



General Certificate of Secondary Education
2009

Science: Biology

Paper 1 Higher Tier

[G0903]

WEDNESDAY 20 MAY, AFTERNOON

TIME

1 hour 30 minutes

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this question paper.

Answer **all eighteen** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 120.

Quality of written communication will be assessed in question **6(d)**

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

71	
----	--

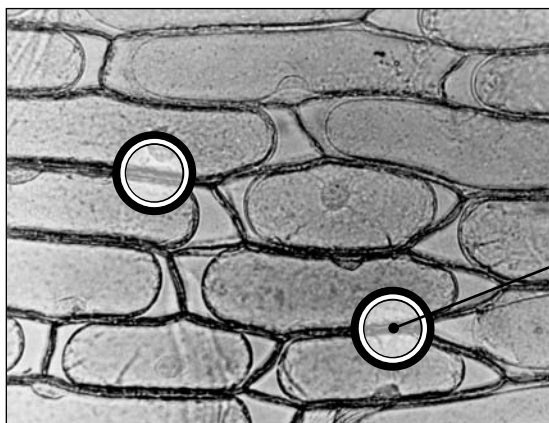
Candidate Number

--

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	

Total Marks	
-------------	--

The drawing shows the appearance of a prepared slide.



Ring shape

(d) What causes the ring shapes?

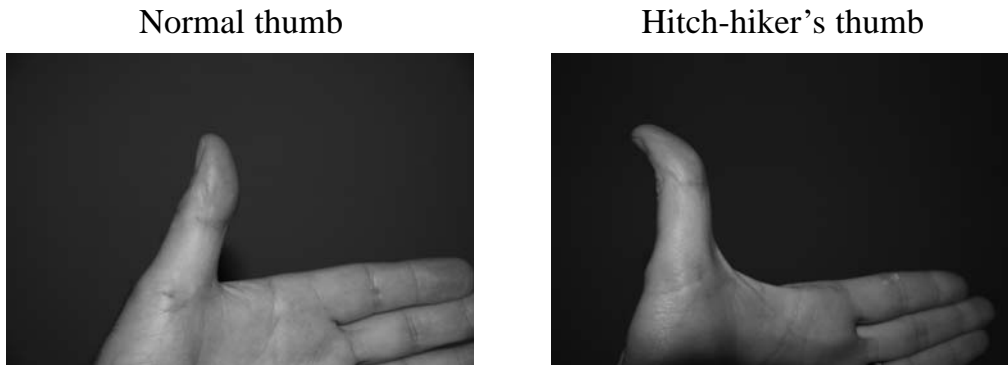
[1]

Examiner Only	
Marks	Remark

3 Thumb shape is controlled by a gene.

The dominant allele, **T** results in a normal thumb shape.

The recessive allele, **t** causes the thumb to be slightly bent to form hitch-hiker's thumb.



(a) Give the phenotype of someone whose genotype is **TT**.

_____ [1]

(b) Complete the Punnett square to show the possible offspring of a cross between a person with a normal thumb and one with a hitch-hiker's thumb.

		Hitch-hiker's thumb	
Normal thumb	Types of gamete		
	T		
	t		

[3]

(c) What portion of the offspring would be expected to have hitch-hiker's thumb?

