

Name:

Date:

B5 - Test 5
HOMEOSTASIS
Advanced

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

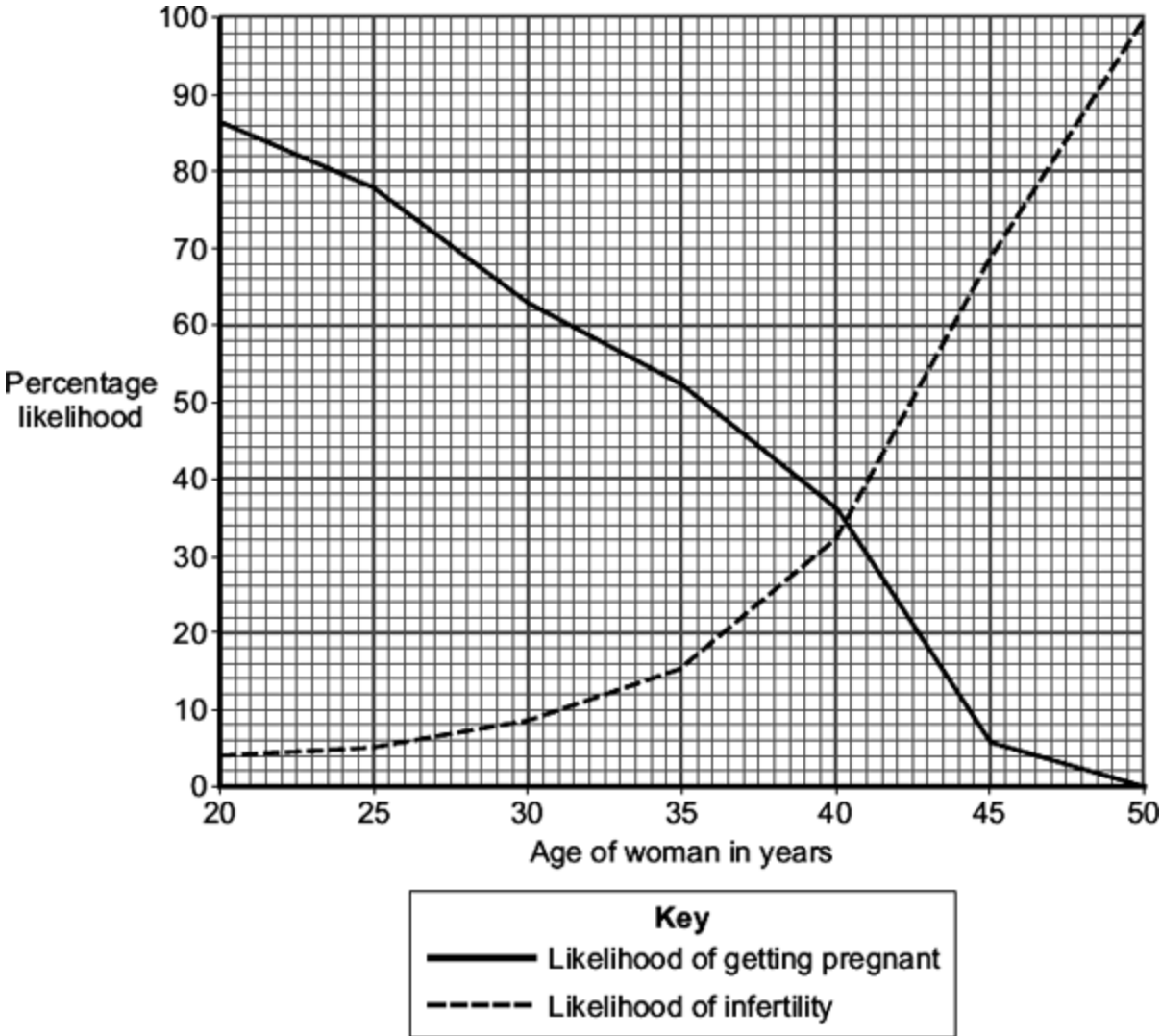
Information

- The marks for the questions are shown in brackets

1.

