



Rewarding Learning

General Certificate of Secondary Education
2013

Centre Number

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Candidate Number

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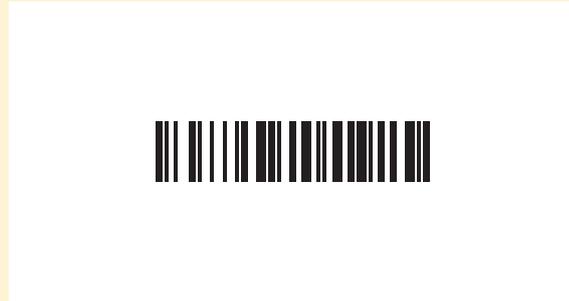
Biology

Unit 2

Foundation

[GBY21]

TUESDAY 18 JUNE, MORNING



GBY21

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.

You must answer the questions in the spaces provided. Do not write outside the box, around each page or on blank pages.

Complete in blue or black ink only. **Do not write with a gel pen.**

Answer **all fourteen** questions.

INFORMATION FOR CANDIDATES

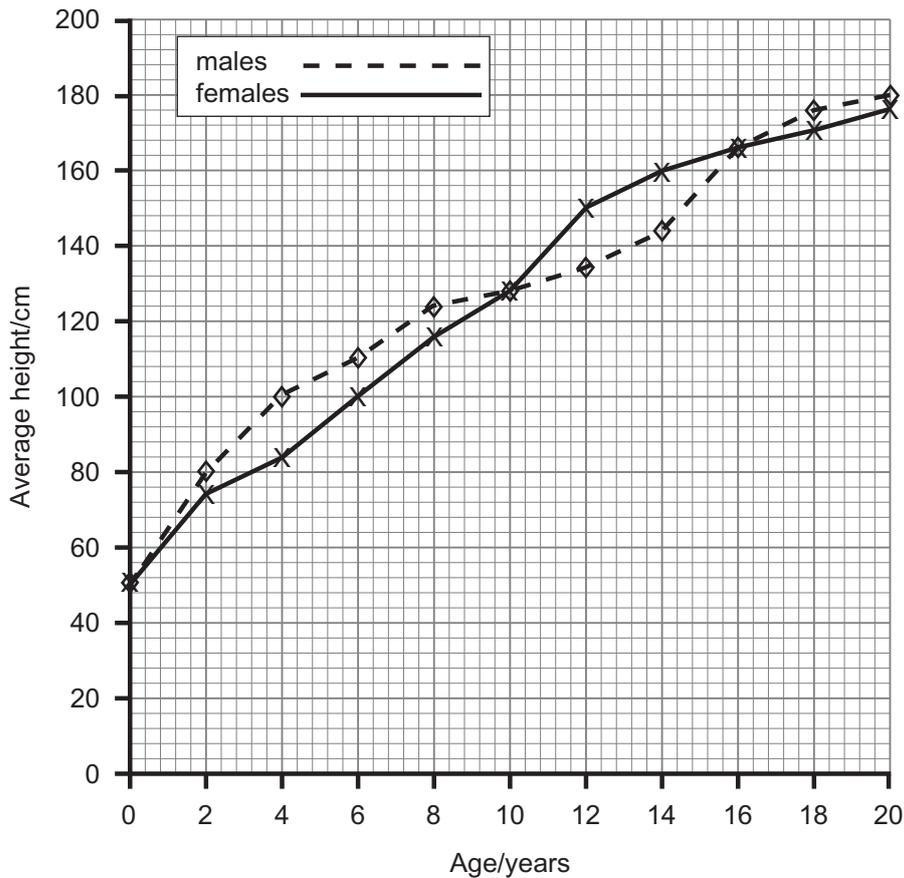
The total mark for this paper is 90.

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

Quality of written communication will be assessed in questions **6, 10(b)** and **14**.



3 The graph shows the average height of males and females from birth to 20 years old.



(a) What is the average height of a newborn baby?

_____ cm [1]

(b) Between which ages are females taller than males?

_____ and _____ [2]

This graph uses height to measure growth.

(c) Name the process which increases cell numbers.

_____ [1]

(d) Name **one other** way to measure growth.

