

NO KAD PENGENALAN

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**ANGKA GILIRAN**

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JABATAN PELAJARAN NEGERI JOHOR**PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2008****PHYSICS**

Kertas 3

Satu jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Tulis nombor kad pengenalan dan angka giliran anda pada ruang yang disediakan.
2. Kertas soalan ini adalah dalam dwibahasa.
3. Soalan di bahagian atas dalam bahasa Inggeris. Soalan di bahagian bawah yang sepadan dalam bahasa Melayu.
4. Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Inggeris atau bahasa Melayu.
5. Calon dikehendaki membaca maklumat di halaman 2 atau 3.

<i>Kod Pemeriksa</i>			
Bahagian	Soalan	Markah Penuh	Markah Diperolehi
A	1	16	
	2	12	
B	1	12	
	2	12	
Jumlah			

Kertas soalan ini mengandungi 12 halaman bercetak

Section A
Bahagian A

[28 marks]
[28 markah]

Answer all questions in this section. Suggested time to answer this section is 60 minutes.

Jawab semua soalan dalam bahagian ini. Masa yang dicadangkan untuk menjawab bahagian ini ialah 60 minit.

- I A student carries out an experiment to investigate the relationship between the sine of the angle of incidence, i and the sine of the angle of refraction, r of a glass block.

The arrangement of the apparatus for the experiment is shown in Diagram 1.0
Seorang pelajar menjalankan eksperimen untuk mengkaji hubungan di antara sin sudut tuju, i dan sin sudut biasan, r bagi suatu blok kaca.

Susunan alat radas eksperimen seperti yang ditunjukkan pada Rajah 1.0

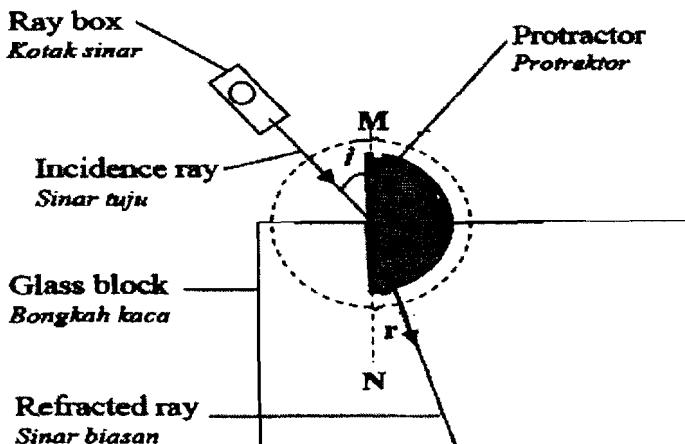


DIAGRAM 1.0 / RAJAH 1.0

A ray of light is directed along the angle of incidence, $i = 15^\circ$ and forms the angle of refraction, r . The angle of refraction is measured by using a protractor. The corresponding reading of r , is shown in Diagram 1.1 on page 5.

The experiment is repeated by varying the angle of incidence, i , to 30° , 45° , 60° and 75° . The corresponding angles of refraction, r are also shown in Diagram 1.2, 1.3, 1.4 and 1.5 on pages 5.

Satu sinar cahaya ditujukan ke bongkah kaca pada sudut tuju, $i = 15^\circ$ dan membentuk sudut biasan, r . Sudut biasan diukur dengan menggunakan protrektor. Bacaan sudut biasan, r yang sepadan ditunjukkan pada Rajah 1.1 pada halaman 5.

Eksperimen ini diulangi dengan mengubah sudut tuju, i , kepada 30° , 45° , 60° dan 75° . Bacaan bagi sudut biasan, r yang sepadan ditunjukkan juga pada Rajah 1.2, 1.3, 1.4 dan 1.5 pada halaman 5.

