Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/52**

Paper 5 Practical Test **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>Mark scheme</th><th>Mark</th><th>Guidance</th></tr>
<tr><td>1(a)</td><td>any 2 of:
<table>
<tr><th>feature</th><th>seedlings grown in light</th><th>seedlings grown in dark</th></tr>
<tr><td>height</td><td>short(er)</td><td>tall (er)</td></tr>
<tr><td>colour</td><td>green</td><td>yellow / light green</td></tr>
<tr><td>coleoptiles</td><td>green / pink / brown / short</td><td>white / pale pink/ brown /long</td></tr>
<tr><td>leaves</td><td>two or three leaves / wider</td><td>one or two leaves</td></tr>
<tr><td>coleoptile / shoot / stem</td><td>wide(er)</td><td>narrow(er)</td></tr>
<tr><td>coleoptile / shoot / stem</td><td>almost vertical / upright</td><td>bent / AW</td></tr>
</table></td><td>2</td><td>comparisons must match</td></tr>
</table>

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Question	Mark scheme	Mark	Guidance
1(b)(i)	1 one table drawn with (ruled) lines; 2 column / row headings with units in the header only; 3 trials identified / numbered; 4 twelve measurements recorded in the appropriate light and dark conditions; 5 all coleoptile lengths should be shorter than the total length; 6 majority of measurements are consistent with Supervisor's range;	**6**	**R** if measurements recorded are inconsistent with the unit heading

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<table>
<tr><th>Question</th><th>Mark scheme</th><th>Mark</th><th>Guidance</th></tr>
<tr><td>1(b)(ii)</td><td>any 2 of:
1 the seeds germinate in both light and dark;

2 light is needed for the leaves become green (as chlorophyll is made / ora;

3 idea that seedlings grow longer (and thinner) without light (because there is no light) / ora;</td><td>2</td><td></td></tr>
<tr><td>1(c)(i)</td><td>add biuret reagent to the crushed seed / crushed seed and water (and observe the colour change);</td><td>1</td><td>R if heated</td></tr>
<tr><td>1(c)(ii)</td><td>
<table>
<tr><td rowspan="2">test reagent</td><td colspan="2">results</td></tr>
<tr><td>seedlings grown in light</td><td>seedlings grown in dark</td></tr>
<tr><td>biuret</td><td>purple</td><td>purple</td></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>
</table>
</td><td>2</td><td></td></tr>
<tr><td>1(c)(iii)</td><td>(maize stores) starch and protein (reducing sugar);</td><td>1</td><td></td></tr>
</table>

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Question	Mark scheme	Mark	Guidance
1(d)(i)	*any 6 of*: 1 ref. to using same species / type / age of 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 place in (constant) light / ref. to one set placed in (constant) 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>Mark scheme</th><th>Mark</th><th>Guidance</th></tr>
<tr><td>2(a)(i)</td><td>94;
134;</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 / resting (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;</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	Mark scheme	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)	*any 1 of:* (s) exercise increases heart / pulse rate; (s) idea that the more intense the exercise the more increase in heart / pulse rate; *any 1 from* (d) jumping without moving arms shows greater increase in males than females; (d) jumping and moving arms shows greater increase in females than males;	**2**	 **I** ref. to resting pulses rate

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Question	Mark scheme	Mark	Guidance
2(c)(i)	*drawing of cross section of artery* **O**(utline) – single clear lines and without shading; **S**(ize) – occupies at least half of the space provided; **D** (detail) to show at least 2 layers and wavy lining;	**3**	
2(c)(ii)	diameter of lumen = 47 (±1) mm; diameter of drawing = **X** ± 1 mm; correct magnification;	**3**	
		Total: 19	

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