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General Certificate of Secondary Education 2011

Science: Biology

Paper 1 Higher Tier

[G0903]



THURSDAY 19 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(c). Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

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Question Number	Marks
1	
2	
3 4	
5	
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15	
16	
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18	

l	
Total	
Iotai	
Manlea	
Marks	



1 (a) Complete the word equation for photosynthesis.

	[3]	Examiner On	у

(b) Name **one** mineral required by plants and give its use.

		[2]
		[2]

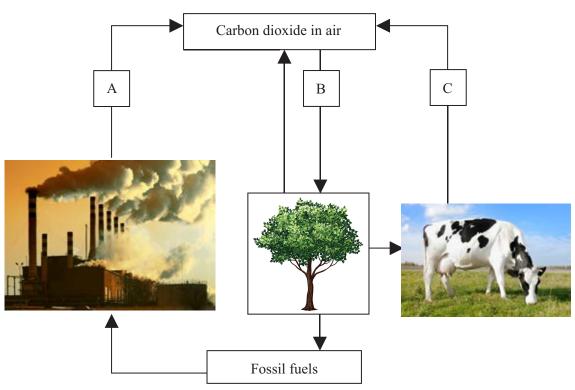
6	4	1	

Breast milk contains all the nutrients a baby needs in the correct proportions.		Examin Marks	er Only Remark
(a) Name the food group needed			
to provide energy.	[1]		
for growth.	[1]		
Breast milk also contains antibodies.			
(b) Explain the advantage of these to the baby.			
(c) Suggest two other advantages of breast feeding.			
	[2]		
(d) Explain why HIV positive mothers are advised not to breast feed.			
	[1]		

2

3 The diagram shows part of the carbon cycle.





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- © Hemera / Thinkstock
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(a) Name processes A, B and C.

A _____

[1]

В _____

[1]

 C

[1]

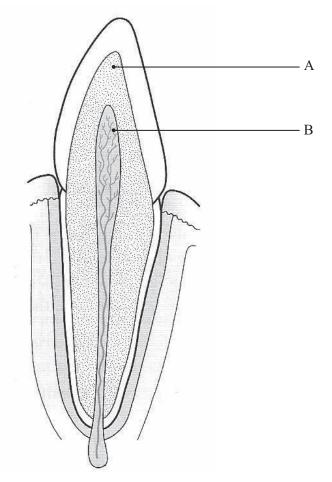
(b) Describe how carbon, present in plant tissue, becomes a named carbon compound in an animal.

_____[2]

(c) Name a fossil fuel.

_____[1]

4 The diagram shows the structure of a tooth.



© Adapted from Biology Lives by Morton Jenkins, published by Hodder & Stoughton, 2001. ISBN 0340790512.

(a) N	Vame	part	A.
-------	------	------	----

_____[1]

(b) Name **one** type of tissue found in cavity B.

[1]

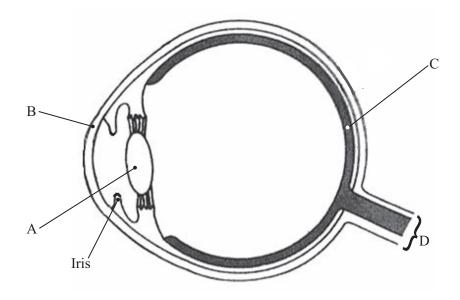
(c) Describe the role of bacteria and sugar in tooth decay.

_____[2]

Examiner Only

One way of ensuring that people get enough fluoride is to add it to the public drinking water. (e) Suggest one reason why some people may object to this.	
public drinking water. (e) Suggest one reason why some people may object to this.	

The diagram shows a simplified cross section of the eye. 5



(a) Name parts A, B and C.

[1]

B _____

[1]

[1]

(b) Name and give the function of part D.

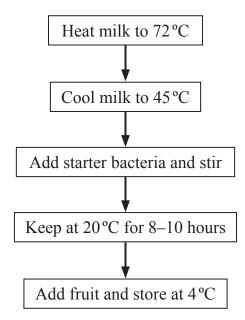
(c) Give one piece of evidence from the diagram, which suggests this eye is in low light conditions.

[1]

- (d) Name one structure which protects the eye from damage.

