

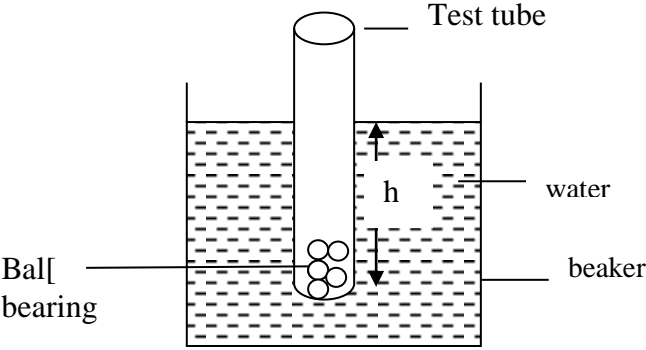
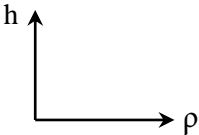
Modul Pintas Tingkatan 5  
Peperiksaan Percubaan SPM 2018  
Skema Jawapan Fizik  
Kertas 3 4531/3

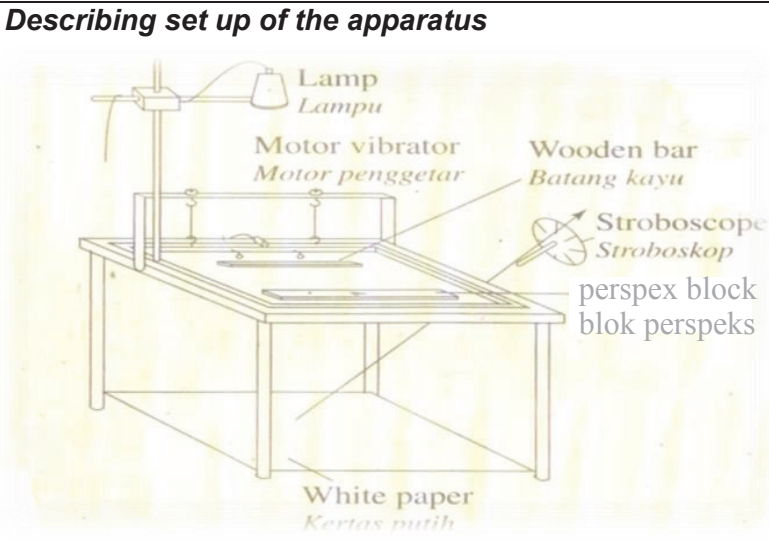
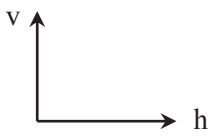
**SECTION A**

Question 1	Marks	Answer																		
(a)(i)	1	<b>Stating the correct manipulated variable.</b> Length of wire// $\ell$																		
(ii)	1	<b>Stating the correct responding variable.</b> Potential difference// Voltage// V																		
(iii)	1	<b>Stating a correct fixed variable.</b> Thickness of wire// resistivity of wire// type of wire																		
(b) (i)	1	<b><math>V_0 = 0.2 \text{ V}</math></b>																		
(ii), (iii)	4	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th><math>V_1</math></th> <th>V</th> </tr> </thead> <tbody> <tr> <td>0.6</td> <td>0.4</td> </tr> <tr> <td>1.1</td> <td>0.9</td> </tr> <tr> <td>1.4</td> <td>1.2</td> </tr> <tr> <td>1.8</td> <td>1.6</td> </tr> <tr> <td>2.1</td> <td>1.9</td> </tr> </tbody> </table> <p><b>5 readings correct - 4 marks</b>  <b>4 readings correct - 3 marks</b>  <b>3 readings correct - 2 marks</b>  <b>2 readings correct - 1 mark</b></p>	$V_1$	V	0.6	0.4	1.1	0.9	1.4	1.2	1.8	1.6	2.1	1.9						
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(c)	2	<p><b>Tabulating results of the experiment</b></p> <p>1. Labels <math>\ell</math> and V and correct unit for <math>\ell</math> and V are shown                  2. All readings of <math>\ell</math>, <math>V_1</math> and V are correct <b>to one decimal place</b></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th><math>\ell / \text{cm}</math></th> <th><math>V_1 / \text{V}</math></th> <th>V/V</th> </tr> </thead> <tbody> <tr> <td>20.0</td> <td>0.5</td> <td>0.3</td> </tr> <tr> <td>40.0</td> <td>1.1</td> <td>0.9</td> </tr> <tr> <td>60.0</td> <td>1.4</td> <td>1.2</td> </tr> <tr> <td>80.0</td> <td>1.8</td> <td>1.6</td> </tr> <tr> <td>100.0</td> <td>2.1</td> <td>1.9</td> </tr> </tbody> </table>	$\ell / \text{cm}$	$V_1 / \text{V}$	V/V	20.0	0.5	0.3	40.0	1.1	0.9	60.0	1.4	1.2	80.0	1.8	1.6	100.0	2.1	1.9
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(d)	5	<p><b>Plotting the V against <math>\ell</math> graph</b></p> <p>A. V on the y-axis and <math>\ell</math> on the x-axis.                  B. Units stated for both <math>\ell</math> and V correctly                  C. The scales on both axes are regular and not an odd scale.                  D. 5 points plotted correctly <b>from table</b>(reading is wrong, plotting from table correct, mark can be given)                  E. 3 points plotted correctly <b>from table</b>.                  F. Line of best fit.                  G. Graph size a minimum of <math>5 \times 4</math> (5 boxes on y-axis, 4 boxes on x-axis).</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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(e)	1	<b>Stating the correct relationship</b> V is directly proportional to $\ell$ // $V \propto \ell$
<b>TOTAL</b>	<b>16</b>	

