UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2011 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)** capacitor is (fully) charged / can hold no more charge B1 [1]

(ii) Z and no resistor / capacitor short circuited / current largest B1 [1]

(b) 88 mA cao B1 [1]

(c) **(i)** axes: labels correct way round, labelled quantity and unit B1
scales: more than ½ grid, sensible B1
y-axis: 2 cm ≡ 10 mA *x*-axis: 2 cm ≡ 10 s
points plotted accurately B1
best fit smooth curve neatly drawn B1 [4]

(ii) as *t* increases I decreases (non-linearly) / inversely related / exponential decrease B1 [1]

(iii) 13 (mA) seen ± 1.0 C1
1.3 V ± 0.10 ecf graph A1 [2]

[Total: 10]

2 **(a)** **(i)** immerse stopper in water/can B1
measure volume/collect water from spout B1
measuring cylinder / balance to find mass hence volume B1 [3]

(ii) diameter too small for stopper/object B1
object not (fully) immersed B1 [2]

(iii) any TWO sensible comments, e.g.:
wait for can to stop dripping before immersing stopper / filled exactly to spout
place stopper in without splashing / tie on thread / lower slowly
use sensitive measuring cylinder
stopper dry before immersing
measuring cylinder dry before use
use level bench
avoid parallax reading measuring cylinder
repeat and average B2 [2]

(b) **(i)** mass B1 [1]

(ii) balance / top-pan balance / beam balance B1 [1]

[Total: 9]

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3 **(a)** **(i)** suitable arrangement of apparatus described or on diagram B1
reads meter / notes weight when just moves B1 [2]

(ii) sensible comment, e.g.:
increase force slowly / adds weights gently
use same part of bench
choice of newton meter described
repeat readings to find average
string horizontal
check for zero error in meter
sensible comment on friction over pulley B1 [1]

(b) use different sides of the same block B1 [1]

(c) **(i)** *F* / N and *W* / N B1 [1]

(ii) plot *F* against *W* (or *W* against *F*) / finds gradient of graph B1
gradient = *k* (or gradient = 1/*k*) B1 [2]

[Total: 7]

4 **(a)** **(i)** straight line from lamp to bench just above/touching top of card B1 [1]

(ii) correct indication of region of shadow B1 [1]

(b) shadow becomes longer B1 [1]

(c) multiple sources e.g.:
moon out
reflections
more street lamps
lights from other sources such as cars/houses
larger lamp size B1 [1]

[Total: 4]

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