



General Certificate of Secondary Education
2012–2013

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

MONDAY 25 FEBRUARY 2013, MORNING

Centre Number

71

Candidate Number



TIME

1 hour.

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 nine** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 60.

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 question **9(a)**.

For Examiner's
use only

Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	

Total
Marks



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1 (a) Complete the table below about microorganisms that cause disease.

Choose from:

thrush bacteria virus salmonella

Type of microorganism	Disease
	polio
fungi	
	gonorrhoea

[3]

(b) Complete the following sentences about the harm smoking cigarettes can do.

Choose from:

oxygen bronchitis tar
 nitrogen nicotine addictive

Harmful substances in cigarette smoke include _____
 and _____. Carbon monoxide is also present and
 it reduces the blood's ability to carry _____. [3]

Examiner Only	
Marks	Remark

- 2 (a) Given below are two named parts of the female reproductive system and some functions. Using lines, link each named part to its correct function.

Name	Function
ovary	where the foetus (baby) develops
uterus	produces eggs (ova)
	where fertilisation occurs

[2]

- (b) Complete the sentence below.

Choose from:

antibody **hormone** **egg** **sperm**

Females can take a contraceptive pill which changes their

_____ level and stops the development of

an _____ .

[2]

Examiner Only	
Marks	Remark

Connor and Anne are 20 year olds with no children and have just got married. The diagram below shows the discussion they had about contraception.



(c) Explain fully why most people would agree with Anne.

[2]

Examiner Only	
Marks	Remark

3 (a) The picture below shows cows feeding in a field.



Source: Chief Examiner

The picture shows the food chain:

Grass → Cow

(i) What term is used to describe the grass in the food chain above?

Choose from:

primary consumer : secondary consumer : producer

_____ [1]

(ii) State the source of energy for all food chains.

_____ [1]

(b) The photograph above shows that the pattern of skin colours on each cow is different. What type of variation is shown by this difference in skin colour?

Circle the correct answer.

uniform discontinuous continuous [1]

Examiner Only	
Marks	Remark

(c) Variation in living organisms can be caused by mutations in cells.

(i) Describe fully what is meant by the term 'mutation'.

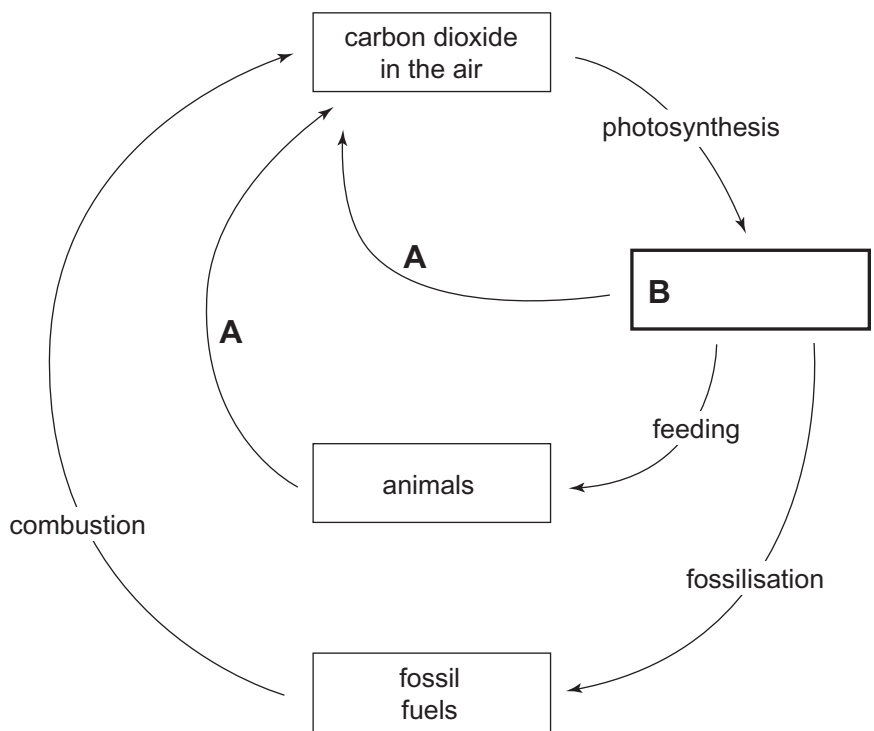
[2]

(ii) Name **one** disease caused by a mutation.

