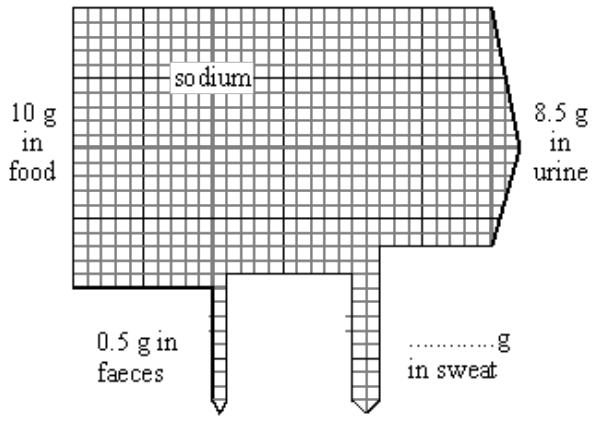
Q1. To stay healthy, the amount of sodium in your body must not change very much.

On average, a girl takes in 10 grams of sodium a day in the food she eats.
The diagram shows what happens to this sodium.



(a) Add the missing figure to the diagram.

(1)

(b) Choose words from this list to complete the sentences below.

bladder **kidneys** **lungs** **skin**

Sweat is produced by the girl's .....

Urine is produced by the girl's .....

(2)

(c) The girl goes on holiday to a very hot place.
Her diet stays the same but she now loses 12 g of sodium each day in sweat.

(i) How will this affect the amount of sodium she loses each day in her urine?

.....

(1)

(ii) What should the girl do to make sure that her body still contains enough sodium?

.....

(1)
(Total 5 marks)

##

The table shows how much water is lost from a boy's body on a cold day and on a hot day.

WATER LOST (cm^3)	COLD DAY	HOT DAY
in sweat	50	300
in breath	100	100
in urine	1000	750

(a) How do the figures for the hot day compare with those for the cold day?
Answer in as much detail as you can.

.....

.....

.....

.....

.....

(2)

(b) The boy does the same things for the same amount of time on both days.

Explain why the amounts of water lost in sweat and urine change.

Sweat .....

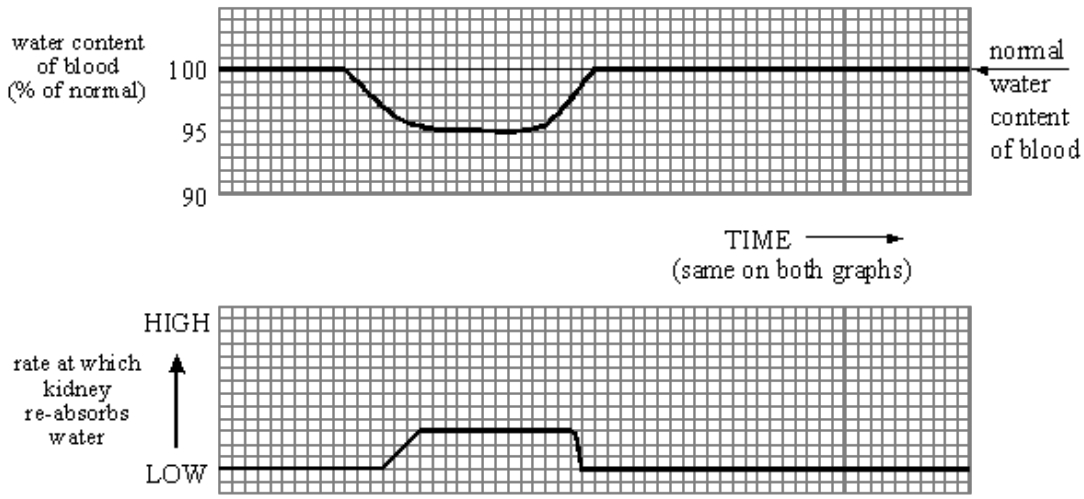
.....

Urine .....

.....

(2)

(c) The rate at which the kidney re-absorbs water depends on the percentage of water in the blood.



Describe, as fully as you can, what the graphs tell you.

.....

.....

.....

.....

(4)

(d) How does your body control the rate at which your kidney re-absorbs water?

.....

.....

