

**MARK SCHEME for the May/June 2011 question paper
for the guidance of teachers**

5054 PHYSICS

5054/42

Paper 4 (Alternative to Practical), maximum raw mark 30

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 must be read in conjunction with the question papers and the report on the examination.

- Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

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Page 2	Mark Scheme: Teachers' version	Syllabus	Paper
	GCE O LEVEL – May/June 2011	5054	42

1	(a) (i)	two metre rules end to end / measuring tape / one ruler and mark	B1	[1]
	(ii)	marker on the ramp align with same point on car	B1 B1	[2]
	(iii)	vertical height marked from floor to between lower wheel and top of car	B1	[1]
	(b) (i)	175.(2) or 1.75(2) seen 175 cm or 1.75 m	C1 A1	[2]
	(ii)	push on release / car does not run straight / uneven ramp or floor / friction varies / wind or draught (varies) / parallax error (in measuring distance)	B1	[1]
	(c) (i)	axes: labels correct way round, labelled quantity and unit scales: more than $\frac{1}{2}$ grid, sensible y-axis: 2 cm \equiv 20 cm or 25 cm x-axis: 2 cm \equiv 4 cm or 5 cm points plotted accurately within $\frac{1}{2}$ small square best fit straight line neatly drawn within plotted points	B1 B1 B1 B1	[4]
	(ii)	$\Delta h \propto \Delta d_{av}$ / as h increases d increases proportionally / $y = mx + c$ as h increases d increases PLUS linear / not through origin / not directly proportional ecf directly proportional if graph straight line through origin	B1	[1]
	(d)	car must be implied in answer does not move / stops before reaching point 2 / moves to bottom of ramp then stops ecf graph	B1	[1]
				[Total: 13]
2	(a) (i)	accurate horizontal distance marked from centre of lens to screen	B1	[1]
	(ii)	focal length / image distance	B1	[1]
	(b)	repeat and average (measuring distance) any TWO good practical points (may be marked on diagram) e.g.: <ul style="list-style-type: none"> • adjust screen/lens distance to give clear image • lens in holder • lens and screen perpendicular to ruler / correct use of set square explained • avoid parallax error in reading ruler/measuring f • lens/screen close to ruler • experiment in darkened room allow alternative experiments to measure f	B1 B2	[3]
				[Total: 5]

Page 3	Mark Scheme: Teachers' version	Syllabus	Paper
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- 3 (a) parallel B1 [1]
- (b) (i) correct voltmeter symbol drawn across power supply B1 [1]
- (ii) X marked in series with resistor A B1 [1]
- (c) (i) 1.5V cao B1 [1]
- (ii) 0.1(0) A ecf (c)(i) $\div 15$ B1 [1]
- (d) circuit 2 **PLUS**
two series resistors in parallel loop / no resistor in series with power supply
owtte / resistance is $6\frac{2}{3}\Omega$ B1 [1]
- [Total: 6]**
- 4 (a) (same) volume/level/mass of water B1
any ONE from:
- **initial** temperature (of water)
 - size/shape/material of test tube
 - identical thermometers
 - same external conditions, e.g. room temperature / draught / position in room / humidity B1 [2]
- (b) time or t / minutes (min) B1
temperature or T or θ / °C B1 [2]
- (c) both axes labelled **AND** correct shape for one curve (not to x-axis) B1
A and B similar shape with A initially cooling faster than B, one labelled B1 [2]
- [Total: 6]**