_____ [1]

Examiner Only

Marks Remark

Total Question 3

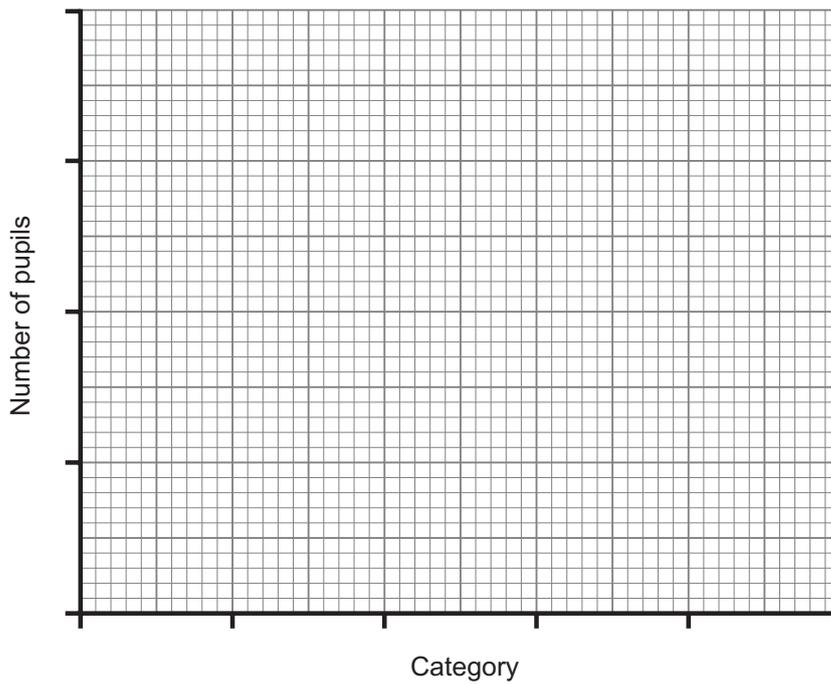
[Turn over



- 5 The table shows the number of pupils in a class who could roll their tongue and the number who were non-rollers.

Category	Number of pupils
Roller	18
Non-roller	8

- (a) Draw an appropriate graph of these results. [3]



- (b) (i) Name this type of graph. [1]
- _____

- (ii) What type of variation is shown by this data? [1]
- _____

- (iii) Give **one** cause of this variation in tongue rolling. [1]
- _____

Examiner Only

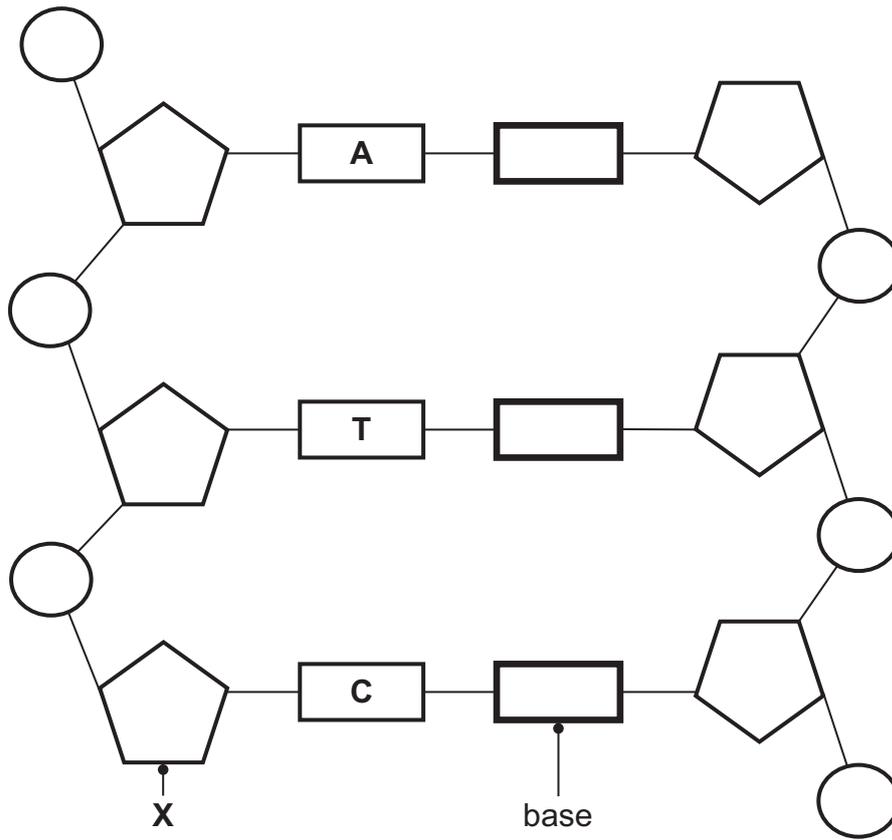
Marks Remark

Total Question 5

[Turn over



7 The diagram shows part of a DNA molecule.



(a) Complete the diagram. Place the correct letters for the bases in the boxes. [2]

(b) What is molecule X?

