

CADANGAN JAWAPAN KERTAS 3 (MPP3 2019)

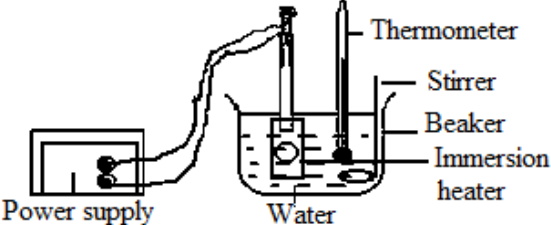
Section	Mark	Answer												
1 (a)(i)	1	State the manipulated variable correctly electric current												
(ii)	1	State the responding variable correctly magnitude of the force // displacement of movement												
(iii)	1	State the constant variable correctly The strength of magnetic field / the mass of light copper rod												
(b) (i) (ii)	3 2 2	<p>Record the position of looking pin correctly All 5 values of x are correct 3 marks (at each diagram without unit) 3 values of x are correct 2 marks</p> <p>Quantities of I and x, and its unit shown in the table All value of I and x consistence in one decimal place Or no decimal place if x is recorded in mm</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>I / A</th> <th>x /cm // mm</th> </tr> </thead> <tbody> <tr> <td>0.5</td> <td>0.6 // 6</td> </tr> <tr> <td>1.0</td> <td>1.2 // 12</td> </tr> <tr> <td>1.5</td> <td>1.8 // 18</td> </tr> <tr> <td>2.0</td> <td>2.3 // 23</td> </tr> <tr> <td>2.5</td> <td>3.0 // 30</td> </tr> </tbody> </table> <p>Full marks : 7</p>	I / A	x /cm // mm	0.5	0.6 // 6	1.0	1.2 // 12	1.5	1.8 // 18	2.0	2.3 // 23	2.5	3.0 // 30
I / A	x /cm // mm													
0.5	0.6 // 6													
1.0	1.2 // 12													
1.5	1.8 // 18													
2.0	2.3 // 23													
2.5	3.0 // 30													
(c)		<p>5 Draw a complete graph of x against I Tick ✓ based on the following aspects;.</p> <p><i>x on the -y axis and I on the -x axis</i> give ✓</p> <p>State the units of the variables each axis give ✓</p> <p>Both axes are marked with uniform scale And not odd scale (1,2, 4,5,10) give ✓</p> <p>All five points are plotted correctly give ✓✓</p> <p>(Only three points plotted correctly, give ✓)</p> <p>Best fitted straight line is drawn give ✓</p> <p>Show the minimum size of graph (8 x 6) cm give ✓</p> <p>score :</p>												

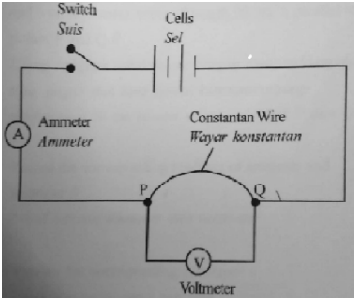
		<p style="text-align: center;">Number of ✓ Score</p> <p style="text-align: center;">7 ✓ 5</p> <p style="text-align: center;">5-6 ✓ 4</p> <p style="text-align: center;">3-4 ✓ 3</p> <p style="text-align: center;">2 ✓ 2</p> <p style="text-align: center;">1 ✓ 1</p> <p style="text-align: center;">Total maks : 5 marks</p>
(d)		<p>1 State the correct relationship between h and H</p> <p>Directly propotional</p>
16 marks		

NO.	MARKING CRITERIA	MARK	
		SUB	TOTAL
2(a)	(i) W is directly proportional to V	1	1
	(ii) - show the method to determine the value of W by showing the corresponding horizontal line with V = 35 cm ³ . - State the value within acceptable range 0.34 – 0.36 N	1 1	2
(b)	- draw a sufficiently large tringle minimum (8 x 8) cm - correct substitution (follow candidate's triangle - sample answer: $\frac{(0.5-0)}{(50-0)}$ - state the correct value / answer with correct unit. - 0.01 N cm ⁻³	1 1 1	3
(c)	-correct substitution -sample answer: $\rho = 100 \text{ k}$ $= 100 (0.01)$ $= 1.0 \text{ g cm}^{-3}$	1 1	2

(d)	- show graphical extrapolation correctly (until $V = 70 \text{ cm}^3$) -show the method to determine the value of W by showing the corresponding horizontal line with $V = 70 \text{ cm}^3$. - state the value within acceptable range $0.69 - 0.71 \text{ N}$.	1 1 1	3
(e)	-Position of eye must be aligned/perpendicular with the scale on the spring balance to avoid parallax error. (anyone relevant response)	1	1
	TOTAL		12 max

