



MODUL PINTAS TINGKATAN 5

Peperiksaan Percubaan Tahun 2019

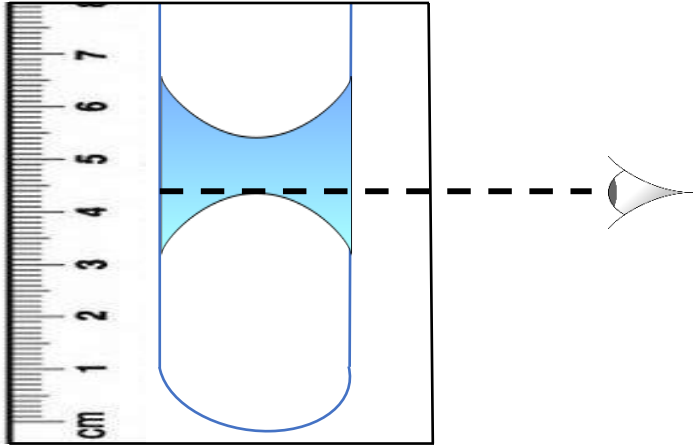
Skema Jawapan Physics

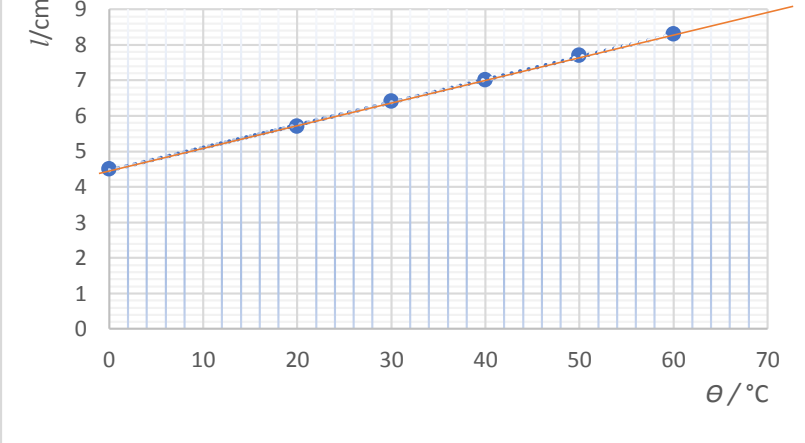
Kertas 3 4531/3

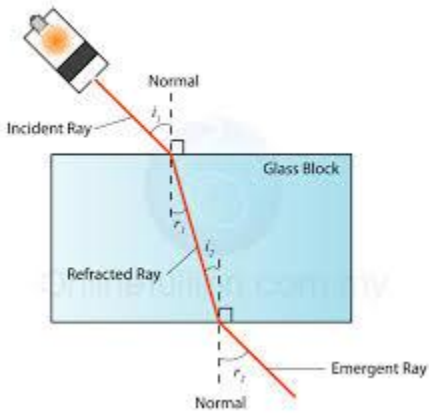
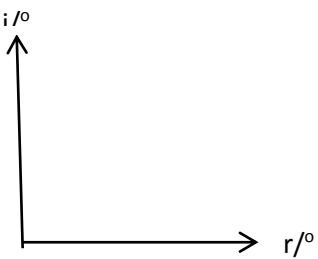
MARK SCHEME PINTAS T5 P3 2019

