

Name:

Date:

B5 - Test 3
HOMEOSTASIS
Intermediate

GCSE

BIOLOGY

AQA - Triple Science

Mark

Grade

Materials

For this paper you must have:

- Ruler
- Pencil and Rubber
- Scientific calculator, which you are expected to use when appropriate

Instructions

- Answer all questions
- Answer questions in the space provided
- All working must be shown

Information

- The marks for the questions are shown in brackets

1.

(a) **List A** gives the names of three stages in trialling a new drug.

List B gives information about the three stages.

Draw a line from each stage in **List A** to the correct information in **List B**.

**List A
Stage**

**List B
Information**

Tests on humans
including a placebo

Used to find if the drug is toxic

Tests on humans using
very small quantities of
the drug

The first stage in the clinical trials
of the drug

Tests on animals

Used to find the optimum dose
of the drug

Used to prove that the drug is
effective on humans

(3)

(b) Read the passage.

Daily coffee dose delays development of Alzheimer's in humans.

Alzheimer's is a brain disease that causes memory loss in elderly people. Scientists studied 56 mice that had been genetically engineered to develop Alzheimer's.

Before treatment all the mice did badly in memory tests.

Half the mice were given a daily dose of caffeine in their drinking water. The dose was equivalent to the amount of caffeine in six cups of coffee for a human.

The other mice were given ordinary water.

After two months, the caffeine-drinking mice did better in memory tests than the mice drinking ordinary water.

The headline for the passage is not justified.

Explain why as fully as possible.

(3)
(Total 6 marks)

2.

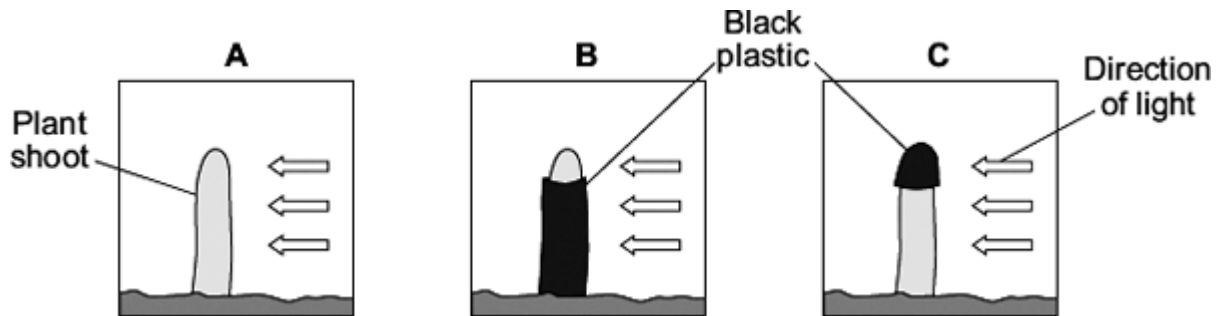
Charles Darwin investigated tropisms in plants.

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

The students:

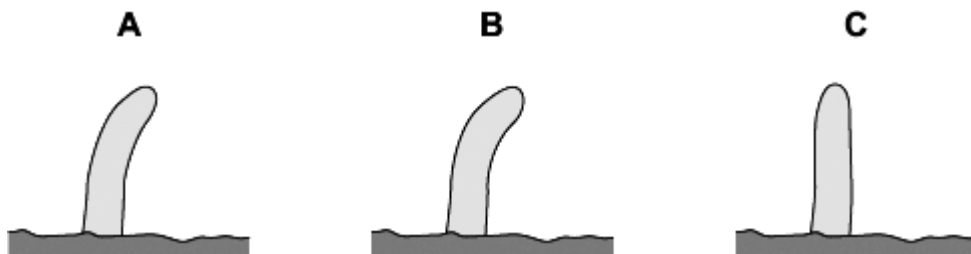
- grew seeds until short shoots had grown
- used black plastic to cover parts of some of the shoots
- put the shoots in light coming from one direction
- put boxes over the shoots to keep out other light.