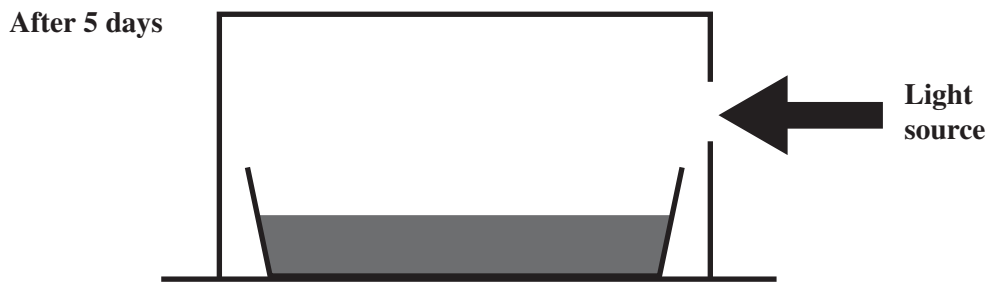
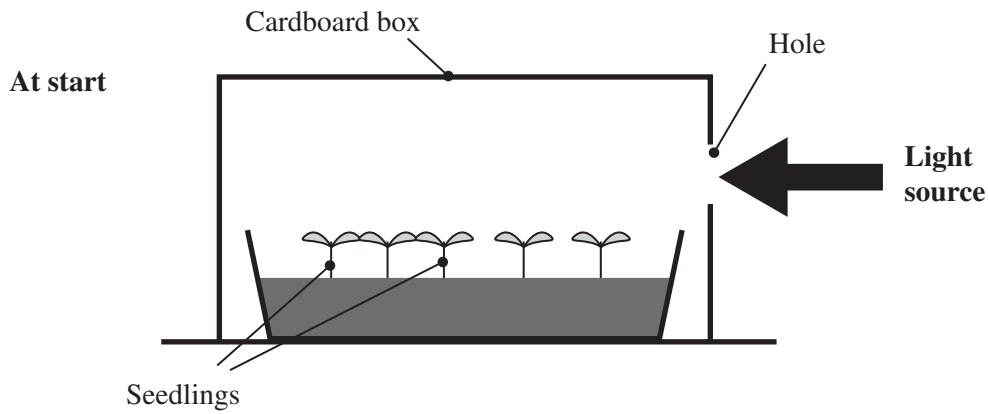
_____ [1]

are heterozygous?

_____ [1]

Examiner Only	
Marks	Remark

7 The diagrams show an experiment to investigate the effect of shining a light from one side on some seedlings.



(a) Complete the diagram to show the appearance of the seedlings after 5 days. [2]

(b) Name this type of growth response. [1]

(c) Explain how this response is an advantage to the plant. [2]

Examiner Only	
Marks	Remark

- 9 The table shows the percentage distribution of skin cancer on different parts of the body.

Part of Body	Percentage of skin cancer	
	Males	Females
Head and neck	22	14
Trunk	38	17
Arm	17	21
Leg	15	42
Other	8	6

- (a) Name the part of the woman's body where skin cancer is most common.

_____ [1]

- (b) Suggest why men suffer from most skin cancers on their trunk.

_____ [1]

- (c) Give **one** way to reduce the risk of skin cancer.

_____ [1]

Examiner Only	
Marks	Remark

(d) Explain why skin cancer has a 99% cure rate if detected early.

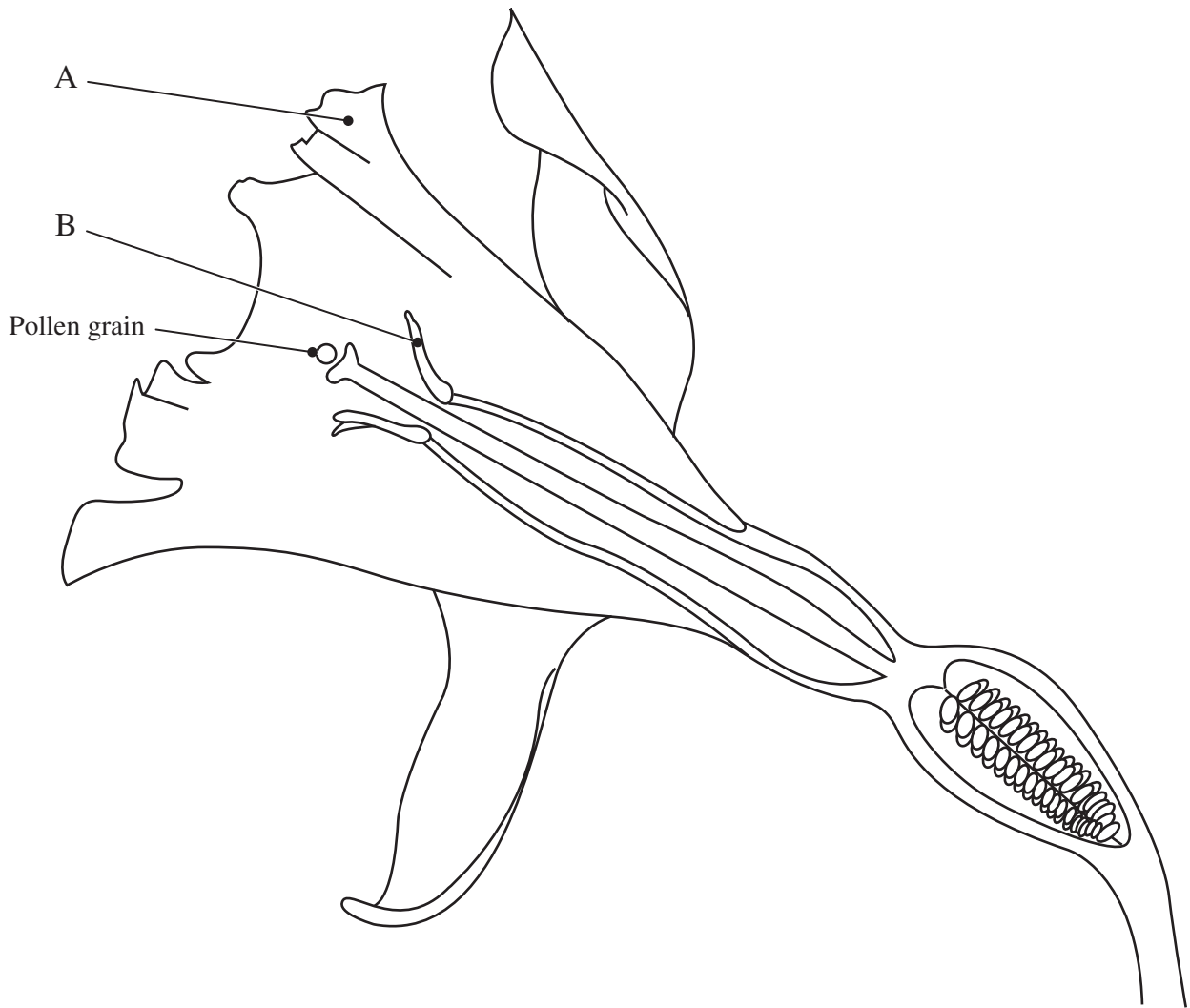
[1]

