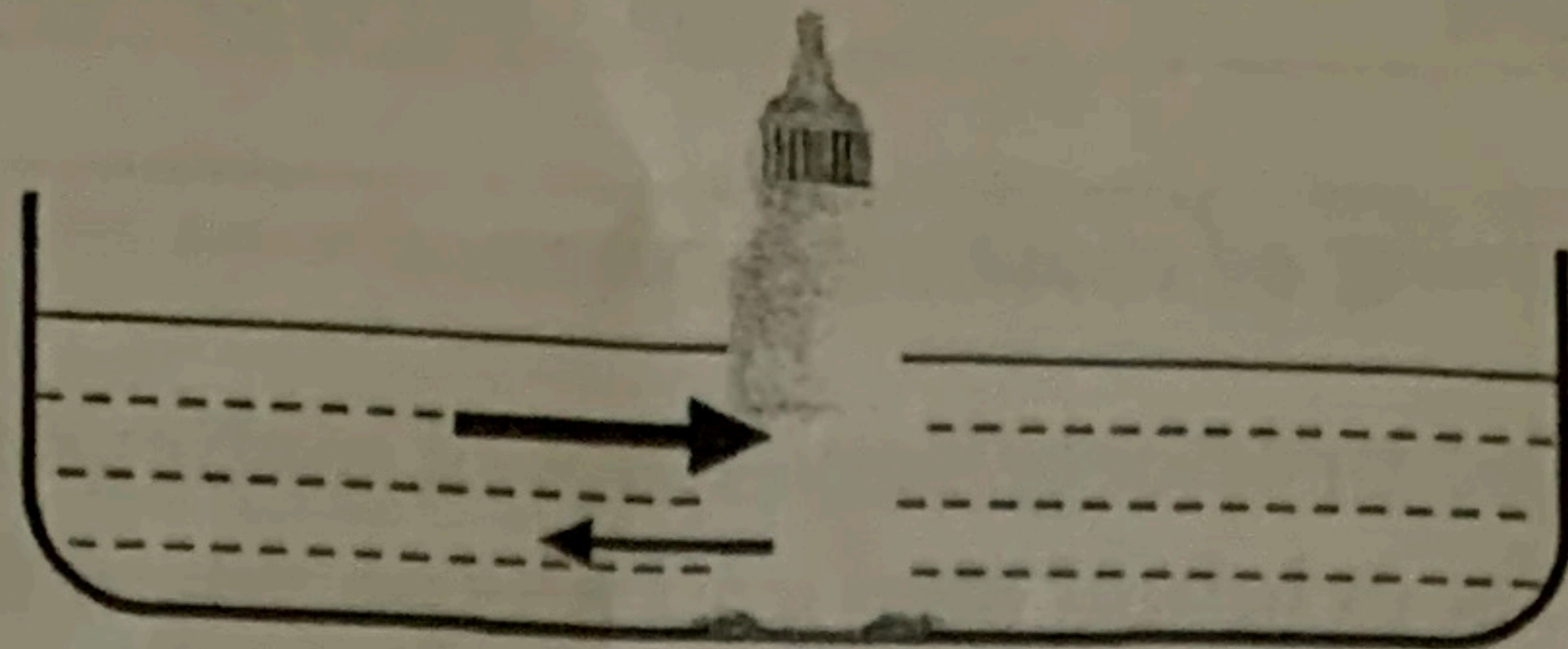
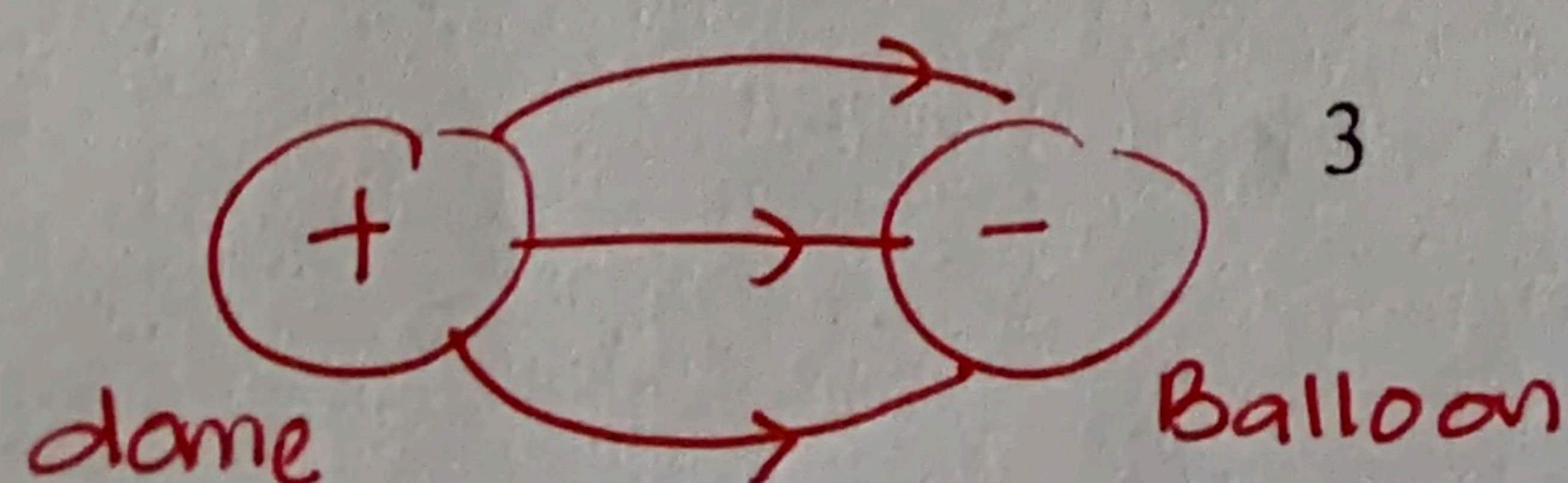


Number	Answer	Number	Answer
1	B	26	A
2	B	27	C
3	B	28	B
4	B	29	B
5	D	30	B
6	D	31	C
7	B	32	A
8	C	33	A
9	C	34	D
10	B	35	A
11	C	36	D
12	A	37	D
13	D	38	B
14	C	39	A
15	A	40	A
16	D	41	A
17	A	42	C
18	A	43	C
19	D	44	A
20	B	45	D
21	A	46	C
22	C	47	D
23	C	48	B
24	D	49	C
25	C	50	D