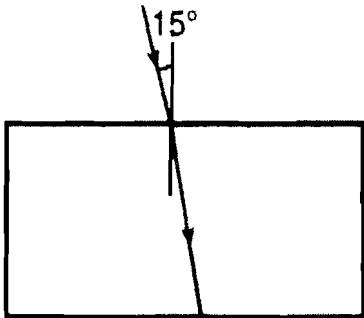


Diagram 1.1
Rajah 1.1

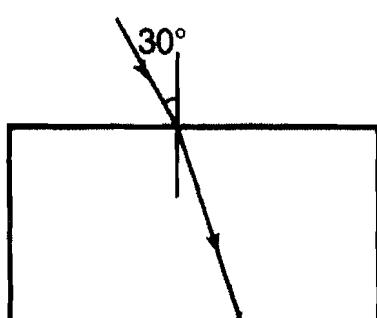


Diagram 1.2
Rajah 1.2

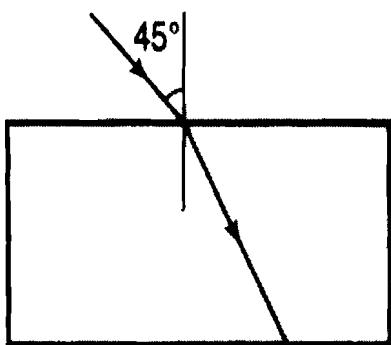


Diagram 1.3
Rajah 1.3

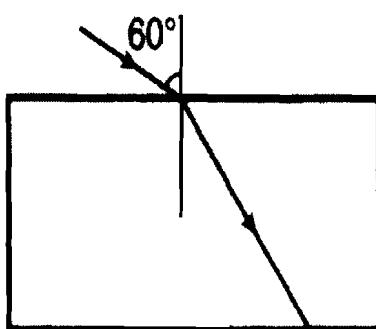


Diagram 1.4
Rajah 1.4

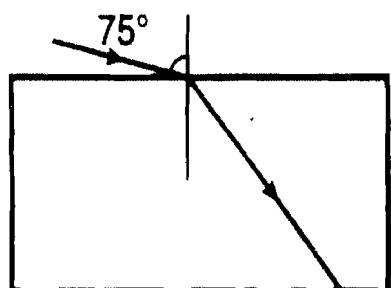


Diagram 1.5
Rajah 1.5

(a) For the experiment described above, identify:

Daripada penerangan eksperimen di atas, kenalpasti:

- (i) The manipulated variable
Pembulahan hubah manipulasi

..... [1 mark]

- (ii) The responding variable
Pembolehubah bergerakbalas

..... [1 mark]

- (iii) The constant variable
Pembolehubah ditetapkan

..... [1 mark]

(b) Based on diagram 1.1, 1.2, 1.3, 1.4 and 1.5, determine the angle of refraction, r , and sine r , when angle of incidence, i is equal to 15° , 30° , 45° , 60° and 75° .

Berdasarkan Rajah 1.1, 1.2, 1.3, 1.4 dan 1.5 tentukan nilai sudut pembiasan, r dan sin r apabila sudut tuju, i ialah 15° , 30° , 45° , 60° dan 75° .

Tabulate the values of i , sine i , r and sine r in the space below.

Jadualkan nilai-nilai bagi i , sin i , r dan sin r pada ruangan di bawah.

[6 marks]

(c) On the graph paper, plot a graph of sine r against sine i .

Di atas kertas graf plotkan graf sin r melawan sin i .

[5 marks]

(d) Based on your graph, state the relationship between sin r and sin i .

Berdasarkan graf anda, nyatakan perhubungan di antara sin r dan sin i .

..... [1 mark]

(e) State **one** precaution that should be taken to obtain the accurate result.

Nyatakan satu langkah berjaga-jaga yang perlu diambil untuk mendapat keputusan yang lebih jitu.

..... [1 mark]

- 2 A student carries out an experiment to investigate the relationship between the electromotive force, E and internal resistance, r of a dry cell. The result of the experiment is shown in the graph Resistance, R against inverse current, $\frac{1}{I}$ as in Diagram 2.1 on page 9.

