CCEA GCSE SCIENCE: SINGLE AWARD

SCIENCE



EXAM QUESTION PACK

UNIT 1 (BIOLOGY) FOUNDATION TIER GSS11 PAPERS

STEMUP

These questions belong to CCEA, not to us.

The examination questions, mark schemes and examiner reports in this pack were written and published by CCEA. They are past assessment materials, reproduced here so that students can revise from them.

What we do not own

STEMUP is not affiliated with CCEA and does not own, and makes no claim to own, any of the question, mark scheme or examiner report material in this pack. CCEA has not endorsed, approved or been involved in the production of it. CCEA and the qualification titles used here belong to their respective owners and appear for identification only.

Where to find the originals

CCEA publishes its past papers, mark schemes and examiner reports free of charge. Always check the current specification at ccea.org.uk before you revise, because content and wording can change between series.

If you hold the rights to any material in this pack and would like it amended or removed, contact admin@stemup.co.uk and we will act on it.

Rewarding Learning

General Certificate of Secondary Education
2016–2017

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

WEDNESDAY 9 NOVEMBER 2016, MORNING

MARK SCHEME

STEMUP.CO.UK

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

					AVAILABLE MARKS
1	**(a)**	Fungus [1] salmonella [1] virus [1]		[3]	
	(b)	Carbon monoxide → reduces the blood's ability to carry oxygen [1] tar → causes cancer [1]		[2]	
	(c)	Nicotine		[1]	6
2	**(a)**	**(i)** Spinal cord [1] control centre [1]		[2]	
		(ii) Reflex actions are faster/protective/do not involve thinking time/ automatic (or converse)		[1]	
	(b)	Insulin is a hormone [1] hormones travel in the blood [1]		[2]	5
3	**(a)**	10 800		[1]	
	(b)	**(i)** All points correct [2] (four points correct [1]) points joined by short straight lines [1]		[3]	
		(ii) 9.6 billion to 12 billion		[1]	
		(iii) Any **two** from: • people are living longer • better medication • better sanitation • better nutrition		[2]	7
4	**(a)**	**(i)** The pairs differ in length		[1]	
		(ii) Down syndrome [1] extra chromosome 21/47chromosomes [1]		[2]	
	(b)	Mutation [1] skin [1]		[2]	5

					AVAILABLE MARKS
5	**(a)**	**(i)**	The fungus killed the bacteria [1]		
		(ii)	Antibiotics [1]		
		(iii)	Antibiotics will only be prescribed for a bacterial infection/ not for viral infection [1]		
	(b)		In-vitro testing – trial and error effect/expensive scientists/equipment [1] clinical trials – payment of volunteers/other appropriate response [1]	[2]	
	(c)		C – B – E – A – D [2] Any two in correct order [1]	[2]	7
6	**(a)**		Nucleus – chromosome – gene	[1]	
	(b)	**(i)**	Gametes correct [1] offspring correct [1]	[2]	
		(ii)	All long hair	[1]	4
7	**(a)**	**(i)**	White chocolate will not affect colour of Benedict's reagent/ 'normal' (brown) chocolate will make it difficult to judge colour changes	[1]	
		(ii)	To see which changed first [1] each will have the same (brick red) end point [1]	[2]	
		(iii)	To ensure both boiling tubes were at same temperature/to control this variable/make sure results were valid	[1]	
	(b)	**(i)**	As age increases more people/men/women have heart disease	[1]	
		(ii)	Any **two** from: • stress • lack of exercise • too much salt • too much saturated fat • high levels of cholesterol • high blood pressure • genetic • diabetes • too much alcohol	[2]	
		(iii)	Stroke	[1]	8

8 Indicative Content:

- contraception is prevention of pregnancy
- condom traps sperm
- easy to use/not a chemical so doesn't affect body/also prevents sexually transmitted diseases
- not as reliable as other methods
- vasectomy cuts sperm tubes/prevents sperm reaching penis
- virtually 100% reliable
- cannot easily be reversed

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe and explain the different types of male contraceptive using **six or seven** of the points above, in a logical sequence. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates use some appropriate specialist terms to describe and explain the different types of male contraceptive using **four or five** of the points above, in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates describe and/or explain at least one type of male contraceptive using **one or two** of the above points. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and have made limited use of specialist terms. The form and style are of a limited standard.	[1]–[2]
D	Not worthy of credit.	[0]

[6]

AVAILABLE MARKS

6

STEMUP.CO.UK

					AVAILABLE MARKS
9	(a)	(i)	Photosynthesis [1] respiration [1]	[2]	
		(ii)	Increase in carbon dioxide taken in (over time) [1] more photosynthesis [1] as plants increase in size [1]	[3]	
		(iii)	Neutral as carbon dioxide given out in respiration and combustion is the same as that taken in in photosynthesis [1] (51 + 66) = 117 given out and 117 taken in [1]	[2]	
	(b)	(i)	White fur/thick fur [1] so not spotted by seals/stay warm [1]	[2]	
		(ii)	Polar bears are too heavy for ice/loss of habitat	[1]	
	(c)	(i)	Ongoing monitoring/can reach inaccessible areas/very accurate	[1]	
		(ii)	To persuade governments to act against global warming/to take appropriate conservation measures	[1]	12
				Total	**60**

STEMUP.CO.UK

Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2015–2016

Science: Single Award

Unit 1 (Biology)
Foundation Tier

GSS11

[GSS11]

TUESDAY 17 MAY 2016, AFTERNOON

TIME

1 hour.

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 boxed area on each page or on blank pages.
Complete in blue or black ink only. **Do not write with a gel pen.**
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**.

STEMUP.CO.UK

BLANK PAGE

DO NOT WRITE ON THIS PAGE

1 **(a)** The table below shows some food types and their functions.
Complete the table.

Choose from:

iron : growth and repair : calcium

carbohydrate : prevents constipation

Food type	Function in the body
	gives us energy
protein	
	for strong teeth and bones

[3]

(b) Given below are two eating disorders and their descriptions.
Using lines, link each disorder with its description.

Eating disorder	Description
anorexia	eat so much they become obese
bulimia	binge eat then make themselves vomit
	eat very little and lose weight

[2]

[Turn over

STEMUP.CO.UK

2 **(a)** The photograph below shows some bean plants growing in a pot.



Source: Chief Examiner

Complete the sentences below.

Choose from:

respiration **water** **phototropism** **light** **heat**

The plants are bending towards the _____.

This process in plants is called _____. [2]

(b) Photosynthesis is another process in plants.

(i) Complete the equation for photosynthesis.

water + _____ → starch + _____

[2]

STEMUP.CO.UK

(ii) The list below gives the steps for testing for starch in a leaf but they are **not** in the correct order.

A Put the green leaf into boiling ethanol (alcohol)

B Add iodine to the leaf

C Remove a leaf from the plant and put it in boiling water for 30 seconds

D Spread the leaf on a white tile

E Dip the leaf in boiling water to soften it

Put the steps **A**, **B**, **C**, **D** and **E** in the correct order.
The first one has been done for you.

C → _____ → _____ → _____ → _____ [2]

(iii) Explain fully why the green leaf is boiled in ethanol.

_____

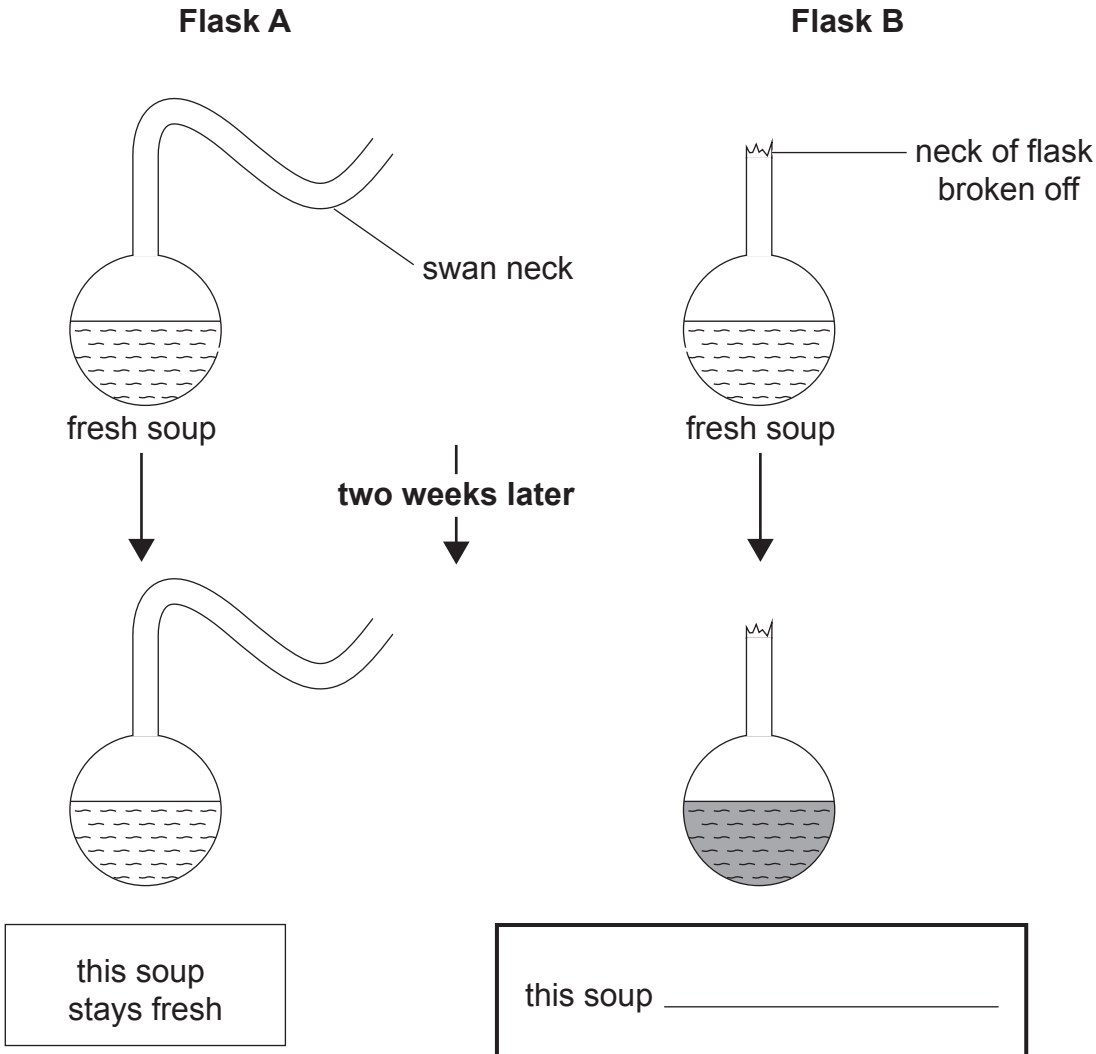
_____

_____ [2]

[Turn over

STEMUP.CO.UK

3 **(a)** The diagram below shows an experiment to find if microorganisms are the cause of food contamination.



Source: CCEA

(i) Complete the box in the diagram above to describe what happens to the soup in flask **B**. [1]

STEMUP.CO.UK

(ii) Explain the result for flask **A**.

_____

_____

_____ [2]

(iii) Name the scientist who carried out a similar experiment.

_____ [1]

(b) Our bodies have many natural defences against disease. Describe how mucous membranes in the nose help protect against disease in humans.

_____

_____

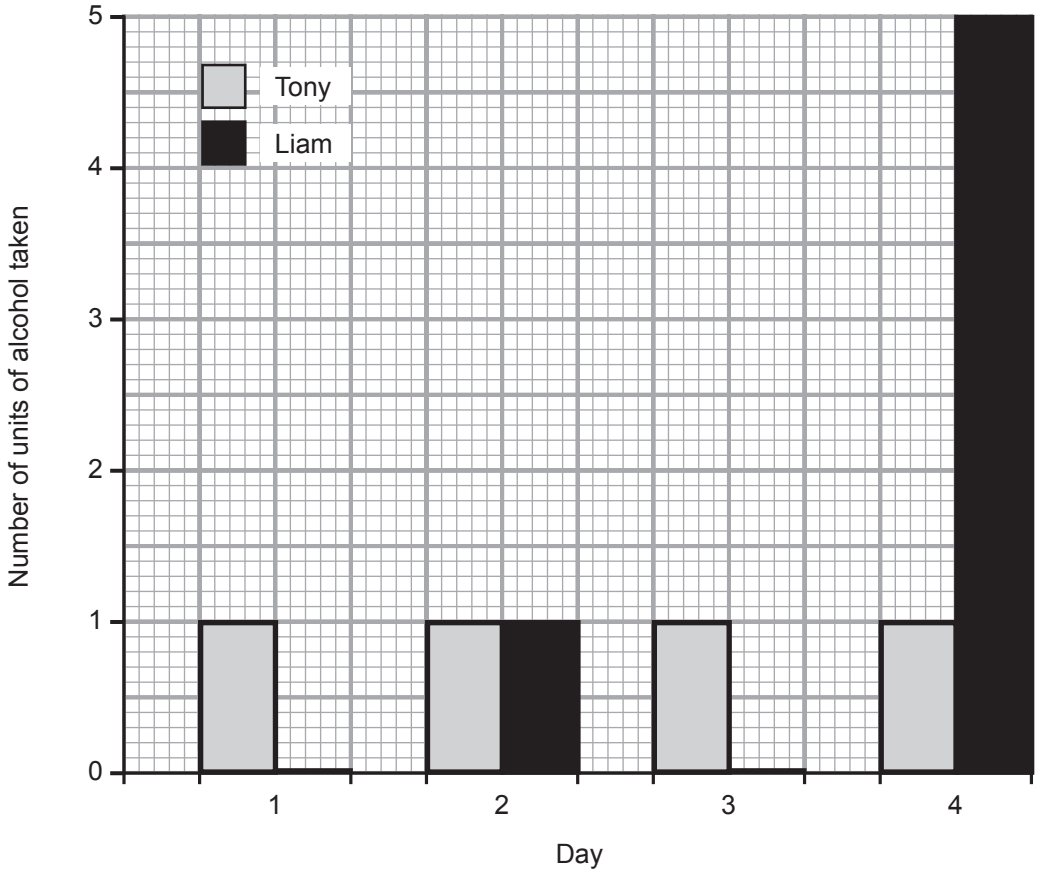
_____ [2]

[Turn over

STEMUP.CO.UK

4 Many young people drink more than the recommended amount of alcohol.

(a) The number of units of alcohol drunk by two 20-year-old men was recorded over a four day period. The results are shown in the graph below.



(i) Calculate how much Tony drank over the four days.

_____ units [1]

(ii) Explain why Liam can be described as a 'binge drinker'.

_____

_____ [1]

STEMUP.CO.UK

(b) Describe one way in which excess drinking of alcohol can harm **society**.

_____

_____ [1]

(c) Apart from stopping drinking alcohol completely, suggest **two** ways in which someone could reduce his or her alcohol intake.

1. _____

2. _____ [2]

[Turn over

STEMUP.CO.UK

5 The table below shows the numbers of people being diagnosed with Type 1 and Type 2 diabetes in a town over a twenty year period.

Year	Number of patients diagnosed with diabetes	
	Type 1	**Type 2**
1996 – 2000	9	87
2001 – 2005	12	100
2006 – 2010	18	125
2011 – 2015	26	161

(a) The number of patients diagnosed with Type 1 diabetes is increasing over time. State **two** other trends shown by this information.

1. _____

_____

2. _____

_____ [2]

(b) Apart from the number of patients, give **one** difference between Type 1 diabetes and Type 2 diabetes.

_____

_____ [1]

(c) Give **one** long term effect (complication) of diabetes.

_____ [1]

STEMUP.CO.UK

BLANK PAGE

DO NOT WRITE ON THIS PAGE

(Questions continue overleaf)

[Turn over

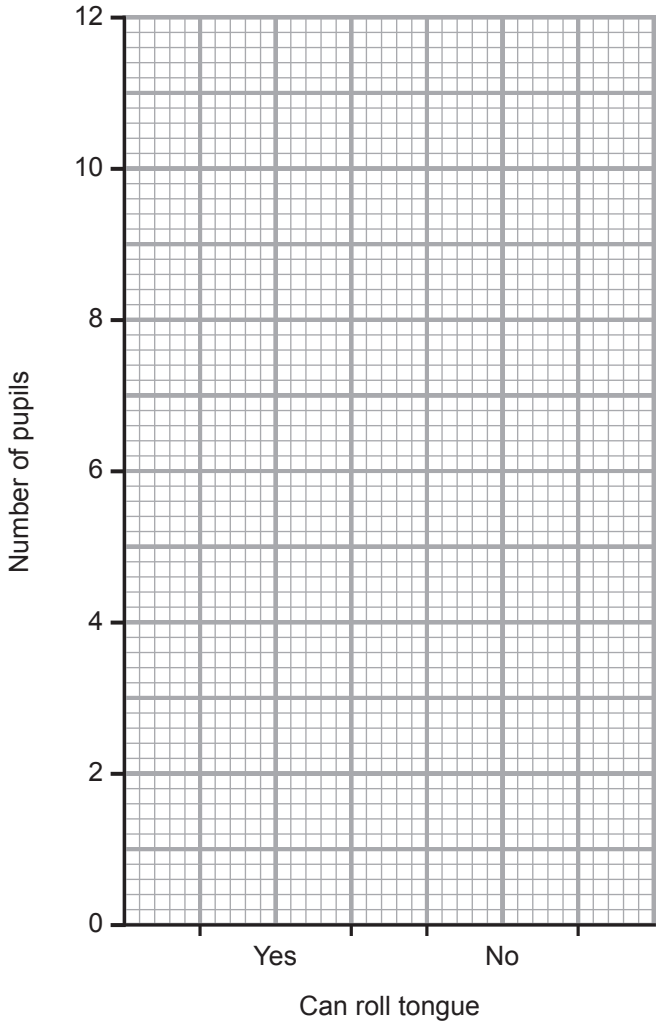
STEMUP.CO.UK

6 **(a)** People either can or cannot roll their tongue.

(i) Name the type of variation shown by tongue rolling.

_____ [1]

(ii) In a class of 20 pupils only 11 can roll their tongue.
Using this information, complete the bar chart below.



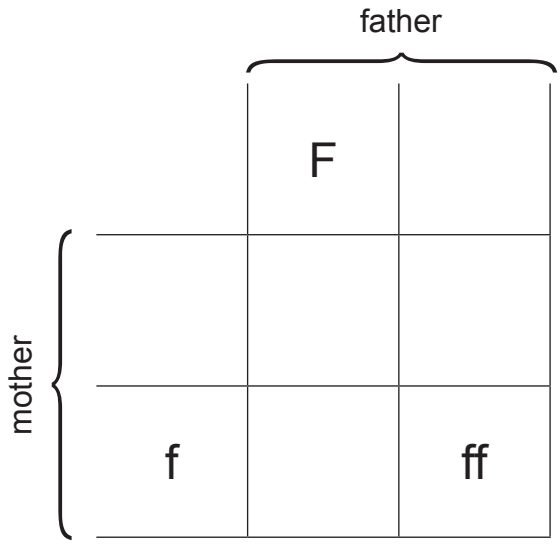
[2]

STEMUP.CO.UK

(b) Differences between people are mainly due to differences in their genes.

For example, the condition cystic fibrosis is a genetic condition. The normal allele **(F)** is dominant to the allele that causes cystic fibrosis **(f)**.

(i) Complete the Punnett square to show how a father with the genotype **(Ff)** and a mother with the genotype **(ff)** can have children with cystic fibrosis.



[2]

(ii) Circle the genotype(s) in the Punnett square that show offspring with cystic fibrosis. [1]

[Turn over

STEMUP.CO.UK

7 Rhododendron is an example of a competitive invasive species in Northern Ireland.

(a) Give **two** features that 'competitive invasive species' have in common.

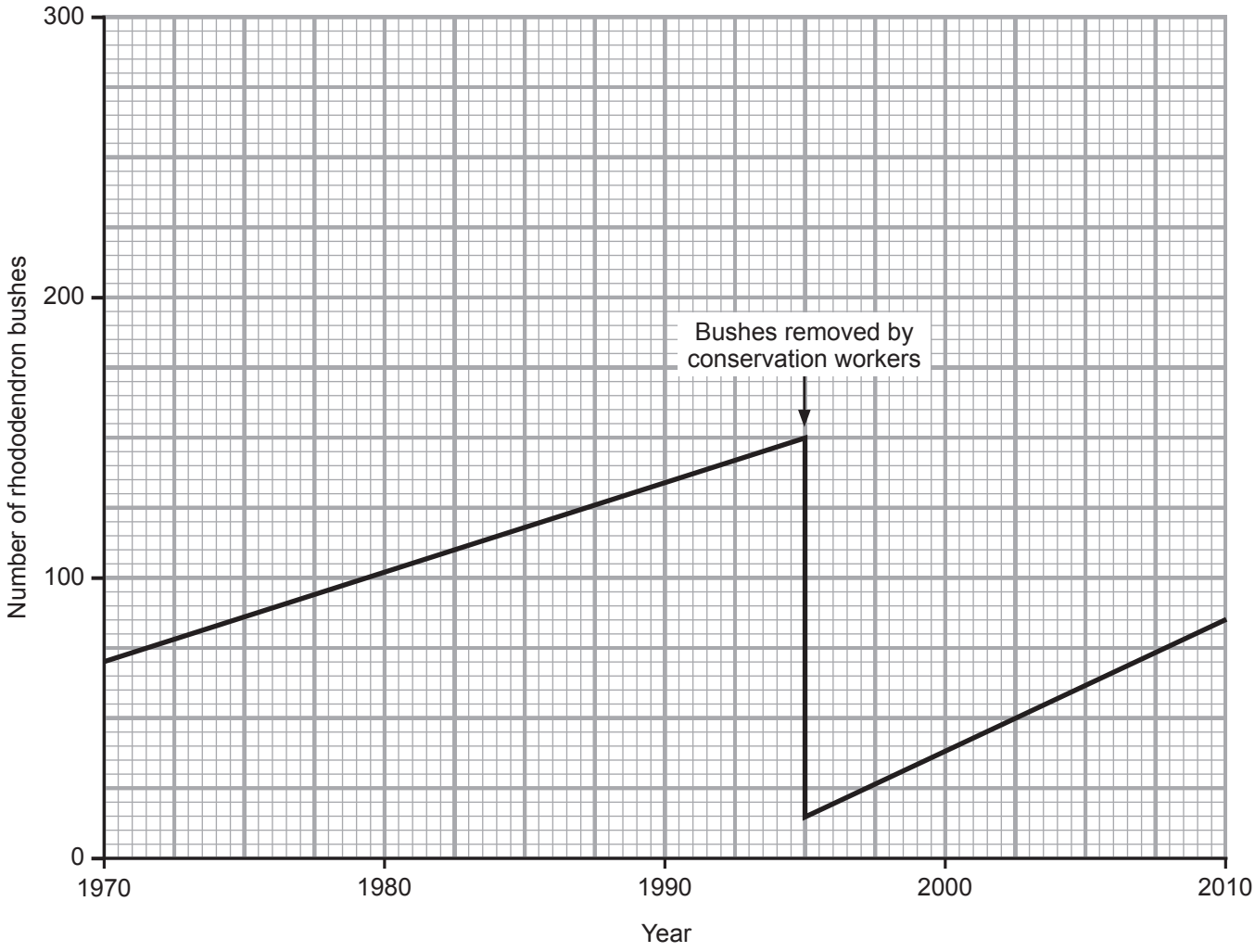
1. _____

_____

2. _____

_____ [2]

(b) The graph below shows how the number of rhododendron bushes has changed over a 40 year period in an area of heathland.



10743

(i) Calculate how many rhododendron bushes were removed in 1995.

(Show your working out.)

_____ [2]

(ii) Calculate the percentage of bushes that were not removed in 1995.

_____ % [1]

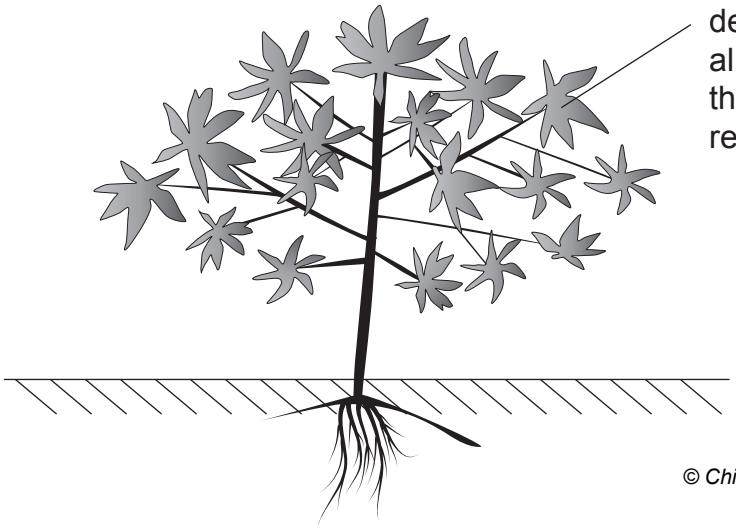
(iii) Predict how many rhododendron bushes there would have been in 2010 if no bushes had been removed.

_____ [1]

[Turn over

STEMUP.CO.UK

(c) The drawing below represents a rhododendron bush.



© Chief Examiner

Using the information provided and your knowledge, answer the following questions.

(i) Suggest the effect a rhododendron bush has on other species of plants growing close to it. Explain your answer.

_____

_____

_____

_____

_____ [3]

(ii) Suggest the effect on biodiversity, if any, the removal of rhododendron bushes will have in the heathland.

_____ [1]

(d) Name **one** other competitive invasive species.

_____ [1]

STEMUP.CO.UK

8 **(a)** There are many different strains (types) of virus that cause flu. Flu viruses mutate easily making many new virus strains that cause flu.

(i) Explain the term 'mutation'.

_____

_____

_____ [2]

Many people in the UK get a flu vaccination each year.

(ii) Describe fully what a flu vaccination contains.

_____

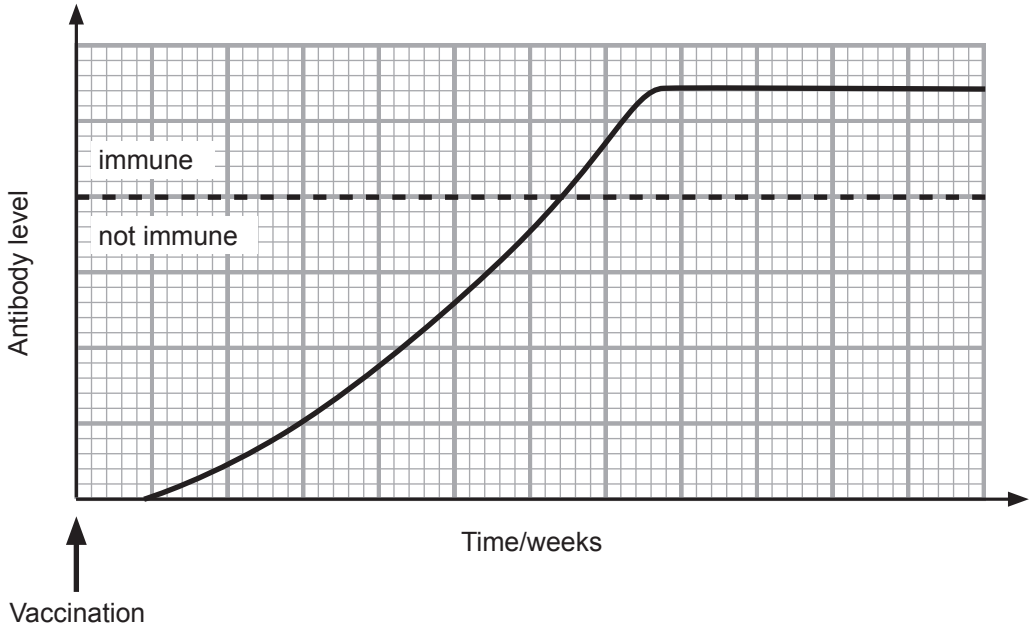
_____

_____ [2]

[Turn over

STEMUP.CO.UK

The graph below shows the effect of a flu vaccination on a person's antibody level.



When developing the flu vaccination in any particular year, scientists have to predict (guess) which strain of virus is likely to infect the most people. They then develop the flu vaccination against this particular strain.

Using the information provided, answer the questions below.

(iii) Use the graph to suggest why people get the flu vaccination well before they are expected to be infected by the flu virus.

_____

_____ [1]

(iv) Suggest why some people who get the flu vaccination still get flu many months later.

_____

_____ [1]

(b) The flow chart below summarises how the number of children being vaccinated for MMR has changed since 1990.

1990 – about 90% of children vaccinated

↓

1998 – some research suggested a link between the MMR vaccination and autism

↓

1998 to 2003 – numbers being vaccinated fall to 80%

↓

2007 – numbers return to the 1990 levels. The link with autism had been disproved

↓

2015 – around 95% of children are vaccinated for MMR

(i) Describe fully the trend in the number of children being vaccinated for MMR between **2003 and 2015**. Use data from the flow chart to support your answer.

[2]

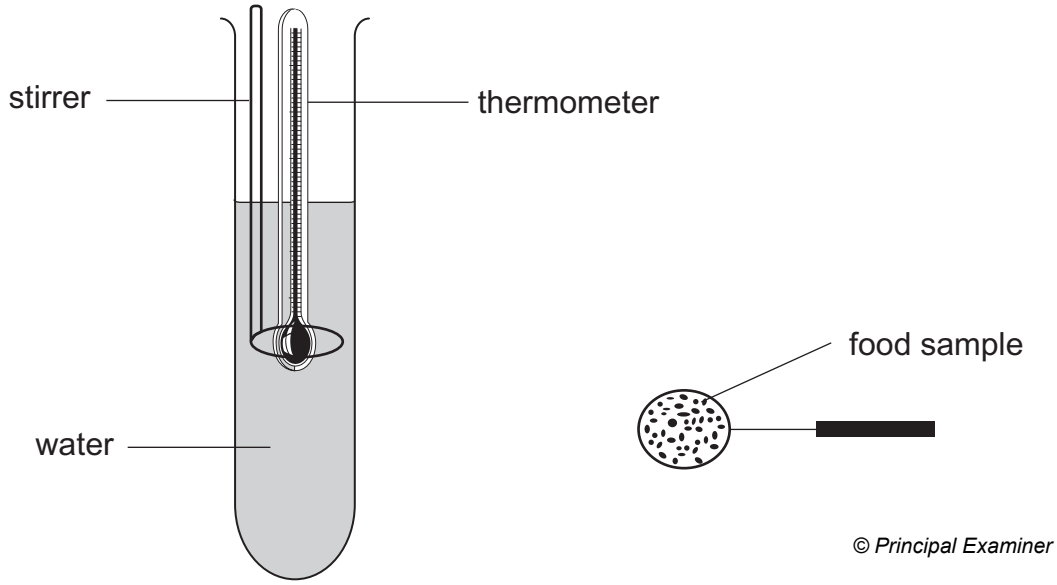
(ii) Suggest why there are still some parents who do not have their children vaccinated for MMR.

[1]

[Turn over

STEMUP.CO.UK

9 Energy released from different foods can be compared using the apparatus shown in the diagram.



© Principal Examiner

Describe how you would compare the amount of energy released from a biscuit to the amount of energy released from bread.

Your answer should include:

- **two** variables to be controlled to make the investigation fair
- **one** reason why the results obtained are likely to be less than the actual amount of energy in the foods

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

[6]

THIS IS THE END OF THE QUESTION PAPER

STEMUP.CO.UK

BLANK PAGE

DO NOT WRITE ON THIS PAGE

BLANK PAGE

DO NOT WRITE ON THIS PAGE

DO NOT WRITE ON THIS PAGE

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total Marks	

Examiner Number

Permission to reproduce all copyright material has been applied for.
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA will be happy to rectify any omissions of acknowledgement in future if notified.

Rewarding Learning

General Certificate of Secondary Education
2015–2016

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

TUESDAY 17 MAY 2016, AFTERNOON

MARK SCHEME

STEMUP.CO.UK

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

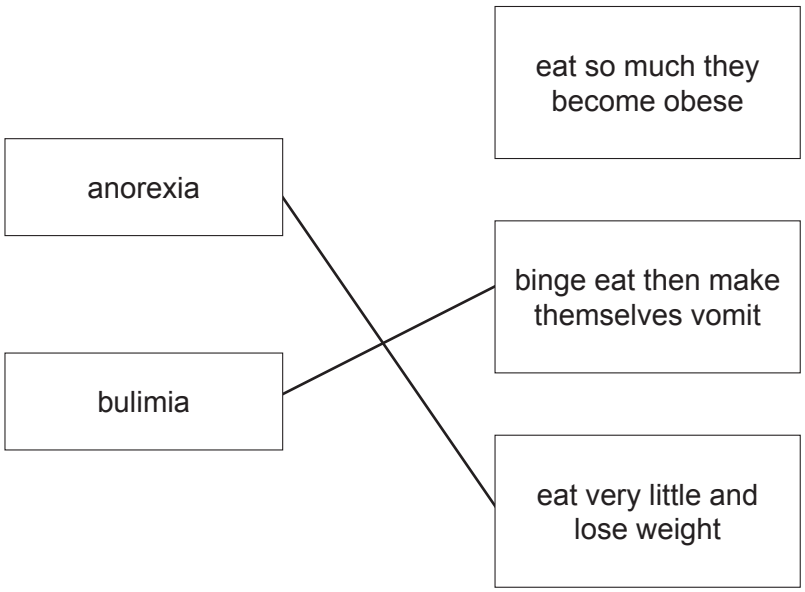
				AVAILABLE MARKS
1	(a)			

Food type	Function in the body
carbohydrate [1]	gives us energy
protein	growth and repair [1]
calcium [1]	for strong teeth and bones

[3]

(b)

Eating disorder **Description**



[2] 5

2 **(a)** Light [1] phototropism [1] [2]

(b) **(i)** Carbon dioxide [1] oxygen [1] [2]

(ii) A – E – D – B
(all correct = 2; any two correct in sequence = 1) [2]

(iii) To remove the chlorophyll/green colour [1]
so that the colour change/iodine is more easily seen [1] [2] 8

3 **(a)** **(i)** The soup is contaminated/gone 'off' [1]

(ii) The swan neck traps microorganisms [1]
therefore they cannot enter the soup [1] [2]

(iii) Pasteur [1]

(b) They trap microorganisms/cause microorganisms to stick to them [1]
preventing (microbes) entering the body [1] [2] 6

STEMUP.CO.UK

					AVAILABLE MARKS
4	**(a)**	**(i)**	4 units	[1]	
		(ii)	He drank a lot/5 units on the one occasion/day 4	[1]	
	(b)		Violence/family breakup/damaged relationships/absence from work/drink driving/cost to health service/anti-social behaviour	[1]	
	(c)		Drink on fewer/only on special occasions [1] Drink less on each occasion, e.g. low alcohol drinks, stick to limits [1]	[2]	5
5	**(a)**		Type 2 is increasing over time [1] Both/either are increasing at a faster rate over time [1]	[2]	
	(b)		Type 1 is usually contracted when a child/is not linked to lifestyle/is treated with insulin/body does not produce insulin/Type 2 usually contracted when older/linked to lifestyle (or explained)/is usually treated through change to lifestyle (and tablets)/body produces insulin but fails to work properly	[1]	
	(c)		Damage to eyesight/kidney damage/heart disease/stroke	[1]	4
6	**(a)**	**(i)**	Discontinuous	[1]	
		(ii)	Both bars correct [2] one bar correct [1]	[2]	
	(b)	**(i)**	Gametes correct [1] offspring correct [1]	[2]	
		(ii)	Children with genotype ff circled	[1]	6
7	**(a)**		Any **two** from: • a non-native species/introduced by man • out-competes other (native) species • spreads (rapidly) across countryside/reproduces rapidly	[2]	
	(b)	**(i)**	150 – 15 [1] 135 [1]	[2]	
		(ii)	10%	[1]	
		(iii)	195–205	[1]	
	(c)	**(i)**	Prevents/reduces other plants' growth [1] not enough light/or other resource described [1] for photosynthesis/explanation of effect of reduced resource [1]	[3]	
		(ii)	Increased	[1]	
	(d)		Grey squirrel (or other suitable example)	[1]	11

				AVAILABLE MARKS
8	(a)	(i)	Change [1] in gene/chromosome/DNA [1] [2]	
		(ii)	Weakened/dead/modified [1] flu virus [1] [2]	
		(iii)	It takes a long time/weeks before immunity is achieved/antibodies reach a high enough level [1]	
		(iv)	The vaccination was for a different strain/two strains (species) were different [1]	
	(b)	(i)	Numbers increased from 2003–2015 [1] increase supported by reference to any two percentages from flow chart [1] [2]	
		(ii)	Don't believe vaccination is safe [1]	9

9 Indicative content

- use the thermometer to record the temperature of the water
- at the start and end of the investigation
- burn the food sample, e.g. biscuit
- record difference in temperature/the higher the temperature rise, the more energy in the food
- repeat for the other food sample (bread)
- any **two** from – use same mass of food/ensure burning food is same distance away from boiling tube/ensure temperature of water is even throughout boiling tube (use of stirrer)/use the same volume of water
- some burnt food remains/used to heat glass/lost in air

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe how to compare the amount of energy in different foods using **six, seven or eight** of the points above, in a logical sequence. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates use some appropriate specialist terms to describe how to compare the amount of energy in different foods using **four or five** of the points above, in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates describe how to compare the amount of energy in food using **one, two or three** of the above points. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and have made limited use of specialist terms. The form and style are of a limited standard.	[1]–[2]
D	Response not worthy of credit.	[0]

[6] 6

Total **60**

STEMUP.CO.UK

Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2015–2016

Science: Single Award

Unit 1 (Biology)
Foundation Tier

GSS11

[GSS11]

WEDNESDAY 24 FEBRUARY 2016, MORNING

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

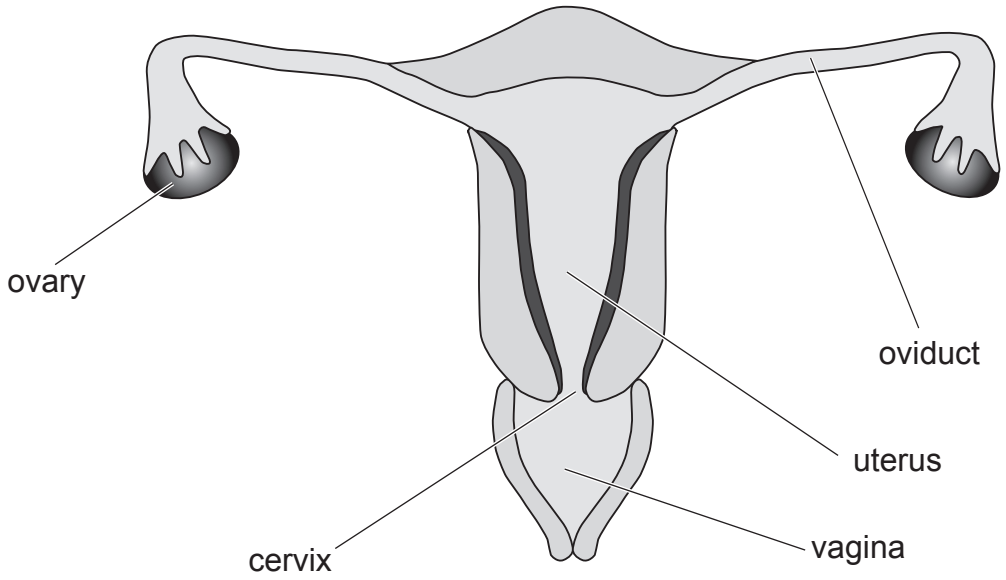
The total mark for this paper is 60.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
Quality of written communication will be assessed in Question **9**.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total Marks	

STEMUP.CO.UK

Examiner Only	
Marks	Remark

1 (a) The diagram below shows parts of the female reproductive system.



