Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/63**

Paper 6 Alternative to Practical **October/November 2018**

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 October/November 2018 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

PUBLISHED

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)	l = 6.0, w = 3.0, h = 4.0 (cm)	**1**
1(a)(ii)	V_1 = 72 (cm^3)	**1**
1(b)	difficult to measure irregular dimensions / owtte	**1**
	repeat (in several places for each dimension and take averages)	**1**
1(c)	W = 1.4 (N)	**1**
1(d)	ρ_1 = 1.9(4)	**1**
	unit g / cm^3	**1**
1(e)(i)	V_2 = 160 (cm^3)	**1**
1(e)(ii)	line of sight perpendicular	**1**
1(f)(i)	V_3 present and ρ_2 = 2.0(g / cm^3)	**1**
1(f)(ii)	*suggestion supported by valid reason e.g.* ρ_2 as volume is measured directly; ρ_1 as measuring cylinder is less precise; string adds to volume displaced.	**1**

Question	Answer	Marks
2(a)	correct voltmeter symbol in parallel with wire **X**	**1**
2(b)	V = 1.9 (V)	**1**
2(c)(i)	graph:	
	axes labelled correct orientation, with quantity and unit	**1**
	appropriate scales (plots occupying at least ½ grid)	**1**
	plots all correct to ½ small square and precise plots	**1**
	well-judged line and thin line	**1**
2(c)(ii)	G present and triangle method seen on graph	**1**
2(c)(iii)	l = 4.5 (cm) and L = 13.5 (cm)	**1**
2(c)(iv)	R in range 0.17 to 0.23	**1**
	2 / 3 sig figs and unit = Ω or Ω / cm	**1**
2(d)	Any **one** from: use smaller current / potential difference; use wire with greater resistance; open switch / switch off circuit in between readings.	**1**

Question	Answer	Marks
3(a)(i)	$\alpha = 20° \pm 1°$	**1**
3(a)(ii)	normal correct	**1**
3(a)(iii)	pin separations $\geqslant$ 5.0 cm	**1**
3(b)(i)	line in correct place and neat	**1**
3(b)(ii)	$\theta = 40° \pm 1°$	**1**
3(c)(i)	line in correct place and neat	**1**
3(c)(ii)	$\theta = 68° \pm 1°$	**1**
3(d)	statement matching results including qualitative justification (e.g. 'within limits of experimental accuracy' / owtte)	**1**
	justification that makes use of the data to support statement	**1**
3(e)	Any **two** suitable precautions: pins upright / view pins at base; thin pins; thin lines / sharp pencil; large pin separations; ensure mirrored surface lies along drawn line.	**2**

Question	Answer	Marks
4	**MP1 Apparatus** thermometer AND stopwatch / (stop)clock / timer	**1**
	MP2 Diagram workable arrangement	**1**
	MP3 Method hot water in beaker and cold water in test-tube AND measure (start and) end temperatures in test-tube AND over measured time	**1**
	MP4 Method repeat for different metals	**1**
	MP5 Comparison calculation of (rate of) temperature rise / heating curves for different metals	**1**
	MP6 and MP7 Precautions Any **two** from: same start temperatures (of hot / cold water); same duration of experiment; same volume of cold water (being heated); repeat experiment and take average (of calculated values); use of insulation; stir (cold) water; heat to keep water in beaker at constant temperature.	**2**