Seorang murid sedang menjalankan satu eksperimen untuk mengkaji hubungan diantara daya gerak elektrik, E dan rintangan dalam, r untuk sebiji bateri kering.

Keputusan eksperimen ditunjukkan oleh graf Rintangan, R melawan $\frac{1}{I}$ pada rajah 2.1 di halaman 9.

- (a) Based on the graph in Diagram 2.1

Berdasarkan graf pada rajah 2.1

- (i) What happen to R when I decrease?

Apakah yang berlaku kepada R apabila I berkurang?

[1 mark]

[1 markah]

- (ii) Determine the value of I when $R = 5 \Omega$. Show on the graph how you determine value of I.

Tentukan nilai I apabila $R = 5\Omega$. Tunjukkan pada graf bagaimana anda menentukan nilai I.

[3 marks]

[3 markah]

- (b) The resistance, R is given by the formula

Rintangan, R diberi oleh rumus

$$R = \frac{E}{I} - r$$

Where E is electromotive force and r is internal resistance.

Dimana E ialah daya gerak elektrik dan r ialah rintangan dalam.

- (i) Calculate the gradient of graph R against $\frac{1}{I}$. Show on the graph how you determine the gradient of graph.

Hitungkan kecerunan graf bagi R melawan $\frac{1}{I}$. Tunjukkan pada graf bagaimana anda menentukan kecerunan graf.

[3 marks]

