



**General Certificate of Secondary Education  
2017–2018**

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**Science: Single Award**

Unit 1 (Biology)

Higher Tier

**[GSS12]**

**WEDNESDAY 21 FEBRUARY 2018, MORNING**

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**MARK  
SCHEME**

## 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) Meal taken/or named example of food/drink [1] containing carbohydrate/named carbohydrate [1]	[2]	8	
		(ii) Glycogen [1] liver [1]	[2]		
	(b)	(i) Any <b>two</b> from: <ul style="list-style-type: none"> <li>• cost of equipment to monitor blood glucose levels</li> <li>• many people affected/can have diabetes for a long period of time</li> <li>• treatment of complications</li> </ul>	[2]		
		(ii) Eye damage/blindness/kidney failure/heart disease/strokes	[1]		
		(iii) Type 1 occurs early in life/type 1 not linked to lifestyle/type 1 treated by insulin/with type 1 insulin not produced (or converse)	[1]		
	2	(a)	(i) Layer A is closer to the light [1] has more chloroplasts [1]		[2]
(ii) Carbon dioxide			[1]		
(b)		Glucose/sugar/starch [1] oxygen [1]	[2]		
3	(a)	(i) To avoid getting the disease	[1]	9	
		(ii) The (antigens on the) microbes in the vaccination cause the production of antibodies [1] these remain at a high enough level in the body/or can be produced quickly enough if infection by same microbe occurs [1] these antibodies latch on to the microbes [1]	[3]		
	(b)	(i) Less able to fight infection/are weaker	[1]		
		(ii) Causes less harm	[1]		
	(c)	(i) People think there is a link with autism	[1]		
		(ii) The uptake of vaccination in Swansea was so low [1] and therefore were not protected against measles [1]	[2]		

4 Indicative content

- carbon dioxide in the atmosphere
- is increasing
- that traps heat
- caused by increased combustion of fossil fuels
- and deforestation
- method of reducing the rate of temperature rise, e.g. reducing use of fossil fuels/reforestation
- decreasing ice fields/water levels/climate change explained

AVAILABLE MARKS

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe global warming using <b>six or seven</b> 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 <b>four or five</b> 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 partially describe global warming using <b>one to three</b> 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

5 (a) Heterozygous

[1]

- (b) (i) Gametes correct [1]  
offspring correct [1]

[2]

(ii)

Genotype	Phenotype
Hh	tall
Hh	tall
hh	short
hh	short

(all rows correct = [2]; one or two rows correct = [1])

[2]

5

			AVAILABLE MARKS		
6	(a) (i)	70	[1]	6	
	(ii)	Continuous [1] no clear boundaries between groups [1]	[2]		
	(b)	Build up/blockage on artery wall [1] oxygen/glucose cannot get through (to heart muscle cells) [1] cells stop respiring (and die leading to a heart attack) [1]	[3]		
7	(a)	Fleming [1] (agar plate of) bacteria contaminated by fungus [1] fungus stopped the growth of/killed the bacteria [1]	[3]	9	
	(b)	People recovered more quickly/fewer affected [1] (fewer infected) so fewer to pass the infection from person to person (by coughing and sneezing) [1]	[2]		
	(c)	(i)	Mutation		[1]
		(ii)	Bacteria become antibiotic resistant [1] nothing to halt increase of number of people infected [1]		[2]
		(iii)	Pandemic very large numbers of people affected/very wide area affected (or converse)		[1]
8	(a)	(i)	Crop containing DNA [1] from a different organism/species [1]	[2]	
			(ii)	Ripe for longer [1] longer shelf life/less likely to 'go off' [1] <b>or</b> Seedless [1] so more flavour [1]	[2]
		(iii)	Perception of GM tomatoes as 'alien'/unnatural/harmful	[1]	
	(b)	Advantage – higher yield/better taste/more ecologically robust [1] Disadvantage – 'super-weeds'/allergies/expensive [1]	[2]		
	(c)	Group/many scientists work together [1] to produce a better outcome/faster research than they could do in isolation [1]	[2]		
	(d)	(i)	Examining chromosomes/genes/DNA [1] for the presence of a genetic disorder [1]	[2]	
		(ii)	Possibility of abortion/can lead to dilemma for parents	[1]	12

- 9 (a) (i) Number of species remain steady until year 3 then fall [1] and level off from year 7 [1] (number of species remain steady decrease and level off over time = [1]) [2]
- (ii) Year 3 [1]
- (iii) Different species grow/are present at different times [1]
- (b) With new lawnmower the shorter growing species could survive [1] taller species unable to survive on lawn [1] proportion of shorter species increase over time (or converse) [1] [3]
- (c) Endangered species have very low numbers (but still exist) [1] extinct species no longer exist/no longer have living members [1] [2]

AVAILABLE MARKS

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10 Indicative content

- 28 day/monthly cycle
- loss of lining at start/menstruation
- (after menstruation) the lining builds up again
- egg released/ovulation around day 14
- pregnancy can occur at this time
- oestrogen causes ovulation/release of egg
- and build-up of the uterine wall
- progesterone maintains uterine lining (after ovulation)
- menstruation occurs when both oestrogen and progesterone levels fall

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe the menstrual cycle using <b>six or more</b> 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 the menstrual cycle using <b>four or five</b> 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 partially describe the menstrual cycle using <b>one to three</b> 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

75