

Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

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General Certificate of Secondary Education
June 2004



SCIENCE SINGLE AWARD (CO-ORDINATED) 3463/1F
FOUNDATION TIER
Paper 1

Monday 7 June 2004 1.30 pm to 2.15 pm

F

In addition to this paper you will require:
a ruler.
You may use a calculator.

Time allowed: 45 minutes

Instructions

- Use blue or black ink or ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want marked.

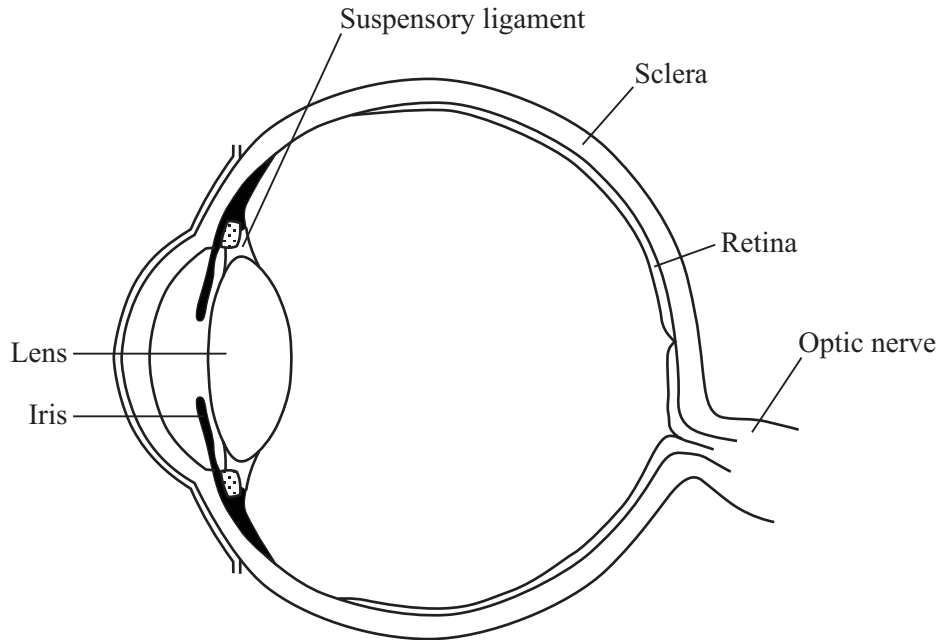
Information

- The maximum mark for this paper is 45.
- Mark allocations are shown in brackets.
- You are reminded of the need for good English and clear presentation in your answers.

For Examiner's Use			
Number	Mark	Number	Mark
1		6	
2		7	
3		8	
4			
5			
Total (Column 1)	→		
Total (Column 2)	→		
TOTAL			
Examiner's Initials			

Answer **all** questions in the spaces provided.

1 The diagram shows the structure of the eye.



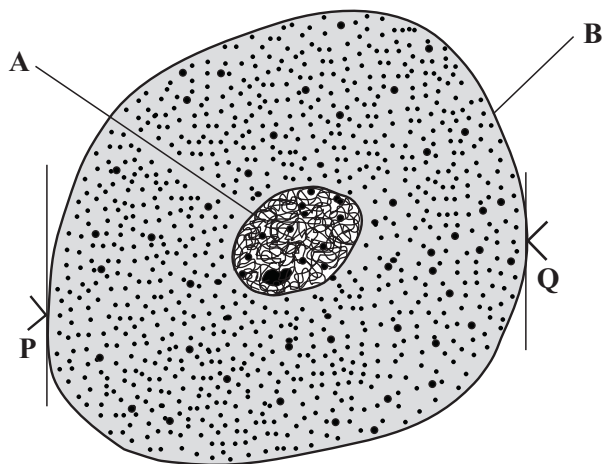
Complete the table by writing in the correct parts of the eye. Choose your answers from the labels on the diagram.

Function	Part of the eye
Contains receptor cells for light	
Carries impulses to the brain	
Controls the amount of light reaching the back of the eye	
Forms a tough outer covering for the eye	
Attaches the lens to the ciliary muscles	

(5 marks)

5

2 The diagram shows an animal cell.



(a) (i) Name structures **A** and **B** by choosing the correct words from the box.

cell membrane cell wall cytoplasm nucleus vacuole

Structure **A**

Structure **B**

(2 marks)

(ii) Which structure named in the box controls the passage of substances in and out of the cell?