[1]

Examiner Only	
Marks	Remark

4 (a) The diagram below shows part of the carbon cycle.



(i) Complete the diagram by filling in the box labelled **B**. [1]

(ii) Name the process labelled **A** on the diagram.

_____ [1]

(iii) Use the diagram and your knowledge to give **two** reasons why the amount of carbon dioxide in the air is increasing.

1. _____

2. _____ [2]

Examiner Only	
Marks	Remark

(b) Global warming has only recently been accepted as a serious environmental issue.

In the table below use ticks to give **two** reasons why most people now accept that global warming is happening.

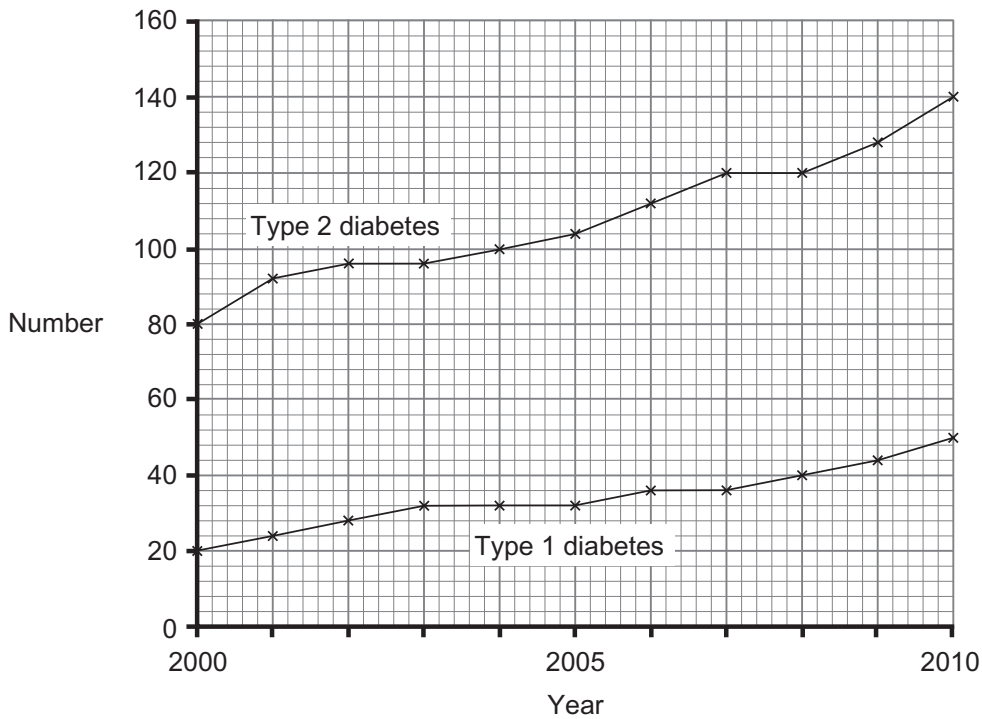
Reason	Tick (✓)
Coal is becoming more expensive	
More evidence of climate change	
More fossil fuels are being used	
Governments do not want to slow down industrial growth	
Better education about global warming	

[2]

Examiner Only	
Marks	Remark

5 (a) The following graph shows the number of patients with diabetes attending a hospital over a ten year period.

Examiner Only	
Marks	Remark



(i) Calculate the difference in the number of people being treated for Type 2 and Type 1 diabetes in 2010.

(Show your working out.)

_____ [2]

(ii) Why has **Type 2** diabetes increased over the ten year period?

Circle your answer.

more obesity : **increased exercise** : **increased stress** [1]

(b) **Type 1** diabetes usually develops in childhood and is managed by self-injection of insulin.

Type 2 usually develops in adults and is managed by a change in diet without injecting insulin.

Both types can produce long term effects including kidney failure if the condition is poorly managed.

Use the information provided and your knowledge to answer the following questions.

(i) The cost of treating diabetes is increasing. Suggest **two** reasons why the treatment of diabetes is very expensive.

1. _____

2. _____ [2]

(ii) Describe **one** way in which diabetes could be “poorly managed” by the **patient**.

_____ [1]

(c) Apart from kidney failure give **one** other long term effect of diabetes.

