

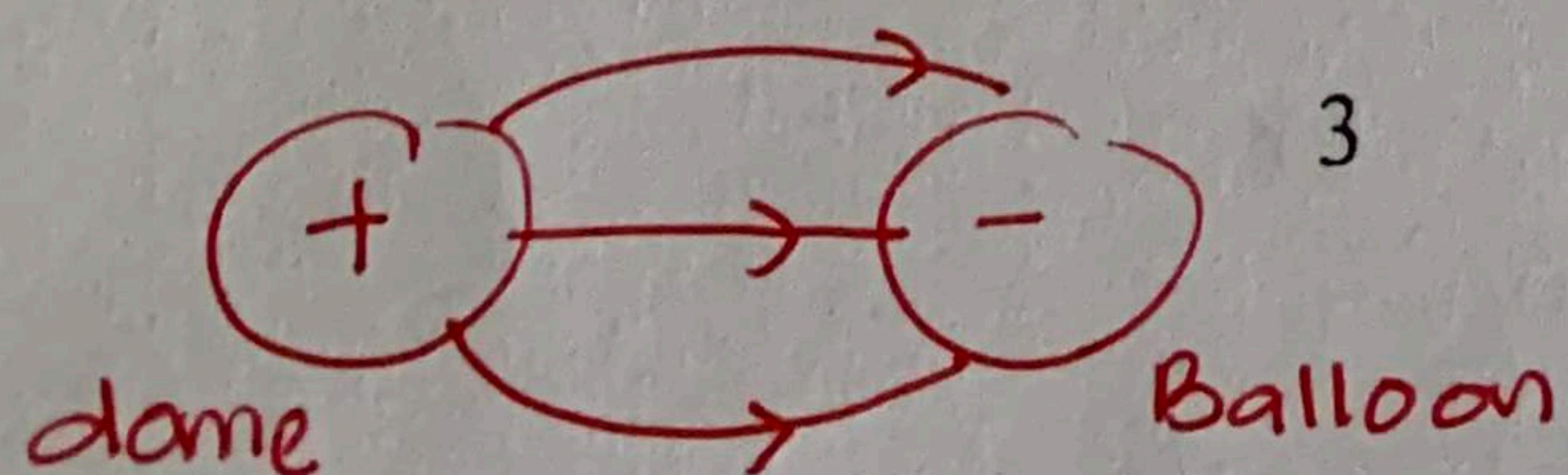
Number	Answer
1	B
2	B
3	B
4	B
5	D
6	D
7	B
8	C
9	C
10	B
11	C
12	A
13	D
14	C
15	A
16	D
17	A
18	A
19	D
20	B
21	A
22	C
23	C
24	D
25	C

Number	Answer
26	A
27	C
28	B
29	B
30	B
31	C
32	A
33	A
34	D
35	A
36	D
37	D
38	B
39	A
40	A
41	A
42	C
43	C
44	A
45	D
46	C
47	D
48	B
49	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 can 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 // not deflected by electric field and magnetic field. Reject propagate in vacuum // does not need medium to travel	1
	(c)		State one detrimental effect correctly Skin burnt //	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 $P = \frac{F}{A}$ $= \frac{50}{0.05}$ $= 1000 \text{ Pa} \text{ (answer with unit)} \quad \text{Nm}^{-2}$	1
		(ii)	State how to lowered the load correctly Open the release valve. //	1
			 pull the handle ✓ pull the handle	TOTAL 5

