



*Rewarding Learning*

**General Certificate of Secondary Education  
2014–2015**

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**Double Award Science:  
Biology**

Unit B1

Foundation Tier

**[GSD11]**

**TUESDAY 12 MAY 2015, AFTERNOON**

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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) | brain; faster; blood; organ  | [4]             | 4 |
| 2 | (a) | Boil leaf → to stop reactions in the leaf/kills leaf<br>Place the leaf in hot alcohol → to remove chlorophyll/decolourise<br>Add to hot water for a short time → to soften the leaf/less brittle | [3]             |   |
|   | (b) | (i) Iodine   | [1]             |   |
|   |     | (ii) blue/black  | [1]             | 5 |
| 3 | (a) | inherited/genetic  | [1]             |   |
|   | (b) | Any <b>two</b> from:<br>Any of: strokes/high blood pressure/joint problems/rickets/scurvy/<br>bowel cancer/anaemia/dental decay<br>Any one of these: CHD/heart attack/heart disease              | [2]             |   |
|   | (c) | (i) DCPIP  | [1]             |   |
|   |     | (ii) <b>blue</b> to colourless (both needed)   | [1]             | 5 |
| 4 | (a) | (i) to produce energy  | [1]             |   |
|   |     | (ii) oxygen  | [1]             |   |
|   |     | (iii) carbon dioxide   | [1]             |   |
|   | (b) | Any <b>two</b> from:<br>• large surface area<br>• thin/(air sac) wall is one cell thick/capillary wall is one cell thick<br>• <b>good</b> blood supply   | [2]             | 5 |

|   |  | AVAILABLE MARKS  |
|---|--|--|
| 5 | <p>(a) A – photosynthesis<br/>B – feeding/eating/ingestion/consumption<br/>C – respiration</p> <p>(b) (i) sun/sunlight</p> <p>(ii) phytoplankton</p> <p>(c)</p>  <p>4 levels, biggest at bottom and symmetrical;<br/>phytoplankton labelled at bottom and biggest;<br/>others labelled in correct order: zooplankton, sand eels, seabird</p>  | <p>[3]</p> <p>[1]</p> <p>[1]</p> <p>[3]</p> <p>8</p>                       |
| 6 | <p>(a) (i) root hair (cells)</p> <p>(ii) protein/amino acids</p> <p>(b) (i) slurry/animal waste/manure/compost/farmyard manure (FYM)/<br/>cow faeces</p> <p>(ii) <b>minerals</b> available for longer/slow release <b>of minerals</b>/improves soil<br/>texture/improves soil structure/improves drainage/more air/adds humus/<br/>adds organic matter</p> <p>(c) (i) must be minerals/nitrates in the soil</p> <p>(ii) 1st mark: increase in yield with increasing fertiliser;<br/>no increase in yield above 120 kg</p> <p>(iii) waste/uneconomic/yield won't get any bigger</p> | <p>[1]</p> <p>[1]</p> <p>[1]</p> <p>[1]</p> <p>[2]</p> <p>[1]</p> <p>8</p> |

|   |     |  | AVAILABLE<br>MARKS |   |
|---|-----|--|--------------------|---|
| 7 | (a) | (i) the place where an organism lives  | [1]                | 8 |
|   |     | (ii) cliffs  | [1]                |   |
|   | (b) | (i) Shag eats surface swimming prey/fish/sand eels and herrings and cormorants eat bottom swimming prey/fish/flatfish and shrimps;<br><br>They are not competing for the same food/prey/fish/different types of food eaten/don't eat each other's food | [2]                |   |
|   |     | (ii) decline in shag population; – due to lack of food; <b>or</b> shags relocate; to get food<br>cormorants stay the same;<br>cormorants still have food/don't eat surface dwelling species<br><b>or</b> cormorants increase; more space for nests     | [4]                |   |

|          |            |   | AVAILABLE MARKS |    |
|----------|------------|---|-----------------|----|
| <b>8</b> | <b>(a)</b> | Any <b>two</b> from:<br><ul style="list-style-type: none"> <li>• (biological) catalysts</li> <li>• proteins</li> <li>• speed up reactions</li> </ul>  | [2]             |    |
|          | <b>(b)</b> | <b>(i)</b> amino acids  | [1]             |    |
|          |            | <b>(ii)</b> fat/lipid/oil/grease  | [1]             |    |
|          |            | <b>(iii)</b> use too much – is a waste/uneconomic/ends up in the waste water<br>don't use enough – stains not removed   | [1]             |    |
|          |            | <b>(iv)</b> less energy is used/less electricity used/less CO <sub>2</sub> produced/less<br>greenhouse gases/less global warming/less fossil fuels burned   | [1]             |    |
|          |            | <b>(v)</b> there are no enzymes that would be broken down at higher<br>temperatures   | [1]             |    |
|          | <b>(c)</b> | <b>(i)</b> glucose  | [1]             |    |
|          |            | <b>(ii)</b> more glucose/substrate in urine of person 1/or converse;<br>greater intensity of dye or greater degree of colour change in<br>person 1/or converse  | [2]             |    |
|          |            | <b>(iii)</b> enzyme is specific to glucose/shape of enzyme only fits with glucose/<br>it is specific/'lock and key'/no other substance will fit   | [1]             |    |
|          | <b>(d)</b> | <b>(i)</b> insulin  | [1]             |    |
|          |            | <b>(ii)</b> pancreas  | [1]             |    |
|          |            | <b>(iii)</b> Any <b>three</b> from:<br>lowers blood sugar/glucose;<br>by converting glucose to glycogen;<br><b>increasing</b> rate of respiration;<br>in the liver;<br>by converting glucose to fat/stores it as fat;<br>uptake of more glucose | [3]             | 16 |

## 9 (a) Indicative content

- 1. weigh cheese sample/use top pan balance/scale;
- 2. put cheese sample onto mounted needle;
- 3. measure water into **measuring cylinder**;
- 4. add water to the test tube;
- 5. record initial temperature (of the water);
- 6. set fire to cheese;
- 7. place (burning) cheese under test tube;
- 8. completely burn the cheese;
- 9. stir the water (before recording temperature);
- 10. record final temperature of the water/measure temperature change = 1 mark

[6]

| Response  | Marks   |
|---|---------|
| Candidates use appropriate terms throughout to give at least five points about how to carry out the experiment. They use good spelling, punctuation and grammar. Form and style are of a high standard.                       | [5]–[6] |
| Candidates use appropriate terms throughout to give at least three or four points on how to carry out the experiment. They use satisfactory spelling, punctuation and grammar. Form and style are of a satisfactory standard. | [3]–[4] |
| Candidates use appropriate terms throughout to give one or two points about how to carry out the experiment. They use limited spelling, punctuation and grammar and have made little use of specialist terms.                 | [1]–[2] |
| Response not worthy of credit.  | [0]     |

(b) Any **three** from:

- stirrer gives more even distribution of heat;
- food more completely burnt/more oxygen for burning of food;
- energy not lost to surrounding air/more insulation/so no heat can escape;
- coiled glass tube means more heat transfer to water;
- no cheese can fall off

[3]

(c)  $20 \times 30 \times 4.2$ ; 2520 J

[2]

11

**Total****70**