NO			SUGGESTED ANSWER	MARK
1	(a)	(i)	Name the electromagnetic waves correctly Infrared	1
		(ii)	Underline the correct answer correctly Electromagnetic wave <u>can</u> propagate in vacuum	1
	(b)		Name one characteristic of electromagnetic wave correctly Electromagnet waves travel at speed of light // transverse waves // show reflection, refraction, diffraction and interference // <u>not</u> deflected by electric field and magnetic field. Reject propagate in vacuum // does not need medium to travel	1
	(c)		State one detrimental effect correctly <u>Skin burnt</u> //	1
				TOTAL 4
2	(a)	(i)	Name the principle correctly Pascal's principle. (spelling of Pascal must be correct)	1
		(ii)	Compare the pressure correctly Same // Equal (=)	1
	(b)	(i)	Calculate the pressure correctly $P = \frac{F}{A}$ $= \frac{50}{0.05}$ $= 1000 \text{ Pa (answer with unit)}$ Nm ⁻²	1 1
		(ii)	State how to lowered the load correctly Open the release valve. // pull the handle ✓ pull the handle backwards // to the left	1
				TOTAL 5

3	(a)	<p>Draw the direction of heat flow correctly</p>  <p>2 arrows to show the transfer of heat from both liquid (tak kisah tebal nipis) Reject one arrow only</p>	1	
	(b)	(i)	<p>State what happen to the temperature correctly</p> <p>same</p>	1
		(ii)	<p>Name the principle correctly</p> <p>Principle of Thermal equilibrium</p>	1
	(c)	(i)	<p>Calculate the temperature correctly</p> $\Theta = \frac{l_{\Theta} - l_0}{l_{100} - l_0} \times 100 \text{ } ^\circ\text{C}$ $= \frac{25.5 - 5}{33 - 5} \times 100 \text{ } ^\circ\text{C} \quad (\text{substitution})$ $= 73.21 \text{ } ^\circ\text{C} \quad (\text{correct answer + unit})$	1 1
		(ii)	<p>State the temperature in Kelvin correctly</p> $\Theta = 73.21 + 273$ $= 346.21 \text{ K (answer with unit)}$	1
			TOTAL 6	
4	(a)	<p>State the meaning correctly</p> <p>Electric current is the rate of charge flow</p>	1	
	(b)	<p>Calculate the charges correctly</p> $Q = It$ $= 7.5 \times 10 \times 60$ $= 4500 \text{ C (answer with unit) } \quad \text{As}$	1 1	
	(c)	(i)	<p>State what happen and explain your answer correctly</p> <p>Balloon X <u>attracted</u> to the dome // balloon X move closer to the dome <u>Different charges</u> attracted to each other // because dome is positive charge</p>	1 1
		(ii)	<p>Draw the pattern correctly</p>	



		Correct direction Correct pattern	1 1 TOTAL 7
5	(a)	<p><i>State the meaning of elasticity correctly</i></p> <p>Elasticity is the property/tendency of matter that enables an object to return to its original size and shape when the forces that are acting on it are removed.</p>	1
	(b)	<p>(i) <i>Compare the number of the springs correctly</i></p> <p>Number of spring in Diagram 5.1 < Diagram 5.2 // Diagram 5.2 > Diagram 5.1</p> <p style="text-align: right; color: red;">$5.2 > 5.1$</p>	1
		<p>(ii) <i>Compare the compression of springs correctly</i></p> <p>Compression of the spring in Diagram 5.1 > Diagram 5.2 // Diagram 5.2 < Diagram 5.1</p> <p style="text-align: right; color: red;">$5.1 > 5.2$</p>	1
		<p>(iii) <i>Compare the stiffness of the springs correctly</i></p> <p>The stiffness of spring in Diagram 5.2 > Diagram 5.1</p> <p style="text-align: right; color: red;">$5.2 > 5.1$</p>	1
		<p>(iv) <i>Relate the number of spring and compression correctly</i></p> <p>The greater the number of spring the lower the compression of the spring // $n \uparrow \quad x \downarrow$</p> <p>The lower the number of spring the greater the compression of the spring. $n \downarrow \quad x \uparrow$</p>	1
		<p>(v) <i>Relate the stiffness of the spring and the compression correctly</i></p> <p>The greater the stiffness of the spring the lower the compression of the spring. $k \uparrow \quad x \downarrow$</p>	1
	(c)	<p><i>Choose the rocker correctly and explain the answer</i></p> <p>Diagram 5.2 // rocker with 2 spring</p> <p>The springs are arranged in <u>parallel</u> // <u>two springs are stiffer</u> // spring constant is greater</p>	1 1
			TOTAL 8
6	(a)	<p><i>State the meaning of electromagnet correctly</i></p> <p>Electromagnet is a magnet made by winding a coil of insulated wire round a soft iron core so that a magnetic field is produced when a current passed through the coil.</p> <p>Temporary magnet in which magnetism is produced by an electric current.</p>	1

			Electromagnet is a temporary magnet when soft iron core is wound by a current carrying coil	
	(b)	(i)	Compare the number of turns correctly Number of turns are the <u>same</u>	1
		(ii)	Compare the distance of magnetic field lines correctly The distance of magnetic field lines in Diagram 6.1 is higher // the distance of magnetic field lines in Diagram 6.2 is closer / smaller <i>6.1 > 6.2</i>	1
		(iii)	Compare the thickness of the conductor correctly The <u>thickness</u> of the conductor in Diagram <u>6.2</u> is higher.	1
		(iv)	Compare the strength of magnetic field correctly The strength of magnetic field in Diagram <u>6.2</u> is greater.	1
		(v)	Relate the thickness, the distance of magnetic field lines and the strength of magnetic field correctly * The higher the thickness of the conductor the smaller the distance of magnetic field lines * The closer / smaller the distance of the magnetic field lines the greater the strength of magnetic field.	1 1
		(c)	State one method to increase the strength of magnetic field correctly Increase the magnitude of current // use soft iron core // increase number of turns <i>Increase the no. of dry cell</i>	1
				TOTAL 8
7	(a)	(i)	Tick the Principle correctly Bernoulli's principle	1
		(ii)	State what happen to the height correctly Height increase Reason Velocity of kite is higher / increases Upward force increases // Upthrust increases // Lift force increases Reject : force increases sahaja	1 1 1