backwards // to the left

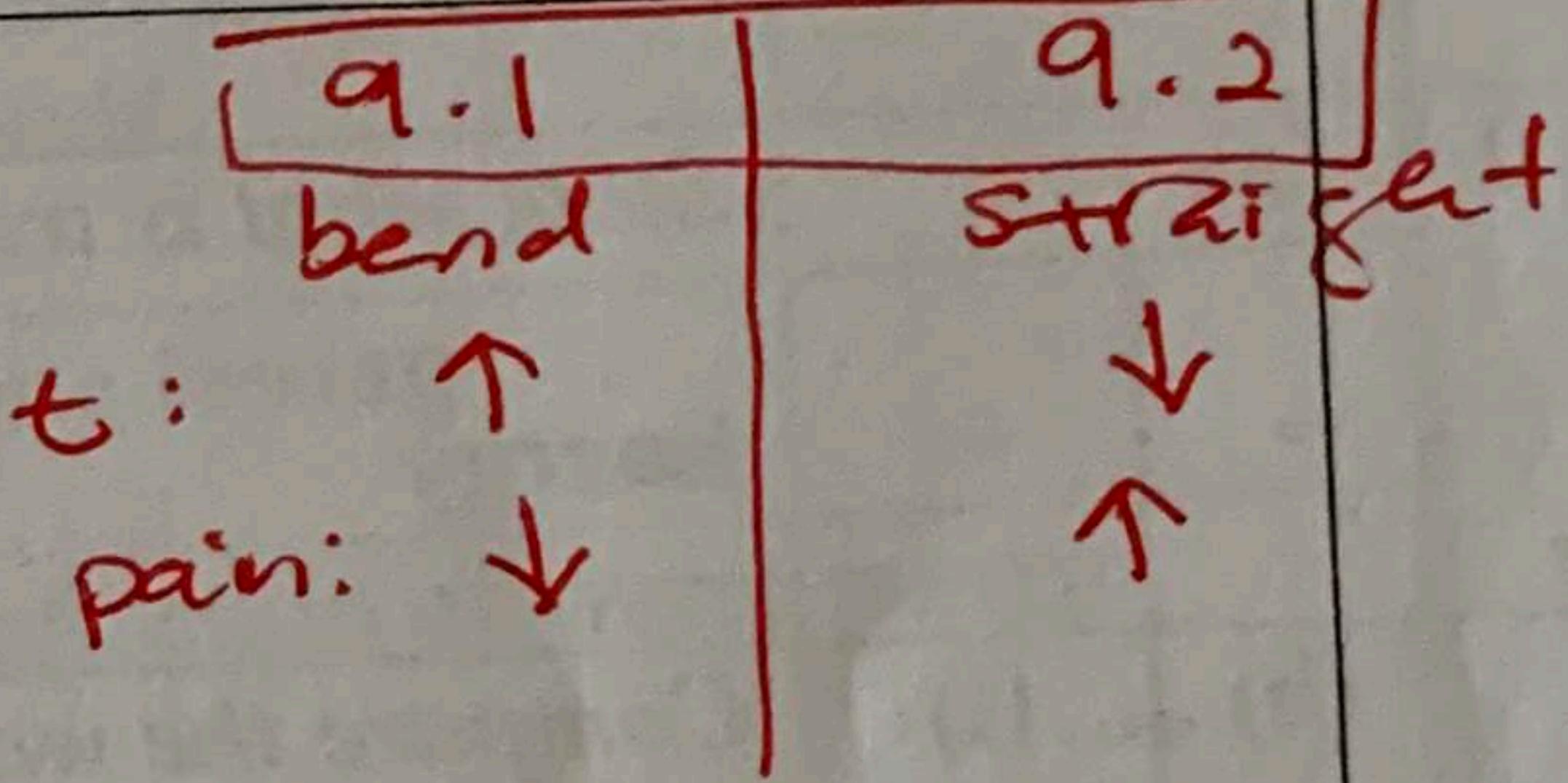
3	(a)	<p><i>Draw the direction of heat flow correctly</i></p> <p>2 arrows to show the transfer of heat from both liquid (tak kisah tebal nipis) Reject one arrow only</p>	1
	(b) (i)	<p><i>State what happen to the temperature correctly</i></p> <p>same</p>	1
	(ii)	<p><i>Name the principle correctly</i>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



