

General Certificate of Secondary Education 2010

Science: Double Award (Non-Modular)

Paper 1 Foundation Tier

[G8401]

FRIDAY 21 MAY, MORNING

TIME

1 hour 30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces Write your answers in the spaces provided in this question paper. Answer all sixteen questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 110. Quality of written communication will be assessed in question 1(a). Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question. Details of calculations should be shown. Units must be stated in numerical answers where appropriate.

For Examiner's use only

Marks

Ouestion



Centre Number

71

Candidate Number



provided at the top of this page.

The	e diagram shows the lungs during expiration (breathing out).	Examin Marks	er Only Remark
(a)	Adapted from: © Balanced Science 1 by Jones, Jones and Marchington, page 219. Marchine display Cambridge University Press, 1990. ISBN 05213568933 Describe and explain the mechanism of expiration. You will be assessed on the quality of written communication in this question.		
	[4]		
	Quality of written communication. [2]		
(b)	Gas exchange takes place in the lungs.		
	Give one way in which the lungs are adapted to carry out this process.		
	[1]		

Examiner Only

2

Marks Remar cancer patients. Number of cigarettes smoked per day Number of lung cancer patients 0 3 1–4 51 5-14 259 15-24 302 More than 24 385 (a) What trend is shown by these results? [1] (b) What do the results show about non-smokers? [1] (c) Name one other disease that can be caused by smoking. [1]

3

The table shows the results of a survey into the smoking habits of 1000 lung





Examiner Only

ato e Beaker 2 8% sugar solution rs that should be controlled a fair test. know if water had moved igation?	Beaker 3 18% sugar solution d during the investigation in [2] out of the potato cores	-
8% sugar solution	18% sugar solution d during the investigation in [2 out of the potato cores	-
s that should be controlled a fair test. know if water had moved ligation?	d during the investigation in [2 out of the potato cores	-
would you expect most wa	[1 ater to move out of the potate	-] 0
investigation?	[1]
		[1

An investigation into osmosis in potato cores was set up as shown in the

Examiner Only

5

The diagram shows the muscles and bones in the arm. The biceps and Marks Remark triceps muscles help to control movement in the arm. upper arm bone biceps triceps muscle muscle © CCEA (a) Describe what happens to the biceps and triceps muscles to straighten the arm. Biceps _____ Triceps [2] (b) The biceps and triceps are **antagonistic** muscles. What does this term mean? [1]

7

Examiner Only

6

Plant shoots grown on a window sill will grow towards the light. 7 Examiner Only Marks Remark 2772 Light coming from this direction Shoots (a) Name this response to light. [1] (b) What is the advantage to the plant of this response? [1]

8 The diagram shows the position of one of the kidneys in the body.



- (a) On the diagram label the
 - (i) ureter
 - (ii) bladder
- (b) Draw the other kidney on the diagram to show its position.

9

Examiner Only Marks Remark

[2]

[1]





11	Pea plants can produce peas that are wrinkled or smooth.	Examiner Only Marks Remark
	The gene (allele) for wrinkled is dominant to the gene (allele) for smoothness.	
	Let R represent the gene (allele) for wrinkled peas. Let r represent the gene (allele) for smooth peas.	
	A plant breeder crossed two heterozygous pea plants.	
	(a) Use a Punnett square to show the possible genotypes of the offspring of this cross.	
	[3]	
	(b) Give the phenotypes of the offspring and the ratio of the phenotypes.	
	Phenotypes and	
	Ratio [2]	
6052	11	
0032	11	

Mother Father Chromosomes in XY parents' cells Stage 1 Chromosomes in Х Х gametes (egg and sperm cells) Stage 2 Possible combinations of chromosomes in child's cells Complete the diagram above to show the sex chromosomes found in each cell. [3]

Examiner Only Marks Remark

Marks Rema of the individual have 47 chromosomes rather than 46. The histogram shows how the risk of having a child with Down's syndrome increases with the age of the mother. of Down's syndrome/ 1000 births 30 Number of cases 20 10 0 30-34 35-39 25 - 2940-44 20 - 2445-49 Age of mother/years (a) Use the histogram to calculate how many times more likely it is for a 42 year old woman to have a Down's syndrome baby than a 32 year old woman. Show your working. times [2] During pregnancy it is possible to detect the presence of Down's syndrome in the developing baby by testing a sample of the amniotic fluid. (b) What must be present in the amniotic fluid so that the test can be carried out? [1]

13 Down's syndrome is one example of an inherited disease where all the cells

Examiner Only

- 14 (a) Photosynthesis occurs in plant leaves.
 - (i) Name the chemical in leaves that absorbs light for photosynthesis.

