



Resources available from

**kickstart
tutors**

Student number

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Name _____

Date _____

Attempt/Time taken _____

GCSE BIOLOGY

Topic Paper: 5 Homeostasis and response
Part 1

Time allowed: 35 minutes

Materials

For this paper you must have:

- the Periodic Table/Data Sheet, provided as an insert (enclosed)
- a ruler with millimetre measurements
- a calculator, which you are expected to use where appropriate.

Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- All working must be shown.
- Do all rough work in this book. Cross through any work you do not want to be marked.

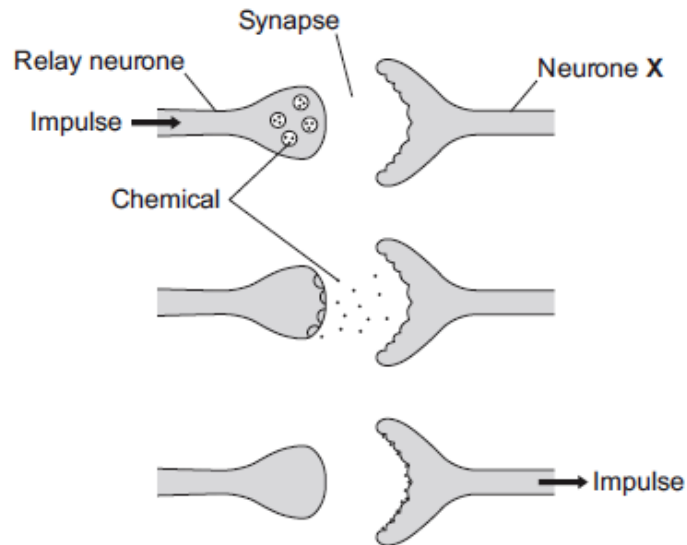
Information

- The Periodic Table/Data Sheet is provided as in insert.
- You are reminded of the need for good English and clear presentation in your answers.
- When answering questions you need to make sure that your answer:
 - is clear, logical, sensibly structured
 - fully meets the requirements of the question
 - shows that each separate point or step supports the overall answer.



31 Marks

Q1. 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**?

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(1)

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

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(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

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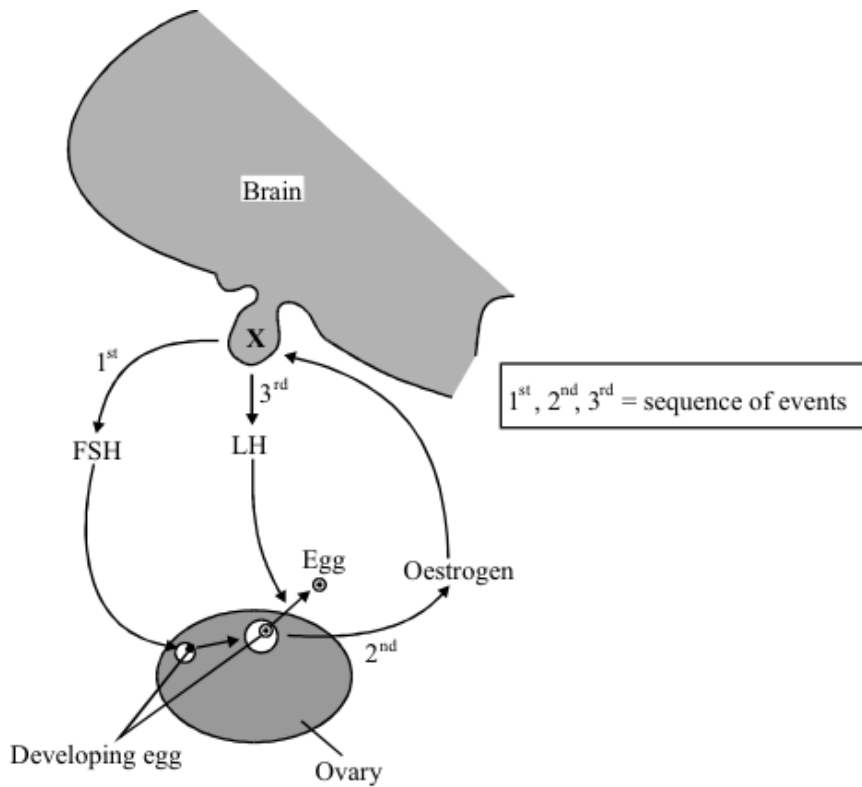
Strychnine

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(2)
(Total 6 marks)

Q2. The diagram shows how three hormones, FSH, LH and oestrogen, work together in a woman's body.