			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)	(i)	<p><i>Compare the number of the springs correctly</i></p> <p>Number of spring in Diagram 5.1 < Diagram 5.2 //</p> <p>Diagram 5.2 > Diagram 5.1</p>	1	$5.2 > 5.1$
		(ii)	<p><i>Compare the compression of springs correctly</i></p> <p>Compression of the spring in Diagram 5.1 > Diagram 5.2 //</p> <p>Diagram 5.2 < Diagram 5.1</p>	1	$5.1 > 5.2$
		(iii)	<p><i>Compare the stiffness of the springs correctly</i></p> <p>The stiffness of spring in Diagram 5.2 > Diagram 5.1</p>	1	$5.2 > 5.1$
		(iv)	<p><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 //</p> <p>The lower the number of spring the greater the compression of the spring.</p>	1	
		(v)	<p><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.</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> // two springs are <u>stiffer</u> // spring constant is greater</p>	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 $6.1 > 6.2$	1
		(iii) Compare the thickness of the conductor correctly The thickness of the conductor in Diagram 6.2 is higher.	1
		(iv) Compare the strength of magnetic field correctly The strength of magnetic field in Diagram 6.2 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
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
		(ii)	<p><i>State the size of container and reason correctly</i></p> <p>Big</p> <p>Reason Store more insecticides</p>	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
				TOTAL 10
8	(a)		<p><i>Name the process correctly</i></p> <p>Nuclear fission <u>Relakuran</u></p>	1
	(b)	(i)	<p><i>State the value of X and Y correctly</i></p> <p>X = 92 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 $= 0.16637 \times 1.66 \times 10^{-27}$ $= 2.76 \times 10^{-28} \text{ kg}$ (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)	<i>State the characteristic and reason correctly</i> Long half life Reason Long lasting // not change frequently // not easy to decay	1 1
	(d)	<i>Determine the suitable radioisotope correctly</i> Californium – 252	1
			TOTAL 12
9	(i)	<i>State the meaning correctly</i> <u>The rate of change of momentum</u>	1
	(ii)	<i>Explain the observation correctly</i> Men in 9.1 bends his leg Time impact in Diagram 9.1 is higher Pain felt in Diagram 9.1 is lower / smaller When the leg is bend, the time impact is longer / greater When time of impact is higher/ longer, impulsive force is smaller  $t \uparrow$ $F \downarrow$	1 1 1 1 1 1
	(b)	<i>Explain how the helmet protect the cyclist from injury correctly</i> inner soft / fabric lengthen the time of impact // reduce impulsive force strong outer surface (reject hard) do not break easily the strap is fasten to prevent the helmet from "tercabut"	1 1 1 1 1 1 (Max 4M)

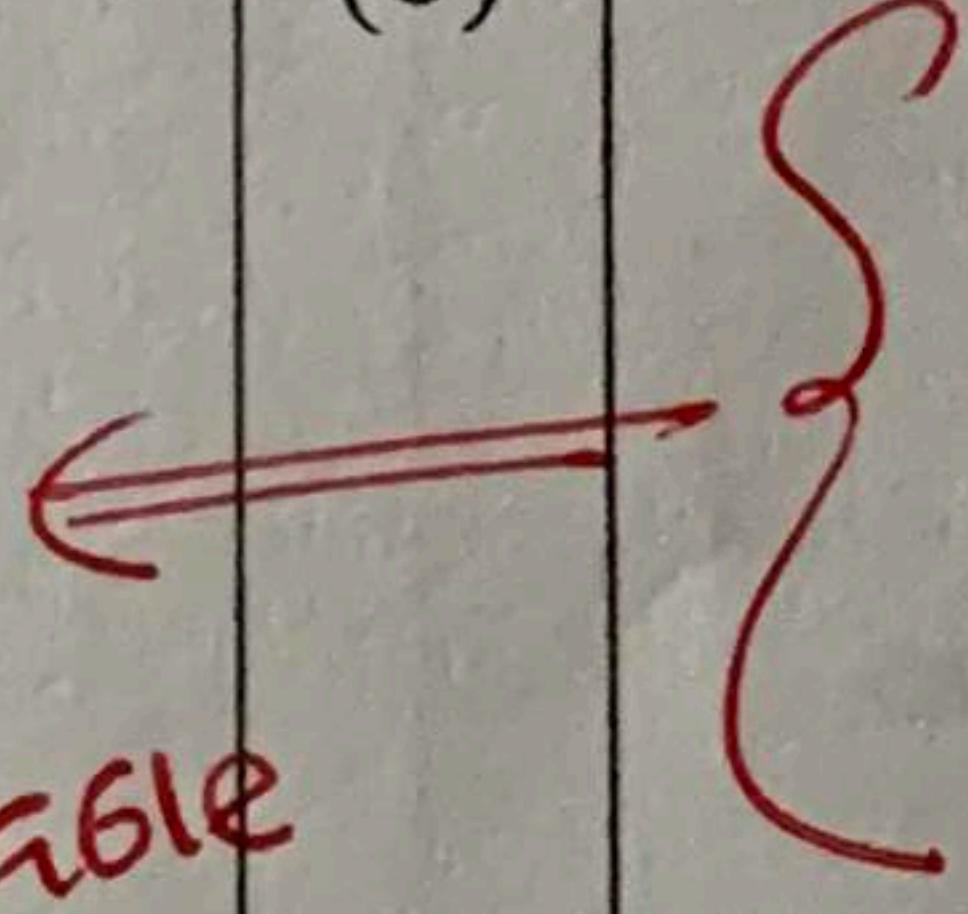
			<i>State and explain your modification correctly</i>																												
	(c)		<table border="1"> <thead> <tr> <th>Aspect</th><th>Characteristic</th><th>Explanation</th></tr> </thead> <tbody> <tr> <td>Type of outer surface</td><td>Rough // stick sponge</td><td>More grip can back to original shape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