.....

(1 mark)

(b) Distance **P** to **Q** on the diagram is the diameter of the cell. This distance was measured on three cells using a microscope. The results were as follows:

- cell 1: 63 micrometres
- cell 2: 78 micrometres
- cell 3: 69 micrometres

Calculate the average diameter of these cells. Show clearly how you work out your final answer.

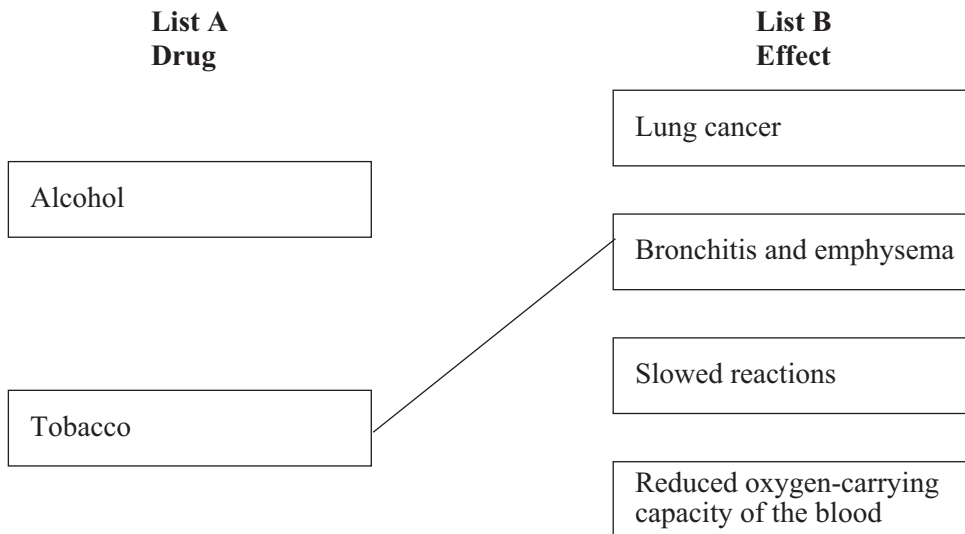
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.....

Average diameter = micrometres
(2 marks)

5

Turn over ►

- 3 (a) List A gives the names of two drugs, alcohol and tobacco. List B gives four effects of these drugs. Draw straight lines to link the drugs with the effects that they cause. (An example line has already been drawn for you.)



(3 marks)

- (b) The smoking of tobacco is addictive. Name the addictive substance found in tobacco.

.....
(1 mark)

- (c) The table shows the death rates among 40 – 60 year old cigarette smokers compared with non-smokers in the same age group.

Age at which smoking started in years	Death rate compared with non-smokers
Non-smokers	1.0
Under 15	2.3
15 – 19	2.2
20 – 24	1.6
25+	1.4

Using information in the table, what is the effect of smoking from an early age on the death rate among 40 – 60 year olds?

.....
.....

(1 mark)

4 Each week, an athlete trains on 5 days (training days) but does not train on the other 2 days (rest days).

The table shows how water losses from the athlete’s body are different on a rest day from those on a training day.

Method	Volume of water lost in cm ³	
	Rest day	Training day
Urine	1500	900
Sweating	625	2400
Breathing	450	1500
Faeces	125	120
Total	2700	

(a) Complete the table to show the total volume of water lost by the athlete on a training day. (1 mark)

(b) Explain why the athlete sweats more on a training day.

.....

.....

.....

.....

(2 marks)

(c) On a training day, the athlete needs to take in more water.

Explain why the athlete needs to take in more water on a training day.

.....

.....

.....

.....

(2 marks)

5 A selective herbicide (a type of pesticide) can be used to kill weeds growing among crop plants.

The table shows the result of adding different amounts of a selective herbicide to a rice crop.