(2)

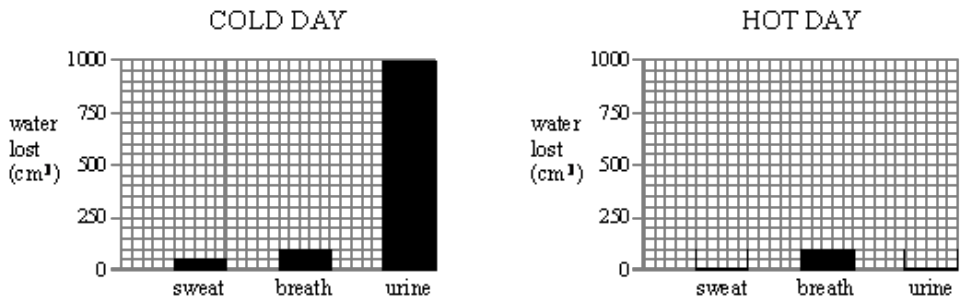
(Total 10 marks)

##

The table shows how much water is lost from a boy's body on a cold day and on a hot day.

WATER LOST (cm^3)	COLD DAY	HOT DAY
in sweat	50	300
in breath	100	100
in urine	1000	750

(a) Use the figures in the table to complete the bar-chart for a hot day.



(2)

(b) How do the figures for the hot day compare with those for the cold day?
Answer in as much detail as you can.

.....

.....

.....

.....

(4)

(c) The boy does the same things for the same amount of time on both days.
Explain why the amounts of water lost in sweat and urine change.

Sweat .....

.....

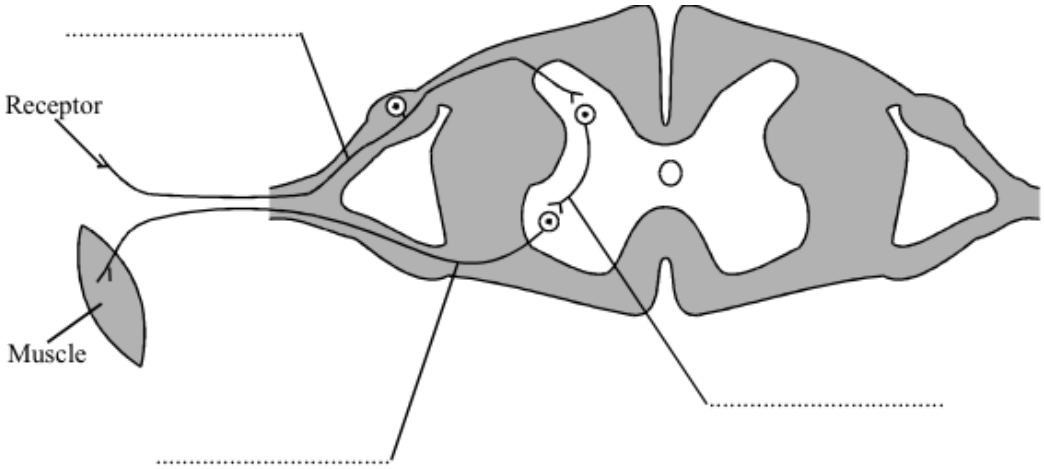
Urine .....

.....

(2)
(Total 8 marks)

Q4. Information is also passed by impulses in the nervous system. Neurones carry impulses very rapidly. The diagram shows a reflex arc.

Label the diagram by adding the names of the neurones.



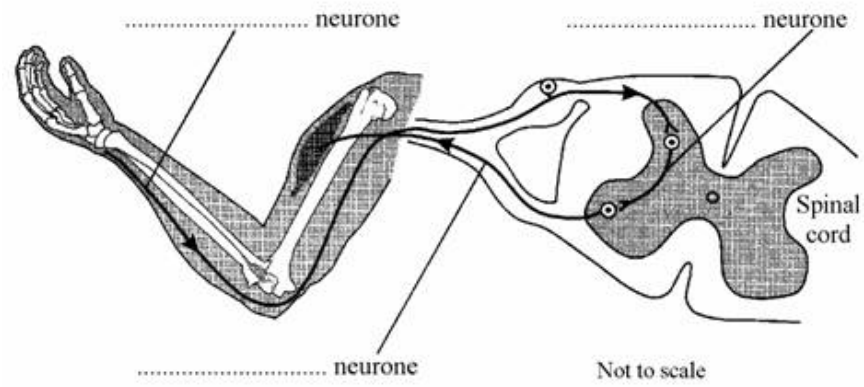
(Total 3 marks)

Q5. (a) What is the name of the organ which controls the nervous system?