The graph shows how the likelihood of getting pregnant and the likelihood of infertility change with a woman's age.

The data is for healthy women who have unprotected sexual intercourse during one year.



(a) Use information from the graph to answer this question.

A woman in her mid-twenties is thinking about waiting until her late-thirties before she has children.
A doctor advises the woman not to wait.

Explain why the doctor gives this advice.

(2)

(b) The hormones FSH and LH are used in fertility treatment.

Give the function in fertility treatment of:

(i) FSH

(1)

(ii) LH.

(1)

(c) In the first stage of in-vitro fertilisation (IVF), eggs from the mother are fertilised with sperm from the father.

Describe the next stages of IVF.

(2)

(Total 6 marks)

2.

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

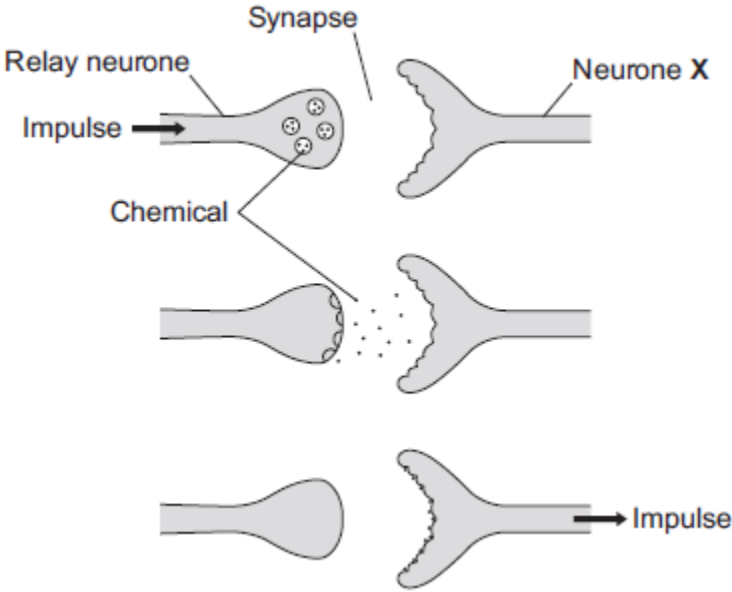
Homeostasis keeps conditions in the body relatively constant.

The amount of water in the body is controlled by homeostasis.

Kidney function is controlled by a gland in the brain.

3.

The diagram below shows how a nerve impulse passing along a relay neurone causes an impulse to be sent along another type of neurone, neurone X.



(a) What type of neurone is neurone X?

(1)

(b) Describe how information passes from the relay neurone to neurone X. Use the diagram to help you.

(3)

(c) Scientists investigated the effect of two toxins on the way in which information passes across synapses. The table below shows the results.

Toxin	Effect at the synapse
Curare	Decreases the effect of the chemical on neurone X
Strychnine	Increases the amount of the chemical made in the relay neurone

Describe the effect of each of the toxins on the response by muscles.

Curare _____

Strychnine _____

(2)
(Total 6 marks)

