

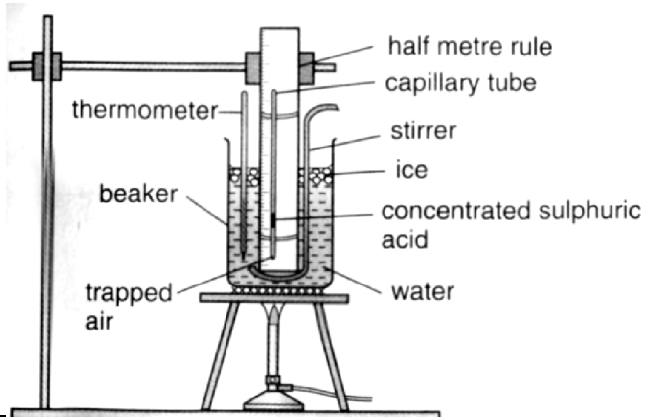
**MARKING SCHEME
PAPER 3 Set A**

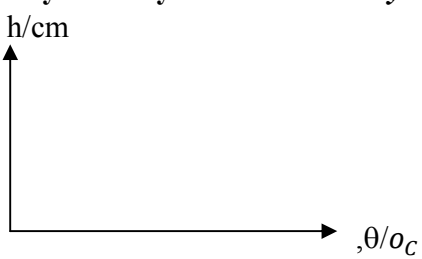
**PRAKTIS BESTARI
JUJ FIZIK 2014**

NO 1		MARKING CRITERIA	SUB	TOTAL MARK
(a)	(i)	State the manipulated variable correctly Object distance/ u	1	1
	(ii)	State the responding variable correctly Image distance/ v /linear magnification/ m	1	1
	(iii)	State the constant variable correctly Focal length/ f /thickness of lens	1	1
(b)	(i)	Record the readings of v correctly Diagram 1.2 : 5.6 cm Diagram 1.3 : 6.0 cm Diagram 1.4 : 6.3 cm Diagram 1.5 : 6.7 cm Diagram 1.6 : 7.1 cm Note : 1. All 5 values correct – 2 marks 2. 3 or 4 values correct – 1 mark	2	2
	(ii)	State the values of linear magnification m correctly Diagram 1.2 : 0.11 Diagram 1.3 : 0.20 Diagram 1.4 : 0.25 Diagram 1.5 : 0.34 Diagram 1.6 : 0.47 Note : 1. Accept e.c.f. from (b)(i) 2. All 5 values correct – 1 mark	1	1
	(iii)	State the values of $\frac{1}{u}$ correctly All 5 values of $\frac{1}{u}$ correct Diagram 1.2 : 0.02 Diagram 1.3 : 0.03 Diagram 1.4 : 0.04 Diagram 1.5 : 0.05 Diagram 1.6 : 0.07 Note : 1. All 5 values correct – 1 mark 2. Consistent two or three d.p.	1	1

