CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2015 series

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

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2015 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

Abbreviations used in the Mark Scheme

- **;** separates marking points
- **/** separates alternatives within a marking point
- **R** reject
- **ignore** mark as if this material was not present
- **A** accept (a less than ideal answer which should be marked correct)
- AW alternative wording (accept other ways of expressing the same idea)
- underline words underlined (or grammatical variants of them) 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
- ecf credit a correct statement that follows a previous wrong response
- ( ) the word / phrase in brackets is not required, but sets the context
- **ora** or reverse argument
- AVP any valid point

Question	Mark scheme	Mark	Guidance
1 (a) (i)	add water / cut egg white / AW ; (addition of) biuret (solution) ;	 [2]	 **R** if heated / acid added
(ii)	blue to purple (means protein is present) ; stays blue / no change means protein is absent ;	 [2]	**ignore** goes purple alone – needs to be a change of colour
(iii)	wear a lab coat / use a test-tube rack / wear gloves ;	[1]	**ignore** goggles
(b) (i)	test-tube **B**: <u>432</u> (seconds) **and** test-tube **C**: <u>266</u> (seconds);	[1]	
(ii)	table with at least two columns and four rows ; column headings test-tube or volume of enzyme / cm^3 **and** time taken / s ; observations recorded for three tests ;	 [3]	 ecf 1(b)(i)

(c)	*any two from:* more enzyme / higher concentration of enzyme means faster change / AW **ora** ; calculated figures from table ; test-tube **A** does not / may not change / took the longest time, because no enzyme is present / AW ;	 max [2]	answer must refer to enzyme e.g. **C** / 10 cm^3 enzyme takes 166 second less than **B** / 5 cm^3 enzyme **ignore** figures just quoted from the table
(d)	(idea of) control / for comparison / AW ;	[1]	
(e)	*two from:* temperature affects enzyme activity / specific reference to an effect e.g. high temperatures denature / warmer temperatures speed up the activity / more activity / cooler temperatures slow activity down or there is less activity ; temperature is a controlled variable (and must not vary) / AW ; if temperature is different in each test-tube, results are less valid / less reliable / AW **ora** ;	 max [2]	**ignore** references to optimum temperature **R** enzymes killed
(f)	**surface area** would alter the rate of enzyme activity / AW ;	[1]	
(g) (i)	(pH)10 ;	[1]	
(ii)	pepsin ;	[1]	**A** gastric protease / protease in stomach
		[Total: 16]	

2 (a)	drawing of outer edge, midrib and main veins uses single clear unbroken lines with no shading anywhere ; drawing is larger than the photograph ; <u>two</u> correct details ; e.g. - pointed tip with correct shape of tip and leaf (width approximately half the length) - veins off the midrib alternate (not paired), extending to outer edge and curving - petiole drawn with narrow double line and indent at base	[3]	
(b) (i)	$0.7 \div 4.2 \times 100$ 16.7 ;;	[2]	two marks for correct answer with no working
(ii)	leaves have different starting masses ; means that results (for different leaves) can be compared / AW **ora** ;	[2]	**ignore** to make the results more fair / more reliable / more valid / accurate / precise

(iii)	axes labelled and with an even scale on y-axis, *x-axis* leaf and letter and *y-axis* percentage decrease in mass ; size bars to fill at least half of the grid in both directions ; plots all accurate ±½ *small square ;* bars **ruled,** of same width**,** not touching, and spaces between bars, same width as each other ;	[4]	**A** ecf from 2(b)(i)
(iv)	lower surface – because less water loss when it is covered **ora** / **Q** loses more than **R** or when lower surface is exposed / **R** loses less than **Q** or when the lower surface is covered /AW;	[1]	**R** lower surface unqualified
(c)	*independent variable:* temperature; *control* variable*: **two from***: leaf type / species / similar size / similar surface area humidity AW / wind speed AW / light (intensity) / time / carbon dioxide concentration ;; *dependent variable:* mass / change or decrease in mass ;	[4]	**R** temperature and mass **A** distance moved by bubble / coloured water (in the context of a photosynthometer) **ignore** rate of transpiration / water loss **R** dry mass
		[Total: 16]	

3 (a)

any two features with matching comparisons:

feature	human red blood cell	frog red blood cell
shape	round / disc / AW	oval / AW
nucleus	absent / not visible	present / visible
size	small	large
number / concentration / density, of cells	more higher	fewer lower

one mark for two features (vertical column) ;

one mark for each correct row ;; [3]

(b)

measurement mark: 80 (mm) ;

formula mark: 80 ÷ 2
*calculation mark: (*x) 40 ;; [3]

A ± 1 (mm)

ecf if original measurement incorrect
two marks for correct answer with no working

(c)

mitosis / make proteins / control cell activity / keep cell alive longer / AVP; [1]

R meiosis / binary fission

[Total: 7]