4. Endocrine glands produce hormones.

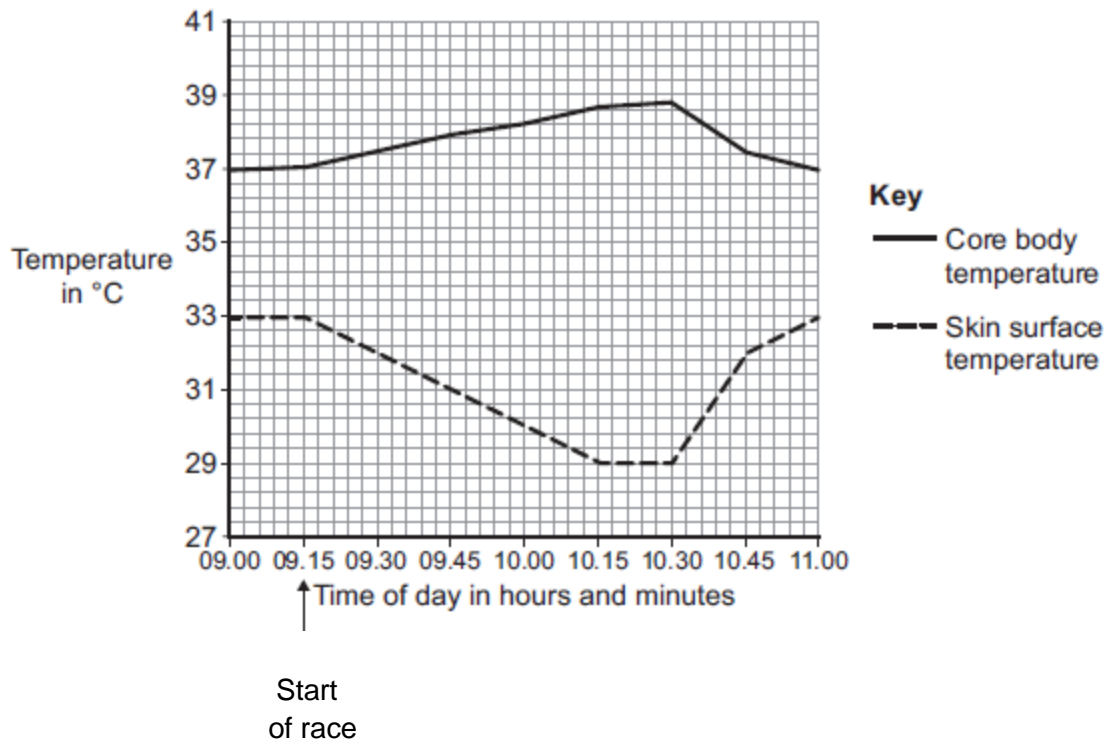
(a) Hyperthyroidism is caused by an overactive thyroid gland.

Suggest what would happen in the body of a person with hyperthyroidism.

(3)

(b) Describe the roles of FSH and LH in the menstrual cycle.

(2)



- (a) (i) When the cyclist finished the race, his core body temperature started to decrease.
How long did the race last?

(1)

(b) During the race, the cyclist's blood glucose concentration began to decrease.

Describe how the body responds when the blood glucose concentration begins to decrease.

(3)
(Total 12 marks)

6. Urine consists of water, ions and other substances such as urea. Urine is formed in the kidney by filtering the blood. The diameter of the pores in the filter is about 6 nanometres.

The table shows the diameters of the molecules of some of the substances in the blood.

Substance	Diameter of molecule in nanometres
A	10 to 20
B	1
C	0.6
D	0.5
E	0.2

Use information from the table and your own knowledge to answer the questions.

(a) (i) Which substance, **A**, **B**, **C**, **D** or **E**, is protein?

(1)

(ii) Protein is **not** found in the urine of a healthy person.

Explain why.

(2)

(b) Substance **B** is **not** found in the urine of a healthy person.
Suggest an explanation for this.

(2)

(c) Haemolytic anaemia is a disease in which some of the red blood cells burst open.

Small amounts of haemoglobin may be found in the urine of a person suffering from haemolytic anaemia.

The diameter of a haemoglobin molecule is 5.5 nanometres.

Haemoglobin is **not** found in the urine of a healthy person, but haemoglobin can be found in the urine of a person with haemolytic anaemia.

Explain why.

(3)

(Total 8 marks)

7.

(a) Which organ in the body monitors the concentration of glucose (sugar) in the blood?

(1)

- (b) In a healthy person, insulin prevents high levels of glucose in the blood.
To make insulin, cells in the pancreas need amino acids.

Amino acids cannot be stored in the body.

Describe, as fully as you can, what happens to amino acids that cannot be stored in the body.

(3)

(Total 4 marks)

8.

Conditions inside the body must be kept constant.

- (a) Urea must be removed from the body.

