

OXFORD CAMBRIDGE AND RSA EXAMINATIONS Advanced Subsidiary GCE

BIOLOGY 2802

Human Health and Disease

Monday

5 JUNE 2006

Morning

1 hour

Candidates answer on the question paper.
Additional materials:
Electronic calculator
Ruler (cm/mm)

Candidate Name	Centre Number	Candidate Number

TIME 1 hour

INSTRUCTIONS TO CANDIDATES

- Write your name in the space above.
- Write your Centre number and Candidate number in the boxes above.
- Answer all the questions.
- Write your answers, in blue or black ink, in the spaces provided on the question paper.
- Read the questions carefully before starting your answer.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- You will be awarded marks for the quality of written communication where this is indicated in the question.
- You may use an electronic calculator.
- You are advised to show all the steps in any calculations.

FOR EXAMINER'S USE			
Qu.	Max.	Mark	
1	10		
2	12		
3	5		
4	10		
5	14		
6	9		
TOTAL	60		



Answer all the questions.

Table 1.1 shows the UK Reference Nutrient Intake (RNI) for vitamins A, C and D. It also shows the amount of each vitamin found in certain foods. The RNI represents enough, or more than enough nutrient, to meet the daily needs of almost all members of the population.

Table 1.1

			amount	of vitamin i	n food / m	g 100g-1	
vitamin	RNI / mg day ⁻¹	milk	egg yolk	orange	carrot	chicken liver	herring
Α	0.35 - 0.60	0.03	1.12	0.90	12.00	11.60	0.04
С	25 – 40	1.70	0.30	50.00	7.10	28.00	0.50
D	0.00 - 0.01	0.00	0.00	0.00	0.00	0.00	0.03

(a)	Sug	gest why there is a range of values given for the RNI for each of these vitamins.
		101
		[2]
(b)	(i)	Describe the effects on the eyes of a long-term deficiency of vitamin A.
		[2]
	(ii)	The RNI for vitamin A for a six year old girl is 0.50 mg day ⁻¹ .
		Calculate the minimum mass of carrot in grams that she would need to eat each day in order to supply this amount of vitamin A.
		Show your working and state your answer to the nearest whole number.

Answer =g day⁻¹ [2]



boo	ny toods contain no vitamin D, but the vitamin is essential for certain functions in the dy.
(i)	Suggest how the body acquires the vitamin D it needs other than from the diet or dietary supplements.
(ii)	State two functions in the body of vitamin D.
(")	1
	2
	[2]
	[Total: 10]

Smoking is considered to be a disease. In 2004, in the UK, the Wanless Report

2

	ommended a change in emphasis in the way that the National Health Service tackle ain diseases, such as smoking and obesity.
(a)	Name one category of disease which includes smoking and obesity.
	[1
(b)	Both these diseases increase the risk of developing coronary heart disease (CHD CHD is known as a multifactorial disease.
	Suggest what is meant by the term multifactorial disease.
	[1
(c)	Explain how cigarette smoke can increase the risk of developing CHD.
	[3
(d)	Suggest reasons why the incidence of CHD is not the same in all parts of the world.
	[4



	With reference to CHD, suggest what benefits this chan-	ge in approach may bring.
		[Total
A nu	mber of definitions are listed in the table below.	
	ne right hand column, write a term that best matchesmn. The first one has been done for you.	the definition in the left
colui		the definition in the left
The	mn. The first one has been done for you.	
The The infe	type of B cell which secretes antibodies.	
The The infe Dise of th	type of B cell which secretes antibodies. eterm which refers to any organism that causes ctious disease. eases which cause a progressive deterioration of part	
The The infe Disc of th	e type of B cell which secretes antibodies. The first one has been done for you. The first one has been done for you. The type of B cell which secretes antibodies. The term which refers to any organism that causes ctious disease. The eases which cause a progressive deterioration of particle body. The type of exercise that uses the heart and lungs to wide oxygen for respiration in muscles. The type of B cell which secretes antibodies.	