.....

(1)

(b) The diagram shows a reflex arc. Label the **three** neurones.



(3)

(c) Snatching your hand from a hot object is an example of a reflex action. Give **one** other example of a reflex action.

.....

(1)

(d) Describe the stages that happen in a reflex action.

.....

.....

.....

.....

(3)
(Total 8 marks)

Q6. Describe how the brain is informed of the image detected by the retina.

.....

.....

.....

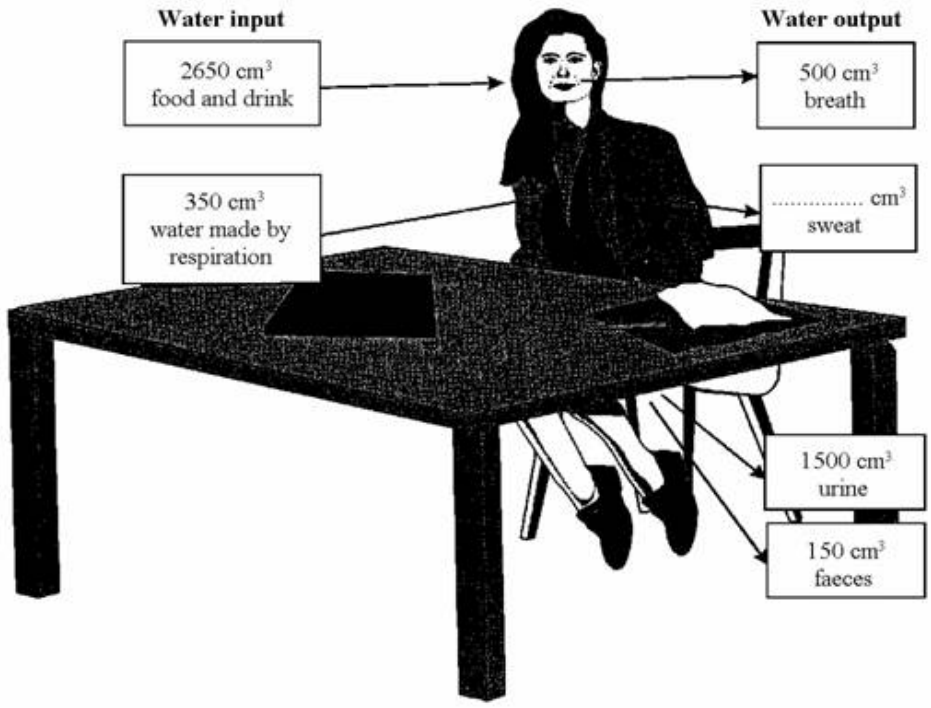
.....

.....

(Total 3 marks)

Q7. The diagram shows a water balance for a girl who spends most of the day working at a desk. It is not complete.

(a) Complete the diagram by writing in the volume of sweat produced.



(1)

(b) The next day she spent much of the day training, doing many different types of exercise.

State how **each** of the following would change and why it would be different from the previous day.

(i) The amount of water given off as sweat.

.....

.....

.....

(2)

(ii) The amount of water breathed out.

.....

.....

.....

(2)

(iii) The amount of urine passed, if she had the same water intake as on the previous day.

.....

.....

.....

(2)

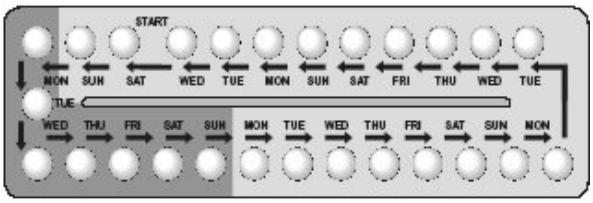
(c) Which organ controls the amount of water in the body?

.....

(1)

(Total 8 marks)

Q8. The picture shows some birth control (contraceptive) pills for women.