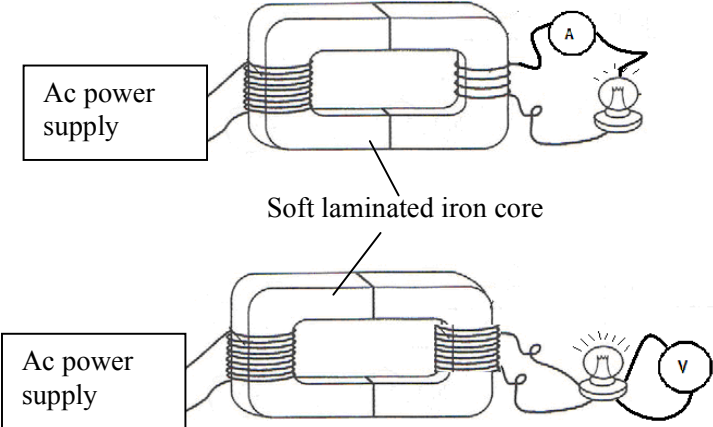
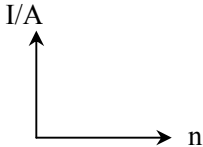
<p>(c)</p>	<p>Tabulate the results for u, v, $\frac{1}{u}$ and m correctly</p> <table border="1" data-bbox="459 360 1066 613"> <thead> <tr> <th>u/cm</th> <th>v/cm</th> <th>$\frac{1}{u}$/cm⁻¹</th> <th>m</th> </tr> </thead> <tbody> <tr> <td>15.0</td> <td>7.1</td> <td>0.07</td> <td>0.47</td> </tr> <tr> <td>20.0</td> <td>6.7</td> <td>0.05</td> <td>0.34</td> </tr> <tr> <td>25.0</td> <td>6.3</td> <td>0.04</td> <td>0.25</td> </tr> <tr> <td>30.0</td> <td>6.0</td> <td>0.03</td> <td>0.20</td> </tr> <tr> <td>50.0</td> <td>5.6</td> <td>0.02</td> <td>0.11</td> </tr> </tbody> </table> <p>Table with 4 columns correctly labelled Unit of each quantities All values consistent in decimal place.</p> <p>Maximum mark</p>	u/cm	v/cm	$\frac{1}{u}$ /cm ⁻¹	m	15.0	7.1	0.07	0.47	20.0	6.7	0.05	0.34	25.0	6.3	0.04	0.25	30.0	6.0	0.03	0.20	50.0	5.6	0.02	0.11	<p>1 1 1</p>	<p>3</p>
u/cm	v/cm	$\frac{1}{u}$ /cm ⁻¹	m																								
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<p>(d)</p>	<p>Draw a complete graph of m against $\frac{1}{u}$</p> <p>Give a tick (✓) based on the following:</p> <ul style="list-style-type: none"> A • m at the y-axis and $\frac{1}{u}$ at the x-axis B • Correct unit for both axes. C • Uniform and even scale at both axes D • 5 points plotted correctly [Note : 3-4 points plotted correctly :] E • Draw a line of best fit F • Minimum size of graph 5 x 4 larger squares (larger square : 2 cm x 2 cm) (From the origin to the last point) <p>Marks awarded / markah diberi:</p> <table border="1" data-bbox="576 1487 1082 1675"> <thead> <tr> <th>Number of ✓</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>	Number of ✓	Marks	7 ✓	5	5-6 ✓	4	3-4 ✓	3	2 ✓	2	1 ✓	1	<p>✓ ✓ ✓ ✓✓ ✓ ✓</p> <p>7</p>	<p>5</p>												
Number of ✓	Marks																										
7 ✓	5																										
5-6 ✓	4																										
3-4 ✓	3																										
2 ✓	2																										
1 ✓	1																										
<p>(e)</p>	<p>State the correct relationship between m and $\sin \frac{1}{u}$</p> <p>m increase linearly to $\frac{1}{u}$</p>	<p>1</p>	<p>1</p>																								
<p>TOTAL</p>		<p>16</p>	<p>16</p>																								

NO	MARKING CRITERIA	MARK	
		SUB	TOTAL
2 (a)(i)	State the correct relationship between R and d^2 R inversely proportional to d^2	1	1
(ii)	$1/d^2 = 25 \text{ mm}^{-2}$ Draws the interpolation line from $1/d^2 = 25 \text{ mm}^{-2}$ to the graph and from the graph to the R – axis States the correct value and its unit of the resistance, $R = 33\Omega$	1 1 1	3
(b)(i)	Draw a sufficiently large triangle (size of triangle > 4 x 4 larger square) Showing the correct calculation Answer with correct unit $1.32 \Omega \text{ mm}^2$	1 1 1	3
(ii)	Showing the correct calculation $\frac{3.142(1.32)}{4(1500)}$ Correct answer $6.91 \times 10^{-4} \Omega \text{ mm}$	1 1	2
(c)	Showing the correct calculation $R = \frac{6.91 \times 10^{-4}(4)(2500)}{\pi(0.30^2)}$ Answer with correct unit 24.44Ω	1 1	2
(d)	State one suitable precaution All wire connections must be tightly fixed/ Switch off the circuit while not taking any reading	1	1
TOTAL MARKS			12

