Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/62**

Paper 6 Alternative to Practical **March 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 March 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)	θ = 23(°)±1°	**1**
1(a)(ii)	normal correct	**1**
1(b)	not at a suitable distance and should be far (as possible) from **N**	**1**
1(c)	all lines present, neat and labelled correctly	**1**
	a = 10.2 (cm) ± 0.1 (cm)	**1**
1(d)	**graph:** • axes labelled with quantity and unit	**1**
	• appropriate scales (plots occupying at least ½ grid)	**1**
	• plots all correct to ½ small square, precise plots	**1**
	• well judged line and thin continuous line	**1**
1(e)	any suitable reason e.g.: ray has finite thickness – (difficult to mark position of ray precisely), reflecting surface of mirror at rear, inaccuracies have more effect for smaller angles, small variations in mirror angle have significant effect on '*a*'	**1**
1(f)	reflect ray below **NL** at same angles and take averages	**1**

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Question	Answer	Marks
2(a)	θ_R = 23 (°C)	**1**
2(b)	s, °C, °C all correct	**1**
	30, 60, 90, 120, 150, 180	**1**
2(c)	lid is more effective	**1**
	correct mention of comparative temperature change over 180 s, supporting conclusion	**1**
2(d)	additional experiment with both insulation and lid / neither insulation nor lid	**1**
	compare result of (previous) experiment with additional / only one factor changed in (each) comparison	**1**
2(e)(i)	x_A = 0.081	**1**
	°C / s	**1**
2(e)(ii)	cooling more rapid at higher temperatures	**1**
	comparison of temperature difference over first 30 s and last 30 s supporting statement	**1**

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Question	Answer	Marks
3(a)(i)	correct voltmeter symbol in parallel with **P** and **Q**	**1**
3(a)(ii)	V = 2.6 (V)	**1**
	I = 0.36 (A)	**1**
3(b)	correct units: V, A	**1**
3(c)(i)	correct calculations of R	**1**
	consistent 2 or consistent 3 sig. figs.	**1**
3(c)(ii)	correct calculations or R / l	**1**
3(d)	R_{25} = 2.0 (Ω) and clear method seen e.g. proportion from other value(s) of R or use of R / l value(s)	**1**
3(e)	any **one** from: difficult to judge position of crocodile clip, difficult to measure wire to nearest mm, contact between wire and crocodile clip not precise, difficult to interpolate readings on meters between marks	**1**
3(f)	correct symbol for variable resistor	**1**
	in series and with all circuit elements in correct arrangement	**1**

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Question	Answer	Marks
4	**MP1** **apparatus:** means of measuring dependent variable (e.g. stop watch / rule / protractor)	**1**
	MP2 **method** (one from): workable means of providing air resistance (e.g. fix card to rod / bob), allow pendulum to swing, suitable measurement (e.g. period, amplitude)	**1**
	MP3 repeat for different value of independent variable (e.g. area of card)	**1**
	MP4 **control variable** (one from): length of pendulum, angle of release, mass of bob	**1**
	MP5 **table:** suitable clear format with column headings and units	**1**
	MP6 **analysis:** compare readings to see if change in air resistance produces change in dependent variable (e.g. change in area of card changes period) / plot graph	**1**

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Question	Answer	Marks
4	**MP7** **additional point** (one from): time 10 oscillations / swings (and calculate period), small angle of swing, at least 5 sets of data taken, repeat each measurement and take average, adjust mass of pendulum to compensate for changing mass of card, repeat with different length of pendulum / mass of bob, length measured to centre of bob / centre of gravity of pendulum, use of fiducial aid	**1**

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