

# Mass and Weight

## Mark Scheme

<b>Level</b>	IGCSE
<b>Subject</b>	Physics
<b>Exam Board</b>	CIE
<b>Topic</b>	General Physics
<b>Sub-Topic</b>	Mass and Weight
<b>Paper Type</b>	Alternative to Practical
<b>Booklet</b>	Mark Scheme

**Time Allowed:** 57 minutes

**Score:** /47

**Percentage:** /100

Question	Answer	Marks
1(a)	indication of taking mean reading / deducing half load length <u>and</u> adding or subtracting scale reading = 70(.0)	1  1
1(b)	F values=1.45, 2.20, 2.80, 3.55, 4.05 consistent 2 dp	1  1
1(c)	<b>graph:</b> <ul style="list-style-type: none"> <li>• axes labelled with quantity and unit</li> <li>• appropriate scales (plots occupying at least ½ grid)</li> <li>• plots all correct to ½ small square</li> <li>• well judged straight line <u>and</u> thin line, precise plots</li> </ul>	1  1  1  1
1(d)(i)	y read correctly from graph	1
1(d)(ii)	W in range 1.4 to 2.0 to 2 or 3 sig fig and with unit of N	1  1
1(e)	any suitable source on inaccuracy, e.g.: <ul style="list-style-type: none"> <li>• rule not uniform / weight not distributed evenly,</li> <li>• load slips on rule,</li> <li>• forcemeter not at zero to start,</li> <li>• load values not exact</li> </ul>	1
		<b>Total: 12</b>



Question	Answer	Marks
3(a)	$l_0 = 55$ (mm) c.a.o.	1
3(b)(i)	4, 9, 14, 19, 23 ecf <b>(a)</b>	1
3(b)(ii)	Viewing scale at right angles or use of straight edge / set square / pointer between bottom of spring and scale / ruler	1
3(c)	Gr  Axes correctly labelled with quantity and unit Suitable scales All plots correct to $\frac{1}{2}$ small square Good line judgement, thin, continuous line, neat plots	1 1 1 1
3(d)(i)	$e = 17$ (mm) ecf <b>(a)</b>	1
3(d)(ii)	method clearly shown on graph W value 3.5–3.75 Unit N needed No ecf from <b>(i)</b>	1 1
		<b>Total: 10</b>

Question	Answer	Marks
4(a)	x shown clearly from centre of <b>P</b> to pivot	1
4(b)	M <b>Q</b> into a cube/regular shape/small contact area with rule	1
4(c)	Move Q or P slowly one way until it just tips, then back other way until it tips back and take middle reading OR repeat procedure/experiment <b>AND</b> take average	1
Question	Answer	Marks
4(d)	Measure width w of cube Place w/2 either side of desired position  <u>OR</u> draw centre line on cube/find centre of mass of cube and mark side of rule in desired position  <u>OR</u> take readings on both sides of the cube and find the mean	1 1
4(e)	Place rule on pivot (without P and Q) and record/find balance point	
		<b>Total: 6</b>

- 5 (a)  $a_0 = 75.5$  (cm) AND  $b_0 = 25.9$  (cm), accept in mm [1]  
matching unit [1]
- (b)  $a_1 = 71.(0)$  AND  $b_1 = 32.9$  [1]  
 $d_A = 4.5$  and  $d_B = 7.(0)$ , allow ecf from earlier results [1]
- (c)  $M$  value rounds to 160 (g), allow ecf from (b) [1]  
2 or 3 sig. figs. and unit: g [1]
- (d) appropriate explanation, e.g. [1]
  - measure height (from bench)/distance from rule at two places
  - line up with rule or suitable horizontal surface
  - use of spirit level
- (e) repeat with different (sized) loops/different values (of  $d_A$ ,  $d_B$ ) [1]  
any one from:
  - (at least) 3 more sets of results and evaluate  $d_A:d_B$
  - plot a graph to (check if) a straight line through the origin [1]

[Total: 9]