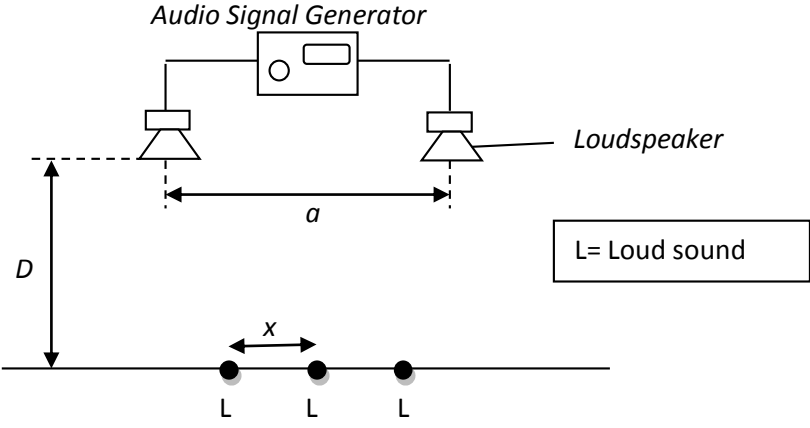
Section A

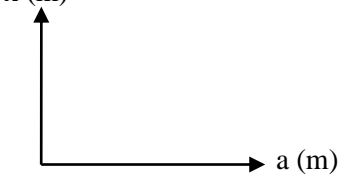
Bahagian A

	Answer	Marks														
1 (a)(i)	Temperature, θ	1M														
(ii)	The length of the air column	1M														
(iii)	Pressure of the trapped air/ diameter of the capillary tube	1M														
(b)		1M														
(c)	<table border="1" data-bbox="320 987 668 1198"> <tbody> <tr> <td>Diagram 1.4</td> <td>4.5</td> </tr> <tr> <td>Diagram 1.5</td> <td>5.7</td> </tr> <tr> <td>Diagram 1.6</td> <td>6.4</td> </tr> <tr> <td>Diagram 1.7</td> <td>7.0</td> </tr> <tr> <td>Diagram 1.8</td> <td>7.7</td> </tr> <tr> <td>Diagram 1.9</td> <td>8.3</td> </tr> </tbody> </table> <div data-bbox="778 1025 1125 1191" style="border: 1px solid blue; padding: 5px; margin-left: 200px;"> <p>** Mark for correct value given. Do not penalize for inconsistent decimal places.</p> </div>	Diagram 1.4	4.5	Diagram 1.5	5.7	Diagram 1.6	6.4	Diagram 1.7	7.0	Diagram 1.8	7.7	Diagram 1.9	8.3	<p>All correct readings, $\pm 0.1\text{cm}$ - 2M</p> <p>2-5 correct readings, $\pm 0.1\text{cm}$ - 1M</p>		
Diagram 1.4	4.5															
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Diagram 1.7	7.0															
Diagram 1.8	7.7															
Diagram 1.9	8.3															
(d)	<table border="1" data-bbox="512 1245 1046 1491" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>$\theta / ^\circ\text{C}$</th> <th>l/cm</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>4.5</td> </tr> <tr> <td>20</td> <td>5.7</td> </tr> <tr> <td>30</td> <td>6.4</td> </tr> <tr> <td>40</td> <td>7.0</td> </tr> <tr> <td>50</td> <td>7.7</td> </tr> <tr> <td>60</td> <td>8.3</td> </tr> </tbody> </table>	$\theta / ^\circ\text{C}$	l/cm	0	4.5	20	5.7	30	6.4	40	7.0	50	7.7	60	8.3	<p>Table lines drawn - 1M</p> <p>Quantity - 1M</p> <p>Unit - 1M</p> <p>Consistent to 1 or 2 decimal places (If 2 dp, 2nd dp only 0 or 5 - 1M)</p> <p style="text-align: center;">4M</p>
$\theta / ^\circ\text{C}$	l/cm															
0	4.5															
20	5.7															
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40	7.0															
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60	8.3															

(e)	<p style="text-align: center;">Graph of l against θ.</p> 	<p>Axis quantity – \surd Unit – \surd Plotting – $\surd\surd$ Best fit – \surd Size – \surd Normal Scale – \surd</p> <p>7\surd - 5M 5-6\surd - 4M 3-4\surd - 3M 2\surd - 2M 1\surd - 1M</p> <p style="text-align: right;">5M</p>
(f)	l increases linearly with θ	1M
TOTAL		16
2(a)	Directly proportional	1M
(b)	Show on graph $\sqrt{\frac{1}{0.42}}$ 1.54 mm	1M 1M 1M
(c)(i)	Show triangle on graph with min size 8 cm x 8 cm $\frac{0.6}{0.5}$ $1.2 \Omega \text{ mm}^2$	1M 1M (Substitution) 1M (Correct answer)
(ii)	$1.2 \Omega \text{ mm}^2 \times 0.786 / 2000$ $0.0004716 \Omega \text{ mm}$	1M 1M
(d)	Answer(c)(ii) $\times 500 / (0.786 \times 2.5^2)$ 0.048Ω	1M 1M
(e)	<ul style="list-style-type: none"> -Make sure all wire connections are tight and complete -Eye level is perpendicular to the scale of the micrometer/vernier callipers/ metre rule -Switch off the circuit when not in use (to avoid heating the wires) 	1M
TOTAL		12
3(a)	The refracted angle depends on the incident angle	1M
(b)	The greater the incident angle, the greater the refracted angle.	1M
(c)(i)	Aim: To investigate the relationship between the incident angle and the refracted angle.	1M
(ii)	Manipulated variable: incident angle, i Responding variable: refracted angle, r	1M 1M

