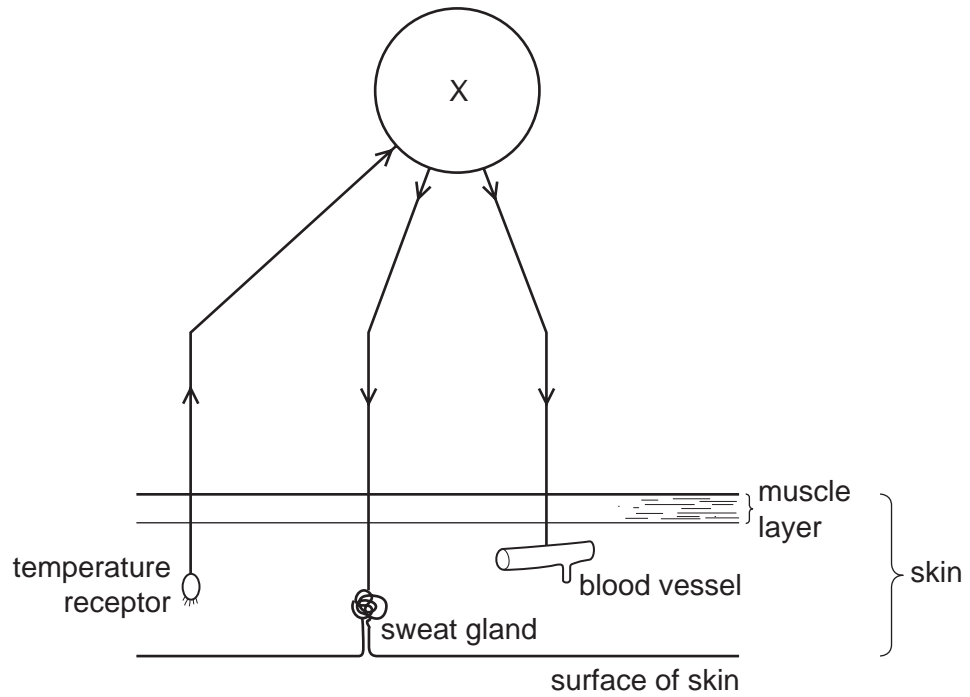
24 The diagram shows a section through the human brain.



What are the functions of the labelled regions?

	memory	balance
A	W	X
B	W	Y
C	X	W
D	X	Y

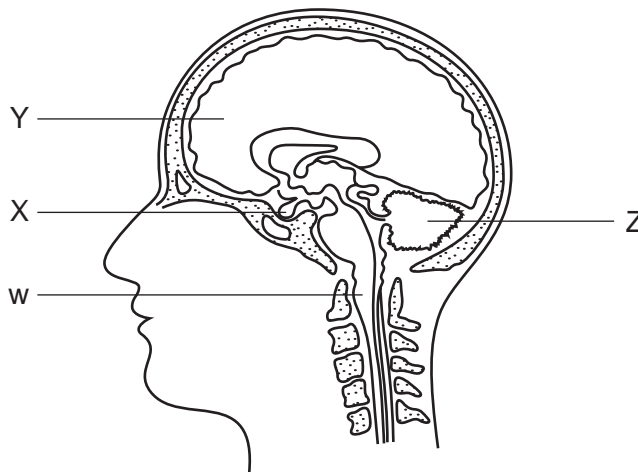
25 The diagram shows some nerve pathways involved in temperature control of the human body.



Which part of the nervous system does X represent?