	(b)	(i)	<p><i>State the size of nozzle and reason correctly</i></p> <p>Small</p> <p>Reason Can produce high speed of spray</p> <p>Reject the spray can go further</p>	1 1
		(ii)	<p><i>State the size of container and reason correctly</i></p> <p>Big</p> <p>Reason Store more insecticides</p>	1 1
		(iii)	<p><i>State the length of cylinder and reason correctly</i></p> <p>Long</p> <p>Reason More air can be pushed</p>	1 1
				TOTAL 10
8	(a)		<p><i>Name the process correctly</i></p> <p>Nuclear <u>fission</u> <i>pelafuran</i></p>	1
	(b)	(i)	<p><i>State the value of X and Y correctly</i></p> <p>X = 92</p> <p>Y = 36</p>	1 1
		(ii)	<p><i>Calculate the mass in kg correctly</i></p> <p>236.0329 a.m.u. - 235.86653 a.m.u</p> <p>= $0.16637 \times 1.66 \times 10^{-27}$</p> <p>= 2.76×10^{-28} kg (answer with unit)</p>	1 1
	(c)	(i)	<p><i>State the characteristic and reason correctly</i></p> <p>Solid</p> <p>Reason Easy to handle // not spill</p>	1 1
		(ii)	<p><i>State the characteristic and reason correctly</i></p> <p>Gamma // Gamma ray</p>	1

		Reason High penetrating power // low ionizing power	1								
	(iii)	State the characteristic and reason correctly Long half life Reason Long lasting // not change frequently // not easy to decay	1 1								
	(d)	Determine the suitable radioisotope correctly Californium - 252	1								
			TOTAL 12								
9	(i)	State the meaning correctly <u>The rate of change of momentum</u>	1								
	(ii)	<p>Explain the observation correctly</p> <p>Men in 9.1 bends his leg Time impact in Diagram 9.1 is higher Pain felt in Diagram 9.1 is lower / smaller</p> <p>When the leg is <u>bend</u>, the time impact is longer / greater When time of impact is higher/ longer, impulsive force is smaller <i>t ↑ F ↓</i></p>	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 5px;">9.1</td> <td style="padding: 5px;">9.2</td> </tr> <tr> <td style="padding: 5px;">bend</td> <td style="padding: 5px;">straight</td> </tr> <tr> <td style="padding: 5px;">t: ↑</td> <td style="padding: 5px;">↓</td> </tr> <tr> <td style="padding: 5px;">pain: ↓</td> <td style="padding: 5px;">↑</td> </tr> </table> 1 1 1 1 1	9.1	9.2	bend	straight	t: ↑	↓	pain: ↓	↑
9.1	9.2										
bend	straight										
t: ↑	↓										
pain: ↓	↑										
	(b)	<p>Explain how the helmet protect the cyclist from injury correctly</p> <p>inner soft / <i>fabric</i> lengthen the time of impact // reduce impulsive force</p> <p>strong outer surface (reject hard) do not break easily</p> <p>the strap is fasten to prevent the helmet from "tercabut"</p>	1 1 1 1 1 1 (Max 4M)								

(c)	State and explain your modification correctly		Total 10	
	Aspect	Characteristic		Explanation
	Type of outer surface	Rough // stick sponge		More grip
	Material used	Elastic		can back to original shape
		Waterproof		Avoid from water from being absorbed
		Heat resistance		To withstand high temperature
		Strong		Do not break easily / tear easily
	Size of entrance	Small		Prevent from thrown out
	Thickness of outer layer	Thick		Stronger // not easy to rip
	Safety features	Handle		To be more stable / Avoid injury
Inner layer-soft		longer the time of impact		
TOTAL 20				
10	(a)	State what is transferred correctly Energy	1	
	(b)	(i) Compare the wavelength correctly Wavelength of wave after passing the obstacle is Diagram 10.1 and 10.2 is the <u>same</u>	1	
		(ii) Compare the size of obstacle correctly The size of the obstacle in Diagram 10.1 is smaller than in Diagram 10.2 $10.2 > 10.1$	1	
		(iii) Compare the pattern of wave after passing the obstacle correctly The pattern of the wave spread out in Diagram 10.1 is more <u>obvious</u> / <u>curve</u> / bent than in Diagram 10.2	1	
	(c)	State the relationship correctly The smaller the size of gap the more obvious the pattern of wave. $size \downarrow = \text{more spreading}$	1	
	(d)	Name the phenomenon correctly Diffraction of water waves $curve // bend$	1	

(e)	<p>Explain the wave pattern formed correctly</p> <p>1 Wave pass through a <u>gap</u></p> <p>2 Wave bend // <u>wave spread</u> around the corner Wavelength of water waves is more than size of gap $\lambda \geq \text{gap}$ (Reject: gap is small)</p> <p>3 Energy is distributed to wider area // <u>Energy decreases</u></p> <p>4 <u>Wavelength before and after pass through obstacle the same</u> <i>pattern: circular</i></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>(Max 4M)</p>
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(f)	<p>State and explain your modification correctly</p> <table border="1"> <thead> <tr> <th>Suggestion <i>Cadangan</i></th> <th>Reason <i>Sebab</i></th> </tr> </thead> <tbody> <tr> <td>Location at bay</td> <td>Water wave at this area is <u>calmer</u> // energy of wave is smaller</td> </tr> <tr> <td>High wall</td> <td>Prevent high wave // prevent water overflow</td> </tr> <tr> <td>Smaller aperture/gap of retaining wall</td> <td>Diffraction obvious // Low wave energy // low amplitude</td> </tr> <tr> <td>Concrete retaining wall</td> <td>Stronger / long lasting</td> </tr> <tr> <td>The surface of the wall rough.</td> <td>To reduce reflection of water wave</td> </tr> </tbody> </table>	Suggestion <i>Cadangan</i>	Reason <i>Sebab</i>	Location at bay	Water wave at this area is <u>calmer</u> // energy of wave is smaller	High wall	Prevent high wave // prevent water overflow	Smaller aperture/gap of retaining wall	Diffraction obvious // Low wave energy // low amplitude	Concrete retaining wall	Stronger / long lasting	The surface of the wall rough.	To reduce reflection of water wave	<p>10</p>
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		TOTAL 20												