(e) Explain how the over use of CFCs has resulted in an increase in the number of people suffering from skin cancer.

[2]

Examiner Only	
Marks	Remark

10 The diagram shows parts of a daffodil flower.



Source: D. G. Mackean, GCSE Biology Second Edition, John Murray (Publishers) Ltd., 1995

(a) Name parts A and B.

A _____ [1]

B _____ [1]

(b) On the diagram draw a line to show the pathway of a pollen tube to an ovule. [2]

(c) Describe what happens to an ovule after it is pollinated.

 _____ [2]

Examiner Only	
Marks	Remark

12 (a) Name the type of organism which causes

gonorrhoea. _____ [1]

AIDS. _____ [1]

(b) Explain how AIDS can be passed from a mother to a baby during pregnancy.

_____ [2]

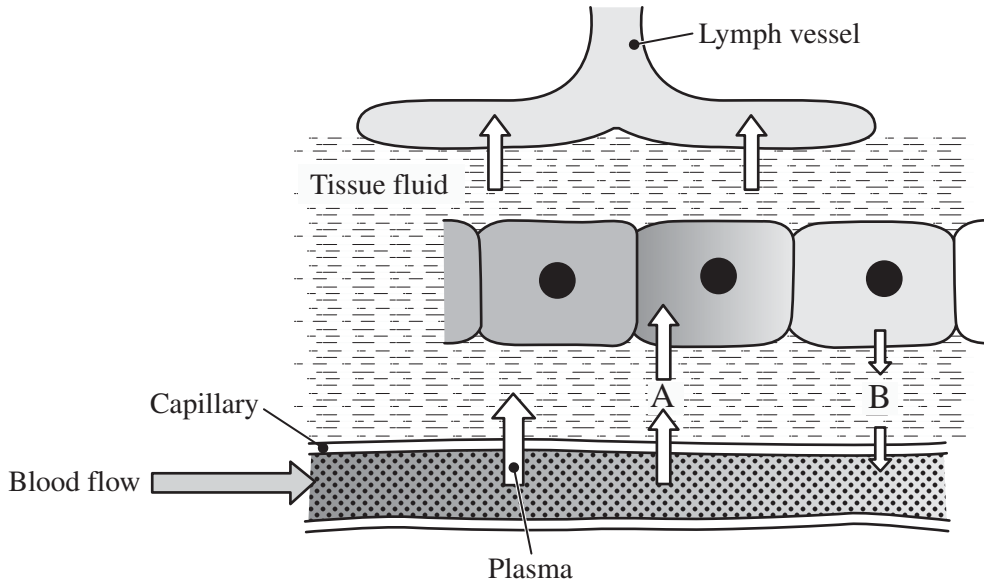
(c) Give **two other** ways AIDS can be spread from one person to another.