- A cerebrum
- B hypothalamus
- C medulla
- D pituitary gland

26 The diagram is a section through the human head showing the brain and associated structures.



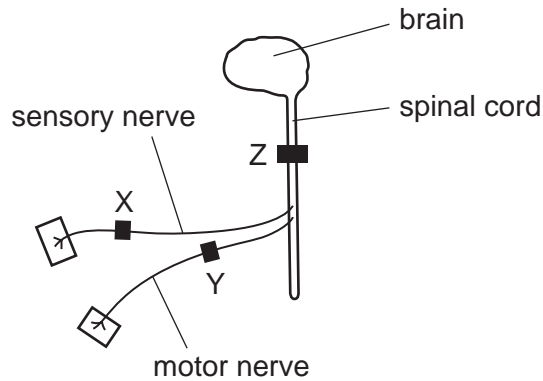
Where are the cerebellum and the pituitary gland?

	cerebellum	pituitary gland
A	W	Z
B	X	Y
C	Y	W
D	Z	X

27 Which part of the nervous system is the centre for processes such as thought, memory and judgement?

- A** cerebellum
- B** cerebrum
- C** medulla
- D** spinal cord

28 The diagram represents a central nervous system. X,Y, and Z show possible sites where the system can be blocked by a local anaesthetic.



Of four men, one had no anaesthetic block and the other three had only one anaesthetic block at X, Y or Z.

One of the men can feel a pinprick on his leg but cannot move it.

Where is the anaesthetic block?

- A block is at X
- B block is at Y
- C block is at Z
- D no block

29 In a reflex action, after the hand touches a hot object, what is the role of the brain?

	receives information	initiates the withdrawal response
A	✓	✓
B	✓	x
C	x	✓
D	x	x

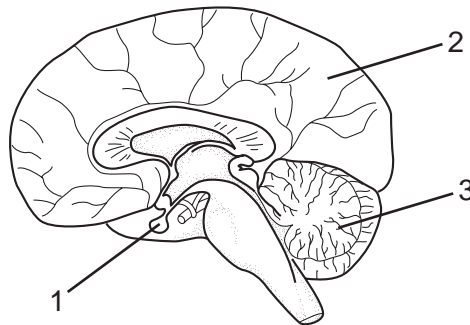
30 What does the hypothalamus control?

- A adrenaline secretion
- B body temperature
- C heart beat
- D memory

31 In temperature control of the body, which types of neurones carry information from skin receptors to the brain, and from the brain to sweat glands?

	from skin receptors to the brain	from the brain to sweat glands
A	motor	sensory
B	relay	motor
C	sensory	motor
D	sensory	relay

32 What are the labels for the parts of the brain

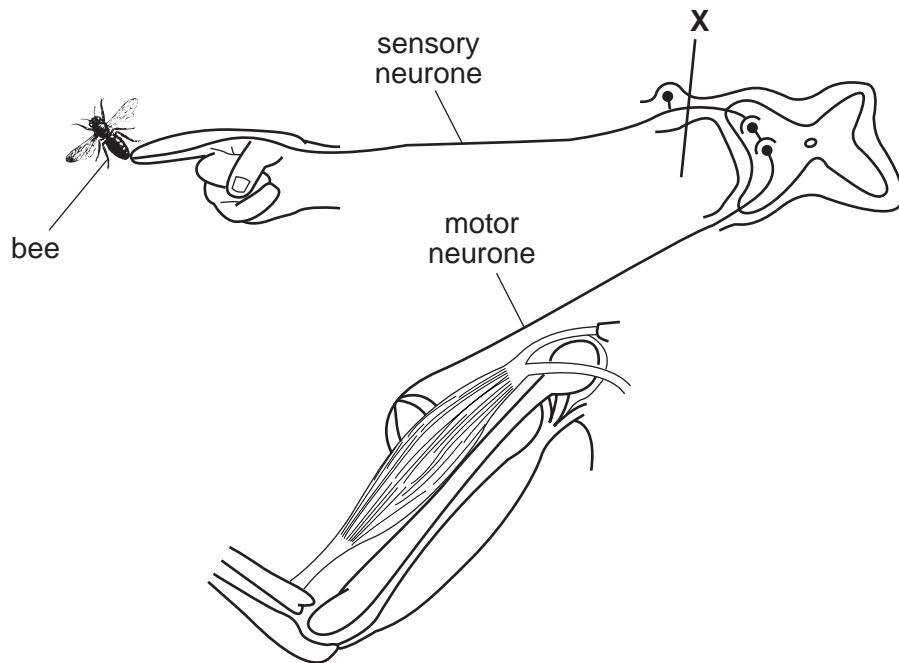


	1	2	3
A	cerebellum	cerebrum	pituitary gland
B	cerebrum	cerebellum	pituitary gland
C	pituitary gland	cerebrum	cerebellum
D	pituitary gland	cerebellum	cerebrum