MOZ@C

Graph of R against $\frac{1}{I}$ / Graf R lawan $\frac{1}{I}$

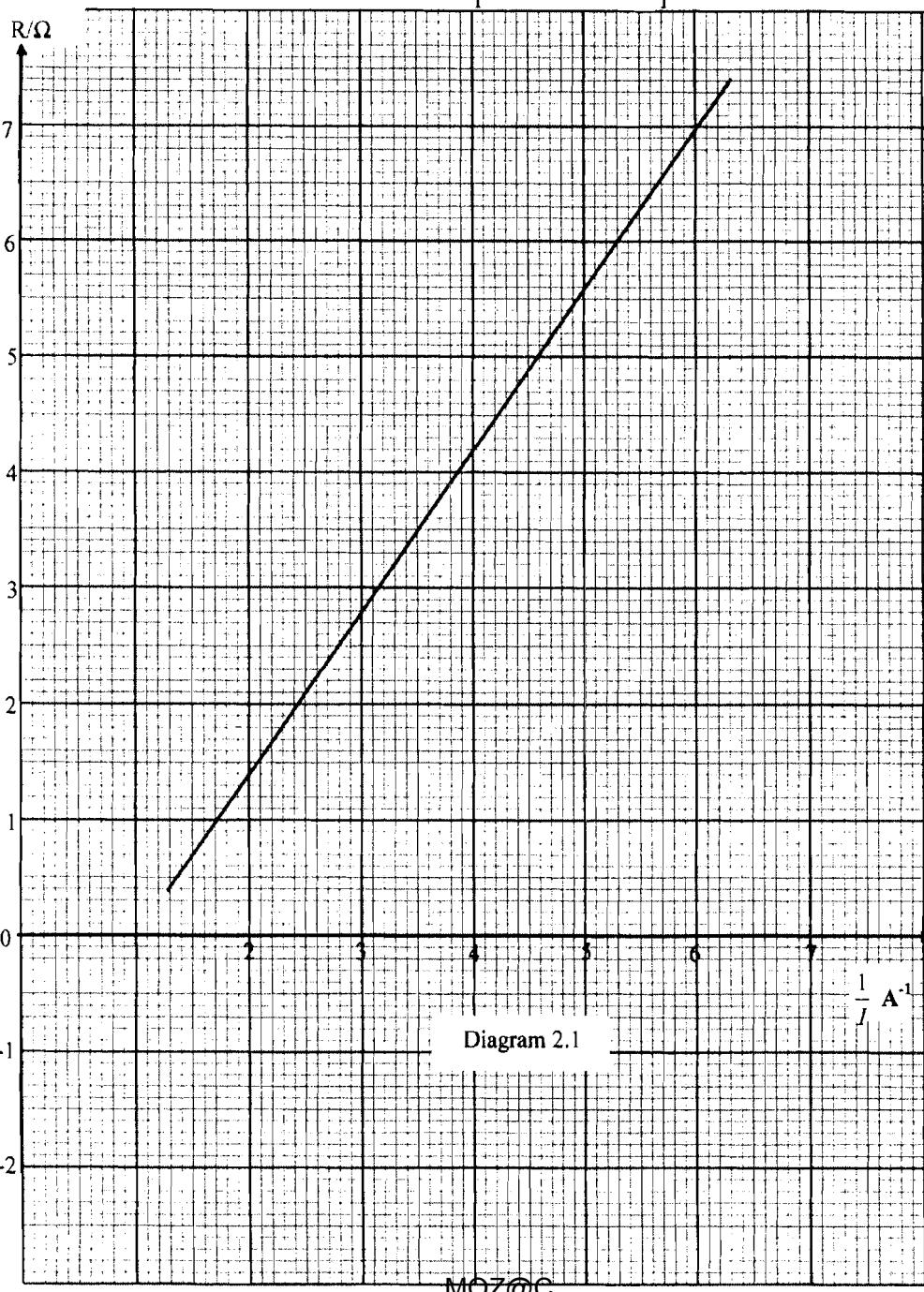


Diagram 2.1

- (ii) By using the formula $R = \frac{E}{I} - r$ and the value obtained in b (i).

Calculate the electromotive force, E.

Dengan menggunakan rumus $R = \frac{E}{I} - r$ dan nilai kecerunan di b(i).

Hitung daya gerak elektrik, E.

[2marks]

- (iii) By using the formula $R = \frac{E}{I} - r$ and the intercept R-axis, find the value of internal resistance, r.

Dengan menggunakan rumus $R = \frac{E}{I} - r$ dan pintaan paksi R, tentukan nilai rintangan dalam, r.

[2 marks]
[2 markah]

- (c) State one precaution that should be taken during this experiment.

Nyatakan satu langkah berjaga-jaga yang perlu diambil semasa eksperimen ini dilakukan.

.....

.....

[1 marks]
[1 markah]

Section B
Bahagian B

[12 marks]
[12 markah]

Answer any **one** question.
Jawab mana-mana satu soalan.

The time suggested to answer this section is 30 minutes.

Masa yang dicadangkan untuk menjawab bahagian ini ialah 30 minit.

- 3 Diagram 3.1 shows a cake before being baked . Diagram 3.2 show cake after being baked
Rajah 3.1 menunjukkan sebiji kek yang belum dimasak. Rajah 3.2 menunjukkan kek selepas dimasak.

Cake before being baked
Kek sebelum dibakar

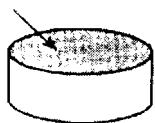


Diagram 3.1
Rajah 3.1

Cake after being baked
Kek selepas dibakar



Diagram 3.2
Rajah 3.2

Based on the information and observation above:

Berdasarkan maklumat dan pemerhatian di atas:

- (a) State **one** suitable inference.

Nyatakan satu inferensi yang sesuai.

[1 mark]

- (b) State **one** suitable hypothesis.

Nyatakan satu hipotesis yang sesuai.

[1 mark]

- (c) With the use of apparatus such as capillary tube with and other apparatus, describe an experiment framework to investigate the hypothesis stated in 3(b).

Dengan menggunakan alat radas seperti Tolok Bardon dan lain-lain radas, terangkan satu rangka eksperimen untuk menyiasat hipotesis yang anda nyatakan di 3(b)

In your description, state clearly the following;

Dalam penerangan anda sila nyata dengan jelas perkara-perkara berikut

- (i) Aim of the experiment.

Tujuan eksperimen.

