Cambridge O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

PHYSICS **5054/31**

Paper 3 Practical Test **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.

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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).

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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)	38.5 ± 2 s ;	**1**
1(b)(i)	35.1 ± 2 s **and** less than a ;	**1**
1(b)(ii)	30.7 ± 2 s ;	**1**
1(c)	The more distance D (between bosses) the less time *T* ;	**1**
1(d)	Faster (at centre of oscillation) so less time taken to pass through this point ;	**1**

Question	Answer	Marks
2(a)(i)	4.5 V / 5.1 V (when rounded) ;	**1**
2(a)(ii)	evidence of at least two *t* measurements averaged ;	**1**
	Between 2 s and 120 s ;	**1**
2(b)	evidence of at least two *t* measurements averaged **and** less than or equal to 50% of **(a)(ii)** ;	**1**
2(c)	less time **and** numerical statement consistent with results ;	**1**

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Question	Answer	Marks
3(a)(i)	(θ =) 15° ± 3° ;	**1**
3(a)(ii)	From their value in a, with angles increasing to a maximum value between 40 and 45° ;	**1**
	constant increase in angle ;	**1**
3(b)	difficulty described e.g. • keeping protractor still • causing apparatus to move when measuring • parallax error due to space between protractor and beam improvement consistent with difficulty e.g. • fix the protractor to the apparatus • minimise the space between protractor and beam ;	**1**
3(c)	parallel by eye to e.g. windowsill **or** equal distance between clamp and ruler at two positions **or** equal height above bench at each end ;	**1**

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Question	Answer	Marks
4(a)	(l =) 27 mm ± 1 mm ;	**1**
	(d =) 17 mm ± 1 mm ;	**1**
4(b)	(l_i =) 55 mm ± 2 mm ; (d_i =) 34 mm ± 2 mm ;	**1**
4(c)	headings and units ;	1
	at least 6 readings ;	**1**
	at least one h value at 4. to 5 cm AND one value at 15–16 cm AND no values lower than 4.0 and higher than 16.0 cm ;	**1**
	d_i and l_i increasing with increasing trend ;	**1**
4(d)	Axes labelled with units and correct orientation ;	**1**
	Suitable scale, ≥ ½ page in both directions ;	**1**
	Two points plotted correctly – check any **two** points at your discretion ;	**1**
	best fit curve and fine points or crosses ;	**1**
4(e)(i)	straight line from 8 to 12 cm on curve ;	**1**
4(e)(ii)	calculation of g to 2 or 3 s.f. **and** no unit ;	**1**
	from a large triangle ;	**1**
4(f)	Yes **and** justification (close enough / not close enough) **and** calculated values of d_i/l_i **or** results not clear enough to give indications and say why ; correct – check one value.	**1**

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