



Rewarding Learning

General Certificate of Secondary Education
2011–2012

Centre Number

71

Candidate Number

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.



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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

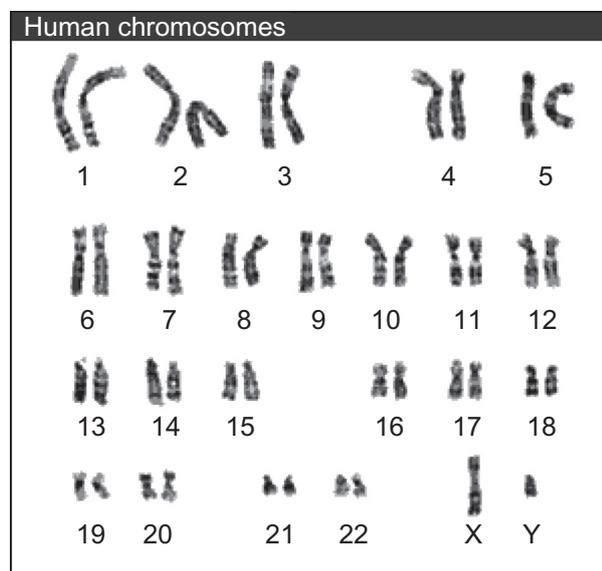
- 3 (a) Tom is heterozygous for eye colour and has brown eyes. His wife Sinead has blue eyes.

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)

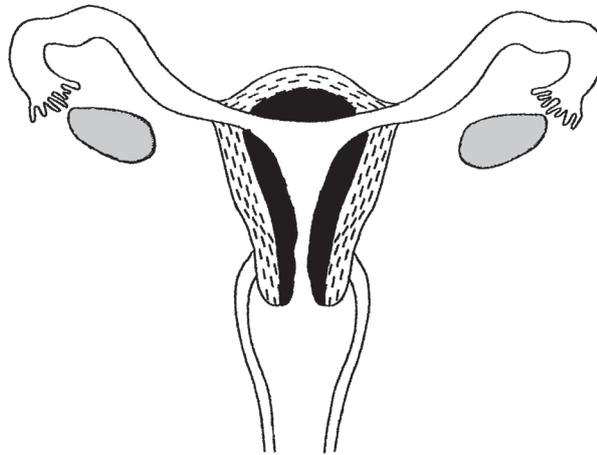
- (i) These chromosomes consist of DNA molecules. What name is given to the shape of DNA?

[1]

- (ii) Describe how the arrangement of chromosomes would be different for a sperm cell compared with a normal body cell. Give the reason for this difference.

_____ [2]

- 4 Below is a diagram of the female reproductive system.



- (a) Sperm is deposited in the vagina and moves from there to fertilise an ovum. List, in order, the names of the three structures that the sperm will travel through before fertilisation can take place.

_____ [2]

- (b) Name the structures that are cut and tied during an operation to sterilise females.

_____ [1]

- (c) This method of sterilising is permanent. Why might this be considered a disadvantage?

_____ [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]

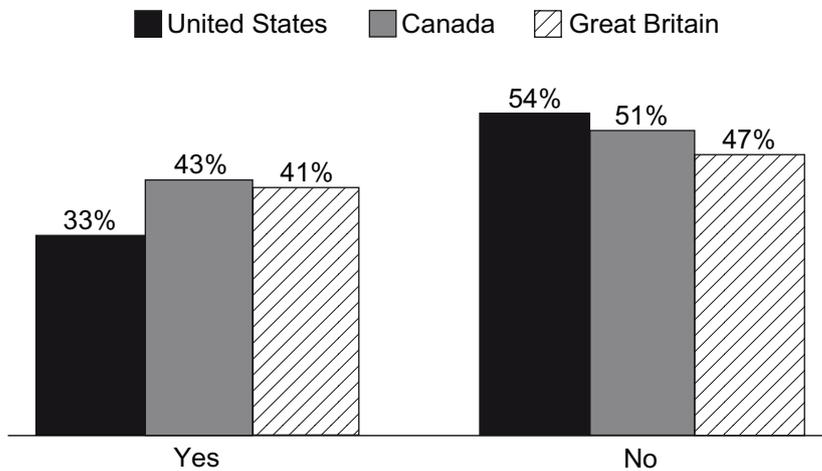
Examiner Only

Marks Remark

- 6 (a) A survey was carried out to investigate people's attitude to GM crops. One of the questions asked was:

Do you believe that GM crops pose a serious health hazard to consumers?

The answers to this question are shown in the bar chart below.



Source: <http://www.gallup.com/poll/19261/britons-show-distaste-biotech-foods.aspx>

- (i) Which group (Americans, Canadians or British) were least concerned about the safety of GM crops?

[1]

- (ii) Suggest one thing you would need to know before you could conclude that the results were reliable.

_____ [1]

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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