UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2012 question paper

for the guidance of teachers

5054 PHYSICS

5054/41 Paper 4 (Alternative to Practical), maximum raw mark 30

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1 (a) (i) to secure the end/prevent slipping/original length doesn't change/ give a strong grip on the wire B1 [1]

(ii) **breaking wire** is hazard/damages eye B1 [1]

(b) (i) increase in **length** (from original length) B1 [1]

(ii) (longer length) increases the extension B1 [1]

(iii) for movement of marker (as wire extends) B1 [1]

(c) (i) 50.3 (cm) cao B1 [1]

(ii) to tension wire/remove kinks/wire straight B1 [1]

(iii) distance between marker and ruler/marker edge not vertical/ difficult to view from above B1 [1]

(iv) larger marker/raise ruler/use of set-square described or drawn B1 [1]

(d) (i) axes: correct way round, labelled quantity and unit B1
y: 2 cm ≡ 5 mm *x*: 2 cm ≡ 5 N

scales: more than ½ page, sensible B1

points plotted accurately B1

best fit straight line neatly drawn B1 [4]

(ii) directly proportional only if line within 1 sq of (0,0)/linear if not through (0,0) B1 [1]

(e) wire breaks/no longer linear/marker creep/load hits floor/plastic extension/permanently deformed B1 [1]

[Total: 15]

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2 **(a)** **(i)** 0.022 and 0.033 (m) ± 0.001 B1 [1]

(ii) 9.167/9.17 seen C1

9.2 (m/s^2) ecf **(a)** A1 [2]

(b) comparison required plus explanation
e.g. too small plus friction on tape through timer/air resistance/person holding tape slows it down

allow ecf e.g. too big plus faulty timer/weight swings/slack in tape at start B1 [1]

[Total: 4]

3 **(a)** wax melts and pea falls off B1 [1]

(b) Any TWO from:
thickness of rod
length of rod/distance to pea
mass of wax/mass of pea/length of rod in water B2 [2]

(c) pea falls off first B1 [1]

(d) credit sensible suggestion, e.g.
peas closer to heat, falls off more quickly/quicker results
can time peas falling off
can plot graph (distance against time) B1 [1]

[Total: 5]

4 **(a)** **(i)** ray drawn through M_1 and M_2 to block B1 [1]

(ii) ray completed accurately through block B1 [1]

(iii) 28° ± 2° B1 [1]

(b) increases angle of incidence described B1

until emergent ray along surface (described or drawn) B1 [2]

(c) ray not along normal/not to middle of diameter/refracted on entry B1 [1]

[Total: 6]

[Total: 30]

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