These are some facts about using the birth control pills:

- birth control pills are 99 per cent effective in preventing pregnancy
- the hormones in the pills have some rare but serious side effects
- this method of birth control gives no protection against sexually transmitted diseases
- the hormones in the pills give protection against some women's diseases
- the woman has to remember to take the pill every day
- the woman's monthly periods become more regular.

Use the information above to answer these questions.

(a) Give **two** advantages of using birth control pills.

1 .....

.....

2 .....

.....

(2)

(b) Give **two** disadvantages of using birth control pills.

1 .....

.....

2 .....

.....

(2)
(Total 4 marks)

Q9. This question is about the hormones that control the monthly cycle in women.

Complete the sentences.

Hormones control the monthly release of an egg from a woman's ..... .

They also control the thickness of the lining of her ..... .

Hormones that are given to women to stimulate the release of eggs are called

..... drugs.

Hormones that are given to women to prevent the release of eggs are called

oral ..... .

(Total 4 marks)

Q10. The monthly cycle of women is controlled by hormones.

(a) Name the **two** glands that secrete these hormones.

1 .....

2 .....

(2)

(b) Describe **two** ways in which fertility in women can be controlled by giving hormones.

1 .....

.....

2 .....

.....

(2)
(Total 4 marks)

##

(a) Fill in the table about receptors. The first answer has been done for you.

RECEPTORS IN THE	SENSITIVE TO
Eyes	Light
Skin	
	Sound
Tongue	

(3)

(b) Describe, in as much detail as you can, how information is transmitted from light receptors in the retina to the brain.

.....

.....

.....

.....

(3)
(Total 6 marks)

Q12. The table shows four ways in which water leaves the body, and the amounts lost on a cool day.

	WATER LOSS (cm^3)	
	COLD DAY	HOT DAY
Breath	400	the same
Skin	500	
Urine	1500	
Faeces	150	

(a) (i) Fill in the table to show whether on a hot day the amount of water lost would be

less	more	the same

The first answer has been done for you.

(3)

(ii) Name the process by which we lose water from the skin.

.....

(1)

(b) On a cool day the body gained 2550 cm^3 of water.
1500 cm^3 came directly from drinking.
Give **two** other ways in which the body may gain water.

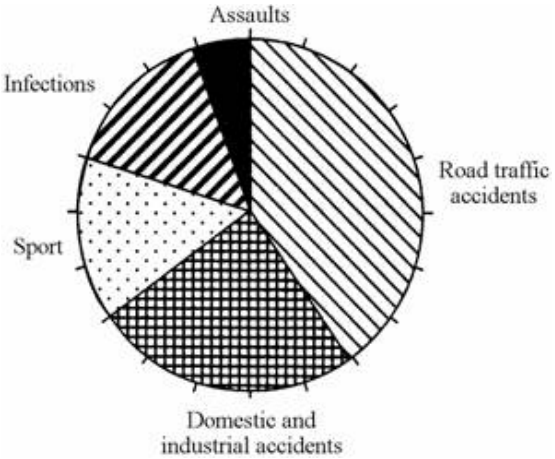
1 .....

2 .....

(2)
(Total 6 marks)

Q13. Every year at least 700 people in Britain break their back or their neck. This damages the spinal cord and may result in permanent paralysis.

(a) The pie chart shows the causes of damage to the spinal cord.



(i) Which is the commonest cause of damage to the spinal cord?

.....

(1)

(ii) Calculate the proportion of injuries to the spinal cord caused by sport.

Proportion .....

(1)

(b) Explain why a man with a damaged spinal cord cannot feel a pin stuck in his toe.

.....

