MODUL PEMANTAPAN PRESTASI TINGKATAN 5

TAHUN 2017

MAJLIS PENGETUA SEKOLAH MALAYSIA (KEDAH)

MODUL 1

FIZIK

Kertas 3

Peraturan Pemarkahan

BAHAGIAN A

<table>
<tr><th>No</th><th>Mark Scheme</th><th>Sub Mark</th><th>Total Mark</th></tr>
<tr><td>1(a) (i)</td><td>State the manipulated variable
Compression of the spring // x</td><td>1</td><td rowspan="3">3</td></tr>
<tr><td>(ii)</td><td>State the responding variable
Height of the ball // h // y</td><td>1</td></tr>
<tr><td>(iii)</td><td>State one constant variable
Spring constant // Mass of the ball</td><td>1</td></tr>
<tr><td>(b) (i)</td><td>Record five values of height y
y = 1.7, 3.8, 6.5, 9.9, 14.1</td><td>1</td><td rowspan="2">3</td></tr>
<tr><td>(ii)</td><td>Record five value of height h
h = 3.2, 5.8, 9.0, 12.9, 17.6
All correct: 2 marks;
Any 3 to 4 values correct: 1 mark</td><td>2</td></tr>
<tr><td>(c)</td><td>Tabulate the results
Table with 4 columns x, y, h and $\sqrt{h}$
Correct units for x, y, h and $\sqrt{h}$
Correct values for $\sqrt{h}$
The values of y, h and $\sqrt{h}$ are consistent
<table>
<tr><th>x / cm</th><th>y / cm</th><th>h / cm</th><th>$\sqrt{h}$ / cm$^{1/2}$</th></tr>
<tr><td>1.5</td><td>1.7</td><td>3.2</td><td>1.789</td></tr>
<tr><td>2.0</td><td>3.8</td><td>5.8</td><td>2.408</td></tr>
<tr><td>2.5</td><td>6.5</td><td>9.0</td><td>3.000</td></tr>
<tr><td>3.0</td><td>9.9</td><td>12.9</td><td>3.592</td></tr>
<tr><td>3.5</td><td>14.1</td><td>17.6</td><td>4.195</td></tr>
</table></td><td>1
1
1
1</td><td>4</td></tr>
<tr><td>(d)</td><td>Draw a complete graph of $\sqrt{h}$ against x
$\sqrt{h}$ at the y-axis, x at the x-axis ✓
Correct unit $\sqrt{h}$ for and x ✓
Suitable scale for both axes ✓
5 points plotted correctly ✓✓ [3/4 points correct: ✓]
Best straight line ✓
Size of graph ✓

7✓ : 5 marks
5-6✓ : 4 marks
3-4✓ : 3 marks
2✓: 2 marks
1✓ : 1 mark</td><td>5</td><td>5</td></tr>
<tr><td>(e)</td><td>State the correct relationship between $\sqrt{h}$ and x
$\sqrt{h}$ is directly proportional to x</td><td>1</td><td>1</td></tr>
<tr><td></td><td></td><td></td><td>16</td></tr>
</table>

No	Mark Scheme	Sub Mark	Total Mark
2(a) (i)	**State the relationship between Q and θ** - Q is directly proportional to θ	1	
(i)	**State the value of Q when θ = 1.25 ºC** - Show graphical intrapolation correctly - Q = 2500 J	 1 1	
(iii)	**Calculate the gradient of the graph, k** - Draw a sufficiently large triangle at least 4 × 4 (2 cm × 2 cm) square - Correct substitution (follow the candidate's triangle) $k = \frac{5000-1000}{2.5-0.5}$ - State the correct value / answer with correct unit 2000 J $ºC^{-1}$	 1 1 1	6
(b)	**Show the correct substitution** - $c = \frac{2000}{5.0\times10^{-1}}$ - Accept e.c.f. for k **Correct answer and unit** - 4000 J kg^{-1} $ºC^{-1}$	1 1	2
(c)	**Show the correct substitution** - $P = \frac{2500}{0.625}$ - Accept e.c.f. for Q from 2(a)(ii) **Correct answer and unit** - 4000 W	1 1	2
(d)	**State the change in the gradient** - decreases	1	1
(e)	**State one correct precaution** - Connect the wire tightly - Position the eyes so that perpendicular to the reading scale of thermometer	 1	1
			12