Draw a circle around the correct answer in the list below.

protein phosphate amino acid starch sugar [1]

(c) What term is used to describe the shape of a DNA molecule? [1]

(d) Where is the DNA molecule found in the cell? [1]

Examiner Only	
Marks	Remark
Total Question 7	

[Turn over



- 8 The table shows the average number of pregnancies occurring per year when using different contraceptive methods.

Method	Average number of pregnancies per year
Female sterilisation	Less than 1 in 200
Male sterilisation	Less than 1 in 2000
Contraceptive pill	
Female condom	5 in 100
Male condom	2 in 100

Source: Family Planning Association leaflet – Your guide to contraception

- (a) The contraceptive pill is 99% effective.

- (i) **Complete the table** by calculating the average number of pregnancies occurring per year for the contraceptive pill.

[1]

- (ii) Suggest **two** reasons why the contraceptive pill is not 100% effective.

1. _____
_____ [1]

2. _____
_____ [1]



Examiner Only	
Marks	Remark

(iii) Give **one** advantage and **one other** disadvantage of using the contraceptive pill.

Advantage _____

_____ [1]

Disadvantage _____

_____ [1]

(iv) Use the information in the table to decide which method of contraception is the most reliable and which is least reliable.

Most reliable _____ [1]

Least reliable _____ [1]

(b) What term is used to describe methods of contraception which include male and female sterilisation?

_____ [1]

Examiner Only

Marks Remark

Total Question 8

[Turn over



(b) The diagram shows a cross between Pamela and Tony.
Pamela and Tony are both heterozygous for normal skin.

Use **N** for the allele for normal skin and
n for the allele for freckled skin.

		Pamela	
		Gametes	N
Tony			
	n		

(i) Name this type of diagram.

_____ [1]

(ii) **Complete the diagram** to show
the parent's gametes and
the possible genotypes of offspring.

[3]

(iii) Give the **ratio** of normal skin to freckled skin in the children.

_____ [1]

(iv) What **proportion** of the offspring will have homozygous genotypes?

_____ [1]

(v) Explain why it is not possible to be certain of the genotype of one
of the children with normal skin.

_____ [2]

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Marks	Remark
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Total Question 9	

[Turn over



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(e) What conclusions can be made about the effect of wind on the rate of loss of mass of the flask?

Use data to support your answer.

_____ [2]

(f) Suggest how the students created the windy conditions.

_____ [1]

(g) Give **two other** environmental factors the students could have investigated using this apparatus.

1. _____ [1]

2. _____ [1]

Examiner Only

Marks Remark

Total Question 10

[Turn over





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(Questions continue overleaf)



12 (a) A ban on smoking in workplaces came into effect in the Republic of Ireland in 2004.

Bar staff completed a health questionnaire about their symptoms, before the ban and three years after the ban.

The table shows the results of the questionnaires.

Symptom	Percentage of bar staff complaining of symptoms	
	Before ban	3 years after ban
Eye irritation	82	51
Sneezing	75	34
Coughing	87	67

Adapted from: "Respiratory health improvement continues after workplace smoking ban in Ireland" by Michele Agnew, Patrick Goodman, Luke Clancy: Reproduced by permission of the European Respiratory Society Eur Respir J October 2008; 32, Suppl. 32: 259s (Abstract 1577) © European Respiratory Society

(i) Suggest **one** conclusion that can be made from the results of the questionnaires about the health of bar staff.

Use data from the table to support your conclusion.

[2]

(ii) Which symptom shows the greatest change after the ban?