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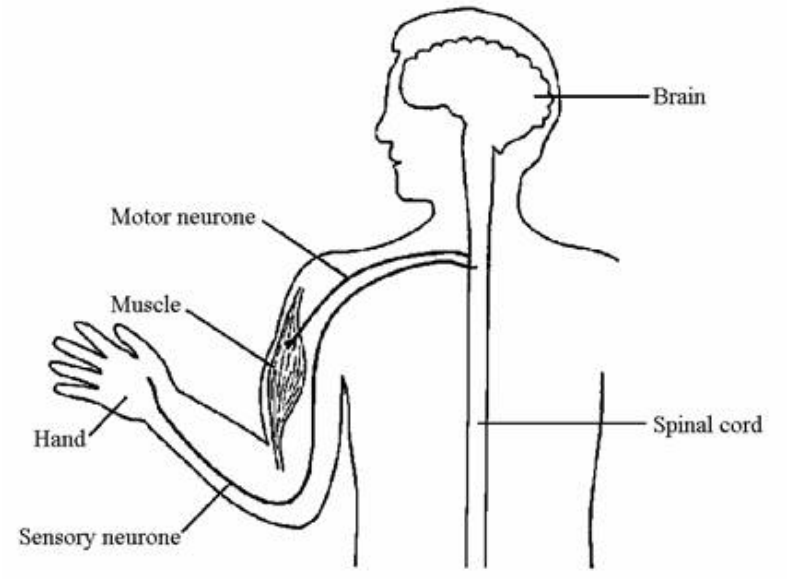
.....

(3)

(Total 5 marks)

Q14. The diagram shows a reflex pathway in a human.



(a) Label the *receptor* on the diagram.

(1)

(b) Label the *effector* on the diagram.

(1)

(c) (i) Suggest a stimulus to the hand that could start a reflex response.

.....

(1)

(ii) Describe the response that this stimulus would cause. .....

.....

.....

(1)

(d) Put arrows on the diagram to show the direction of the path taken by the nerve impulses.

(1)

(Total 5 marks)

Q15. Hormones are sometimes used to regulate human reproduction.

(a) (i) What is a hormone?

.....

.....

(1)

(ii) How are hormones transported around the body?

.....

.....

(1)

(b) Describe the benefits and possible problems that may result from the use of hormones to regulate human reproduction. You should refer to fertility drugs and contraceptives in your answer.

To gain full marks in this question you should write your ideas in good English. Put them into a sensible order and use the correct scientific words.

.....

.....

.....

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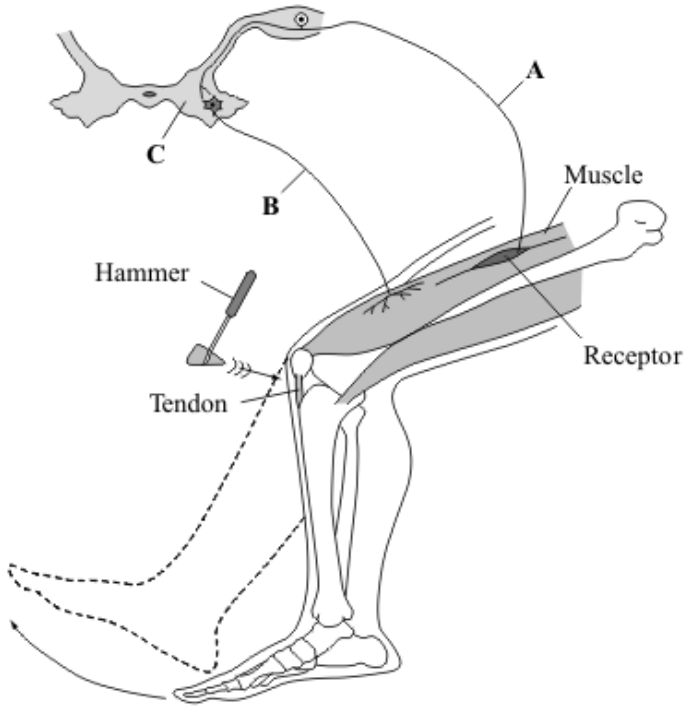
(4)
(Total 6 marks)

Q16. The diagram shows the structures involved in the knee-jerk reflex. When the tendon is struck with the hammer, the receptor is stimulated and the lower leg moves forward.



(a) Name the structures labelled **A**, **B** and **C**.

A .....

B .....

C .....

(3)

(b) How is information passed from structure **A** to structure **B**?

.....

.....

(1)

(c) What is the effector in this response?

.....

(1)

(Total 5 marks)

Q17. Reflex actions are rapid and automatic.

(a) Name the following structures in a reflex action.

(i) The structure that detects the stimulus.

.....

(1)

(ii) The neurone that carries impulses to the central nervous system.

.....