11	(a)	<p>State the phenomenon correctly</p> <p>Reflection of light Reject: Reflection of water</p>	<p>1</p>
	(b)	<p>Explain how the phenomenon occur correctly</p> <p>Light travels in a <u>straight line</u></p> <p>Light reflected on the <u>surface of water</u> / Water surface act as reflective surface</p> <p><i>Law</i> { 1 Angle of incidence <u>equal to the angle of reflection</u></p> <p>2 Incident ray, <u>reflected ray and normal line</u> lie on the same plane (Max 2 marks)</p> <p><i>circ image</i> { 3 Image formed are inverted</p> <p>4 Image is same size Image is virtual Distance of object equal to distance of image (Max 2 marks)</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>

		Explain the suitability and give reason correctly								
		Characteristic	Reason							
	(c)	Narrow angle of view	To converge light / magnify distant ob / object appear closer / sharper image	8						
		High purity lens	Light easy to refract // clear + brighter							
		Low density lens	Smaller mass / lighter							
		Long focal length	Can see far object							
		Lens Q Because it is narrow angle of vision, high purity lens, low density lens and long focal length			1 1					
	(d)	(i)	Able to calculate power of lens correctly $P = \frac{1}{f} = \frac{1}{1} = 1 \text{ D} = \frac{100}{100}$ $P = \frac{1}{f} = \frac{1}{0.25} = 4 \text{ D} = \frac{100}{25}$	3 unit						
		(ii)	Able to calculate length correctly $l = 100 + 25 = 125 \text{ cm}$ (answer with unit) $f_o + f_e$	1						
		(iii)	Able to calculate linear magnification correctly $M = \frac{f_o}{f_e} = \frac{100}{25} = 4$	1						
				TOTAL 20						
12	(a)	Give meaning of logic gate correctly Logic gate is an electronic switch circuit have <u>one or more</u> inputs but only <u>one</u> output.		1						
	(b)	Able to explain Security system correctly When there is intruder, the infrared signal is switched on / logic 1 During night, the light sensor is on / the logic is 1 / switched is on Output of AND gate is <u>1</u> Alarm <u>on</u> // activate the alarm <table border="1" style="margin-left: 20px;"> <tr> <td>Intruder</td> <td>Night</td> <td>AND</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> </tr> </table>		Intruder	Night	AND	1	1	1	1 1 1 1
Intruder	Night	AND								
1	1	1								
	(c)	(i)	Calculate the potential difference correctly $V_{MO} = 6 \text{ V}$	1 activate the alarm						
		(ii)	Calculate the resistance of LDR correctly $V_2 = R_2 \times V$							

boleh dlm bentuk truth table

$$V_2 = \left(\frac{R_2}{R_1 + R_2} \right) 6$$

$$4 = \frac{R_1 + R_2}{R_2} \times 6$$

$$(10 \text{ k}\Omega + R_2)$$

$$R_2 = \underline{20\,000 \Omega // 20 \text{ k}\Omega}$$

$$V_1 = \left(\frac{R_1}{R_1 + R_2} \right) 6$$

1

1

(iii) Calculate the potential difference of LDR correctly

$$V = IR$$

$$V = (0.0002 \text{ A}) (20 \text{ k}\Omega)$$

$$V = \underline{4 \text{ V}}$$

1

1

(d) Explain the suitability and give reason correctly

Characteristic	Reason
<u>High Melting point</u>	The substance does not melt at high temperature
Valency of doping substance is <u>higher</u> than <u>pure</u> semiconductor	to produce <u>n-type</u> semiconductor // to produces semiconductor with more <u>free electron</u> <i>more free e⁻ - npn -</i>
Size of doping substance is about the <u>same size</u> as the semiconductor atom <u>small</u>	so that it can <u>fit into the crystal structure</u> of the semiconductor
Density must be low	lighter
Choice : K	Medium melting point, medium valency of doping substance, small size and low density

10

more e⁻
∴ I flow easily
Pentavalent

TOTAL 20

Question		Mark	Suggested Answer	Note												
1.	(a)(i)	1	<p>State the correct manipulated variable</p> <p>Temperature of <u>trapped</u> air, θ <i>Suhu udara terperangkap, θ</i></p>	Reject: Temperature of <u>air</u>												
	(ii)	1	<p>State the correct responding variable</p> <p>Length of trapped air, l <i>Panjang udara yang terperangkap, l</i></p>	Reject: Length / length of air												
	(iii)	1	<p>State the correct constant variable</p> <p>Mass of trapped air // power of immersion heater // pressure of <u>trapped</u> air <i>Jisim udara yang terperangkap // Kuasa pemanas rendam // tekanan udara yang terperangkap</i></p>	Reject: volume of water												
	(b)(i)	3	<p>Record 5 values of y correctly</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Diagram</th> <th>l (cm)</th> </tr> </thead> <tbody> <tr> <td>1. <u>2</u></td> <td>7.1</td> </tr> <tr> <td>1. <u>3</u></td> <td>7.6</td> </tr> <tr> <td>1. <u>4</u></td> <td>7.9</td> </tr> <tr> <td>1. <u>5</u></td> <td>8.2</td> </tr> <tr> <td>1. <u>6</u></td> <td>8.4</td> </tr> </tbody> </table> <p>Note:</p> <ul style="list-style-type: none"> • 1 - 2 reading correct – 1 mark • 3 - 4 reading correct – <u>2</u> mark • 5 reading correct – 3 marks 	Diagram	l (cm)	1. <u>2</u>	7.1	1. <u>3</u>	7.6	1. <u>4</u>	7.9	1. <u>5</u>	8.2	1. <u>6</u>	8.4	
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	(ii)	4	<p>Tabulate results for θ and l in the space provide</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>θ ($^{\circ}\text{C}$)</th> <th>l (cm)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>7.1 <u>6.8</u></td> </tr> <tr> <td>20</td> <td>7.6 <u>7.4</u></td> </tr> <tr> <td>30</td> <td>7.9 <u>7.7</u></td> </tr> <tr> <td>40</td> <td>8.2 <u>8.0</u></td> </tr> <tr> <td>50</td> <td>8.4 <u>8.2</u></td> </tr> </tbody> </table> <p>Note:</p> <ul style="list-style-type: none"> • Correct symbol - 1 mark • Correct units - 1 mark • Correct column - 1 mark • Consistent (1 decimal place for <u>l</u>) - 1 mark 	θ ($^{\circ}\text{C}$)	l (cm)	0	7.1 <u>6.8</u>	20	7.6 <u>7.4</u>	30	7.9 <u>7.7</u>	40	8.2 <u>8.0</u>	50	8.4 <u>8.2</u>	<p>+ 0.1 cm</p> <p>6.9</p> <p>7.5</p> <p>7.8</p>
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0	7.1 <u>6.8</u>															
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	(c)	5	<p>Plot a complete graph l against θ</p> <p>Tick (\checkmark) based on the following aspects</p>													

