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Paper Reference(s)

7042/02

London Examinations GCE

Human Biology Ordinary Level

Paper 2

Friday 18 May 2007 – Morning

Time: 2 hours

Materials required for examination

Items included with question papers

Nil

| Instructions | to | Candidates |
|--------------|----|------------|
| | | |

In the boxes above, write your centre number, candidate number, your surname, initial(s) and signature. Answer FIVE questions, THREE from Section A and TWO from Section B. Indicate which question you are answering by marking the box (\boxtimes). If you change your mind, put a line through the box (\boxtimes) and then indicate your new question with a cross (\boxtimes). Write your answers in the spaces provided in this question paper.

Information for Candidates

The total mark for this paper is 100. All questions carry equal marks. Marks for parts of questions are shown in round brackets: e.g. (2). This paper has 9 questions. All blank pages are indicated.

Advice to Candidates

Write your answers neatly and in good English.

Draw labelled diagrams where these will make the answers clearer. Facts explained in a labelled diagram need not be repeated in the written answer.

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Examiner's use only



SECTION A

| | | SECTION |
|-----|------|---|
| | | Answer THREE questions in this section. |
| | | If you answer Question 1, put a cross in this box \square . |
| (a) | | en a person's finger touches a very hot plate, a reflex action results in the person ing the finger away immediately. |
| | (i) | State three features of reflex actions. |
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| | | (3) |
| | (ii) | Draw a diagram of a spinal reflex arc. On your diagram, label the regions of the spinal cord and the nerve pathway. |
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| (b) | Several reflexes help the eye to keep a car in focus as it moves towards a person. |
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| | Describe how the eye focuses on a car in the distance and the changes that occur in the eye as the car moves nearer. In your account, include details of the nerve pathway involved. |
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| | If you answer Question 2, put a cross in this box \square . |
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| (a) (i) | Explain why the levels of oxygen and carbon dioxide in the blood change as a result of a high demand for energy in the body. |
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| (ii) | How does oxygen in the blood reach the interior of the muscle cells? |
| (ii) | |
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| (ii) | How does oxygen in the blood reach the interior of the muscle cells? |
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| (ii) | How does oxygen in the blood reach the interior of the muscle cells? |

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| (c) | Name the hormone that affects the rate of breathing and describe other effects of this hormone that help prepare the body for vigorous activity. |
| (c) | Name the hormone that affects the rate of breathing and describe other effects of this |
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5 **Turn over**



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| | | If you answer Question 3, put a cross in this box \square . | |
| 3. | In the concent | cell anaemia is an inherited condition that can be lethal in the homozygous state. heterozygous state, the red blood cells become sickle shaped in low oxygen rations. This change in the shape of the red blood cells reduces their ability to aygen and they may now block some capillaries. | |
| | (a) (i) | What is meant by the term heterozygous ? | |
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| | | (2) | |
| | (ii) | The allele that causes sickle cell anaemia is said to be codominant with the normal allele. What is meant by the term codominant ? | |
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| (0) | elde you | oy first showed the symptoms of sickle cell anaemia during a football game. His er brother had died from the condition as a baby. What are the chances that his enger sister may also show the symptoms? You may draw a genetic diagram to to explain your answer. | |
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| | | (5) | |
| (c) | (i) | Explain why a person heterozygous for sickle cell anaemia is most likely to develop sickle-shaped cells when performing vigorous exercise. | |
| (c) | (i) | Explain why a person heterozygous for sickle cell anaemia is most likely to develop | |
| (c) | (i) | Explain why a person heterozygous for sickle cell anaemia is most likely to develop | |
| (c) | (i) | Explain why a person heterozygous for sickle cell anaemia is most likely to develop | |
| (c) | (i) | Explain why a person heterozygous for sickle cell anaemia is most likely to develop | |
| (c) | | Explain why a person heterozygous for sickle cell anaemia is most likely to develop sickle-shaped cells when performing vigorous exercise. | |
| (c) | | Explain why a person heterozygous for sickle cell anaemia is most likely to develop sickle-shaped cells when performing vigorous exercise. (2) Suggest why, in some cases, the symptoms of the disease may be reduced by a | |
| (c) | | Explain why a person heterozygous for sickle cell anaemia is most likely to develop sickle-shaped cells when performing vigorous exercise. (2) Suggest why, in some cases, the symptoms of the disease may be reduced by a | |
| (c) | | Explain why a person heterozygous for sickle cell anaemia is most likely to develop sickle-shaped cells when performing vigorous exercise. (2) Suggest why, in some cases, the symptoms of the disease may be reduced by a | |



