Centre No.					Pape	er Refer	ence			Surname	Initial(s)
Candidate No.			6	1	0	6	/	0	3	Signature	

Paper Reference(s)

6106/03 Edexcel GCE Biology Biology (Human)

Advanced

Unit Test 6 Paper 03 Synoptic Paper Friday 23 June 2006 – Afternoon

Time: 1 hour 10 minutes

Materials required for examination	Items included with question paper
Ruler	Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initial(s) and signature. Check that you have the correct question paper.

Answer Questions 1 and 2 and then either Question 3 or either 4B or 5H in the spaces provided in this question paper.

Show all the steps in any calculations and state the units. Calculators may be used. Include diagrams in your answers where these are helpful.

Information for Candidates

The marks for individual questions and parts of questions are shown in round brackets: e.g. (2). The total mark for this paper is 38.

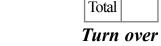
There are 20 pages in this question paper. All blank pages are indicated.

Advice to Candidates

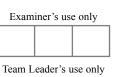
You will be assessed on your ability to organise and present information, ideas, descriptions and arguments clearly and logically, taking account of your use of grammar, punctuation and spelling. This question paper is designed to give you the opportunity to make connections between different areas of biology and to use skills and ideas developed throughout the course in new contexts. You should include in your answers any relevant information from the whole of your course.

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Question Number Blank

1
2
3
4B
5H

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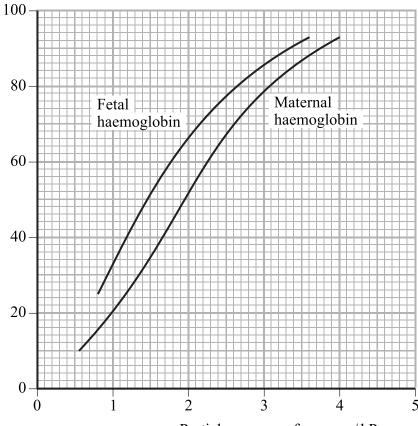
Answer Questions 1 and 2 in the spaces provided.

1. (a) Explain why haemoglobin is an efficient respiratory pigment.

(2)

(b) The graph below shows oxygen dissociation curves for fetal and maternal haemoglobin from a goat.

Percentage saturation of haemoglobin with oxygen (%)



Maternal haemoglobin	kP	Fetal haemoglobin
(ii) Suggest why it is important that the dissociation curve for fetal haemoglobin to the left of the dissociation curve for maternal haemoglobin.		
to the left of the dissociation curve for maternal haemoglobin.		waternar nacmogroom

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(c) Soon after most babies are born, their fetal haemoglobin is replaced with adult haemoglobin. However, a mutation sometimes occurs which results in a condition known as hereditary persistence of fetal haemoglobin (HPFH). Carriers of HPFH have the genotype Hb ^b Hb ^f . A person affected with HPFH has the genotype Hb ^f Hb ^f .	
In the space below, draw a genetic diagram to find the probability that a baby, born to parents who are both carriers for HPFH, will also be a carrier.	
(3)	Q1
(Total 9 marks)	

Extensive field trials have been carried out to assess the environmental effects of growing genetically modified (GM) crop plants, such as maize and oilseed rape. The crop plants have been genetically modified so that they are resistant (tolerant) to certain herbicides. Each crop was planted in a number of different sites. Each site was divided into two. One half of each site was planted with a non-genetically modified (non-GM) crop and the other half was planted with the genetically modified crop. The crops were grown for three years and during this time many different measurements were made. Measurements included the density of weeds in the crops and the numbers and types of invertebrates, such as predatory insects, living on and in the soil. (a) Explain what is meant by the term genetically modified organism (GMO). (b) Suggest why predatory insects, such as hoverfly larvae and ladybirds, may be beneficial to crop plants.	genetically modified (GM) crop plants, such as maize and oilseed rape. The crop plants have been genetically modified so that they are resistant (tolerant) to certain herbicides. Each crop was planted in a number of different sites. Each site was divided into two. One half of each site was planted with a non-genetically modified (non-GM) crop and the other half was planted with the genetically modified crop. The crops were grown for three years and during this time many different measurements were made. Measurements included the density of weeds in the crops and the numbers and types of invertebrates, such as predatory insects, living on and in the soil. (a) Explain what is meant by the term genetically modified organism (GMO). (b) Suggest why predatory insects, such as hoverfly larvae and ladybirds, may be beneficial to crop plants.		
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(d) Some of	of the results of these	field trials are summarised	d in the table below.
	Factor	GM maize compared with non-GM maize	GM oilseed rape compare with non-GM oilseed rap
Weed den	sity	Increase	Decrease
Number o	of weed seeds in soil	No change	Decrease
37 1	of invertebrates		
on soil su		Increase	Decrease
on soil su:	rface		
on soil su:	rface escribe a method which		Decrease mine the density of weeds
on soil su:	rface escribe a method which		
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b	(ii) Using the evidence in the table, state which genetically modified crop seemed to	
	be less harmful to the environment and give an explanation for your answer.	
	(2)	
	Suggest one environmental disadvantage of growing herbicide-tolerant GM maize compared with non-GM maize.	(e)
	(1)	
	(Total 14 marks)	
- 1		

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Write an essay on ONE of the following topics. Put a cross in the box below indicating the question you have chosen (☒). If you change your mind, put a line through the box (₩) and then put a cross in the other box (♥). Chosen question number: Question 3 X Question 4B Question 5H For Biology you should choose EITHER Question 3 OR Question 4B. The transport of molecules and ions through the cell surface membrane. (15 marks) **4B.** The detection of light by mammals and flowering plants. (15 marks) For Biology (Human) you should choose EITHER Question 3 OR Question 5H. The transport of molecules and ions through the cell surface membrane. (15 marks) 5H. The production of gametes, fertilisation and the detection of fetal abnormality by amniocentesis. (15 marks) Marks will be awarded for scientific content, coverage of the topic, and the quality of written communication. You should include in your answers any relevant information from the whole of your course. You may include diagrams if you wish, but make sure that they are relevant to your essay and add extra information to it. Write your answer, including any plan, here.



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(Total 15 marks)	
TOTAL FOR PAPER: 38 MARKS	
END	

