



**General Certificate of Secondary Education  
2021**

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**Single Award Science:  
Biology**

**Unit 1**

**Foundation Tier**

**[GSA11]**

**MONDAY 22 NOVEMBER, 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**

#### **COVID-19 Context**

Given the unprecedented circumstances presented by the COVID-19 public health crisis, senior examiners, under the instruction of CCEA awarding organisation, are required to train assistant examiners to apply the mark scheme in case of disrupted learning and lost teaching time. The interpretation and intended application of the mark scheme for this examination series will be communicated through the standardising meeting by the Chief or Principal Examiner and will be monitored through the supervision period. This paragraph will apply to examination series in 2021–2022 only.

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.

|   |         |                                                                                                                                                                    | AVAILABLE MARKS |
|---|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 1 | (a) (i) | Vagina: D<br>cervix: C                                                                                                                                             | [2]             |
|   | (ii)    | B                                                                                                                                                                  | [1]             |
|   | (b)     | Oviduct [1]<br>zygote [1]                                                                                                                                          | [2]             |
|   |         |                                                                                                                                                                    | 5               |
| 2 | (a) (i) | Nucleus                                                                                                                                                            | [1]             |
|   | (ii)    | Chromosomes                                                                                                                                                        | [1]             |
|   | (b) (i) | Any <b>two</b> from:<br>• chloroplasts<br>• cell wall<br>• vacuole                                                                                                 | [2]             |
|   | (ii)    | Iodine                                                                                                                                                             | [1]             |
|   |         |                                                                                                                                                                    | 5               |
| 3 | (a) (i) | There is a gradual change in the characteristic across a population/no clear boundaries between groups/difficult to decide where one group ends and another starts | [1]             |
|   | (ii)    | Genetic/environmental                                                                                                                                              | [1]             |
|   | (iii)   | Length/weight/hand span                                                                                                                                            | [1]             |
|   | (b)     | Histogram                                                                                                                                                          | [1]             |
|   |         |                                                                                                                                                                    | 4               |
| 4 | (a) (i) | Primary consumer: grasshopper/aphid<br>Secondary consumer: mice/beetle                                                                                             | [2]             |
|   | (ii)    | Photosynthesis                                                                                                                                                     | [1]             |
|   | (iii)   | Decrease<br>hawks will eat more mice (as they have less sparrows to feed on)                                                                                       | [2]             |
|   | (b)     | Replant hedgerows [1]<br>not plant crops right to the edge of his fields [1]                                                                                       | [2]             |
|   |         |                                                                                                                                                                    | 7               |

| 5       | (a)                                          | <table><tr><th>Substance</th><th>Effect</th></tr><tr><td>tar</td><td>causes lung cancer [1]</td></tr><tr><td>nicotine [1]</td><td>increases heart rate</td></tr></table> | Substance                                                                                                                                                                                                                                                                          | Effect | tar | causes lung cancer [1] | nicotine [1] | increases heart rate | [2] | AVAILABLE MARKS |
|---------|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----|------------------------|--------------|----------------------|-----|-----------------|
|         |                                              | Substance                                                                                                                                                                | Effect                                                                                                                                                                                                                                                                             |        |     |                        |              |                      |     |                 |
|         |                                              | tar                                                                                                                                                                      | causes lung cancer [1]                                                                                                                                                                                                                                                             |        |     |                        |              |                      |     |                 |
|         | nicotine [1]                                 | increases heart rate                                                                                                                                                     |                                                                                                                                                                                                                                                                                    |        |     |                        |              |                      |     |                 |
| (b) (i) | $50 \times 10 = \text{£}5.00$                | [1]                                                                                                                                                                      |                                                                                                                                                                                                                                                                                    |        |     |                        |              |                      |     |                 |
| (ii)    | $\text{£}5.00 - \text{£}3.88 = \text{£}1.12$ | [1]                                                                                                                                                                      |                                                                                                                                                                                                                                                                                    |        |     |                        |              |                      |     |                 |
| (iii)   | Reduce hospital admissions                   | [1]                                                                                                                                                                      |                                                                                                                                                                                                                                                                                    |        |     |                        |              |                      |     |                 |
| 6       | (c)                                          | Structure <b>X</b> – placenta [1]                                                                                                                                        | [2]                                                                                                                                                                                                                                                                                | 7      |     |                        |              |                      |     |                 |
|         |                                              | Structure <b>Y</b> – umbilical cord [1]                                                                                                                                  |                                                                                                                                                                                                                                                                                    |        |     |                        |              |                      |     |                 |
|         | (a)                                          | (i)                                                                                                                                                                      | 4 bars correct [2]<br>3 bars correct [1]                                                                                                                                                                                                                                           |        | [2] |                        |              |                      |     |                 |
|         |                                              | (ii)                                                                                                                                                                     | As the age increases the recommended carbohydrate intake increases                                                                                                                                                                                                                 |        | [1] |                        |              |                      |     |                 |
| (iii)   |                                              | Carbohydrates provide energy [1]<br>more is required as they are more active/still growing [1]                                                                           | [2]                                                                                                                                                                                                                                                                                |        |     |                        |              |                      |     |                 |
|         | (b)                                          | Oxygen                                                                                                                                                                   | [1]                                                                                                                                                                                                                                                                                | 11     |     |                        |              |                      |     |                 |
|         | (c)                                          | (i)                                                                                                                                                                      | Any <b>three</b> from: <ul style="list-style-type: none"><li>less blood getting to the heart muscle cells</li><li>less glucose/oxygen getting to the heart muscle cells</li><li>less respiration</li><li>heart muscle cells die</li><li>heart stops beating/heart attack</li></ul> |        | [3] |                        |              |                      |     |                 |
|         |                                              | (ii)                                                                                                                                                                     | Choosing low salt                                                                                                                                                                                                                                                                  |        | [1] |                        |              |                      |     |                 |
|         | (d)                                          | A solvent/for transport                                                                                                                                                  | [1]                                                                                                                                                                                                                                                                                |        |     |                        |              |                      |     |                 |

