



Rewarding Learning

General Certificate of Secondary Education
2011–2012

Centre Number

71	
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Candidate Number

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Science: Single Award (Modular)

Staying Alive

Module 1

Higher Tier

[GSC12]

TUESDAY 8 NOVEMBER 2011

1.30 pm–2.15 pm



TIME

45 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 seven** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 45.

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	
6	
7	

Total Marks

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1 (a) The picture below shows cuttings of plants.



© Geoff Wakeling

The statements below give advice on taking cuttings.

- A Select cuttings from a healthy plant.
- B Quickly insert the cuttings into a pot containing moist compost and place in a large sealed plastic bag.

(i) For each statement suggest why it is necessary to follow this advice.

A _____

B _____

_____ [2]

(ii) Taking cuttings is an example of cloning. Name the type of reproduction involved in taking cuttings.

_____ [1]

(iii) State two advantages of growing plants from cuttings.

1. _____

2. _____ [2]

(b) Suggest two reasons why many people find cloning of humans unacceptable.

1. _____

2. _____ [2]

Examiner Only	
Marks	Remark

- 2 The table below shows the results of the first recorded clinical experiment carried out by James Lind to investigate cures for scurvy.

He divided ten sailors who had scurvy into five groups. They all received the same diet but each group had a different addition as shown.

Group	Added to diet	Effect
1	Apple cider	Some improvement
2	Sulphuric acid	None
3	Vinegar	None
4	Seawater	None
5	2 oranges 1 lemon	Complete recovery

- (a) Describe and explain fully the results of this investigation.

[3]

- (b) (i) Name the chemical reaction that takes place in all living cells.

[1]

- (ii) Write the word equation for this reaction.

[2]

Examiner Only

Marks Remark

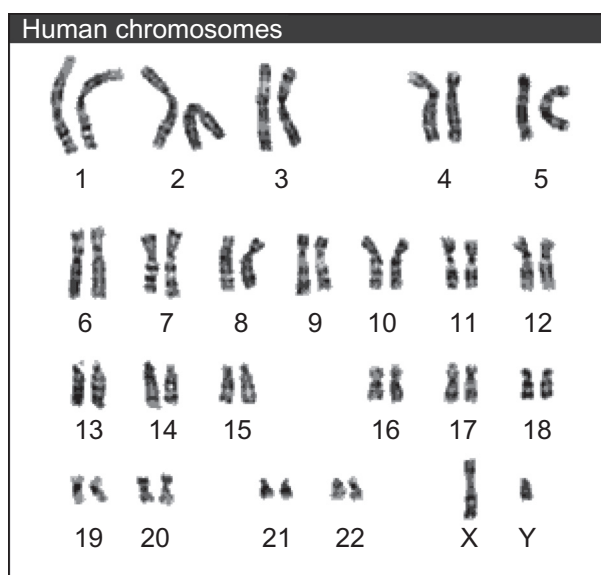
- 3 (a) Tom is heterozygous for eye colour and has brown eyes. His wife Sinead has blue eyes.

Let (B) represent the allele for brown eyes and (b) the allele for blue eyes.

Draw a genetic diagram below to show the possible genotypes of their children.

[3]

- (b) The diagram below shows the chromosomes in a normal body cell.



Source: [news.bbc.co.uk/2/hi/science/nature/1717396.stm](https://www.bbc.com/news/health-1717396)

- (i) These chromosomes consist of DNA molecules. What name is given to the shape of DNA?

[1]

Examiner Only	
Marks	Remark

5 (a) A class wanted to find out if light is needed for photosynthesis to make starch. On the first day they set up the investigation and the following day they tested for starch.

(i) Describe how the investigation is set up on the first day.

[2]

(ii) State how you would test for starch describing and explaining the results you would expect to get.

[3]

(b) State where most chloroplasts are found in a leaf and explain the benefit of this to the plant.

[2]

Examiner Only	
Marks	Remark

(b) At present, the two main types of GM crops being grown are ones that have been inserted with a gene that:

1. makes them resistant to herbicides (chemicals that kills weeds).
2. makes them toxic to pests that live on them.

(i) Explain how these features (1 and 2) will be advantageous for the farmer.

[4]

(ii) Many people are opposed to the use of GM crops.

Give two reasons for this.

1. _____
2. _____ [2]

Examiner Only	
Marks	Remark

- 7 The relative percentages of the bases in DNA, in different organisms, are shown in the table below.

Organism	%			
	A	G	T	C
Chicken	28.0	22.0	28.0	22.0
Rat	28.6	21.4	28.6	21.4
Human	29.3	20.7	29.3	20.7
Octopus	32.4	17.6	32.4	17.6

- (a) What pattern for the relative percentage of bases is shown by the information in the table?

_____ [1]

- (b) What is meant by the base triplet hypothesis?

_____ [2]

- (c) The shape of DNA was discovered using the processes of X-ray diffraction and modelling. For each process state the scientist(s) involved and describe how their research helped work out the structure of DNA.

_____ [4]

THIS IS THE END OF THE QUESTION PAPER

Examiner Only

Marks Remark

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