© GCSE Science Single Award for CCEA Foundation and Higher Tier by James Napier, Alyn G McFarland and Roy White. Published by Hodder Education in 2013. ISBN: 9781444195729. Reproduced by permission of Hodder Education

Complete the table below.

Choose from:

cervix **ovary** **uterus** **vagina** **oviduct**

Part of female reproductive system	Function
	produces eggs (ova)
	where the baby develops
	where fertilisation takes place

[3]

(b) Contraceptives are used to prevent pregnancy.

(i) Using lines, link each method of contraception with its correct description.

Method	Description
condom	changes a woman's hormone levels and stops eggs being released
contraceptive pill	prevents eggs from reaching the uterus
	barrier to prevent sperm entering the female

[2]

(ii) Give **one** reason why some people do not approve of using contraceptives.

_____ [1]

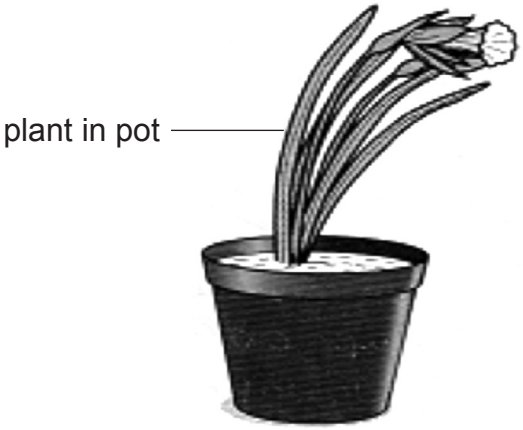
Examiner Only

Marks	Remark

STEMUP.CO.UK

Examiner Only	
Marks	Remark

2 The diagram below shows a plant which has been given light from one direction **only** over a period of two weeks.



Source: CCEA

(a) Draw an arrow on the diagram to show the direction of light. [1]

(b) **(i)** Complete the sentence below.

Choose from:

photosynthesis **hormone** **phototropism**

neurone **growth**

This plant's response to light is called _____

and is controlled by a _____. [2]

(ii) Explain fully how this response benefits the plant.

_____

_____

_____ [2]

BLANK PAGE

(Questions continue overleaf)

STEMUP.CO.UK

Examiner Only	
Marks	Remark

3 **(a)** The table below gives statements about some food tests.

(i) Complete the table by placing a tick (✓) if the statement is correct for each food group.
Only use **one** tick for each food group.

	Statement		
Food group	**Biuret reagent is used**	**Iodine changes to blue/black**	**Test solution is heated**
protein			
sugar			
starch			

[3]

(ii) From the table name the food group that is used for growth and repair in the body.

_____ [1]

(b) Give **one** function of water in the body.

_____ [1]

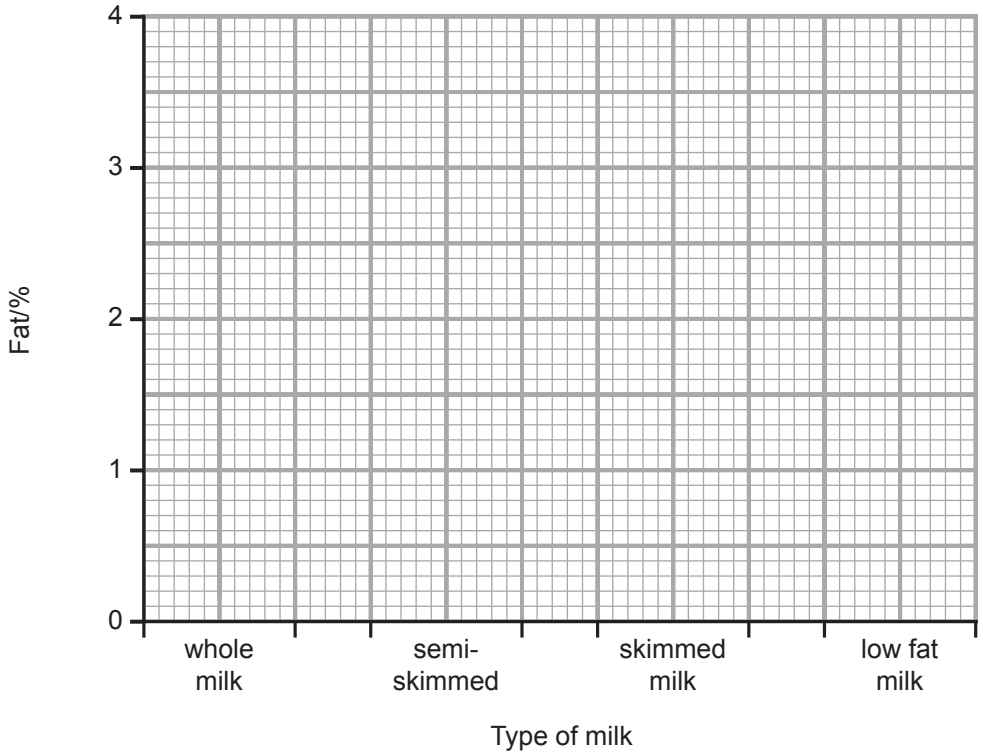
STEMUP.CO.UK

(c) The table below shows the percentage of fat in four different types of milk.

Type of milk	Fat/%
whole milk	3.5
semi-skimmed	1.7
skimmed milk	0.3
low fat milk	1.0

© Nutrition, Types of Milk. Dairy Council for Northern Ireland.
http://www.dairycouncil.co.uk/consumers/nutrition/types-of-milk

On the grid below draw a **bar chart** of this information.



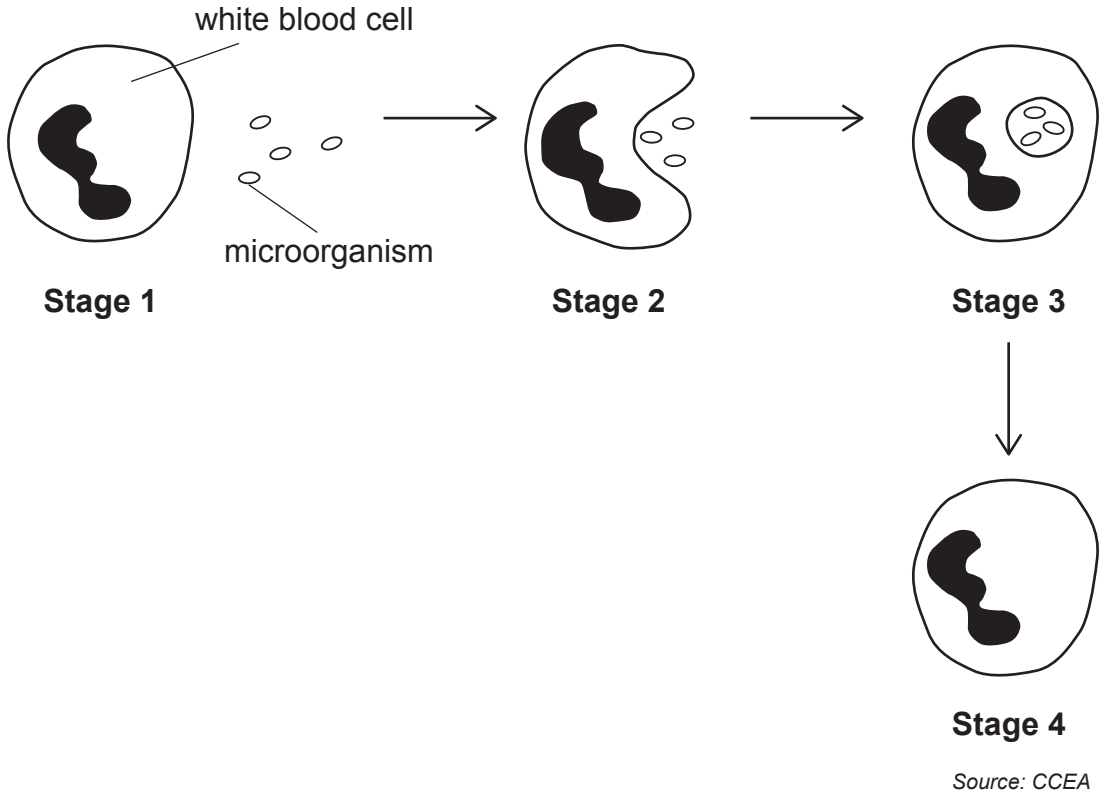
[2]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

4 **(a)** The diagram below shows the process of phagocytosis.



Source: CCEA

(i) Using the diagram and your knowledge describe the process of phagocytosis.

_____

_____

_____

_____ [2]

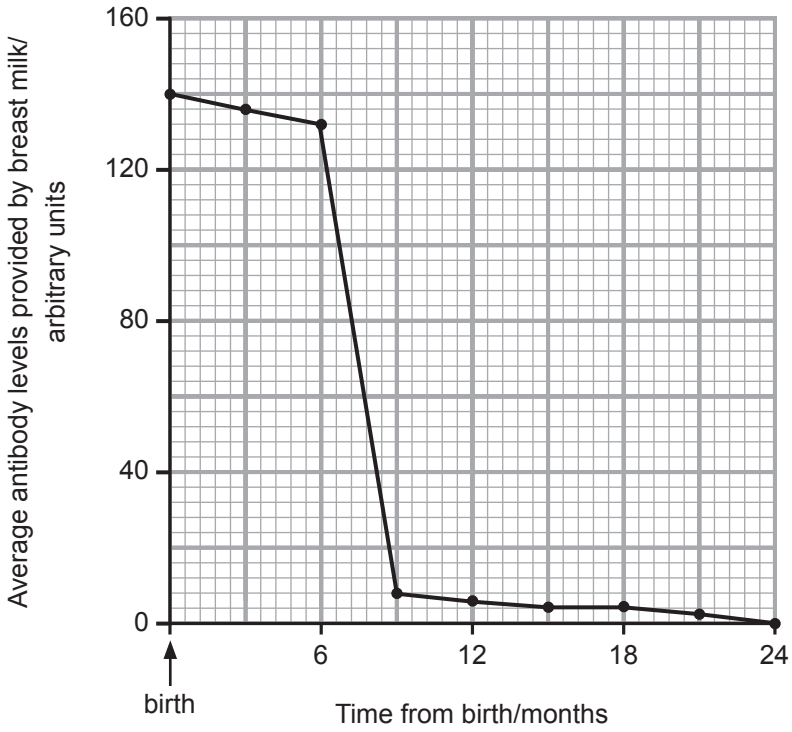
(ii) Name the type of white blood cell which carries out phagocytosis.

_____ [1]

Examiner Only	
Marks	Remark

(b) Many newborn babies are fed breast milk by their mothers for the first few months after birth. The breast milk contains antibodies.

The graph below shows the average antibody levels provided by breast milk over the first 24 months after birth.



(i) Name the type of immunity shown by this graph.

_____ [1]

(ii) Use the graph to suggest when the mother might stop breastfeeding because of a reduced benefit to the baby. Explain your answer.

_____

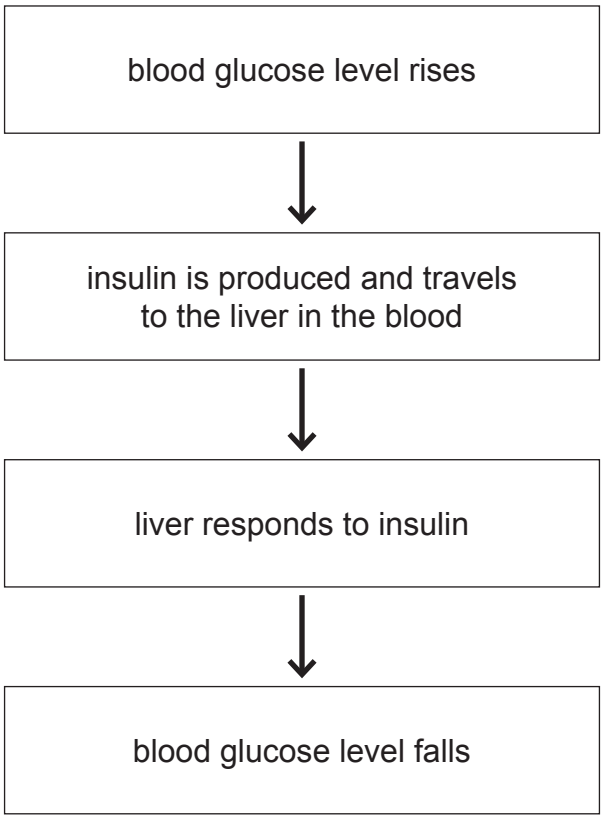
_____

_____ [2]

STEMUP.CO.UK

Examiner Only	
Marks	Remark

5 **(a)** The flow chart below shows some of the stages involved in the control of the blood glucose level in the human body.



(i) Name the organ that produces insulin.

_____ [1]

(ii) Using the information above give **two** reasons why insulin is described as a hormone.

1. _____

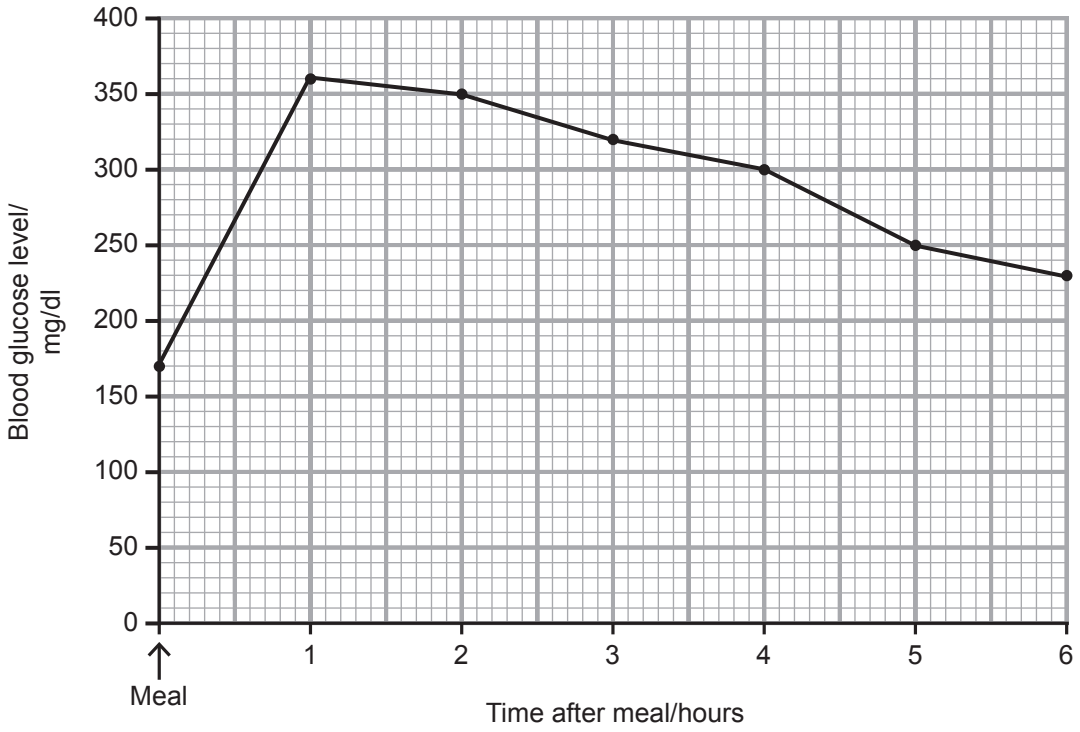
2. _____ [2]

(iii) Complete the following sentence.

The blood glucose level falls because glucose is converted

to _____ in the liver. [1]

(b) The graph below shows the blood glucose level in a person with Type 1 diabetes after a meal.



(i) Calculate the difference in the blood glucose level from when the meal was taken to 6 hours later.

(Show your working out.)

_____ mg/dl [2]

(ii) Type 1 diabetes is managed by self-injection of insulin. Suggest a time this person may have injected insulin.

_____ hour(s) after meal [1]

(iii) Describe fully the trend shown by this graph.

_____

_____

_____ [2]

Examiner Only

Marks	Remark

STEMUP.CO.UK

Examiner Only	
Marks	Remark

6 **(a)** The table below shows information about different sources used to produce electricity in the United Kingdom.

	Electricity produced/%	Cost to customer per unit of electricity/pence	Carbon dioxide produced
coal	22.2	2.5	Yes
gas	23.8	3.1	Yes
wind	5.2	5.5	No
wave	1.2	6.8	No

Electricity produced - © Crown Copyright https://www.gov.uk/government/statistics/electricity-section-5-energy-trends.
Cost - Copyright © 2005 The Telegraph & The Royal Academy of Engineering, 26 March 2005.

Carbon dioxide is a greenhouse gas. Increasing levels of carbon dioxide are being linked to global warming.

(i) Suggest why the UK government wants to produce more electricity from wind and wave sources. Explain why customers might disagree.

_____

_____

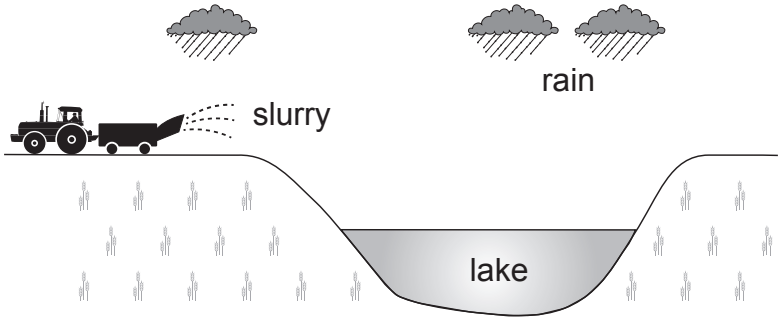
_____

_____ [2]

(ii) Apart from a rise in temperature, state **one** effect of global warming.

_____ [1]

(b) The diagram below shows slurry being spread onto farmland.



Source: CCEA

(i) Using the diagram and your knowledge give **two** reasons why the lake is at risk of pollution due to the slurry.

1. _____

_____

2. _____

_____ [2]

The table below gives some information about this lake from 2006 to 2010.

	2006	2007	2008	2009	2010
level of nitrates	very high	high	moderate	low	very low
oxygen in water/mg/l	3	5	8	10	12
number of species of fish in the lake	6	8	10	20	26
level of bacteria	very high	high	moderate	low	very low

Use the information in the table to answer the questions below.

(ii) Explain why the oxygen level has increased between 2006 and 2010.

_____

_____ [1]

(iii) Give **one** effect of this increase in oxygen.

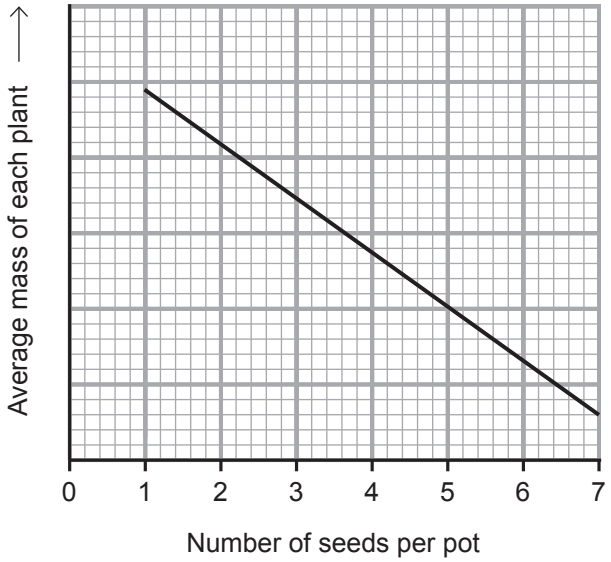
_____ [1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

7 The graph below shows the results of an investigation into the effect of the number of seeds per pot on the average mass of each plant.



© GCSE Science Single Award for CCEA Foundation and Higher Tier by James Napier, Alyn G McFarland and Roy White. Published by Hodder Education in 2013. ISBN: 9781444195729. Reproduced by permission of Hodder Education

(a) Describe and explain these results.

_____

_____

_____

_____ [2]

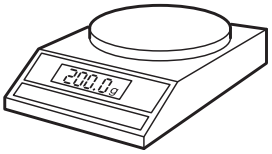
(b) The equipment used to obtain these results is shown below.

Examiner Only	
Marks	Remark



© Chimpinski / iStock / Thinkstock

plant pot(s) with compost



© CCEA

balance



© colematt / iStock / Thinkstock

flower seeds



© Creative_Outlet / iStock / Thinkstock

watering can

(i) Describe fully how this equipment could be used to carry out the investigation.

_____

_____

_____

_____

_____

_____

_____ [3]

(ii) Give **two** things that need to be done to give valid results (fair test) in this investigation.

1. _____

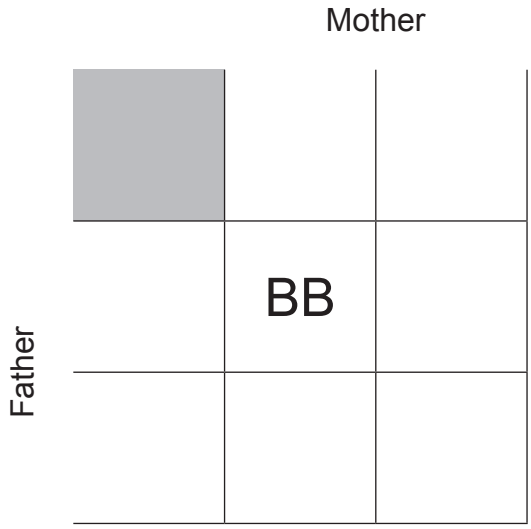
2. _____ [2]

Examiner Only	
Marks	Remark

8 **(a)** Cystic fibrosis is an inherited disease.
It is possible for two heterozygous parents without cystic fibrosis to have a child with cystic fibrosis.

(i) Complete the Punnett square to show how two heterozygous parents could have a child with cystic fibrosis.

B = dominant allele
b = recessive allele



[2]

(ii) In the Punnett square above circle the genotype for cystic fibrosis. [1]

(iii) How many different genotypes are shown in the Punnett square?

_____ [1]

(b) Explain the term 'homozygous'.

_____

_____ [1]

STEMUP.CO.UK

(c) Explain the genetic terms dominant and recessive.

dominant

_____

_____

recessive

_____

_____ [2]

Examiner Only	
Marks	Remark

9 Name and describe the two types of variation in living things and give **one** example of each.

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

[6]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

Sources:
Thinkstock.com 153573626
Thinkstock.com 472980748
Thinkstock.com 503151431
Thinkstock.com 480816107

Permission to reproduce all copyright material has been applied for.
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA will be happy to rectify any omissions of acknowledgement in future if notified.

Rewarding Learning

General Certificate of Secondary Education
2015–2016

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

WEDNESDAY 24 FEBRUARY 2016, MORNING

MARK SCHEME

STEMUP.CO.UK

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

AVAILABLE MARKS

1 **(a)**

Part of female reproductive system	Function
ovary [1]	produces eggs (ova)
uterus [1]	where the baby develops
oviduct [1]	where fertilisation takes place

[3]

(b) **(i)** Condom – barrier to prevent sperm entering the female [1]
Contraceptive pill – changes a woman's hormone levels and stops eggs being released [1] [2]

(ii) Against their religion [1] 6

2 **(a)** Arrow pointing left at plant which is bending over [1]

(b) **(i)** Phototropism [1]
hormone [1] [2]

(ii) Plant gets more light [1]
for more photosynthesis/for more growth [1] [2] 5

3 **(a)** **(i)**

	Statement		
Food group	**Biuret reagent is used**	**Iodine changes to blue/black**	**Test solution is heated**
protein	✓		
sugar			✓
starch		✓	

[3]

(ii) Protein [1]

(b) Acts as a solvent/for transport/for chemical reactions [1]

(c) All bars correct [2]
3 bars correct [1] [2] 7

STEMUP.CO.UK

					AVAILABLE MARKS
4	**(a)**	**(i)**	Microorganisms are surrounded/engulfed [1] microorganisms are digested/broken down [1]	[2]	
		(ii)	Phagocyte	[1]	
	(b)	**(i)**	Passive	[1]	
		(ii)	6 months [1] dramatic fall in antibody level [1]	[2]	6
5	**(a)**	**(i)**	Pancreas	[1]	
		(ii)	Travels in the blood [1] goes to a target organ/only goes to the liver [1]	[2]	
		(iii)	Glycogen	[1]	
	(b)	**(i)**	230–170 [1] 60 [1]	[2]	
		(ii)	Between 0 and 1 hours	[1]	
		(iii)	Blood glucose levels increase to (a peak) one hour after meal [1] then decrease [1]	[2]	9
6	**(a)**	**(i)**	Wind and wave do not produce carbon dioxide/do not contribute to global warming [1] however, the cost of producing electricity is far greater from wind and wave than coal and gas/people not prepared to pay extra cost [1]	[2]	
		(ii)	Melting polar ice caps/increasing sea levels/climate change	[1]	
	(b)	**(i)**	Slurry being spread on sloping land/too close to lake [1] It is raining (so slurry is going to be washed off land) [1]	[2]	
		(ii)	Fewer bacteria so less oxygen being used up	[1]	
		(iii)	Number of species of fish increases	[1]	7

STEMUP.CO.UK

					AVAILABLE MARKS
7	**(a)**	As number of seeds per pot increases average mass of each plant decreases [1] competition/for light/space/water [1]		[2]	
	(b)	**(i)**	Any **three** from: • add different numbers of seeds in each pot [1] • leave for a period of time that is specified [1] • weigh plant in each pot [1] • calculate average mass of each plant in the pot [1]	[3]	
		(ii)	Any **two** from: • use the same size of pot • use the same volume/type of compost • give each pot equal amount of water • same amount of light • same temperature • grow for same length of time • same type of seeds	[2]	7
8	**(a)**	**(i)**	Gametes correct [1] offspring correct [1]	[2]	
		(ii)	bb circled	[1]	
		(iii)	3	[1]	
	(b)		Both alleles the same	[1]	
	(c)		Dominant allele is expressed/characteristic shows if heterozygous [1] recessive allele is masked by dominant allele/characteristic only shows if homozygous [1]	[2]	7

STEMUP.CO.UK

9 Indicative content

AVAILABLE MARKS

- continuous
- (continuous variation) is a gradual change in a characteristic across a population
- discontinuous
- (discontinuous variation) occurs when all individuals can be clearly divided into two or more groups
- height (continuous)
- tongue rolling (discontinuous)

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe variation using **all** of the points above, in a logical sequence. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates must use appropriate specialist terms throughout to describe variation using **four or five** of the points above, in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates describe variation using **one, two or three** of the points above. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar. The form and style are of a limited standard.	[1]–[2]
D	Response not worthy of credit.	[0]

[6] 6

Total **60**

STEMUP.CO.UK

Rewarding Learning

General Certificate of Secondary Education
2015–2016

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

WEDNESDAY 11 NOVEMBER 2015, MORNING

MARK SCHEME

STEMUP.CO.UK

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

					AVAILABLE MARKS
1	**(a)**		Producer [1] Secondary consumer [1]	[2]	
	(b)		Carbohydrate [1] fat [1] (either order)	[2]	4
2	**(a)**	**(i)**	Microorganisms [1] swan neck [1] soup [1]	[3]	
		(ii)	Pasteur	[1]	
	(b)		Active immunity …… antibodies produced by patient's body [1] phagocytosis …….. phagocytes engulf and digest microorganisms [1]	[2]	6
3	**(a)**	**(i)**	Penis	[1]	
		(ii)	**Y** label line to urethra (after prostate)	[1]	
	(b)	**(i)**	(Male) sterilisation/vasectomy	[1]	
		(ii)	Prevents sperm passing into penis/out of body/into the female [1] stops fertilisation/sperm meeting egg [1]	[2]	
	(c)		Any **two** from: • protects against sexually transmitted diseases/named disease • not permanent/is temporary • not chemical/no side effects • readily available/easy to use	[2]	
	(d)		Tony	[1]	8
4	**(a)**	**(i)**	Respiration	[1]	
		(ii)	Amount of carbon dioxide entering atmosphere exceeds that leaving [1] combustion (and respiration) exceeds photosynthesis [1]	[2]	
	(b)		Polar ice caps melting/rising sea levels/climate change/increased deserts	[1]	4
5	**(a)**	**(i)**	Four bars correct [2] three bars correct [1]	[2]	
		(ii)	Number of deaths decreases between 2008–2012	[1]	
		(iii)	Increased hygiene/reduction in antibiotic use/new antibiotics/isolation	[1]	
	(b)		Resistant (to antibiotics) [1] due to mutations [1]	[2]	6

STEMUP.CO.UK

				AVAILABLE MARKS
6	**(a)**	Acid rain	[1]	
	(b)	**(i)** 2.5 km	[1]	
		(ii) More trees sampled/larger area of tree measured/other appropriate answer	[1]	
		(iii) More combustion/use of fossil fuels due to more houses/industry	[1]	4
7	**(a)**	**(i)** Double helix	[1]	
		(ii) Genes	[1]	
	(b)	**(i)** RR [1] Rr [1]	[2]	
		(ii)		

red flowered plant

white flowered plant			
		r	
r		rr	
	Rr	rr	

1 mark for each set of parental gametes [2]
1 mark for offspring [1] [3]

	(c)	Continuous [1] no discrete groups/difficulty in allocating to group [1]	[2]	9

8 Indicative content

- blood glucose levels increase
- as insulin no longer produced/insulin ceases to function
- glucose not converted to glycogen
- symptom – increased glucose in urine/thirst/need to visit toilet more often/ coma (if treatment delayed)/tiredness
- long term effect – eye damage/heart disease/strokes/kidney damage/limb damage
- increase mainly due to increase in Type 2
- due to obesity/increase in fat or carbohydrate intake/reduced exercise

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe and explain the effect of diabetes on humans using **five to seven** of the points above, in a logical sequence. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates use some appropriate specialist terms to describe and explain the effect of diabetes on humans using **three or four** of the points above, in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates describe and/or explain the effect of diabetes on humans using **one or two** of the above points. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and have made limited use of specialist terms. The form and style are of a limited standard.	[1]–[2]
D	Response not worthy of credit.	[0]

AVAILABLE MARKS

6

9 (a) Shading in central T zone and bottom and top of leaf [1]

(b) (i) Moving the lamp position/dimmer switch [1]

(ii) To make sure the temperature can be kept constant [1]

(iii) Number of oxygen bubbles increases with increasing light intensity [1]
difference is greater between medium and high (compared to low and medium light intensities) [1]
with increasing light more photosynthesis [1] [3]

(iv) Number of bubbles increases as temperature increases [1]

7

STEMUP.CO.UK

				AVAILABLE MARKS
10	**(a)**	**(i)**	70 bpm [1]	
		(ii)	100% [1]	
		(iii)	Kerry [1] heart rises less during exercise/returns to normal quicker [1] [2]	
	(b)		Involves long periods in hospital/ill and so off work [1] usually parents/fathers so no one to earn money/look after young children/ other appropriate answer [1] [2]	6
			Total	**60**

STEMUP.CO.UK

Rewarding Learning

General Certificate of Secondary Education
2014–2015

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

TUESDAY 12 MAY 2015, AFTERNOON

MARK SCHEME

STEMUP.CO.UK

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

			AVAILABLE MARKS
1	**(a)**		

Substance	Harmful effect
Tar	causes cancer [1]
Carbon monoxide [1]	stops red blood cells carrying oxygen
Nicotine	affects heart rate [1]

[3]

(b) Liver [1]
violence [1]
binge [1] [3]

6

2 **(a)** A – Ash
B – Hazel
C – Horse chestnut
D – Alder
½ mark each round down [2]

(b) We can see a relationship between different groups [1]
allows us to put a newly discovered organism into a group [1] [2]

4

3 **(a)** **(i)** Fossil (or named) [1]

(ii) Sulfur dioxide travels in the wind [1]

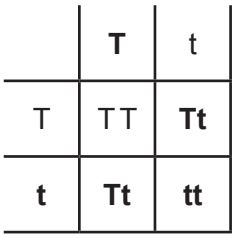
(b) Bushy [1]
Shows the greatest change (over distance from factory) [1] [2]

(c) 3.8 – 0.9 [1]
2.9 [1] [2]

6

STEMUP.CO.UK

				AVAILABLE MARKS
4	**(a)**	**(i)** To remove any starch which is already present in the leaf [1]		
		(ii) Any **three** from: • (use the scissors to) cut a small hole in the centre of the black paper/idea that only some of leaf is covered • place the black paper with the cut hole over one leaf (which is still attached to the plant) • use the paper clips to hold the black paper in place • (switch the lamp on and) leave the plant in (bright) light for at least 24 hours [3]		
	(b)	**(i)** Any **one** from: Grass → Greenfly → Bluetit → Owl Grass → Greenfly → Bluetit → Fox Tree leaves → Greenfly → Bluetit → Owl Tree leaves → Greenfly → Bluetit → Fox Berry bushes → Greenfly → Bluetit → Owl Berry bushes → Greenfly → Bluetit → Fox [1] Starts with producer [1] [2]		
		(ii) Producer/make own food/photosynthesise [1] provide food energy for rest of food web/consumers/animals [1] [2]		
		(iii) Number of owls increase [1] owls have more food [1] [2]		10
5	**(a)**	D, C, A, E, B Any two in correct sequence [1] All correct [2] [2]		
	(b)	**(i)** It is a (physical and) mental illness/no one treatment works for all patients [1]		
		(ii) Bulimia (nervosa) [1]		
	(c)	**(i)** 20 + 22 + 25 + 18 + 10 = 95 [1] 100 – 95 = 5 [1] [2]		
		(ii) Only one hospital/only one eating disorder/only taken over one year/ only 100 admissions [1]		7

				AVAILABLE MARKS
6	(a)	(i)	Niamh [1] received recessive alleles from both parents for blond hair/ and blue eyes/father did not pass on his dominant allele for brown hair [1] [2]	
		(ii)	As he carries a recessive allele for eye colour (and neither parent has a recessive allele to give) [1]	
	(b)	(i)	Tt [1]	
		(ii)	 Gametes correct [1] Offspring correct [1] [2]	
		(iii)	3 [1]	
		(iv)	Discontinuous [1]	8
7	(a)	(i)	Doctors and nurses have close contact with infected patients [1]	
		(ii)	In vitro [1] animal [1] (in correct order) both stages present but in wrong order [1] [2]	
	(b)	(i)	Active [1] slow to act/long lasting [1] [2]	
		(ii)	So it does not give the person the disease [1]	
		(iii)	If the initial vaccination does not produce enough antibodies/ so antibody level reaches level of immunity [1]	7
8	(a)	(i)	X in pancreas [1]	
		(ii)	Lowers blood sugar levels [1] as glucose is converted to glycogen/increased respiration/converted to fat [1] [2]	
	(b)	(i)	No increase in percentage of people (with diabetes) with long term effects between 40 and 160 arbitrary units of blood sugar [1] sharp increase in percentage of people with long term effects from 160 – 200 arbitrary units of blood sugar [1] [2]	
		(ii)	Blood sugar levels can fluctuate due to eating, exercise/ to check how much insulin to give themselves [1]	6

9 Indicative content

- protein found in meat, nuts and seeds, seafood, beans and peas, poultry (named source)
- growth/repair
- place a little piece of the food in a test tube/boiling tube
- add Biuret reagent
- (if the Biuret reagent changes) colour from blue
- to purple/lilac/mauve then protein is present

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe how to carry out the food test investigation using **five or six** of the points above, in a logical sequence. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates must use appropriate specialist terms throughout to describe how to carry out the food test investigation using **three or four** of the points above, in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates describe how to carry out the food test investigation using **one or two** of the points above. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar. The form and style are of a limited standard.	[1]–[2]
D	Response not worthy of credit.	[0]

[6] 6

Total **60**

AVAILABLE MARKS

Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2014–2015

Science: Single Award

GSS11

Unit 1 (Biology)
Foundation Tier

[GSS11]

TUESDAY 24 FEBRUARY 2015, MORNING

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	

STEMUP.CO.UK

BLANK PAGE

Examiner Only	
Marks	Remark

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

Choose from:

tuberculosis **bacteria** **flu** **fungi**

Type of microorganism	Disease
	athlete's foot
virus	
	chlamydia

[3]

(b) Complete the following sentences.