## 7 Indicative content

- a condition in which the blood glucose control mechanism fails

Differences – Any **two** from:

- Type 1 treated using insulin/Type 2 controlled by diet/medication
- Type 1 usually occurs in early life/Type 2 is a progressive disease/ linked to lifestyle factors and obesity
- Type 1 pancreas stops producing insulin/Type 2 pancreas gradually produces less insulin

Symptoms – Any **two** from:

- High blood glucose/presence of glucose in the urine/lethargy/thirst

Long term effects – Any **two** from:

- Eye damage/kidney failure/heart disease/stroke

| Band | Response                                                                                                                                                                                                                                                                                                       | Mark    |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| A    | Candidates must use appropriate specialist terms throughout to explain what diabetes is and how it can be treated using <b>five, six or seven</b> of the above points 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 throughout to explain what diabetes is and how it can be treated using <b>three or four</b> of the points 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 explain what diabetes is and how it can be treated using <b>one or two</b> of the above points and are not present 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

- 8 (a) (i) Asian hornet is bigger [1]  
Asian hornet can travel faster [1]

[2]

- (ii) Honeybees are a food source for Asian hornets

[1]

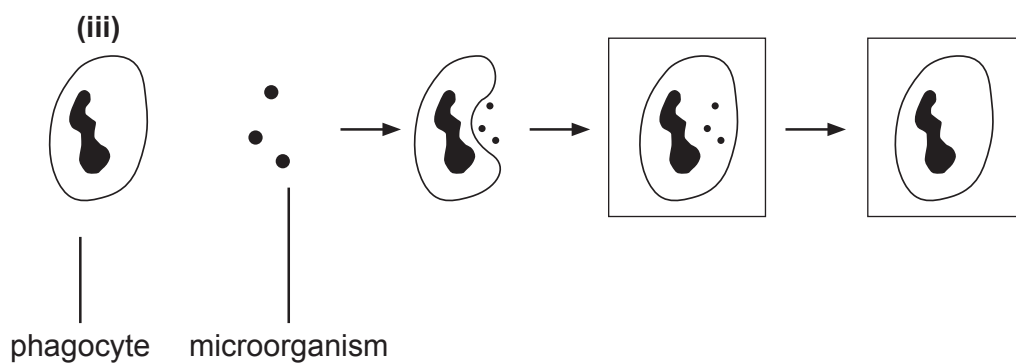
(b) Any **two** from:

- spread rapidly when introduced into a region [1]
- outcompete native species
- they are almost always introduced to a country by humans [1]

[2]

5

- 9 (a) (i) Antibiotic B has a larger clear area around it than antibiotic A [1]  
Antibiotic B has killed/destroyed more bacteria [1] [2]
- (ii) Same volume/concentration of antibiotic used [1]
- (b) There would be no clear area around either antibiotic/  
no fungus would have been killed by either antibiotic [1]  
antibiotics only kill bacteria not fungi [1] [2]
- (c) (i) Antibodies attach on to the antigen on the microorganism [1]  
Antibodies clump microorganisms together [1] [2]
- (ii) Antibodies do not match/don't fit antigens on this microorganism [1]



[2]

**Total**

**AVAILABLE  
MARKS**

10

**60**