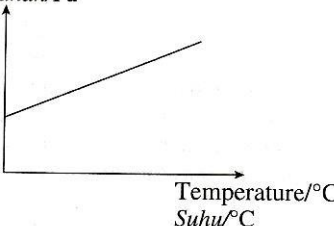
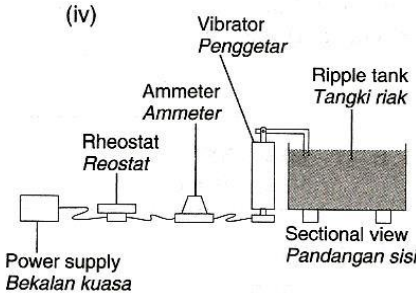


SKEMA PERCUBAAN SPM FIZIK 2018
KERTAS 3

1	(a)	(i)	The angle of incident, i . // Sudut tuju. i .		1																															
		(ii)	The angle of refraction, r . // Sudut biasan, r .		1																															
		(iii)	Refractive index// type of glass//thickness of glass /density of glass block Index biasan// jenis kaca// ketebalan kaca//ketumpatan blok kaca		1																															
	(b)	$i = 20^\circ, r = 14^\circ;$ $i = 30^\circ, r = 19^\circ;$ $i = 40^\circ, r = 25^\circ;$ $i = 50^\circ, r = 30^\circ;$ $i = 60^\circ, r = 35^\circ$			2																															
	(c)	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>$i/^\circ$</th> <th>$r/^\circ$</th> <th>$\sin i$</th> <th>$\sin r$</th> </tr> </thead> <tbody> <tr> <td>20</td> <td>14</td> <td>0.342</td> <td>0.242</td> </tr> <tr> <td>30</td> <td>19</td> <td>0.500</td> <td>0.326</td> </tr> <tr> <td>40</td> <td>25</td> <td>0.643</td> <td>0.423</td> </tr> <tr> <td>50</td> <td>30</td> <td>0.766</td> <td>0.500</td> </tr> <tr> <td>60</td> <td>35</td> <td>0.866</td> <td>0.574</td> </tr> </tbody> </table> Physical quantities symbols -1 m S.I unit symbols - 1 m Magnitude of $\sin i$ - 1 m Magnitude of $\sin r$ - 1 m Consistency of data - 1 m			$i/^\circ$	$r/^\circ$	$\sin i$	$\sin r$	20	14	0.342	0.242	30	19	0.500	0.326	40	25	0.643	0.423	50	30	0.766	0.500	60	35	0.866	0.574	5							
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	(d)	Draw correctly a graph of t against F. Give a tick (\checkmark) based on the following: <table style="margin-left: 20px;"> <tr> <td>A</td> <td><input checked="" type="checkbox"/></td> <td>$\sin i$ at the y-axis, $\sin r$ at the x-axis</td> <td rowspan="6" style="border: 1px solid black; padding: 5px;"> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>No. of \checkmark</th> <th>Marks</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> </td> </tr> <tr> <td>B</td> <td><input checked="" type="checkbox"/></td> <td>Correct units at both axes</td> </tr> <tr> <td>C</td> <td><input checked="" type="checkbox"/></td> <td>Uniform scale at both axes</td> </tr> <tr> <td>D</td> <td><input checked="" type="checkbox"/></td> <td> <input checked="" type="checkbox"/> 5 points plotted correctly <input checked="" type="checkbox"/> 3 to 4 point plotted correctly </td> </tr> <tr> <td>E</td> <td><input checked="" type="checkbox"/></td> <td>Best fitted straight line</td> </tr> <tr> <td>F</td> <td><input checked="" type="checkbox"/></td> <td> Minimum size of graph 5 x 4 big square (Big square :2 cm x 2 cm) (From the origin to the last point) </td> </tr> </table>			A	<input checked="" type="checkbox"/>	$\sin i$ at the y-axis, $\sin r$ at the x-axis	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>No. of \checkmark</th> <th>Marks</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 \checkmark	Marks	7	5	5-6	4	3-4	3	2	2	1	1	B	<input checked="" type="checkbox"/>	Correct units at both axes	C	<input checked="" type="checkbox"/>	Uniform scale at both axes	D	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> 5 points plotted correctly <input checked="" type="checkbox"/> 3 to 4 point plotted correctly	E	<input checked="" type="checkbox"/>	Best fitted straight line	F	<input checked="" type="checkbox"/>	Minimum size of graph 5 x 4 big square (Big square :2 cm x 2 cm) (From the origin to the last point)	5
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	(e)	$\sin i$ is directly proportional to $\sin r$. // $\sin i$ berkadar langsung dengan $\sin r$.		1																																
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2	(a)	(i)	F meningkat secara linear dengan a <i>F increase linearly to a</i>	1
		(ii)	1. Tunjukkan dalam graf / <i>Show on the graph</i> 2. $F = 7.0 \text{ N}$	2
		(iii)	Daya geseran / <i>Frictional force</i>	1
		(iv)	Lukis segitiga yang cukup besar (min 8x8 cm) <i>Draw a sufficiently large triangle (min 8x8 cm)</i> Penggantian tepat / <i>correct substitution</i> $k = \frac{35 - 7}{9 - 0}$ $= 3.11 \text{ kg (accept N ms}^{-2}\text{)}$ Nilai tepat berserta unit / <i>correct value with unit</i>	1 1 1
	(b)		1. show on the graph 2. $a = 2.3 \text{ ms}^{-2}$	2
	(c)		1. $\frac{\text{kg ms}^{-2}}{\text{ms}^{-2}}$ 2. Mass /jisim	2
	(d)		Mana-mana satu jawapan 1. Pastikan kedudukan mata berserenjang dengan skala pada pembaris meter untuk mengelakkan ralat paralaks 2. Ulang bilangan eksperimen dan kirakan purata 1. Position of eyes are perpendicular to the scale of metre rule to avoid parallax error 2. Repeat the experiment times and calculate the average.	1
TOTAL MARKS				12