Choose from:

poisoned **hair** **skin** **trapped**

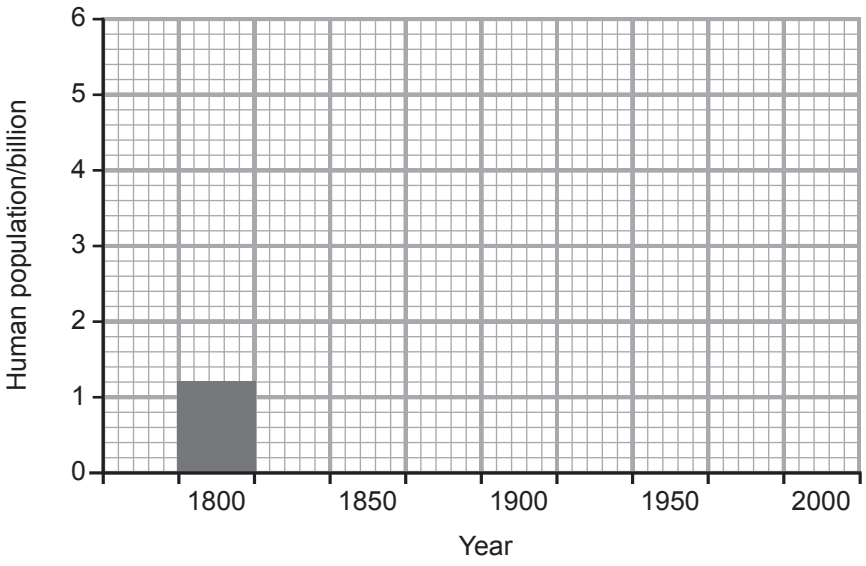
The _____ acts as a barrier to prevent most microorganisms entering the body. Microorganisms that enter through the mouth and nose are _____ by mucous membranes. [2]

STEMUP.CO.UK

2 The following table shows the change in human population between the years 1800 and 2000.

Year	Human population/ billion
1800	1.2
1850	1.4
1900	1.8
1950	2.4
2000	6.0

(a) Using the information in the table, complete the bar chart below.



[2]

(b) Describe the trend shown by this information.

_____

_____ [1]

Examiner Only

Marks	Remark

(c) Humans are responsible for causing the extinction of some species, including many types of fish.

(i) What is meant by the term 'extinction'?

_____

_____ [1]

(ii) Below are some features of modern sea fishing.

Circle **two** features that may protect fish stocks and help prevent extinctions.

large fishing nets

refrigerators to store caught fish

nets with large mesh sizes

limits on the number of fishing boats

boats with good navigation systems

[2]

Examiner Only

Marks	Remark

STEMUP.CO.UK

Examiner Only	
Marks	Remark

3 **(a)** The following table gives information about some pupils in a class.

	Characteristic			
Pupil	**Can roll tongue**	**Height/cm**	**Weight/kg**	**Eye colour**
Maeve	yes	141	39	blue
Mary	yes	152	37	brown
Sean	yes	152	41	brown
John	yes	155	46	blue
Katrina	no	146	42	blue

(i) Which **two** characteristics show continuous variation?

_____ and _____ [1]

(ii) Calculate the percentage of pupils that have brown eyes.

(Show your working out.)

_____ % [2]

STEMUP.CO.UK

(b) The photograph below shows some swans in a small shallow lake.



Source: Chief Examiner

The swans feed on plants, insects and water snails from the bottom of the lake. Using only the information provided, explain fully **one** way the swans are adapted for feeding.

_____

_____

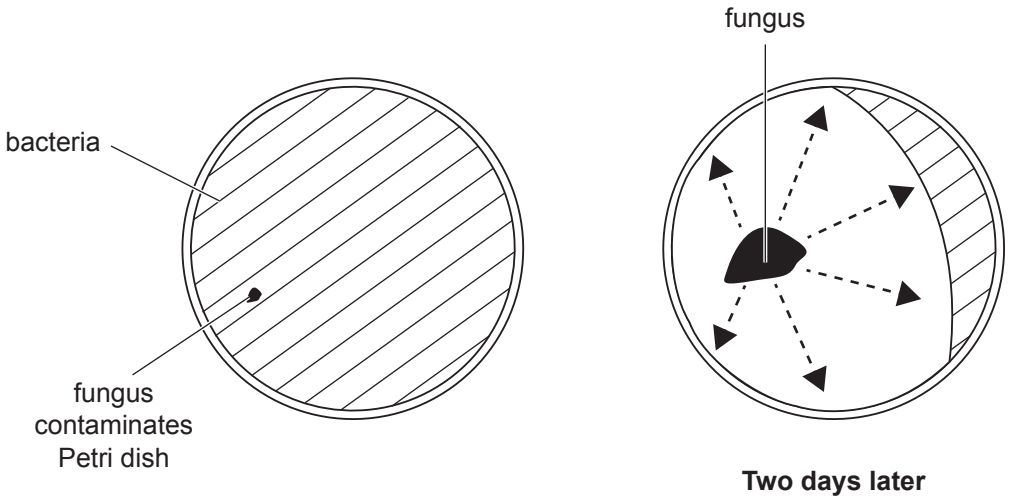
_____ [2]

Examiner Only	
Marks	Remark

STEMUP.CO.UK

Examiner Only	
Marks	Remark

4 **(a)** The diagram below shows what can happen if a Petri dish containing bacteria is contaminated by fungus.



© CCEA

(i) Describe and explain the effect of contamination by the fungus.

_____

_____

_____ [2]

(ii) Name the scientist who first observed the effect of fungus on bacteria.

Choose from:

Pasteur **Wilson** **Fleming**

_____ [1]

(iii) Name the antibiotic developed from this fungus.

_____ [1]

(b) Mushrooms are another type of fungus that are often used in cooking. They contain very little carbohydrate and fat but are rich in vitamins and minerals. Mushrooms also contain a large amount of water.

(i) Using the information above, suggest why mushrooms are suitable for someone who is trying to reduce energy intake.

_____

_____ [1]

(ii) Give **one** function of water in the body.

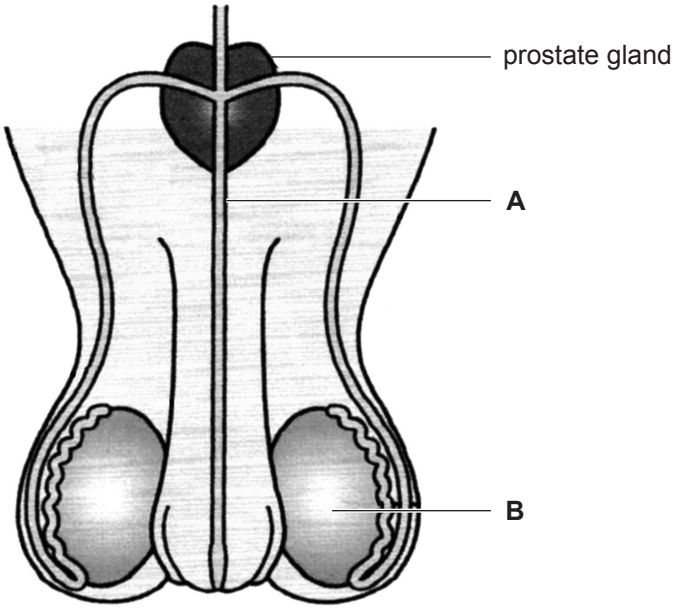
_____ [1]

Examiner Only	
Marks	Remark

STEMUP.CO.UK

Examiner Only	
Marks	Remark

5 **(a)** The diagram below shows the male reproductive system.



© GCSE Science Single Award For CCEA by James Napier, Alyn G. McFarland, Roy White, publisher Hodder Education (2013). ISBN: 9781444195729. Reproduced by permission of Hodder Education.

(i) Name the structures labelled **A** and **B**.

A _____

B _____ [2]

(ii) On the diagram, mark with an **X** a structure that is cut during a vasectomy. [1]

(iii) What is the function of the prostate gland?

Choose from:

makes sperm : feeds sperm : stores urine

_____ [1]

(b) The table below shows information about some methods of contraception.

Method of Contraception	Permanent	Advantages	Disadvantages
Condom	no	protects against sexually transmitted diseases	mainly reliable but could fail
Contraceptive pill	no	very reliable	can cause side-effects such as weight gain
Male and female sterilisation	yes	almost 100% reliable	very difficult or impossible to reverse

(i) Explain how the condom prevents pregnancy.

_____

_____

_____ [2]

(ii) Using the information in the table, explain why many just-married 20 year olds prefer condoms, rather than the pill or sterilisation, as a contraceptive method.

_____

_____

_____

_____

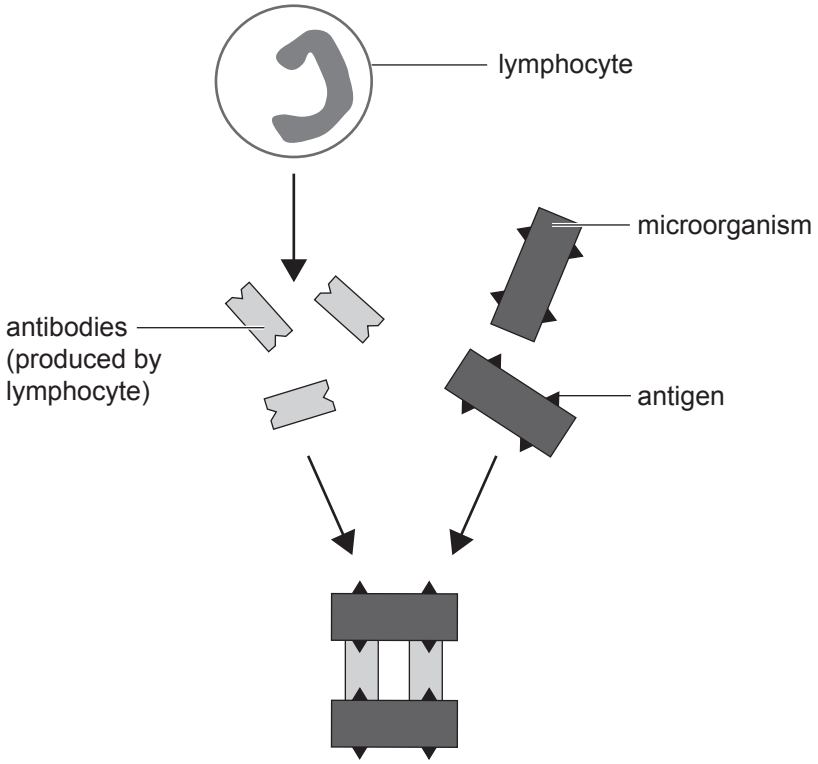
_____ [3]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

6 **(a)** The diagram below shows how lymphocytes (white blood cells) produce antibodies in response to infection by microorganisms.



© GCSE Science Single Award For CCEA by James Napier, Alyn G. McFarland, Roy White, publisher Hodder Education (2013). ISBN: 9781444195729. Reproduced by permission of Hodder Education.

(i) Using the diagram and your knowledge, describe and explain how antibodies fight infection.

_____

_____

_____

_____

_____ [3]

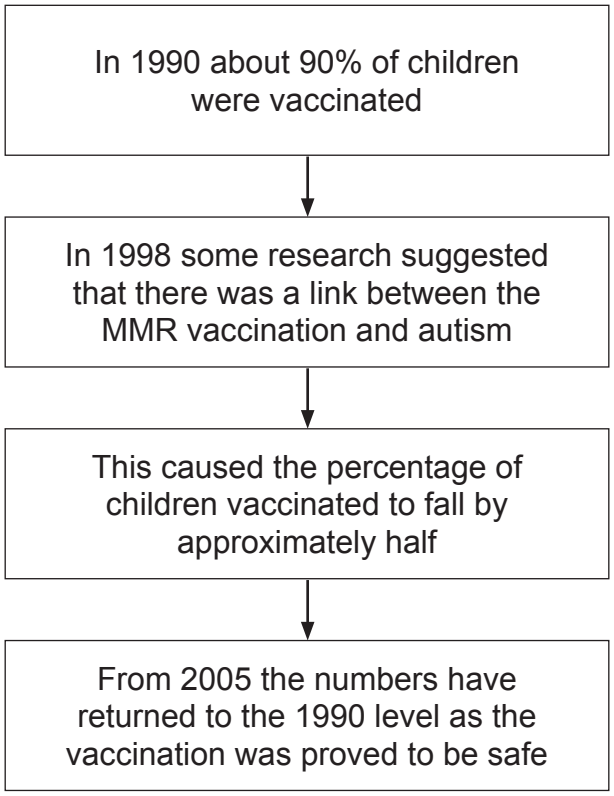
(ii) Another type of white blood cell also fights infection by phagocytosis. Describe the process of 'phagocytosis'.

_____

_____

_____ [2]

(b) The following flow chart outlines how the number of children being vaccinated for MMR changed between 1990 and the present.



(i) Describe how the number of children having the MMR vaccination changed between 1990 and today.

_____

_____

_____

_____ [2]

(ii) How does the information suggest that not all parents are convinced that the MMR vaccination is safe today?

_____ [1]

(c) Name the type of immunity produced by vaccinations.

_____ [1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

7 **(a)** Albinism is an inherited condition in which affected individuals are unable to make the skin pigment melanin. The melanin gives skin its colour, but more importantly, helps protect against the Sun's harmful UV rays.

Albinism is caused by a mutation in the gene that controls the production of melanin.

(i) Name the core component in a gene that is damaged in a mutation.

_____ [1]

(ii) Explain fully why people with albinism are advised to stay out of strong sunlight.

_____

_____

_____ [2]

(b) The allele that causes albinism is recessive to the normal allele.

(i) Complete the genetic diagram below to show the offspring of a cross between two parents who are **heterozygous** for albinism.

Use the symbols: A = normal allele; a = albino allele

		a
A	AA	

[2]

(ii) Give the genotype that causes albinism.

_____ [1]

(iii) From the genetic diagram, what is the probability of a child **not** having albinism?

_____ [1]

Examiner Only

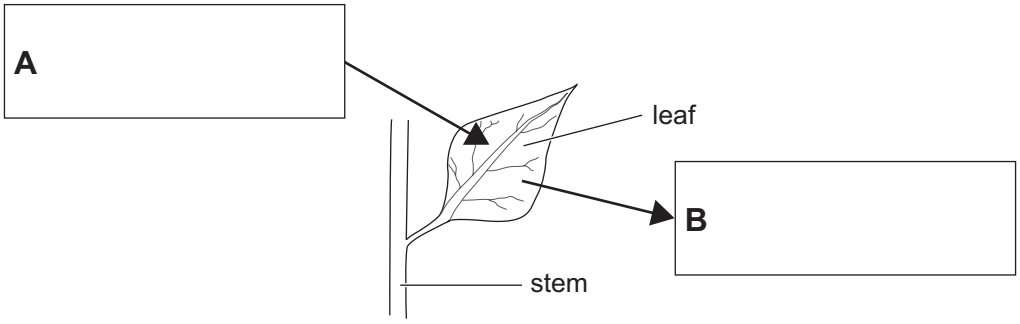
Marks	Remark

STEMUP.CO.UK

Examiner Only	
Marks	Remark

8 **(a)** The diagram below shows a leaf from a plant in darkness.

(i) Complete the diagram by naming the gases that enter (**A**) and leave (**B**) the leaf during **darkness**.

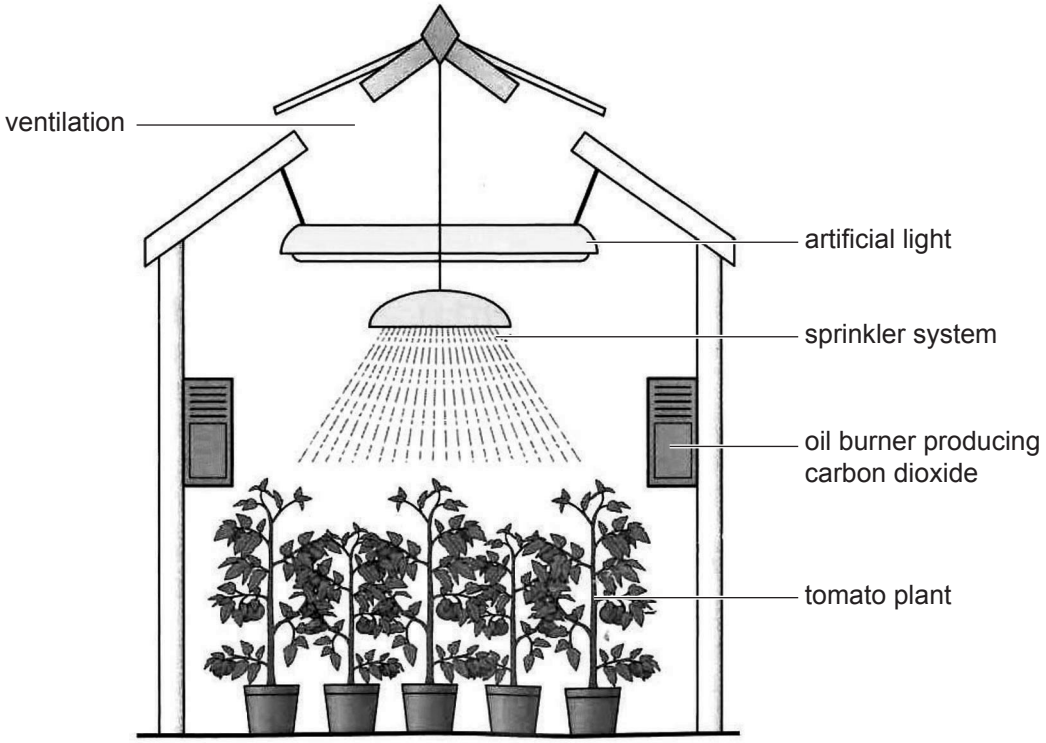


[1]

(ii) Name the process that causes this gas exchange.

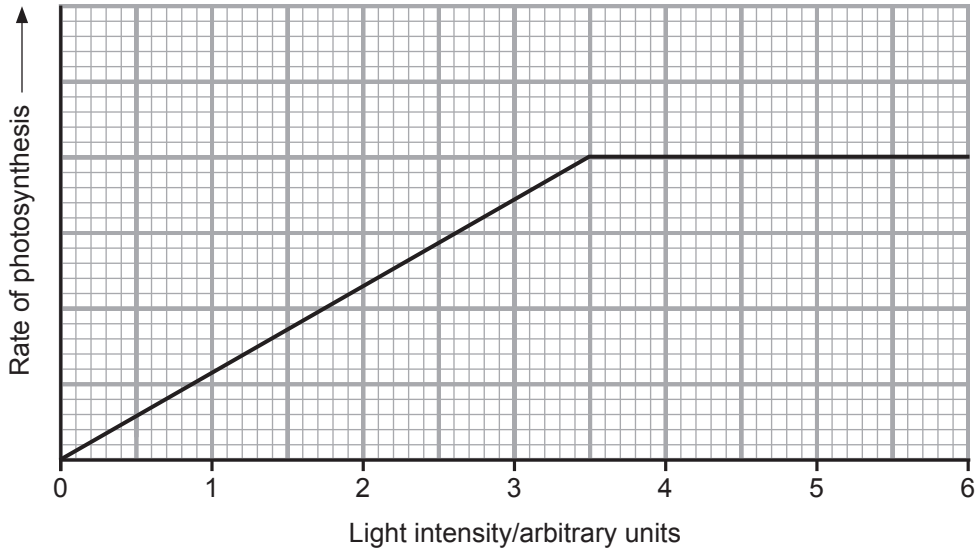
_____ [1]

(b) The diagram below shows tomato plants growing in a glasshouse.



© GCSE Biology for CCEA by James Napier, publisher Hodder Education (2011). ISBN: 9780340983805. Reproduced by permission of Hodder Education.

The graph below shows the effect of light intensity on the rate of photosynthesis in tomato plants in a glasshouse. In glasshouses, the light intensity can be increased by using artificial lighting.



(i) From the graph, state the best light intensity to use that would give the most profit if the tomatoes were grown for sale. Explain your choice.

Light intensity _____ arbitrary units

Explanation _____

_____

_____ [2]

(ii) Apart from artificial lighting to increase light intensity, explain **one** other way in which glasshouses are adapted for increasing the rate of plant growth.

_____

_____ [1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

9 **(a)** Describe how you could investigate the effect of planting density (the number of seedlings in a pot) on plant growth.

Your answer should also include:

- **two** things that make the results valid (fair test)
- a description and explanation of the results you would expect.

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

[6]

(b) The grey squirrel is a competitive invasive species.

(i) Name **one** other competitive invasive species.

[1]

(ii) Suggest **one** feature that all competitive invasive species have in common.

[1]

THIS IS THE END OF THE QUESTION PAPER

Permission to reproduce all copyright material has been applied for.
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA will be happy to rectify any omissions of acknowledgement in future if notified.

113166

Rewarding Learning

General Certificate of Secondary Education
2014–2015

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

TUESDAY 24 FEBRUARY 2015, MORNING

MARK SCHEME

STEMUP.CO.UK

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

				AVAILABLE MARKS
1	**(a)**			

Type of microorganism	Disease
fungi [1]	athlete's foot
virus	**flu** [1]
bacteria [1]	chlamydia

[3]

(b) Skin [1] trapped [1] [2] 5

2 **(a)** All four bars correctly added [2]
three bars correct [1] [2]

(b) Over time the human population increases [1]

(c) **(i)** No living members (of that species) remain [1]

(ii) Nets with large mesh sizes [1]
limits on the number of fishing boats [1] [2] 6

3 **(a)** **(i)** Height **and** weight (both needed) [1]

(ii) 2/5 × 100 [1]
= 40% [1] [2]

(b) Long neck/pointed beak [1]
explanation of description (e.g. long neck allows swans to reach river bed) [1] [2] 5

4 **(a)** **(i)** Fungus kills/destroys bacteria (not just stops growth) [1]
due to substance (antibiotic) spreading across Petri dish [1] [2]

(ii) Fleming [1]

(iii) Penicillin [1]

(b) **(i)** They contain very little carbohydrate/fat [1]

(ii) Solvent/medium for chemical reactions [1] 6

STEMUP.CO.UK

					AVAILABLE MARKS
5	(a)	(i)	**A** – urethra [1] **B** – testis [1]	[2]	
		(ii)	**X** on a sperm tube	[1]	
		(iii)	Feeds sperm	[1]	
	(b)	(i)	**Any two from:** • traps sperm (leaving penis)/acts as a barrier • sperm cannot enter female • prevents fertilisation	[2]	
		(ii)	**Any three from:** • condom not permanent/might want children later • not the most reliable but not an issue if pregnancy results • contraceptive pill can cause side effects/condoms have no side effects • sterilisation is permanent	[3]	9
6	(a)	(i)	Antibodies are complementary shape to antigens [1] antibodies latch on to antigens/microorganisms [1] clumping/immobilisation [1]	[3]	
		(ii)	Phagocyte/white blood cell surrounds/engulfs microorganism [1] microorganism is digested/broken down/destroyed/killed [1]	[2]	
	(b)	(i)	Percentage of children vaccinated fell to around 45%/half after 1998 [1] from 2005 on the numbers vaccinated have risen to 90% [1]	[2]	
		(ii)	Number of children vaccinated never reaches 100%	[1]	
	(c)		Active	[1]	9
7	(a)	(i)	DNA	[1]	
		(ii)	People with albinism do not have melanin/protection (against UV light) [1] are at increased risk of (skin) cancer [1]	[2]	
	(b)	(i)	<table><tr><td></td><td>A</td><td>a</td></tr><tr><td>A</td><td>AA</td><td>Aa</td></tr><tr><td>a</td><td>Aa</td><td>aa</td></tr></table> Gametes [1] offspring [1]	[2]	
		(ii)	aa	[1]	
		(iii)	75%/3 out of 4 children do not have albinism/3:1	[1]	7

					AVAILABLE MARKS
8	(a)	(i)	**A** – oxygen; **B** – carbon dioxide (both needed)	[1]	
		(ii)	Respiration	[1]	
	(b)	(i)	3.5 arbitrary units [1] maximum yield with minimum lighting (cost) [1]	[2]	
		(ii)	More carbon dioxide/heat for photosynthesis/ other appropriate response (e.g. no damaging effect of wind)	[1]	5

9 (a) Indicative content

- number of pots each with different number of seedlings
- **any two** from: same type/volume compost/same water/same light/ same temperature/left for same length of time/same size of pot/ same type of seed
- (at end measure) mass/number of leaves/any suitable plant feature
- most growth would be in pots with fewest seedlings (or converse)
- due to reduced competition between plants (or converse)

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe how to investigate the effect of planting density on plant growth using **five or six** of the points above, in a logical sequence. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates use some appropriate specialist terms to describe how to investigate the effect of planting density on plant growth using **three or four** of the points above, in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates describe how to investigate the effect of planting density on plant growth using **one or two** of the above points. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and have made limited use of specialist terms. The form and style are of a limited standard.	[1]–[2]
D	Response not worthy of credit.	[0]

[6]

	(b)	(i)	Rhododendron/other appropriate example	[1]	
		(ii)	Introduced by man/spread rapidly/outcompete native species	[1]	8
				Total	**60**

STEMUP.CO.UK

Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
2014–2015

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

GSS11

WEDNESDAY 12 NOVEMBER 2014, MORNING

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

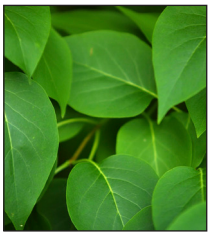
The total mark for this paper is 60.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
Quality of written communication will be assessed in Question **9**.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total Marks	

STEMUP.CO.UK

Examiner Only	
Marks	Remark

1 **(a)** Shown below is a simple food chain.






Leaves → Aphid → Blue tit → Hawk

(i) From the food chain name the:

producer _____

secondary consumer _____ [2]

(ii) What is the original source of energy in all food chains?

_____ [1]

(iii) What do the arrows in a food chain tell us?

_____ [1]

(b) Suggest what could happen to the number of aphids if the blue tit numbers **increased**.

_____ [1]

Examiner Only	
Marks	Remark

2 **(a)** The labels below are from two different foods, **A** and **B**.

Food A/100 g	
Energy	215 kJ
Protein	1.6 g
Carbohydrates (of which sugars)	6.4 g 1.0 g
Fat (of which saturates)	1.9 g 0.8 g
Fibre	1.2 g

Food B/100 g	
Energy	2073 kJ
Protein	2.2 g
Carbohydrates (of which sugars)	47.3 g 37.7 g
Fat (of which saturates)	30.1 g 9.0 g
Fibre	4.4 g

(i) Give **two** reasons why eating too much of food **B** may cause a person to gain weight.

1. _____

2. _____ [2]

(ii) Name the food group which changes Biuret reagent from blue to lilac.

Circle the correct answer.

fat **fibre** **protein**

[1]

(b) Complete the table below.

Choose from:

for strong teeth and bones : iron : prevents scurvy : fat

Food group	Function in the body
	to help the red blood cells carry oxygen
calcium	

[2]

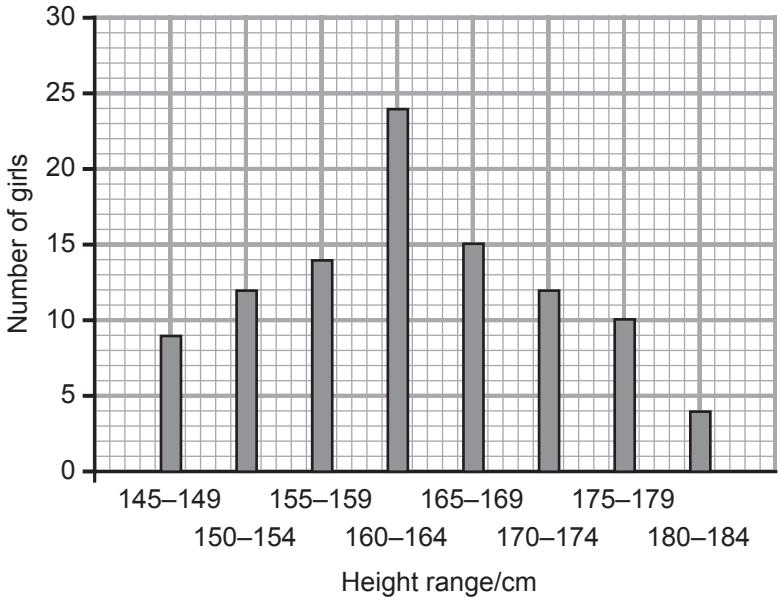
STEMUP.CO.UK

Examiner Only	
Marks	Remark

3 **(a)** Some pupils investigated the variation in height of 16-year-old girls in their school.

The results are shown in the table and bar chart below.

Height range/cm	Number of girls
145–149	9
150–154	12
155–159	14
160–164	24
165–169	15
170–174	12
175–179	
180–184	4



Use this information to answer the following questions.

(i) How many girls were in the height range 175–179 cm?

_____ [1]

(ii) What was the total number of girls measured in the investigation?

_____ [1]

(iii) What is the most common height range of 16-year-old girls in the school?

_____ cm [1]

(b) What type of variation does height show?

Choose from:

continuous **discrete** **discontinuous**

_____ [1]

BLANK PAGE

(Questions continue overleaf)

STEMUP.CO.UK

Examiner Only	
Marks	Remark

4 **(a)** Shown below are the main substances found in cigarette smoke.



© iStock / Thinkstock

(i) Which substance named above can cause cancer?

_____ [1]

(ii) Cancer is caused by a mutation. Complete the sentence below to describe what a mutation is.

Choose from:

different **random** **cells** **chromosomes**

A mutation is a _____ change in the

structure or number of _____. [2]

(iii) Carbon monoxide is a gas that takes the place of oxygen in red blood cells.

Using this information and your knowledge, explain fully why many smokers are often short of energy when active.

_____

_____

_____ [2]

(b) Stopping smoking is one lifestyle change that can help reduce the risk of heart disease.

(i) Give one other **lifestyle** change to help reduce the risk of heart disease.

_____ [1]

The table below gives information about deaths from heart disease and numbers of smokers in Northern Ireland between 2006 and 2010.

Year	Number of deaths from heart disease	Number of smokers
2006	2554	470 000
2007	2493	425 000
2008	2410	350 000
2009	2300	322 000
2010	2200	300 000

(ii) Doctors think that smoking can lead to heart disease.
How does the table suggest this?

_____

_____ [1]

(iii) Calculate how many more people died from heart disease in 2006 compared to 2010.

(Show your working out.)

_____ [2]

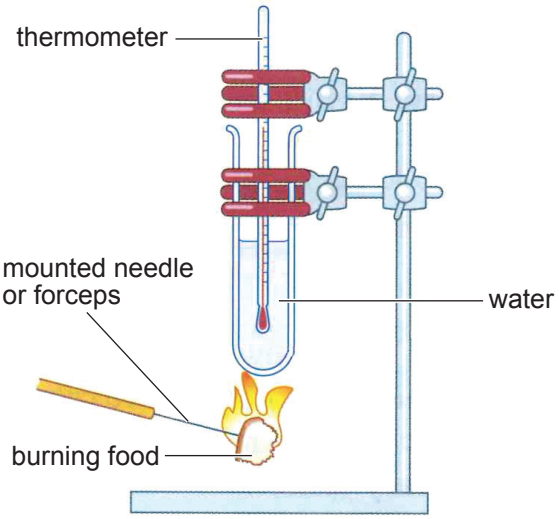
Examiner Only

Marks	Remark

STEMUP.CO.UK

Examiner Only	
Marks	Remark

5 **(a)** The diagram shows how to investigate the energy content of foods.



Source: CCEA

Below are the main steps in the investigation but **not** in the correct order.

A Hold the food in a Bunsen burner flame until it catches fire

B Measure out 20 cm^3 of water into a boiling tube and record the temperature

C As soon as the food has burnt away completely, record the final temperature

D Weigh out 1.5 g of the first food

E Once the food is burning hold it 2 cm from the bottom of the boiling tube

(i) Using the letters, **A**, **B**, **C**, **D** and **E** put the steps in the correct order. The first one has been done for you.

D _____ → _____ → _____ → _____ → _____

[2]

(ii) Using the information above, give **two** things that were done to make the investigation a fair test.

1. _____

2. _____ [2]

STEMUP.CO.UK

(iii) Some of the energy in the food does not heat the water. Suggest **one** reason for this.

_____

_____ [1]

(b) (i) Complete the word equation below to show the process by which energy is released from food (glucose).

Choose from:

nitrogen : **carbon dioxide** : **starch**

oxygen + glucose → [ ] + water + energy

[1]

(ii) Name the process by which energy is released from food.

_____ [1]

Examiner Only

Marks	Remark

STEMUP.CO.UK

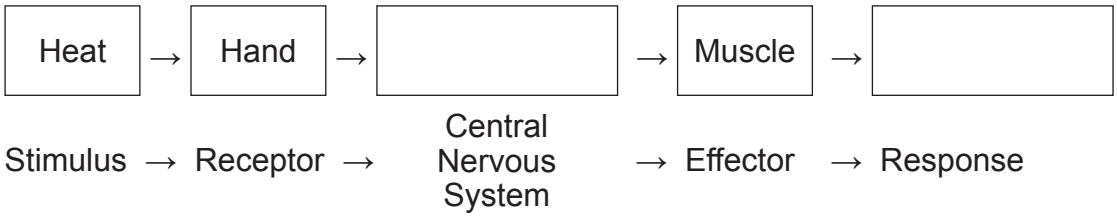
Examiner Only	
Marks	Remark

6 **(a)** Mark put his hand on a hot iron. His nervous system responded and the muscle in his arm contracted to pull his hand away. This is an example of a reflex action.

(i) State **one** advantage of a reflex action.

_____ [1]

(ii) Using the information above and your knowledge, complete the following flow chart.



[2]

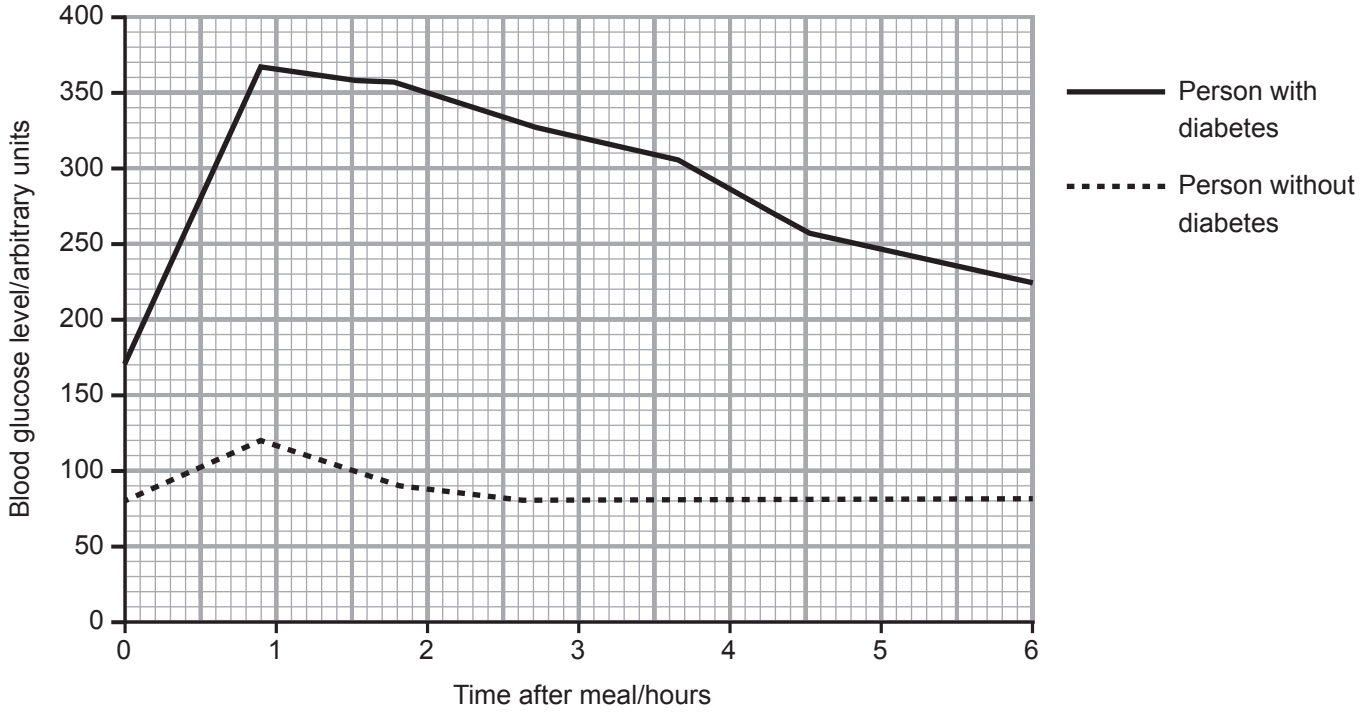
(b) Hormones also bring about responses in the body.

State **two** differences between hormones and the nervous system.

1. _____

2. _____ [2]

(c) The graph below shows the blood glucose levels of two people after a meal – one with diabetes and one without diabetes.



Examiner Only	
Marks	Remark

(i) Give **two** differences between the graph for the person with diabetes and the graph for the person without diabetes.