1. _____ [1]

2. _____ [1]

Examiner Only	
Marks	Remark

13 The diagram shows the formation of a tissue fluid.



Source: D. G. Mackean, GCSE Biology Second Edition, John Murray (Publishers) Ltd., 1995

(a) Describe how tissue fluid forms.

_____ [2]

(b) Name **one** chemical which moves in the direction of arrow

A _____ [1]

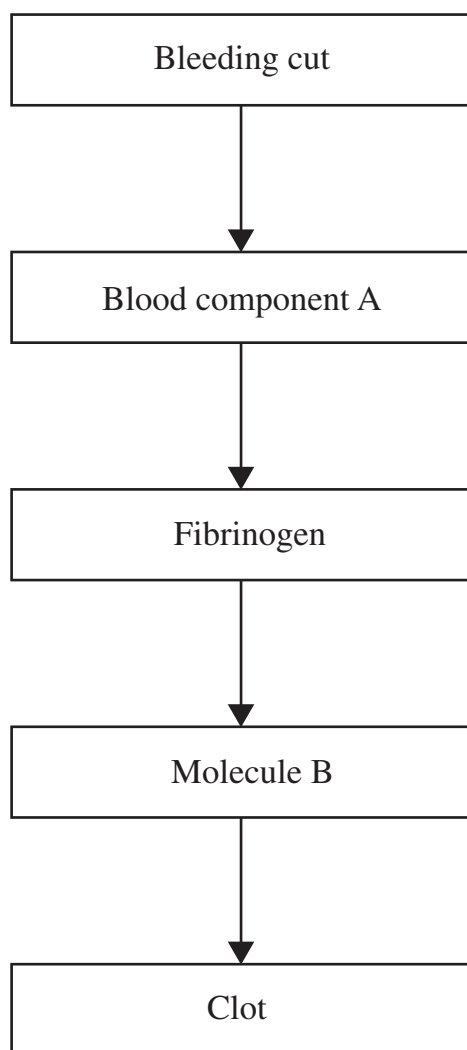
B _____ [1]

(c) Explain why plasma proteins are not found in tissue fluid.

_____ [1]

Examiner Only	
Marks	Remark

The diagram summarises the processes involved in blood clotting.



(d) Name

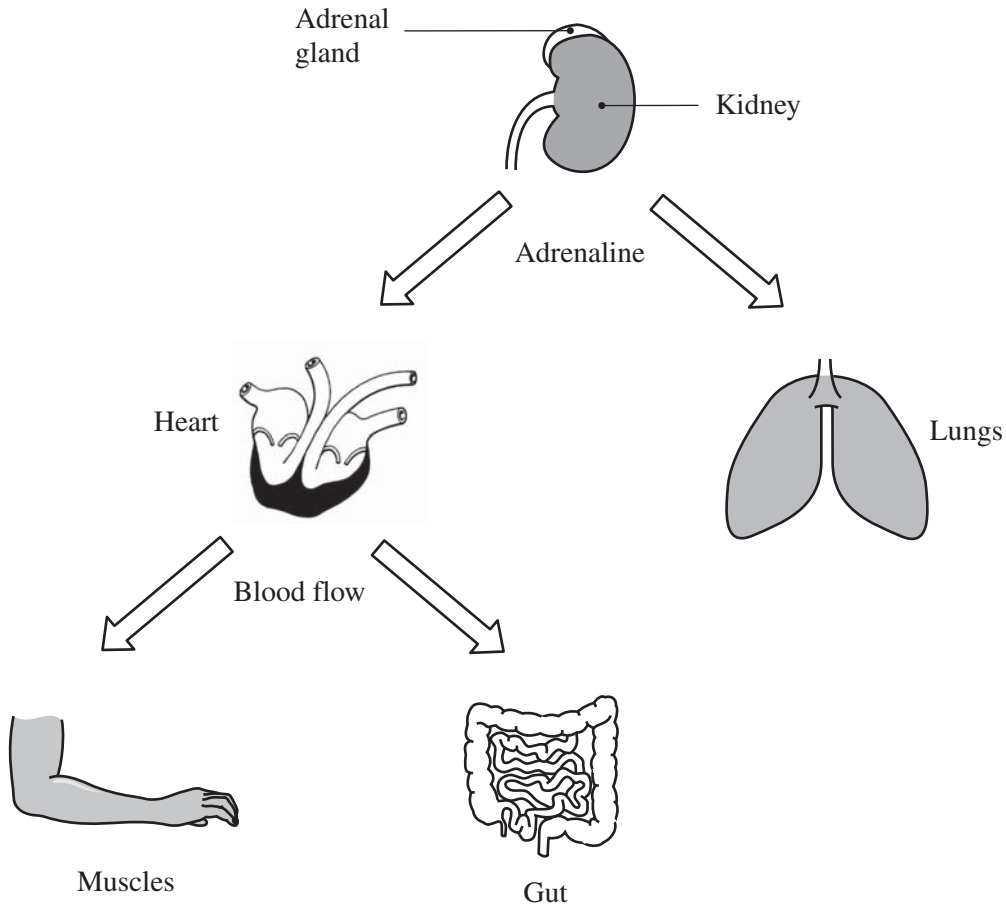
blood component A. _____ [1]