- (ii) Variables in the experiment.

Pembolehubah dalam eksperimen.

- (iii) List of apparatus and materials.

Senarai radas dan bahan.

- (iv) Arrangement of the apparatus.

Susunan radas.

- (v) The procedure of the experiment which include the method of controlling the manipulated variable and the method of measuring the responding variable.
Prosedur eksperimen termasuk kaedah mengawal pemboleh ubah dimanipulasikan dan kaedah mengukur pemboleh ubah bergerak balas.
- (vi) The way you would tabulate the data.
Cara anda akan menjadualkan data.
- (vii) The way you would analyse the data.
Cara anda akan menganalisis data.

[10 marks]

- 4 Diagram 4.1 shows a cradle with a baby in it is oscillating vertically. Diagram 4.2 shows another identical cradle with a heavier baby in it is oscillating vertically. It is observed that the cradle with a heavier mass baby oscillates at a higher frequency.

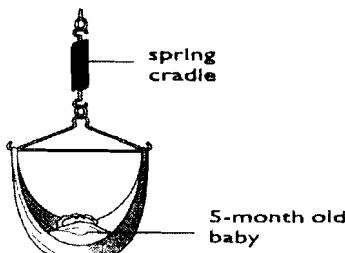


Diagram 4.1
Rajah 4.1

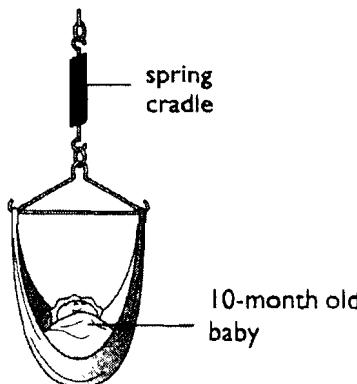


Diagram 4.2
Rajah 4.2

Based on the situation above,

- (a) State **one** suitable inference.
Nyatakan satu inferensi yang sesuai

[1mark]

- (b) State **one** appropriate hypothesis that could be investigated.
Nyatakan satu hipotesis yang sesuai dan boleh disiasat.

[1 mark]

- (c) With the use of apparatus such as spring, slotted weight and others apparatus, describe an experiment to investigate the hypothesis stated in 4 (b)

Dengan menggunakan radas seperti spring, jisim berbeban dan radas lain, terangkan satu eksperimen untuk menyiasat hipotesis yang dinyatakan di 4(b).

In your description, state clearly the following;

Dalam penerangan anda jelaskan perkara berikut;

- (i) Aim of the experiment,
Tujuan eksperimen,

- (ii) Variables in the experiment,
Pembolehubah yang terlibat dalam eksperimen,
- (iii) List of apparatus and materials,
Senarai radas dan bahan,
- (iv) Arrangement of the apparatus,
Susunan radas,
- (v) The procedure of the experiment, which includes the method of controlling the manipulated variable and the method of measuring the responding variable,
Procedur eksperimen termasuk kaedah mengawal pembolehubah dimasipulasi dan kaedah mengukur pembolehubah bergerak balas.
- (vi) The way to tabulate the data,
Cara untuk menjadualkan data,
- (v) The way to analyse the data.
Cara untuk menganalisis data.

[10 marks]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT



JABATAN PELAJARAN NEGERI JOHOR
PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2008

FIZIK

Kertas 3

PERATURAN PEMARKAHAN

Kertas soalan ini mengandungi 5 halaman bercetak .