1. _____

_____

2. _____

_____ [2]

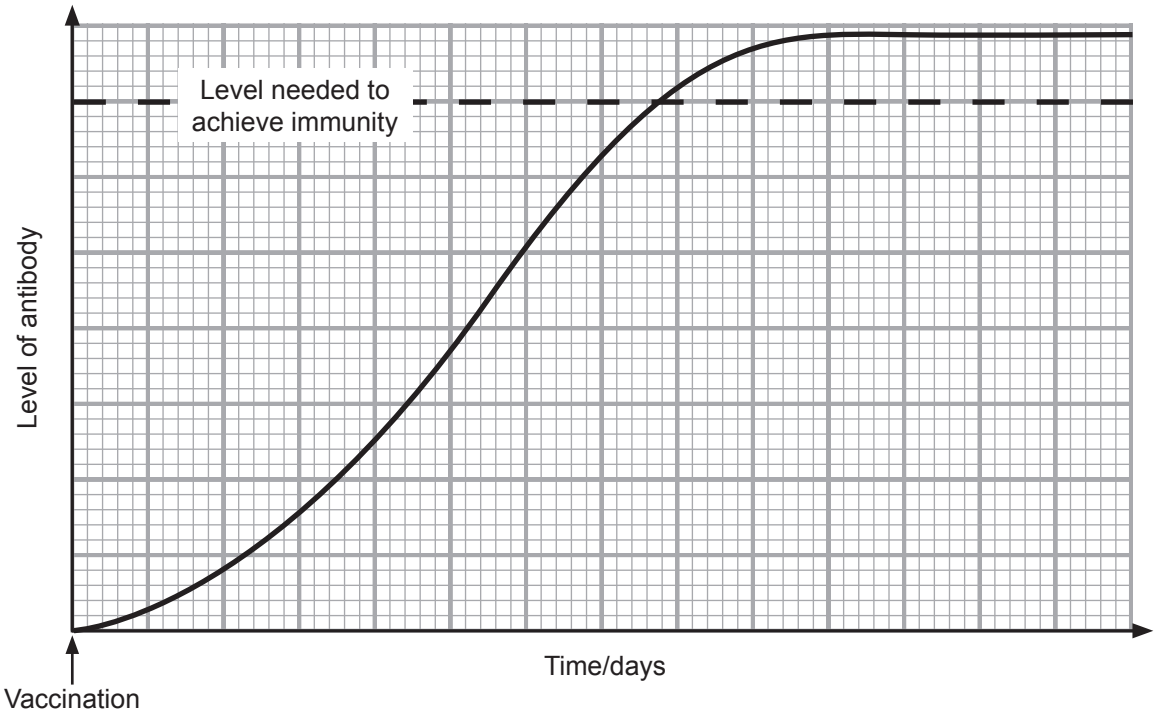
(ii) Insulin is the hormone that controls blood glucose levels. Name the part of the body that produces insulin.

_____ [1]

STEMUP.CO.UK

Examiner Only	
Marks	Remark

7 **(a)** The graph below shows how antibody level changes after we have been given a vaccination.



(i) Suggest why there is a time delay between being given the vaccination and achieving immunity.

_____ [1]

(ii) Using the graph above, give **two** pieces of evidence that show the immunity achieved is active immunity.

1. _____

_____

2. _____

_____ [2]

STEMUP.CO.UK

Examiner Only	
Marks	Remark

(b) All 2- and 3-year-old children in Northern Ireland are now offered a flu vaccination. The vaccine contains weakened live microorganisms.

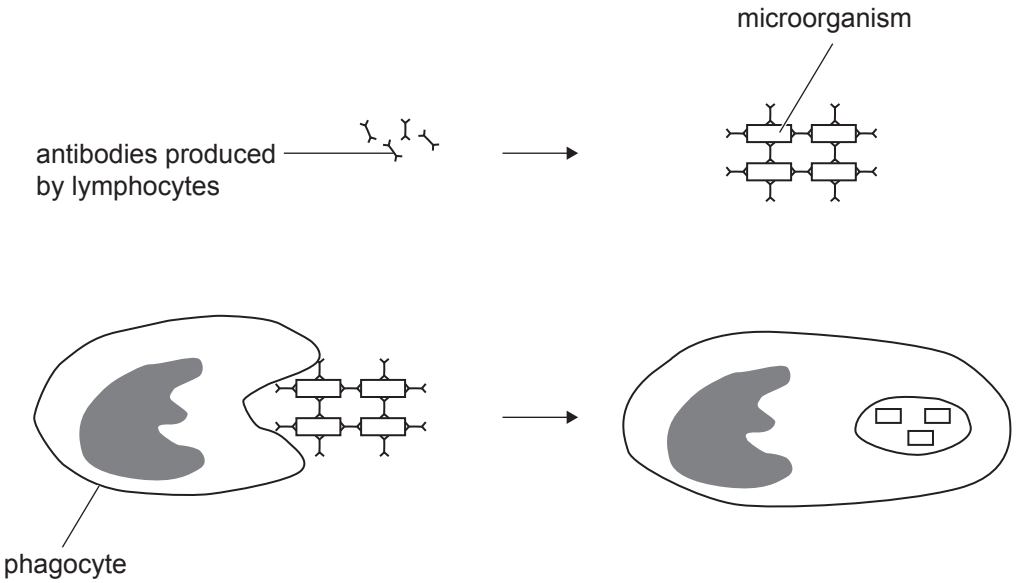
(i) Explain why the microorganisms are weakened.

_____ [1]

(ii) The microorganisms in the vaccine still have the structures on their surface which stimulate an immune response.
What are these structures called?

_____ [1]

(iii) Using the diagrams below and your knowledge, explain fully how the different types of white blood cell (lymphocytes and phagocytes) deal with microorganisms.



_____

_____

_____

_____

_____

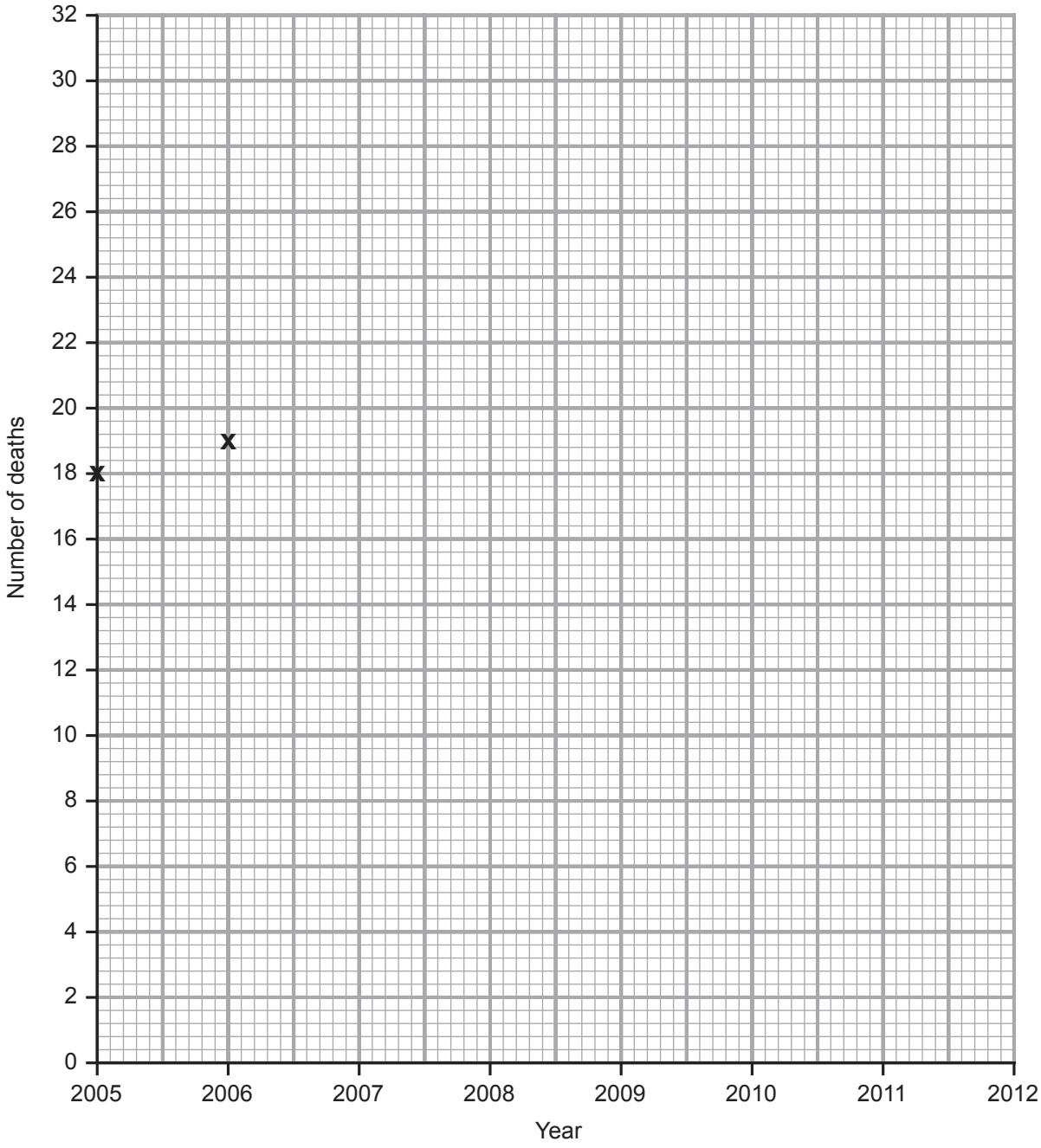
_____ [3]

STEMUP.CO.UK

8 **(a)** MRSA is known as a superbug because it is resistant to many antibiotics. The table below shows the number of deaths from MRSA in a hospital in Northern Ireland between 2005 and 2012.

Year	Number of deaths
2005	18
2006	19
2007	20
2008	31
2009	15
2010	8
2011	6
2012	4

(i) Complete a line graph of these results on the grid below.



[3]

Examiner Only	
Marks	Remark

(ii) Describe fully the trend shown by these results.

_____

_____

_____

_____ [2]

STEMUP.CO.UK

(b) Explain fully why antibiotics are not used to treat the cold or flu.

Examiner Only	
Marks	Remark

_____

_____

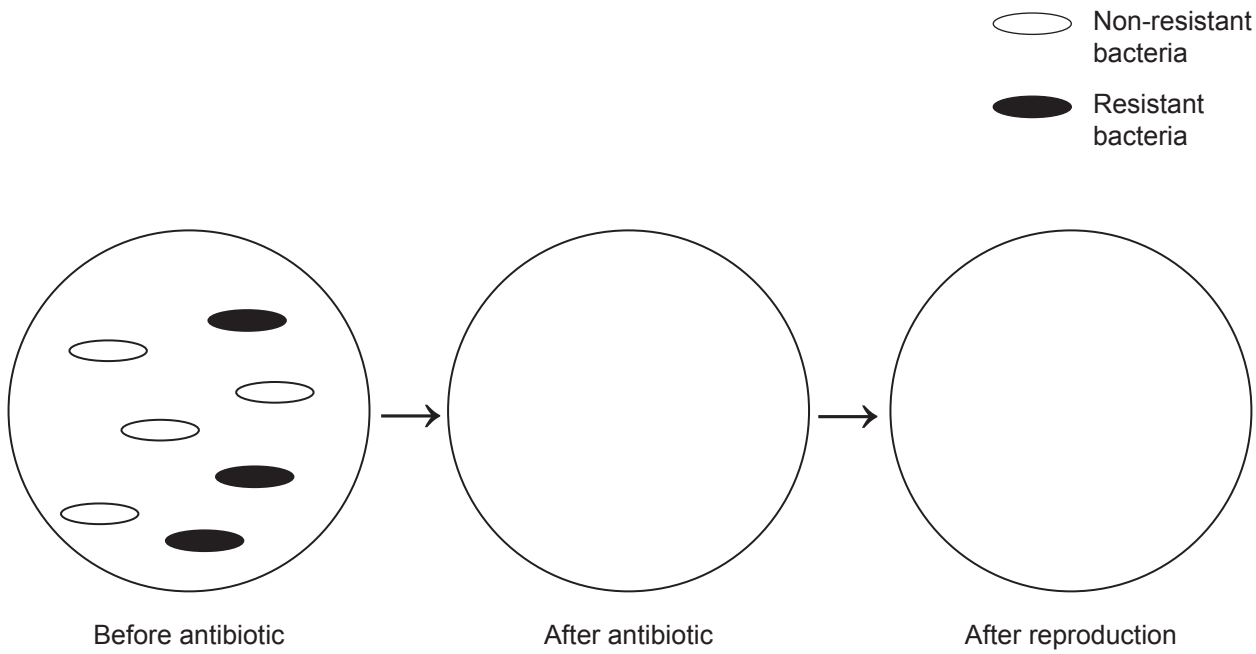
_____ [2]

(c) Antibiotic resistance is brought about by mutations in bacteria.

The main steps in the development of resistance are:

Antibiotics kill bacteria of the non-resistant strain → Resistant bacteria survive and reproduce → The population of the resistant bacteria increases

Using this information, complete the diagram below showing the change in bacteria over time.

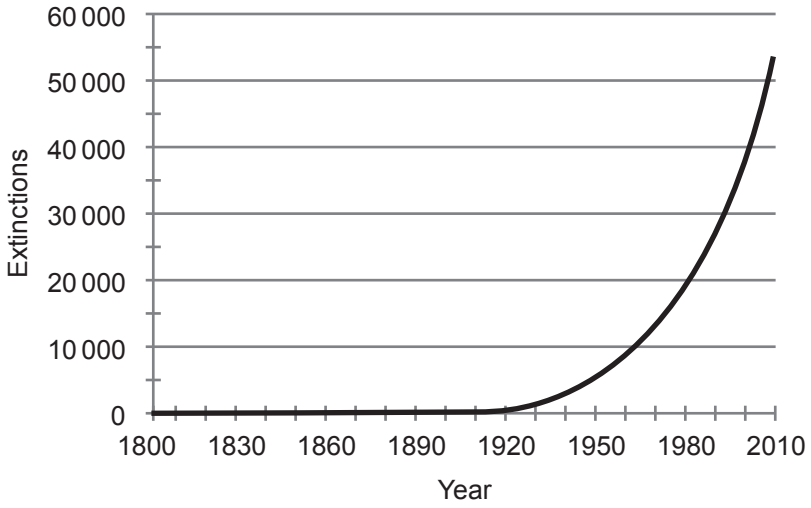


[1]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

9 The following graph shows the number of species extinctions since the year 1800.



Source: http://www.whole-systems.org/extinctions.html

Describe and explain the results shown by the graph.

Your answer should include:
- a definition of extinction
- reasons why some species are becoming extinct
- ways to help prevent them becoming extinct.

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

[6]

THIS IS THE END OF THE QUESTION PAPER

Sources:

Q1a - Leaves - © Hemera Technologies / AbleStock.com / Thinkstock
Q1a - Aphid - © Steve Gschmeissner / Science Photo Library
Q1a - Blue tit - © iStock / Thinkstock
Q1a - Hawk - © iStock / Thinkstock

Permission to reproduce all copyright material has been applied for.
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA will be happy to rectify any omissions of acknowledgement in future if notified.

Rewarding Learning

General Certificate of Secondary Education
2014–2015

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

WEDNESDAY 12 NOVEMBER 2014, MORNING

MARK SCHEME

STEMUP.CO.UK

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

					AVAILABLE MARKS
1	**(a)**	**(i)**	Leaves [1] blue tit [1]	[2]	
		(ii)	Sun/sunlight	[1]	
		(iii)	Energy flow	[1]	
	(b)		Decrease	[1]	5
2	**(a)**	**(i)**	Any **two** from: • taking in high number of kJ/energy • very high in fat • very high in carbohydrates/sugar	[2]	
		(ii)	Protein	[1]	
	(b)		Iron [1] for strong teeth and bones [1]	[2]	5
3	**(a)**	**(i)**	10	[1]	
		(ii)	100	[1]	
		(iii)	160–164 cm	[1]	
	(b)		Continuous	[1]	4
4	**(a)**	**(i)**	Tar	[1]	
		(ii)	Random [1] chromosomes [1]	[2]	
		(iii)	Less oxygen (in red blood cells) [1] less respiration [1]	[2]	
	(b)	**(i)**	(Increasing) exercise/reducing stress	[1]	
		(ii)	As the number of smokers decrease the number of deaths from heart disease also decrease (or converse)	[1]	
		(iii)	2554 – 2200 [1] 354 [1]	[2]	9

					AVAILABLE MARKS
5	(a)	(i)	**D B A E C** Any two in correct sequence [1] All correct [2]	[2]	
		(ii)	Any **two** from: • same mass of food (1.5 g) • same volume of water (20 cm^3) • hold the food the same distance from boiling tube (2 cm)	[2]	
		(iii)	Some is still locked in the food/some is lost into the room/some does not go through the boiling tube	[1]	
	(b)	(i)	Carbon dioxide	[1]	
		(ii)	Respiration	[1]	7
6	(a)	(i)	Faster/protective/does not involve thinking time	[1]	
		(ii)	Spinal cord [1] pulling his hand away [1]	[2]	
	(b)		Any **two** from: • hormones are produced by glands • travel in the blood • only affect certain organs called target organs • act more slowly • act over a longer period of time • hormones are chemicals/nervous system is electrical	[2]	
	(c)	(i)	Any **two** from: • blood glucose level is higher at start for a person with diabetes • blood glucose levels rise more steeply/quickly for a person with diabetes • blood glucose levels fall more slowly for a person with diabetes • blood glucose levels do not level off for a person with diabetes • blood glucose levels are higher for a person with diabetes	[2]	
		(ii)	Pancreas	[1]	8
7	(a)	(i)	Time for antibodies to be made	[1]	
		(ii)	Takes time for immunity level to be achieved [1] antibody level remains high/immunity level maintained [1]	[2]	
	(b)	(i)	So they do not give the person the disease	[1]	
		(ii)	Antigens	[1]	
		(iii)	Any **three** from: • antibodies latch on to microorganisms • microbes clumped together/immobilised • phagocyte surrounds/engulfs microorganisms • break down/digest microorganisms	[3]	8

	AVAILABLE MARKS

8 **(a)** **(i)** All points plotted correctly [2] 5 points correct [1]
correct line joining points [1] [3]

(ii) Number of deaths increased from 2005 to 2008/to 31 over time [1]
peaked at 2008/31 then decreased [1] [2]

(b) Cold or flu caused by a virus/don't work on viruses [1]
antibiotics only work on bacteria [1] [2]

(c) After antibiotic only resistant bacteria remain
after reproduction only resistant bacteria but more of them [1] 8

9 **Indicative content**

- extinction increasing from 1920
- species are extinct when there are no living examples left/have died out
- climate change or natural disasters/meteor hit the Earth/flooding/global warming
- loss of habitat/deforestation/pollution/invasive species
- hunting (by humans)/overfishing
- disease
- legislation (preventing the hunting of endangered species)/laws
- special programmes such as creating nature reserves/education/ breeding programmes/increased mesh sizes/reforestation [6]

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe extinction, the reasons why it is happening and what is being done to prevent it, using **six to eight** of the points above, in a logical sequence. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates must use appropriate specialist terms throughout to describe extinction, the reasons why it is happening and what is being done to prevent it, using **three to five** of the points above, in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates describe extinction, the reasons why it is happening and what is being done to prevent it, using **one or two** of the points above. However these are not presented in a logical sequence. They use limited spelling, punctuation and grammar. The form and style are of a limited standard.	[1]–[2]
D	Response not worthy of credit.	[0]

6

Total **60**

Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
2013–2014

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

GSS11

TUESDAY 13 MAY 2014, MORNING

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

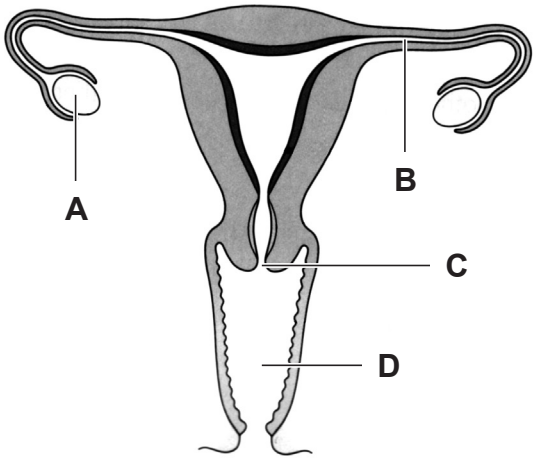
The total mark for this paper is 60.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
Quality of written communication will be assessed in Question **9**.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total Marks	

STEMUP.CO.UK

Examiner Only	
Marks	Remark

1 The diagram below shows the female reproductive system.



(a) (i) Complete the table below by placing the correct letter beside the name of each part. One letter will not be used.

Name	Letter
Ovary	
Cervix	
Oviduct	

[3]

(ii) On the diagram place an **X** in the part where the baby grows. [1]

STEMUP.CO.UK

Examiner Only	
Marks	Remark

(b) (i) Given below are two methods of contraception. Using lines, link each method to how it prevents pregnancy.

Method	How method prevents pregnancy
 Contraceptive pills	Stops sperm entering female
	Stops the baby growing
 Condom	Changes the hormone levels in females and prevents an egg being released

© DuÜan Zidar/iStock/Thinkstock

© zagorskid/ iStock/Thinkstock

[2]

(ii) Name a method of contraception which will help prevent infection by a sexually transmitted disease.

_____ [1]

(iii) In a vasectomy operation, which part of the male reproductive system is cut?

Choose from:

penis : sperm tubes : prostate gland

_____ [1]

Examiner Only	
Marks	Remark

2 Shown below is a food chain.



© LoopAll/iStock/Thinkstock



© Ingram Publishing/Thinkstock



© JensGade/iStock/Thinkstock



© GlobalP/iStock/Thinkstock

oak tree → caterpillar → small bird → fox

(a) (i) What do the arrows in a food chain tell us?

_____ [1]

(ii) What is the source of energy for all food chains?

_____ [1]

(b) The table below shows the numbers of each animal in a small area over three years.

Animal / Year	Caterpillar	Small bird	Fox
2006	600	250	6
2007	400	320	3
2008	200	580	1

(i) Suggest **one** problem in counting the number of animals.

_____

_____ [1]

(ii) State the trend shown by the number of foxes and small birds over the three years.

_____

_____ [1]

(iii) Suggest an explanation for the change in the number of small birds.

_____

_____ [1]

Examiner Only	
Marks	Remark

STEMUP.CO.UK

Examiner Only	
Marks	Remark

3 **(a)** Complete the following sentences about drugs.

Choose from:

relaxed **mental** **antibiotics** **addictive** **cocaine**

Drugs can change the physical or _____ state of people. Cannabis and _____ are two illegal drugs which people take. Cannabis when taken can create a _____ mood. [3]

(b) Mark is 25 years old and he drinks alcohol regularly. Anna who is the same age never drinks alcohol.

The diagram below shows the discussion they had about the effects of alcohol.



(i) What is meant by the term 'binge drinking'?

_____

_____ [1]

(ii) State **one** harmful effect of alcohol on society.

_____ [1]

(iii) Using the information provided, explain why Mark drinks alcohol but Anna does not drink alcohol.

Mark _____

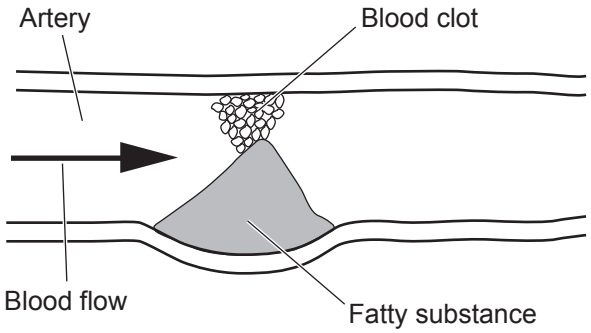
_____

Anna _____

_____ [2]

Examiner Only	
Marks	Remark

4 The diagram below shows an artery that has narrowed because of a build-up of a fatty substance.



(a) Name the fatty substance in the diagram that builds up in the artery causing it to narrow.

Choose from:

cholesterol **sugar** **fibre**

_____ [1]

(b) Using the diagram above and your knowledge, suggest what might happen if the fatty substance is blocking an artery leading to the muscle that makes the heart beat.

_____

_____

_____ [2]

Examiner Only

Marks	Remark

(c) The Public Health Agency has launched a campaign to encourage people to reduce their waist size by making some lifestyle changes. Increasing waist size can lead to an increase in the risk of heart disease and diabetes.



© Public Health Agency

Increasing the amount of exercise is one lifestyle change they suggest.

(i) Give one other **lifestyle** change that we could make to help reduce our risk of developing heart disease.

_____ [1]

Diabetes is a condition in which the body is unable to control blood glucose levels.

(ii) Give **two** long term effects of diabetes.

1. _____

2. _____ [2]

(iii) Suggest **two** reasons why the treatment of diabetes is very expensive.

1. _____

2. _____ [2]

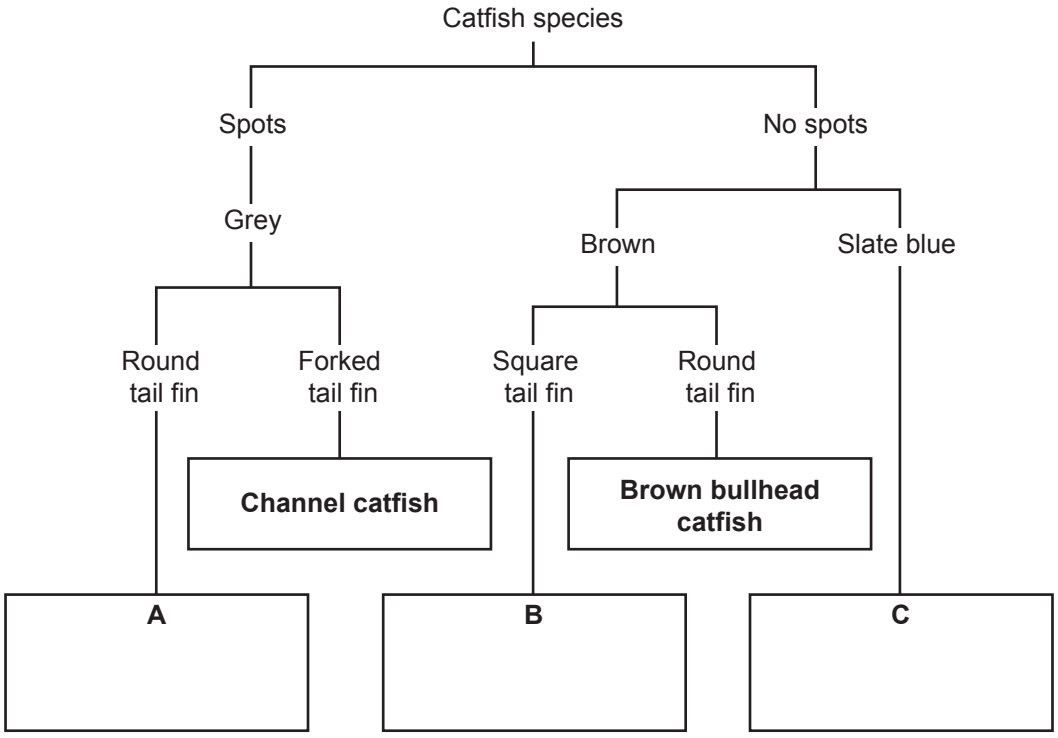
Examiner Only

Marks	Remark

5 Some features of five species of catfish are shown in the table below.

Species of catfish	Colour	Tail fin shape	Spots
Channel	Grey	Forked	Yes
Blue	Slate blue	Forked	No
Flathead	Brown	Square	No
Brown bullhead	Brown	Round	No
Walking	Grey	Round	Yes

(a) Identify the catfish species **A**, **B** and **C** using the information in the table and the key.



[2]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

(b) The walking catfish is native to Asia but was introduced to Florida and within 10 years had spread to 20 counties. It can breathe air when out of water and using spiny front fins 'walk' from pond to pond, where it feeds on fish. The walking catfish is known as a competitive invasive species.

Using this information and your knowledge, answer the questions below.

(i) Give **two** adaptations of the walking catfish that allow it to spread quickly.

1. _____

2. _____ [2]

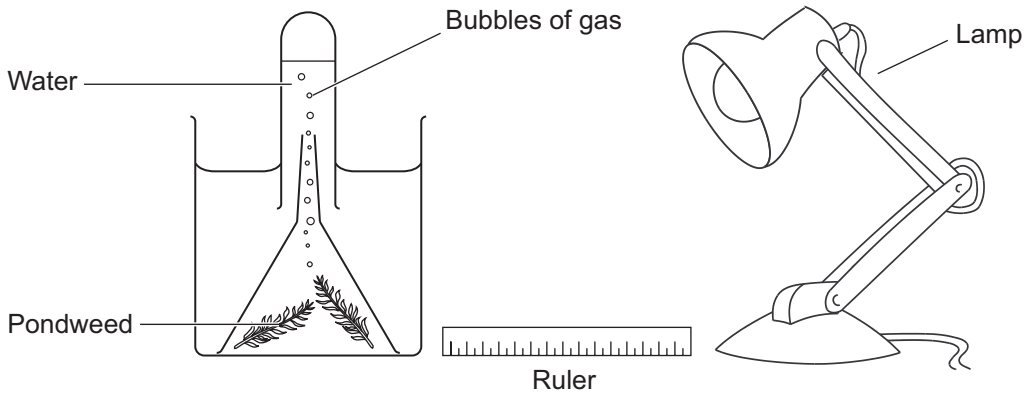
(ii) Apart from spreading quickly, give **two** other features of all 'competitive invasive species'.

_____

_____

_____ [2]

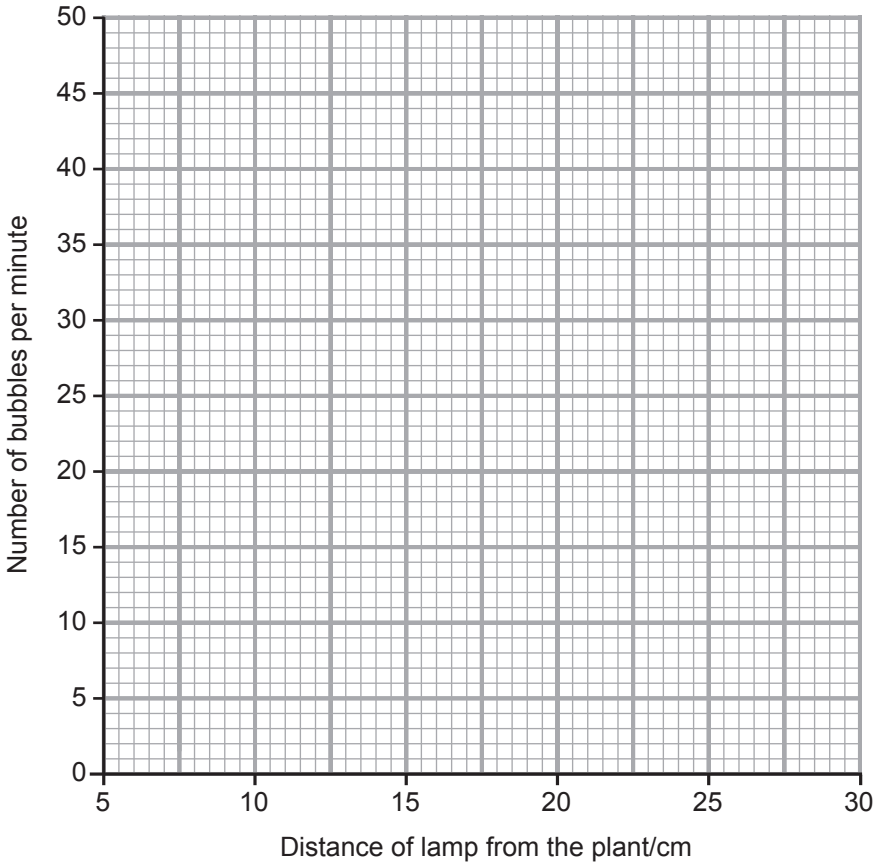
6 The following experiment was set up to investigate the effect of light intensity on photosynthesis. The lamp was set at different distances from the plant and the number of bubbles of gas per minute was counted.



The results of the experiment are shown below.

Distance of lamp from the plant/cm	Number of bubbles per minute
5	50
10	45
15	36
20	20
25	8
30	8

(a) Use these results to plot a line graph on the grid below.



[3]

(b) **(i)** Name the gas produced during this experiment.

_____ [1]

(ii) Describe and explain the results of this investigation.

_____

_____

_____

_____ [3]

(c) In order to get the most light a plant will often grow in the direction of the sunlight.

What is this response to light called?

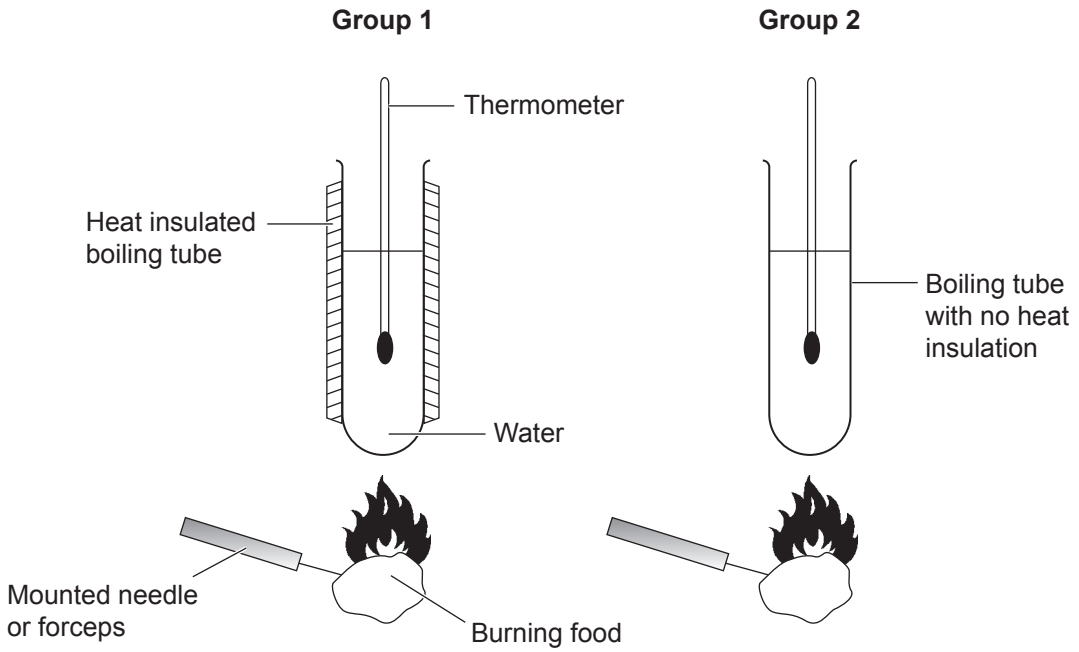
_____ [1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

7 The energy content of food was investigated by two groups each using a different method as shown below. The methods were identical except Group 1 used a heat insulation material.



The results are shown below but two values are missing.

(a) Complete the **two** missing values in the tables.

Group 1

Food	Temperature at the start/°C	Temperature at the end/°C	Temperature rise/°C
bacon	18	64	46
crisps	18	52	34
biscuit	18	42	

Group 2

Food	Temperature at the start/°C	Temperature at the end/°C	Temperature rise/°C
bacon	18	54	36
crisps	18		26
biscuit	18	36	18

[2]

(b) Using the information provided, explain fully why the temperature rises obtained by Group 2 were lower than that obtained by Group 1.

Examiner Only

Marks	Remark

_____

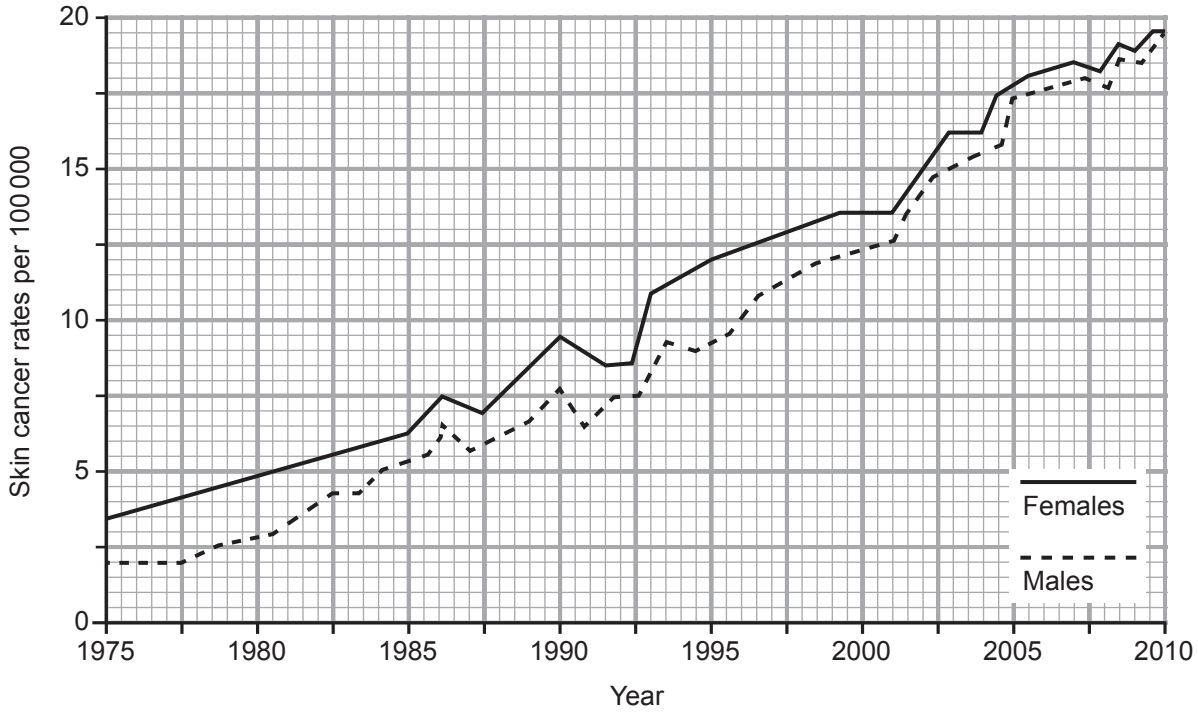
_____

_____

_____ [2]

STEMUP.CO.UK

8 **(a)** The graph below shows the skin cancer rates (number per 100 000) in the UK between 1975 and 2010.