	(e)	<p><i>Explain the wave pattern formed correctly</i></p> <p>1 Wave pass through a gap 2 Wave bend // wave spread around the corner Wavelength of water waves is more than size of gap $\lambda > \text{gap}$ (Reject: gap is small) 3 Energy is distributed to wider area // Energy decreases 4 Wavelength before and after pass through obstacle the same pattern: circular</p>	1 1 1 1 1 (Max 4M)
--	-----	--	--

	(f)	<p><i>State and explain your modification correctly</i></p> <table border="1"> <thead> <tr> <th><i>Suggestion Cadangan</i></th><th><i>Reason Sebab</i></th></tr> </thead> <tbody> <tr> <td>Location at bay</td><td>Water wave at this area is calmer // 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>	<i>Suggestion Cadangan</i>	<i>Reason Sebab</i>	Location at bay	Water wave at this area is calmer // 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	10
<i>Suggestion Cadangan</i>	<i>Reason Sebab</i>														
Location at bay	Water wave at this area is calmer // 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														

11	(a)	<p><i>State the phenomenon correctly</i></p> <p>Reflection of light Reject: Reflection of water</p>	TOTAL 20
----	-----	--	-----------------

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

		<p>Explain the suitability and give reason correctly</p> <table border="1"> <thead> <tr> <th>Characteristic</th><th>Reason</th></tr> </thead> <tbody> <tr> <td>Narrow angle of view</td><td>To converge light / magnify distant object / object appear closer / sharper image</td></tr> <tr> <td>High purity lens</td><td>Light easy to refract // clear + brighter</td></tr> <tr> <td>Low density lens</td><td>Smaller mass / lighter</td></tr> <tr> <td>Long focal length</td><td>Can see far object</td></tr> </tbody> </table>	Characteristic	Reason	Narrow angle of view	To converge light / magnify distant object / object appear closer / sharper image	High purity lens	Light easy to refract // clear + brighter	Low density lens	Smaller mass / lighter	Long focal length	Can see far object	8
Characteristic	Reason												
Narrow angle of view	To converge light / magnify distant object / object appear closer / sharper image												
High purity lens	Light easy to refract // clear + brighter												
Low density lens	Smaller mass / lighter												
Long focal length	Can see far object												
		<p>Lens Q Because it is narrow angle of vision, high purity lens, low density lens and long focal length</p>	1 1										
	(d)	<p>Able to calculate power of lens correctly</p> $P = \frac{1}{f} = \frac{1}{1} = 1 \text{ D} = \frac{100}{100}$ $P = \frac{1}{f} = \frac{1}{0.25} = 4 \text{ D} = \frac{100}{25}$ <p style="text-align: right;">unit</p>	3										
		<p>Able to calculate length correctly</p> $l = 100 + 25 = 125 \text{ cm}$ (answer with unit) <p style="text-align: right;">$f_0 + f_e$</p>	1										
		<p>Able to calculate linear magnification correctly</p> $M = \frac{f_0}{f_e} = \frac{100}{25} = 4$	1										
			TOTAL 20										
12	(a)	<p>Give meaning of logic gate correctly</p> <p>Logic gate is an electronic switch circuit have <u>one or more</u> inputs but only <u>one</u> output.</p>	1										
	(b)	<p>Able to explain Security system correctly</p> <p>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 1 Alarm on // activate the alarm</p> <p style="margin-left: 100px;">  intruder night AND 1 1 1 </p> <p style="text-align: right; margin-right: 100px;"> 1 1 1 1 </p> <p style="text-align: right; margin-top: 20px;"> activate the alarm </p>	1 1 1 1 1										
	(c)	<p>Calculate the potential difference correctly</p> $V_{MO} = 6 \text{ V}$	1										
		<p>Calculate the resistance of LDR correctly</p> $V_2 = R_2 \times V$											