BAHAGIAN B

<table>
<tr><th>No</th><th>Mark Scheme</th><th>Sub Mark</th><th>Total Mark</th></tr>
<tr><td>3(a)</td><td>State a suitable inference
The mass affects the rise / change of temperature</td><td>1</td><td>1</td></tr>
<tr><td>(b)</td><td>State a relevant hypothesis
The rise / change of temperature decreases as the mass increases</td><td>1</td><td>1</td></tr>
<tr><td>(c)
(i)</td><td>Describe a complete and suitable experimental framework
State the aim of the experiment
To investigate the relationship between mass and rise / change of temperature</td><td>1</td><td rowspan="8">11</td></tr>
<tr><td>(ii)</td><td>State the variables
Manipulated variable: Mass, m
Responding variable: Rise in temperature / Change of temperature, θ
Constant variable: Specific heat capacity // Power / Heat supplied</td><td>1
1
1</td></tr>
<tr><td>(iii)</td><td>List out the important apparatus and materials
Power supply, Immersion heater, Stirrer, Beaker, Thermometer, Asbestos sheet, Stopwatch, Inertial balance</td><td>1</td></tr>
<tr><td>(iv)</td><td>State a functional arrangement of the apparatus
Labelled diagram showing set up of apparatus that will function</td><td>1</td></tr>
<tr><td>(v)</td><td>State the method to control the manipulated varible
1. 100 g of water is filled in the beaker.

State the method to measure the responding variable
2. Switch on the power supply to heat up the water for 2 minutes.
3. Read and record the reading of thermometer.

Repeat the experiment with different mass of water
4. Repeat the experiment for mass of water, m = 150 g, 200 g, 250 g and 300 g.</td><td>1

1

1</td></tr>
<tr><td>(vi)</td><td>State how the data is tabulated
<table><tr><td>m / g</td><td>θ / °C</td></tr><tr><td>100</td><td></td></tr><tr><td>150</td><td></td></tr><tr><td>200</td><td></td></tr><tr><td>250</td><td></td></tr><tr><td>300</td><td></td></tr></table></td><td>1</td></tr>
<tr><td>(vii)</td><td>Show how the data is analysed
Plot a graph of θ against m.</td><td>1</td></tr>
<tr><td></td><td></td><td></td><td>Max 12</td></tr>
</table>

<table>
<tr><th>No</th><th>Mark Scheme</th><th>Sub Mark</th><th>Total Mark</th></tr>
<tr><td>4(a)</td><td>State a suitable inference
The number of turns of secondary coil affects the output voltage</td><td>1</td><td>1</td></tr>
<tr><td>(b)</td><td>State a relevant hypothesis
The output voltage increases as the number of turns of secondary coil increases</td><td>1</td><td>1</td></tr>
<tr><td>(c)
(i)</td><td>Describe a complete and suitable experimental framework
State the aim of the experiment
To investigate the relationship between the number of turns of secondary coil and the output voltage</td><td>1</td><td rowspan="8">11</td></tr>
<tr><td>(ii)</td><td>State the variables
Manipulated variable: Number of turns of secondary coil, N_s
Responding variable: Output voltage, V_s
Constant variable: Input voltage /V_P // Number of turns of primary coil / N_P</td><td>1
1
1</td></tr>
<tr><td>(iii)</td><td>List out the important apparatus and materials
Copper coils, C-shaped soft iron core, A.C. power supply, A.C voltmeter</td><td>1</td></tr>
<tr><td>(iv)</td><td>State a functional arrangement of the apparatus
Labelled diagram showing set up of apparatus that will function</td><td>1</td></tr>
<tr><td>(v)</td><td>State the method to control the manipulated varible
1. Start the experiment with 200 turns of the primary coil and 300 turns of the secondary coil
State the method to measure the responding variable
2. Switch on the power supply
3. Record the reading of output voltage.
Repeat the experiment with different number of turns of secondary coil
4. Repeat the experiment with number of turns of secondary coil, N_s = 400, 500, 600 and 700 turns.</td><td>1
1
1</td></tr>
<tr><td>(vi)</td><td>State how the data is tabulated
<table>
<tr><td>Ns</td><td>Vs / V</td></tr>
<tr><td>300</td><td></td></tr>
<tr><td>400</td><td></td></tr>
<tr><td>500</td><td></td></tr>
<tr><td>600</td><td></td></tr>
<tr><td>700</td><td></td></tr>
</table></td><td>1</td></tr>
<tr><td>(vii)</td><td>Show how the data is analysed
Plot a graph of V_S against N_S.</td><td>1</td></tr>
<tr><td></td><td></td><td></td><td>Max 12</td></tr>
</table>