Adapted from: © Cancer Research UK http://www.cancerresearchuk.org/cancer-info/cancerstats/types/skin/incidence/uk-skin-cancer-incidence-statistics 2013

(i) State **two** conclusions that can be made from the information provided.

1. _____

_____

2. _____

_____ [2]

Examiner Only	
Marks	Remark

A new law in England and Wales bans people under 18 from using sunbeds.



© Boris Kaulin/iStock/Thinkstock

(ii) Describe and explain the effect this new law may have on the rates of skin cancer over the next ten years.

_____

_____

_____ [2]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

(b) The table below shows how the age of a mother affects the risk of having a Down syndrome child.

Age of mother/years	Risk of having a child with Down syndrome
25	1 in 1350
30	1 in 940
35	1 in 350
40	1 in 85
45	1 in 35
50	1 in 10

A test can be carried out to see if a child has Down syndrome before it is born. However, there is a 1% (1 in 100) risk of a miscarriage (loss of baby) with this test.

(i) Using the information provided, explain fully why this test is normally only offered to mothers over the age of 35 and not offered to mothers aged under 35 years.

_____

_____

_____

_____ [2]

(ii) Apart from the risk involved, suggest **one** other factor that may influence a mother's decision whether to take the test or not.

_____

_____ [1]

(c) Skin cancer and Down syndrome are both caused by a change to genetic material in body cells. Give the general name that describes a change to genetic material.

_____ [1]

9 A completely new and unusual antibiotic has been extracted from a marine microorganism found in California.

Describe the stages this new antibiotic would have to go through before it can safely be prescribed by doctors.

Your account should include:

- the names of each stage and what is involved
- the reasons for each stage
- one ethical issue involved

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

[6]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

Permission to reproduce all copyright material has been applied for.
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA will be happy to rectify any omissions of acknowledgement in future if notified.

113166

Rewarding Learning

General Certificate of Secondary Education
2013–2014

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

TUESDAY 13 MAY 2014, MORNING

MARK SCHEME

STEMUP.CO.UK

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

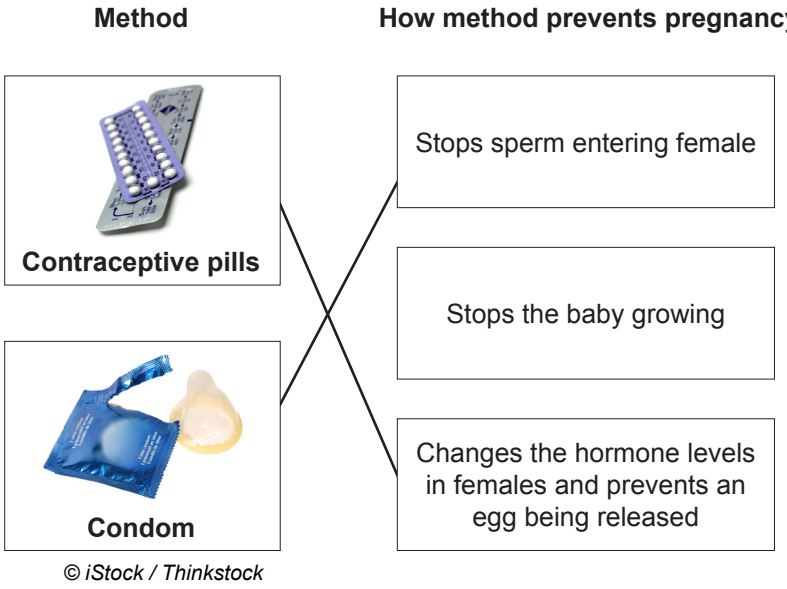
The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

					AVAILABLE MARKS
1	(a)	(i)		[3]	

Name	Letter
Ovary	A [1]
Cervix	C [1]
Oviduct	B [1]

		(ii)	X placed in the uterus	[1]
	(b)	(i)		



© iStock / Thinkstock

			Each line correct [1]	[2]	
		(ii)	Condom	[1]	
		(iii)	Sperm tubes	[1]	8
2	(a)	(i)	Energy flow	[1]	
		(ii)	Sunlight/sun	[1]	
	(b)	(i)	Can fly or move away	[1]	
		(ii)	Foxes go down, small birds go up	[1]	
		(iii)	Fewer foxes to eat them/less birds being eaten	[1]	5
3	(a)		Mental [1] cocaine [1] relaxed [1]	[3]	
	(b)	(i)	Drinking a lot of alcohol over a short period of time	[1]	
		(ii)	Violence/crime/unemployment/relationships breakdown/days off work	[1]	
		(iii)	Mark is suffering from peer pressure/needs to drink alcohol to lose his inhibitions [1] Anna has high esteem/understands that alcohol can be harmful [1]	[2]	7

				AVAILABLE MARKS
4	(a)	Cholesterol	[1]	
	(b)	A blood clot forms and stops blood/oxygen/glucose (reaching the heart muscle) [1] respiration cannot take place/heart cells die/heart stops beating/person has a heart attack [1]	[2]	
	(c) (i)	Reducing stress/stopping smoking	[1]	
	(ii)	Any **two** from: • kidney damage • circulatory problems (e.g. heart disease/amputation/stroke) • eyesight problems/blindness • other appropriate response	[2]	
	(iii)	Any **two** from: • high number of patients affected/more people with diabetes • cost of (producing) insulin/insulin needed every day/a lot of insulin is used • long term effect named and explanation of cost • lasts a long time/get it for life	[2]	8
5	(a)	**A** = Walking catfish **B** = Flathead catfish **C** = Blue catfish All three correct = [2]; one or two correct = [1]	[2]	
	(b) (i)	It can breathe air, allowing it to survive out of water [1] can use its (spiny front) fins to move from wetland to wetland [1]	[2]	
	(ii)	Non-native/introduced by man [1] more successful than native species [1]	[2]	6
6	(a)	All points correct [2] 1 error [1] more than 1 error [0] line joined between points [1]	[3]	
	(b) (i)	Oxygen	[1]	
	(ii)	The number of bubbles/oxygen given off decreases with distance from lamp [1] reduced photosynthesis [1] due to reduced light intensity [1]	[3]	
	(c)	Phototropism	[1]	8
7	(a)	Group 1 = 24 [1] Group 2 = 44 [1]	[2]	
	(b)	The test tube in the apparatus set up by Group 2 is not insulated or converse [1] so a lot of heat is lost out into the room or converse [1]	[2]	4

				AVAILABLE MARKS
8	**(a)**	**(i)**	Any **two** from: • the number of people (males and females) with skin cancer has increased (every year) from 1975/over time • the number of females with skin cancer is (always) higher than the number of males • in 2010 the rates of skin cancer cases in both males and females is the same • when the rate of skin cancer cases rises in females it also rises in males [2]	
		(ii)	Rates will decrease [1] Less exposure to UV rays [1] [2]	
	(b)	**(i)**	Any **two** from: • risk of Down Syndrome increases with age • under 35 risk of miscarriage exceeds that of Down Syndrome • over 35 risk of Down Syndrome greater than miscarriage [2]	
		(ii)	Religious conviction/not wishing to have ethical decision to make/ if other children in family/other appropriate response [1]	
	(c)		Mutation [1]	8

STEMUP.CO.UK

9 Indicative content

- in vitro testing medicines or drugs are developed in the laboratory/tested on cells/tissues
- does the drug work
- animal testing is testing on live animals/whole body systems/before testing on humans
- many people are opposed to animal testing for ethical reasons – explained
- a drug may have different effect on animal as on a human (due to humans being a different species)
- drugs are given to humans in clinical trials
- to see if the drug works on humans/what the required dose will be/if there are any side effects
- licensed for use when medicines or drugs are shown to be effective/safe (with no or limited side effects)

Band	Response	Mark
A	Candidates must use appropriate terms throughout to describe what stages this new antibiotic would have to go through before it could safely be given to humans using **six to eight** of the points above. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5–6]
B	Candidates use some appropriate specialist terms to describe what stages this new antibiotic would have to go through before it could safely be given to humans using **three to five** of the points above. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3–4]
C	Candidates use **one to two** of the points above. They use limited spelling, punctuation and grammar to describe what stages this new antibiotic would have to go through before it could safely be given to humans. They have made limited use of specialist terms. The form and style are of a limited standard.	[1–2]
D	Response not worthy of credit.	[0]

[6] 6

Total **60**

AVAILABLE MARKS

Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
2013–2014

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

GSS11

MONDAY 24 FEBRUARY 2014, MORNING

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(b)**.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total Marks	

STEMUP.CO.UK

Examiner Only	
Marks	Remark

1 **(a)** Complete the table below.

Choose from:

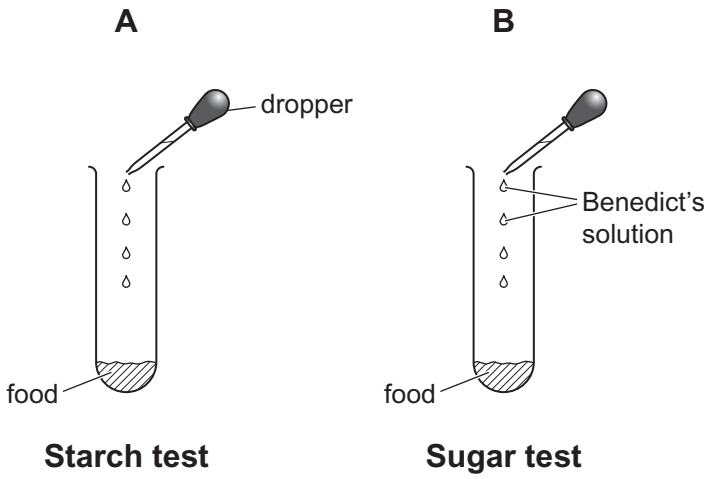
to give us energy : fat : for strong teeth and bones

fibre : protein

Food group	Function in the body
	growth and repair
carbohydrate	
	prevents constipation

[3]

(b) The diagrams below show two food tests.



(i) Name the solution used to test for starch in diagram **A**.

_____ [1]

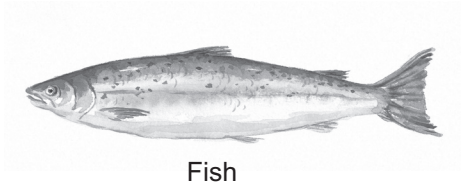
(ii) What colour shows that starch is present in diagram **A**?

_____ [1]

(iii) An orange-red colour shows that sugar is present in diagram **B**. What is done after adding the Benedict's solution to give this colour change?

_____ [1]

(c) The pictures below show foods which are good sources of either vitamin **C** or **D**.



Fish

© Digital Vision / Thinkstock



Eggs

© iStockphoto / Thinkstock



Lemon

© iStockphoto / Thinkstock



Kiwi

© iStockphoto / Thinkstock

(i) Complete the table to show which of these foods contain each vitamin.

Vitamin	Foods
C	
D	

[2]

(ii) Give **one** function for vitamin **C** in the body.

Circle the correct answer.

strengthens teeth and bones : prevents scurvy

good for eyesight [1]

Examiner Only

Marks	Remark

STEMUP.CO.UK

Examiner Only	
Marks	Remark

2 **(a)** The photograph below shows a boy rolling his tongue. Humans either can or cannot roll their tongue.

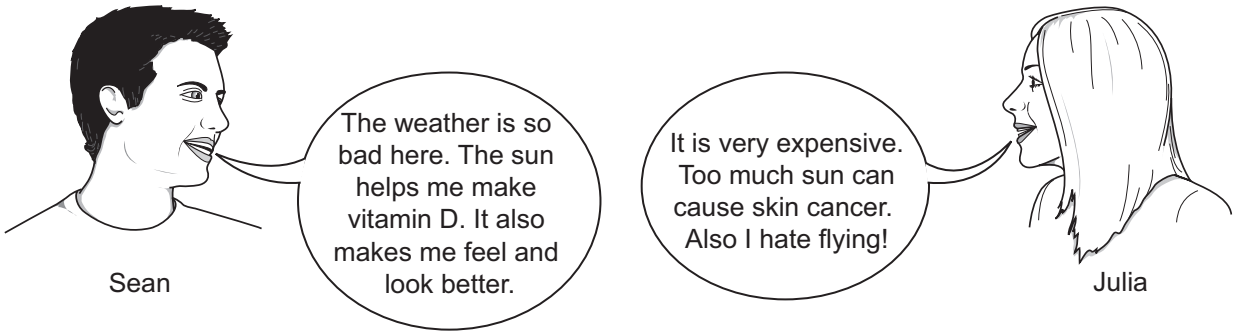


© Cordelia Molloy / Science Photo Library

Name the type of variation that tongue rolling shows.

_____ [1]

(b) Sean and Julia are discussing whether to go to sunny Majorca for their holiday this year.



Examiner Only	
Marks	Remark

Using only the information provided, give one **health** reason for, and one against, Sean and Julia going to Majorca for their holidays.

For _____

Against _____ [2]

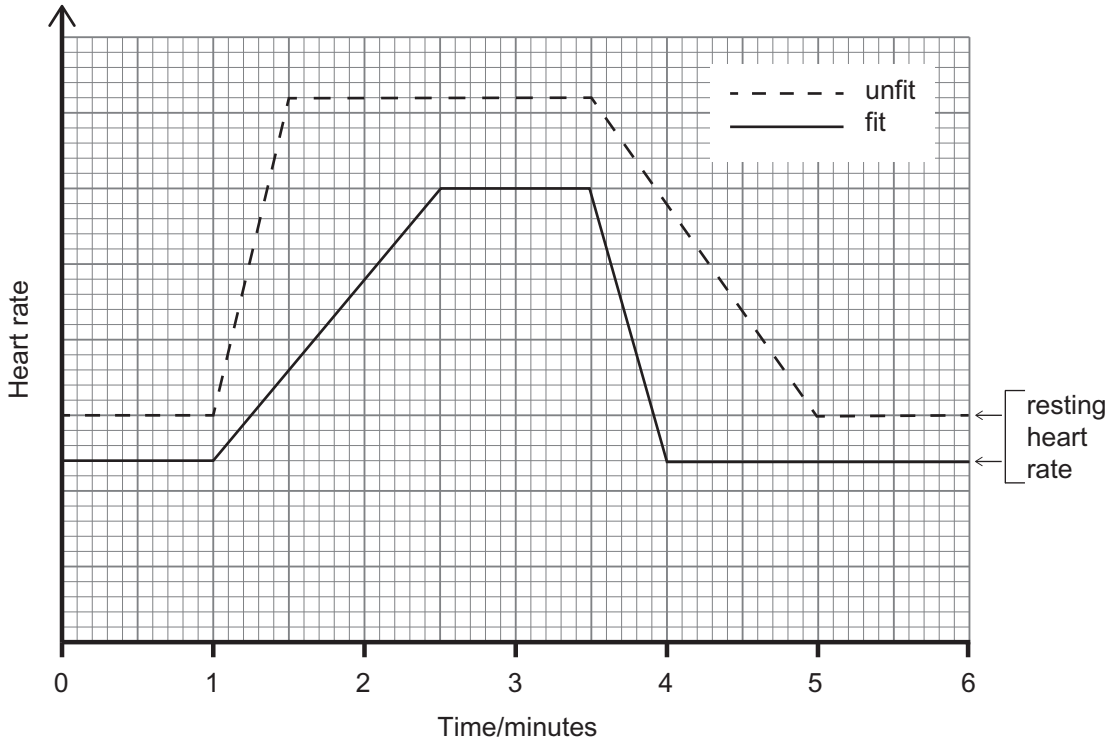
BLANK PAGE

(Questions continue overleaf)

STEMUP.CO.UK

Examiner Only	
Marks	Remark

3 The following graph shows how exercise affects the heart rate of a student who is fit and a student who is unfit.



(a) Using the graph answer parts **(i)** and **(ii)**.

(i) At what time did the exercise start?

_____ minute(s) [1]

(ii) State **two** differences between the heart rates of the fit student and the unfit student.

1. _____

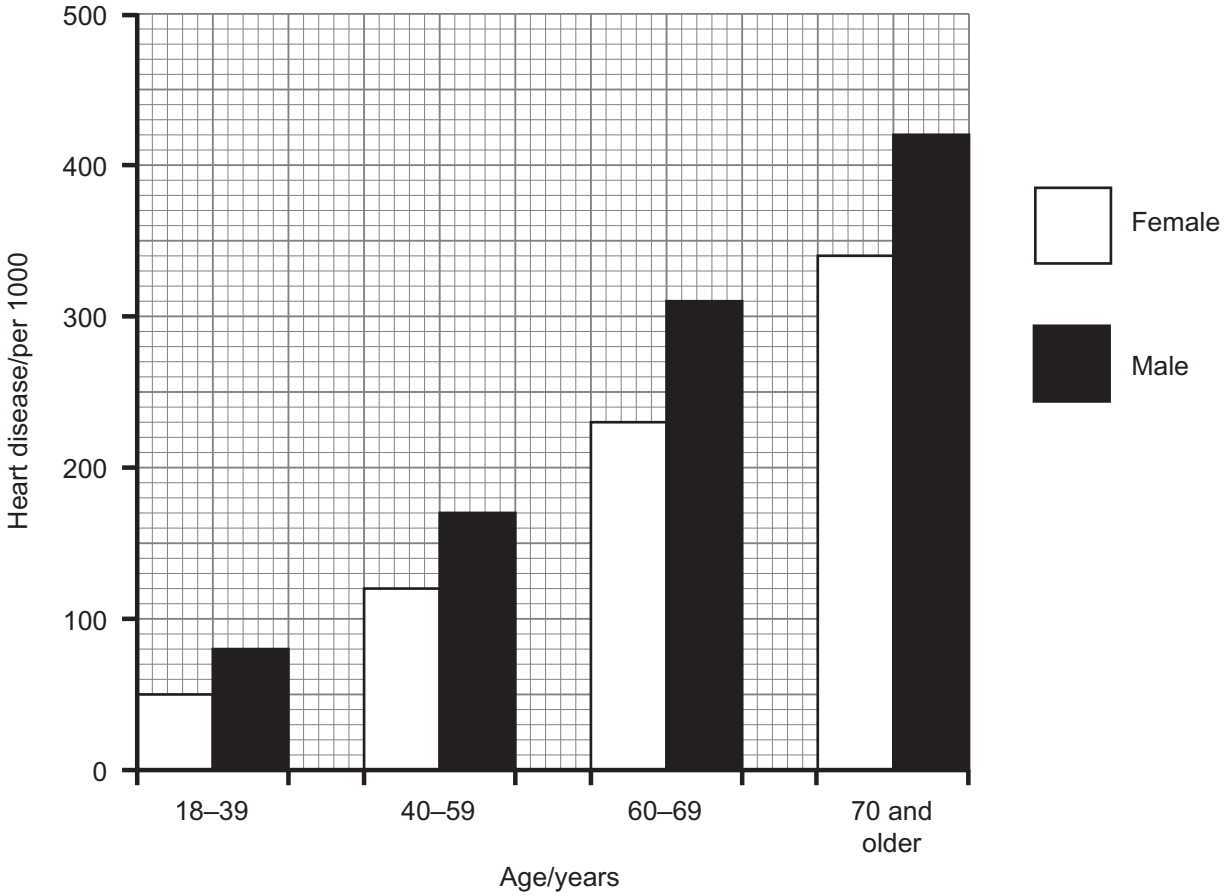
_____

2. _____

_____ [2]

STEMUP.CO.UK

(b) The graph below shows the results of a survey on heart disease in different age groups.



Give **two** trends shown by the information in the graph.

1. _____

_____

2. _____

_____ [2]

(c) Suggest **two** reasons why the treatment of heart disease is very expensive.

1. _____

_____

2. _____

_____ [2]

Examiner Only	
Marks	Remark

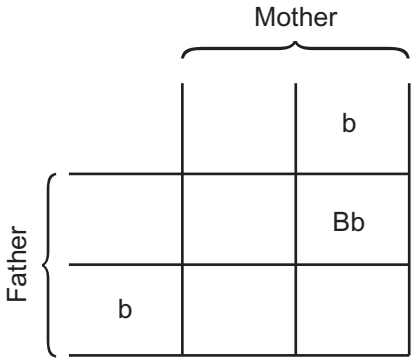
STEMUP.CO.UK

Examiner Only	
Marks	Remark

4 **(a)** A person's eye colour is inherited from his/her parents.

A **mother** with the genotype (**bb**) has blue eyes and a **father** with the genotype (**Bb**) has brown eyes. Brown (B) is dominant to blue (b).

(i) Complete the Punnett square to show the gametes of the parents and the genotypes of the children.



[2]

(ii) What percentage of the children may have brown eyes?

Choose from:

25 **50** **75** **100**

_____ % [1]

STEMUP.CO.UK

(b) The diagram below shows a section of DNA.



© *iStockphoto / Thinkstock*

(i) What name is given to the shape of DNA?

Choose from:

ladder : spiral : double helix

_____ [1]

(ii) DNA is formed into chromosomes. Name the part of the cell where chromosomes are found.

_____ [1]

(iii) What are small sections of chromosomes called?

Choose from:

codes genes cells

_____ [1]

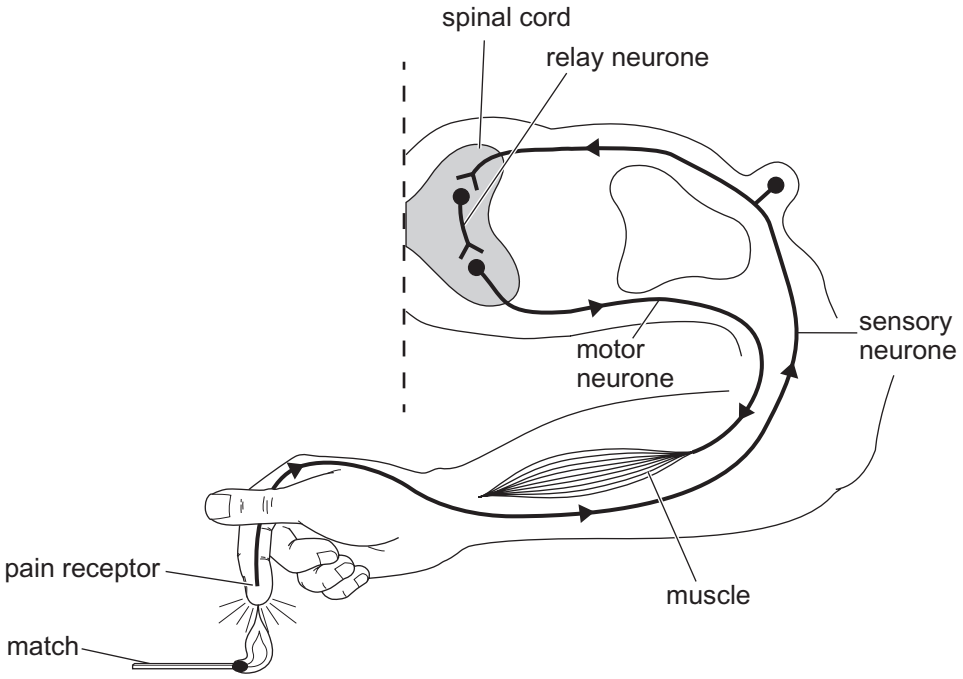
Examiner Only

Marks	Remark

STEMUP.CO.UK

Examiner Only	
Marks	Remark

5 **(a)** Reflex actions are very quick. For example, you pull your hand away from a hot flame without thinking.



The list below gives the steps in a reflex action but **not** in the correct order.

A Sensory neurone carries nerve impulse to the spinal cord

B Muscle bends arm

C Pain receptor in finger feels heat

D Relay neurone carries impulse from sensory to motor neurone

E Motor neurone carries impulse to muscle

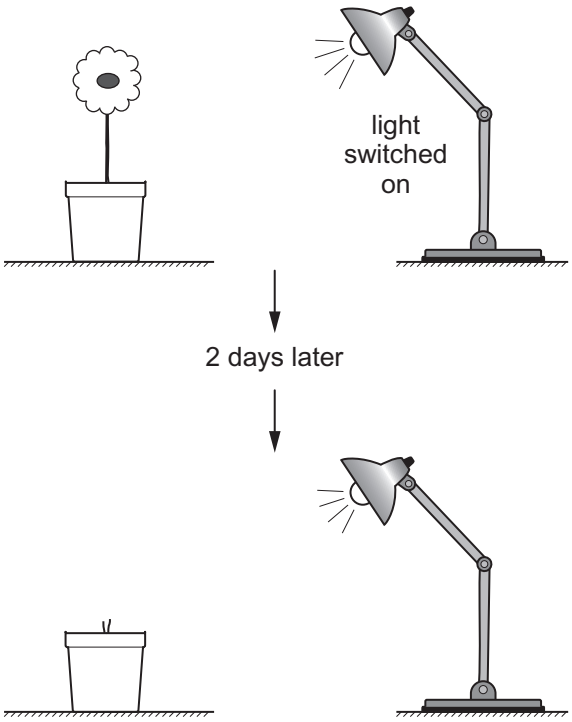
(i) Using the letters **A**, **B**, **C**, **D** and **E** put the steps in the correct order. The first one has been done for you.

C → _____ → _____ → _____ → _____ [2]

(ii) Suggest why the nerve impulse is carried to the spinal cord but **not** the brain.

_____ [1]

(b) The diagram below shows a plant growing in bright light.



(i) Complete the diagram to show how this plant responds to light after 2 days. [1]

(ii) What name is given to the plant's response to light?

_____ [1]

(iii) What controls this response in plants?

Choose from:

carbon dioxide : water : hormones

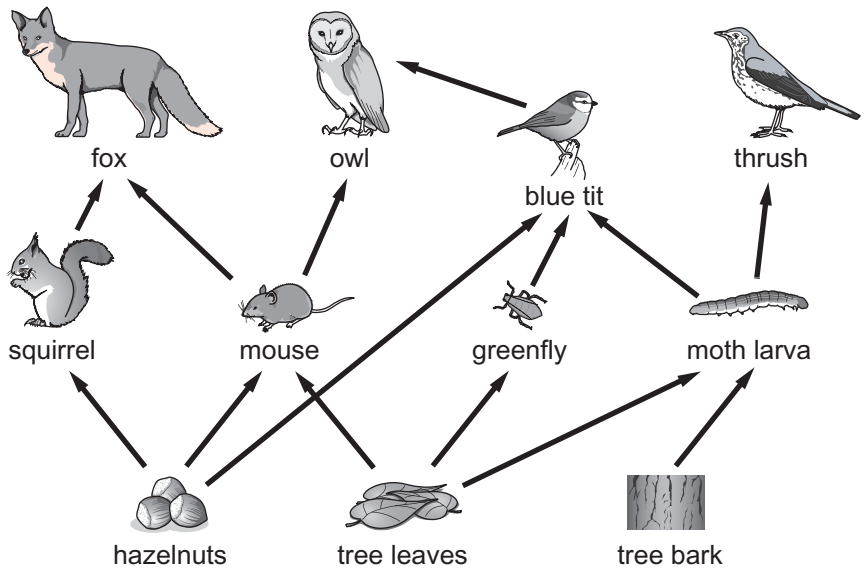
_____ [1]

Examiner Only

Marks	Remark

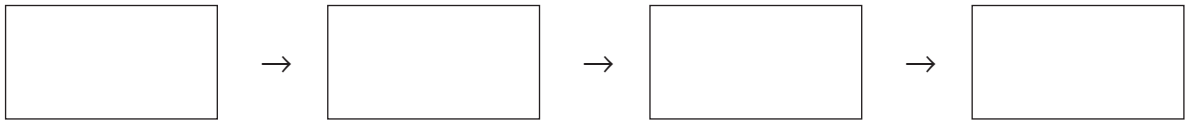
Examiner Only	
Marks	Remark

6 **(a)** The diagram below shows a food web.



© KS3 science revision Level 5-7 by Patricia Millar, published by HarperCollins, 2006.
Reprinted by permission of HarperCollins Publishers Ltd

(i) Using the diagram, complete a food chain containing **four** organisms in the boxes below.



[2]

(ii) Name **one** primary consumer from this food web.

_____ [1]

(b) Suggest what might happen to the number of squirrels if the fox numbers go down. Explain your answer.

_____

_____

_____

_____ [2]

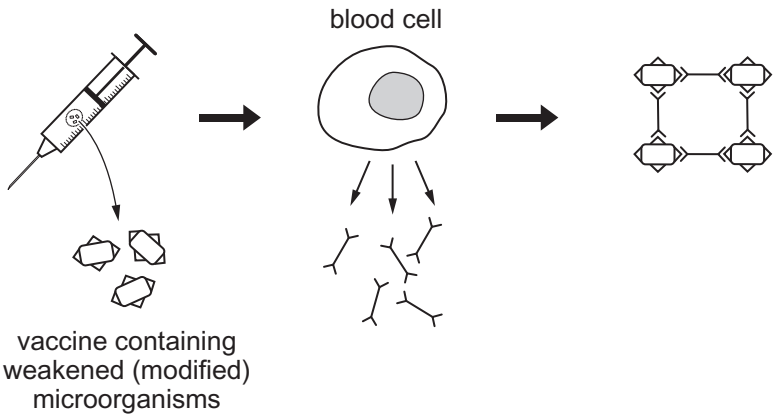
BLANK PAGE

(Questions continue overleaf)

STEMUP.CO.UK

Examiner Only	
Marks	Remark

7 The diagram summarises how a vaccine works.



(a) Using the diagram and your knowledge describe how vaccinations protect against disease.

_____

_____

_____

_____

_____

_____

_____ [3]

(b) Before a vaccination is licensed for use it goes through a number of trials (in vitro, animal and clinical).

(i) Clinical trials test the drug on human volunteers. Give **two** reasons why it is necessary to carry out testing on humans.

1. _____

_____

2. _____

_____ [2]

(ii) Suggest **one** reason why many people are against testing on animals.

_____ [1]

The table below shows information about the development and production of different drugs by a company.

	Antibiotics	Painkillers	Other medical drugs
Cost of producing drug/million pounds	7.4	7.5	4.9
Time to produce drug/years	9.5	6.5	6.5
Profit per drug/ million pounds	2.1	2.9	4.2
Number of drugs in development	2	4	7

(c) Using the information provided, suggest **two** reasons why this company is more interested in developing 'other medical drugs' rather than antibiotics and painkillers.

1. _____

_____

_____

2. _____

_____

_____ [2]

(d) Explain fully why some antibiotics have become less effective in recent years.

_____

_____

_____

_____ [2]

Examiner Only

Marks	Remark

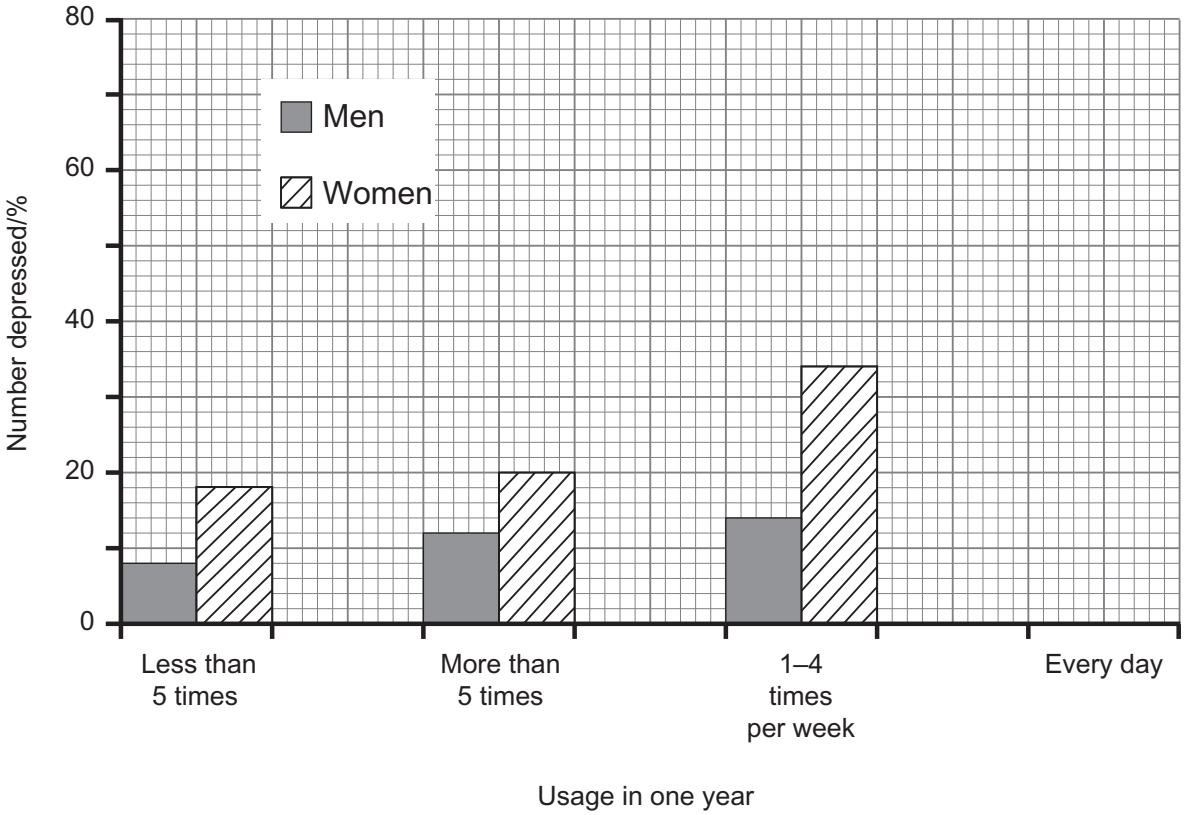
Examiner Only	
Marks	Remark

8 Cannabis is the most widely used illegal drug in Britain. Some doctors think that taking cannabis can lead to depression.

Doctors investigated the use of cannabis by 800 males and 800 females who had used the drug. The results are shown below.

Usage in one year	Men who became depressed/%	Women who became depressed/%
Less than 5 times	8	18
More than 5 times	12	20
1–4 times per week	14	34
Every day	20	67

(a) Using the information in the table complete the bar chart below.



[1]

STEMUP.CO.UK

Examiner Only	
Marks	Remark

(b) A quarter ($\frac{1}{4}$) of the males in the investigation used cannabis **every day** throughout the year. Calculate the **number** of men who became depressed because of this.

(Show your working out.)

_____ [2]

(c) Explain how the results suggest that doctors are correct in linking depression to cannabis use.

_____

_____

_____ [1]

(d) Unlike cannabis, alcohol is a legal drug. However, it can still have an effect on a person's health. Give **one** harmful effect alcohol can have on a user and **one** harmful effect it can have on society.

User _____

_____

Society _____

_____ [2]

Examiner Only	
Marks	Remark

9 **(a)** Abiotic factors can be used to measure the rate at which global warming is occurring.

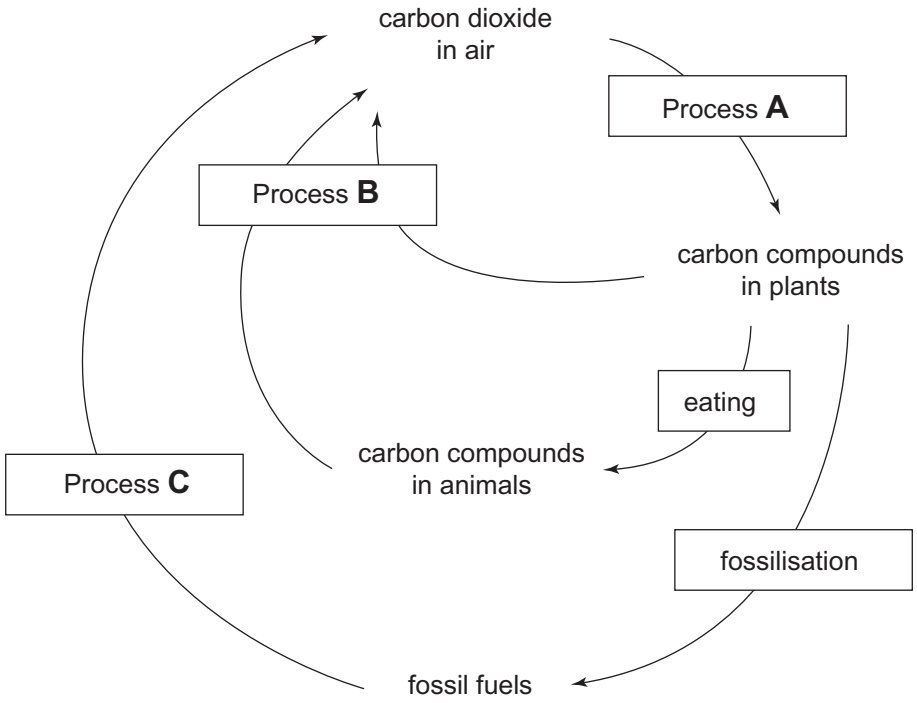
(i) What is meant by the term 'abiotic'?

_____ [1]

(ii) Apart from temperature, name **one** abiotic factor which could be used to measure the rate of global warming.

_____ [1]

(b) The diagram below shows a simple carbon cycle.



Using the diagram and your knowledge, explain the carbon cycle.

Your answer should include:

- the names of the processes labelled **A**, **B** and **C**,
- and how it has become unbalanced causing increased levels of carbon dioxide.

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

[6]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

Sources:
Fish_dv302166_Digital Vision_Thinkstock.com
Eggs_95698188_iStockphoto_Thinkstock.com
Lemon_155853998_iStockphoto_Thinkstock.com
Kiwi_153679007_iStockphoto_Thinkstock.com

Permission to reproduce all copyright material has been applied for.
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA will be happy to rectify any omissions of acknowledgement in future if notified.

