UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2010 question paper for the guidance of teachers

5054 PHYSICS

5054/41 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.

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1 (a) (i) ruler drawn perpendicular to floor close to end of rule
at least as tall as horizontal dotted line — B1

(ii) eye drawn level with end of rule looking towards rule
dotted line (extended) must pass through representation of eye — B1

(b) (i) 0.5 1.3 2.1 2.8 3.5 4.3 cao all correct — B1

(ii) axes — B1

scales x: 2 cm ≡ 20 g y: 2 cm ≡ 0.5 cm — B1

plotting points — B1

best fit straight line NOT through (0,0)
ignore outside plotted points — B1

(iii) line does not pass through the origin — B1

(c) (i) at least ½ grid used,
e.g. triangle drawn on graph › ½ length of line or values seen — C1
0.038 ± 0.003 (other units may be used) NOT 0.04 — A1

(ii) 0.85 m / 85 cm cao unit required — B1

(iii) 11.6 ecf **(c)(i)** and **(ii)** ignore unit — B1

[Total: 12]

2 (a) (i) 1.7(1) (s) — B1

(ii) 2.924 m/s ecf **(i)** unit required — C1
2.9 or 2.92 m/s ecf **(i)** — A1

(b) (i) student not in line with end of rule /
distance between rule and spring / students or between spring and students
allow lines drawn on diagram — B1

(ii) start stopwatch after wave has passed start /
stop stopwatch before wave gets to end /
observed distance is smaller (than 5 m) — B1

(iii) students have different reaction times / students in different positions — B1

(iv) how to start stopwatch accurately — B1
e.g. teacher / student says 'go' as wave starts; student stands at start of spring / rules
how to stop stopwatch accurately e.g. student (at end) says stop — B1
NOT just student stands closer to rule

(c) immerse in fluid, e.g. water / oil / foam / decrease the tension in the spring / teacher closer to student / spring shorter B1

[Total: 9]

3 **(a)** circuit containing thermistor and power supply M0
allow picture of thermistor
ammeter in series B1
voltmeter in parallel with thermistor B1

OR
circuit with ohmmeter and thermistor with no power supply M0
ohmmeter symbol correct or labelled B1
no other component in circuit B1

(b) thermometer and water / oil bath used (allow oven, max 2) B1
waterbath heated / how temperature changed B1
thermometer close to thermistor (even in air) /
stir water / allow to settle B1

(c) it may not be linear / does not show shape / curve of graph B1
accept to get a good line of best fit / make graph / result more accurate

[Total: 6]

4 **(a)** how force is produced B1
how force is the same B1
e.g. balance weight / mass on top of pencil / drop pencil
same weight used on both pencils / drop from same height

(b) correctly shaped indentations in the plasticine and pointed deeper B1

[Total: 3]