[Total: 5]



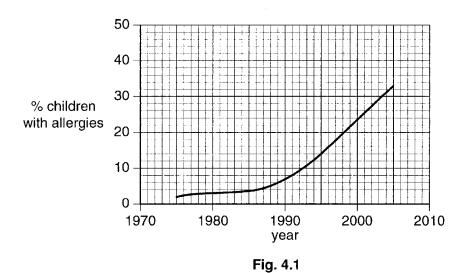
4 (a) During an immune response, phagocytic cells are attracted to the site of infection.

Describe the action of these phagocytic cells at the site of infection.

.....[4]

Sometimes the immune system overreacts and responds to otherwise harmless substances. This occurs in allergic reactions.

Fig. 4.1 shows the increase in the percentage of children with allergies. The figures were collected between 1975 and 2005 in the UK.



(b) (i) Suggest one reason for the increase shown in Fig. 4.1.

.....[1]

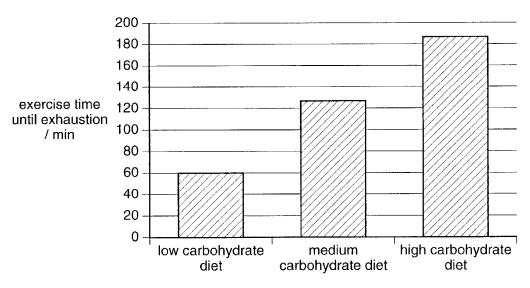
(ii) Use the information in Fig. 4.1 to estimate the percentage of children who are likely to have an allergy in 2010. Assume the rate of increase remains constant.

.....[1

(C)	Allergic reactions, such as asthma, are responses to substances called allergens.
	Name two allergens that may cause asthma.
	1
	2[2]
(d)	State two changes that occur in the lungs during an asthma attack.
	1
	2
	[2]
	[Total: 10]

5 An investigation was carried out to determine the effects of increasing carbohydrate levels in the diet. Consuming extra carbohydrate is a technique called carbohydrate loading. It is often used by endurance athletes, such as long distance cyclists.

Fig. 5.1 shows the effect that different amounts of carbohydrate have on the length of time an athlete can continue exercising until exhausted.



(a)

Fig. 5.1

Using the evidence in Fig. 5.1, describe the effect of carbohydrate loading on a athlete's performance.	ın
	••
	••
	••
	••
	31



(b) Fig. 5.2 shows the effect that different amounts of carbohydrate have on the concentration of glycogen stored in the muscles.

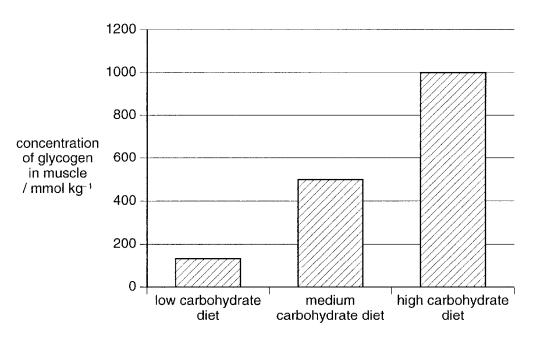


Fig. 5.2

performance ir	high concentra n an endurance e	event.	,, 0		·	

						[2]

grammar.
Describe the factors, related to the heart, lungs and circulatory system, that may affect an athlete's performance in an endurance event.
[8]

[Total: 14]

Quality of Written Communication [1]



6

(a) (i)	Name the virus that leads to AIDS.
	[1]
(ii)	The virus infects and kills T helper cells in the immune system.
	State three ways in which the lack of T helper cells will affect the functioning of the immune system.
	1
	2
	3
	[3]
(iii)	State three ways in which this virus can be transmitted from person to person.
	1
	2
	3
	[3]
	plain why antibiotics may be used to treat a person with AIDS, despite the fact that ibiotics have no effect on viruses.
••••	

	[2]
	[Total: 9]

END OF QUESTION PAPER