114837

Rewarding Learning

General Certificate of Secondary Education
2013–2014

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

MONDAY 24 FEBRUARY 2014, MORNING

MARK SCHEME

STEMUP.CO.UK

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

AVAILABLE MARKS

1 **(a)**

Food group	Function in the body
protein	growth and repair
carbohydrate	**to give us energy**
fibre	prevents constipation

[3]

(b) **(i)** Iodine [1]

(ii) Blue/black [1]

(iii) Heated [1]

(c) **(i)**

Vitamin	Foods
C	**Lemon**
	Kiwi
D	**Fish**
	Eggs

[$\frac{1}{2}$] each, round down [2]

(ii) prevents scurvy [1] 9

2 **(a)** Discontinuous [1]

(b) For – increases vitamin D/feel better
Against – too much sun can cause skin cancer [2] 3

STEMUP.CO.UK

		AVAILABLE MARKS
3 **(a)** **(i)**	1 minute [1]	
(ii)	**Any two from** ● fit person has a lower resting heart rate before they begin to exercise/fit person has a lower heart rate ● fit person's heart rate rises more slowly/unfit person's heart rate rises more quickly ● maximum heart rate reached by fit person is a lot lower than the unfit person/fit person's heart rate rises less ● the fit person's heart rate drops quicker (when they finish exercise)/the heart rate of the fit person returns to normal resting heart rate in a quicker time/fit person has faster recovery time ● fit person has a maximum heart rate for a shorter time [2]	
(b)	Incidence of heart disease increases with age [1] men have a higher incidence of heart disease than women of same age [1] [2]	
(c)	**Any two from** ● expensive drugs/medicines/expensive equipment/surgery/ transplant ● patients need long-term care ● many people have heart disease [2]	7
4 **(a)** **(i)**		

	b	b
B	**Bb**	Bb
b	**bb**	**bb**

Gametes correct [1]
Offspring correct [1] [2]

(ii)	50% [1]	
(b) **(i)**	double helix [1]	
(ii)	Nucleus [1]	
(iii)	genes [1]	6

STEMUP.CO.UK

		AVAILABLE MARKS
5 **(a)** **(i)** C **A** **D** **E** **B** Any two in correct sequence [1] All correct [2] [2]		
(ii) It is much quicker/shorter pathway [1]		
(b) **(i)** Plant bending towards the light [1]		
(ii) Phototropism [1]		
(iii) hormones [1]		6
6 **(a)** **(i)** **Any one** ● leaves greenfly blue tit owl ● leaves moth larva blue tit owl ● bark moth larva blue tit owl (correct animals) [1] Starts with producer [1] [2]		
(ii) Squirrel/mouse/greenfly/moth larva/blue tit [1]		
(b) The number of squirrels would increase [1] as there are less foxes to eat them/more squirrels survive to breed or they survive longer to breed [1] [2]		5
7 **(a)** **Any three from** ● Vaccines cause antibodies (to be produced) (by white blood cells) ● called lymphocytes ● these antibodies lock on to antigens on pathogen ● due to complementary shape ● clumping/immobilisation ● destroyed by phagocytes/phagocytosis/(other) white blood cells ● memory cells [3]		
(b) **(i)** **Any two from** ● to see how effective the drug is on humans ● to find out what the required dose is ● to see if there are any harmful side effects/to check if safe ● animals are a different species/react differently [2]		
(ii) People think it is cruel/harms the animals/any ethical issue [1]		
(c) Cheaper to produce (than antibiotics and painkillers) [1] average profit per drug is greater (than antibiotics and painkillers) [1] [2]		
(d) Antibiotic resistance/bacteria have mutated [1] due to overuse/not taking the full course [1] [2]		10

			AVAILABLE MARKS
8	**(a)** Both bars completed correctly and shading [1]		
	(b) 200 [1] 40 [1]	[2]	
	(c) With increased cannabis use, increased number of users have depression	[1]	
	(d) User – Impaired judgement qualified/lack of inhibition qualified/liver or brain damage [1] Society – Family breakdown/absenteeism at work/antisocial behaviour/violence/cost of treating alcohol linked diseases/ crime [1]	[2]	6

AVAILABLE MARKS

9 (a) (i) Non-living factors [1]

(ii) Climate change/size of polar ice caps/sea levels [1]

(b) Indicative content

- Plants take in/use carbon dioxide
- Process A is photosynthesis/by photosynthesis
- Plants/animals produce carbon dioxide
- Process B is respiration/by respiration
- Burning/use of fossil fuels produces carbon dioxide
- Process C is combustion/by combustion
- Deforestation
- Increased combustion/increased use of fossil fuels

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe the carbon cycle and why it has become unbalanced using **six to eight** of the points above, and which must include the names of at least two of the processes (A, B and C), in a logical sequence. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates use some appropriate specialist terms to describe the carbon cycle and why it has become unbalanced using **three to five** of the points above, in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates describe the carbon cycle and/or why it has become unbalanced using **one or two** of the above points. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and have made limited use of specialist terms. The form and style are of a limited standard.	[1]–[2]
D	Not worthy of credit.	[0]

[6] 8

Total **60**

STEMUP.CO.UK

Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
2013–2014

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

GSS11

WEDNESDAY 13 NOVEMBER 2013, AFTERNOON

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**.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total Marks	

STEMUP.CO.UK

BLANK PAGE

Examiner Only	
Marks	Remark

1 **(a)** Complete the following sentences about the voluntary and reflex actions of humans.

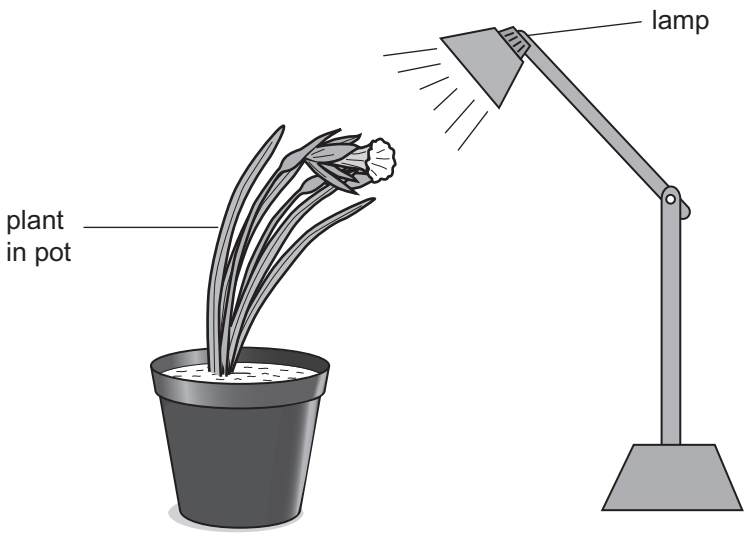
Choose from:

slow **hand** **brain** **fast**

Reflex actions are usually _____ and they help prevent injury. Unlike reflex actions, voluntary actions are controlled by the

_____ . [2]

(b) The diagram below shows a plant growing towards the light.



(i) What name is given to this response by the plant?

Choose from:

photosynthesis **phototropism** **respiration**

_____ [1]

(ii) Explain fully how this benefits the plant.

_____

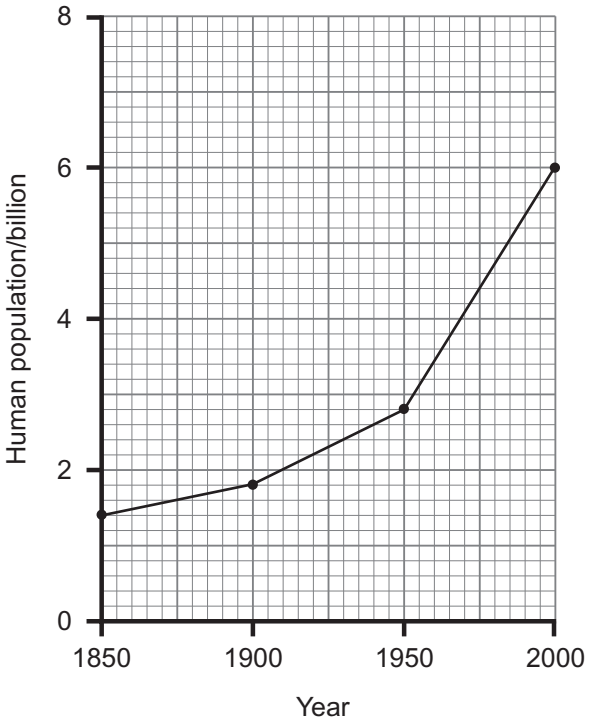
_____

_____ [2]

STEMUP.CO.UK

Examiner Only	
Marks	Remark

2 **(a)** The following graph shows the change in human population between the years 1850 and 2000.



(i) Calculate the change in population from 1850 to 2000.

(Show your working out.)

_____ billion [2]

(ii) Describe the trend shown by the graph.

_____

_____ [1]

STEMUP.CO.UK

(b) Suggest **two** reasons to explain the change in human population size after 1850.

1. _____

2. _____ [2]

(c) Given below are two examples of pollution caused by humans. Using lines, link each example of pollution to **one** method of reducing its effect.

Example of pollution	Method to reduce effect
acid rain	better storage of slurry
nitrate in water	using renewable fuels
	planting more trees

[2]

Examiner Only

Marks	Remark

STEMUP.CO.UK

Examiner Only	
Marks	Remark

3 **(a)** The table below gives information about some food tests.

(i) Complete the table by giving the correct food group for each test.

Choose from:

starch **fat** **sugar** **protein**

Food group	Test	Result if food group is present
	Benedict's	changes from blue to red when heated
	Biuret	changes from blue to lilac
	emulsion	a white emulsion when shaken with water

[3]

(ii) What is the function of water in our body?

_____ [1]

(b) A change in lifestyle can reduce the risk of having a heart attack, for example by taking more exercise.

(i) Why does increased exercise help prevent heart disease?

Circle **two** correct answers.

reduces salt levels

prevents obesity

produces more energy

reduces the amount of fat in blood

[2]

(ii) State **one** other lifestyle change that can reduce the risk of having a heart attack.

_____ [1]

(iii) Suggest **one** reason why the cost of treating heart disease in the United Kingdom is so expensive.

_____

_____ [1]

STEMUP.CO.UK

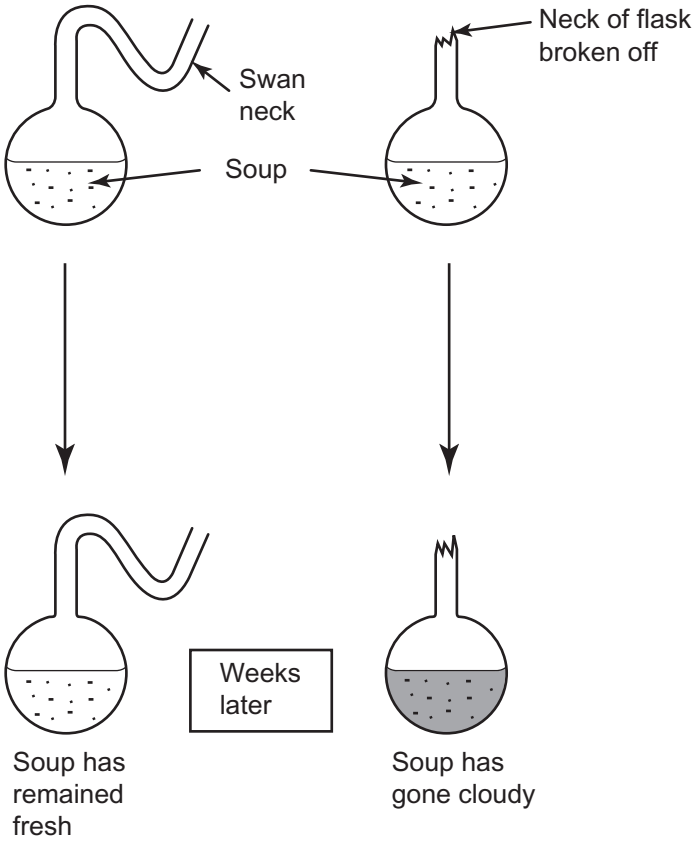
BLANK PAGE

(Questions continue overleaf)

STEMUP.CO.UK

Examiner Only	
Marks	Remark

4 **(a)** The following diagram shows Louis Pasteur's experiment to find if microorganisms are the cause of food contamination.



Describe and explain the results of Pasteur's experiment.

_____

_____

_____ [2]

Microorganisms can cause harm to humans if they gain entry to the body.

(b) Describe how mucous membranes and blood clotting reduce the harm caused by microorganisms.

Mucous membranes _____

_____

Blood clotting _____

_____ [2]

(c) Sophie has a severe bacterial infection in her foot that needs treatment.
She thinks her doctor should give her either a vaccination or an antibiotic.
Vaccinations provide immunity but it can take weeks or months to make enough antibodies.

Should the doctor give Sophie a vaccination or an antibiotic? Fully explain your answer.

_____

_____

_____

_____

_____ [3]

Examiner Only	
Marks	Remark

STEMUP.CO.UK

BLANK PAGE

Examiner Only	
Marks	Remark

5 The holly tree produces evergreen leaves (leaves that remain on the tree all year). The leaves also have sharp protective spikes at their edges as shown in the photograph below.



Source: Photo: Chief Examiner

(a) Suggest **one** advantage to the holly tree in having:

(i) evergreen leaves. _____

_____ [1]

(ii) sharp spikes. _____

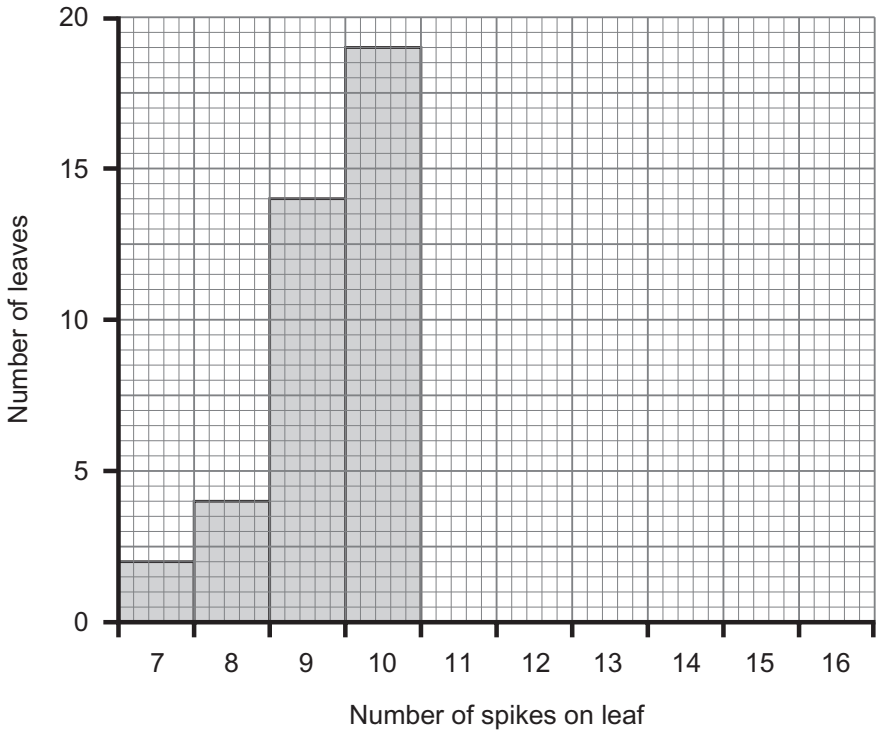
_____ [1]

STEMUP.CO.UK

(b) Pupils in a class collected a sample of leaves from a holly tree and counted the number of spikes on each leaf. Their results are shown in the table below.

Number of spikes on leaf	Number of leaves
7	2
8	4
9	14
10	19
11	12
12	14
13	10
14	6
15	3
16	2

(i) Use the information in the table to complete the histogram (graph) below.



[2]

Examiner Only

Marks	Remark

(ii) How many leaves did the pupils collect?

_____ [1]

(iii) What is the most common number of spikes on the holly leaves?

_____ [1]

(iv) The variation shown by the holly leaves is discontinuous.
Describe what discontinuous variation is.

_____

_____ [1]

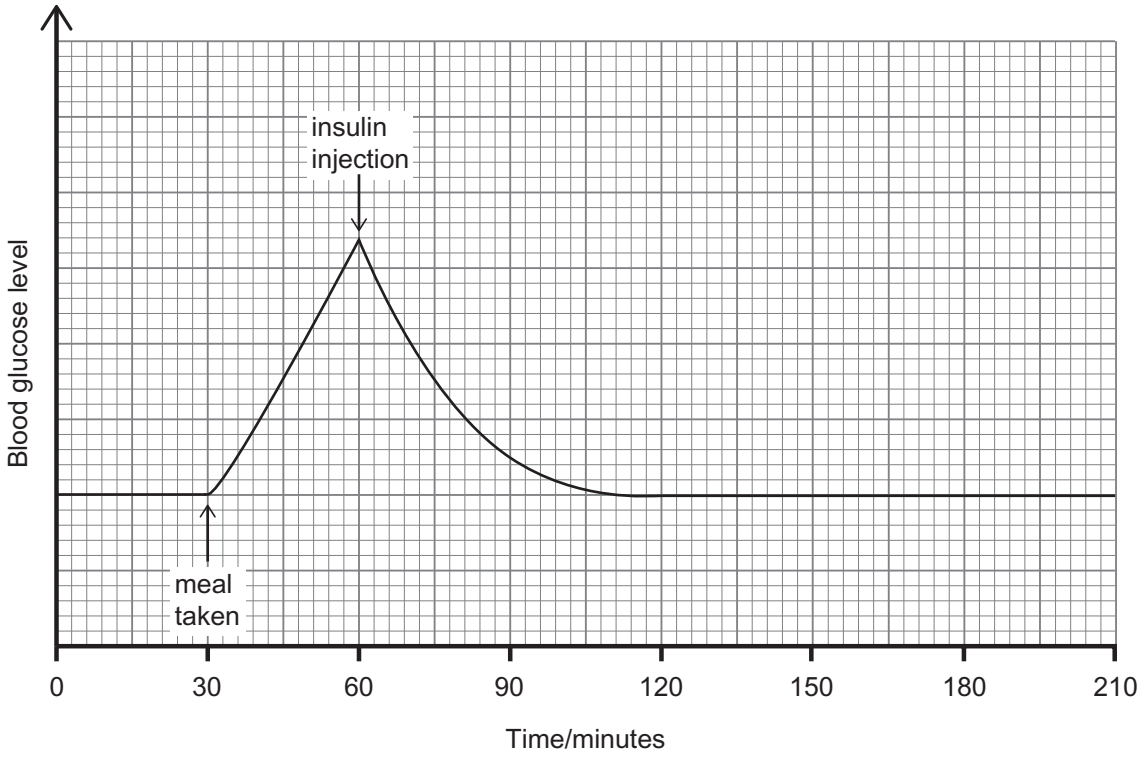
Examiner Only	
Marks	Remark

STEMUP.CO.UK

Examiner Only	
Marks	Remark

6 Hormones such as insulin are produced by the body. However, sometimes insulin is injected if a person has diabetes.

(a) The graph below shows how the blood glucose level in a person with diabetes changes because of a meal and an insulin injection.



(i) Describe and explain the effect of the insulin on blood glucose level.

_____

_____

_____ [2]

(ii) Use the information provided to suggest which type of diabetes (Type 1 or Type 2) this person has. Explain your answer.

_____

_____ [1]

(b) Insulin, like all medical drugs, had to be tested in trials before it could be used on humans. Testing involves clinical, in-vitro and animal trials.

(i) Put these trials (**clinical, in-vitro** and **animal**) in the order they take place.

_____ _____ _____ [1]

(ii) Describe what in-vitro testing is and suggest why it is a very expensive process.

_____

_____

_____ [2]

Examiner Only	
Marks	Remark

STEMUP.CO.UK

Examiner Only	
Marks	Remark

7 The red squirrel is at risk of extinction in Ireland. There are many reasons for its decline but a major factor has been the introduction of the grey squirrel (a competitive invasive species) into Ireland from North America. In comparison to the red squirrel, grey squirrels are a common woodland animal and their numbers are increasing rapidly.

The table below includes some information about red and grey squirrels.

Feature	Red squirrel	Grey squirrel
Average body length	21 cm	26 cm
Average body mass	290 g	600 g
Habitat	coniferous (e.g. pine) forest	all types of forest
Feeding area	in the trees	in the trees and on the ground
Diet	ripe berries, nuts and seeds	ripe and unripe berries, nuts and seeds
Response to poxvirus	not immune to virus	immune to virus (but can carry it and spread it to other squirrels)

(a) Use the information provided to answer parts **(i)**, **(ii)** and **(iii)**.

(i) Suggest **three** reasons for the grey squirrel being able to outcompete the red squirrel.

1. _____

_____

2. _____

_____

3. _____

_____ [3]

(ii) Suggest **one** reason why grey squirrels are much more likely to be killed by motor vehicles than red squirrels.

_____ [1]

(iii) Suggest **one** thing that could be done to increase the number of red squirrels.

_____ [1]

(b) Give **two** things that all competitive invasive species have in common.

1. _____

_____

2. _____

_____ [2]

Examiner Only	
Marks	Remark

STEMUP.CO.UK

Examiner Only	
Marks	Remark

8 **(a)** Cystic fibrosis is an inherited disease. Jack and Jill are heterozygous (carriers) for cystic fibrosis but do not have the condition.

(i) What is meant by the term inherited disease?

_____ [1]

(ii) Using the information provided, explain how you know the allele for cystic fibrosis is recessive.

_____

_____ [1]

(b) The following Punnett square shows how Jack and Jill could have a child with cystic fibrosis.

		Jack: C	Jack: c
Jill	C	CC	Cc
Jill	c	Cc	cc

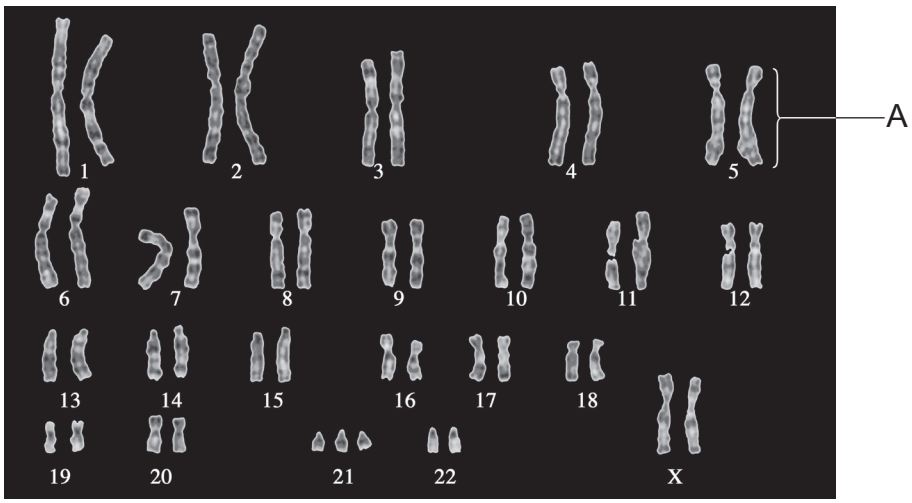
(i) Circle the genotype for cystic fibrosis in the Punnett square. [1]

(ii) How many different genotypes are shown in the Punnett square?

_____ [1]

STEMUP.CO.UK

(c) The photograph below shows a human karyotype.



© Look at Sciences / Science Photo Library

(i) What does structure A represent?

_____ [1]

(ii) What genetic disorder is shown by this karyotype? Explain your answer.

_____

_____

_____ [2]

Examiner Only	
Marks	Remark

9 Describe how you would carry out an investigation to show that light is needed for photosynthesis.

In your account you should describe:

- the experimental set-up
- the results you would expect
- how the results show that light is necessary.

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

[6]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

Permission to reproduce all copyright material has been applied for.
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA
will be happy to rectify any omissions of acknowledgement in future if notified.

113989

Rewarding Learning

General Certificate of Secondary Education
2013–2014

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

WEDNESDAY 13 NOVEMBER 2013, AFTERNOON

MARK SCHEME

STEMUP.CO.UK

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

		AVAILABLE MARKS
1	**(a)** Fast [1] brain [1] [2]	
	(b) **(i)** Phototropism [1]	
	(ii) **Any two from** ● plant gets more light ● more photosynthesis ● more growth [2]	5
2	**(a)** **(i)** 6 billion – 1.4 billion [1] 4.6 billion [1] [one mistake in reading graph and correct calculation = 1] [2]	
	(ii) The human population increases over time/rate of increase increases over time [1]	
	(b) **Any two from** ● people living longer ● better medication/healthcare ● better sanitation/hygienic ● better diets/more food [2]	
	(c) Acid rain ---------- using renewable fuels [1] nitrate in water -------- better storage of slurry [1] [2]	7
3	**(a)** **(i)**	

Food group	Test	Result if food group is present
Sugar		
Protein		
Fat		

[3]

	(ii) Solvent/medium for chemical reactions/transport [1]	
	(b) **(i)** Prevents obesity [1] reduces the amount of fat in blood [1] [2]	
	(ii) Stopping smoking/reducing stress [1]	
	(iii) Many people affected/long recovery time/expensive equipment required/cost of staff [1]	8

STEMUP.CO.UK

				AVAILABLE MARKS
4	**(a)**		In flask with broken neck contamination occurred/no contamination in flask with swan neck [1] contamination caused by microorganisms entering flask /no contamination in flask with swan neck as microorganisms unable to enter [1] [2]	
	(b)		Mucous membranes trap microorganisms [1] blood clotting prevents microorganisms entering the body [1] [2]	
	(c)		Antibiotic [1] antibiotic effective against bacteria [1] works quickly/vaccination too slow [1] [3]	7
5	**(a)**	**(i)**	Evergreen leaves allows photosynthesis throughout year/for longer [1]	
		(ii)	Sharp spines give protection against herbivores/being eaten [1]	
	(b)	**(i)**	6 bars correct [2] 4 or 5 bars correct [1] [2]	
		(ii)	86 [1]	
		(iii)	10 [1]	
		(iv)	Discrete categories/no intermediate values [1]	7
6	**(a)**	**(i)**	Insulin causes reduction in blood glucose level [1] converts glucose to glycogen (in liver) [1] [2]	
		(ii)	Type 1 as insulin taken by injection [1]	
	(b)	**(i)**	Invitro ------ animal -------- clinical [1]	
		(ii)	Testing on cells/in laboratory [1] expensive equipment/specialist scientists needed/trial and error effect [1] [2]	6

STEMUP.CO.UK

				AVAILABLE MARKS
7	(a)	(i)	**Any three from** ● can live in wider range of forests/habitats ● can feed on food (e.g. fallen seeds) on the ground/in more places ● can eat unripe berries/nuts/seeds/wider range of food ● therefore can use up food before the red squirrels can use it ● immune to the virus (that can kill red squirrels) [3]	
		(ii)	More likely to be on the ground/occur in larger numbers [1]	
		(iii)	Plant more coniferous forests/vaccinate against virus/eliminate or prevent movement of grey squirrels/special feeders for reds/ breeding programmes [1]	
	(b)		**Any two from** ● introduced from another country/by man ● spread rapidly/increase in numbers rapidly ● out-compete native species/better adapted than native species [2]	7
8	(a)	(i)	Passes genetically through the generations [1]	
		(ii)	Jack and Jill are carriers/heterozygous/have allele but do not have CF [1]	
	(b)	(i)	cc [1]	
		(ii)	3 [1]	
	(c)	(i)	Chromosome [1]	
		(ii)	Down syndrome [1] an extra chromosome present [1] [2]	7

9 Indicative content

AVAILABLE MARKS

- plant with leaf (or part of leaf) covered and leaf (or part of leaf) uncovered/one plant in light and one in dark
- method of covering described
- plant left in bright light for e.g. 24 hours to 1 week
- iodine added
- blue black/starch only present where uncovered/in light
- if starch present iodine turns blue/black
- starch only present if photosynthesis takes place

Band	Response	Mark
A	Candidates use appropriate specialist terms throughout to describe an investigation showing that light is needed for photosynthesis using **five to seven** of the points above, in a logical sequence. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5–6]
B	Candidates use some appropriate specialist terms to describe an investigation showing that light is needed for photosynthesis using **three or four** of the points above, in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3–4]
C	Candidates describe an investigation showing that light is needed for photosynthesis using **one or two** of the above points. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and have made limited use of specialist terms. The form and style are of a limited standard.	[1–2]
D	Not worthy of credit.	[0]

6

Total **60**

Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
2012–2013

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

GSS11

TUESDAY 14 MAY 2013, MORNING

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	

STEMUP.CO.UK

Examiner Only	
Marks	Remark

1 (a) (i) The table below gives information about two minerals needed in our diet. Complete the table.

Mineral	Function	Source
calcium		milk
iron	making red blood cells	

[2]

(ii) Give the role of fibre in our diet.

Circle the correct answer.

provides energy : prevents constipation : prevents scurvy

[1]

(b) (i) Complete the following sentences.

Choose from:

boys : less active : active : girls

A person's gender (sex) can affect how much energy they need,

_____ usually need **more energy** than

_____ . Also, _____ people need

more energy than _____ people. [2]

(ii) Apart from gender and activity, name **one** other thing that affects the energy we need.

_____ [1]

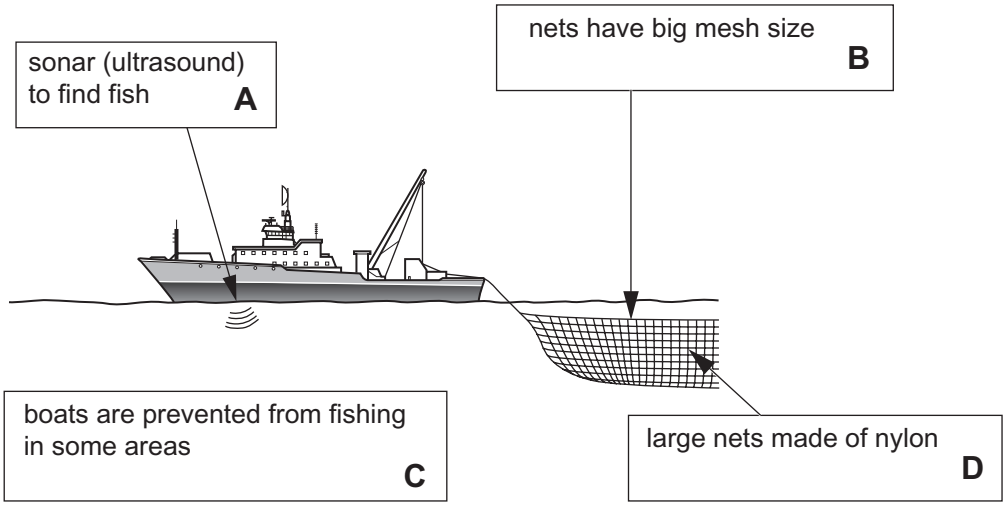
Examiner Only	
Marks	Remark

2 Some types of fish in the Irish Sea are endangered and at risk of extinction due to overfishing.

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

_____ [1]

(b) Shown below are some features of modern fishing.



(i) Which **two** features shown above (**A**, **B**, **C** or **D**) will help protect fish numbers?

_____ and _____ [2]

(ii) Apart from overfishing state **one** other thing that can cause some types of fish to become endangered.

Choose from:

creating nature reserves : pollution : animal testing

_____ [1]

STEMUP.CO.UK

Examiner Only	
Marks	Remark

3 Respiration and photosynthesis are processes involved in energy flow.

(a) Complete the word equation for **respiration**.

Choose from:

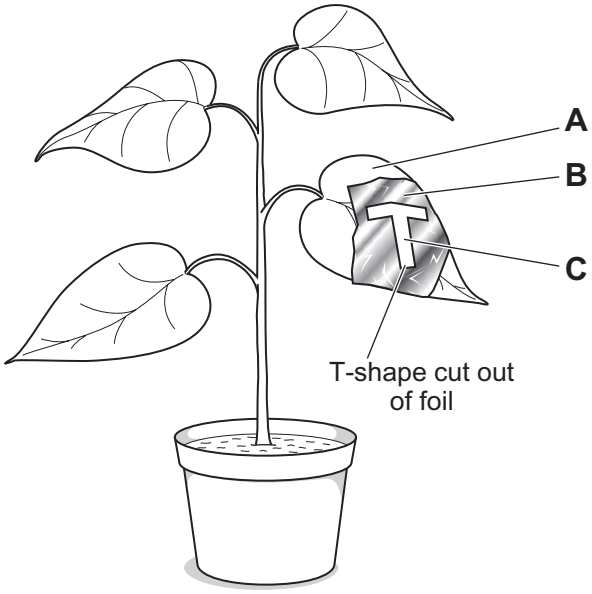
nitrogen : glucose : vitamin C : water

Oxygen + _____ → carbon dioxide + _____ + energy

[2]

A student set up the investigation below to test if light is needed for **photosynthesis**.

One leaf was covered with aluminium foil as shown.



The plant was left in bright light for 48 hours. The leaf was then removed and tested for starch using iodine.

(b) Complete the table below.

Part of leaf	Colour after starch test	Starch present or absent
A	black	present
B		
C		

[2]

STEMUP.CO.UK

(c) Shown below is a simple food chain.

Examiner Only	
Marks	Remark



(i) From the food chain name the:

producer. _____

secondary consumer. _____ [2]

(ii) What is the original source of energy in all food chains?

_____ [1]

STEMUP.CO.UK

Examiner Only	
Marks	Remark

4 **(a)** Given below are parts of the male reproductive system.

Using lines, link each part to its function.

Part	Function
	nourishes (feeds) sperm
testes	
	makes sperm
prostate gland	
	tube which carries sperm

[2]

(b) Complete the sentence below to describe what a hormone is.

Choose from:

chemical messengers : nervous system : blood : nerve impulses

Hormones are _____ that travel in the _____ to a target organ where they act. [2]

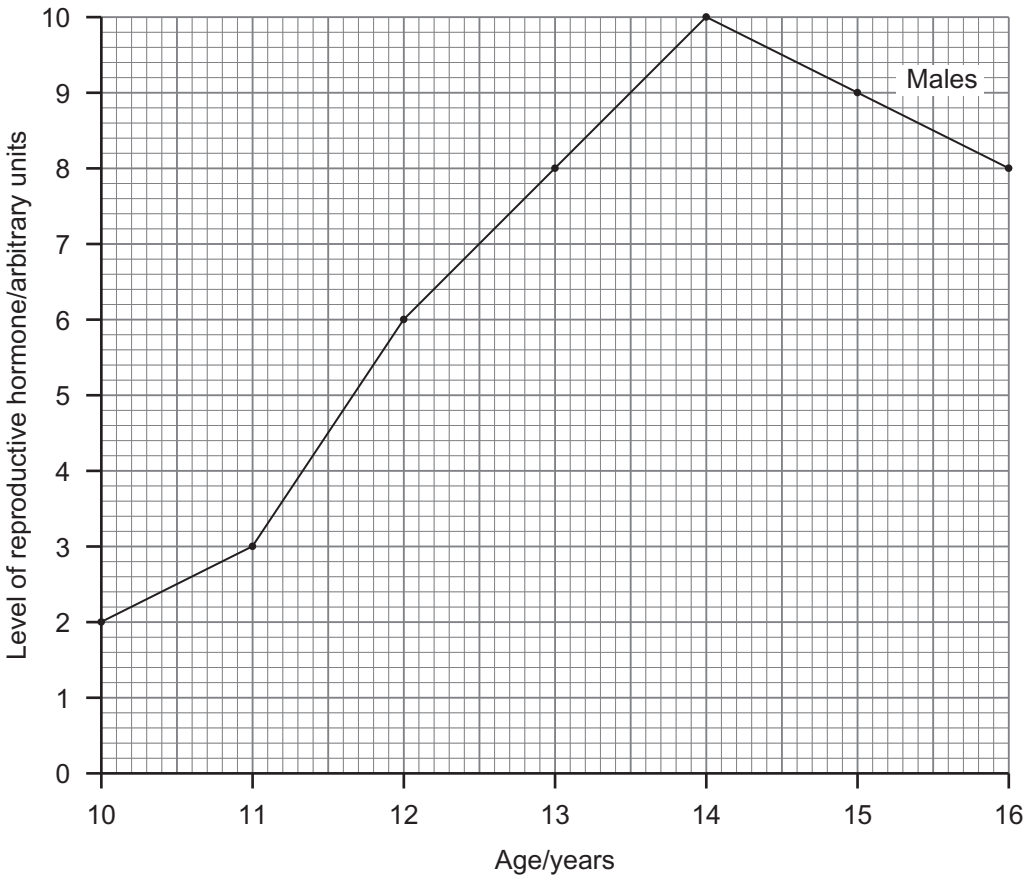
(c) The table below shows how the level of hormones controlling sexual development changes between the ages of ten and sixteen.

	Level of reproductive hormone/arbitrary units	
Age/years	**Females**	**Males**
10	4	2
11	6	3
12	10	6
13	9	8
14	8	10
15	7	9
16	5	8

STEMUP.CO.UK

The values for males have been plotted on the graph below.

(i) Plot and draw a line graph for the **females**.



[3]

(ii) Describe fully the trend shown in **male** hormone levels.

_____

_____ [1]

(iii) Identify **one** difference in the trend between male and female hormone levels.

_____

_____ [1]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

5 The table shows the results from an experiment investigating how the number of cress seedlings in a pot affects the mass of the seedlings.

Number of seedlings per pot	Total mass of seedlings/g	Average mass of seedlings/g
1	20	20
5	65	13
10		7
15	90	

(a) Complete the table by calculating the missing values.

[2]

(b) Describe **and** explain how the number of seedlings per pot affects the **average mass** of seedlings.

[3]

(c) Suggest **two** things that had to be kept the same in this investigation to make the results valid.