	Constant/fixed variable: refractive index // density of glass block	1M												
(iii)	List of apparatus: Glass block, A4 paper, Ray box, protractor.	1M												
(iv)	Arrangement of apparatus: 	1M												
(v)	<ol style="list-style-type: none"> The apparatus is set up as the above diagram. <u>A ray of light is directed at $i = 20^\circ$</u> <u>The angle of r is measured.</u> <u>The experiment is repeated with different values of i which is $i = 30^\circ, 40^\circ, 50^\circ$ and 60°.</u> All the readings are tabulated. 	1M 1M 1M												
(vi)	Tabulate the data <table border="1" data-bbox="454 1288 726 1500"> <thead> <tr> <th>i ($^\circ$)</th> <th>r ($^\circ$)</th> </tr> </thead> <tbody> <tr> <td>20</td> <td></td> </tr> <tr> <td>30</td> <td></td> </tr> <tr> <td>40</td> <td></td> </tr> <tr> <td>50</td> <td></td> </tr> <tr> <td>60</td> <td></td> </tr> </tbody> </table>	i ($^\circ$)	r ($^\circ$)	20		30		40		50		60		1M
i ($^\circ$)	r ($^\circ$)													
20														
30														
40														
50														
60														
(vii)		1M												
TOTAL		13 (Max :12)												

4(a)	The distance between two successive positions of clear and loud sound, x depends on the distance between the loudspeakers, a	1M										
(b)	The distance between two successive loud sounds, x , increases when the distance between the loudspeakers decreases.	1M										
(c)(i)	Aim: To investigate the relationship between distance, x , and a	1M										
(ii)	Manipulated variable: Distance between loudspeakers, a Responding variable: Distance between two successive positions of loud sound, x Constant/fixed variable: Distance between the two loudspeakers and the position where the loud sound is detected, D / frequency / wavelength of sound wave.	1M 1M 1M										
(iii)	List of apparatus: Audio signal generator, two (identical) loudspeakers, connecting wires, metre rule or measuring tape.	1M										
(iv)	Arrangement of apparatus: 	1M										
(v)	1. The apparatus is set up with the two loudspeakers placed apart at a distance, $a = 1$ m as shown in the diagram. 2. The audio generator <u>is switched on</u> 4. The observer will move along a parallel straight line at a distance from the loudspeakers. 5. <u>The positions of loud sounds that can be heard are marked as L.</u> 6. Distance between 2 successive loud sound, x is measured using a metre rule <u>and recorded</u> . 7. The experiment is repeated with different values of a which is 2 m, 3 m, 4m and 5m. 8. All the readings are tabulated.	1M 1M 1M										
(vi)	Tabulate the data <table border="1" data-bbox="459 1839 724 2022"> <thead> <tr> <th>a (m)</th> <th>x (m)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> </tr> <tr> <td>2</td> <td></td> </tr> <tr> <td>3</td> <td></td> </tr> <tr> <td>4</td> <td></td> </tr> </tbody> </table>	a (m)	x (m)	1		2		3		4		1M
a (m)	x (m)											
1												
2												
3												
4												

		5			
(vii)	<p>Analysis of data</p>  <p>A graph of x against a is drawn to analyse the data.</p>				1M
<i>TOTAL</i>					13 (Max :12)