Examiner Only Marks Remar

[1]

(ii) Complete the word equation for photosynthesis.



(b) The diagram shows the apparatus used to investigate if carbon dioxide is needed for photosynthesis.

The plant was destarched and then the leaves were sealed in glass flasks. The plant was then left in sunlight for 12 hours.



The diagrams show the stages in the starch test on the leaves from the plant.

Step 1 Boil in wate	Alcohol Water Water Step 2 Step 3 Heat in alcohol Rinse in warm water GCSE biology for CCEA by R McIlwaine & J Napier, published by Hodder & Stoughton, 200 ISBN 9780340858257. 'Reproduced by permission of Hodder Education	rch
(ii)	What is the purpose of	
	Step 2	
	Step 3?	[2]
(iii)	Why is the Bunsen burner turned off before Step 2?	[1] n.
(iv)	What colour would you expect to obtain when iodine is added to the leaf from	0
(iv)	What colour would you expect to obtain when iodine is added to the leaves to test for starch the leaf from Flask 1	.0
(iv)	What colour would you expect to obtain when iodine is added to the leaves to test for starch the leaf from Flask 1Flask 2?	

Examiner Only

Marks Remark

(c) The enzyme amylase breaks down starch. John carried out an experiment with amylase to see how much starch remained after 15 minutes at different temperatures.

The table gives his results.

Temperature/°C	Amount of starch remaining/ arbitrary units after 15 minutes
20	30
30	16
40	10
50	25
60	35

(i) Draw a line graph of the results.



[3]

Examiner Only

Rem

Marks

[1]
_
[1]
b
[2]
[1]
[1]
[1]
it
[1]

(f) The diagram shows a cross section of the heart and its blood vessels. Examiner Only Marks Remar - Aorta Pulmonary artery Pulmonary vein Vena cava Use the diagram to help answer the following questions. (i) Name the blood vessel that carries blood from the heart to the lungs. _____[1] (ii) Which two blood vessels shown carry oxygenated blood? _____ and _____ [2]

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(Questions continue overleaf)

15 (a) The diagram shows a food web for an island in the Arctic.

Examiner Only Marks Remark



 (ii) Use the food web to name a primary consumer a secondary consumer (iii) Use the food web to give a food chain with only five types of organisms. →→→→ (iv) Explain why the phytoplankton (plants) are called producers. 	[2] [3]
a primary consumer a secondary consumer (iii) Use the food web to give a food chain with only five types of organisms. →→→→ (iv) Explain why the phytoplankton (plants) are called producers.	[2] [3]
 a secondary consumer	_[2] [3]
 (iii) Use the food web to give a food chain with only five types of organisms. →→→→→ (iv) Explain why the phytoplankton (plants) are called producers. 	[3]
\rightarrow \rightarrow \rightarrow \rightarrow (iv) Explain why the phytoplankton (plants) are called producers.	
	[2]
winter.	
	[2]
(vi) On the grid draw a pyramid of numbers for your food chain in Use the numbers of organisms shown in the food web. Beside each level write the name of the organism.	(iii).

(vii)Explain why it is an advantage for the polar bear to have more than one food source.





- (i) Complete the empty box in this process.
- (ii) Name one other substance that could cause the same effect if it entered a river.
 - _____ [1]
- (iii) Explain how hot water from cooling processes can lead to the death of fish if added to a river.

_____ [1]

[1]

Examiner Only Marks Remar





(iii) Following implantation the placenta develops.

Examiner Only Marks Remark

Give two functions of the placenta.

	2	[2]
	Describe one way in which the placenta is adapted for its role.	
		[1]
(i	v) Name the structure that protects the developing baby.	
		[1]
(v) Name the disease that teenagers are vaccinated against to help protect the developing baby.	
		[1]
1) O	ther diseases such as gonorrhoea are sexually transmitted.	
(ij	Name the type of organism that causes gonorrhoea.	[1]
G	i) The incubation period between getting the disease and showing symptoms can be up to 14 days. How might this lead to the spreaf the disease?	ead
(I)	of the disease?	
(I		[1]
(i	ii) What is the treatment for this disease?	[1]
(i (ii (i	 ii) What is the treatment for this disease?	[1]

THIS IS THE END OF THE QUESTION PAPER

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