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)

3.

In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

The human body is kept at a constant internal temperature of about 37 °C.

Body temperature is monitored and controlled by the thermoregulatory centre in the brain.

4.

This question is about hormones.

(a) (i) Hormones carry messages.

What type of messenger is a hormone?

Draw a ring around the correct answer.

chemical

electrical

environmental

(1)

(ii) Which part of the brain secretes hormones?

Draw a ring around the correct answer.

cerebellum

medulla

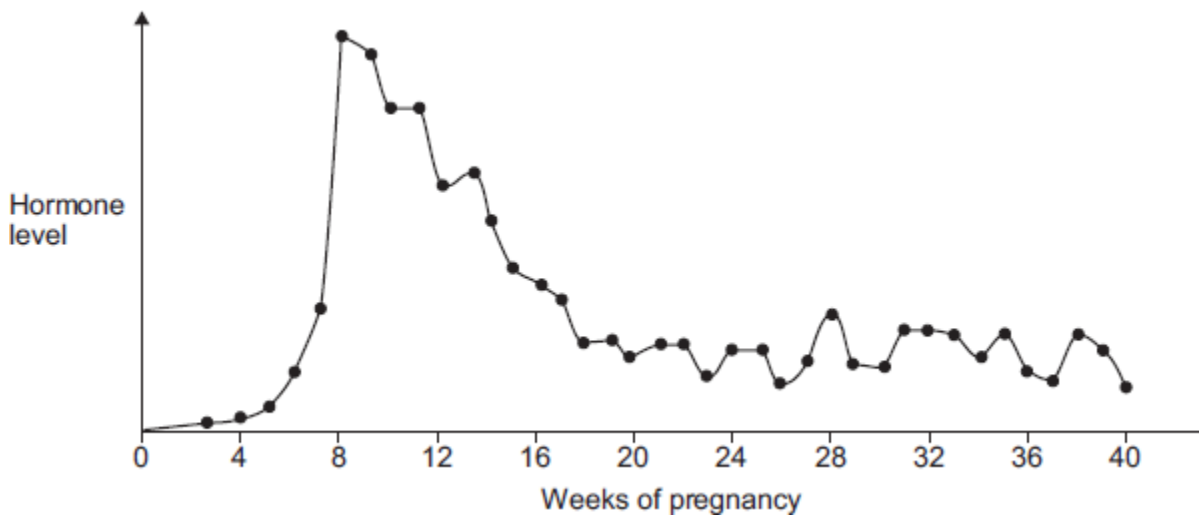
pituitary gland

(1)

(b) **Figure 1** shows the level of a pregnancy hormone over a 40-week pregnancy.

This hormone can be detected in a pregnancy test.

Figure 1



A woman takes a pregnancy test.

In which week of pregnancy is the test most likely to give a positive result?

Use information from **Figure 1**.

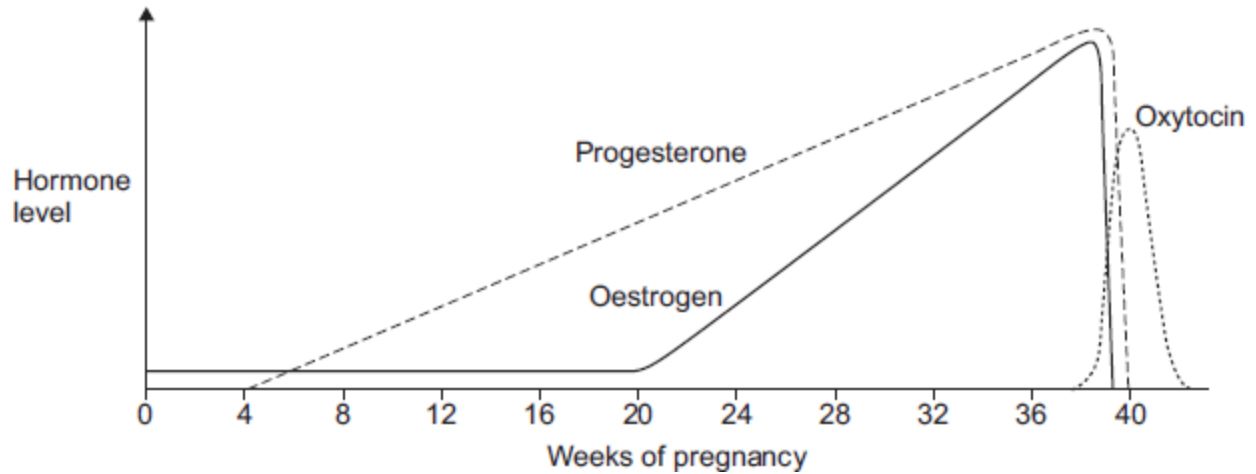
Write the correct answer in the box.