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

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

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

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

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

1
1

(iii) Calculate the potential difference of LDR correctly

$$V = IR$$

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

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

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	10
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 free electron <u>more free e</u> - <u>[NPN]</u>	more e^- $\therefore I$ flow easily pentavalent
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	

TOTAL 20

Question		Mark	Suggested Answer	Note												
1.	(a)(i)	1	<p>State the correct manipulated variable</p> <p>Temperature of trapped air, θ Suhu udara terperangkap, θ</p>	Reject: Temperature of air												
	(ii)	1	<p>State the correct responding variable</p> <p>Length of trapped air, l Panjang udara yang terperangkap, l</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 trapped air Jisim udara yang terperangkap // Kuasa pemanas rendam // tekanan udara yang terperangkap</p>	Reject: volume of water												
	(b)(i)	3	<p>Record 5 values of y correctly</p> <table border="1"> <thead> <tr> <th>Diagram</th> <th>l (cm)</th> </tr> </thead> <tbody> <tr> <td>1.2</td> <td>7.1</td> </tr> <tr> <td>1.3</td> <td>7.6</td> </tr> <tr> <td>1.4</td> <td>7.9</td> </tr> <tr> <td>1.5</td> <td>8.2</td> </tr> <tr> <td>1.6</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 – 2 mark • 5 reading correct – 3 marks 	Diagram	l (cm)	1.2	7.1	1.3	7.6	1.4	7.9	1.5	8.2	1.6	8.4	
Diagram	l (cm)															
1.2	7.1															
1.3	7.6															
1.4	7.9															
1.5	8.2															
1.6	8.4															
	(ii)	4	<p>Tabulate results for Θ and l in the space provide</p> <table border="1"> <thead> <tr> <th>θ ($^{\circ}$C)</th> <th>l (cm)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>7.1</td> </tr> <tr> <td>20</td> <td>7.6</td> </tr> <tr> <td>30</td> <td>7.9</td> </tr> <tr> <td>40</td> <td>8.2</td> </tr> <tr> <td>50</td> <td>8.4</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 l) – 1 mark 	θ ($^{\circ}$ C)	l (cm)	0	7.1	20	7.6	30	7.9	40	8.2	50	8.4	$+ 0.1 \text{ cm}$ 6.9 7.5 7.8
θ ($^{\circ}$ C)	l (cm)															
0	7.1															
20	7.6															
30	7.9															
40	8.2															
50	8.4															
	(c)	5	<p>Plot a complete graph l against θ</p> <p>Tick (✓) based on the following aspects</p>													

