
PHYSICS

5054/41

Paper 4 Alternative to Practical

May/June 2017

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.

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Question	Answer	Marks
1(a)(i)	decelerating	B1
1(a)(ii)	less distance travelled in equal time / 0.020 s	B1
1(b)	table of two columns – one with heading time / s (or t / s)	B1
	second column with heading distance / cm (or d / cm or s / cm)	B1
	correct data in table – any 3 correct lines	C1
	4 correct lines	A1
1(c)	$12 / .06 = 200 \text{ cm / s}$ or 2 m / s	B1

Question	Answer	Marks
2(a)	35.4 (s)	B1
2(b)	axes labelled quantity and unit axes correct way round	B1
	scales linear, not awkward, start from (0,0)	B1
	points plotted accurately	B1
	smooth best fit curve drawn	B1
2(c)	31.06 / 31.1	B1
	31 cao	A1
2(d)	curved line of similar shape below original line	B1
2(e)	takes a long time (for last few cm) / would not empty completely / difficult to judge when empty / low pressure	B1

Question	Answer	Marks
3(a)(i)	line through each pair of dots to mirror and line joined between mirrors – correct by eye	B1
3(a)(ii)	described: line through P ₁ and P ₂ and line through P ₃ and P ₄	B1
	described: joining the two lines in the middle at the points where the lines meet the mirror	B1
3(a)(iii)	lines through the centre of the blobs / a thin line drawn / use of a sharp pencil / any sensible precaution	B1
3(b)(i), (ii)	normal drawn at Q by eye	B1
3(b)(iii)	$i = 44^\circ \pm 1^\circ$	B1
3(b)(iv)	$r = 47^\circ \pm 1^\circ$	B1
3(c)	P ₃ and P ₄ further apart / line up the bases of the pins / ensure pins are vertical	B1

Question	Answer	Marks
4(a)	top box – ammeter bottom box – voltmeter	B1
4(b)	meter 1 – current meter 2 – voltage / p.d / emf	B1
4(c)	meter 1 = 0.24 A	B1
	meter 2 = 7.2 V	B1
4(d)	R = 30 ohms	B1
4(e)	check zero error / tap to avoid sticking / switch off to prevent overheating / parallax in reading scale / tight connections any other sensible precaution	B1