



**Cambridge International Examinations**  
Cambridge Ordinary Level

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**PHYSICS**

**5054/42**

Paper 4 Alternative to Practical

**October/November 2016**

MARK SCHEME

Maximum Mark: 30

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**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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Page 2	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2016	5054	42

1	(a) (i) 64(cm <sup>3</sup> )	B1
	(ii) reading top of meniscus instead of bottom / parallax error explained	B1
	(b) (i) balance / scales	B1
	(ii) find mass using tare / subtract mass of measuring cylinder from that of measuring cylinder + liquid (density) = mass/volume	B1 B1
	(c) smaller value for density	B1
		<b>[Total: 6]</b>
2	(a) (i) crocodile clips	B1
	(ii) (close jaws) <u>gently</u> <b>or</b> use ratchet / thimble / spindle <b>or</b> until wheel slips repeat at <u>different places / positions</u> (and average)	B1 B1
	(iii) 0.055796(using $\pi$ button) / 0.055768(using 3.14) / 0.055818 (using 22/7) 0.056	C1 A1
	(b) (i) axes labelled quantity and unit <b>and</b> axes correct way round scales linear, not awkward, start from (0,0) points plotted accurately best-fit <u>straight line</u> drawn	B1 B1 B1 B1
	(ii) large triangle or any other indication of chosen points <u>shown on graph</u> 93 $\pm$ 2 accept numbers rounding down to 95 and up to 91 not accept fractional values	B1 B1
	(iii) candidate's (a)(iii) $\div$ 200 $\times$ (b)(ii) answer correct (must be checked) <u>in standard form</u>	C1 A1
		<b>[Total: 13]</b>

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2016	5054	42

<b>3</b>	<b>(a)</b> orange, orange brown	B1 B1
	<b>(b)</b> power supply, fixed resistor and diode (any orientation) in series	B1
	ammeter in series (with diode and resistor)	B1
	voltmeter across diode	B1
	<b>(c)</b> variable power supply add rheostat/variable resistor add resistor (in series)/use different values of resistor add cells/batteries	B1
	<b>(d)</b> reverse power supply reverse diode / it	B1
		<b>[Total: 7]</b>
<b>4</b>	<b>(a)</b> 27	B1
	<b>(b) (i)</b> range 100–140 range 110–130	C1 A1
	<b>(ii)</b> 4 × their <b>(b)(i)</b>	B1
		<b>[Total: 4]</b>