

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.

For Examiner's					
use only					
Question Number	Marks				
1					
2					
3					
4					
5					
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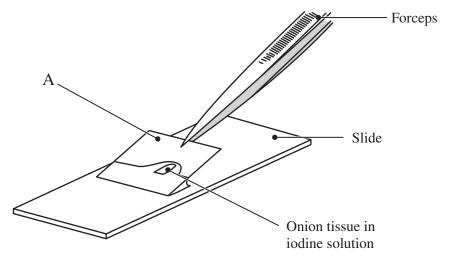
Total	
Marks	

17

18

1 The diagram shows a microscope slide being prepared.

<b>Examiner Only</b>				
Marks	Remark			



Source: A. D. G. Mackean, Life Study A Textbook of Biology. John Murray (Publishers) Ltd, 1981

(a)	Name	A.
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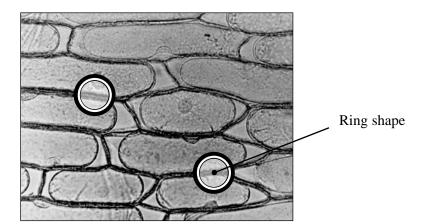
[]	1	1

**(b)** Describe how the forceps are used when preparing a slide.

		Γ1 <sup>-</sup>

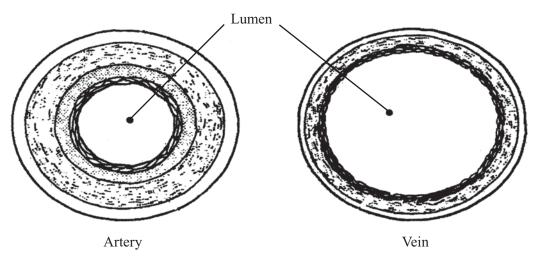
(c) Explain why the onion tissue is placed in iodine solution.

The drawing shows the appearance of a prepared slide.



<b>(d)</b>	What causes the ring shapes?	

Г	11
	IJ



Source: Human Biology An activity approach, P. Rowlinson, M. Jenkins, Cambridge University Press, 1982

(a)	Gi	ve two	ways	the	structure	of a	an a	artery	dif	ffers	from	a vein.	
-----	----	--------	------	-----	-----------	------	------	--------	-----	-------	------	---------	--

	[1]
1.	1 1
	1 1 1

<b>(b)</b>	Describe how	the composition	of blood in	an artery	differs	from	that in	n
	a vein.							

_			
			[2]

\_\_\_\_\_[2]

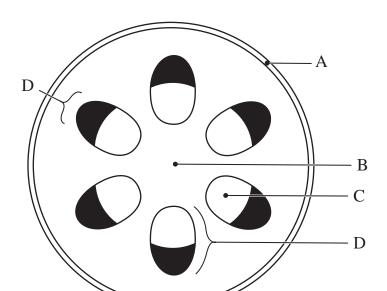
(c) Name the artery which takes blood to the

kidney.	[1]
---------	-----

lung. \_\_\_\_\_ [1]

The dominant	allele, <b>T</b> results in a	normal thumb shape.
The recessive niker's thumb		humb to be slightly bent to form hitch-
No	rmal thumb	Hitch-hiker's thumb
(a) Give the	phenotype of someon	ne whose genotype is <b>TT</b> .
		[1]
_	_	to show the possible offspring of a cross
_	a person with a norm	to show the possible offspring of a cross hal thumb and one with a hitch-hiker's  Hitch-hiker's thumb
between a	_	al thumb and one with a hitch-hiker's
between a thumb.	a person with a norm	al thumb and one with a hitch-hiker's
between a thumb.	Types of gamete	al thumb and one with a hitch-hiker's
between a thumb.	Types of gamete  T	al thumb and one with a hitch-hiker's
Normal thumb	Types of gamete  T  t  tion of the offspring	Hitch-hiker's thumb  [3]
Normal thumb	Types of gamete  T	Hitch-hiker's thumb  [3]
Normal thumb	Types of gamete  T  t  tion of the offspring	Hitch-hiker's thumb  [3]

4 The diagram shows a cross section of a stem.



(a) Name parts A, B, C and D.