- (i) Name the organ which makes urea.

(1)

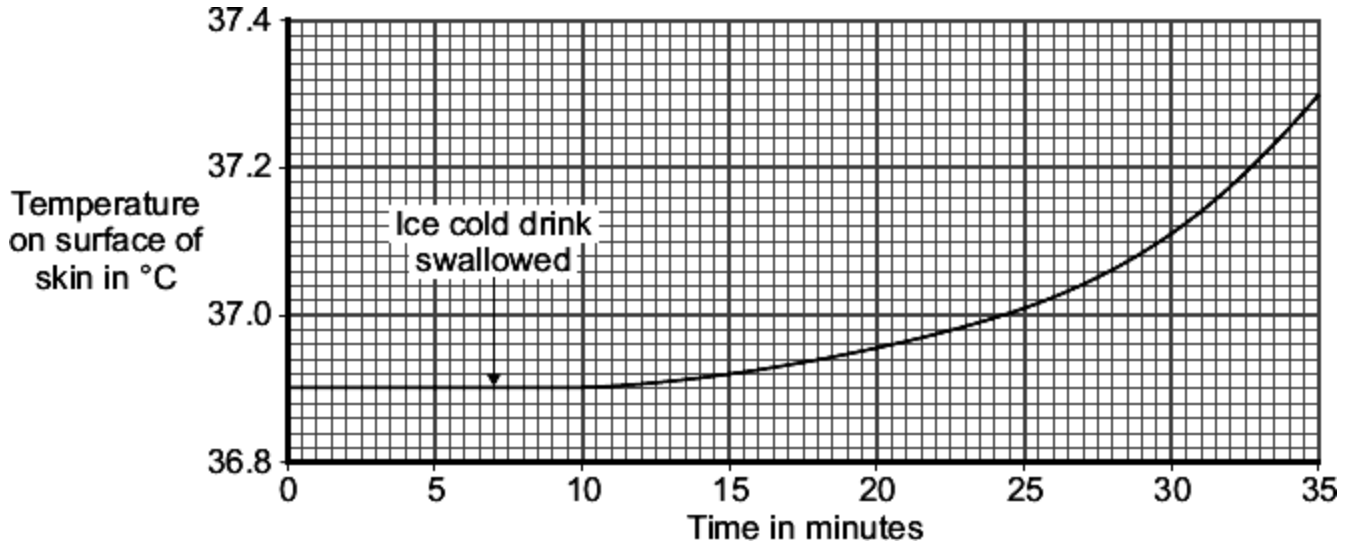
- (ii) Which organ removes urea from the body?

(1)

- (iii) What is urea made from?

(1)

A man sat in a room where the temperature was maintained at 40 °C. The temperature on the surface of his skin was monitored for 35 minutes. He swallowed an ice cold drink at the time indicated on the graph.



- (b) The sweat glands contribute to the change in the temperature on the surface of the skin shown on the graph.

Explain how.

(2)

- (c) The blood vessels near the surface of the skin also contribute to the changes in skin temperature shown on the graph.

- (i) How do the blood vessels in the skin change when the core body temperature falls?

(1)

- (ii) How does this change in the blood vessels explain the change in the skin temperature shown on the graph?

(1)

(Total 7 marks)

9.

A person had diseased kidneys.

The table shows the concentrations of dissolved substances in this person's urine.

Substance	Concentration in grams per dm ³
Protein	6
Glucose	0
Amino acids	0
Urea	21
Mineral ions	19

- (a) One of the substances found in this person's urine would **not** be found in the urine of a healthy person.

(i) Name this substance. _____

(1)

- (ii) Explain why this substance would **not** be found in the urine of a healthy person.

(2)

- (b) A man ate and drank the same amounts of the same substances and he did the same amount of exercise on two different days. On one of the two days the weather was hot and on the other day the weather was cold.

The man's urine contained a higher concentration of mineral ions and urea on the hot day than on the cold day.

Explain why.

(4)
(Total 8 marks)