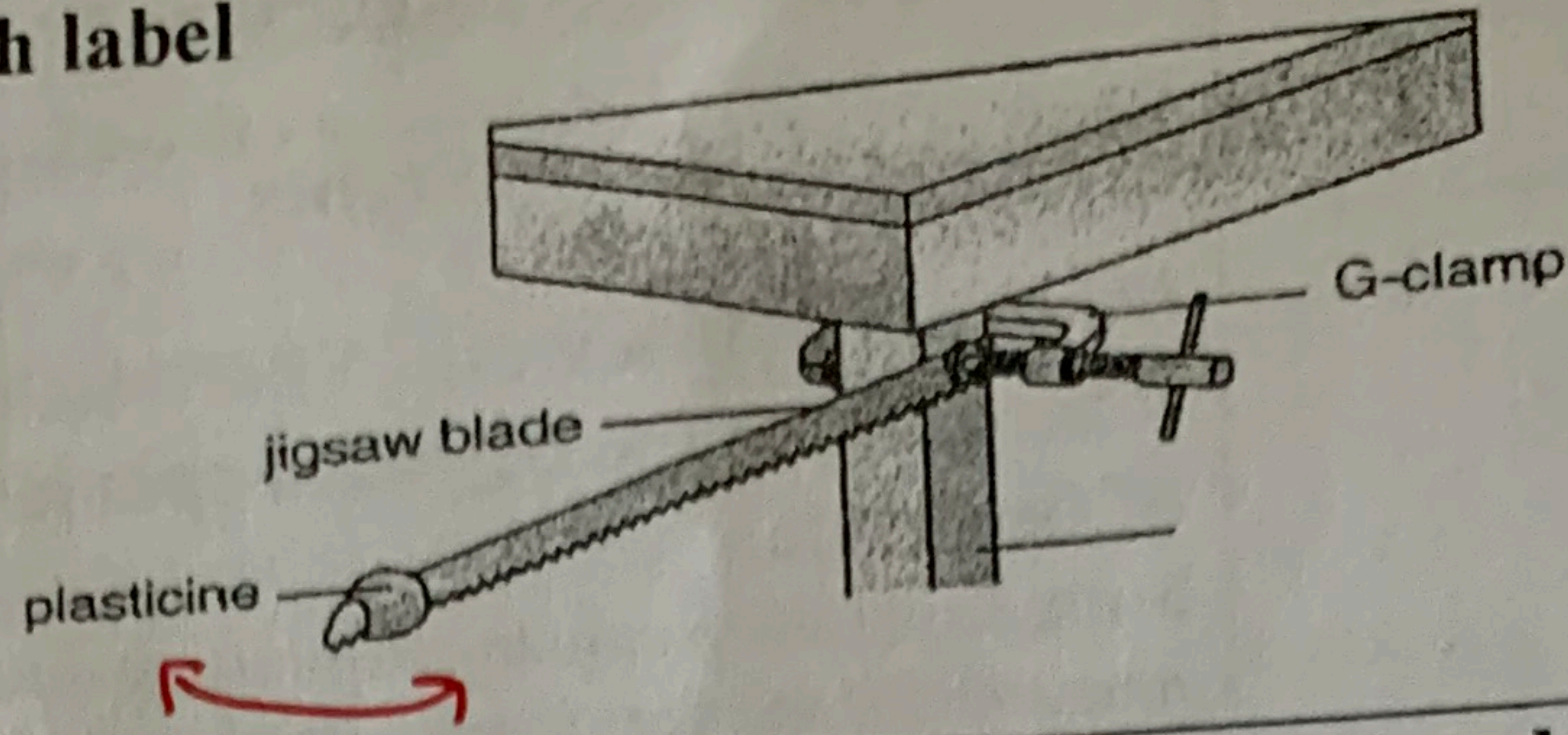
		<p>√ A: Show how θ on the horizontal axis and l is on the vertical axis</p> <p>√ B: State the units of variables correctly</p> <p>√ C: Both axes are marked with uniform scale</p> <p>√√ D: All five points are plotted correctly (note: if only three points correctly, award (√))</p> <p>√ E: Best fit straight line is drawn</p> <p>√ F: Show maximum size of graph (scale on X axis - 4 cm : 10 °C)</p> <p>Score:</p> <table border="1"> <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	
No of ticks	Score														
7	5														
5-6	4														
3-4	3														
2	2														
1	1														
	(d)	1	<p>State the correct relationship between l and θ</p> <p>l increase linearly with θ</p> <p><i>l increase linearly with θ</i></p>												
	TOTAL	16													

