

MARKING SCHEME TRIAL SPM PAPER 3 2015

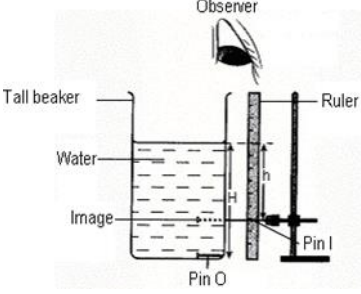
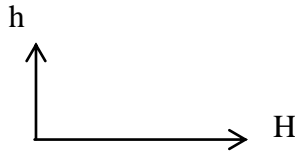
SECTION A

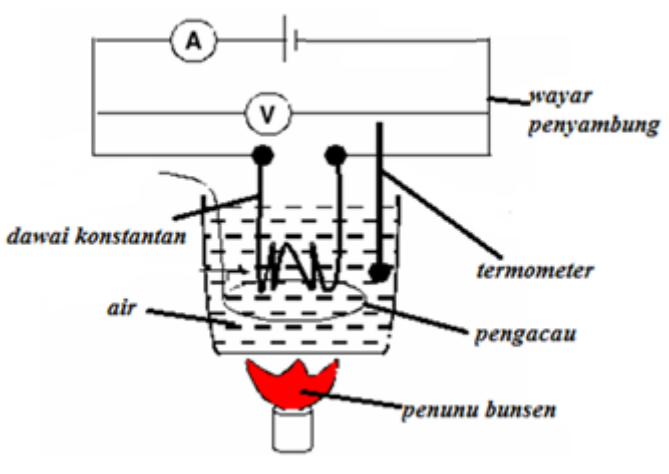
No.	Answer	Mark																																
1																																		
(a) (i)	Manipulated variable = Weight//W	1																																
(ii)	Responding variable = Length of spring//extension /x	1																																
(iii)	Constant variable = Initial length of spring/ l_0 //spring constant//diameter of spring	1																																
(b) (i)	10.0// 10	1																																
(ii)	$l = 12.4, 14.8, 17.2, 19.6, 22.0$	2																																
(iii)	$x = 2.4, 4.8, 7.2, 9.6, 12.0$	1																																
(c)	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="width: 15%;"></th> <th style="width: 20%;">W/N</th> <th style="width: 20%;">l₁/ cm</th> <th style="width: 20%;">x /cm</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>		W/N	l ₁ / cm	x /cm																													3
	W/N	l ₁ / cm	x /cm																															
	-table -1 -unit- 1 -consistent 1 d.p- 1																																	
(d)	<p>Draw the graph of x against W .</p> <p>A - Label y-axis and x-axis correctly B - States the unit at the axis correctly C - Both axes with the even and uniform scale: D - 5 points correctly plotted: \surd \surd at least 3 points correctly plotted \surd E - a smooth best straight line F - minimum size of the graph is 5 x 4 squares of 2 x 2 cm.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>No of ticks</th> <th>Score</th> </tr> </thead> <tbody> <tr><td>7</td><td>5</td></tr> <tr><td>5-6</td><td>4</td></tr> <tr><td>3-4</td><td>3</td></tr> <tr><td>2</td><td>2</td></tr> <tr><td>1</td><td>1</td></tr> </tbody> </table>	No of ticks	Score	7	5	5-6	4	3-4	3	2	2	1	1																					
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7	5																																	
5-6	4																																	
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1	1																																	

		5
(e)	State the correct relationship based on the candidate's graph x is increasing linearly to $W // x \propto W$	1
TOTAL		16
No 2	Answer	
(a)(i)	λ is directly proportional to $\frac{1}{f}$	1
(ii)	1. Doing correct interpolation by drawing at least a vertical or horizontal line at $\lambda = 0.3$ cm 3. The corresponding value of $\frac{1}{f} = 0.25 \text{ Hz}^{-1}$ 4. $f = 4 \text{ Hz}$ (correct unit)	1 1 1
(iii)	1. Draw a sufficient large triangle (8 cm x 10 cm) 2. $h = \frac{0.6 - 0}{0.5 - 0}$ $= 1.2 \text{ cm Hz/cm s}^{-1}$	1 1 1
(b)	$v = \text{gradient of the graph}$ $= 1.2 \text{ cm s}^{-1}$ $= 1.2 \times 10^{-2} \text{ m s}^{-1}$	1 1 1
(c)	h increase	1
(d)	Eye position must be perpendicular to scale of meter /repeat the experiment and find the average .	1
Total		12