[1]

6 The flow diagram shows a method used to make yoghurt.



Examiner Only

[1]

(a)	Suggest	why	the	milk	is	heated	to	72°	$^{\circ}C$	at	the	start	t
-----	---------	-----	-----	------	----	--------	----	-----	-------------	----	-----	-------	---

(b)	Explain why starter bacteria are not added until after the milk has been
	cooled to 45 °C.

		[1]

(c) Describe how the bacteria change the milk into yoghurt at 20 °C. The quality of written communication will be assessed in this question.

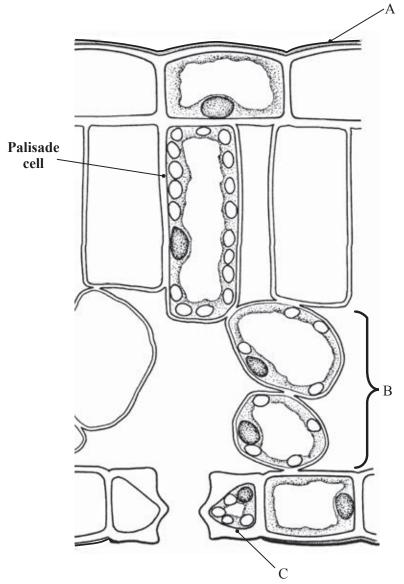
[3]

Quality of written communication [2]

(d) Explain why the yoghurt is stored at 4°C.

______[1]

7 The diagram shows a section through a leaf.



@ Biology GCSE by G & M Jones, published by Cambridge University Press, 1984. ISBN 0521285321

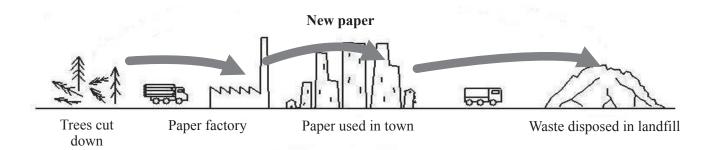
(a)	Name	parts	A	В	and	C
(a)	Tallic	parts	<i>1</i> 1,	$\boldsymbol{\mathcal{L}}$	una	\sim

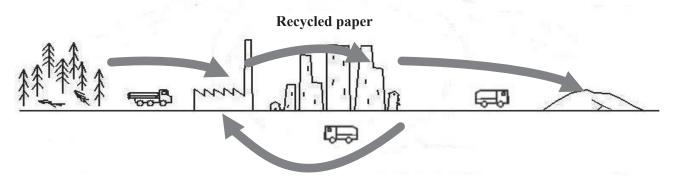
(h)	Describe	how the	nalisade	cell is	adapted	for its	function
J	v	Describe	HOW the	parisade	CCII IS	adapted	101 113	Tunction

 		[2]

Examiner Only

8 The diagram compares the production and use of new and recycled paper.





 $@\ Giorgio\ Carboni/Fun\ Science\ Gallery\ http://www.funsci.com/fun3_en/paper/paper.htm\#5$

Examiner Only

		Marks	Remark
(a)	Use the information in the diagram to suggest two environmental advantages of using recycled paper.		
	1		
	[1]		
	2		
	[1]		
(b)	Explain how the increased transport required to recycle paper may affect the environment.		
	[2]		
(c)	Give one other disadvantage of using recycled paper instead of new paper.		
	[1]		

9 The diagram shows some solvents.

Examiner Only		
Marks	Remark	



© The Bridge Project

(a)	What is solvent abuse?				
		[2]			

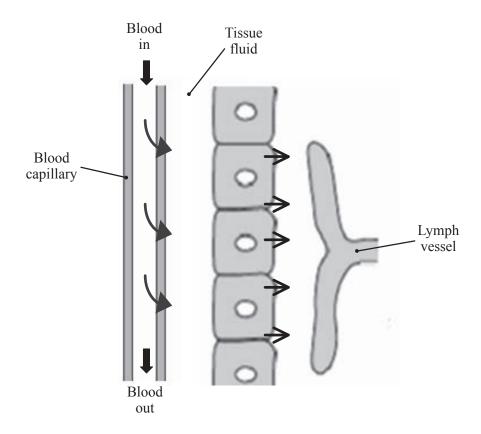
(b)	Give two harmful effects of solvent abuse on the human body.			
		[2]		

(c)	Describe two ways solve	ent abuse can be damaging to society.	

