



BIOLOGY

0610/62

Paper 6 Alternative to Practical

May/June 2017

MARK SCHEME

Maximum Mark: 40

Published

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

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This document consists of **7** printed pages.

Mark schemes will use these abbreviations

- ; separates marking points
- / alternatives
- I ignore
- R reject
- A accept (for answers correctly cued by the question, or guidance for examiners)
- AW alternative wording (where responses vary more than usual)
- 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 word given must be used by candidate (grammatical variants excepted)
- max indicates the maximum number of marks that can be given

Question	Answer	Marks	Guidance
1(a)(i)	one table drawn with appropriate lines and number of cells ; correct column and row headings with appropriate units ; ten correct values recorded in correct boxes ; correct conversion of minutes to seconds for all numbers ;	4	R if units are in the body of table
1(a)(ii)	X = 71 s ; Y = 229 s ;	2	A correct times in minutes and seconds ecf from 1(a)(i) for wrong conversion of minutes to seconds max 1 if not rounded up to nearest whole number max 1 if both correct whole numbers but no units
1(a)(iii)	labelled axes with units ; even scale and at least 50% of grid used for time axis ; two correctly plotted bars ($\pm \frac{1}{2}$ a small square), of equal width and separated by a space ;	3	ecf from 1(a)(ii)
1(a)(iv)	gas / oxygen (produced) is trapped within the leaf space ; density is reduced / becomes lighter / buoyancy increases ;	1	
1(a)(v)	to identify anomalies / for reliability / for repeatability / to calculate an average ;	1	
1(a)(vi)	<i>measured:</i> time taken for leaf disc to rise / rate of photosynthesis ; <i>changed:</i> location of plant / growing conditions of plant ;	2	

Question	Answer	Marks	Guidance
2(a)(i)	<p>1 sun leaf / Fig 2.2, is thicker (overall) / has bigger cells; ora</p> <p>2 sun leaf has a thicker palisade mesophyll layer / thicker spongy mesophyll / thicker mesophyll ; ora</p> <p>3 sun leaf palisade layer is more tightly packed / denser ; ora</p> <p>4 sun leaf has a thicker epidermis ; ora</p> <p>5 sun leaf palisade <u>cells</u> are thinner / taller ; ora</p> <p>6 sun leaf has larger air spaces ; ora</p> <p>7 AVP e.g. sun leaf has a deeper / different shaped, vascular bundle ; ora</p>	2	
2(a)(ii)	<p>Lines drawn that are clear and continuous ;</p> <p>Scale: to fill more than half the space ;</p> <p>Detail: 4 or 5 layers shown ;</p> <p>Proportion: palisade mesophyll layer is between third to a half of total mesophyll ;</p>	4	R shading / stippling / hatching / cells / ruled lines

Question	Answer	Marks	Guidance
2(a)(iii)	19 <u>mm</u> (± 1 mm) ; 19 \div 130 = 0.15 mm ;;	3	ecf incorrect measurement of line PQ if answer incorrect, award 1 mark for correct working shown (19 \div 130)
2(b)(i)	(70 – 105 =) 35 (.00) ; (35 \div 70) \times 100 = 50 (.00) ;	2	ecf from calculated difference
2(b)(ii)	comparative data quote in either section with units at least once ; <i>supports hypothesis:</i> shade leaves are longer ; ora <i>does not support hypothesis:</i> sun leaves are thicker ; ora	3	I larger or bigger A sun leaves may be wider / width not measured / width is not given, so cannot calculate area ;
2(c)(i)	extinguish flame / do not use a Bunsen burner / no flames ; use a water-bath / place ethanol in a test-tube in boiled water ;	1	

Question	Answer	Marks	Guidance
2(c)(i)	to be able to see colour change / AW ;	1	
2(c)(iii)	<p>1 leaves from the same plant / species ;</p> <p>2 at least three leaves from sun and three from shade ;</p> <p>3 boil / heat in water ;</p> <p>4 heat in ethanol ;</p> <p>5 rinse leaf ;</p> <p>6 spread on a white tile ;</p> <p>7 add iodine solution ;</p> <p>8 positive test gives a blue-black colour ;</p> <p>9 detail of a controlled variable, e.g. heated for same length of time / same volume or concentration of iodine solution / leaves picked at same time ;</p>	5	<p>I de-starching leaves</p> <p>I use of a control</p> <p>I ref to lab safety</p>
	Total:	21	