A

[1]

**Examiner Only** 

В

[1]

C \_\_\_\_\_

[1]

D \_\_\_\_\_

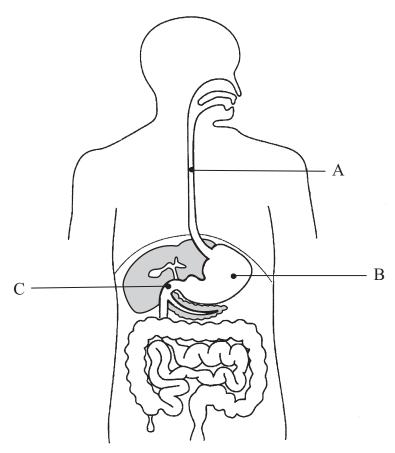
[1]

**(b)** Describe the function of the phloem.

[2]

5 The diagram shows the human digestive system.





Adapted from: R. McIlwaine, J Napier, GCSE BIOLOGY for CCEA, Hodder & Stoughton Educational, 2003

(a) On the diagram draw a line

**labelled X** to show where ingestion takes place. [1]

**labelled Y** to show where water is absorbed. [1]

**(b)** Name parts A, B and C.

A\_\_\_\_\_\_[1]

B \_\_\_\_\_\_ [1]

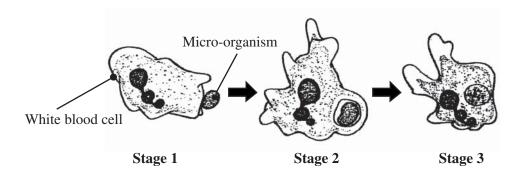
C\_\_\_\_\_\_[1]

(c) Explain why digestion is necessary.

\_\_\_\_\_

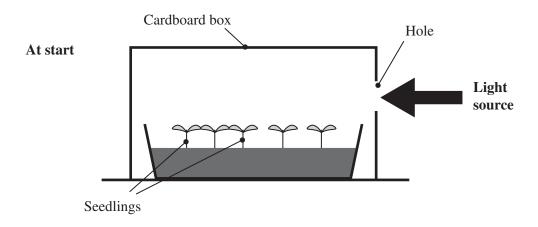
The diagram shows one way white blood cells destroy bacteria. 6

**Examiner Only** 



n) Name the process shown in the diagram.	
	[1]
Explain how the bacteria are destroyed.	
	[1]
) Give <b>one</b> other way white blood cells fight infection.	
	[1]
accination is another way of fighting infection.	
1) Describe how Jenner developed a vaccine for smallpox.	
	F03
Quality of written communication	[3]

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.
- (b) Name this type of growth response.

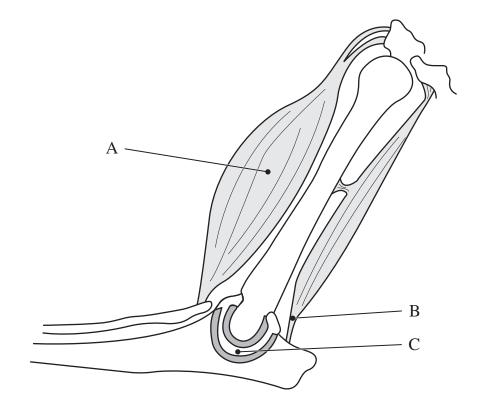
\_\_\_\_\_[1]

[2]

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

The diagram shows an elbow joint. 8

Examiner Only					
Marks	Remark				



(a) Name parts A, B and C.

[1]

[1]

C \_\_\_\_\_

[1]

(b) Describe how the arm straightens.

[2]

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

Examiner Only		
Marks	Remark	

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

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

	E 4 1
	[1]

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

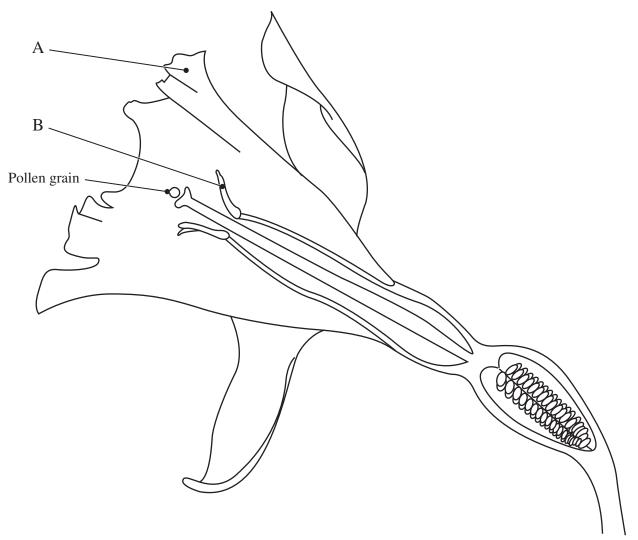
		Γ1

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

Г1

( <b>d</b> )	Explain why skin cancer has a 99% cure rate if detected early.		Examino Marks	er Only Remar
		- 1]		
(e)	Explain how the over use of CFCs has resulted in an increase in the number of people suffering from skin cancer.			
		_		
	[2	2]		