No.	Mark	Answer
3(a)	1	<u>State a suitable inference</u> The mass affects the rise / change of temperature
(b)	1	<u>State a relevant hypothesis (with direction)</u> The rise / change of temperature decreases as the mass increases
(c)		<u>Describe a complete and suitable experimental framework</u>
(i)	1	<u>State the aim of the experiment</u> To investigate the relationship between mass and rise / change of temperature
(ii)	1 1	<u>State the manipulated variable and the responding variable</u> Manipulated variable: Mass, m Responding variable: Rise in temperature / Change of temperature, θ
	1	<u>State the constant variable</u> Constant variable: Specific heat capacity // Power / Heat supplied

(iii)	1	<p><u>List out the important apparatus and materials</u></p> <p>Power supply, Immersion heater, Stirrer, Beaker, Thermometer, Asbestos sheet, Stopwatch, Inertial balance</p>												
(iv)	1	<p><u>State a function arrangement of the apparatus</u></p>  <p>The diagram illustrates the experimental setup. On the left, a rectangular power supply is connected by two wires to an immersion heater submerged in a beaker of water. The beaker also contains a stirrer and a thermometer. Labels with leader lines identify the Power supply, Water, Immersion heater, Beaker, Stirrer, and Thermometer.</p>												
(v)	1	<p><u>State the method of controlling the manipulated variable</u></p> <p>1. 100 g of water is filled in the beaker.</p>												
	1	<p><u>State the method of measuring the responding variable</u></p> <p>2. Switch on the power supply to heat up the water for 2 minutes.</p> <p>3. Read and record the reading of thermometer.</p>												
	1	<p><u>Repeat the experiment at least 4 times with different values</u></p> <p>4. Repeat the experiment for mass of water, $m = 150\text{ g}$, 200 g, 250 g and 300 g.</p>												
(vi)	1	<p>Tabulation the data</p> <table border="1" data-bbox="576 1444 1238 1518"> <tbody> <tr> <td>m/g</td> <td>100</td> <td>150</td> <td>200</td> <td>250</td> <td>300</td> </tr> <tr> <td>$\theta / ^\circ\text{C}$</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	m/g	100	150	200	250	300	$\theta / ^\circ\text{C}$					
m/g	100	150	200	250	300									
$\theta / ^\circ\text{C}$														
(vii)	1	<p><u>State how data will be analysed (sketch graph/statement)</u></p> <p>Plot graph θ against m</p>												
Total	12 Max.													

No.	Mark	Answer
4(a)	1	<p><u>State a suitable inference</u></p> <p>Brightness of the bulb influenced of length of wire. Resistance of conductor influenced of length.</p>
(b)	1	<p><u>State a relevant hypothesis (with direction)</u></p> <p>If length of conductor increases the resistance increases.</p>
(c)		<p>Describe a complete and suitable experimental framework</p>
(i)	1	<p><u>State the aim of the experiment</u></p> <p>To investigate the relationship between length and resistance</p>
(ii)	1 1	<p><u>State the manipulated variable and the responding variable</u></p> <p>Manipulated variable: length Responding variable: resistance</p>
	1	<p><u>State the constant variable</u></p> <p>Constant variable: diameter of wire/resistivity</p>
(iii)	1	<p><u>List out the important apparatus and materials</u></p> <p>Dry cell, ammeter, voltmeter, constantan wire and meter ruler.</p>
(iv)	1	<p><u>State a function arrangement of the apparatus</u></p> 

(v)	1	<p><u>State the method of controlling the manipulated variable</u></p> <p>1 Experiment started by using a constantan wire length of 10.0 cm.</p>												
	1	<p><u>State the method of measuring the responding variable</u></p> <p>2 Switched on the switch and record the reading of ammeter, I, and voltmeter, V 3 Calculated the resistance, $R = V / I$</p>												
	1	<p><u>Repeat the experiment at least 4 times with different values</u></p> <p>4 The experiment is repeated by using the with different length of constantan wire such as 20.0 cm, 30.0 cm, 40.0 cm and 50.0 cm.</p>												
(vi)	1	<p>Tabulation the data</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>Length, ℓ / cm</td> <td>10.0</td> <td>20.0</td> <td>30.0</td> <td>40.0</td> <td>50.0</td> </tr> <tr> <td>Resistance, R / Ω</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Length, ℓ / cm	10.0	20.0	30.0	40.0	50.0	Resistance, R / Ω					
Length, ℓ / cm	10.0	20.0	30.0	40.0	50.0									
Resistance, R / Ω														
(vii)	1	<p><u>State how data will be analysed (sketch graph/statement)</u></p> <p>Plot graph R against ℓ</p>												
Total	12 Max.													