Question	Answer	Marks
3 (a)	State a suitable inference / Menyatakan inferen yang sesuai Temperature influence the volume container.	1
(b)	State a relevant hypothesis/ Menyatakan satu hipotesis yang sesuai When the temperature increases, the height of air trapped also increases.	1
(c)(i)	State the aim of experiment / Menyatakan tujuan eksperimen To investigate the relationship between temperature and height of air trapped	1
(ii)	State the variable of experiment / Menyatakan pembolehubah eksperimen Manipulated variable : Temperature Responding variable : Height of air trapped Fixed variable : Pressure	1 1
(iii)	State the list of apparatus/ Menyatakan senarai radas eksperimen Capillary tube, <u>thermometer</u> , beaker, <u>ruler</u> , stirrer, tripod stand, bunsen burner, concentrated sulfuric, rubber bands and retort stand with clamp.	1
	Draw the arrangement of the apparatus/ Melukis rajah susunan radas yang berfungsi. 	1
	State the procedure of experiment/ Menyatakan prosedur eksperimen -Controlling Manipulated Variable: When the temperature is, $\theta = 10^{\circ}\text{C}$ -Measuring Responding Variables: The height of the air column, h is read on the ruler scale and record -Repetition: -Experiment is repeated using $=20^{\circ}\text{C}, 30^{\circ}\text{C}, 40^{\circ}\text{C}, 50^{\circ}\text{C}$ and 60°C	1 1 1

	<p>State the way to tabulate the data/ Menyatakan cara menjadualkan data</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Temperature, $\theta/^\circ\text{C}$</td> <td>10</td> <td>20</td> <td>30</td> <td>40</td> <td>50</td> </tr> <tr> <td>Height of air, h/cm</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Temperature, $\theta/^\circ\text{C}$	10	20	30	40	50	Height of air, h/cm						1
Temperature, $\theta/^\circ\text{C}$	10	20	30	40	50									
Height of air, h/cm														
	<p>State the way to analyse the data/ Menyatakan cara menganalisis data</p> 	1												
	TOTAL	12												

Question	Answer	Marks
4 (a)	<p>State a suitable inference / Menyatakan inferen yang sesuai The number of turn of secondary coils affects the brightness of the bulb</p>	1
(b)	<p>State a relevant hypothesis/ Menyatakan satu hipotesis yang sesuai The larger the number of turns of the secondary coil, the greater the (induced) current // potential difference (output)</p>	1
(c)(i)	<p>State the aim of experiment / Menyatakan tujuan eksperimen To study the relationship between the number of turns of the secondary coil and the magnitude of (induced) current // potential difference (Vs)</p>	1
(ii)	<p>State the variable of experiment / Menyatakan pembolehubah eksperimen</p> <p>Manipulated variable : the number of turns of the secondary coil, N_s Responding variable : (induced) current // potential difference (output) Fixed variable : input voltage // no of turns of the primary coil // size / diameter / thickness of wire of coils.</p>	1 1
(iii)	<p>State the list of apparatus/ Menyatakan senarai radas eksperimen Ammeter / ac voltmeter, ac power supply</p>	1

<p>(iv)</p>	<p>Draw the arrangement of the apparatus/ <i>Melukis rajah susunan radas yang berfungsi</i></p>  <p>OR</p>	<p>1</p>												
<p>(v)</p>	<p>State the procedure of experiment/ <i>Menyatakan prosedur eksperimen</i></p> <ol style="list-style-type: none"> 1. Set up the apparatus as shown, with a 240 V ac current supply with 100 turns on the primary coil. 2. Set the secondary coil so that the number of turns $n = 100$ 3. Switch on the power supply, measure the current, I (with the ammeter) that passes through the secondary coil. 4. Repeat step 2 and 3 for $n = 200, 300, 400,$ and 500 turns. 	<p>1 1 1</p>												
<p>(vi)</p>	<p>State the way to tabulate the data/ <i>Menyatakan cara menjadualkan data</i></p> <table border="1" data-bbox="411 1238 1326 1317"> <tr> <td>N_s</td> <td>100</td> <td>200</td> <td>300</td> <td>400</td> <td>500</td> </tr> <tr> <td>I_s/A</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	N_s	100	200	300	400	500	I_s/A						<p>1</p>
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I_s/A														
<p>(vii)</p>	<p>State the way to analyse the data/ <i>Menyatakan cara menganalisis data</i></p>  <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-left: auto; margin-right: auto;"> <p>**This mark may be given at the last line for procedure.</p> </div>													
	<p>TOTAL</p>	<p>12</p>												