molecule B. _____ [1]

Examiner Only	
Marks	Remark

14 The diagram shows some effects of adrenaline.

Examiner Only	
Marks	Remark



(a) Give **one** condition which causes adrenaline to be released.

_____ [1]

(b) Complete the table.

Organ	Effect of adrenaline
Heart	
Gut	
Muscles	

[3]

(c) Describe the effect adrenaline has on the lungs and explain the advantage of this to the body.

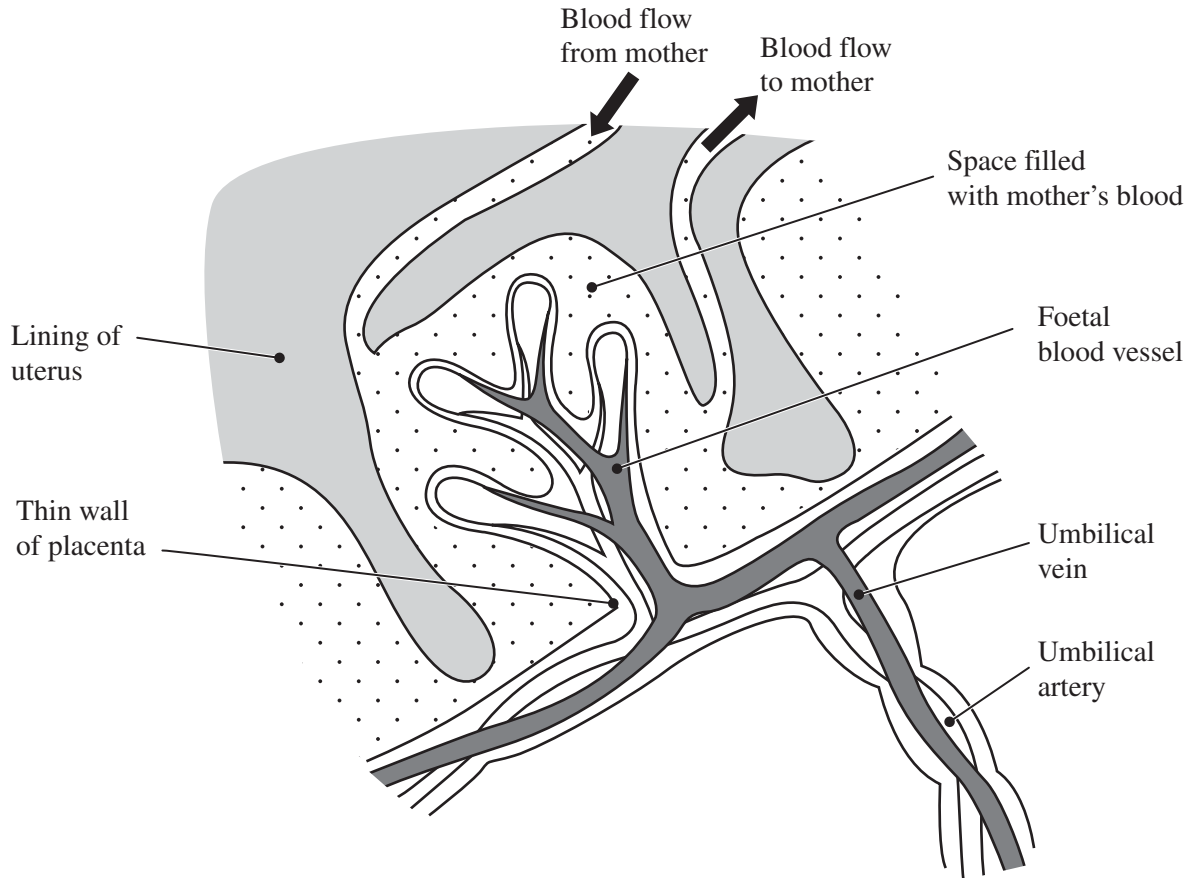
Effect. _____ [1]