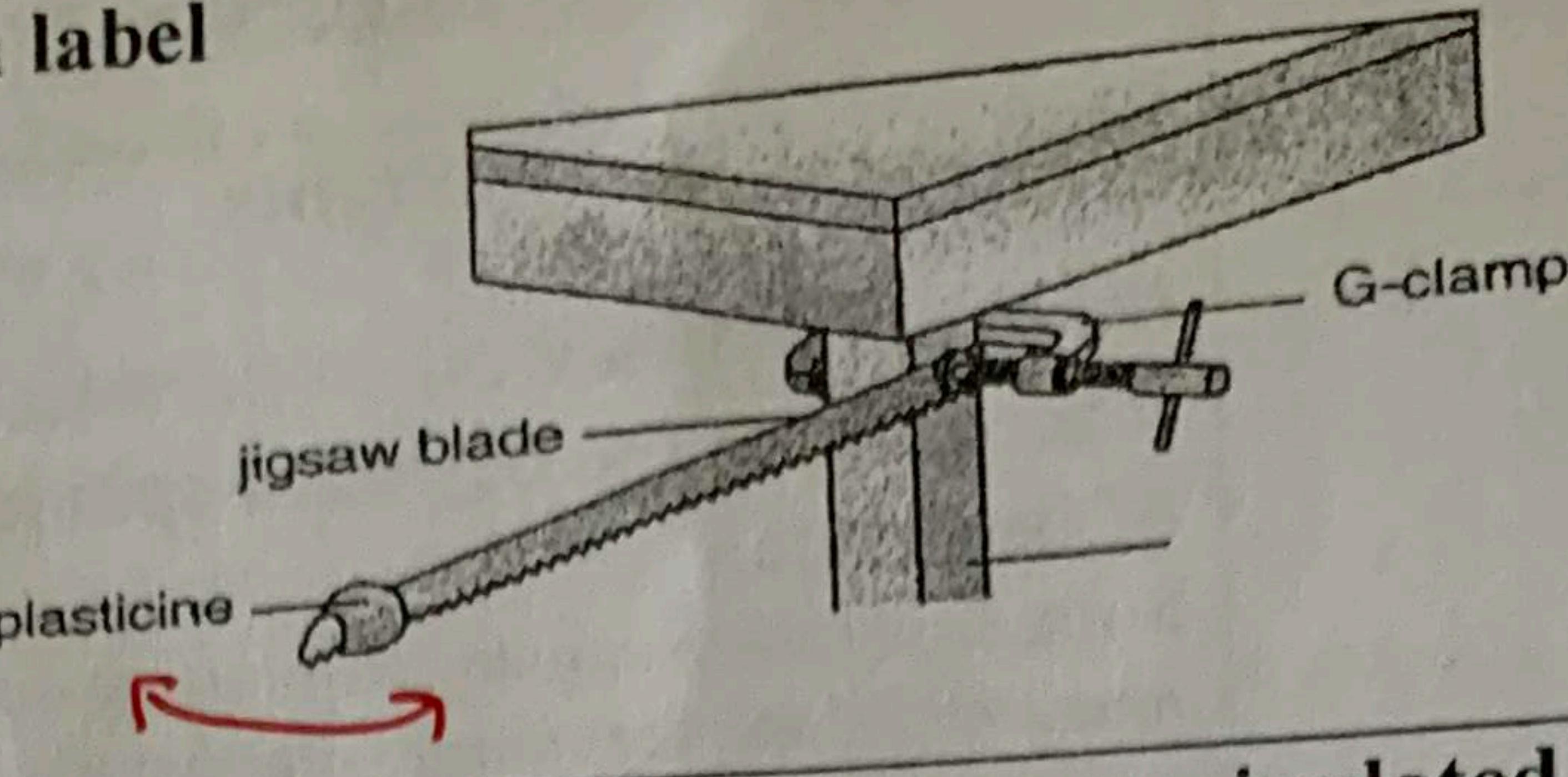
		<p>✓ A: Show how θ on the horizontal axis and l is on the vertical axis</p> <p>✓ B: State the units of variables correctly</p> <p>✓ C: Both axes are marked with uniform scale</p> <p>✓✓ D: All five points are plotted correctly (note: if only three points correctly, award (✓))</p> <p>✓ E: Best fit straight 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)	<p>1 State the correct relationship between l and θ</p> <p>l increase linearly with θ</p> <p>l increase linearly with θ</p>													
TOTAL	16														

