Cambridge O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

PHYSICS **5054/31**

Paper 3 Practical Test **October/November 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 October/November 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level 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.

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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)(i)	(Average of two or more readings in calculation) 49.0 ± 2.0 s ;	**1**
1(a)(ii)	The amplitude decreases (during time, t / from first to last oscillation ;	**1**
1(b)(i)	Larger than t in **1(a)(i)** by no less than 0.5 and no more than 2.5 s 49.5 ± 2.0 s ;	**1**
1(b)(ii)	With the card amplitude decreases in less time ;	**1**
1(b)(iii)	With the card there is more air resistance ;	**1**

Question	Answer	Marks
2(a)	Compare with a distant horizontal reference line or measure distance from (top of / lower edge of) the rule to the bench in at least two places and ensure they are the same ;	**1**
2(b)(i)	30 to 60 degrees ;	**1**
2(b)(ii)	Change the mass at A **and** measure the angle with the new mass ; keep the mass at B constant ;	**2**
2(c)	Θ increasing as mass increases, ending at 90 or horizontal line from 90 starting at 0, 0 or with small *y*-axis intercept ;	**1**

Question	Answer	Marks
3(a)	U labelled and straight line from T to U ; arc drawn at correct angle of refraction and labelled r ;	**2**
3(b)	,i = 55 ± 1 ; ,r = 33 ± 3 ;	**2**
3(c)	Correct calculation **and** working shown **and** no unit, to 2 or 3 sig figs ;	**1**

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Question	Answer	Marks
4(a)(i)	V_{AC}= 3.5-4.5 Volts ;	**1**
4(a)(ii)	Checked for clean / tight connections / checked for zero error / selected appropriate range on digital meter / **how** he / she dealt with varying readings of digital meter / **how** he / she took readings avoiding parallax error on analogue meter / took repeat readings **and** averaged them ;	**1**
4(b)(i)	(V_{AB}) = 0.65 ± 0.2 V ;	**1**
4(b)(ii)	Their 0.01 × their (V_{AB}) ; *(may be a new VAB from the table if cand started again).*	**1**
4(b)(iii)	Their (VAC – VAB) / their current ;	**1**
4(c)	Correct headers and units on top row of table ;	**1**
4(d)(i) and 4(d)(ii)	Table fully completed and consistent sig fig ; V_{AB} increasing and I increasing ; R calculated and decreasing ; R decreasing with decreasing rate as t increases ;	**4**
4(e)(i)	Labels, units and orientation of axes correct ; suitable and sensible scale, plots over at least half the grid ; plots correct to 0.5 small square ; best fit line and fine plots(visible dots or crosses) ;	**4**
4(e)(ii)	Evidence seen on the curve of correct use to find the value of R at 2.5 min and their value of R is consistent with that annotation (to same precision as plotting points) ;	**1**

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