(1)

(iii) The neurone that carries impulses away from the central nervous system.

.....

(1)

(iv) The structure that brings about the response.

.....

(1)

(b) Describe what happens at a synapse when an impulse arrives.

.....

.....

.....

.....

.....

(2)

(c) Some people have a condition in which information from the skin does not reach the brain.

Explain why this is dangerous for the person.

.....

.....

.....

.....

.....

(2)
(Total 8 marks)

Q18. Hormones regulate the functions of many organs.

Complete the following sentences.

(a) Hormones control the monthly release of an egg from the

woman's ..... .

(1)

(b) Hormones also control the thickness of the lining of her ..... .

(1)

(c) Hormones given to women to stimulate the release of eggs

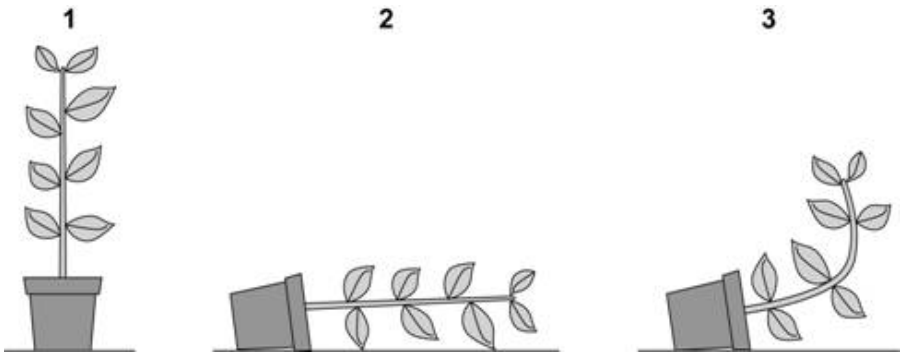
are called ..... drugs.

(1)
(Total 3 marks)

Q19. A student grew a plant in an upright pot.

She then put the pot in a horizontal position and left the plant in the dark for two days.

Diagram **3** shows the potted plant after two days in the dark.



Plant growing upright | **Plant put horizontal in the dark** | **Plant after 2 days in the dark**

Explain fully why the plant responded in this way.

.....

.....

.....

.....

.....

.....

.....

.....

(Total 4 marks)

Q20. In-vitro fertilisation (IVF) is used to help some women get pregnant.

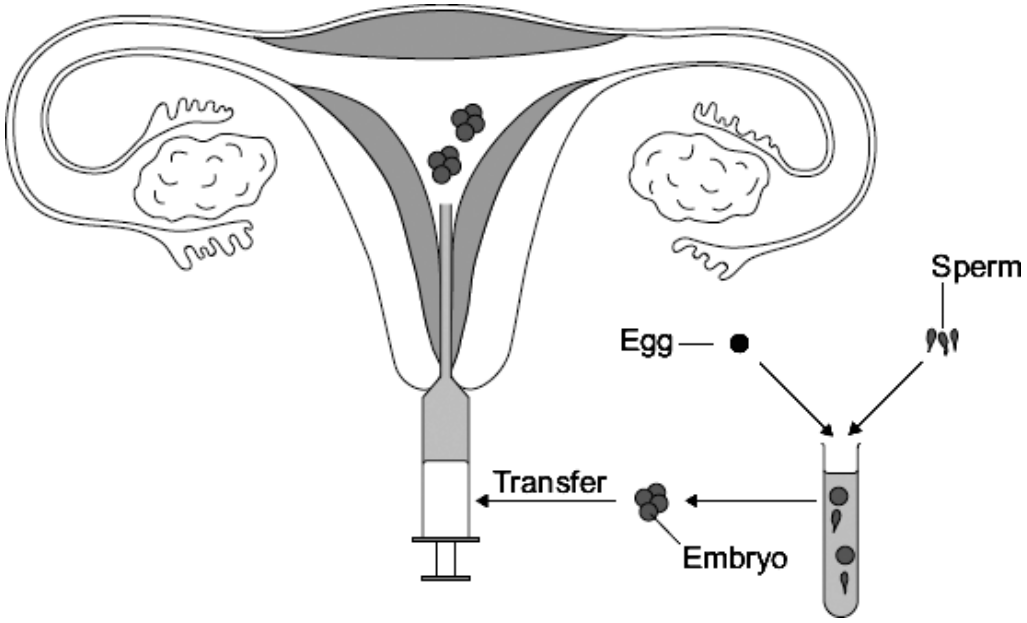
(a) Name the **two** hormones used in IVF treatment.

