



Rewarding Learning

General Certificate of Secondary Education  
2013

Centre Number

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Candidate Number

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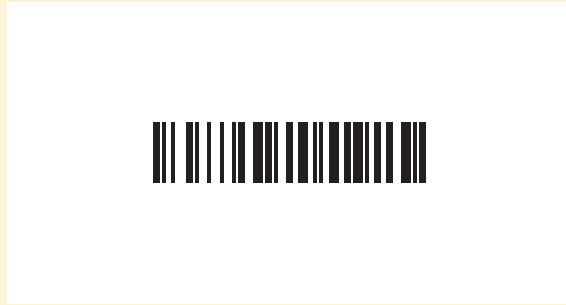
## Biology

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**.

8251



1 Cigarette smoke has a range of effects on the body.

(a) Name **two** lung diseases caused by tar in cigarette smoke.

1. \_\_\_\_\_ [1]

2. \_\_\_\_\_ [1]

Carbon monoxide combines permanently with haemoglobin in red blood cells.

(b) What effect does this have on the body?

\_\_\_\_\_  
\_\_\_\_\_ [1]

(c) Name **one** chemical in cigarette smoke which affects the heart rate.

\_\_\_\_\_ [1]

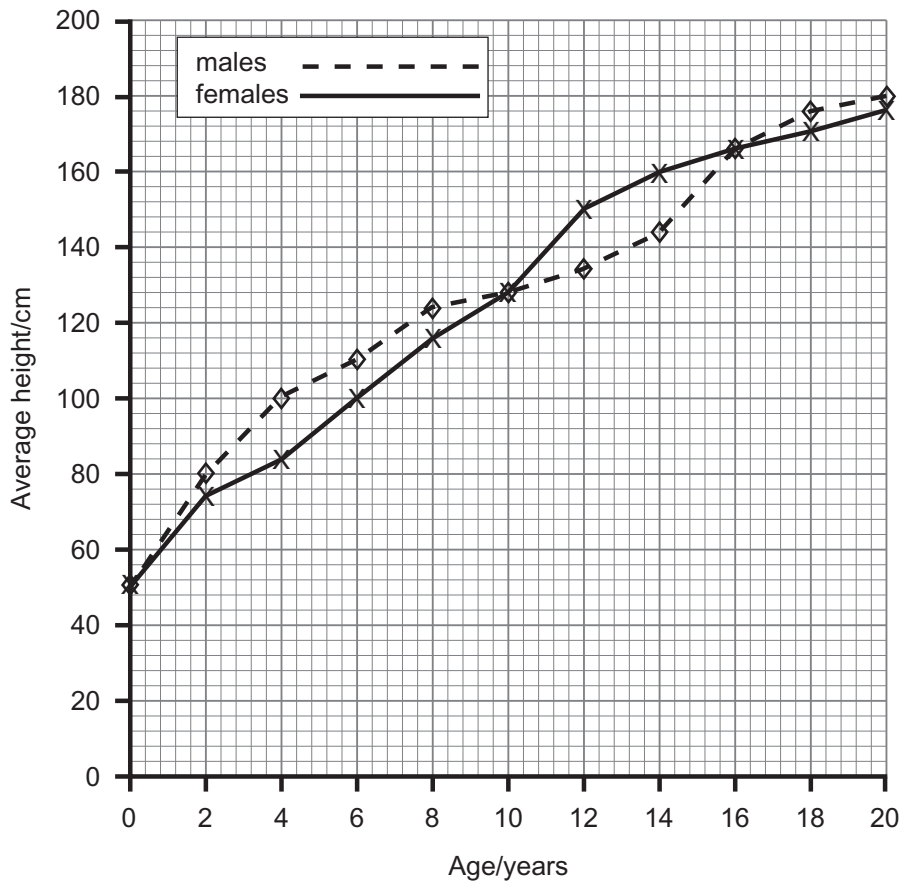
Examiner Only	
Marks	Remark
Total Question 1	
Total Question 2	

2 Complete the table showing the features of blood vessels.

Feature	Artery	Vein	Capillary	
Presence of valves	no	yes		[1]
Wall thickness		thin		[2]
Blood pressure	high		very low	[1]



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

Marks	Remark

Total Question 3

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[Turn over



- 4 The table shows the percentage of women surviving after being diagnosed with breast cancer.

Time since diagnosis/months	Percentage of women surviving	
	1996	2006
6	94.2	96.6
12	91.0	94.3
18	87.4	92.6
24	84.5	90.6

© N. Ireland Cancer Registry, Centre for Public Health, Queen's University, Belfast.

- (a) How does the percentage of women surviving 24 months after diagnosis change from 1996 to 2006?

**Use percentages from the table** to support your answer.

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[2]

- (b) The number of women screened for breast cancer increased from 1996 to 2006.

Give **two** advantages to the women screened for breast cancer.

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[2]

- (c) Give **one** way breast cancer can be treated.