[1]

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Marks	Remark





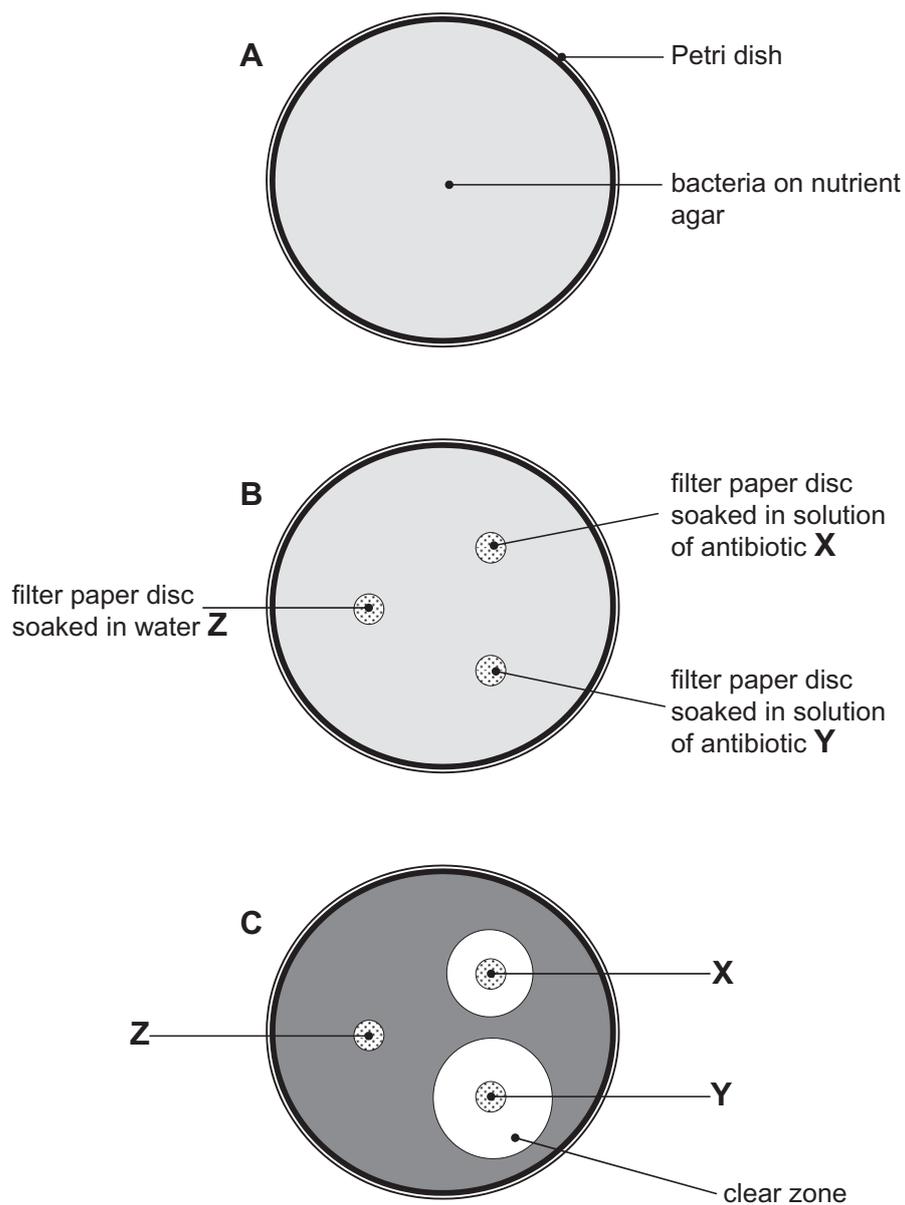
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(Questions continue overleaf)



14 A student investigated the effect of two antibiotics **X** and **Y** on the growth of a bacterium.

She carried out the following procedure using aseptic techniques.

1. 1 ml of bacterial culture was added to a sterile Petri dish containing sterile nutrient agar as shown in diagram **A**.
2. Discs of filter paper were soaked in antibiotic solutions or water and placed on top of the nutrient agar. This is shown in diagram **B**.
3. The Petri dish was sealed, inverted and incubated at no more than 20°C for 48 hours. Diagram **C** shows the appearance of the Petri dish after this time.



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Marks Remark



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For Examiner's use only	
Question Number	Marks
1	
2	
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12	
13	
14	

Total Marks	
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Examiner Number

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