Herbicide added in kg per hectare	Amount of rice produced in tonnes per hectare	Percentage cover of weeds
0.0	50	85
1.7	70	32
3.4	76	24

(a) As more herbicide is applied, what happens to:

(i) the amount of rice produced;

.....
(1 mark)

(ii) the percentage cover of weeds?

.....
(1 mark)

(b) Suggest **two** reasons why rice does not grow well when there are a lot of weeds present.

1

.....

2

.....
(2 marks)

(c) Suggest **one** possible danger of spraying crops with pesticides.

.....

.....
(1 mark)

6 Hormones are sometimes used to regulate human reproduction.

(a) (i) What is a hormone?

.....
.....
(1 mark)

(ii) How are hormones transported around the body?

.....
.....
(1 mark)

(b) Describe the benefits and possible problems that may result from the use of hormones to regulate human reproduction. You should refer to fertility drugs and contraceptives in your answer.

To gain full marks in this question you should write your ideas in good English. Put them into a sensible order and use the correct scientific words.

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(4 marks)

6

TURN OVER FOR THE NEXT QUESTION

Turn over ►

- 7 (a) (i) What name is given to an enzyme which catalyses the breakdown of protein?

.....
(1 mark)

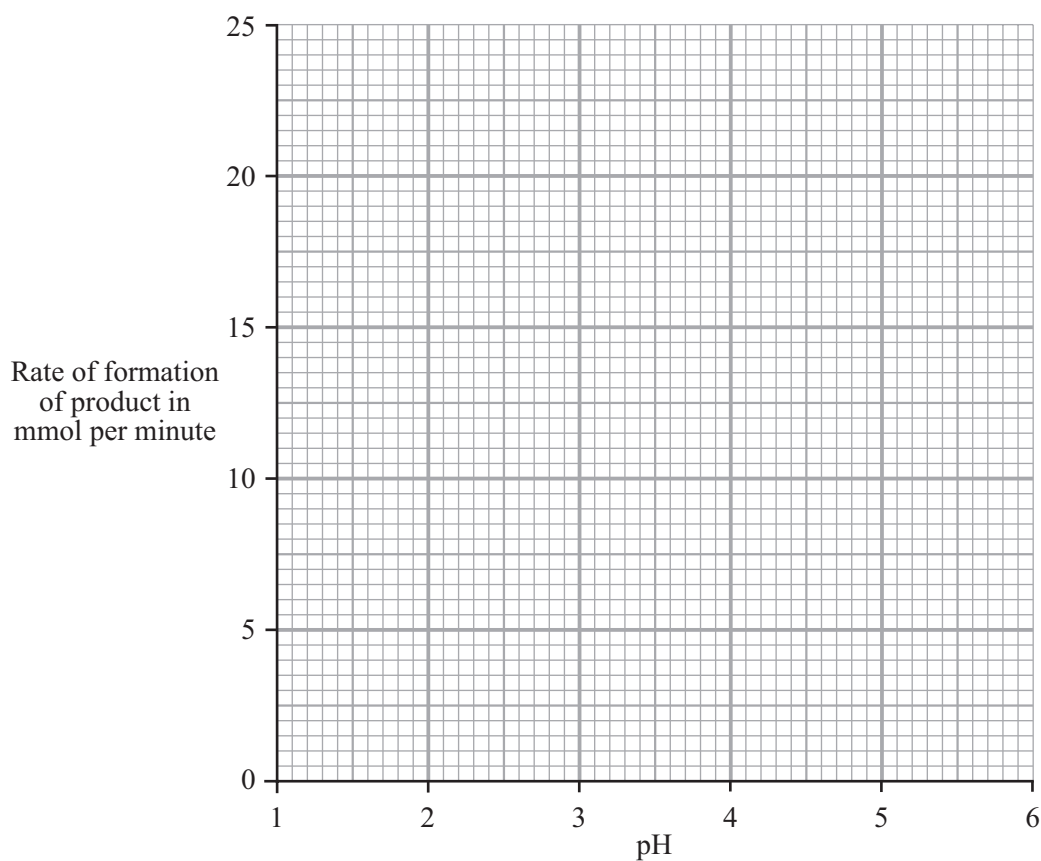
- (ii) What product is formed when protein is broken down by the enzyme?

