

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

Advanced Subsidiary GCE

BIOLOGY

Human Health and Disease

2802

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												
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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	

This question paper consists of 12 printed pages.

Answer **all** the questions.

- 1 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

vitamin	RNI / mg day ⁻¹	amount of vitamin in food / mg 100g ⁻¹					
		milk	egg yolk	orange	carrot	chicken liver	herring
A	0.35 – 0.60	0.03	1.12	0.90	12.00	11.60	0.04
C	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) Suggest why there is a range of values given for the RNI for each of these vitamins.

.....

 [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]

(c) Many foods contain no vitamin D, but the vitamin is essential for certain functions in the body.

(i) Suggest how the body acquires the vitamin D it needs other than from the diet or dietary supplements.

.....
.....
.....[2]

(ii) State **two** functions in the body of vitamin D.

1
.....
2
.....[2]

[Total: 10]

2 Smoking is considered to be a disease. In 2004, in the UK, the Wanless Report recommended a change in emphasis in the way that the National Health Service tackles certain 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.

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.....
.....
.....
.....
.....[3]

(d) Suggest reasons why the incidence of CHD is **not** the same in all parts of the world.

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.....
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.....
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.....
.....[4]

(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.

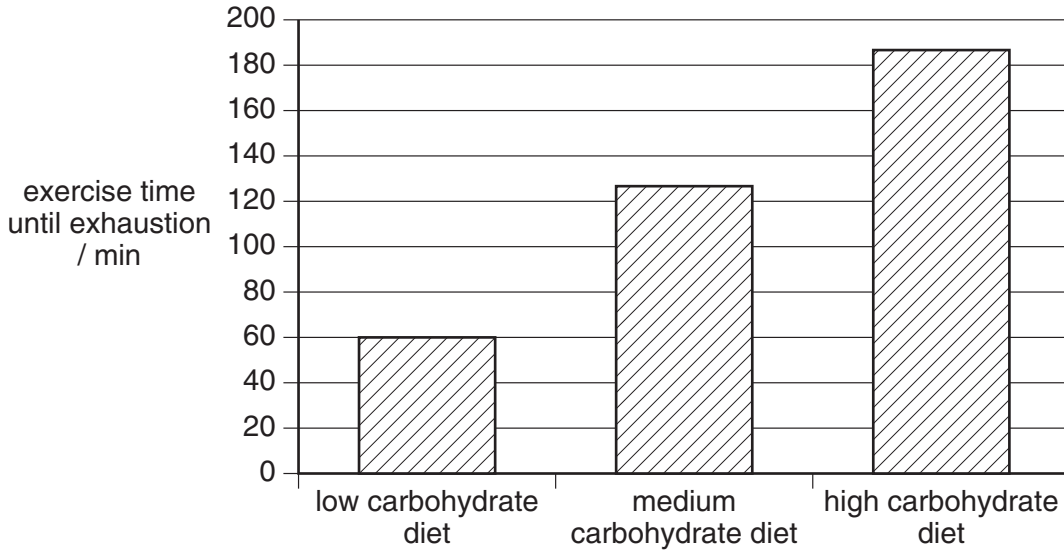


Fig. 5.1

- (a) Using the evidence in Fig. 5.1, describe the effect of carbohydrate loading on an athlete's performance.

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.....[3]

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

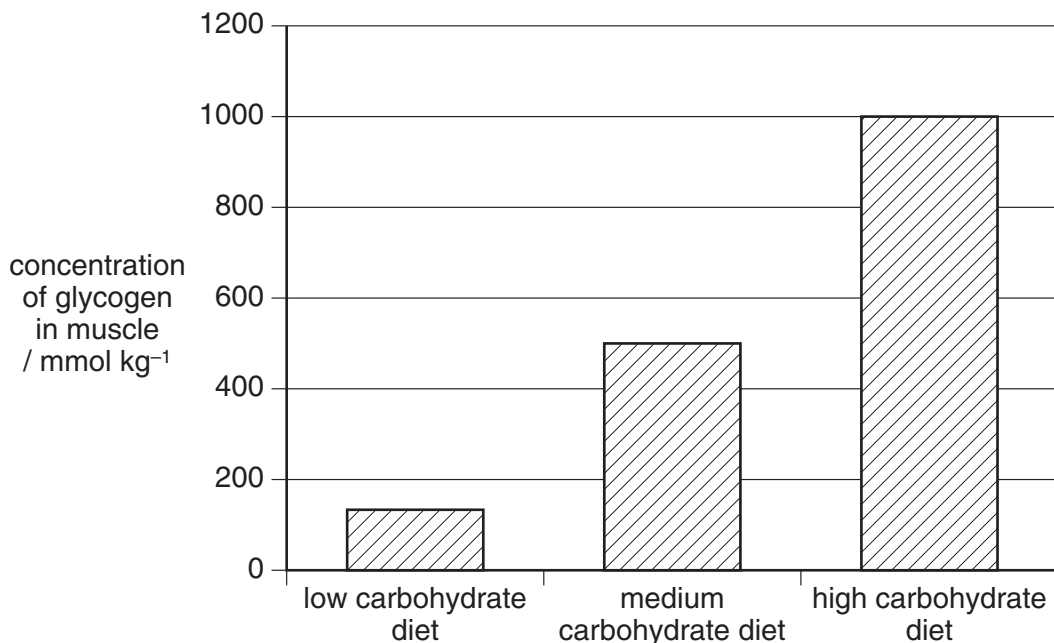


Fig. 5.2

Explain why a high concentration of glycogen in the muscles improves an athlete's performance in an endurance event.

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[2]

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]

(b) Explain why antibiotics may be used to treat a person with AIDS, despite the fact that antibiotics have no effect on viruses.

.....

.....

.....

.....[2]

[Total: 9]

END OF QUESTION PAPER

Copyright Acknowledgements:

Question 1 Table 1.1 Carl Schaschke (1999) 'Vital Vitamins' Biological Sciences Review vol. 11 No. 5.

Question 5 Figs 5.1 & 5.2 Clyde Williams (1999) 'Does carbo-loading work?' Biological Sciences Review vol. 12 No. 2.

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