<b>Question</b> <b>2</b>	<b>Marks</b>	<b>Answer</b>
(a)(i)	1	P is directly proportional to $1/V$ // $P \propto 1/V$
(ii)	1 1 1	1. Show on graph with appropriate vertical and/or horizontal line corresponding to 0.5 kPa 2. $1/V = 0.02 \text{ cm}^{-3}$ 3. $V = 50 \text{ cm}^3$
(b)	3	1. <b>Drawing the gradient triangle</b> Triangle size a minimum of 6cm x 8cm 2. <b>Substitution</b> (values from student's triangle) 3. <b>Answer with correct unit</b> $25 \text{ kPa cm}^3$
(c) (i)	2	$PV = m$  <b>1. Show that P (40) = m</b>  <b>3. Answer with correct unit.</b> $0.625 \text{ kPa}$
(ii)	1	Temperature // mass of gas
(iii)	1	Remains constant // unchanged
(d)	1	When measuring the values of P and V, make sure the eyes are perpendicular to the scale on the metre rule// Repeat the experiment to get an average value of t.
<b>JUMLAH</b>	<b>12</b>	

Question 3	Marks	Answer
(a)	1	<b>Making the right inference</b> The depth of sinking depends on the density of liquid
(b)	1	<b>Building an appropriate hypothesis</b> The higher the density , the lower the depth of sinking
(c)(i)	1	<b>Stating the aim of the experiment</b> To study the relationship between the depth of sinking and the density of liquid
(ii)	1 1 1	<b>Stating the correct variables</b> Manipulated variable : density of liquid Responding variable : depth of sinking Fixed variable : mass of test tube// mass of ball bearing
(iii)	1	<b>List of appropriate apparatus and material</b> Liquid of different densities, ruler
(iv)	1	<b>Describing set up of the apparatus</b> 
(v)	1 1 1	<b>Stating the procedure of the experiment</b> 1. Set up the apparatus as shown 2. Use liquid of density, $\rho = 1 \text{ g cm}^{-3}$ 3. Measure the depth of sinking, h 4. Repeat step 2 and 3 for liquid of different $\rho = 2 \text{ g cm}^{-3}, 3 \text{ g cm}^{-3}, 4 \text{ g cm}^{-3}$ and $5 \text{ g cm}^{-3}$
vi)	1	<b>Tabulating data</b> Show table with ,h and $\rho$ as headings
viii)	1	<b>Analysing data</b> 
<b>Total</b>	<b>13</b> <b>Max 12</b>	

Question 4	Marks	Answer
(a)	1	<b>Making the right inference</b> Velocity of water waves depend on depth
(b)	1	<b>Building an appropriate hypothesis</b> The deeper the water the higher the velocity
(c)(i)	1	<b>Stating the aim of the experiment</b> To study the relationship between depth of water waves and its velocity
(ii)	1 1 1	<b>Stating the correct variables</b> Manipulated variable : depth of water Responding variable : velocity Fixed variable : frequency
(iii)	1	<b>List of appropriate apparatus and material</b> Ripple tank, stroboscopes, metre rule, perspex block, power supply
(iv)	1	<b>Describing set up of the apparatus</b> 
(v)	1 1 1	<b>Stating the procedure of the experiment</b> <ol style="list-style-type: none"> <li>1. A ripple tank is filled with water.</li> <li>2. A perspex with 0.5 cm is immersed in the centre of the tank.</li> <li>3. The motor is switched on to produce plane waves.</li> <li>4. The wave pattern is observed through a stroboscope.</li> <li>5. The wave length is measured.</li> <li>6. The experiment is repeated by placing of different thickness of perspex block, <math>d = 1.0 \text{ cm}, 1.5 \text{ cm}, 2.0 \text{ cm}</math> and <math>2.5 \text{ cm}</math>.</li> </ol>
vi)	1	<b>Tabulating data</b> Show table with depth, $h$ and velocity, $v$ as headings
viii)	1	<b>Analysing data</b> 
<b>Total</b>	<b>13</b> <b>Max 12</b>	