**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**International General Certificate of Secondary Education**

# MARK SCHEME for the May/June 2011 question paper

# for the guidance of teachers

## 0610 BIOLOGY

**0610/63** Paper 6 (Alternative to Practical), maximum raw mark 40

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

- Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

| Question | Mark scheme | Guidance / comments |
|---|---|---|
| 1 (a) | | ***If no table drawn, mark other parts independently if appropriately laid out*** but if bar chart / histogram **MAX 2** |
| | Complete table with cells neatly drawn; | **Reject** cells not drawn completely / headings outside cells / obviously unruled lines<br><br>***Table can be either way round*** |
| | Columns or rows headed **S1, S2, S3**; | **Accept** 0.2%, 0.05%, ?/ unknown if **S1**, **S2** and **S3** are not present in the table |
| | Column or row headed drops of iodine solution; | **Ignore** drops alone / iodine without solution<br>**Reject** if drops appears in the body of the table |
| | Correct results (22, 6, 11);<br>**[4]** | **Ignore** tally without numbers |
| (b) | 0.09% – 0.11%; | Incorrect percentage = 0<br>If no percentage given<br>**Accept S3** (concentration) in between **S1** and **S2** or<br>**S3** (concentration) less than **S1** / 0.2% or<br>**S3** (concentration) greater than **S2** / 0.05% |
| | Correct use of 11 drops for **S3**; | If 11 drops not mentioned<br>**Accept** number of drops for **S3** = half number for **S1** / number of drops for **S3** = double number for **S2** |
| | Correct reference to drops **and** concentration (for **S1** or **S2**);<br>**[3]** | ***N.B. Can refer to conc. and number of drops separately or together anywhere in answer.***<br><br>**Accept** as an alternative –<br>calculation of ratio of drops : concentration even if **S1** / **S2** are not specifically mentioned |

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|---|---|---|
| **(c)** | **Four marks from:**<br><br>Repeats / replicates the original experiment / AW;<br><br>Average / mean;<br><br>Use more precise instrument to measure volume of drops;<br><br>Measure volume in $cm^3$ not drops alone;<br><br>Use a colorimeter / white card to judge colour / AW;<br><br>Narrow the range between the concentrations on either side of unknown / increase concentrations between **S1** and **S2** / AW;<br><br>Control variables (iodine solution / starch solution / size of tubes);<br>**MAX [4]** | <br><br>**Ignore** repeat experiment with different conditions<br><br><br><br>**Accept** syringe / burette / (Pasteur) pipette<br>**Ignore** measuring cylinder<br>Measure $cm^3$ with a burette = 2 marks<br><br><br><br>**Ignore** 'more concentrations' alone<br><br><br>**Ignore** temperature, stirring, pH, time<br>**Ignore** apparatus alone |
| **(d) (i)** | **O –** Orientation;<br><br>**A –** Axes labels;<br><br>**S –** Scale;<br><br>**P –** Plots – correct heights of columns;<br><br>**L –** Line – neat columns;<br><br>**[5]** | **O –** '***x***' axis – juices and '***y***' axis – number of drops of iodine solution<br><br>**A – accept** as minimum 'drops' and named fruit (juices) without general fruit juice label<br><br>**S –** columns plotted to fill greater than half of grid<br><br>**P –** deduct mark for any incorrect<br><br>**L –** ruler used and columns of equal width<br><br>If line graph allow **O, A** and **S** only **MAX [3]** |
| **(ii)** | Blackcurrant<br>**[1]** | |
| | **[Total: 17]** | |

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|---|---|---|
| **2 (a) (i)** | **O** – single clear lines;<br><br>**S** – larger than photograph;<br><br>**N** – number of segments drawn;<br><br>**D** – detail / markings within at least 3 segments;<br><br>**A** – appendages on opposite sides of at least 6 segments;<br>**[5]** | **Reject** sketched / artistic lines<br>**Reject** shading<br><br>**Accept** 11 / 12 / 13 segments (not including the head)<br><br>Segments must be distinct / discrete / complete<br><br>**Accept** even if sketchy or shaded or incomplete |
| **(ii)** | **Fig 2.1** larva = 8.3 +/– 0.1 cm / 83 +/– 1 mm;<br><br>Length of larva in drawing in mm / cm (+/– 1 mm or +/– 0.1 cm);<br>**[2]** | |
| **(iii)** | correct magnification and X;;<br><br>**[2]** | **Accept** correct answer for 2 marks even if no working shown<br>**Accept** correct answers to any number decimal places (i.e. allow correctly rounded answers)<br>**Accept** X before or after magnification / 'times'<br>If answer incorrect (incorrectly calculated / no X / units used) then allow max 1 for correct working e.g. length of drawing / length of image (in words or figures) |

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|---|---|---|
| **(b) (i)** | ***Method***<br>Marks on grid or leaf to show it was used to calculate area of leaf / tubes;<br><br>***Working***<br>(area of tubes) = 3 to 20, (total area of leaf) = 55 to 60;<br><br>Correct calculation to work out percentage / 3 to 20 / 55 to 60 x 100;<br>**[3]** | It must be clear that method of adding squares and parts of squares on the grid to find total area was used.<br>**Accept** obvious reference to number of squares **and** parts of squares(covered by leaf or tubes) in working<br><br>**Accept** the formula in words 'area of tubes / total area of leaf multiplied by 100' if equation not expressed numerically<br>**Accept** error carried forward from their figures |
| **(ii)** | **Two marks from:**<br>Able to eat through palisade and spongy mesophyll;<br><br>(Midrib too ) tough / AW;<br><br>Cannot get food out from within midrib;<br><br>Correct reference to (tough) lignin / xylem (tubes);<br>**MAX [2]** | **Accept** leaf blade, **ignore** leaf tissue<br><br>**Accept** strong, thick, hard<br><br>**Ignore** too little food in midrib<br><br>**Ignore** phloem |
| **(iii)** | No / less photosynthesis (in damaged areas) / AW;<br><br>Dries out / too much water lost / reduced water transported (to cells) / AW;<br><br>Infected with fungi / bacteria / viruses / AW;<br>**MAX [2]** | **Accept** valid descriptions e.g. less food made<br><br>**Ignore** reduced transpiration / damage to stomata<br>**Ignore** larva takes away water<br><br>**Accept** disease |

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|---|---|---|
| (c) (i) | jointed legs or appendages or limbs; **[1]** | **Ignore** exoskeleton (as not clear in fig.) / joined legs<br>**Reject** if answer contains incorrect characteristics e.g. wings |
| (ii) | **Three marks from:**<br>Head, thorax and abdomen / 3 parts to body;<br>1 pair antennae;<br>3 pairs legs;<br>2 pairs wings;<br>**MAX [3]** | **Ignore** segments / body segments<br>**Ignore** compound eyes |
| | **[Total: 20]** | |
| 3 (a) | increases / dilates / AW;<br>**[1]** | |
| (b) | Low(er) intensity / less light (enters eye) / to get more light into the eye / AW;<br>Circular muscles (of iris) relax / lengthen;<br>Radial muscles contract / shorten;<br>**MAX [2]** | **Accept** room is darker<br>**Ignore** references to ciliary / longitudinal muscles<br>**Ignore** descriptions of reactions to full light / photograph A |
| | **[Total: 3]** | |

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