1	
	[1
2	
	Г1

10 The diagram shows the formation of tissue fluid.





-	(a)	Describe	how	ticque	fluid	forms
1	a	Describe	IIUW	เบรรนต	Hulu	1011115.

_____[3]

(b) Name two components of the blood which are not found in tissue fluid.

1. ______ [1

2._____[1]

(c) Describe the role of the lymph vessel.

_____[1]

11 The photograph shows the effect of light on cress seedlings.



© Science Photo Library

(a) Explain how light has affected the cress seedlings.

______[2]

(b) Name the process shown and explain why it is beneficial to the seedlings.

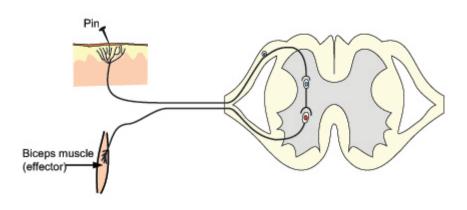
_____[2]

The process was caused by a plant hormone.

(c) Give two other uses of plant hormones.

1.______[1]

2. ______[1]



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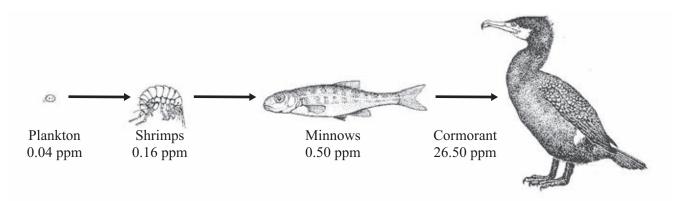
- (a) Draw a line labelled R to show the receptor. [1]
- **(b)** Describe the pathway taken as the nerve impulse passes from the receptor to the effector.

_____[3]

(c) Describe the response when the impulse reaches the effector.

_____[2]

13 The diagram shows the concentration of DDT in each type of organism in a food chain.

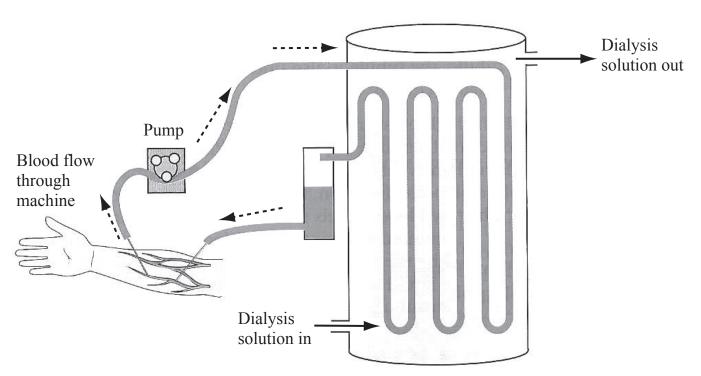


© Biology: GCSE Edition by Geoff & Mary Jones, published by Cambridge University Press, 1987. ISBN 978 0521338691

DD	T is a pesticide.	Marks	Remark
(a)	What is a pesticide?		
(b)	Calculate the percentage increase of the concentration of DDT from the plankton to the shrimps. Show your working.		
(c)			
(d)	Give two reasons why, although it is banned in many countries, DDT is still used in some underdeveloped countries. 1		
	2		

14 The diagram shows a kidney dialysis machine.

dialysis solution.



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72.	Examiner Only			
ion	Marks	Remark		
1]				
-]				
ls.				
_				
_				
2]				
_				
1]				
1]				
	1			

(b)	Explain w	hy the dia	lysis solut	tion has to	be chang	ged at regular	r intervals

(a) Name the process which causes urea to pass from the blood into the

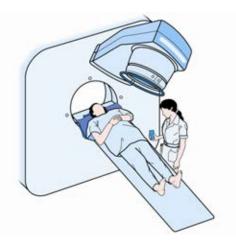
(c) Explain why patients have to eat a low salt diet when not on the dialysis machine.