Question		Mark	Suggested Answer	Notes
2.	(a)(i)	1	Stating a correct relationship V is directly proportional to I <i>V berkadar langsung dengan I</i>	
	(a)(ii)	1	Determine the value of m correctly Extrapolation graph <i>Mengekstrapolasi graf</i>	
		1	Show the horizontal line to the x-axis, $I = 0.6A$ <i>Tunjukkan pada garis melintang paksi x, $I=0.6A$</i>	
		1	Show the vertical line to the y-axis, $V = 3.0 V$ <i>Tunjukkan pada garisan menegak pada paksi-y, $V=3.0 V$</i>	
	(b)(i)	1	Calculate the gradient, k of the graph correctly Draw a sufficient large triangle (8 cm x 8 cm) <i>Lukiskan segitiga besar (8 cm x 8 cm)</i>	
		1	Substitute correctly <i>Gantikan dengan betul</i>	
			$\frac{3.0 - 0}{0.6 - 0}$	
		1	State the correct value of the gradient with correct unit <i>Nyatakan nilai kecerunan dengan unit yang betul</i> $m = 5.0 \Omega / V A^{-1}$ (answer and correct unit)	
	(ii)	1	Calculate the value of E correctly $E = I^2 mt$ $= I^2 (\text{gradient})t$ $= (0.6)^2 5 (30)$	
		1	Answer with correct unit $= 54 J$	
	(c)	1	State the change in gradient Decrease <i>Berkurang</i>	Reject : Less steep \times
		1	State the answer Low Resistance <i>Rintangan berkurang</i>	
	(d)	1	State a correct precaution Position of eye must be perpendicular to the reading scale of voltmeter / ammeter to avoid parallax error // Make sure all of the wire connections are tight // Switch off the circuit when not taking the reading <i>to avoid over heating</i> <i>to ensure smooth current flow</i> <i>Pastikan kedudukan mata berserenjang dengan skala bacaan voltmeter / ammeter untuk mengelakkan ralat paralaks // Pastikan semua sambungan adalah ketat // Pastikan suis dibuka bila bacaan tidak diambil</i>	

TOTAL		12		
Question		Mark	Suggested Answer	Note
3.	(a)	1	<p>State a suitable inference</p> <p>Mass of beyblade effect the time of the beyblade to stop // the time of the beyblade spin is affected by the mass of beyblade. <i>Jisim beyblade mempengaruhi masa untuk beyblade berhenti // masa Beyblade berputar dipengaruhi oleh jisim Beyblade.</i></p>	INERTIA
	(b)	1	<p>State a relevant hypothesis</p> <p>The larger the mass, the larger the inertia/period of oscillation. <i>Semakin bertambah jisim semakin bertambah inersia / tempoh ayunan</i></p>	
	(c)(i)	1	<p>Describe a complete and suitable experimental framework</p> <p>State the aim of the experiment</p> <p>To investigate the relationship between mass and inertia / period of oscillation <i>Mengkaji hubungan antara jisim dan inersia / tempoh ayunan</i></p>	
	(ii)	1 1 1	<p>State the manipulated variable and the responding variable</p> <p>Manipulated variables: mass of plasticine, m <i>Pembolehubah Dimanipulasikan : Jisim plastisin, m</i></p> <p>Responding variables: Period of oscillation, T / Inertia <i>Pembolehubah Bergerak balas : Inersia / Tempoh ayunan</i></p> <p>Constant variable: Angle of oscillation // length of hacksaw blade. <i>Pembolehubah Dimalarkan : sudut ayunan // jarak bilah gergaji</i></p>	
	(iii)	1	<p>State the complete list of apparatus and materials</p> <p>Hacksaw blade, G-clamp, stopwatch, plasticine ball of mass <u>20.0 g, 40.0 g, 60.0 g, 80.0 g, 100.0 g</u> and <u>electronic balance, protactor</u> <i>Bilah gergaji, apit G, jam randik, bebola plastisin dengan jisim 20.0 g, 40.0 g, 60.0 g, 80.0 g, 100.0 g dan penimbang elektronik, protaktor.</i></p>	

(iv)

State the functional arrangement of the apparatus with label



1

(v)

State the method to control the manipulated variable

The apparatus is set up as above.
Set radas seperti di atas.

1

20.0 g mass of plasticine is measured by electronic balance.
Jisim 20.0g plastisin ditimbang menggunakan penimbang elektronik

State the method to measure the responding variable

1

Oscillate the hacksaw blade horizontally at angle 10° .
Ayunkan bilah gergaji secara melintang pada sudut 10°

The time taken for 10 complete oscillation is measured using stopwatch and recorded.
Masa yang diambil untuk 10 ayunan lengkap diambil menggunakan jam randik dan direkodkan.

The period of oscillation is calculated by using formula $T=t/10$.
Tempoh ayunan dihitung dengan menggunakan formula $T=t/10$.

Repeat the experiment at least 4 times

1

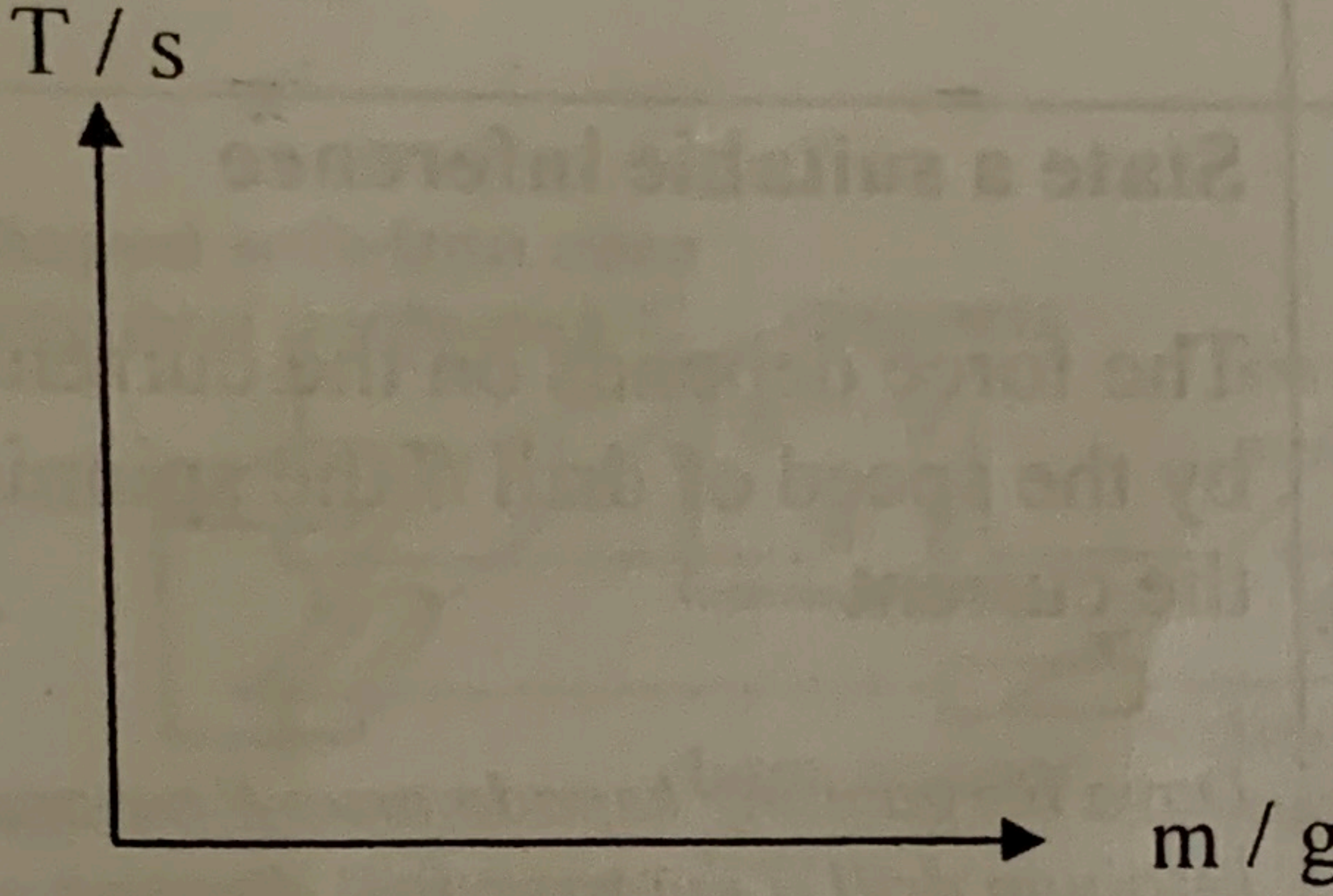
Experiment was repeated using plasticine balls with masses 40.0 g, 60.0 g, 80.0 g, and 100.0 g.
Eksperimen diulang dengan menggunakan jisim 40.0 g, 60.0 g, 80.0 g, and 100.0 g.