		<p><i>temperature</i></p> <p>4. Pada 40°C, tekanan udara diukur dengan menggunakan tolok Bourdon <i>At 40°C, the pressure of the air is measured by using a Bourdon gauge</i></p> <p>5. Eksperimen diulangi dengan menggunakan suhu 50°C, 60°C, 70°C, 80°C dan 90°C <i>The experiment is repeated at temperatures 50°C, 60°C, 70°C, 80°C and 90°C</i></p>															
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4	(a)	<p>Panjang gelombang air bertambah apabila frekuensi kala bunyi berkurang dan dalam situasi yang sama, panjang gelombang air berkurang apabila frekuensi kala bunyi bertambah</p> <p><i>The wavelength of the water waves increases when the frequency of tuning fork decreases and in same situation, the wavelength of the water waves decreases when the frequency of the tuning fork increases</i></p>	1
	(b)	<p>Arus elektrik adalah berkadar songsang dengan panjang gelombang air.</p> <p><i>The electric current is inversely proportional to the wavelength of the water waves.</i></p>	1
	(c) (i)	<p>Untuk menyiasat hubungan antara arus yang mengalir melalui motor dengan panjang gelombang air.</p> <p><i>To investigate the relationship between the current passing through the motor and the wavelength of the water waves.</i></p>	1
	(ii)	<p>Dimanipulasikan/ <i>Manipulated</i> :</p> <p>Arus Elektrik, I / <i>Electric Current, I</i></p> <p>Bergerakbalas / <i>Responding</i> :</p> <p>Panjang gelombang air, λ / <i>Wavelength of water waves, λ</i></p> <p>Dimalarkan / <i>Constant</i> :</p> <p>Kedalaman air / <i>Depth of water</i></p>	1
	(iii)	<p>Tangka riak, rheostat, stoboskop, ammeter, pembaris meter,skrin putih.</p> <p><i>Ripple tank, rheostat, stroboscope, ammeter, meter rule and white screen.</i></p>	1
	(iv)	<p>(iv)</p>  <p>The diagram illustrates the experimental setup. On the left, a power supply (Bekalan kuasa) is connected in series with a rheostat (Reostat) and an ammeter. This circuit is connected to a vibrator (Vibrator Penggetar) which is placed on top of a ripple tank (Tangki riak). A sectional view (Pandangan sisi) of the ripple tank is shown to the right, indicating the water level and the vibrator's position.</p>	1
	(v)	<ol style="list-style-type: none"> 1. Air dengan kedalaman sekata disediakan dalam tangki riak <i>Water of uniform depth is prepared in a ripple tank</i> 2. Hidupkan bekalan kuasa dan laraskan rheostat sehingga ammeter menunjukkan bacaan 0.1 A <i>Switch on the power supply and adjust the rheostat until the ammeter show the reading of 0.1 A</i> 	3

		<p>3. Perhatikan gelombang yang dihasilkan oleh bar kayu yang menggetar pada skrin putih yang diletakkan di bawah tangki riak itu <i>Observe the waves produced by the vibrating wooden bar on the white screen placed below the ripple tank</i></p> <p>4. Ulang prosedur 1 hingga 3 bagi arus $I = 0.2 \text{ A}$, 0.3 A, 0.4 A dan 0.5 A <i>Repeat procedure 1 until 3 for current $I = 0.2 \text{ A}$, 0.3 A, 0.4 A and 0.5 A</i></p>													
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