Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/62**

Paper 6 Alternative to Practical **October/November 2016**

MARK SCHEME

Maximum Mark: 40

Published

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 should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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Abbreviations used in the Mark Scheme:

- **;** separates marking points
- / alternatives
- **I** ignore
- **R** reject
- **A** accept (for answers correctly cued by the question, or guidance for examiners)
- AW alternative wording
- AVP any valid point
- ecf credit a correct statement / calculation that follows a previous wrong response
- **ora** or reverse argument
- ( ) the word / phrase in brackets is not required, but sets the context
- underline actual words given must be used by the candidate (or grammatical variants of them)

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<table>
<tr><th>Question</th><th>Answer</th><th>Mark</th><th>Guidance</th></tr>
<tr><td>1(a)</td><td>any two from:
<table>
<tr><th>feature</th><th>seedlings grown in light</th><th>seedlings grown in dark</th></tr>
<tr><td>total height (of shoot / seedling / seed)</td><td>short</td><td>tall;</td></tr>
<tr><td>coleoptile height</td><td>short</td><td>long;</td></tr>
<tr><td>leaves</td><td>leaf opened out / present</td><td>leaf still curled / not opened out / not present;</td></tr>
<tr><td>position of shoot / stem / coleoptile</td><td>almost vertical</td><td>bent;</td></tr>
<tr><td>AVP, e.g. width of stem / shoot / coleoptiles</td><td>wider</td><td>narrower;</td></tr>
</table></td><td>2</td><td></td></tr>
</table>

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Question	Answer	Mark	Guidance
1(b)(i)	1 one table drawn with (ruled) lines; 2 column and row headings with units in the header only; 3 three trials identified; 4 twelve measurements entered; 5 all measurements taken in the light within the ranges: coleoptiles 19 – 26 / 1.9 – 2.6 total lengths 57 – 65 / 5.7 – 6.5 6 all measurements taken in the dark within the ranges: coleoptiles 64 – 80 / 6.4 – 8.0 total lengths 83 – 111 / 8.3 – 11.1	**6**	

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<table>
<tr><th>Question</th><th>Answer</th><th>Mark</th><th>Guidance</th></tr>
<tr><td>1(b)(ii)</td><td>1 light not needed for germination / seeds can germinate in the dark;
2 (in the light) leaf is visible / open / ora;
3 (in light) seedlings are shorter / do not grow as tall / ora;
4 (in light) coleoptiles are shorter / ora;
5 (in the light) seedlings grow upright / AW / seedlings grow slanted in the dark;
6 (in the light) stem / coleoptiles is wider / ora;</td><td>2</td><td></td></tr>
<tr><td>1(c)(i)</td><td><table><tr><th>test</th><th>seedlings grown in light</th><th>seedlings grown in dark</th></tr><tr><td>Benedict’s</td><td>blue</td><td>blue;</td></tr><tr><td>iodine</td><td>blue-black</td><td>blue-black;</td></tr><tr><td>biuret</td><td>purple</td><td>purple;</td></tr></table></td><td>3</td><td></td></tr>
<tr><td>1(c)(ii)</td><td>starch and protein present but not (simple) sugars;</td><td>1</td><td></td></tr>
</table>

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Question	Answer	Mark	Guidance
1(d)(i)	1 ref to using same species / age, etc. maize; 2 ref. to finding starting (dry) mass; 3 ref. to method of drying; 4 ref. to planting maize (grains) in soil / AW; 5 ref. to planting two sets of at least 100 maize / seeds; 6 ref. to keeping (both sets) in a warm room at / given °C / constant temperature; 7 one other valid detail of the method; 8 ref. to one set of seeds placed in light ref. to one set of seeds placed in dark; 9 ref to removing (10) seedlings (from each set) every two days for drying and weighing 10 repeat and calculate the mean / average;	**6**	
1(d)(ii)	water content in, seeds / seedlings, is variable; for comparisons to be valid;	**1**	
		Total: 21	

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<table>
<tr><th>Question</th><th>Answer</th><th>Mark</th><th>Guidance</th></tr>
<tr><td>2(a)(i)</td><td><u>94</u>;

<u>134</u>;</td><td>2</td><td></td></tr>
<tr><td>2(a)(ii)</td><td>same time / 2 minutes for whole exercise;

same time / 10 minutes for rest between exercises;

same rate / every 2 sec for each jump;

equal numbers of male and female students;

idea of same students in each exercise;</td><td>2</td><td></td></tr>
<tr><td>2(a)(iii)</td><td>to allow pulse rate to recover / return to normal (before doing another exercise);

so the effect of the two exercises can be compared;</td><td>1</td><td></td></tr>
<tr><td>2(a)(iv)</td><td><table><tr><th>variable</th><th>effect on results</th></tr><tr><td>idea of effort put into exercise / height</td><td>more effort would make pulse rate increase more ;</td></tr><tr><td>idea of fitness;</td><td>pulse would increase less for fitter students;</td></tr></table></td><td>2</td><td></td></tr>
</table>

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Question	Answer	Mark	Guidance
2(b)(i)	**A**(xes) – labelled with units on y axis; **S**(cale) – suitable even linear scale and plots to fill more than half of the printed grid; **P(**lot) – all points plotted accurately ±½ square; **B**(ars) – have a gap between each component;	**4**	**R** if line graph drawn
2(b)(ii)	*similarity* any 1 from: exercise increases (average) pulse rate; (idea of) more intense the exercise the more increase in (average) pulse rate; *difference* jumping produces greater increase in males than females; jumping and moving arms produces greater increase in females than males;	**2**	
2(c)(i)	**O** outline – single clear lines; **S** size – occupies at least half of the space provided; **D** detail – to show at least 2 layers and wavy lining;	**3**	

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Question	Answer	Mark	Guidance
2(c)(ii)	diameter of lumen = 47 ± 1 mm; diameter of drawing = **X** ± 1 mm; correct magnification;	**3**	
		Total: 19	

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