Advantage. _____

_____ [2]

Examiner Only	
Marks	Remark

16 The diagram shows part of a placenta.



Source: G. Jones, M. Jones, BIOLOGY GSCE edition, Cambridge University Press, 1984

(a) Use the features shown in the diagram, to explain how the placenta is adapted for exchange of substances between the mother and the foetus.

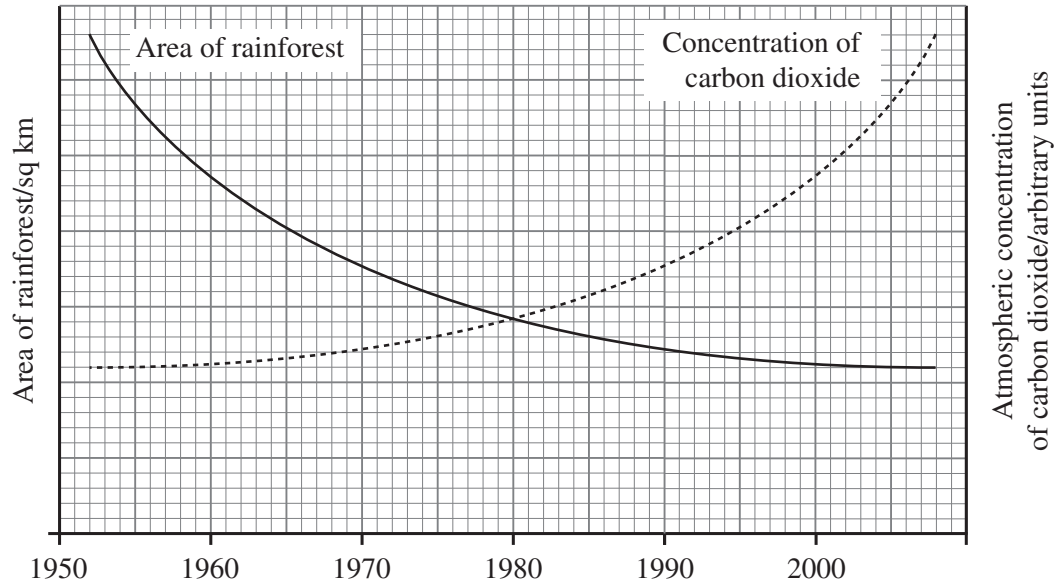
[3]

Examiner Only	
Marks	Remark

17 (a) What is deforestation?

[1]

The graph shows changes in the area of rainforest and atmospheric carbon dioxide concentration since 1950.



(b) What evidence is there of deforestation from the graph?

[1]

(c) Explain how the change in atmospheric carbon dioxide concentration may be caused by deforestation.

[2]

Examiner Only	
Marks	Remark

(d) Suggest and explain **one other** way Man's activities could cause the changes in the atmospheric carbon dioxide concentration.