33 What is controlled by the medulla in the brain?

- A balance
- B breathing
- C memory
- D vision

34 The diagram shows part of a person's nervous system that has been cut at X.

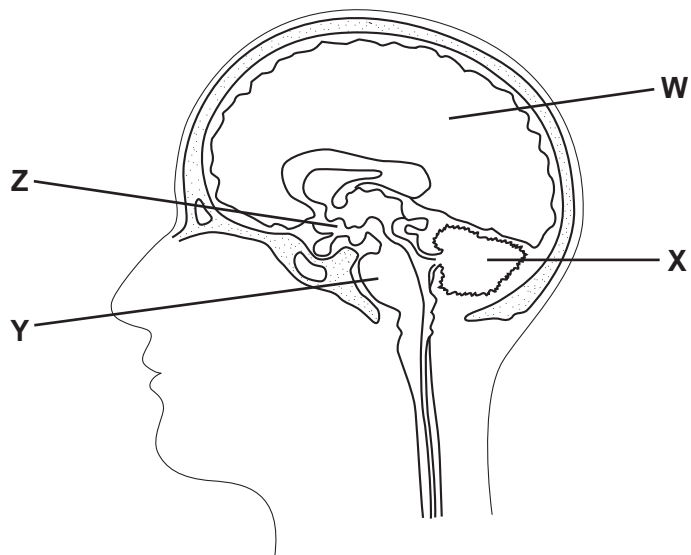


A bee stings the finger, as shown.

What are the effects of this sting on the person?

	pain felt	arm moved
A	no	no
B	no	yes
C	yes	no
D	yes	yes

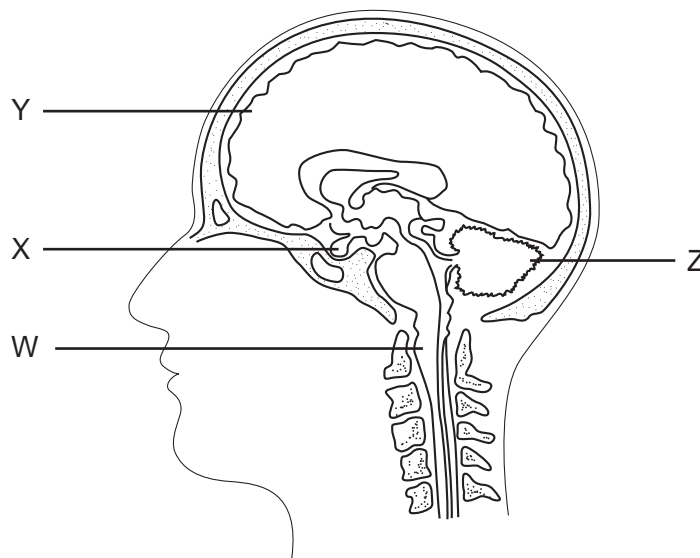
35 The diagram shows a section through the brain.



Which regions control balance, heart rate and temperature?

	balance	heart rate	temperature
A	W	Z	X
B	X	Y	Z
C	Y	X	W
D	Z	W	Y

36 The diagram shows a section through the head showing the brain and part of the spinal cord.



Which structures carry out the functions below?

	conscious thought and memory	control of balance and posture
A	X	W
B	W	X
C	Y	Z
D	Z	Y

37 The diagram shows a section of the brain.

Which part produces hormones?