(1)

(c) **Figure 2** shows the levels of three other hormones during pregnancy.

The baby is usually born at about 40 weeks.

Figure 2



Adaptation by kind permission of Biozone International

(i) Describe the patterns in the levels of oestrogen and progesterone from 0 to 36 weeks.

(4)

(ii) Which hormone is likely to stimulate contractions of the uterus (womb) when the baby is born?

Use information from **Figure 2** to give a reason for your answer.

(2)

(Total 9 marks)

5.

The human body produces many hormones.

(a) (i) What is a *hormone*?

(1)

(ii) Name an organ that produces a hormone.

(1)

(iii) How are hormones transported to their target organs?

(1)

(b) Describe how the hormones FSH, oestrogen and LH are involved in the control of the menstrual cycle.

(3)

(Total 6 marks)

6.

(a) Control systems help to keep conditions in the human body relatively constant.

What is the general name for the processes that keep body conditions relatively constant?

Draw a ring around the correct answer.

eutrophication

homeostasis

hydrotropism

(1)

(b) The concentration of glucose in the blood is controlled by hormones.

Use the correct answer from the box to complete each sentence.

glucagon	glycerol	glycogen
kidney	liver	pancreas

When the blood glucose concentration increases, an organ called the _____ releases the hormone insulin.

Insulin causes glucose to move from the blood into the cells of the muscles and the _____ .

Inside these organs, the glucose is changed into a carbohydrate called _____ , which can be stored.

When the blood glucose concentration falls, another hormone is released, which causes the storage carbohydrate to break down into glucose again.

This hormone is called _____ .

(4)

(c) A person with Type 1 diabetes does not make enough insulin.

The person needs to test their blood at intervals throughout the day.

If the concentration of glucose in their blood is too high, the diabetic person needs to inject insulin.

(i) Insulin is a protein.

It must be injected and cannot be taken by mouth.

Explain why.

(2)

- (ii) Apart from injecting insulin, give **one other** way that a diabetic person could help to control the concentration of glucose in their blood.

(1)

- (d) Pet dogs have been trained to detect if the concentration of glucose in the blood of their diabetic owners is outside the normal healthy range. These dogs are called 'medical response dogs'.

The dogs respond in different ways. They may bark, jump up, or stare at their owners. They may even fetch a blood-testing kit.

- (i) Suggest what stimulus the dogs might be responding to when they behave like this.

(1)

- (ii) **Table 1** shows how the concentration of glucose varied in blood samples from five diabetic people. Measurements were made both before and after getting a medical response dog.

Table 1

		Mean percentage of blood samples with different concentrations of glucose from the five diabetic people		
		Low glucose	Within normal range of glucose	High glucose
	Number of blood samples measured			
Before getting a dog	1704	32.6	54.8	12.6
After getting a dog	1724	18.6	61.6	19.8

(ii) Give **two** reasons why it is useful for a young root to grow towards gravity.

1. _____

2. _____

(2)

(iii) The root grows towards gravity due to the unequal distribution of a substance in the root.