(a) Name the part of the brain labelled **X**.

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(1)



- (b) Use information from the diagram and your own knowledge to explain why some oral contraceptive pills contain oestrogen.

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(3)
(Total 4 marks)

Q3. Read the information about the trialling of the first contraceptive pill.

The Pill was developed by a team of scientists led by Gregory Pincus. The team needed to carry out large scale trials on humans.

In the summer of 1955, Pincus visited the island of Puerto Rico. Puerto Rico is one of the most densely populated areas in the world. Officials supported birth control as a form of population control. The women in Puerto Rico were mainly poor and uneducated.

The scientists selected a pill with a high dose of hormones. The Pill was found to be 100 % effective when taken properly. But 17 % of the women in the study complained of side effects.

The women in the trial had been told only that they were taking a drug that prevented pregnancy. They had not been told that the Pill was experimental or that there was a chance of dangerous side effects.



Evaluate the issues involved with methods used by Pincus in trialling the contraceptive pill.

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(Total 6 marks)

Q4. Hormones are used in contraceptive pills.

(a) Explain how a contraceptive pill works.

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(2)



- (b) Read the information about the trialling of the first contraceptive pill.

The Pill was developed by a team of scientists led by Gregory Pincus. The team needed to carry out large scale trials on humans.

In the summer of 1955, Pincus visited the island of Puerto Rico. Puerto Rico is one of the most densely populated areas in the world. Officials supported birth control as a form of population control. Pincus knew that if he could demonstrate that the poor, uneducated women of Puerto Rico could use the pill correctly then so could women anywhere in the world.

The scientists selected a pill with a high dose of hormones to ensure that no pregnancies would occur while test subjects were taking the drug. The Pill was found to be 100% effective when taken properly. But 17% of the women in the study complained of side effects. Pincus ignored these side effects.

The women in the trial had been told only that they were taking a drug that prevented pregnancy. They had not been told that the Pill was experimental or that there was a chance of dangerous side effects.

Evaluate the methods used by Pincus in trialling the contraceptive pill.

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(5)
(Total 7 marks)



Q5. The human menstrual cycle is controlled by hormones.

Name the gland which produces:

(i) FSH

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(1)

(ii) oestrogen.

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(1)

(Total 2 marks)

Questions continue on the following page



Q6. A new fertility treatment that could allow women to have IVF in their lunch hour has been developed.

In standard IVF:

Eggs are fertilised with sperm in a dish in a laboratory.

Any resulting embryos are incubated and monitored in a laboratory for three to five days.

The best embryo is transferred to the woman's womb.

Standard IVF treatment can also be used in cases where the male is infertile. In this treatment a sperm nucleus is injected into an egg. The average success rate for standard IVF treatment is 29.6 per cent.

In the *Invozell* technique:

The *Invozell* device, shown below, is a sealed capsule that allows fertilisation to take place inside the woman's body, in the vagina.



Eggs are removed from the ovaries while the woman is under sedation.

The eggs and sperm are put into the *Invozell* capsule.

The capsule is placed inside her vagina.

After three days the capsule is removed and the best embryo is transferred to the woman's womb.

This IVF treatment can be performed in a doctor's surgery because at no time are eggs, sperm or embryo stored outside the body. No costs are involved for laboratory incubation.

The *Invozell* company tried the technique on 800 women with a success rate of 19.7 per cent.

(a) In both IVF treatments a woman is given hormones to stimulate her ovaries.

Name the **two** hormones that stimulate the ovaries.

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(2)



- (b) Evaluate the use of the *Invozell* technique compared with standard IVF treatment.
Remember to give a conclusion as part of your evaluation.

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(4)
(Total 6 marks)