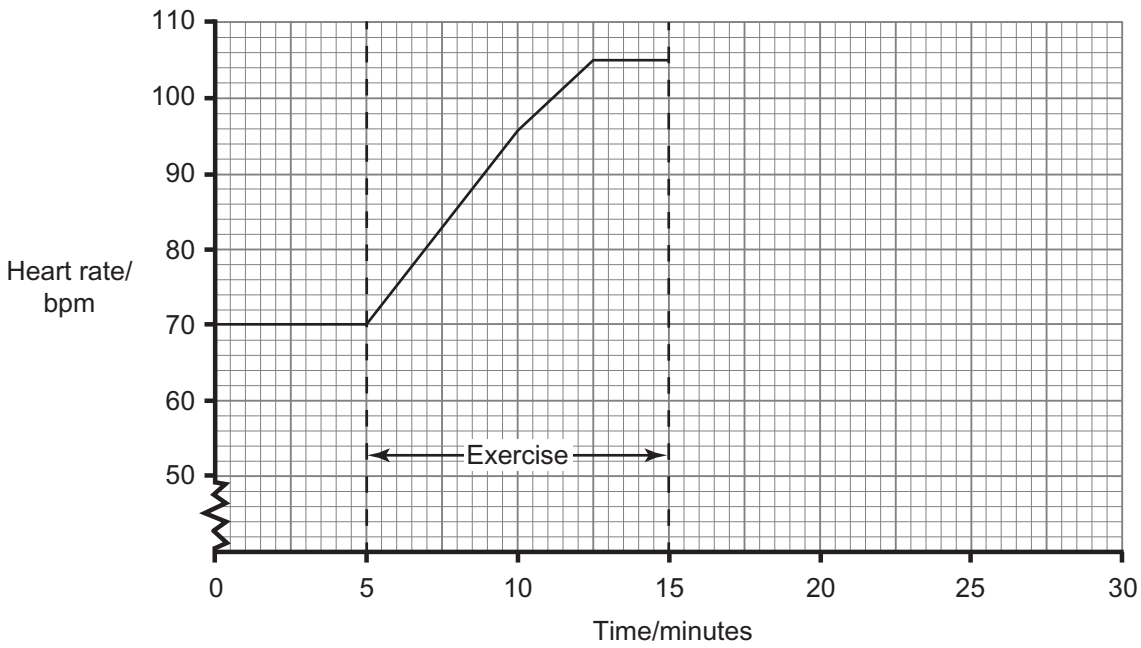
_____ [1]

Examiner Only

Marks Remark

6 (a) The following graph shows the effect of exercise on Tracey's heart rate.

Examiner Only	
Marks	Remark



Tracey stopped exercising at 15 minutes and her heart rate steadily returned to her resting rate in 5 minutes.

(i) Complete the graph to show Tracey's heart rate between 15 and 30 minutes. [2]

(ii) Calculate the increase in Tracey's heart rate during exercise.
 _____ bpm [1]

(iii) Calculate the percentage increase in Tracey's heart rate during exercise.
 _____ % [1]

(iv) Explain fully why Tracey's heart rate increased during exercise.

 _____ [3]

The following table shows the average cholesterol levels for men and women in various age groups.

Age	Average cholesterol level/arbitrary units	
	Men	Women
15–24	4.2	4.1
25–34	5.2	4.8
35–44	5.5	5.1
45–54	5.9	5.8
55–64	6.5	6.3

(b) Give **two** trends shown by the information in the table.

1. _____

2. _____
_____ [2]

(c) Give **two** lifestyle changes that can help reduce heart disease.

1. _____
2. _____ [2]

Examiner Only

Marks Remark

- 7 The flowers of a particular plant can be either red or white. When two plants with red flowers were crossed the following colours were produced.

	Red flowers	White flowers
Number	150	50

- (a) What is the ratio of red to white flowers?

_____ [1]

- (b) (i) Complete the genetic diagram below to explain the outcome of the cross above.

		r
	Rr	

[2]

- (ii) Complete the offspring genotypes and phenotypes for the cross above.

genotypes _____ Rr _____ [1]

phenotypes _____ Red _____ [1]

Examiner Only	
Marks	Remark

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(Questions continue overleaf)

