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Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series

0610 BIOLOGY

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

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Abbreviations used in the Mark Scheme

- ; separates marking points
- / separates alternatives within a marking point
- R reject
- I ignore (mark as if this material was not present)
- A accept (a less than ideal answer which should be marked correct)
- AW alternative wording
- underline words underlined must be present
- max indicates the maximum number of marks that can be awarded
- mark independently the second mark may be given even if the first mark is wrong
- A, S, P, L Axes, Size, Plots and Line for graphs
- O, S, D, L Outline, Size, Detail and Label for drawings
- (n)ecf (no) error carried forward
- ( ) the word / phrase in brackets is not required, but sets the context
- ora or reverse argument.
- AVP any valid point

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Question	Answer	Marks	Additional Guidance
1 (a) (i)	position e.g. wrist, neck, elbow; (reference to) artery; (artery) close to surface / can be pressed against hard structure beneath or bone / AW; number of beats / pulses per unit time counted;	max 2	**A** other valid accessible positions for pulse **I** chest / heart beat **R** vein **A** count pulse for 15 sec (then × 4) **A** use a pulse meter
(ii)	to compare results (before and after exercise) / AW;	1	**A** as a comparison / see a difference

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(b) (i)

table drawn with (ruled) lines;

cells for each piece of data;

two appropriate headings including unit for pulse rate e.g. beats per min;

correct results recorded in table;

time / min	pulse rate / beats per min
0 / resting	68
1	88
2	82
3	102
4	110
5	110

4

outer border not needed

I unit for time

A exercise period / time (of exercise) / activity

A 0 / resting

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(b) (ii)	description: (general) increase in pulse rate with (increased) exercise; levels off (from the 4th period of exercise) / AW; credit use of calculated figures; anomaly / pulse decreased after 2nd exercise / to 82 / AW; explanation: heart beats faster / more blood needs to be pumped; more energy needed for exercise; increased (aerobic) respiration; more oxygen / glucose needed; more carbon dioxide to be removed; (anomaly / levelling off) – may be miscount / lower / different intensity of exercise / variation for individual / AW; (levelling off) – idea of sufficient oxygen / heart is beating fast enough / AW;	**4**	max 3 for either description or explanation **A** increases after every exercise for general trend **A** levels off towards the end e.g. after 1st period of exercise, pulse rate increased by 20 beats per minute **A** chemical symbols if correct

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(c)

change	explanation
repeat the experiment with 1 person or large group;	for reliability / pulse rate varies / find anomalies / to calculate average;
ensure exercise is of same level of intensity / same type;	different levels (of intensity) will affect pulse rate differently;
longer period of exercise;	allows one to see long-term pattern / can tell whether it levels off or continues to rise / AW;
idea of controlling other variables e.g. temperature / time of day / diet / clothing / AW;	ensures results are only influenced by the exercise / not influenced by other variable;
use a pulse counter / AW;	eliminates error in counting / allows continuous monitoring;
standardise time to measure pulse rate;	eliminate errors / more reliable / AW;
AVP;	AVP;

max 4

changes and explanations must be linked

two changes and two matching explanations needed for 4 marks

A AW throughout

A accurate / precise / to minimise errors / reduce errors / AW in the explanation for all explanations except number 3

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(d) (i)	measurement of **AB**: 43 ± 1 (mm); formula: magnification = AB ÷ actual diameter or 43/4.3; magnification: = (×) 10;	**3**	**A** ecf from measurement **A** words or figures **I** units given for magnification **A** if formula uses their measured diameter and actual length incorrectly in either a multiplication or inverted division then no marks for formula but allow 1 for correct calculation

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(d) (ii)	decrease in diameter: 4.3 (**AB**) – 2.0 (**CD**) = 2.3 (mm); formula: 2.3 / 4.3 × 100; calculation: 53 / 54 (%);	**3**	**A** ecf from measurement in **1(d)(i)** **I** units whole number answer required
		[Total: 21]	

2 (a)

difference	**E**	**F**
shape / outline / projections	blades / wings / aerodynamic shape / smooth / 2 projections / AW	spines / thorns / spikes / hooks / branched / uneven / many or 5+ projections /AW;;
symmetry	regular	irregular;
point of attachment	visible	not visible;
seed position/ seed	at one end / two	not visible / one / number not known (seeds/cores/parts);;

any two;;

max 2

A AW throughout

differences must be comparative or contrasting for both fruits

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(b) (i)	**A** – axes labelled **and** scaled evenly; **S** – size; **P** – points plotted accurately ±½ small square; **L** – line E or F correct; **K** – labelling of both lines / key;	**5**	*x*-axis: wind speed / ms^{-1} *y*-axis: average distance / m **I** orientation if no '0' on an axis then scale can begin at any number but if '0' on an axis then scale must be even or have discontinuity mark plots to fill half, or more than half, of grid along both axes **A** 1 plotting error lines should be point to point ±½ small square **A** ruled lines or smooth unbroken line **R** double lines / sketchy lines / broad lines > ½ small square **R** extrapolation > ½ small square other graphs (e.g. histogram / bar chart) = max 4 (no **L**)
(b) (ii)	distance travelled by **E** increases with wind speed / positive correlation between the two / AW;	**1**	
(c)	**O** – outline is single clear line (and no shading anywhere); **S** – size is larger than photograph; **D** – detail; **L** – one label from testa / seed coat / radicle / plumule / cotyledon / hypocotyl;	**4**	**I** minor overlaps or breaks drawing larger than 60 mm (length from top of plumule to tip of radicle) **R** if drawing touches / extends into printed words minimum detail of seed with radicle below seed equal to or longer than the seed, tapering at the tip

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(d) (i)	temperature;	**1**	
(d) (ii)	how many germinate / rate of germination / % germinated / time taken (to germinate);	**1**	**A** number that grow
(d) (iii)	volume of water; concentration / percentage of oxygen; seed type / species / age / size / AW;	**max 2**	**A** amount of moisture **I** pH / light / soil type / minerals / humidity
(e) (i)	prepare seed; test with Biuret reagent;	**2**	**A** cut / chop / crush / grind / AW **A** use a piece of seed **A** add to water **/** form a solution **A** alternative tests e.g. Millon's / xanthoproteic / albustix
(e) (ii)	blue to lilac / mauve / purple;	**1**	**A** colour changes for alternative tests: Millon's – clear to brick red xanthoproteic – yellow to orange albustix – yellow to green
		[Total: 19]	

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