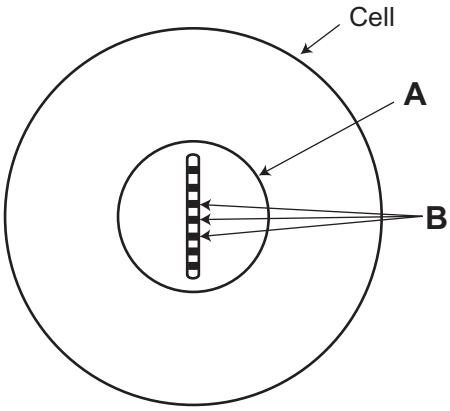
1. _____

2. _____

[2]

Examiner Only	
Marks	Remark

6 **(a)** The diagram represents an animal cell. Only one chromosome is shown.



(i) Name the structure labelled **A**.

_____ [1]

(ii) Name the structures labelled **B** on the chromosome.

_____ [1]

(b) Tulip flowers can be red or white. The allele for red colour is dominant to the allele for white colour.

(i) Complete the genetic diagram below to show the offspring of a cross between a **heterozygous** red tulip and a white tulip.

Use the symbols; R = red r = white

		Red	
		R	
White		Rr	
	r		rr

[2]

(ii) What percentage of the offspring are white?

_____ % [1]

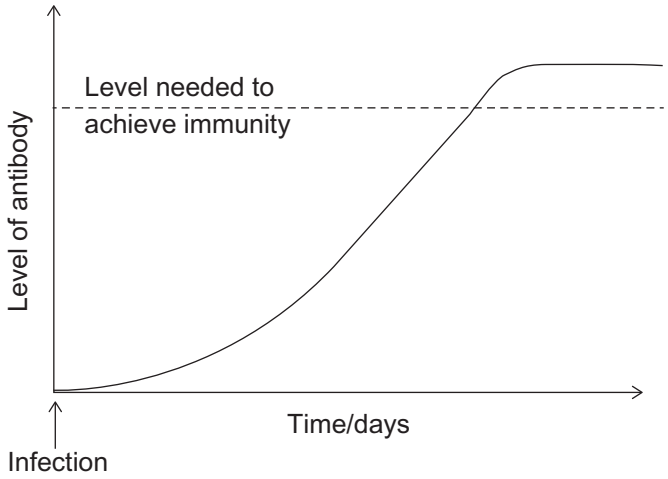
(iii) Give the genotype of a **homozygous** red tulip.

_____ [1]

STEMUP.CO.UK

Examiner Only	
Marks	Remark

7 **(a)** The following graph shows how our antibody level changes when we have a bacterial infection.



(i) Suggest why there is a delay between infection and achieving immunity.

_____

_____ [1]

(ii) Using the graph above, give **two** pieces of evidence that show the immunity achieved is active immunity.

1. _____

_____

2. _____

_____ [2]

(b) Phagocytosis also helps protect against bacterial infection.

Describe fully the process of phagocytosis.

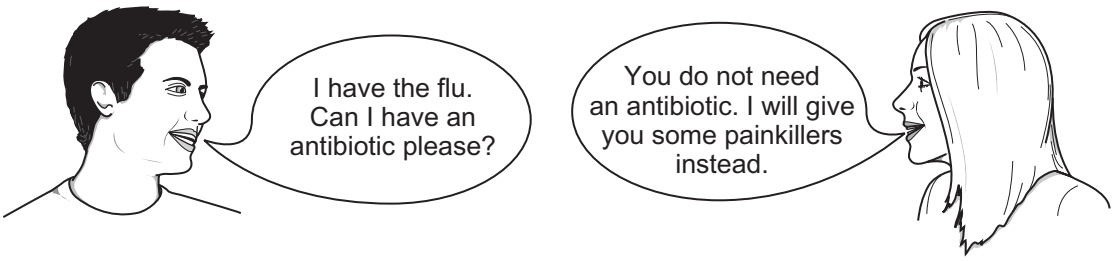
_____

_____

_____ [2]

STEMUP.CO.UK

(c) The following diagram shows Mr Wilson talking to his doctor.



Mr Wilson Doctor

(i) Explain fully why the doctor did not prescribe an antibiotic for Mr Wilson's flu.

_____

_____

_____ [2]

(ii) Suggest why new types of antibiotics need to be continually developed.

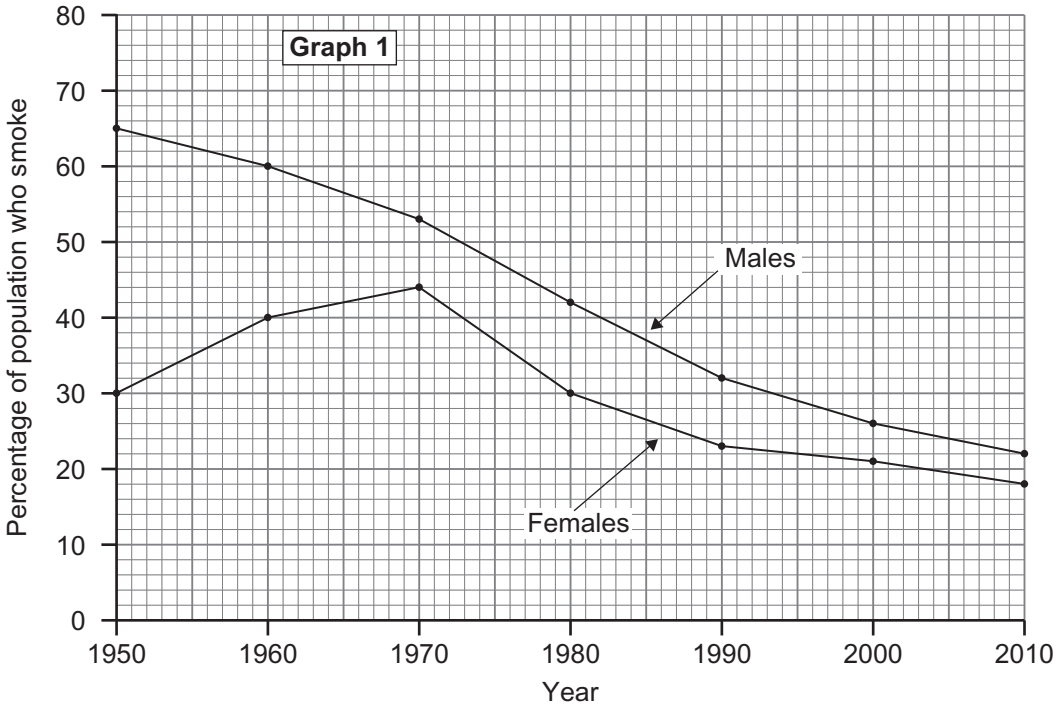
_____ [1]

Examiner Only	
Marks	Remark

STEMUP.CO.UK

Examiner Only	
Marks	Remark

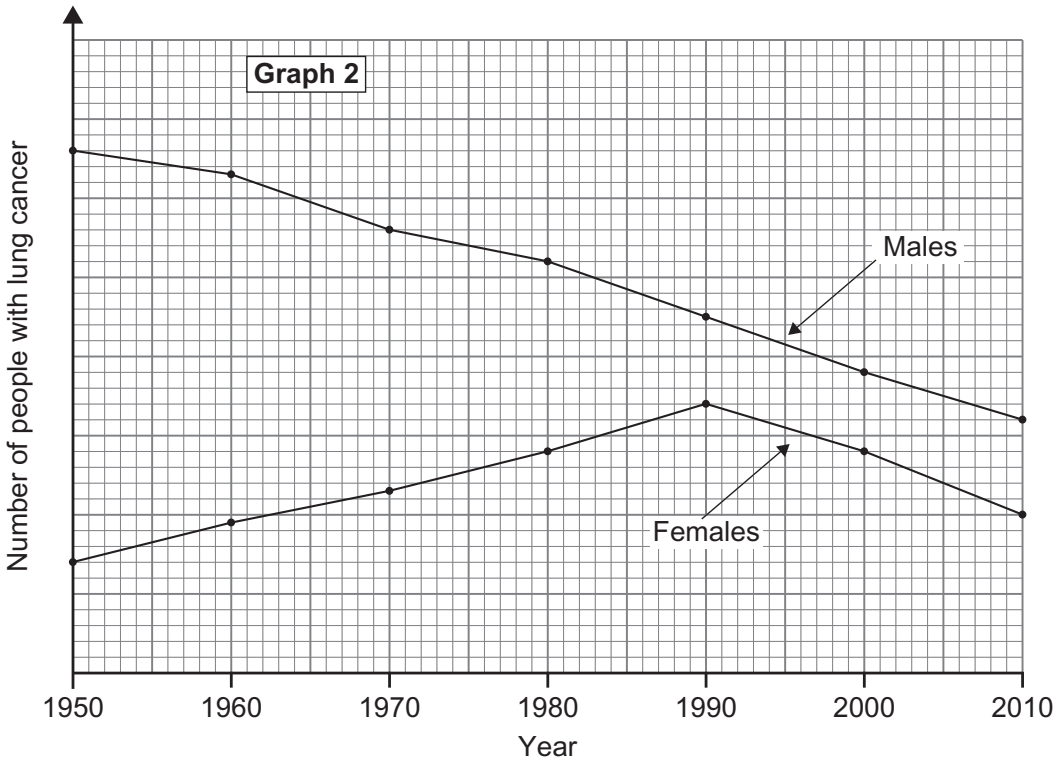
8 **Graph 1** shows the percentage of the population who were smokers between the years 1950–2010.



(a) Which year had the maximum percentage of female smokers?

_____ [1]

Graph 2 shows how the number of people with lung cancer changed between the years 1950–2010.



STEMUP.CO.UK

(b) Use **Graphs 1** and **2** to describe **and** explain the evidence that links smoking to lung cancer.

_____

_____

_____

_____

_____ [3]

(c) Apart from causing lung cancer, smoking affects smokers in many other ways. For example, many smokers often lack energy.

Explain why.

_____

_____

_____ [2]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

9 **(a)** Global warming is a result of the carbon cycle becoming unbalanced. Give an account of global warming.

Your account should describe **and** explain:

- the causes
- the effects
- what can be done to reduce global warming.

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

[6]

(b) Pollution in the environment can be monitored through the use of biotic indicators such as lichens. Explain why lichens are effective in doing this.

[1]

THIS IS THE END OF THE QUESTION PAPER

Permission to reproduce all copyright material has been applied for.
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA will be happy to rectify any omissions of acknowledgement in future if notified.

113285

Rewarding Learning

General Certificate of Secondary Education
2012–2013

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

TUESDAY 14 MAY 2013, MORNING

MARK SCHEME

STEMUP.CO.UK

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

					AVAILABLE MARKS
1	**(a)**	**(i)**	Helps bones/teeth develop [1] red meat, green vegetables [1]	[2]	
		(ii)	Prevents constipation	[1]	
	(b)	**(i)**	Boys – girls [1] active – less active [1]	[2]	
		(ii)	Age	[1]	6
2	**(a)**		Species dies out	[1]	
	(b)	**(i)**	B [1] C [1]	[2]	
		(ii)	Pollution	[1]	4
3	**(a)**		Glucose [1] water [1]	[2]	
	(b)		B yellow/red – absent C black – present [$\frac{1}{2}$ mark each point; round down]	[2]	
	(c)	**(i)**	Nettle [1] Blue tit [1]	[2]	
		(ii)	Sun/sunlight	[1]	7
4	**(a)**		Testes – makes sperm [1] prostate gland – nourishes (feeds) sperm [1]	[2]	
	(b)		Chemical messengers [1] blood [1]	[2]	
	(c)	**(i)**	All points accurately plotted [2] one error [1] Line joined between points [1]	[3]	
		(ii)	Males rise to optimum then fall [1]		
		(iii)	Females peak before males [1]	[2]	9
5	**(a)**		70 [1] 6 [1]	[2]	
	(b)		As seedling number increases average mass of seedlings decrease [1] competition for water/nutrient/light/space (any two) [2]	[3]	
	(c)		Any **two** from ● same amount/type of compost/size of pot ● same amount of water ● kept at same temperature/light ● left for same length of time	[2]	7

				AVAILABLE MARKS
6	**(a)**	**(i)**	Nucleus [1]	
		(ii)	Genes [1]	
	(b)	**(i)**		

		r
r		rr
	Rr	

Gametes correct [1] offspring correct [1] [2]

(ii) 50 % [allow ncm] [1]

(iii) RR [1] 6

7 **(a)** **(i)** Time for antibodies to be made/immune system responding to infection [1]

(ii) Takes time for immunity level to be achieved [1]
antibody level remains high [1] [2]

(b) Phagocytes engulf/surround/bacteria/microbes [1]
bacteria/microbes are digested/broken down/eaten/killed [1] [2]

(c) **(i)** Flu is a virus/antibiotics do not work on viruses [1]
antibiotics only work on bacteria [1] [2]

(ii) Bacterial/microbe resistance/bacteria mutate [1] 8

8 **(a)** 1970 [1]

(b) Any **three** from
- Both percentage of males who smoke and lung cancer in males decreasing from 1950–2010/when percentage of male smokers high/number of males with cancer high
- When percentage of male smokers low, number of males with lung cancer low
- When percentage of female smokers rise so does number with lung cancer
- lag between smoking and lung cancer peaks due to time taken to develop lung cancer
- more male (than female) smokers, more males than females had lung cancer [3]

(c) Any **two** from
- carbon monoxide in cigarette smoke
- reduces blood's ability to carry oxygen/less oxygen
- for respiration [2] 6

AVAILABLE MARKS

9 (a) Indicative content

- increased combustion/use of fossil fuels
- deforestation
- increases carbon dioxide in atmosphere/too much carbon dioxide
- greenhouse layer/carbon dioxide layer traps escaping heat energy/heat cannot escape from atmosphere
- climate change/more extreme weather conditions
- melting of ice caps/sea levels rise
- alternative fuels/reduced combustion/energy efficiency
- increase in forests

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe global warming using **six to eight** of the points above, in a logical sequence. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5–6]
B	Candidates use some appropriate specialist terms to describe global warming using **three to five** of the points above, in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3–4]
C	Candidates describe global warming using **one or two** of the above points. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and have made limited use of specialist terms. The form and style are of a limited standard.	[1–2]
D	Not worthy of credit.	[0]

[6]

(b) Only grow where pollution levels are low/high levels of pollution kills them [1]

7

Total **60**

STEMUP.CO.UK

Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
2012–2013

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

GSS11

MONDAY 25 FEBRUARY 2013, MORNING

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	

STEMUP.CO.UK

BLANK PAGE

Examiner Only	
Marks	Remark

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
	where the foetus (baby) develops
ovary	
	produces eggs (ova)
uterus	
	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]

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.



Connor Anne

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

_____

_____

_____ [2]

Examiner Only	
Marks	Remark

STEMUP.CO.UK

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]

(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.

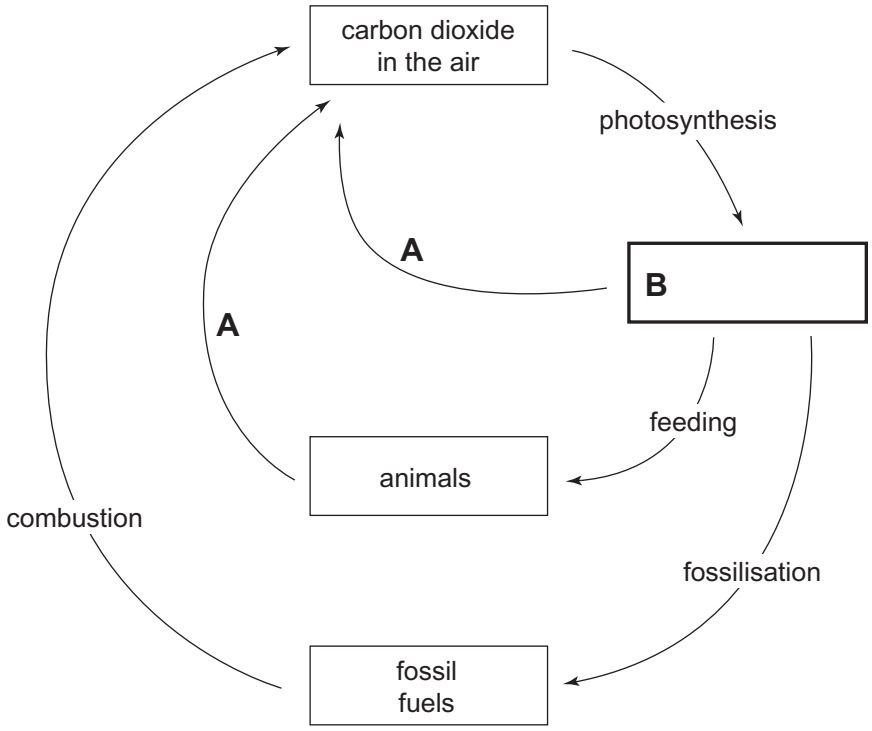
_____ [1]

Examiner Only

Marks	Remark

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]

(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.

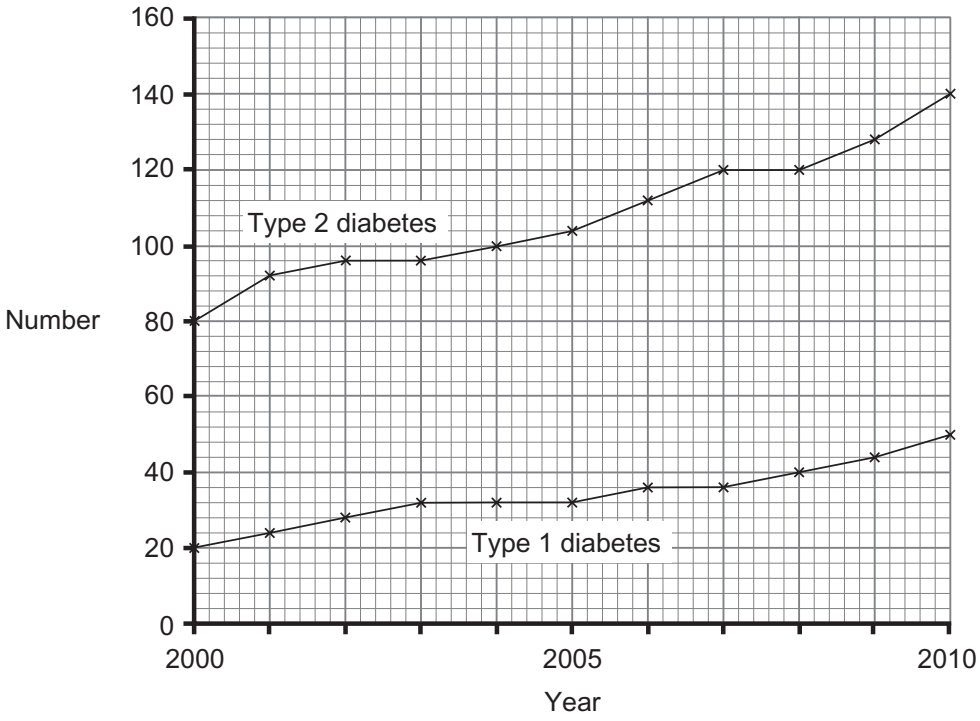
Reason	Tick (✓)
Coal is becoming more expensive	
More evidence of climate change	
More fossil fuels are being used	
Governments do not want to slow down industrial growth	
Better education about global warming	

[2]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

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



(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]

STEMUP.CO.UK

Examiner Only	
Marks	Remark

(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**.

_____

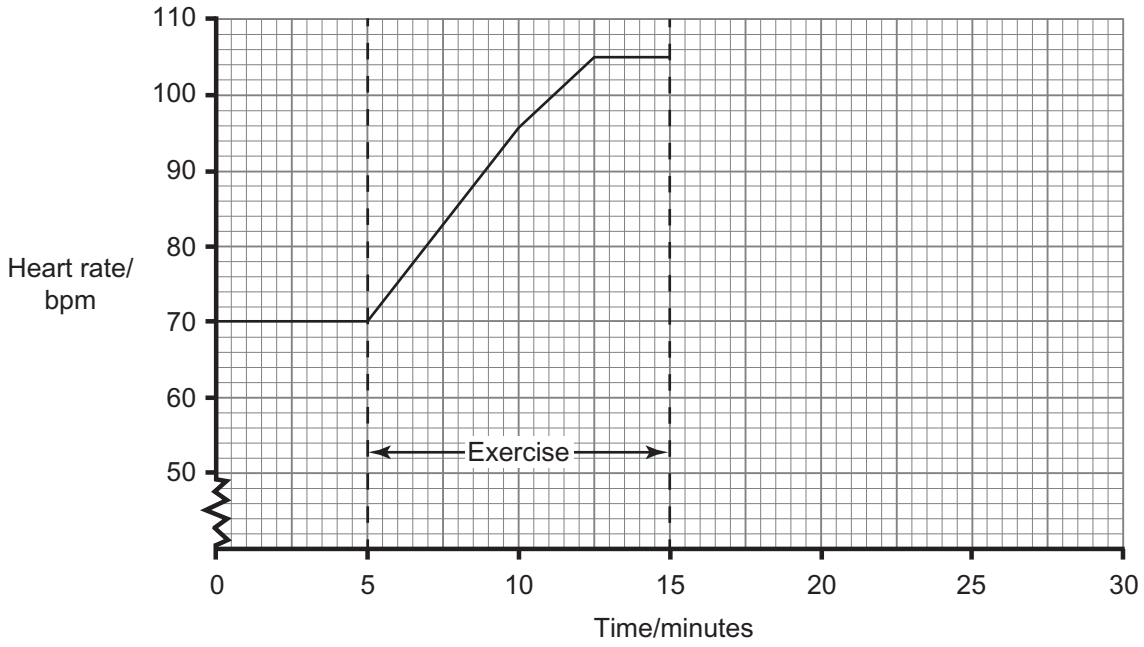
_____ [1]

(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.



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

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]

BLANK PAGE

(Questions continue overleaf)

STEMUP.CO.UK

8 The photograph below shows lichen growing on a tree.



Source: Chief Examiner

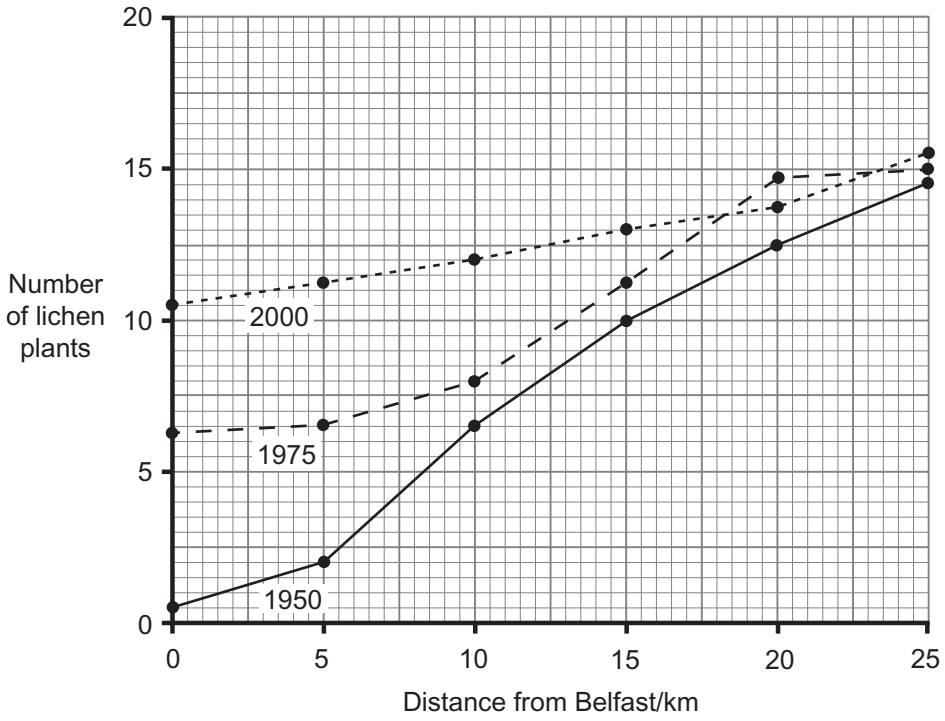
Lichen is a biotic pollution monitor as it only grows in large numbers where there is very little pollution.

(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

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.

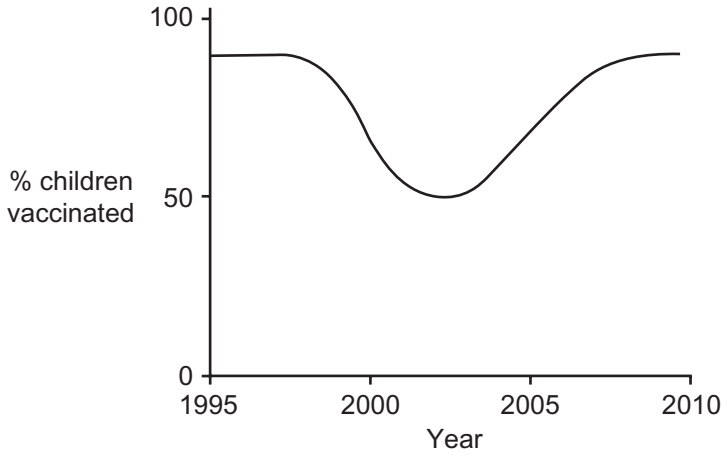
In this question you will be assessed on your written communication skills including the use of specialist scientific terms.

[6]

STEMUP.CO.UK

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

Permission to reproduce all copyright material has been applied for.
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA will be happy to rectify any omissions of acknowledgement in future if notified.

113837

Rewarding Learning

General Certificate of Secondary Education
2012–2013

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

MONDAY 25 FEBRUARY 2013
9.30 am–10.30 am

MARK SCHEME

STEMUP.CO.UK

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

				AVAILABLE MARKS
1	**(a)**			

Type of microorganism	Disease
virus	polio
fungi	**thrush**
bacteria	gonorrhoea

one mark for each correct answer [3]

(b) tar [1] nicotine [1] (either order) oxygen [1] [3] — 6

2 **(a)** Ovary – produces eggs (ova) [1]
Uterus – where foetus (baby) develops [1] [2]

(b) hormone [1]
egg [1] [2]

(c) May eventually want children/might change mind/sterilisation permanent [1]
as only 20 year olds/just married/have no children [1] [2] — 6

3 **(a)** **(i)** Producer [1]

(ii) Sun/sunlight [1]

(b) Continuous [1]

(c) **(i)** (Random) changes in the (structure/number) [1]
of chromosomes/genes/DNA [1] [2]

(ii) (skin) cancer/Down syndrome/any appropriate alternative [1] — 6

4 **(a)** **(i)** Plants/named plant [1]

(ii) Respiration [1]

(iii) Increased combustion/increased use of fossil fuels [1]
deforestation [1] [2]

(b) More evidence of climate change [1]
Better education about global warming [1] [2] — 6

				AVAILABLE MARKS
5	**(a)**	**(i)**	140 – 50 [1] 90 [1] (1 correct reading from graph and correct answer through non-sequential marking = 1) [2]	
		(ii)	More obesity [1]	
	(b)	**(i)**	Any **two** from: ● high number of patients affected/more people with diabetes ● cost of (producing) insulin/insulin needed every day/a lot of insulin is used ● long term effect named and explanation of cost ● lasts a long time/get it for life [2]	
		(ii)	Not taking insulin/taking incorrect amount of insulin/not controlling sugar/carbohydrate intake/not exercising [1]	
	(c)		Heart disease/stroke/blindness/circulatory problems [1]	7
6	**(a)**	**(i)**	Each point accurate (20 min = 70 bpm; 30 min = 70 bpm) [1] with correct line joining points from end of exercise [1] [2]	
		(ii)	35 bpm [1]	
		(iii)	50% [1]	
		(iv)	Any **three** from: ● more/quicker blood (or blood component) ● provides oxygen/glucose ● for respiration ● in muscles [3]	
	(b)		Men have higher cholesterol levels than women [1] cholesterol levels increase with age (in both sexes) [1] [2]	
	(c)		Any **two** from: ● reducing stress ● stopping smoking ● exercise ● reducing drinking of alcohol [2]	11

		AVAILABLE MARKS
7 **(a)** 3 : 1/75%:25% [1]		
(b) **(i)** Punnett Square (gamete;) (offspring based on gametes;)		

	R	
R	RR	Rr
r		rr

[2]

(ii) Offspring genotypes RR ____ Rr rr [1]
(based on Punnett Sq)

Offspring phenotypes Red ____ Red White [1] — 5
(based on genotypes)

8 **(a)** Living/biological [1]

(b) **(i)** Decrease in pollution between 1950–2000/decrease in pollution the further away from Belfast [1]
less fossil fuels used/more alternative fuels used/Belfast more polluted as has more industry [1] [2]

(ii) Any **two** from:
- same number of trees sampled at each point
- same area of each tree sampled
- same place on each tree sampled
- same time of year/season
- same type of trees
- same trees/geographical area [2] — 5

AVAILABLE MARKS

9 **(a)** Indicative content

- modified/weakened/dead microorganisms/pathogens/named microorganisms
- (cause) antibody production
- by lymphocytes/white blood cells
- due to antigens present
- (if infected with same microorganism) antigens and antibodies combine/due to complementary shape
- causing clumping/immobilisation
- (long term immunity due to) creation of memory cells/antibody levels remain high/antibodies produced faster
- as antibodies produced by body is active immunity

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe how vaccinations work using **five to eight** of the points above, in a logical sequence. They use good spelling, punctuation and grammar and the form and style are of a high standard.	5–6
B	Candidates use some appropriate specialist terms to describe how vaccinations work using **three to four** of the points above, in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	3–4
C	Candidates describe how vaccinations work using **one or two** of the above points. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and have made limited use of specialist terms. The form and style are of a limited standard.	1–2
D	Not worthy of credit.	0

[6]

(b) **(i)** The percentage of children vaccinated has increased [1]

(ii) The vaccination uptake does not reach 100%/not all children are vaccinated [1] 8

Total **60**

New Specification

Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2012–2013

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

GSS11

MONDAY 12 NOVEMBER 2012, AFTERNOON

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 **7**.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total Marks	

STEMUP.CO.UK

BLANK PAGE

Examiner Only	
Marks	Remark

1 **(a)** The fen violet is a plant that is nearly extinct.



© Crown copyright – The Department of the Environment (Northern Ireland)

What word is used to describe plants that are nearly extinct?

Choose from:

discontinuing **non-active** **endangered**

_____ [1]

(b) Complete the sentence below.

Choose from:

water : oxygen : carbon dioxide : food : colour

It is important to save plants from extinction as they provide us with

_____ and _____. [2]

STEMUP.CO.UK

Examiner Only	
Marks	Remark

2 **(a)** Below are some processes in the carbon cycle and their descriptions.

Use lines to link each process with its correct description.

Process	Description
burning	carbon released into the air from fossil fuels
feeding	carbon taken in by animals from plants
	carbon taken in by plants from animals

[2]

Increasing carbon dioxide is causing global warming and affecting the area of ice in polar regions.

Year	1998	1999	2000	2001	2002
Average area of ice/thousands km^2	10.3	10.2	8.8	7.2	5.4

The picture below shows how a polar bear uses ice to hunt for food.



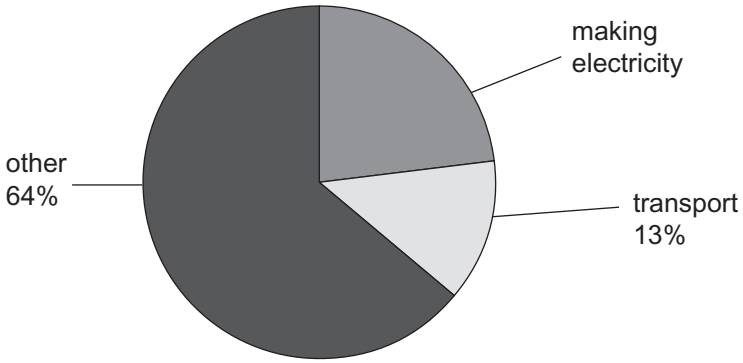
© Design Pics / Thinkstock

(b) Use the information to suggest how global warming is affecting the polar bear.

_____

_____ [2]

The pie chart shows some sources of carbon dioxide in the UK.



(c) Calculate the percentage of carbon dioxide produced when making electricity.
(Show your working out.)

_____ % [2]

(d) To reduce the carbon dioxide in the air more trees are being planted.
Name the process by which trees remove carbon dioxide from the air.

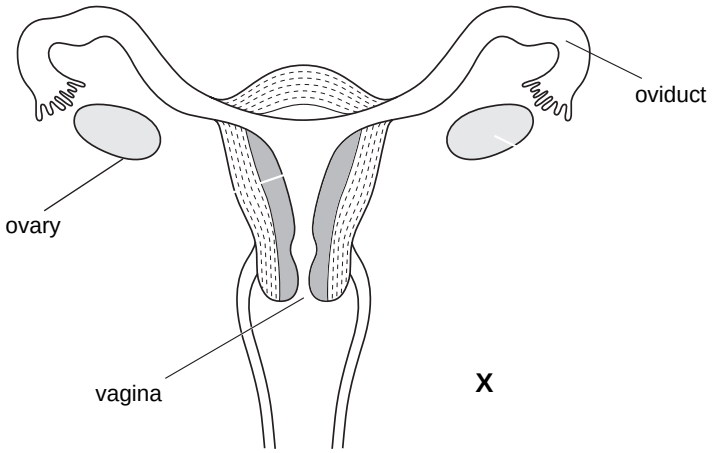
_____ [1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

3 **(a)** The diagram shows the female reproductive system.



© Focus Educational Software

(i) On the diagram draw a line from **X** to the cervix. [1]

(ii) Name the part where sperm fertilises an ovum (egg).

_____ [1]

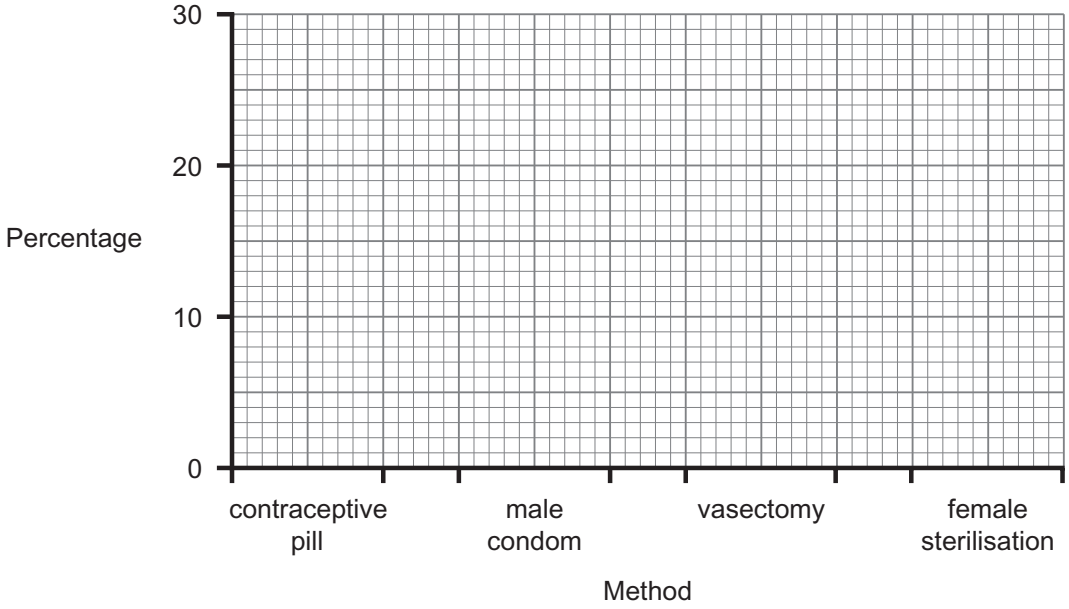
(iii) What is the function of the ovaries?

_____ [1]

(b) The table below shows some methods of contraception used by 20 and 40 year olds.

Method	Percentage	
	20 year olds	40 year olds
contraceptive pill	27	22
male condom	22	18
vasectomy	8	20
female sterilisation	6	14

(i) On the grid below draw a **bar chart** showing the contraceptive methods used by 40 year olds.



[2]

(ii) State the method least used by **20 year olds** and suggest a reason for this.

_____

_____

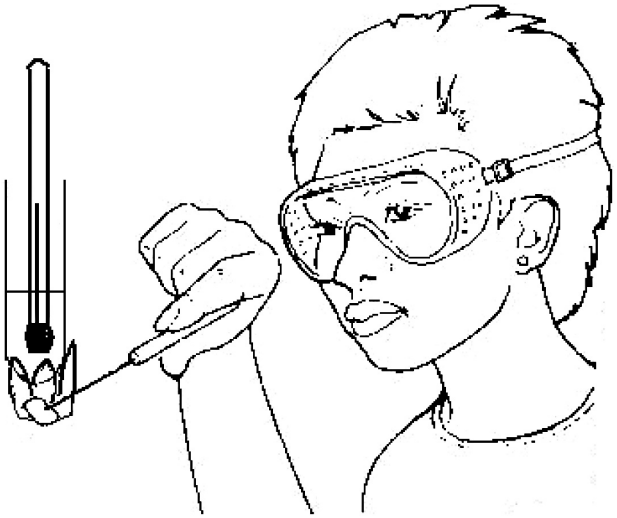
_____ [2]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

4 **(a)** Shown below is Doreen who is investigating the amount of energy in different foods.



© Science at work – Body Maintenance by L Mooney & A Rivers, published by Longman Publishing, 1992, reproduced by permission of Pearson Education Ltd. Further duplication other than for teaching and study is prohibited – Pearson Education Ltd, copyright holders.

(i) State **two** things that have to be done to make this investigation valid (a fair test).

1. _____

2. _____ [2]

Doreen is given three foods labelled **A**, **B** and **C** to test. Her results are given below.