(vi)

State how the data is tabulated

1

Mass of plasticine, m / g <i>Jisim plastisin, m/g</i>	Time for 10 oscillation, t / s <i>Masa yang diambil untuk 10 ayunan, t / s</i>	Period of oscillation, T / s <i>Tempoh ayunan, T/s</i>
10.0		
20.0		
30.0		
40.0		
50.0		

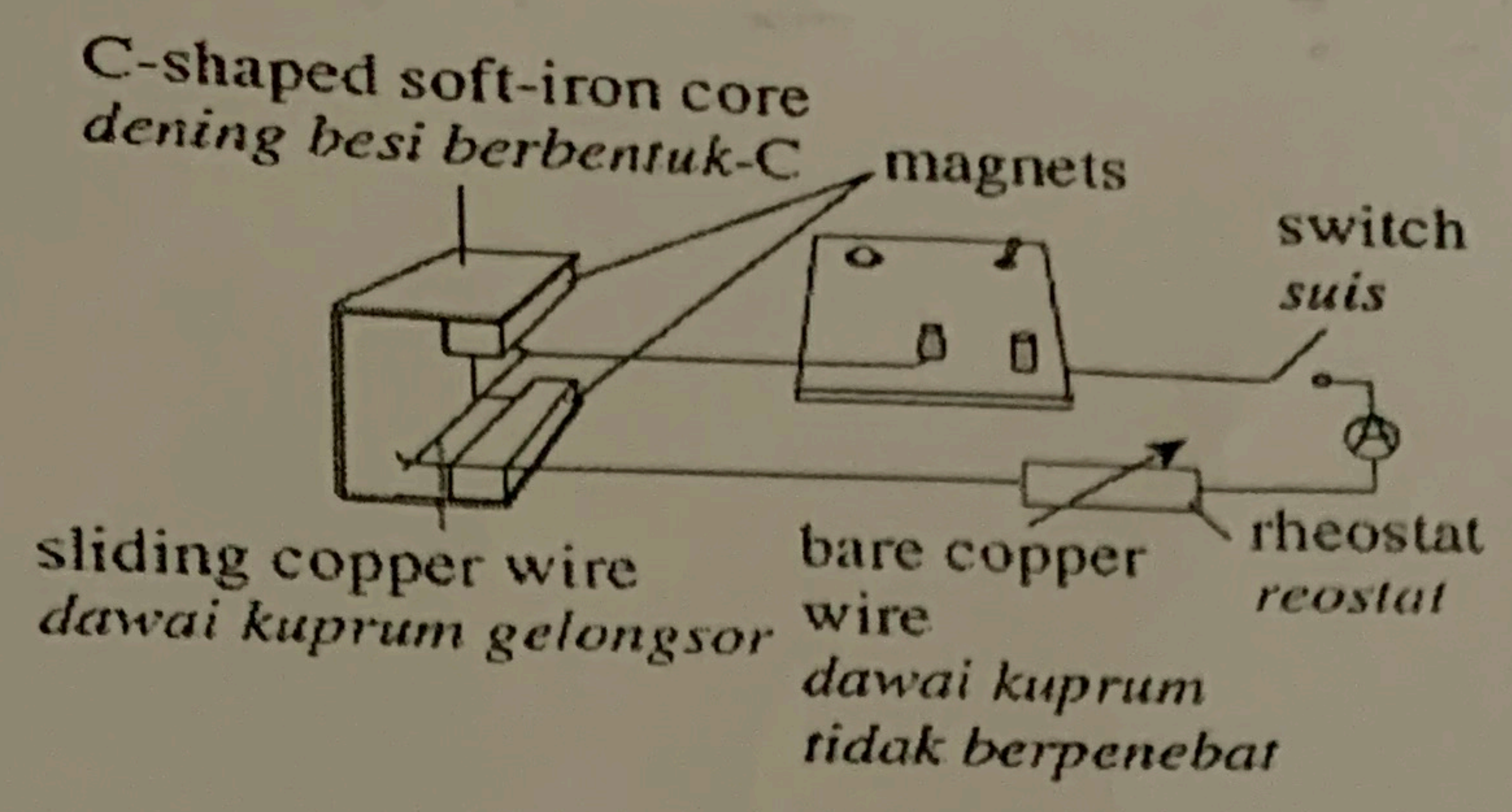
(vii)	1	State how the data is analysed	
			
TOTAL	12		

Question		Mark	Suggested Answer	Notes
4.	(a)	1	<p>State a suitable inference</p> <p>The force depends on the current // the spinning is affected by the speed of drill // the spinning of drill is affected by the current</p> <p><i>Daya bergantung kepada arus // putaran drill dipengaruhi oleh kelajuan drill // putaran drill dipengaruhi oleh arus.</i></p>	
	(b)	1	<p>State a relevant hypothesis</p> <p>The higher the current is, the higher the force / displacement.</p> <p><i>Semakin tinggi arus, semakin tinggi daya / sesaran</i></p>	
	(c)		<p>Describe a complete and suitable experimental framework</p> <p>State the aim of the experiment</p> <p>To study the relationship between the current and the force / displacement.</p> <p><i>Mengkaji hubungan antara arus dengan daya / sesaran.</i></p>	
	(i)	1		
	(ii)	1	<p>State the manipulated variable and the responding variable</p> <p>Manipulated variables: Current <i>Pemboleh ubah Dimanipulasikan : Arus</i></p> <p>1 Responding variables: displacement of the copper wire. <i>Pemboleh ubah Bergerak balas: sesaran wayar kuprum.</i></p> <p>1 Constant variable : <u>Strength</u> of the magnet <i>Pemboleh ubah Dimalarkan : Kekuatan magnet.</i></p>	<p><i>rod</i></p> <p><i>move</i></p> <p><i>X - no. of magnet</i></p> <p><i>- distance between magnet</i></p>