8 The photograph below shows lichen growing on a tree.



Source: Chief Examiner

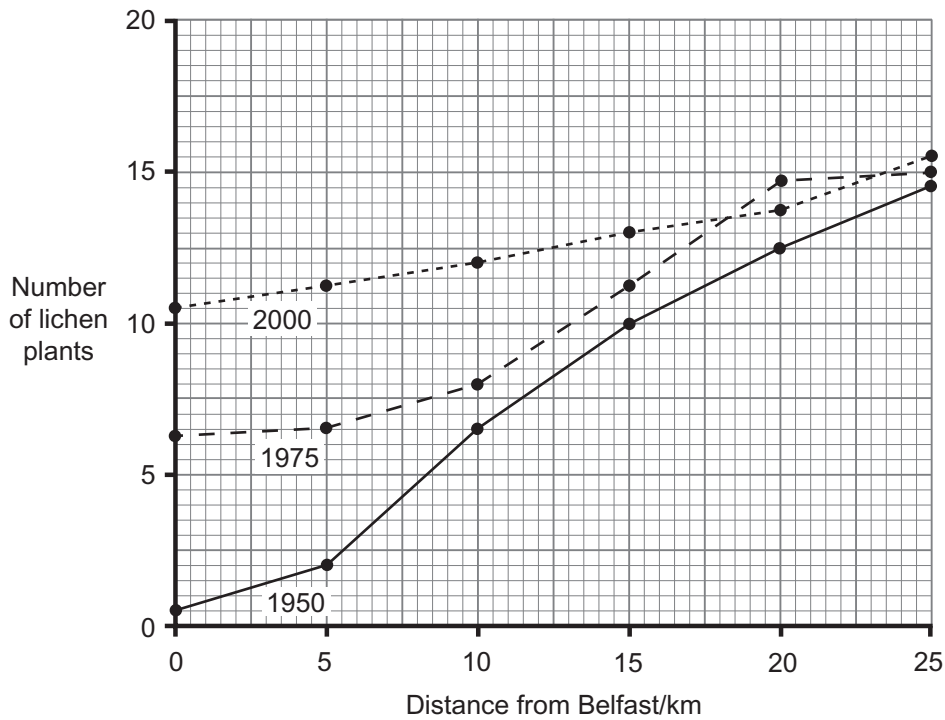
Lichen is a biotic pollution monitor as it only grows in large numbers where there is very little pollution.

(a) What is meant by the term 'biotic'?

_____ [1]

Examiner Only	
Marks	Remark

- (b) The graph shows the relationship between the number of lichen plants on trees and their distance from Belfast in the years 1950, 1975 and 2000.



- (i) Using the information provided, describe and explain **one** trend about the change in **air pollution** in and around Belfast.

[2]

- (ii) When collecting the data suggest **two** things that must be done to make the investigation valid (a fair test).

1. _____

2. _____ [2]

Examiner Only	
Marks	Remark

9 (a) Vaccinations help us defend against disease by giving us active immunity.

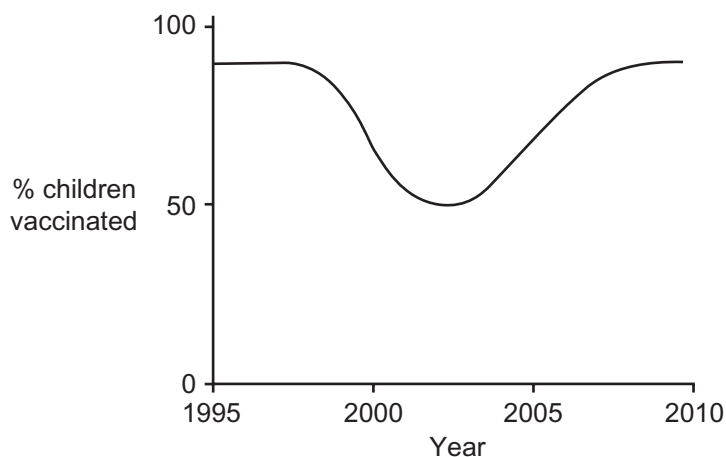
Describe and explain how vaccinations protect against disease and why they provide long term active immunity.

In this question you will be assessed on your written communication skills including the use of specialist scientific terms.

[6]

Examiner Only	
Marks	Remark

- (b) The following graph shows how the percentage of children being vaccinated against MMR has changed between 1995 and 2010.



Use the graph to answer the following questions.

- (i) In 1998 a scientist suggested that there was a link between the MMR vaccination and autism. What is the evidence that the link between autism and the MMR vaccination has been disproved?

_____ [1]

- (ii) Give **one** piece of evidence that suggests that some parents still have other concerns about the MMR vaccination.

_____ [1]

THIS IS THE END OF THE QUESTION PAPER

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Marks Remark

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