Cambridge O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

PHYSICS **5054/42**

Paper 4 Alternative to Practical **May/June 2018**

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.

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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: 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.

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Question	Answer	Marks
1(a)	correct symbol and parallel connection with the lamp	**B1**
1(b)	V = 1.6(0) (V)	**B1**
	I = 0.17(0) (A)	**B1**
1(c)	9.4 / 9.41 (Ω), 7.5 / 7.55 (Ω)	**B1**
1(d)	(no -) values too different / too far apart / beyond the limits of experimental accuracy / > 10% apart	**B1**
1(e)	(the results show that the lamp has a greater resistance when) brighter	**B1**

Question	Answer	Marks
2(a)	line of length 10.0 (cm) and with its end labelled D	**B1**
	angle of incidence 40° to the left of the normal and below the mirror	**B1**
2(b)(i)	line passing through P_3 and P_4 and reaching mirror	**B1**
2(b)(ii)	42 (°)	**B1**
2(c)	pins vertical / (align by) viewing bases of pins / pins far apart / > 5 cm	**B1**

Question	Answer	Marks
3(a)	5.0 and 2.3 (either way around for length and width)	**B1**
	11.5(0) (cm^2), accept 12	**B1**
3(b)	0.14 (N)	**B1**

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Question	Answer	Marks
3(c)	0.012 (N / cm^2) (0.013 if 11 cm^2 used, 0.012 if 12 cm^2 used)	**B1**
3(d)	the outline traced is larger than the actual area of the block	**B1**

Question	Answer	Marks
4(a)	some indication of working shown either on the diagram or in the space provided e.g. 8.6 (cm) or 10.2 (cm) seen / lines marked either side of cylinder / line marked in middle / centre marked	**B1**
	9.4 cm / 94 mm	**B1**
4(b)(i)	50.6 and 30.0	**B1**
4(b)(ii)	axes labelled quantity and unit and axes correct way round allow $r_2 - 60$ / cm for y / cm, $60 - r_1$ / cm for x / cm	**B1**
	scales linear, not awkward	**B1**
	points plotted accurately, to the nearest ½ square	**B1**
	best-fit thin straight line drawn	**B1**
4(b)(iii)	indication on graph of how data obtained AND at least half of the line between the extreme plotted points used ($\Delta y \geqslant 10$)	**B1**
	0.45 ± 0.02 (or values rounding to 0.47 and 0.43) ignore unit, if given (if the graph axes in **(b)(ii)** reversed, gradient range is 2.0 to 2.5 e.c.f.)	**B1**
4(b)(iv)	150 × candidate's **(b)(iii)** to the nearest gram	**B1**
4(c)	57 (cm^3)	**C1**
	7 (cm^3)	**A1**

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Question	Answer	Marks
4(d)	candidate's **(b)(iv)** ÷ **(c)**	**B1**
4(e)	difficulty in balancing rule / difficulty in finding position of centre of cylinder / measuring cylinder only reads to 1 cm^3	**B1**

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