	(iii)	1	<p>State the complete list of apparatus and materials</p> <p>Metre rule, <u>d.c. power supply</u>, connecting wires, C-shaped iron yoke, magnet, ammeter, rheostat and bare copper wire</p> <p><i>Pembaris meter, bekalan kuasa a.t., dawai penyambung, dening besi berbentuk-C, magnet, ammeter, rheostat dan dawai kuprum tidak berpenebat.</i></p>	<p><i>- P of copper rod</i></p> <p><i>- that diameter of rod</i></p>

(iv)

State the functional arrangement of the apparatus with label

1



(v)

State the method to control the manipulated variable

Switch is on.

1 ✗

Adjust the rheostat to get current of 1.0 A.
Suis di tutup.
Laraskan rheostat untuk mendapatkan arus 1.0 A.

State the method to measure the responding variable

1 ✗

Measure the displacement of the sliding wire using metre rule.
Ukur sesaran dawai gelongsor menggunakan pembaris meter.

Repeat the experiment at least 4 times

1 ✗

Repeat the experiment with current of 2.0 A, 3.0 A, 4.0 A and 5.0 A.
Ulangi eksperimen dengan arus 2.0 A, 3.0 A, 4.0 A dan 5.0 A.

(vi)

State how the data is tabulated

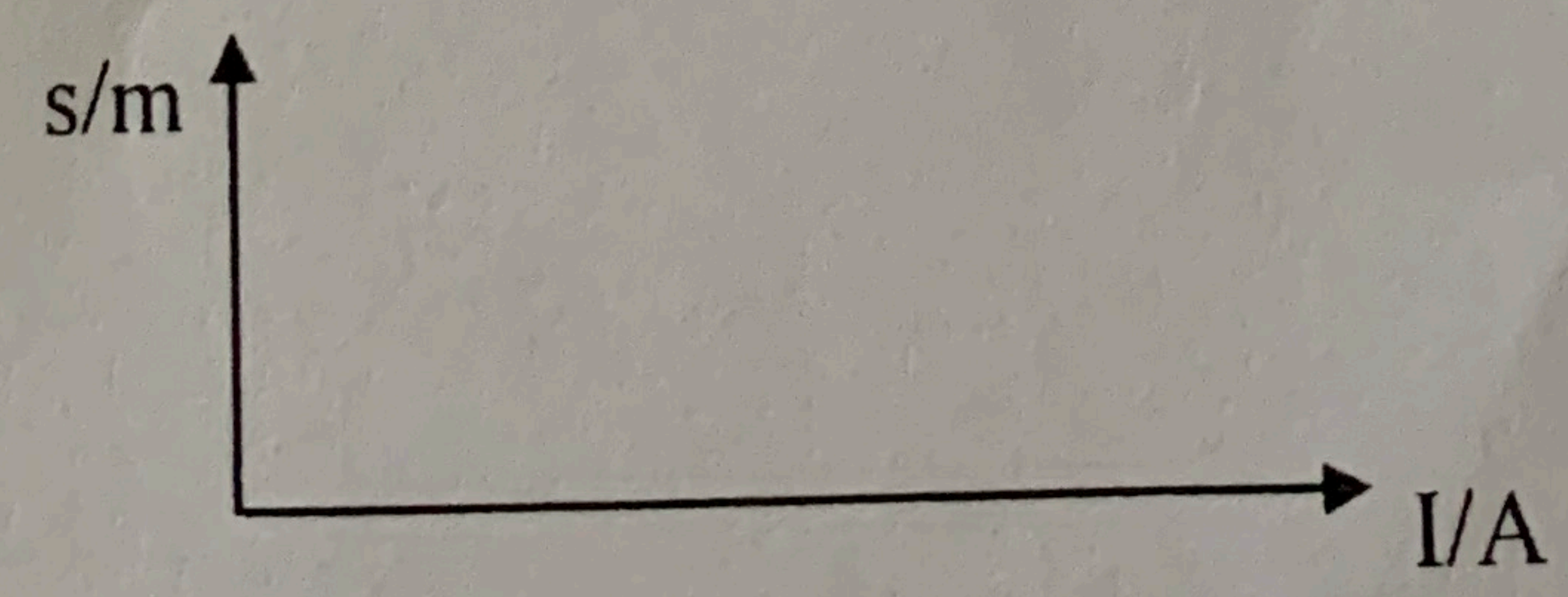
1

Current, I/A <i>Arus, I/A</i>	Displacement moved by the sliding wire. s / m <i>Sesaran yang dilalui oleh dawai gelongsor, s/m</i>
1.0	
2.0	
3.0	
4.0	
5.0	

(vii)

State how the data is analysed

1



TOTAL

12