
BIOLOGY

0610/62

Paper 6 Alternative to Practical

May/June 2017

MARK SCHEME

Maximum Mark: 40

Published

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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) \cdot 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 | |