.....
(1 mark)

The table shows the effect of pH on the activity of an enzyme which catalyses the breakdown of protein.

pH	1.0	2.0	3.0	4.0	5.0
Rate of formation of product in mmol per minute	10.5	23.0	10.5	2.5	0.0

- (b) Draw a graph of the data in the table.



(3 marks)

(c) The enzyme is produced by the human digestive system.

(i) At what pH does this enzyme work best?
(1 mark)

(ii) Suggest which part of the digestive system produces this enzyme.
.....
(1 mark)

(d) Why is it necessary to break down proteins in the digestive system?

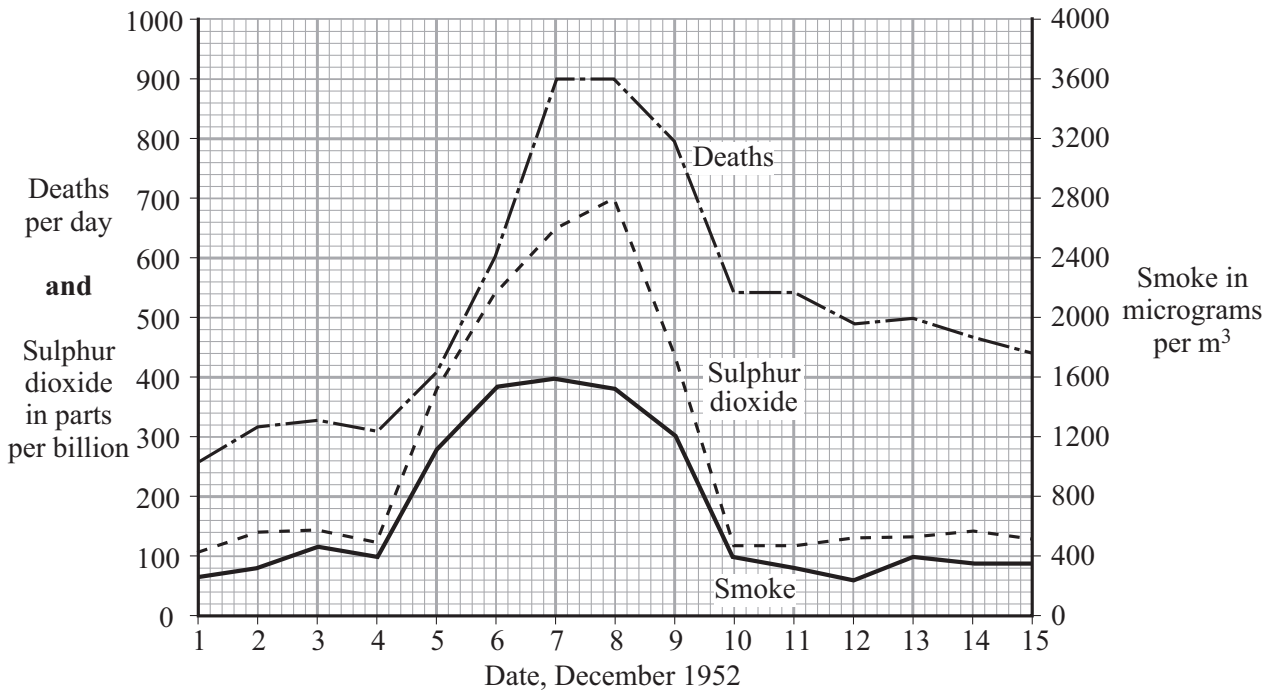
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(3 marks)

10

TURN OVER FOR THE NEXT QUESTION

Turn over ►

8 In December 1952, there was a thick fog in London. The graph shows changes in the amounts of sulphur dioxide and smoke in the air and the number of people dying during this period.



(a) Describe **one** human activity which releases sulphur dioxide into the air.

.....
(1 mark)

(b) Human deaths during this period were caused mainly by lung diseases.

(i) Why were the lungs particularly affected?

.....
(1 mark)

(ii) Give evidence from the graph which suggests that sulphur dioxide might have caused these deaths.

.....
.....
(1 mark)

(iii) Does the graph prove that sulphur dioxide caused these deaths? Explain your answer.

.....
.....
(1 mark)

END OF QUESTIONS

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