SECTION B

NO	ANSWER	MARK
3 (a)	State a suitable inference The apparent depth depend on the real depth	1
(b)	State a relevant hypothesis The higher the real depth the higher apperent depth	1
(c)(i)	State the aim of experiment To investigate the relationship between apparent depth and the real depth	1
(ii)	State the manipulated variable and the responding variable Manipulated : real depth Responding : apparent depth	1
	State the constant variable Constant variable: Refractive index //Density	1

(iii)	Complete list of apparatus and materials Pin,ruler,water	1												
Draw the functional arrangement of the apparatus		1												
		1												
State the method of controlling the manipulated variable		1												
1.The beaker is filled with water until the depth, H is 5 cm		1												
State the method of measuring the responding variable		1												
2. The position of pin I is adjusted until no parallax between the pin O and the pin I.		1												
3.By using the ruler ,the position of pin I is measured as the apparent depth, h		1												
Repeat the experiment at least 4 times		1												
4. The experiment is repeated with 10, 15, 20 and 25 cm depth of water.		1												
Tabulation of data:		1												
<table border="1" data-bbox="300 1146 1125 1355"> <thead> <tr> <th>H</th> <th>h</th> </tr> </thead> <tbody> <tr> <td>5</td> <td></td> </tr> <tr> <td>10</td> <td></td> </tr> <tr> <td>15</td> <td></td> </tr> <tr> <td>20</td> <td></td> </tr> <tr> <td>25</td> <td></td> </tr> </tbody> </table>		H	h	5		10		15		20		25		1
H	h													
5														
10														
15														
20														
25														
Analyze the data.		1												
		1												
TOTAL MARK		12												

No	ANSWER	MARK
4		
(a)	State the suitable inference Brightness of the bulb depends on temperature// Resistance /current depends on temperature	1
(b)	State a relevant hypothesis The higher the temperature, the higher the Resistance // The higher the temperature the lower the current	1
(c)(i)	State the aim of experiment To study the relationship between current/resistance and temperature	1
(ii)	State the manipulated variable and the responding variable Manipulated : Temperature Responding : Resistance/ Current	1
	State the constant variable Constant variable: length//diameter//resistivity of wire	1
(iii)	State the complete list of apparatus and materials Voltmeter, Ammeter, thermometer, constantan wire, water	1
(iv)	Draw the functional arrangement of the apparatus 	1
(v)	State the method to control the manipulated variable 1. Heat the water until 25°C State the method to measure the responding variable 2. Record the reading of ammeter and voltmeter . 3. Calculate the resistance by using formulae $R = V/ I$	1 1

		<p>Repeat the experiment at least 4 times with the values</p> <p>4. The experiment is repeated with temperature = 30⁰C, 35⁰C, 40⁰C and 45⁰C.</p>	1												
	(vi)	<p>State how the data tabulated with the title MV and RV</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Temperature</th> <th>Resistance</th> </tr> </thead> <tbody> <tr> <td>25</td> <td></td> </tr> <tr> <td>30</td> <td></td> </tr> <tr> <td>35</td> <td></td> </tr> <tr> <td>40</td> <td></td> </tr> <tr> <td>45</td> <td></td> </tr> </tbody> </table>	Temperature	Resistance	25		30		35		40		45		1
Temperature	Resistance														
25															
30															
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40															
45															
	(vii)	<p>State how the data is analysed, plot a graph RV against MV</p> <div style="text-align: center;"> </div>	1												
		Total	12												