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.		Examin	er Only
( )	1		Marks	Remark
	A	[1]		
	B	[1]		
<b>(b)</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]		

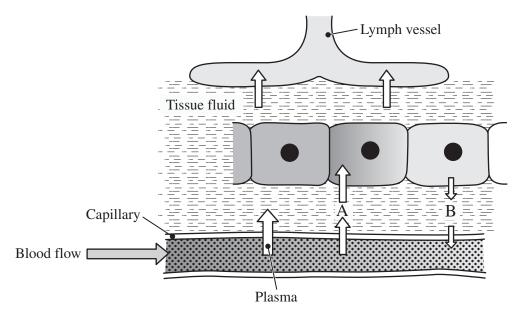
[Turn over

,, <sub>f</sub>	ne leaves of a plant lacking in magi	nesium turn yenow.
<b>b</b> ) Give <b>one</b> mine	ral plants require for	
growth.		_ [1]
cell walls		_ [1]
n flooded ground t	here is no oxygen around the roots	3.
<b>c</b> ) Explain why th	nis stops minerals being absorbed.	
		[2]

12	(a)	Name the type of organism which causes		Examin Marks	er Only Remark
		gonorrhoea	[1]		
		AIDS	[1]		
	(b)	Explain how AIDS can be passed from a mother to a baby during pregnancy.			
	(c)	Give <b>two other</b> ways AIDS can be spread from one person to anoth	her.		
		1	[1]		
		2	[1]		

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]

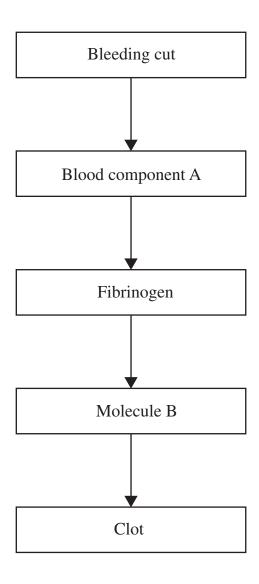
**(b)** Name **one** chemical which moves in the direction of arrow

A	[1]
---	-----

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

			Г17

The diagram summarises the processes involved in blood clotting.



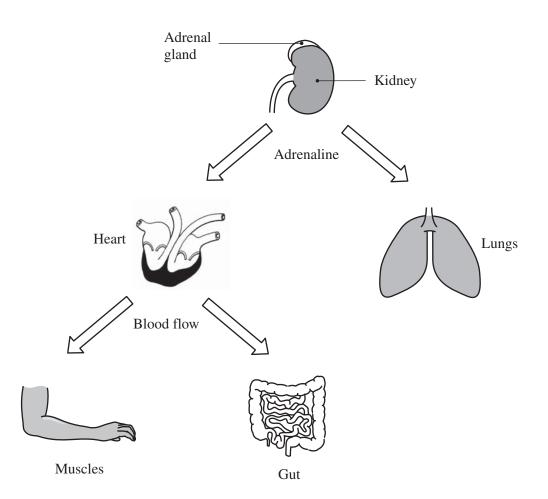
( ~ )	Niaraa
1111	Name
1 U /	1 value

blood component A. \_\_\_\_\_[1]

molecule B. \_\_\_\_\_[1]

**Examiner Only** 

14 The diagram shows some effects of adrenaline.



(a) (	Give one	condition	which	causes	adrenaline	to 1	he rel	eased

		E 1

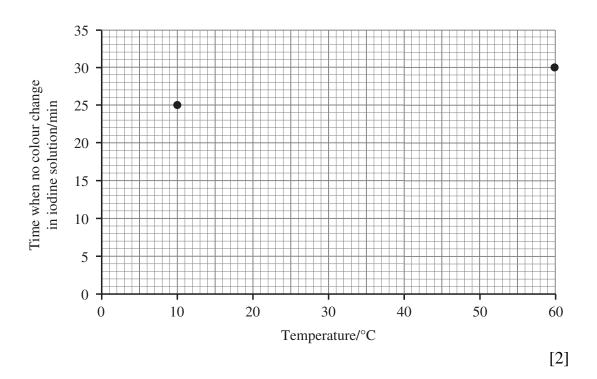
**(b)** Complete the table.