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[1]

Examiner Only

Marks Remark

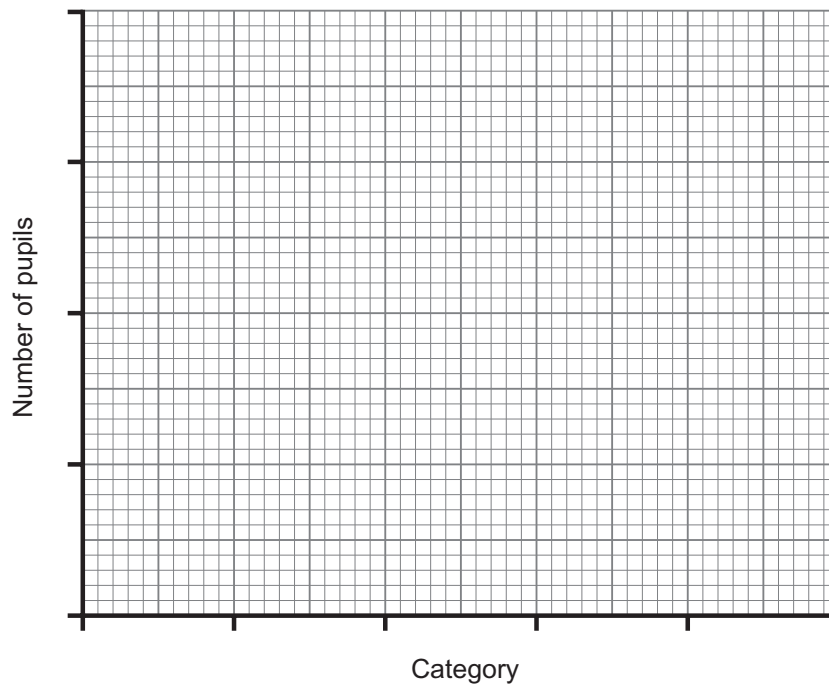
Total Question 4



- 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

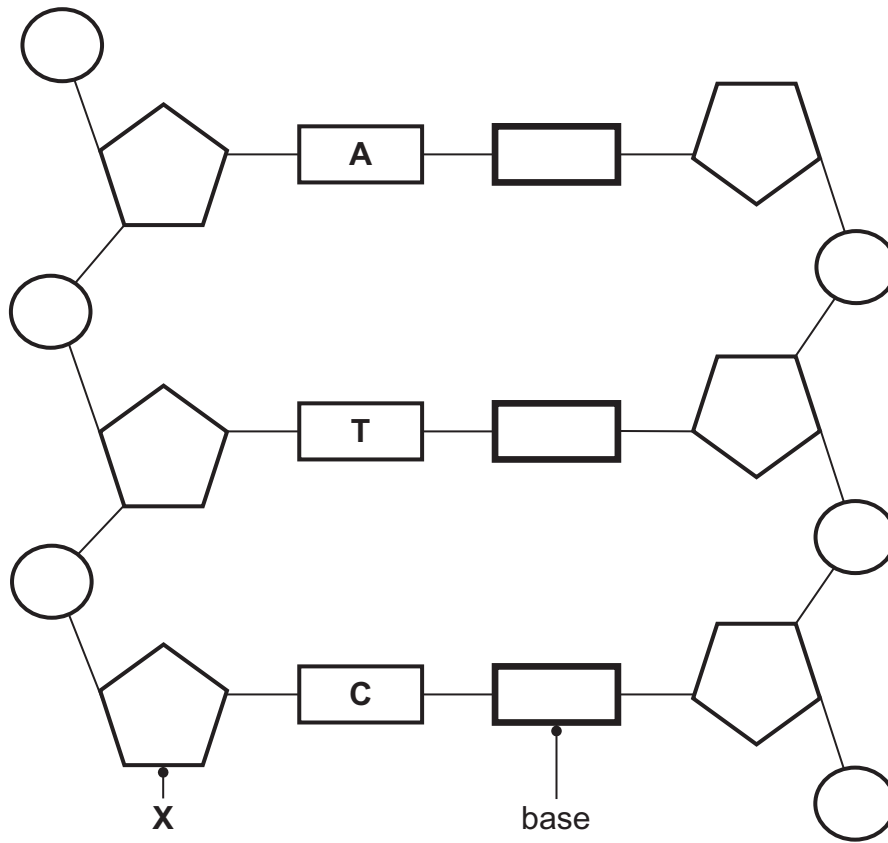
Total Question 5

[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	
	<b>Gametes</b>	<b>N</b>	
Tony	<b>n</b>		

(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]

Examiner Only

Marks Remark

Total Question 9

[Turn over



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The apparatus was used by a group of students to investigate the effect of wind on the rate of water loss from a leafy shoot over a period of 24 hours.

The results are shown in the table.

Time/hours	Loss in mass of flask/g	
	In still conditions	In windy conditions
0	0	0
4	2	8
8	4	16
12	6	24
16	8	32
20	10	40
24	12	48

(c) Suggest **one** way the students made the investigation a fair test.

\_\_\_\_\_ [1]

(d) Calculate the average rate of loss of mass per hour of the flask during 24 hours in still conditions.  
Show your workings.

Average rate of loss of mass \_\_\_\_\_ g per hour [2]

Examiner Only	
Marks	Remark



(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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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.

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[2]

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

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[1]

Examiner Only	
Marks	Remark





(b) Give **one** reason why a ban on smoking in workplaces could benefit non-smokers.

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[1]

(c) Suggest why some people are opposed to a ban on smoking in workplaces.

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[1]

Examiner Only	
Marks	Remark
Total Question 12	

[Turn over





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For Examiner's use only	
Question Number	Marks
1	
2	
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4	
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6	
7	
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10	
11	
12	
13	
14	

<b>Total Marks</b>	
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Examiner Number

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