**CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
Cambridge Ordinary Level

**MARK SCHEME for the May/June 2015 series**

<table>
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<th>5054 PHYSICS</th>
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<td><strong>5054/42</strong></td>
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<td>Paper 4 (Alternative to Practical), maximum raw mark 30</td>
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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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1 (a) (i) line marked from one shoe to same point on other shoe  

(ii) 40 to 90 cm OR 0.4 to 0.9 m max 2 sf unit required  

(iii) 100/(a)(ii) in m OR 10000/(a)(ii) in cm  

(b) (i) (push along ground and) count 100/200 clicks/turns  

(ii) sensible comment, e.g. length of step/stride may vary/each ‘click’ exactly 50/100 cm/stride length only an estimate  

[Total: 5]

2 (a) (i) 1.268 seen  

1.27 s c.a.o. unit required  

(ii) large variation in raw data/data to 2 d.p. time to fall varies  

(iii) allows time for parachute to inflate/larger times/more repeatable/minimises percentage error in the time/minimises the effect of (human) reaction error  

(iv) 441(.0)cm², c.a.o. unit required correct precision  

(v) largest square from A4 sheet of paper/sheet 21 (cm) wide/if greater area used, it won’t be a square  

(b)(i)(ii) 441 and 1.27 in table with no unit ecf (a)(i)  

400, 324, 256, 196, 144 c.a.o. ecf  

(iii) axes: correct way round, labelled quantity and unit scales: more than ½ grid, linear, not awkward no scales of 3, 7 etc. points plotted accurately within ½ small square best fit straight line drawn  

(iv) time needed to fall with no parachute  

[Total: 13]
3  (a) correct circuit symbols  
all components in a series circuit  
   B1  

(b) A and B labelled at ends of fixed resistor 
   B1  

(c) y-shift c.a.o. no additions 
   B1  

(d) (i) 3.2 V ± 0.2 unit required 
(ii) dot moves up 
   B1  

[Total: 5]  

4  (a) thermometer  
stopwatch/(stop-)clock/timer/watch 
   B1  

(b) diagram of test tube  
containing water  
thermometer with bulb in water  
eye drawn level with top of thread in thermometer 
   B1  

(c) temperature/temp/T/θ AND time/t (or vice versa)  
°C/deg C/degree C AND second(s)/s/minutes/min 
   B1  

(d) any two sensible points, e.g. 
timer close to test tube/see both together  
test tube in clamp stand  
thermometer in clamp stand  
thermometer with scale facing you  
two people with explanation (e.g. count down)  
clamp not obscuring the reading  
thermometer not touching the sides/bottom of test tube/  
⅓ or ½ of thermometer immersed  
parallax avoided qualified 
   B2  

[Total: 7]