1 .....

2 .....

(2)

(b) The diagram shows the process of IVF.



Describe the process of IVF. Use information from the diagram to help you.

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.....

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.....

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.....

(4)
(Total 6 marks)

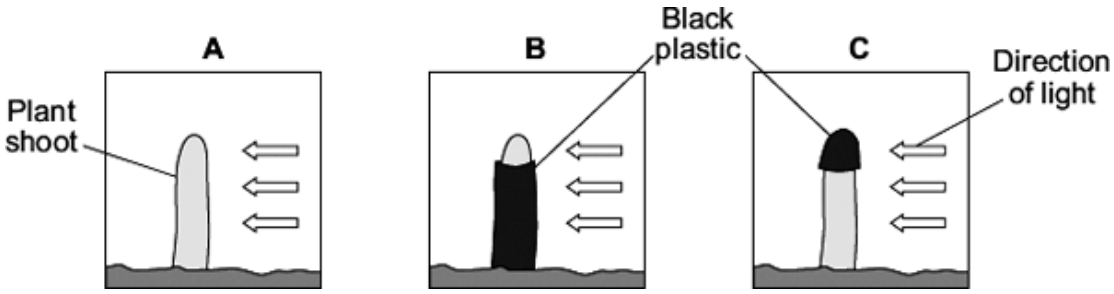
Q21. Charles Darwin investigated tropisms in plants.

Some students did an investigation similar to Darwin's investigation.

The students:

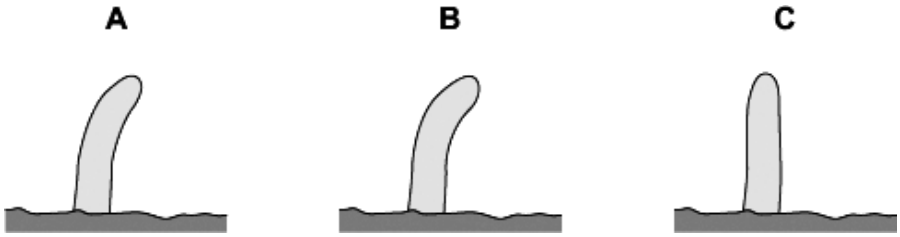
- grew seeds until short shoots had grown
- used black plastic to cover parts of some of the shoots
- put the shoots in light coming from one direction
- put boxes over the shoots to keep out other light.

The diagrams show how the investigation was set up.



Two days later the students took off the black plastic covers and looked at the shoots.

The diagrams show the results.



(a) Give **two** variables that the students should control in this investigation.

.....

.....

.....

.....

(2)

(b) Shoot **A** bent towards the light as it grew.

Explain how.

.....

.....

.....

.....

.....

.....

.....

.....

(4)

(c) What conclusions can be drawn from the results about:

(i) the detection of the light stimulus

.....

.....

(1)

(ii) where in the shoot the response to the light takes place.

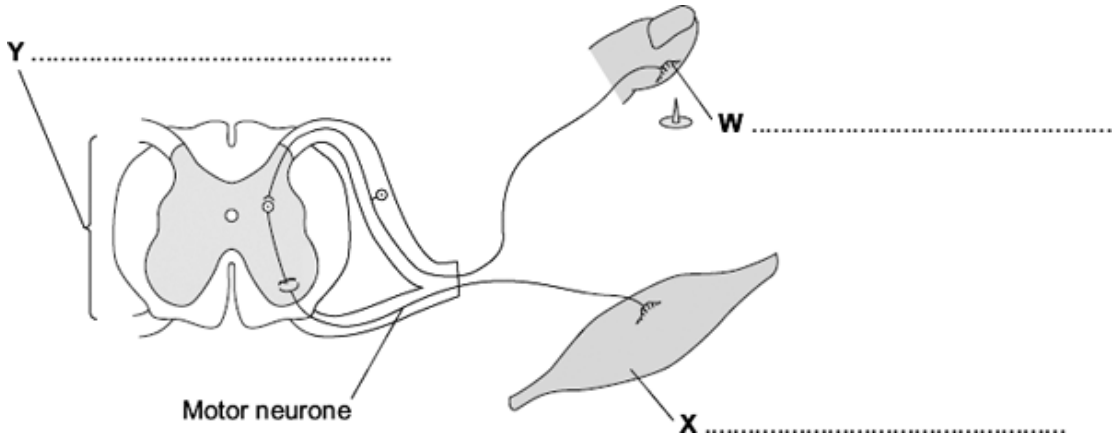
.....

