Cambridge O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

PHYSICS **5054/31**

Paper 3 Practical Test **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)	from 18 to 25 mm / 1.8 to 2.5 cm ;	**1**
1(b)(i)	70 ± 10 mm ;	**1**
1(b)(ii)	$l_D > l_C > l_B > l_A$;	**1**
1(c)	(conclusion): the more contact between the string and the rod, the longer the spring **owtte** ;	**1**
	(suggested explanation): (increased) friction ;	**1**

Question	Answer	Marks
2(a)	idea of harm e.g. causes burn / scald / blister / pain OR not knocking water / equipment over OR not breaking equipment ;	**1**
2(b)	temperature decreases quickly at first and then more slowly ;	**1**
2(c)	two readings in the range 20 to 90 seconds **and** correctly averaged ;	**1**
2(d)	two readings **and** correct average seen, all larger than value seen in **2(c)** ;	**1**
2(e)	Decision as to whether or not results support the statement	**B0**
	the thermometer that is wrapped in foil / when air is trapped cools more slowly ;	**B1**

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Question	Answer	Marks
3(a)	five readings with generally increasing trend ;	**1**
	size of increase decreases (by eye) ;	**1**
	readings within the range 0.20 to 2.6 V AND all and consistent number of d.p. ;	**1**
3(b)	Use of any V ÷ 47 to calculate a current ;	**B1**
	Yes (no marks)	**M0**
	Use of another V ÷ 47 to calculate a current **and yes** when correctly compared ;	**A1**

Question	Answer	Marks
4(a)(i)	no marking point	**–**
4(a)(ii)	any realistic time value (>10 s) **in seconds** recorded to 1 d.p or better ;	**1**
4(a)(iii)	30 ÷ **(a)(ii) and** correct unit ;	**1**
4(a)(iv),(v)	ans to **(iv)** > ans to **(ii)** **and** 60 ÷ **(a)(iv)** ;	**1**
4(b)	headings + units: (volume) / cm^3 **and** time (t_1) / s, **and** time (t_2) / s **and** average time (t) / s ;	**1**
	at least 5 complete sets of readings across full range with correct calculations ;	**1**
	at least 7 complete sets of readings across full range with consistent decimal places ;	**1**
	t increases with volume and max t < 350 seconds ;	**1**
	time increases by increasing amounts ;	**1**

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Question	Answer	Marks
4(c)	axes labelled with units and correct orientation ;	**1**
	suitable scale, points occupy ⩾ ½ page in both directions ;	**1**
	points plotted correctly ;	**1**
	best fit line (curve) and fine points or crosses ;	**1**
4(d)	tangent at 70 cm^3 ;	**1**
	correct calculation of *G* to 2 or 3 s.f. (s / cm^3) using triangle method ;	**1**
	from a large triangle ⩾ half the drawn line (long line drawn for tangent) ;	**1**

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