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Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.						7	0	4	2	/	0	2	Signature	

Paper Reference(s)

7042/02

London Examinations GCE

Human Biology

Ordinary Level

Paper 2

Friday 16 May 2008 – Morning

Time: 2 hours

Examiner's use only

Team Leader's use only

Question Number	Leave Blank
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total	

Materials required for examination
Nil

Items included with question papers
Nil

Instructions to Candidates

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

Answer any THREE questions in this section.

If you answer Question 1, put a cross in this box ☒.

1. (a) (i) Describe how blood leaving the vena cava reaches the left atrium of the heart.

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(ii) Describe and explain the changes that occur in the blood as it passes from the vena cava to the left atrium.

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(b) The heart is made of cardiac muscle. Describe **two** ways in which cardiac muscle differs from skeletal muscle.

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(4) **Q1**

(Total 20 marks)

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If you answer Question 2, put a cross in this box ☒.

2. (a) Describe the function of receptor organs and illustrate your answer with reference to **one** named receptor organ.

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(b) Rays of light from a tree in the distance form an image on the retina of the eye. Explain how this is brought about.

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(c) Explain how vision may be affected in older people if the following changes occur in the lens of the eye.

The lens becomes harder and less flexible

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The lens becomes cloudy

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(d) Some people consider that the reflex response of the iris of the eye is a type of homeostatic mechanism.

(i) Explain what is meant by the term **homeostatic mechanism**.

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(ii) Explain how the iris mechanism works and its value to a person.

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Q2

(Total 20 marks)

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If you answer Question 3, put a cross in this box ☒.

3. All living cells require a supply of energy.

(a) (i) Name the chemical substance in food that supplies the energy and describe where and how this energy is released in a cell.

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(ii) Describe the role of ATP in energy transfer.

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(b) When a muscle becomes very active it needs more energy and may begin anaerobic respiration, in addition to aerobic respiration.

(i) Describe **three** differences between these two types of respiration and explain why anaerobic respiration cannot continue for very long.

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(ii) Both aerobic and anaerobic respiration result in waste products. Describe how the body either alters or excretes these waste products.

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Q3

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If you answer Question 4, put a cross in this box ☒.

4. (a) The small intestine (duodenum and ileum) has two main functions – digestion and absorption.

(i) Describe how the structure of the small intestine is suited to the function of digestion.

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(ii) Describe what happens to food materials present in the small intestine so that they can be absorbed.

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(iii) Describe how the absorption of the products of digestion occurs in the small intestine.

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(b) Blood containing absorbed materials passes directly to the liver. Describe the role of the liver in processing these materials.

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(Total 20 marks)

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If you answer Question 5, put a cross in this box ☒.

5. The placenta is a structure that is found only in mammals.

(a) Describe the events that occur between the fertilisation of an ovum and the formation of a functioning placenta.

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(b) The placenta has been described as 'the small intestine, the lungs and the kidneys of the fetus'.

(i) Describe how the structure of the placenta allows it to carry out absorption.

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(ii) Explain how the placenta carries out some of the functions of each of these organs.

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(c) The placenta produces a hormone during most of a pregnancy. Name this hormone and explain why this hormone is needed to maintain a pregnancy.

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Q5

(Total 20 marks)

TOTAL FOR SECTION A: 60 MARKS

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SECTION B

Answer any TWO questions in this section.

If you answer Question 6, put a cross in this box ☒.

6. Many disease organisms cannot enter their host unless they make use of a vector.

(a) What is meant by the term **vector**?

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(b) Describe the role of a **named** vector in the transmission of each of the following diseases.

(i) Typhus

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(ii) Malaria

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(c) Describe the role of the snail in the transmission of *Schistosoma* from person to person.

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(d) The HIV virus cannot penetrate unbroken human skin. Describe ways by which this virus can gain entry to the body and be transmitted from person to person.

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(Total 20 marks)

Q6

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If you answer Question 7, put a cross in this box ☒.

7. (a) (i) Describe the structure of a typical bacterium.

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(ii) Describe and explain the main methods by which bacteria obtain their food supply.

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(b) Many bacteria are considered to be pathogens.

(i) Name **one** disease caused by bacteria and describe the methods of treatment and measures used to control the spread of this disease.

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(ii) Describe, with examples, **three** processes in which bacteria are of use to humans.

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(Total 20 marks)

Q7

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If you answer Question 8, put a cross in this box ☒.

8. (a) What is a vaccine?

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(b) (i) Describe how a vaccine can bring about long-term immunity to a disease.

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(ii) Explain why a vaccine is of little value after a person has been infected.

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(iii) Suggest why a baby often has immunity to some diseases at birth but this immunity disappears after about 3 months.

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(c) On rare occasions a baby is born who lacks the ability to form active white blood cells.

How might this affect the development of the child? Suggest why the condition can sometimes be treated by a carefully matched bone marrow transplant.

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Q8

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If you answer Question 9, put a cross in this box ☒.

9. (a) (i) Describe how energy is incorporated into a plant at the beginning of a food chain.

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(ii) Using an example of a food chain of at least three organisms, explain how energy incorporated in grass plants becomes part of the human body. What happens to the energy as it passes along the food chain?

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(b) For healthy growth, plants need a good supply of nitrates.

(i) Explain why these are needed and suggest **two** ways in which farmers can increase the supply of nitrates in their fields.

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(ii) Describe the problems that can arise if too much nitrate is applied to fields.

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(Total 20 marks)

Q9

TOTAL FOR SECTION B: 40 MARKS

TOTAL FOR PAPER: 100 MARKS

END

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