



**Cambridge International Examinations**  
Cambridge Ordinary Level

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**PHYSICS**

**5054/41**

Paper 4 Alternative to Practical

**May/June 2017**

MARK SCHEME

Maximum Mark: 30

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**Published**

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

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

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

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