Organ	Effect of adrenaline
Heart	
Gut	
Muscles	

[3]

Effect.	 [1]	
Advantage		
	 [2]	

15		e following method was used to investigate the effect of temperature on time human amylase enzyme requires to breakdown starch.	Examin Marks	er Only Remark
	1.	Five cm <sup>3</sup> of starch solution was placed in test tube A and five cm <sup>3</sup> of amylase solution was placed in test tube B.		
	2.	Tubes A and B were placed in a waterbath at 10 °C for five minutes.		
	3.	The contents of tube A were added to tube B which was returned to the waterbath. A timer was started.		
	4.	A drop of the amylase and starch mixture was removed from tube B every minute and tested with iodine.		
	5.	The time was recorded when the iodine no longer changed colour.		
	6.	Steps 1 to 5 were repeated at temperatures 20 °C, 30 °C, 40 °C, 50 °C and 60 °C.		
	(a)	Explain why tubes A and B were placed in the waterbath in step 2.		
	(b)	Explain the colour change in step 4 when the first drop of amylase and starch mixture was tested with iodine.  [1]		



 $(\mathbf{d})$  Explain why there was no colour change after

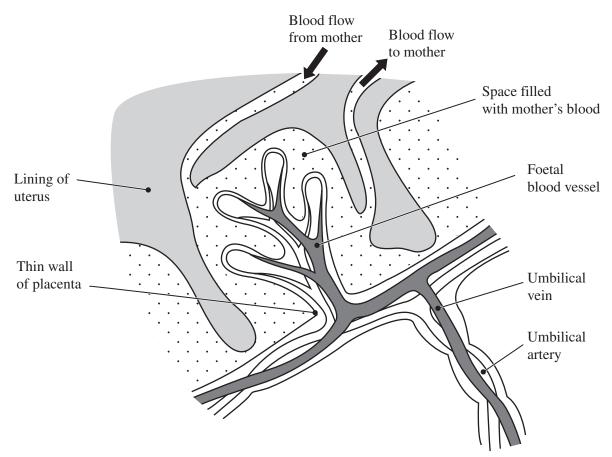
25 minutes at 10 °C.

[1]

30 minutes at 60 °C.

\_\_\_\_\_[1]

## 16 The diagram shows part of a placenta.



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

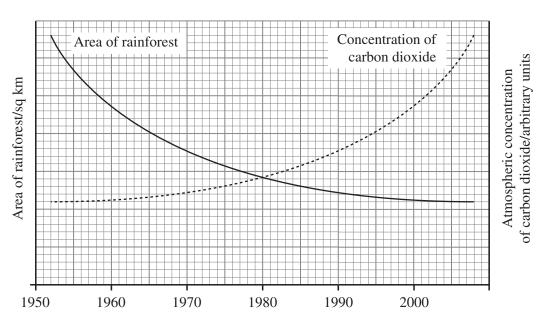
(a)	Use the features shown in the diagram, to explain how the placenta is adapted for exchange of substances between the mother and the foetus.		Examiner Only		
	adapted for exchange of substances between the mother and the foctus.	•	Marks	Remar	
		•			
	[3	1			
		J			

milarity	
	[1]
ifference 1	
	[1]
ifference 2.	
	[1]
escribe the process of birth.	
	[2]
	[2]

\_\_\_\_\_

\_\_\_\_\_[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?

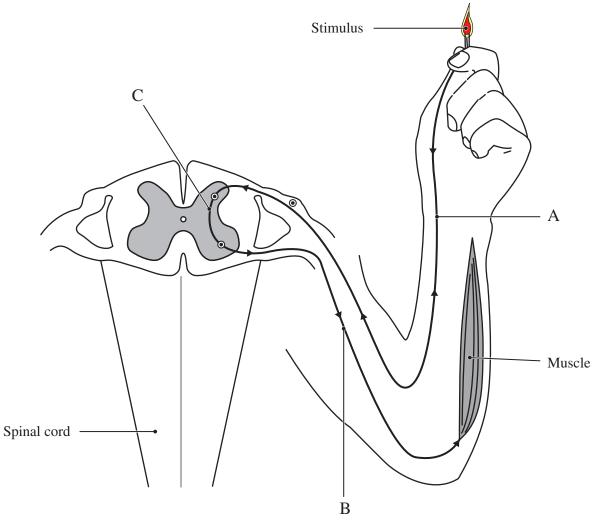
[1]

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

\_\_\_\_\_

Suggest and explain <b>one other</b> way Man's activities could cause the changes in the atmospheric carbon dioxide concentration.	Examine Marks
[2]	
Explain how changes in atmospheric carbon dioxide concentration are linked to changes in global temperatures.	
[3]	

# 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]	
	В	[1]	
	C	[1]	
<b>(b)</b>	Use the information in the diagram to help explain why a reflex arc provides a very fast response.		
		[2]	

Ho	rmor	nes such as insulin are chemical messages.		Examin Marks	er Only Remark
(c)	(i)	How are hormones transported?			
			[1]		
	(ii)	Name the organ which produces insulin.			
			[1]		
	(iii)	Explain how insulin controls blood sugar levels.			
			[2]		
			_		
	THI	S IS THE END OF THE QUESTION PAPER	_		

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