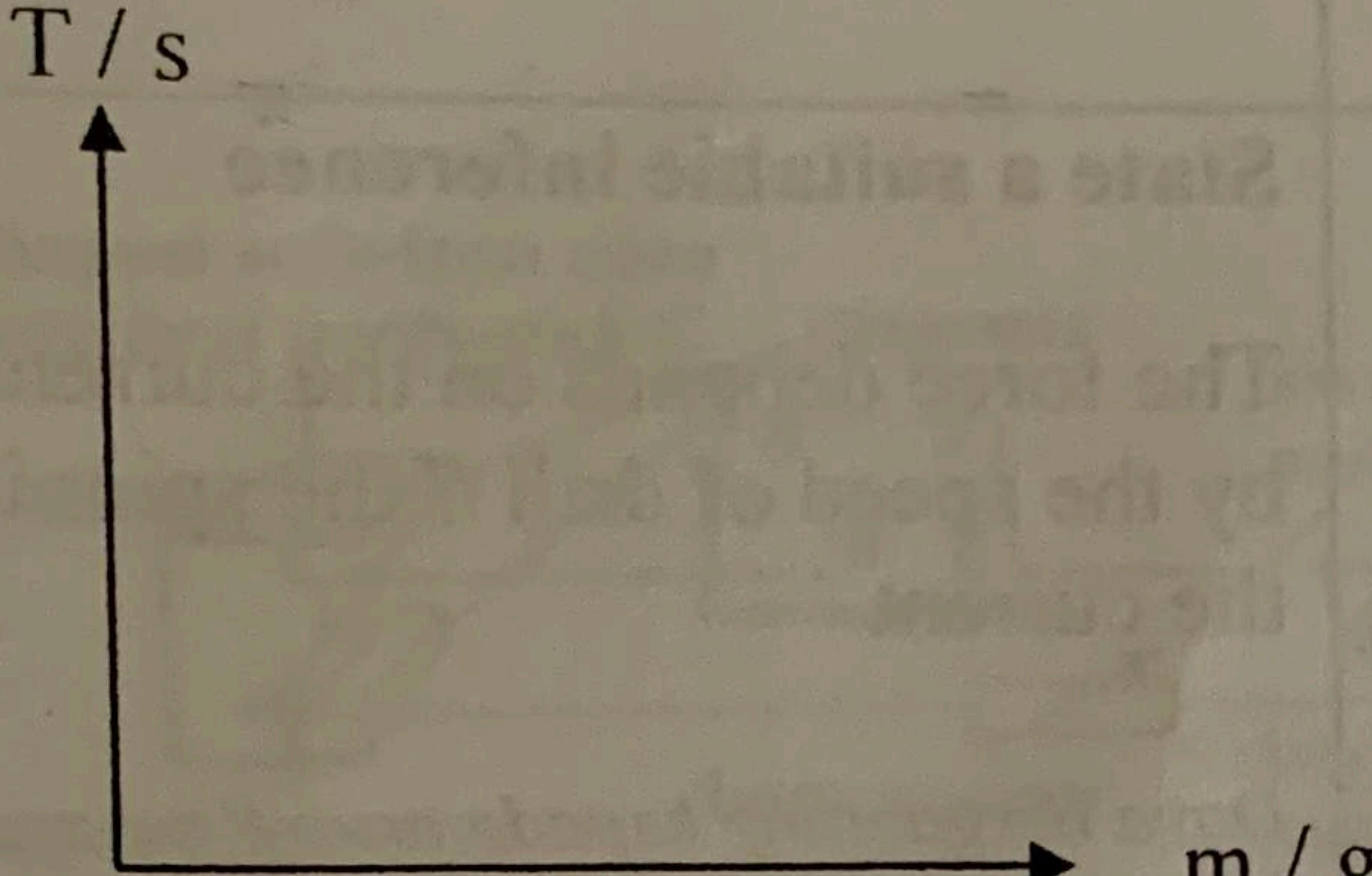
Suggested Answer

Notes

Question	Mark		
2.	(a)(i)	1 Stating a correct relationship V is directly proportional to I V berkadar langsung dengan I	
	(a)(ii)	1 Determine the value of m correctly Extrapolation graph Mengektrapolasi graf 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, $V = 3.0V$ <i>Tunjukkan pada garisan menegak pada paksi-y, $V = 3.0V$</i>	
	(b)(i)	1 Calculate the gradient, k of the graph correctly Draw a sufficient large triangle ($8\text{ cm} \times 8\text{ cm}$) <i>Lukiskan segitiga besar ($8\text{ cm} \times 8\text{ cm}$)</i> 1 Substitute correctly <i>Gantian 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 $\begin{aligned} E &= I^2 mt \\ &= I^2 (\text{gradient})t \\ &= (0.6)^2 5 (30) \end{aligned}$ $A^2 \cancel{\times} s$ X 1 Answer with correct unit $= 54 J$	
	(c)	1 State the change in gradient Decrease <i>Berkurang</i> 1 State the answer Low Resistance <i>Rintangan berkurang</i>	Reject : <i>Less steep</i> X
	(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 ensure smooth current flow to avoid overheating</i> <i>Pastikan kedudukan mata berserentang 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)	<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>	<i>INERTIA</i>
	(b)	<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)	<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)	<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)	<p>State the complete list of apparatus and materials</p> <p>Hacksaw blade, G-clamp, stopwatch, plasticine ball of mass <u>20.0 g</u>, <u>40.0 g</u>, <u>60.0 g</u>, <u>80.0 g</u>, <u>100.0 g</u> and electronic balance, protractor</p> <p><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>	