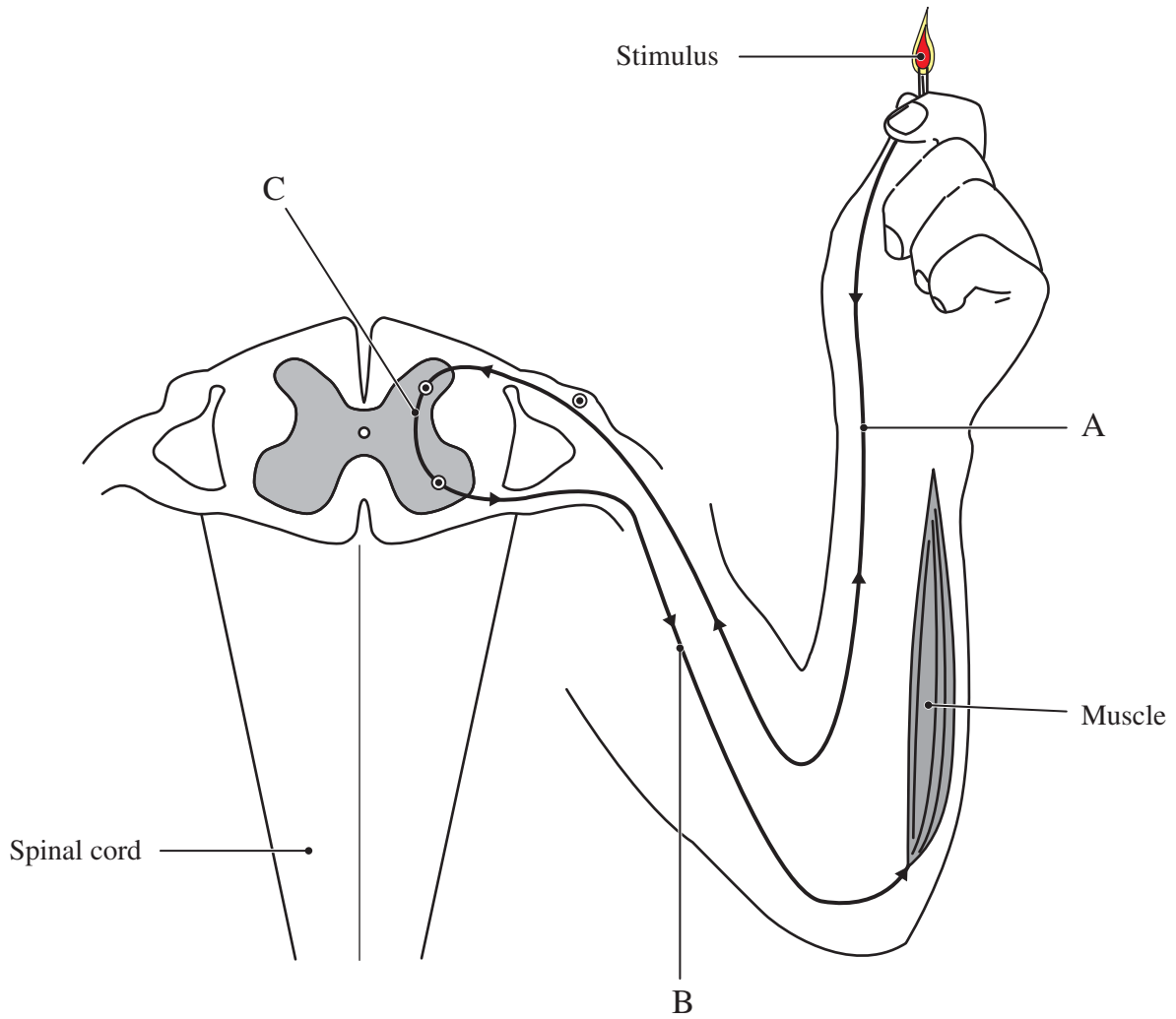
[2]

(e) Explain how changes in atmospheric carbon dioxide concentration are linked to changes in global temperatures.

[3]

Examiner Only	
Marks	Remark

18 The diagram shows a reflex arc.



Adapted from: J. Sears, S. Taylor, *Life and Living*, Hodder & Stoughton Educational, 1994

(a) Name parts A, B and C.

A _____ [1]

B _____ [1]

C _____ [1]

(b) Use the information in the diagram to help explain why a reflex arc provides a very fast response.

 _____ [2]

Examiner Only	
Marks	Remark

Hormones such as insulin are chemical messages.

(c) (i) How are hormones transported?

_____ [1]

(ii) Name the organ which produces insulin.

_____ [1]

(iii) Explain how insulin controls blood sugar levels.

_____ [2]

THIS IS THE END OF THE QUESTION PAPER

Examiner Only	
Marks	Remark

Permission to reproduce all copyright material has been applied for.
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA
will be happy to rectify any omissions of acknowledgement in future if notified.