

New  
Specification



*Rewarding Learning*

General Certificate of Secondary Education  
2018–2019

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**Single Award Science:  
Biology**

Unit 1

Higher Tier

[GSA12]

WEDNESDAY 7 NOVEMBER 2018, MORNING

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**MARK  
SCHEME**

## General Marking Instructions

### **Introduction**

Mark schemes are intended to ensure that the GCSE examinations are marked consistently and fairly. The mark schemes provide markers with an indication of the nature and range of candidates' responses likely to be worthy of credit. They also set out the criteria which they should apply in allocating marks to candidates' responses.

### **Assessment objectives**

Below are the assessment objectives for GCSE Single Award Science

Candidates must:

- AO1** Demonstrate knowledge and understanding of scientific ideas, scientific techniques and procedures;
- AO2** Apply knowledge, skills and understanding of scientific ideas, scientific enquiry, techniques and procedures; and
- AO3** Analyse information and ideas to interpret and evaluate; make judgements and draw conclusions; develop and improve experimental procedures.

### **Quality of candidates' responses**

In marking the examination papers, examiners should be looking for a quality of response reflecting the level of maturity which may reasonably be expected of a 16-year-old which is the age at which the majority of candidates sit their GCSE examinations.

### **Flexibility in marking**

Mark schemes are not intended to be totally prescriptive. No mark scheme can cover all the responses which candidates may produce. In the event of unanticipated answers, examiners are expected to use their professional judgement to assess the validity of answers. If an answer is particularly problematic, then examiners should seek the guidance of the Supervising Examiner.

### **Positive marking**

Examiners are encouraged to be positive in their marking, giving appropriate credit for what candidates know, understand and can do rather than penalising candidates for errors or omissions. Examiners should make use of the whole of the available mark range for any particular question and be prepared to award full marks for a response which is as good as might reasonably be expected of a 16-year-old GCSE candidate.

### **Awarding zero marks**

Marks should only be awarded for valid responses and no marks should be awarded for an answer which is completely incorrect or inappropriate.

### **Marking Calculations**

In marking answers involving calculations, examiners should apply the 'own figure rule' so that candidates are not penalised more than once for a computational error.

### **Types of mark schemes**

Mark schemes for tasks or questions which require candidates to respond in extended written form are marked on the basis of levels of response which take account of the quality of written communication.

- 1 (a) (i) E [1]
- (ii) D [1]
- (b) Adds fluid to feed the sperm [1]

(c) (i)

Contraceptive	How it works
Condom	Acts as a barrier to trap sperm
Contraceptive pill	Prevents release of egg by changing hormone levels
vasectomy	Sperm tubes cut to prevent sperm entering penis

- [1] mark [1]
- (ii) Contraceptive pill [1]
- (iii) Vasectomy [1]  
very difficult or impossible to reverse [1] [2]
- (d) Moral/ethical/religious reasons [1]

AVAILABLE  
MARKS

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- 2 (a) Any **three** from:
- Insulin is a chemical (messenger) [1]
  - produced in a gland/pancreas [1]
  - travels in the blood [1]
  - to a target organ [1]
- [3]

(b) **Indicative content:**

- insulin lowers blood glucose levels
- insulin ceases to function/isn't enough
- glucose not converted to glycogen
- blood glucose levels stay high
- symptom – increased glucose in urine/thirst/need to go to the toilet more often/coma (if treatment delayed)/lethargy
- long term effect – eye damage/heart disease/strokes/kidney damage/loss of limbs
- 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 <b>5, 6 or 7</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 effect of diabetes on humans using <b>3 or 4</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 the effect of diabetes on humans using <b>1 or 2</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]

9

- 3 (a) (i) It outcompetes other (native) species/it was brought from another country/reproduces rapidly [1]
- (ii) Extinction is the loss of all members of that species/none of the species are left alive [1]
- (b) (i) Poison kills foxes but leaves the native animals alive [1]
- (ii) Dingos may kill farm animals [1]  
fences exclude foxes without harming farm animals [1] [2]

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			AVAILABLE MARKS	
4	(a)	Dominant allele will always be expressed/will be expressed when only one copy of the allele	[1]	5
	(b) (i)	Father RR, [1] mother Rr [1]	[2]	
	(ii)	Offspring all correct	[1]	
	(iii)	0%	[1]	
5	(a) (i)	Phagocyte	[1]	11
	(ii)	Microorganisms are surrounded/engulfed [1] and then digested [1]	[2]	
	(b)	Active immunity means the body produces its own antibodies [1] passive immunity means antibodies come from another source/injected [1]	[2]	
	(c) (i)	To prevent contamination	[1]	
	(ii)	A [1] killed the most bacteria [1]	[2]	
	(iii)	As a control	[1]	
	(d) (i)	Many patients in close proximity/open wounds/weak immune systems	[1]	
	(ii)	Improved hand washing facilities/antiseptic gels/better hygiene/isolation wards	[1]	
6	(a)	Voluntary actions are slower than reflex actions/voluntary actions require conscious thought but reflex actions don't (are automatic)	[1]	5
	(b) (i)	A. Association/relay neurone [1] B. Sensory neurone [1]	[2]	
	(ii)	Effector	[1]	
	(c)	As the number of units of alcohol increases, the reaction speed decreases	[1]	
7	(a)	Bradley his recovery time decreased the most [1]	[1]	4
	(b)	Strengthens the heart [1] fewer beats per minute/beat less often/increased cardiac output [1] so less wear and tear on the heart [1]	[3]	

		AVAILABLE MARKS
8	(a) The range/number of [1] <b>different</b> varieties of living things in an area [1]	[2]
	(b) (i) Number of each species counted in 1 m <sup>2</sup> in each site	[1]
	(ii) <b>Site 1</b> as it has more species present/ site 1 has 5 species, site 2 has 3 species	[1]
	(iii) $18 \div 40 \times 100$ [1] 45% [1]	[2]
	(c) Any <b>two</b> from: <ul style="list-style-type: none"> <li>• nature reserves</li> <li>• organic farming/no pesticides</li> <li>• maintain hedgerows/managing field margins/grass verges</li> <li>• build on brown field rather than green field sites</li> </ul>	[2]
9	(a) The remains of a living organism that has been preserved (usually in rock) for millions of years	[1]
	(b) (i) The continuing process of natural selection [1] that leads to the change in a species over time/leads to a new species [1]	[2]
	(ii) It is possible to date the age of a fossil [1] so they can show different changes that took place in a species over time [1]	[2]
	<b>Total</b>	<b>60</b>