			State the functional arrangement of the apparatus with label																			
(iv)	1																					
(v)			State the method to control the manipulated variable The apparatus is set up as above. <i>Set radas seperti di atas.</i>																			
	1	}	20.0 g mass of plasticine is measured by electronic balance. <i>Jisim 20.0g plastisin ditimbang menggunakan penimbang elektronik</i>																			
	1	}	State the method to measure the responding variable Oscillate the hacksaw blade <u>horizontally</u> at angle 10°. <i>Ayunkan bilah gergaji secara melintang pada sudut 10°</i>																			
	4	}	The time taken for 10 complete oscillation is <u>measured</u> using stopwatch and <u>recorded</u> . <i>Masa yang diambil untuk 10 ayunan lengkap diambil menggunakan jam randik dan direkodkan.</i>																			
			The period of oscillation is calculated by using <u>formula</u> $T=t/10$. <i>Tempoh ayunan dihitung dengan menggunakan formula $T=t/10$.</i>																			
			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. <i>Eksperimen diulang dengan menggunakan jisim 40.0 g, 60.0 g, 80.0 g, and 100.0 g.</i>																			
(vi)			State how the data is tabulated																			
	1		<table border="1"> <thead> <tr> <th>Mass of plasticine, m / g <i>Jisim plastisin, m/g</i></th> <th>Time for 10 oscillation, t / s <i>Masa yang diambil untuk 10 ayunan, t / s</i></th> <th>Period of oscillation, T / s <i>Tempoh ayunan, T/s</i></th> </tr> </thead> <tbody> <tr><td>10.0</td><td></td><td></td></tr> <tr><td>20.0</td><td></td><td></td></tr> <tr><td>30.0</td><td></td><td></td></tr> <tr><td>40.0</td><td></td><td></td></tr> <tr><td>50.0</td><td></td><td></td></tr> </tbody> </table>	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			
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				

Suggested Answer

Note

Question	Mark	Suggested Answer	Note
4.			
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>	
4. (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>	
4. (c) (i)	1	<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>	
4. (c) (ii)	1	<p>State the manipulated variable and the responding variable</p> <p>Manipulated variables: Current <i>Pemboleh ubah Dimanipulasikan : Arus</i></p>	
	1	<p>Responding variables: displacement of the copper wire. <i>move</i></p> <p><i>Pemboleh ubah Bergerak balas: sesaran wayar kuprum.</i></p>	
	1	<p>Constant variable : <u>Strength</u> of the magnet <i>X - no. of magnet</i> <i>Pemboleh ubah Dimalarkan : Kekuatan magnet.</i> <i>- distance between magnet</i></p>	
4. (c) (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, <u>magnet</u>, 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>	<i>- P of copper rod</i> <i>- third diameter of rode</i>

	(iv)	1	<p>State the functional arrangement of the apparatus with label</p> <p>C-shaped soft-iron core dening besi berbentuk-C</p> <p>magnets</p> <p>switch suis</p> <p>sliding copper wire dawai kuprum gelongsor</p> <p>bare copper wire dawai kuprum</p> <p>rheostat reostat</p> <p>tidak berpenebat</p>												
	(v)	1 X	<p>State the method to control the manipulated variable</p> <p>Switch is on.</p> <p>Adjust the rheostat to get current of 1.0 A. <i>Suis di tutup.</i> <i>Laraskan rheostat untuk mendapatkan arus 1.0 A.</i></p>												
		1 6	<p>State the method to measure the responding variable</p> <p>Measure the displacement of the sliding wire using metre rule. <i>Ukur sesaran dawai gelongsor menggunakan pembaris meter.</i></p>												
		1 A	<p>Repeat the experiment at least 4 times</p> <p>Repeat the experiment with current of 2.0 A, 3.0 A, 4.0 A and 5.0 A. <i>Ulangi eksperimen dengan arus 2.0 A, 3.0 A, 4.0 A dan 5.0 A.</i></p>												
	(vi)	1	<p>State how the data is tabulated</p> <table border="1"> <thead> <tr> <th>Current, I/A Arus, I/A</th> <th>Displacement moved by the sliding wire. s / m <i>Sesaran yang dilalui oleh dawai gelongsor, s/m</i></th> </tr> </thead> <tbody> <tr> <td>1.0</td> <td></td> </tr> <tr> <td>2.0</td> <td></td> </tr> <tr> <td>3.0</td> <td></td> </tr> <tr> <td>4.0</td> <td></td> </tr> <tr> <td>5.0</td> <td></td> </tr> </tbody> </table>	Current, I/A Arus, I/A	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	
Current, I/A Arus, I/A	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)	1	<p>State how the data is analysed</p> <p>s/m ↑</p> <p>→ I/A</p>												
	TOTAL	12													