Cambridge O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

PHYSICS **5054/41**

Paper 4 Alternative to Practical **May/June 2019**

MARK SCHEME

Maximum Mark: 30

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 May/June 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

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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.

GENERIC MARKING PRINCIPLE 5: 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: 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)(i)	3.2 (cm) and 8.0 (cm) both correct to 0.1 cm with unit	**B1**
1(a)(ii)	4.8 cm	**B1**
1(a)(iii)	ruler must be vertical / access to centre of lamp / filament / judge where the filament is / ruler dead space / ruler too far from lamp	**B1**
1(b)(i)	correct diagram for power supply, ammeter and LDR with correct symbols.	**B1**
	correct symbol voltmeter in parallel across LDR	**B1**
1(b)(ii)1	6.5V **and** 77mA cao	**B1**
1(b)(ii)2	84.415…	**B1**
	84ohms – unit required	**B1**
1(c)(i)	axes labelled quantity and unit axes correct way round	**B1**
	scales linear, not awkward	**B1**
	points plotted accurately	**B1**
	smooth best fit curve drawn	**B1**
1(c)(ii)	as *d* increases, *R* increases	**B1**

Question	Answer	Marks
2(a)	2.5 ms	**B1**
2(b)	metre rule gets rubbed away at the edges owtte	**B1**
2(c)	328 m/s correct with unit	**B1**
2(d)	A and B further apart / repeat and average	**B1**

Question	Answer	Marks
3(a)	5.9 (N) cao	**B1**
3(b)(i)	5.2 (N) cao	**B1**
3(b)(ii)	0.7(0) N	**B1**
3(c)(i)	73.7 (cm^3)	**B1**
3(c)(ii)	take the maximum value across the top / use of set squares / repeat and average at different places around the diameter or 'top and bottom' of cylinder	**B1**
3(c)(iii)	1 $74 \times 10 \times 0.0010$ seen and answer 0.74	**B1**
3(c)(iii)	2 yes because within 10% / they are very close / difference is small / difference within experimental error newton meter cannot be read to that precision	**B1**

Question	Answer	Marks
4(a)	thermometer stopwatch	**B1** **B1**
4(b)(i)	basic method correct and read initial temperature	**B1**
	leave for the same period of time/ same temp drop **and** take final temperature	**B1**
	conclusion – least temp drop/longest time is best insulator	**B1**
4(b)(ii)	same thickness of insulator/same volume of water/ same initial temp/same room temp/ any sensible	**B1**