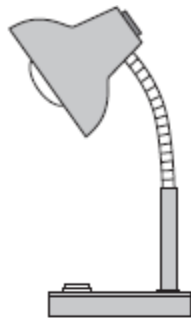
Draw a ring around the correct answer to complete the sentence.

This substance is

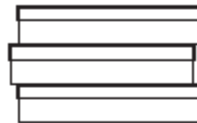
auxin.
chlorophyll.
sugar.

(1)

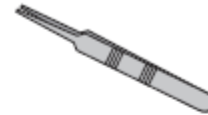
(b) The drawings show some apparatus and materials.



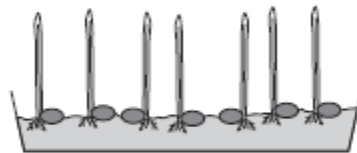
Lamp



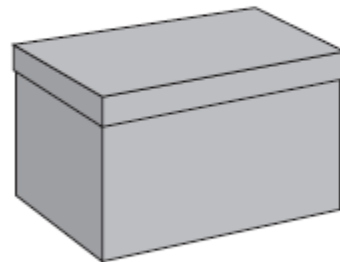
Petri dishes



Forceps



50 maize seedlings
on damp cotton wool



Supply of cardboard boxes with lids



Ruler



Scissors

8.

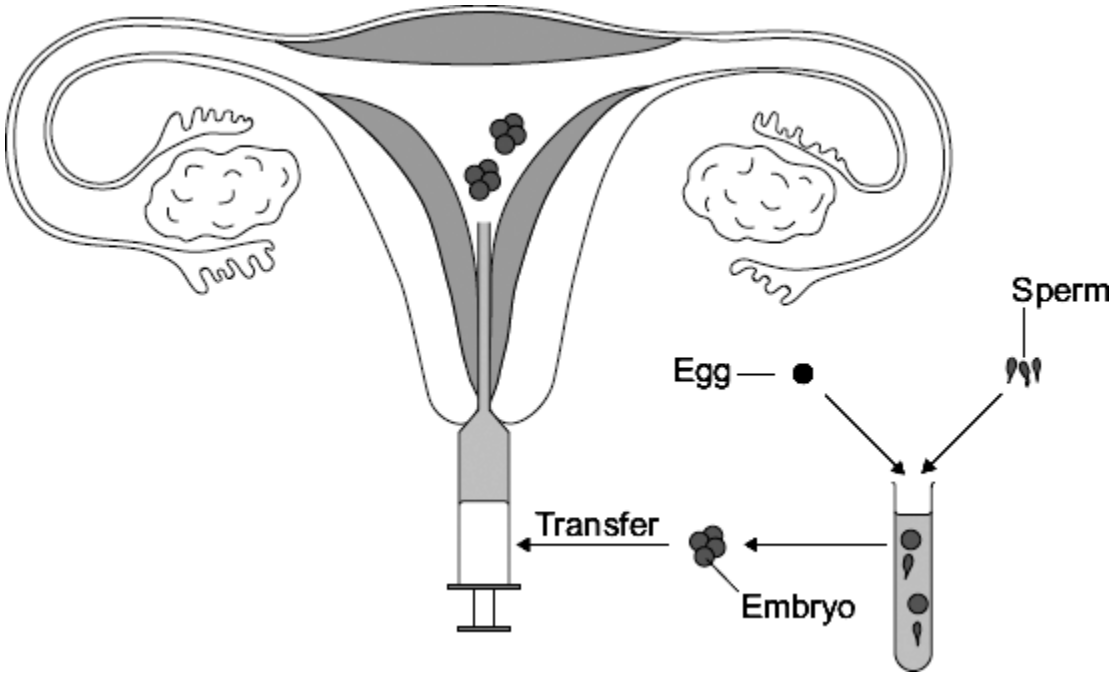
In-vitro fertilisation (IVF) is used to help some women get pregnant.

(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.

(4)

(Total 6 marks)