.....

(1)

(Total 8 marks)

Q22. The diagram shows the structures involved in a reflex action.



(a) On the diagram, name the structures labelled **W**, **X** and **Y**.

(3)

(b) The control of blood sugar level is an example of an action controlled by hormones.

Give **two** ways in which a reflex action is different from an action controlled by hormones.

1 .....

.....

.....

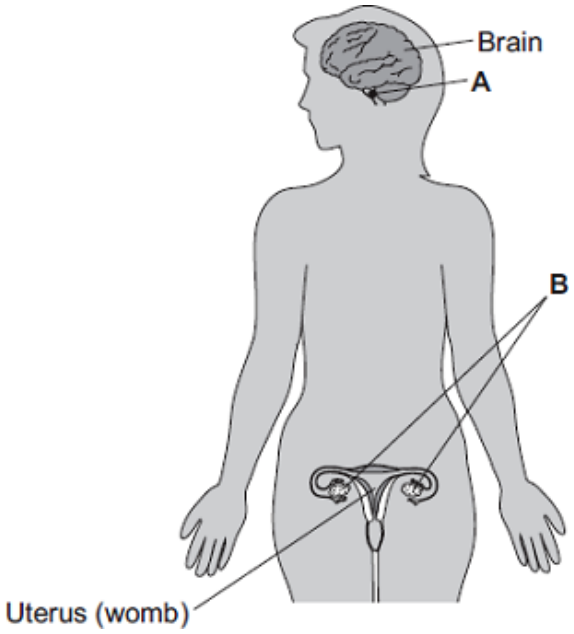
2 .....

.....

.....

(2)
(Total 5 marks)

Q23. The diagram shows the position of two glands, **A** and **B**, in a woman.



(a) (i) Name glands **A** and **B**.

A .....

B .....

(2)

(ii) Gland **A** produces the hormone Follicle Stimulating Hormone (FSH).

FSH controls changes in gland **B**.

How does FSH move from gland **A** to gland **B**?

.....

(1)

(b) (i) A woman is not able to become pregnant. The woman does not produce mature eggs. The woman decides to have In Vitro Fertilisation (IVF) treatment.

Which **two** hormones will help the woman produce and release mature eggs?

Tick (✓) **one** box.

FSH and Luteinising Hormone (LH) ☐

FSH and oestrogen ☐

Luteinising Hormone (LH) and oestrogen ☐

(1)

(ii) Giving these hormones to the woman helps her to produce several mature eggs. Doctors collect the mature eggs from the woman in an operation.

Describe how the mature eggs are used in IVF treatment so that the woman may become pregnant.

.....

.....

.....

.....

.....

.....

(3)

(iii) IVF clinics have been set a target to reduce multiple births.

> At least 76% of IVF treatments should result in single babies and a maximum of 24% of treatments should result in multiple births.

Suggest **one** reason why the clinics have been set this target to reduce multiple births.

.....

.....

(1)

(c) Two clinics, **R** and **S**, used IVF treatment on women in 2007. Doctors at each clinic used the results of the treatments to predict the success rate of treatments in 2008.

The table shows the information.

	Total number of IVF treatments in 2007	**Number of IVF treatments resulting in pregnancy in 2007**	**Predicted percentage success rate in 2008**
Clinic **R**	1004	200	18–23
Clinic **S**	98	20	3–56

(i) Compare the success rates of the two clinics in 2007.

.....

.....

(1)

(ii) The range of the predicted success rate in 2008 for clinic **R** is much smaller than the range of the predicted success rate for clinic **S**.

Suggest why.

.....

.....

.....

.....

(2)

(Total 11 marks)