| | (iii) | Suggest why a severe attack of the condition, if untreated, may result in permanent | Leave blank |
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| | | damage to body organs or even death. | |
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| | | (2) | |
| (d) | Inh | erited disorders can arise as the result of a mutation. | |
| | | What is a mutation ? | |
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| | | (1) | |
| | (ii) | Name two possible causes of mutations and state where a mutation would occur if it is to affect children of the next generation. | |
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| | | (3) | Q3 |
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| If you answer Question 4, put a cross in this box □ . | | |
| 4. (a) (i) Draw a large fully labelled diagram of the renal system. | | |
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| | pelvis of the kidney. | |
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| (iii) | Describe how urine is moved from the kidney to the outside of the body. | |
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| | In the body, the water content of the blood remains within narrow limits. Why is this important? |
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| | (3) |
| (ii) | In cases of severe diarrhoea, too much water is lost. This can be replaced by Oral Rehydration Therapy (ORT). Explain why ORT is both cheap and effective. |
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| | ain how it is adapted for the special functions it carries out. |
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| (a) | The skull |
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| (b) | The rib cage |
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| | (6) |
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| | QUESTION 5 CONTINUES ON PAGE 14 |
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| (c) | The pelvis and leg | Leave blank |
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| | (7) | Q5 |
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| | TOTAL FOR SECTION A: 60 MARKS | |



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| SECTION B | | | |
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Answer any TWO questions in this section.

| | | If you answer Question 6, put a cross in this box □ . |
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| 6. | | arasite that causes the disease malaria is endemic in parts of the world where the is suitable for the survival of its vector, the <i>Anopheles</i> mosquito. |
| | (a) (i) | Explain the meaning of each of the terms endemic and vector . |
| | | Endemic |
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| | | Vector |
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| · / | Describe, with reasons, the conditions that are necessary for the vector of the malarial parasite to complete its life cycle. |
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| (iii) | Suggest, with reasons, three measures that the authorities could take to break the life cycle of the mosquito. |
| (iii) | Suggest, with reasons, three measures that the authorities could take to break the |
| (iii) | Suggest, with reasons, three measures that the authorities could take to break the life cycle of the mosquito. |
| (iii) | Suggest, with reasons, three measures that the authorities could take to break the life cycle of the mosquito. |
| (iii) | Suggest, with reasons, three measures that the authorities could take to break the life cycle of the mosquito. |
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| (iii) | Suggest, with reasons, three measures that the authorities could take to break th life cycle of the mosquito. |
| (iii) | Suggest, with reasons, three measures that the authorities could take to break th life cycle of the mosquito. |

| (b) | Many people visit regions where malaria occurs. Explain three measures that people visiting a region where malaria occurs could take before or during their visit to reduce the risk of contracting malaria. |
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| | If you answer Question 7, put a cross in this box □ . |
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| A man o | cuts his foot on a rusty nail while digging in the garden and it begins to bleed. |
| (a) (i) | Suggest reasons why the wound caused by the nail should be rinsed with cold running water for several minutes. |
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| | (2) |
| (ii) | Why should the wound then be covered? |
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| | QUESTION 7 CONTINUES ON PAGE 20 |
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| | escribe how the body would deal with any pathogens that had entered the ound. | Leave blank |
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| | (6) | |
| (c) If the an ant | wound is seen by a doctor, a course of antibiotics may be prescribed. What is ibiotic and why might it be prescribed? | |
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| | If you answer Question 8, put a cross in this box ■ . | |
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| . (a) (i) | Why should human urine and faeces never be left on the surface of the ground or got rid of into waterways? | |
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| | s of two chambers containing different types of microorganisms. |
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| Explain the role the septic tank. | e of these microorganisms in the breakdown of excretory material in |
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| | | If you answer Question 9, put a cross in this box □ . | |
| 9. | | ny people think that some of the activities of humans damage the environment for all ng things. | |
| | Sug | gest some harmful effects of each of the following. | |
| | (a) | Pollution resulting from the increased burning of fossil fuels for energy | |
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| (b) | Attempt fertiliser | ts to | increase | crop | yields | from | agricultural | land, | including | the | use | of |
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| (c) The rapid rise in human populations in some regions (6) Q9 (Total 20 marks) TOTAL FOR SECTION B: 40 MARKS TOTAL FOR PAPER: 100 MARKS END | | |
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