**Cambridge Assessment International Education**
Cambridge International General Certificate of Secondary Education

**PHYSICS** **0625/63**

Paper 6 Alternative to Practical **October/November 2019**

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.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

This syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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## Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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| GENERIC MARKING PRINCIPLE 5:<br><br>Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen). |
| GENERIC MARKING PRINCIPLE 6:<br><br>Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind. |

| Question | Answer | Marks |
|---|---|---|
| 1(a) | correct voltmeter symbol in parallel with lamp | **1** |
| 1(b)(i) | $V$ = 0.6(V) and $I$ = 0.14(A) | **1** |
| 1(b)(ii) | $R$ = 4.3(Ω) | **1** |
| 1(c) | graph: | |
| | axes labelled correct orientation, with quantity and unit | **1** |
| | appropriate scales (plots occupying at least ½ grid) | **1** |
| | plots all correct to less than ½ small square and precise plots | **1** |
| | well-judged line and thin line | **1** |
| 1(d) | resistance increases as temperature increases | **1** |
| | temperature / resistance increases with length | **1** |
| 1(e) | variable resistor symbol correct (rectangle with strike-through arrow only) | **1** |
| | in series and rest of circuit correct | **1** |

| Question | Answer | Marks |
|---|---|---|
| 2(a)(i) | $u$ = 5.0(cm) and $v$ = 7.6(cm) | **1** |
| 2(a)(ii) | $U$ = 25(.0)(cm) and $V$ = 38(.0)(cm) | **1** |
| 2(a)(iii) | $f_1$ 15(.1)(cm) and 2/3 sig fig and unit | **1** |
| 2(a)(iv) | move screen slowly / backwards and forwards | **1** |
| 2(b)(i) | $h_O$ = 1.5(cm) and $h_I$ = 2.4(cm) | **1** |
| 2(b)(ii) | $M$ = 1.6 and no unit | **1** |
| 2(b)(iii) | $f_2$ = 15 / 14.6(cm) | **1** |
| 2(c) | statement matching results | **1** |
| | values within limits of experimental accuracy / owtte | **1** |
| 2(d) | any **one** from:<br>• mark position of lens on holder ;<br>• clamp rule / place rule on bench ;<br>• ensure screen, lens and object all perpendicular (to bench) / vertical ;<br>• view scale perpendicularly ;<br>• mark top and bottom of image and measure later | **1** |
| 2(e) | either method suggested if matching valid explanation<br>e.g.<br>METHOD 1: difficult to measure height of image in method 2<br>METHOD 1: smaller lengths measured in method 2 / reverse argument<br>METHOD 2: can't measure $u$ and $v$ to lens accurately in method 1 | **1** |

| Question | Answer | Marks |
|---|---|---|
| 3(a) | any **two** from:<br>• rule close / parallel to spring ;<br>• eye perpendicular to reading / use set square ;<br>• clamp rule | **2** |
| 3(b) | correct calculations of *e* (4.2, 8.4, 12.6) | **1** |
| 3(c)(i) | $l_x$ = 11.4(cm) | **1** |
| 3(c)(ii) | 2.0 N < $W_x$ < 2.5(N) | **1** |
| | working showing use of ratio/correct logic | **1** |
| 3(d) | data only given to 1 dp / 2 or 3 sig fig | **1** |
| 3(e)(i) | statement matching results | **1** |
| | correct justification matching statement e.g.<br>• *L*/*e* constant<br>• *e* doubles when *L* doubles | **1** |
| 3(e)(ii) | straight line | **1** |
| | (line) through origin | **1** |

| Question | Answer | Marks |
|---|---|---|
| 4 | **MP1 Apparatus**<br>beaker and (material for) lid and thermometer and stop clock (or alternative) | 1 |
| | **MP2 Method**<br>pour (hot) water into container<br>measure temperature of (hot) water over period of time | 1 |
| | **MP3 Method**<br>repeat for different thicknesses of lid | 1 |
| | **MP4 & MP5 Control variables**<br>any **two** from:<br>• same initial/starting temperature of water ;<br>• same volume of water ;<br>• same size / material / thickness of beaker ;<br>• same material for lid ;<br>• same time for measuring temperature change / same temperature difference for measuring time taken<br>• same room temperature / other environmental condition | 2 |
| | **MP6 Table**<br>suitable column headings and units | 1 |
| | **MP7 Analysis**<br>any **one** from:<br>• comparison of temperature decrease / rates of cooling with thickness / different lids<br>• draw a suitable graph with axes stated | 1 |