_ [1]

Suggest one disadvantage compared to dialysis.	ge and two advantage	es of a kidney transpi	ant Exami Marks	inei
Disadvantage				
Advantages				
			_ [3]	

15 (a) The diagram shows a radiotherapy machine. This produces X-ray radiation which damages DNA, reducing the growth of a malignant cancerous tumour.

Examiner Only					
Marks	Remark				



© Reproduced with permission from Macmillan Cancer Support

(i)	Explain what is meant by a malignant cancerous tumour.	
		[2]
(ii)	Suggest how X-ray radiation may reduce the growth of a cance tumour.	rous
		[1]
(iii)	Give one advantage of having this treatment before surgery is carried out.	
		[1]
(iv)	Suggest why this machine directs the X-ray radiation on to the tumour from several different angles.	
		[1]

(b)	Son	ne of the radiation in sunlight can cause cancer.		Examin	
	(i)	Name the type of radiation in sunlight which causes cancer.		Marks	Remark
			[1]		
	(ii)	Explain how skin cancer is linked to atmospheric pollution.			
			 _ [2]		

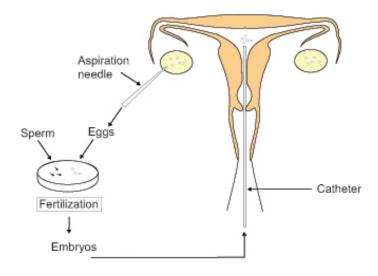
16 Some women who are sterile may undergo in vitro fertilization (IVF).

Examiner Only					
Marks	Remark				

(a) Describe the effect of the hormones on the ovaries at the start of *in vitro* fertilization.

[2]

The diagram shows the process of *in vitro* fertilization.



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Use the diagram to help answer the following questions.

(b) Describe how the eggs are obtained.

[1]

(c)	Explain why eggs are examined after sperm are added to the dish.	 Examine Marks	er Only Remark
(d)	What happens to the embryos after they are inserted into the uterus using the catheter?		
(e)	Give two reasons why females may be sterile. 1		

17 The pictures show hornless and horned Hereford bulls owned by a farmer.

Examiner Only					
Marks	Remark				





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Source: http://en.wikipedia.org/wiki/Hereford_(cattle)

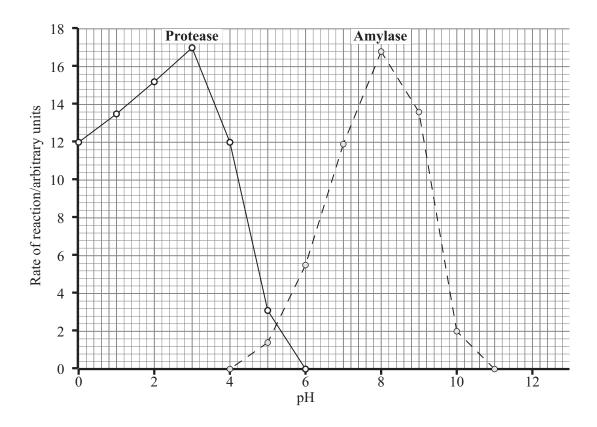
The presence of horns in this breed is controlled by two alleles. The allele (\mathbf{H}) for the hornless condition is dominant to the allele (\mathbf{h}) for horned.

(a)	What is an allele?	
		[1]
(b)	Explain the term phenotype.	
		[1]
(c)	Explain which of the bulls could have a heterozygous genotype.	
		[2]

The	farmer bought a hornless cow.		Examin	<u>-</u>
(d)	Explain how mating this cow to one of his bulls could determine the cow's genotype.	_	Marks	Remark
		[3]		
(e)		F17		
		[1]		
(f)	Explain why the cow may have to produce several calves before the genotype can be determined.			
		 [1]		

18 The graph shows how pH affects the activity of two human enzymes.





(a) Describe and explain the change in the rate of reaction of the amylase above pH 8.

(b) Where is amylase found in the digestive system?

_____[1]

(c) What is a protease enzyme?

[3]

(d)	Use information from the graph to help suggest where the protease enzyme is found in the body.		Examiner Marks I	r Only Remark
		[2]		
(e)	Give one other factor which affects the activity of an enzyme.	[1]		
	THIS IS THE END OF THE QUESTION PAPER			





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