Food	Starting temperature/°C	Final temperature/°C	Temperature rise/°C
A	18	25	7
B	19	51	32
C	17	30	13

The three foods tested were:

Deep fried potato (chips)
Baked potato
Boiled cabbage

(ii) Use the list to state which of the three foods was labelled **B** and explain your choice.

_____

_____

_____ [2]

Examiner Only	
Marks	Remark

(b) Below are some statements about food. Place a tick (✓) beside one statement which is correct for **protein**.

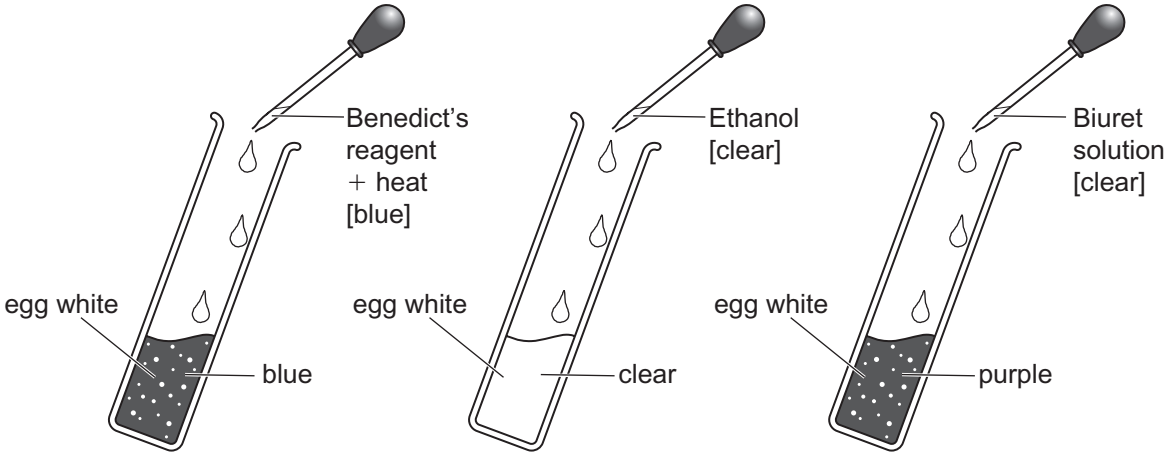
Lemons and oranges are a good source ☐

It is used for growth and repair ☐

Too much can block coronary arteries ☐

[1]

(c) Egg white was tested with three different chemicals to determine the main food type it contained. The colour before and after each test is given in the diagram below.



Use the diagram and your knowledge to answer the questions below.

(i) Name the chemical used to test for sugars.

_____ [1]

(ii) Name the main food type in egg white. Explain your answer.

_____

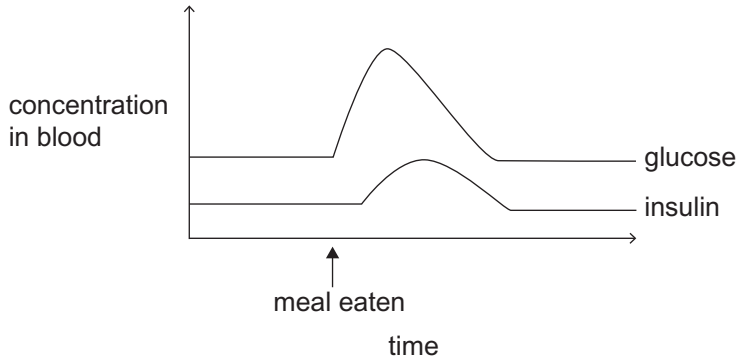
_____

_____ [2]

STEMUP.CO.UK

Examiner Only	
Marks	Remark

5 **(a)** The graph shows the levels of insulin and glucose in the blood.



(i) Use the graph to describe **one** difference between the concentration of glucose and the concentration of insulin in the blood.

_____ [1]

(ii) Explain how the graph suggests that insulin is released into the blood because of an increase in glucose.

_____

_____ [1]

(b) Insulin is a chemical messenger carried in the blood to the liver. What general name is given to chemical messengers?

Choose from:

antibodies **phagocytes** **hormones**

_____ [1]

STEMUP.CO.UK

(c) Diabetes Type 1 is caused when the body does not produce enough insulin.

(i) State **two** symptoms of diabetes.

1. _____

2. _____ [2]

(ii) Diabetes Type 1 is treated with injections of insulin. Suggest what might happen to glucose levels if too much insulin is taken.

_____ [1]

(d) Suggest **one** reason why the number of teenagers with diabetes Type 2 is rising.

_____ [1]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

6 **(a)** The ability to roll your tongue is caused by a dominant allele (R).

(i) Complete the diagram below to show how two parents who are tongue rollers can have a child who cannot roll his/her tongue.

	R	
	Rr	

[3]

(ii) What is the probability that they will have a child who cannot roll his/her tongue?

_____ [1]

(b) Tongue rolling is an example of discontinuous variation.

(i) What is meant by the term **discontinuous**?

_____ [1]

(ii) Suggest **one** other example of discontinuous variation.

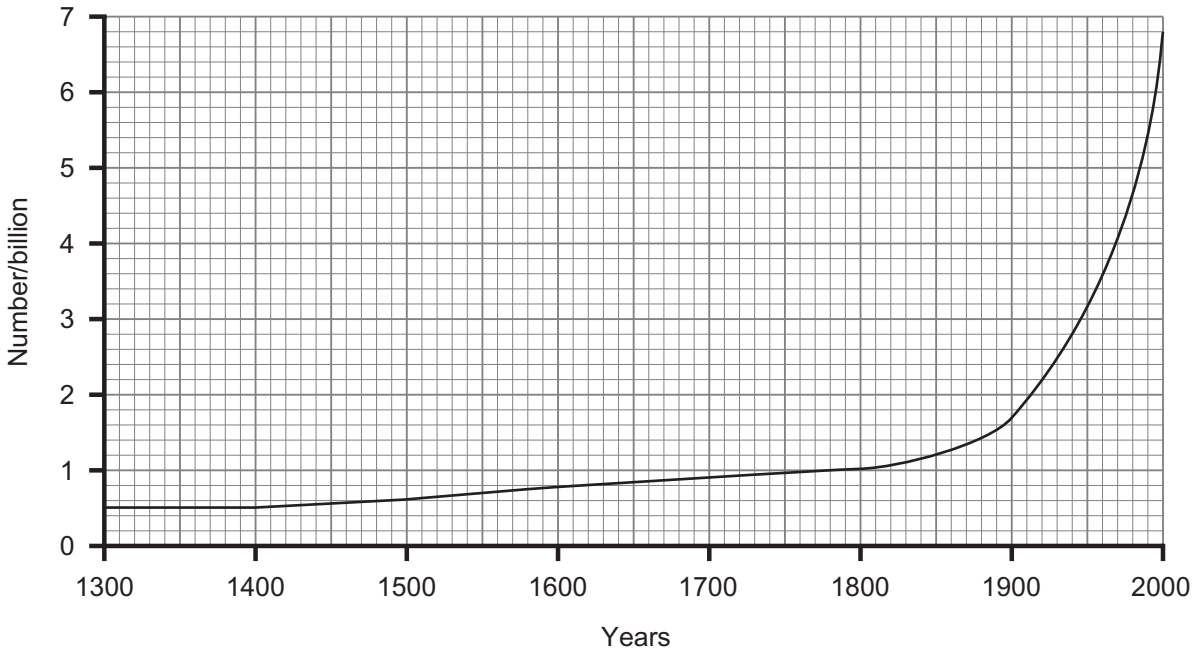
_____ [1]

(c) The graph shows the result of recording the heights of a very large number of people. Complete the sketched line in the graph below.



[2]

7 The graph below shows the human population from the year 1300 to the year 2000.



Use this graph and your knowledge to explain why there is concern that the human population size is putting planet Earth at risk.

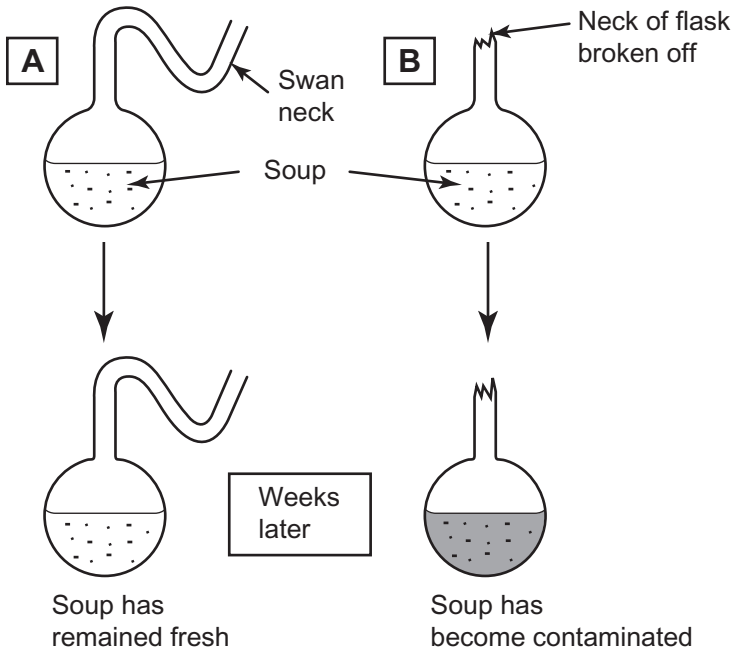
In this question you will be assessed on your written communication skills including the use of specialist scientific terms.

[6]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

8 **(a)** The following diagram shows the apparatus Louis Pasteur used to show that contamination of food was caused by microorganisms from the air.



(i) Explain fully why the soup in **A** stayed fresh and the soup in **B** did not.

[3]

(ii) Suggest **one** reason why there were less deaths from open wounds after Pasteur's discovery.

[1]

(b) **(i)** Explain fully why diseases such as flu cannot be treated with antibiotics.

[2]

(ii) Give **one** example of a disease that can be treated by antibiotics.

[1]

Examiner Only	
Marks	Remark

9 **(a)** Complete the table to show the differences between a voluntary and a reflex action.

Choose from:

varies : fast : always the same : slow

Differences	Voluntary	Reflex
speed of response		
response to stimulus		

[2]

(b) Describe the pathway taken when we respond to the stimulus of a loud noise by covering our ears with our hands. Include **three** structures of the nervous system in your answer.

_____

_____

_____

_____ [3]

(c) Describe the effect on the speed of reactions of:

alcohol. _____

_____

cocaine. _____

_____ [2]

THIS IS THE END OF THE QUESTION PAPER

Permission to reproduce all copyright material has been applied for.
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA will be happy to rectify any omissions of acknowledgement in future if notified.

112989

New Specification

Rewarding Learning

General Certificate of Secondary Education
2012–2013

Science: Single Award

Unit 1 (Biology)

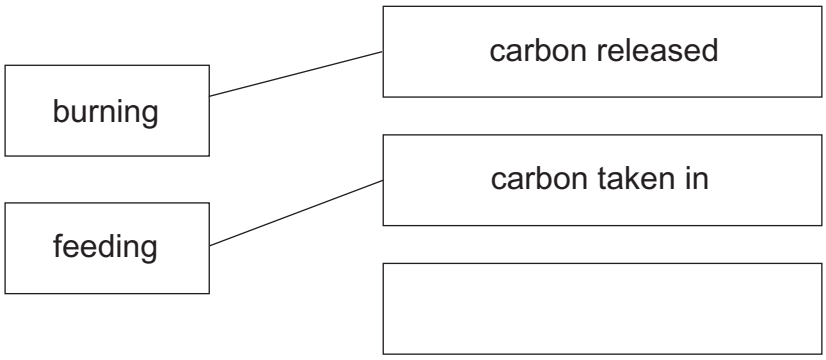
Foundation Tier

[GSS11]

MONDAY 12 NOVEMBER 2012
1.30 pm–2.30 pm

MARK SCHEME

STEMUP.CO.UK

				AVAILABLE MARKS
1	**(a)**	endangered	[1]	
	(b)	food [1] oxygen [1]	[2]	3
2	**(a)**		[2]	
	(b)	melting ice [1] losing habitats/cannot hunt/no food [1] endangered [1] *Any* 2	[2]	
	(c)	64 + 13 = 77 / 100 − 77 [1] 23 [2]	[2]	
	(d)	photosynthesis	[1]	7
3	**(a)**	**(i)** line from X to cervix	[1]	
		(ii) oviduct	[1]	
		(iii) produce/store/release eggs [ova]	[1]	
	(b)	**(i)** all bars correct – 2 2/3 – 1	[2]	
		(ii) (female) sterilisation [1] : permanent [1] [not too young on own]	[2]	7
4	**(a)**	**(i)** same amount of water [1] same amount of food [1] hold until fully burned [1] same distance from TT [1] *Any* 2	[2]	
		(ii) chips [1] most energy/fat [1] [not just fat provides energy]	[2]	
	(b)	middle box ticked	[1]	
	(c)	**(i)** Benedict's (reagent)	[1]	
		(ii) protein [1] turns *biuret* purple [so positive]/*biuret* changes colour [1]	[2]	8

AVAILABLE MARKS

5 **(a)** **(i)** glucose higher than insulin [not faster]/rise at different times [1]

(ii) insulin rises after glucose rises [1]

(b) hormones [1]

(c) **(i)** need to urinate frequently [1] increased thirst and fluid intake [1] increased appetite [1] lethargy/dizziness/blurred vision/fainting/ shaking [1] agitation/mood swings [1] weight loss [1] sugar in urine/high sugar levels [1] *Any* 2 [2]

(ii) levels become too low/hypoglycaemia [1]

(d) more obesity/more processed food/less exercise [must be qualified] [1]

7

6 **(a)** **(i)**

	R	**r**
R	**RR**	**Rr**
r	Rr	**rr**

1 – parents [1]
1 – each row F1 [2]
[use ncm for offspring if parents incorrect]

(ii) 25%/1 in 4/1:3 [allow ncm] [1]

(b) **(i)** does not change/narrow range/discrete groups/small number of groups
[not can be put into groups] [1]

(ii) Any example (e.g. eye colour, blood groups, ear lobes, sex) [1]

(c) descending curve [1]
levelling out [1] [2]

8

STEMUP.CO.UK

7 Indicative content

AVAILABLE MARKS

- (Huge) increase over short time/1800–2000
- Increase more in future
- Increased demand for resources/supplies, e.g. food/will run out quicker
- Increased *pollution*
- example of *pollution* ×2 e.g. carbon dioxide/sewage/nitrate/more fossil fuels burnt/more global warming [any two of final bullet point]

Band	Response	Mark
A	Candidates must use appropriate specialised terms throughout to explain the concern in a logical sequence using 5 or 6 of the IC. SPG, form and style is of a high standard.	[5]–[6]
B	Candidates use some appropriate specialised terms to partially describe the concern using 3 or 4 of the IC. SPG, form and style is of a satisfactory standard.	[3]–[4]
C	Candidates describe the concern using 1 or 2 of the IC. However these are not in a logical sequence. SPG, form, style and use of specialised terms are limited.	[1]–[2]
D	Not worthy of credit.	[0]

6

8 (a) (i) A-microorganisms trapped [1] swan neck/bend [1] could not reach soup [1]/B – not trapped [1] no bend [1] could reach soup [1] [not just can or cannot cause contamination] [3]

(ii) knew to stop microorganisms getting in/cover wounds [1]

(b) (i) only affect diseases caused by bacteria [1] flu viral [1] [2]

(ii) TB/gonorrhoea/salmonella/chlamydia/MRSA/tonsillitis/meningitis/acne/tetanus *Any* 1 [1]

7

STEMUP.CO.UK

AVAILABLE MARKS

9 **(a)**

Differences	Voluntary	Reflex
speed of response	*slow/varies*	*fast*
response to stimulus	*varies*	*always the same*

$\frac{1}{2}$ mark each response marked down [2]

(b) (sound) receptors/ear sends signal [1] to coordinator/brain [1]
effector/muscles [1]
or sensory neurone [1] sends signal to relay neurone [1] sends signal to motor neurone [1] [3]

(c) slows reactions/depressant [1]
quicker/more alert/stimulant [1] [2]

7

Total **60**

STEMUP.CO.UK

New Specification

Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2012–2013

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

MONDAY 27 FEBRUARY 2012
9.30 am–10.30 am

GSS11

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 eight** 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 **7(a)**.

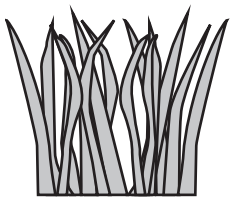
For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
Total Marks	

STEMUP.CO.UK

BLANK PAGE

Examiner Only	
Marks	Remark

1 Shown below is a food chain but it is not complete because the arrows are missing.



grass



rabbit



fox

(a) (i) Complete the food chain by adding the arrows. [1]

(ii) What do the arrows in a food chain show?

_____ [1]

(iii) Name the producer in this food chain.

_____ [1]

(iv) What is the source of energy for all food chains?

_____ [1]

(b) The table below shows the number of rabbits and foxes in a forest over a period of three years.

	Year		
	1st	2nd	3rd
rabbits	200	300	600
foxes	4	2	0

Explain how the drop in the number of foxes may have caused the rise in the number of rabbits.

_____

_____ [2]

STEMUP.CO.UK

Examiner Only	
Marks	Remark

2 **(a)** Given below are some eating disorders and the effect they have.

(i) Use lines to link each disorder with **one** effect it has on sufferers.

Eating disorder	Effect on sufferers
Bulimia	They become obese
Anorexia	They binge eat then make themselves vomit
	They eat very little and become thin

[2]

(ii) Modelling is a job that has a higher than average number of people who suffer from eating disorders. Suggest a reason for this.

_____

_____ [1]

(iii) Apart from modelling suggest another job that may have a high number of people with eating disorders.

_____ [1]

STEMUP.CO.UK

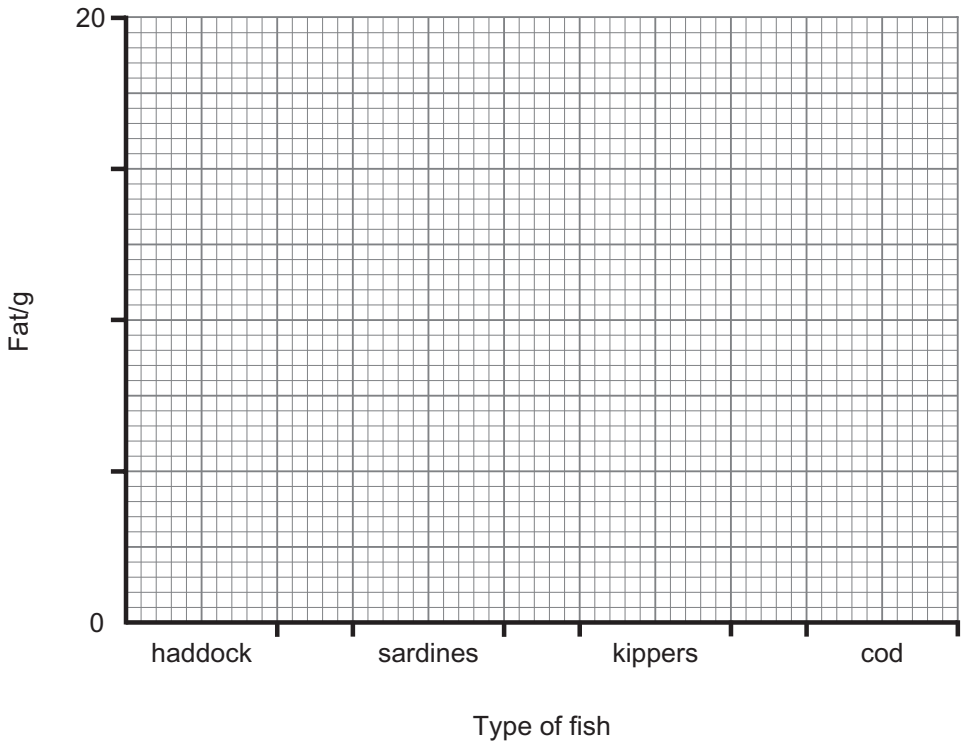
(b) The table below shows the amount of fat in four types of fish.

Type	Fat/g
haddock	8
sardines	14
kippers	11
cod	1

(i) On the grid below:

1. complete the scaling for the Y axis.

2. draw a **bar chart** for the information. [3]



(ii) Name the type of fish someone should eat if they are trying to lose weight. Explain your choice.

_____

_____ [2]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

3 **(a)** The table below shows information about some methods of contraception. Using a tick (✔) complete the table to give **one** statement for each method.

The first is done for you.

Method of contraception	Permanent	Prevents sexually transmitted diseases	Changes hormone levels
female sterilisation	✔		
condoms			
contraceptive pill			

[2]

(b) **(i)** Complete the sentences below.

Choose from:

cervix **oviduct** **sperm**

testes **fertilisation** **prostate**

Female sterilisation is permanent because the _____

is cut. Therefore an ovum (egg) and a _____ do not

meet and _____ cannot happen. [3]

(ii) Give **two** reasons why some people do not approve of contraception.

1. _____

_____

2. _____

_____ [2]

STEMUP.CO.UK

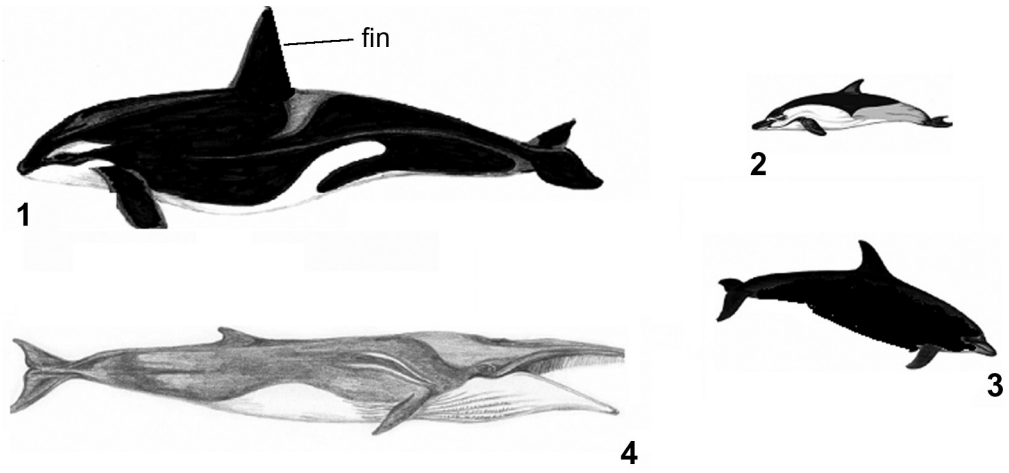
BLANK PAGE

(Questions continue overleaf)

STEMUP.CO.UK

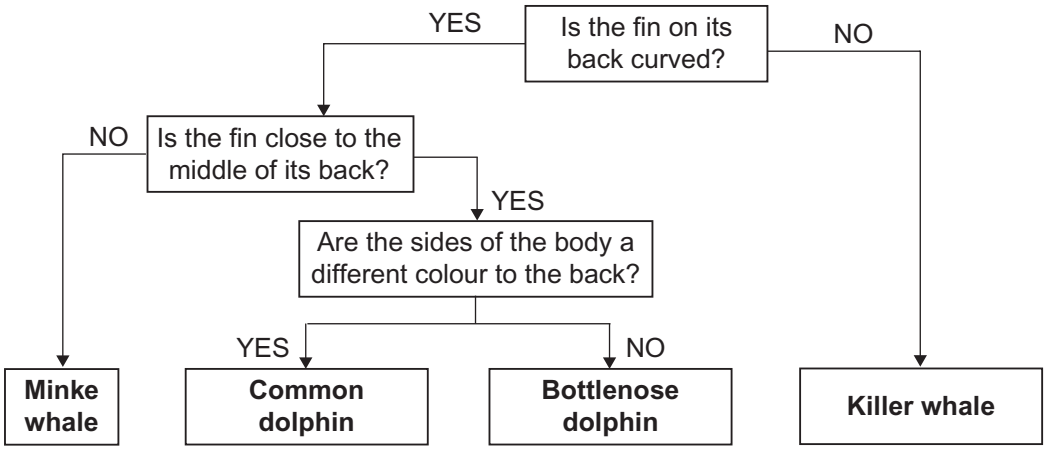
Examiner Only	
Marks	Remark

4 Shown below are pictures of whales and dolphins.



© *Hebridean Whale and Dolphin Trust*

(a) Identify the animals **1**, **2**, **3** and **4** using the classification key below.



1 _____

2 _____

3 _____

4 _____

[3]

STEMUP.CO.UK

(b) (i) Complete the sentence below.

Choose from:

boxes **features** **diet** **groups** **areas**

Classification means putting species into different

_____ according to their _____. [2]

(ii) State **one** reason why scientists classify organisms.

_____ [1]

Examiner Only	
Marks	Remark

STEMUP.CO.UK

Examiner Only	
Marks	Remark

5 **(a)** Name **two** parts of the body that act as barriers to microbes (microorganisms).

_____

_____ [2]

(b) The statements below give the steps the immune system takes to defend us against microbes, but they are **not** in the correct order.

A – antibodies attach to the microbes' antigens

B – microbes enter blood

C – microbes clump together

D – microbes are 'eaten'

E – white blood cells produce antibodies

Using the letters **A**, **B**, **C**, **D** and **E** put the steps in the correct order.

The first one has been done.

B _____ _____ _____ _____ [2]

(c) Jilly has rubella (German measles). Suggest a reason why her doctor has not given her antibiotics.

_____

_____ [1]

STEMUP.CO.UK

Examiner Only	
Marks	Remark

6 The picture below shows cress plant seedlings.



© Jerome Wexler/Science Photo Library

(a) Name and fully explain the process that causes the seedlings to bend to one side.

_____

_____

_____

_____ [3]

(b) Photosynthesis is the process which enables plants to make food.

In the box below write the word equation for photosynthesis.

[3]

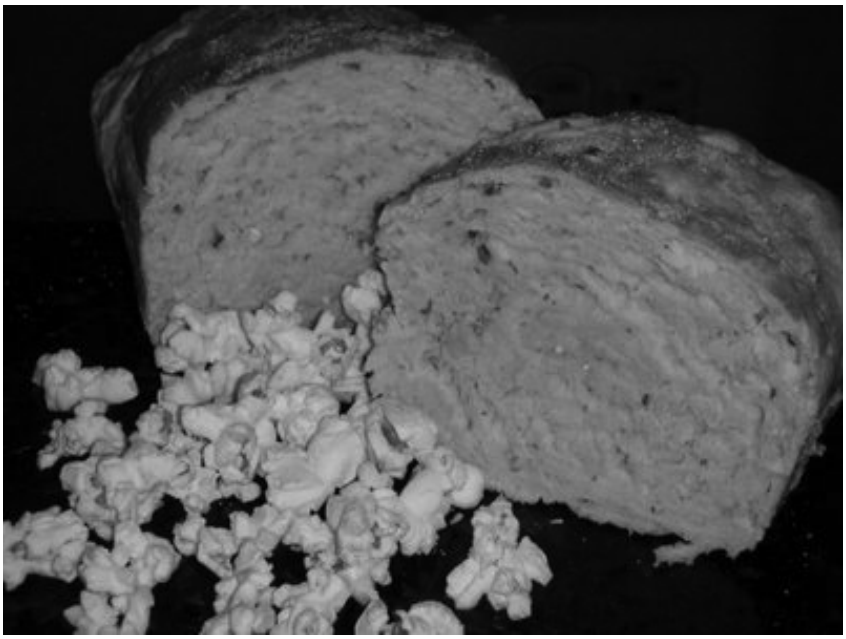
(c) Name a process carried out by **both** plants and animals and state its function.

_____

_____ [2]

Examiner Only	
Marks	Remark

7 **(a)** Below is a picture of bread and popcorn.



Describe an experiment to find which of these foods contains the most energy. All common laboratory equipment including thermometers and boiling tubes is available. Your answer should include how you make your results valid (fair test) and also reliable.

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

[6]

STEMUP.CO.UK

(b) A doctor has to decide which of three different brands of iron supplements (A, B or C) to prescribe to his patients. He collected facts about each brand and the table below shows his findings.

Key
High = 3
Low = 1

Brand	Number of side effects	Swallowing problems	Cost per unit
A	3	3	2
B	3	2	3
C	2	1	3

(i) Analyse the facts for each brand and state which one he should prescribe. Referring to each brand fully explain your choice.

_____

_____

_____

_____

_____ [3]

(ii) Suggest **one** other fact about each brand that he should consider before making his decision.

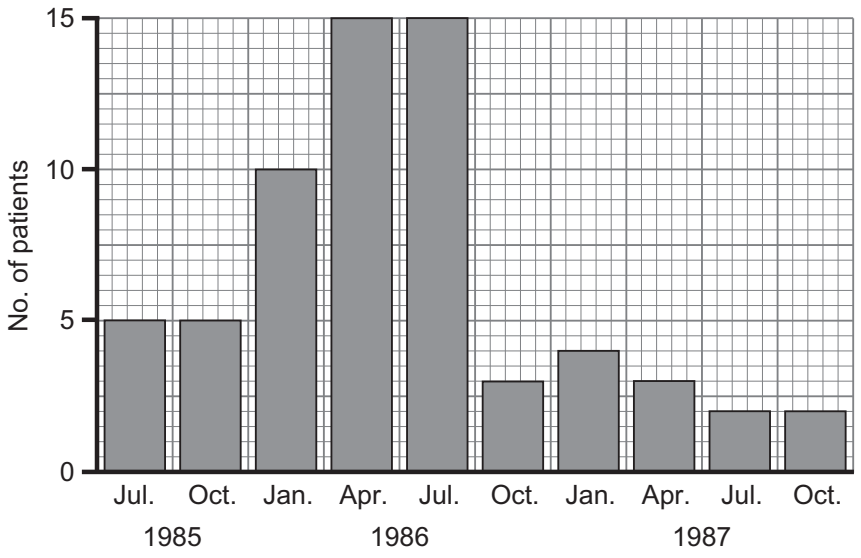
_____ [1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

8 **(a)** The bar chart shows the number of patients who caught MRSA in a hospital between July 1985 and October 1987. Part of their treatment involved antibiotics.



Source: National Institutes of Health

(i) Suggest when the hospital started to take measures to control the spread of MRSA. Explain your answer.

_____

_____ [2]

(ii) What is the evidence in the graph that suggests that MRSA bacteria are resistant to antibiotics?

_____

_____ [1]

(b) **(i)** One of the measures to control the spread of MRSA is to put infected patients into isolation wards. Suggest a reason why this method is not widely used in hospitals.

_____

_____ [1]

STEMUP.CO.UK

Examiner Only	
Marks	Remark

(ii) Apart from isolation describe **one** measure that controls the spread of MRSA and suggest why it is effective.

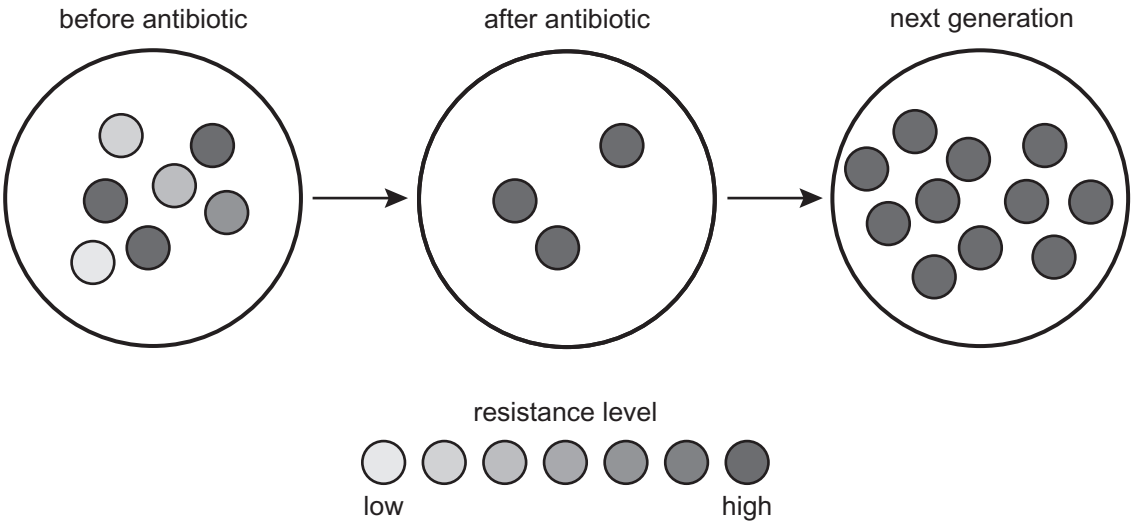
_____

_____

_____

_____ [2]

(c) MRSA is caused by a type of skin bacteria becoming resistant to antibiotics. The diagram below shows how this would have happened.



Use the diagram and your knowledge to explain how the population of skin bacteria became resistant.

_____

_____

_____

_____ [3]

THIS IS THE END OF THE QUESTION PAPER

Permission to reproduce all copyright material has been applied for.
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA will be happy to rectify any omissions of acknowledgement in future if notified.

112837

New Specification

Rewarding Learning

General Certificate of Secondary Education
2012–2013

Science: Single Award

Unit 1 (Biology)

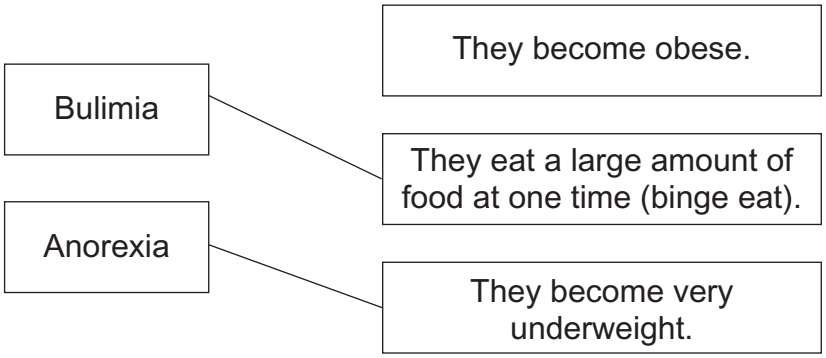
Foundation Tier

[GSS11]

MONDAY 27 FEBRUARY 2012
9.30 am–10.30 am

MARK SCHEME

STEMUP.CO.UK

		AVAILABLE MARKS
1	**(a)** **(i)** arrows pointing right between grass and rabbit and fox [1]	
	(ii) who is eaten by whom/direction of energy flow [1]	
	(iii) grass [1]	
	(iv) the sun [1]	
	(b) less predation; more reproduction [2]	6
2	**(a)** **(i)**  [2]	
	(ii) any correct e.g. industry demands/social expectation/need to be thin [link with occupation needed or implied] [1]	
	(iii) jockeys/celebrities/sumo wrestlers *any correct* [1]	
	(b) **(i)** Y axis scaled 1 mark 4 bars 2 marks 2/3 1 mark [3]	
	(ii) cod; least fat/lowest fat/low fat/only 1 g fat [2]	9
3	**(a)**	

method of contraception	permanent	prevents STDs	changes hormone levels
condom		yes	
contraceptive pill			yes

[2]

	(b) **(i)** oviduct, sperm, fertilisation [3]	
	(ii) regard it as abortion, unnatural, religious teachings, promiscuity, culture *Any* [2]	7

			AVAILABLE MARKS
4	**(a)**	1. – killer whale, 2. – common dolphin, 3. – bottlenose dolphin, 4. – minke whale [2-3 correct = 2 marks; 1 correct = 1 mark] [3]	
	(b)	**(i)** groups: features [2]	
		(ii) large numbers of species/easier to identify/work out relationships [1]	6
5	**(a)**	skin/mucous membranes (mucus) [2]	
	(b)	E A C D [2] *Any two in correct order* (disregard position) 1 mark	
	(c)	only kill bacteria/rubella is a viral disease [1]	5
6	**(a)**	Any three from: they respond/grow to light, for more photosynthesis, controlled by hormones, phototropism [3]	
	(b)	carbon dioxide + water ⟶ sugar/starch/glucose + oxygen [3] [1 mark each side – 1 mark for arrow]	
	(c)	respiration: energy *or* reproduction: produce young *or* excretion: to get rid of waste [2]	8

STEMUP.CO.UK

AVAILABLE MARKS

7 **(a)** Indicative content

- Use BB/other to set alight to each food
- Same mass food/volume water/distance lit food from tube/same distance from bunsen/time to get lit food under tube [any two required]
- Place under boiling tube of water
- Record temperature difference
- Repeat experiment

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe all **four or five** points above, including two or more controlled variables (listed in second point) in a logical sequence. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5–6]
B	Candidates use some appropriate specialist terms to describe **three** of the points above in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3–4]
C	Candidates describe the experimental procedure using one or two of the above points. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and they have made little use of specialist terms. The form and style are of a limited standard.	[1–2]
D	Response not worthy of credit.	[0]

[6]

(b) **(i)** C;

C – better than A as has fewer swallowing problems/fewer side effects;

C – better than B as has fewer swallowing problems/fewer side effects; [3]

(ii) effectiveness/how strong it is/amount of iron it contains [1]

10

STEMUP.CO.UK

				AVAILABLE MARKS
8	(a)	(i)	July – October 1986 (July/October 1986); biggest fall/lowest cases/less cases/numbers dropped [2]	
		(ii)	never no patients/rise in numbers [1]	
	(b)	(i)	lack of space/lack of funds/lack of facilities [1]	
		(ii)	hand/good hygiene, gloving, mouth/nose/eye protection, gowning, (thorough) cleaning/wiping spillages (not hygiene on own) *any* 1 mark cannot spread as easily/cross contamination 1 mark [2]	
	(c)		before antibiotic variation in resistance/different levels of resistance; only those with strongest resistance survived [or converse]; all offspring inherited strong resistance/resistant survivors reproduce [3]	9
			Total	**60**