



*Rewarding Learning*

**General Certificate of Secondary Education  
2016–2017**

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**Science: Single Award**

Unit 1 (Biology)

Higher Tier

**[GSS12]**

**WEDNESDAY 9 NOVEMBER 2016, 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.

- 1 (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]

AVAILABLE  
MARKS

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**2 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 <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 and explain the different types of male contraceptive 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 describe and/or explain at least one type of male contraceptive using <b>one or two</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	Not worthy of credit.	[0]

[6]

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AVAILABLE  
MARKS

			AVAILABLE MARKS	
3	(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]	
3	(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]	
3	(c) (i)	Ongoing monitoring/can reach inaccessible areas/very accurate	[1]	12
	(ii)	To persuade governments to act against global warming/to take appropriate conservation measures	[1]	
4	(a)	The spread of disease over a large area (town or region)/many people are affected in the one area	[1]	5
	(b)	The bacteria causing the disease are resistant to antibiotics [1] there is no vaccination for the disease [1]	[2]	
	(c)	Phagocytes/white blood cells engulf [1] and digest/break down microorganisms [1]	[2]	
5	(a) (i)	Central Nervous System/CNS/brain	[1]	
	(ii)	Nerve impulses	[1]	
5	(b)	Reflex actions are rapid/automatic/protective/do not involve thinking time [1] as have short pathways/do not involve thinking (explanation must match the description/allow converse for voluntary actions) [1]	[2]	6
	(c)	The revolving platform means that all sides of the seedling receive equal light [1] grows evenly/hormones were evenly spread across the seedling [1]	[2]	

			AVAILABLE MARKS
6	(a) (i)	The average age of patients when diagnosed decreases with time [1]	8
	(ii)	Any <b>two</b> from: <ul style="list-style-type: none"> <li>• more people obese at a younger age</li> <li>• more fatty/high sugar foods in the diet</li> <li>• less exercise taken than previously</li> <li>• better screening/more education or awareness</li> </ul> [2]	
	(b) (i)	Bronchitis/emphysema [1]	
	(ii)	Carbon monoxide reduces the blood's ability to carry oxygen [1] less oxygen reaches the muscles/body cells/for respiration [1] [2]	
	(c)	Advantage – E-cigarettes are less harmful/they do not contain tar/carbon monoxide/less likely to lead to cancer [1] Disadvantage – contain nicotine/could possibly lead to starting real cigarettes [1] [2]	
7	(a) (i)	Slug [1]	5
	(ii)	The garden plants will grow more/fewer will be eaten [1] fewer thrushes and birds of prey [1] [2]	
	(b)	Ammonia converted to nitrates [1] by nitrification/nitrifying bacteria [1] [2]	
8	(a)	Continuous variation [1] no discrete groups/no clear boundaries/gradual change in speed [1] [2]	10
	(b) (i)	Average maximum speed increases/lowest maximum speed is higher [1]	
	(ii)	Foxes more able to catch slower hares/slower hares die out/all eaten [1] faster hares more likely to survive and have (faster) offspring [1] [2]	
	(c) (i)	The process of change in a species/type of organism [1] over time [1] [2]	
	(ii)	Large timescales involved/complex process [1]	
	(d)	The process in which scientific discoveries is checked/ approved/validated [1] by other scientists [1] [2]	

**9 Indicative content**

- carbon dioxide/global warming
- acid rain/sulfur dioxide
- plant more trees/reduce deforestation/alternative fuels/use less fossil fuels
- filters/scrubbers in factory chimneys/low sulfur fuels/alternative fuels (allow once)
- abiotic monitoring – carbon dioxide levels/temperature/climate change
- biotic monitoring – lichens

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe and explain human pollution of the atmosphere using <b>five or six</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 and explain human pollution of the atmosphere using <b>three or four</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 describe/explain human pollution of the atmosphere using <b>one or two</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	Not worthy of credit.	[0]

AVAILABLE  
MARKS

6

10 (a) Protein [1]

(b) (i) Son-in-law/married to A's daughter [1]

(ii) None [1]

(iii)

	K	k
K	KK	Kk
k	Kk	kk

[3]

(iv) 1 in 4/25% [1]

(c) (i) Genetic screening [1]

(ii) Ethical reasons over deciding whether to have an abortion/screening process may have a risk/religious reasons [1]

**Total**

**AVAILABLE MARKS**

9

**75**