
BIOLOGY

5090/62

Paper 6 Alternative to Practical

May/June 2017

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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Mark schemes will use these abbreviations:

| | |
|-------------------------|---|
| ; | separates marking points |
| / | alternatives |
| () | contents of brackets are not required but should be implied |
| R | reject |
| A | accept (for answers correctly cued by the question, or guidance for examiners) |
| lg | ignore (for incorrect but irrelevant responses) |
| AW | alternative wording (where responses vary more than usual) |
| AVP | alternative valid point (where a greater than usual variety of responses is expected) |
| ORA | or reverse argument |
| <u>underline</u> | actual word underlined must be used by candidate |
| + | statements on both sides of the + are needed for that mark |

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This document consists of **6** printed pages.

| Question | Answers | Marks | Guidance |
|-----------|--|----------|---|
| 1(a)(i) | A 0.3 B 0.1 C - 0.2 D - 0.4 ; ; negative signs / decrease for C and D only ; | 3 | 4 correct values 2 marks 3 correct values 1 mark 2 or fewer 0 marks Ig units included in table e.g. 0.3 g |
| 1(a)(ii) | reference to movement of <u>water</u> ; <u>osmosis</u> ; into A / taken up by A ; out of D / lost by D ; | 4 | Ig diffusion R If osmosis and active transport in same answer |
| 1(a)(iii) | to remove surface / excess solution ; so that excess solution is not included in the mass of the strip / so that only the mass of the strip is measured / AW ; | 1 | A water |
| 1(a)(iv) | to remove variable / so that sucrose solution concentration is the only variable ; to make comparison valid / increase validity ; same (surface) area of potato in contact with solution ; | 2 | |
| 1(a) (v) | add 50 cm ³ <u>water</u> / add equal volume of <u>water</u> / make volume up to 100 cm ³ with <u>water</u> ; | 1 | |
| 1(b)(i) | (plasmolysed cells) 7 (non-plasmolysed cells) 21 ; | 1 | |
| 1(b)(ii) | 25.0 ; ; | 2 | correct answer with no working shown gains both marks A one mark for correct working if answer incorrect |

| Question | Answers | Marks | Guidance |
|----------|---|-----------|-------------------------------|
| 1(c)(i) | both axes fully labelled: 'concentration of sucrose solution / mol per dm ³ ' 'percentage of plasmolysed cells' ; sucrose concentration <u>on x-axis</u> , % cells <u>on y-axis</u> + linear scales + 0 at origin + at least half grid used ; all 5 points visibly plotted correctly ; plotted points joined with <u>ruled</u> lines + not extrapolated beyond 0.8 / 100 plot ; | 4 | |
| 1(c)(ii) | working shown on graph ; value read correctly from candidate's working + mol per dm ³ ; | 2 | tolerance ± half small square |
| | Total: | 20 | |

| Question | Answers | Marks | Guidance |
|-----------|--|-----------|--|
| 2(a)(i) | add iodine (solution) ; yellow to black (blue-black) ; | 2 | |
| 2(a)(ii) | add Benedict's solution ; heat ; blue to green / yellow / orange / red ; | 3 | |
| 2(b)(i) | as fat (content) increases energy increases / ORA ; | 1 | R reference to 'proportional' |
| 2(b)(ii) | 62.5 ; ; | 2 | correct answer with no working shown gains both marks A one mark for correct working if answer incorrect |
| 2(b)(iii) | 500 ; ; | 2 | correct answer with no working shown gains both marks A one mark for correct working if answer incorrect |
| | Total: | 10 | |

| Question | Answers | Marks | Guidance |
|----------|---|-----------|---|
| 3(a) | cell P at least 80 mm long + good proportions ; line clear, clean, and continuous drawn with a sharp pencil + no shading / stippling / cross-hatching anywhere ; cell wall indicated with a double line ; chloroplasts shown in acceptable numbers + all drawn with complete outlines ; | 4 | |
| 3(b) | measurement 48–51 ; measurement \div 200 ; correct value ; mm ; | 4 | |
| 3(c) | chloroplasts ; (cell) wall ; | 2 | R chlorophyll lg vacuole (not visible) |
| | Total: | 10 | |