MARKING SCHEME PHYSICS PAPER 3 (2008)

No.	Answer	Marks																								
1 (a) (i)	Incident angle, // i, // sine i	1																								
(ii)	Refracted angle, // r, //sine r	1																								
(iii)	Refractive index	1																								
(b)	<table border="1"> <thead> <tr> <th>i/$^{\circ}$</th> <th>r/$^{\circ}$</th> <th>Sine i</th> <th>Sine r</th> </tr> </thead> <tbody> <tr><td>15</td><td></td><td></td><td></td></tr> <tr><td>30</td><td></td><td></td><td></td></tr> <tr><td>45</td><td></td><td></td><td></td></tr> <tr><td>60</td><td></td><td></td><td></td></tr> <tr><td>75</td><td></td><td></td><td></td></tr> </tbody> </table> <p>note: teacher must measure r and calculate sine i and sine r.</p> <p>Tabulate data</p> <ol style="list-style-type: none"> Shows a table which have i, r, sine i and sine r State the correct unit for i and r. All values of r are correct Values of sin i are consistent to 3 decimal places. Values of sin r are consistent to 3 decimal places. 	i/ $^{\circ}$	r/ $^{\circ}$	Sine i	Sine r	15				30				45				60				75				
i/ $^{\circ}$	r/ $^{\circ}$	Sine i	Sine r																							
15																										
30																										
45																										
60																										
75																										
(c)	<p>Draw the graph of sin r against sin i</p> <ol style="list-style-type: none"> The responding variable, sin r at y axis, the manipulated variable, sine i at x axis States the unit of the variable correctly Both axis with the even and uniform scale 5 points correctly plotted A smooth best fit straight line Minimum size of the graph is 10 cm x 8 cm <table border="1"> <thead> <tr> <th>No of ticks \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 ticks \checkmark	Marks	7	5	5,6	4	3,4	3	2	2	1	1													
No of ticks \checkmark	Marks																									
7	5																									
5,6	4																									
3,4	3																									
2	2																									
1	1																									
(d)	Sine r is increase linearly to sine i	1																								
(e)	<ul style="list-style-type: none"> Put on the curtain to avoid excess light from outside. The position of the eyes must be perpendicular to the reading taken to avoid parallax error. 	1																								
	TOTAL	16																								

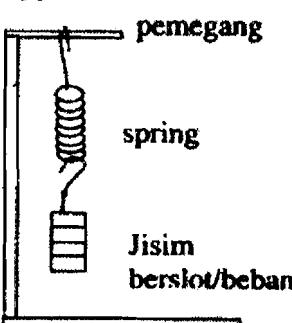
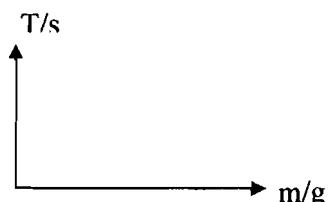
2 (a) (i)	Increase	1
(ii)	1. Show the vertical line from $R = 5\Omega$ until touches the graph, then horizontal line until it touches the $1/I$ axis. 2. $1/I = 4.6$ 3. $I = 0.22A$ (w unit)	1 1 1
(b) (i)	1. Shows the triangle with an acceptable size/ minimum size $8 \text{ cm} \times 8 \text{ cm}$ 2. Substitute correctly $= (7-0) / (6-1)$ 3. States the value of gradient and its unit $= 1.4 \text{ V}$	1 1 1
(ii)	Rewrite $R = E(1/I) - r$ corresponding to $y = mx + c$ // gradient / m = E $E = 1.4V$	1 1
(iii)	1. Extrapolation of the graf. 2. $r = 1.4\Omega$	1 1
(c)	1. Do not let the circuit close for a long time to prevent from increasing the temperature/resistance 2. All the wire must be connect tightly to prevent current lost 3. Use new battery to ensure maximum emf	1
	TOTAL	12

SECTION B

NO	ANSWER	Marks
3(a)	Inference : The volume of the gas depends on the temperature which acts on it.	1
(b)	Hypothesis: The larger the temperature, the larger is the volume of a fixed mass of gas. / The volume of a gas varies directly with its temperature.	1
(c)(i)	Aim : To investigate the relationship between the temperature and volume for a fixed mass of gas at a constant pressure.	1
(ii)	Variables : Manipulated : Gas temperature, T Responding : Gas volume, V Fixed : Gas pressure, P or mass of gas, m	1 1
(iii)	Apparatus : beaker, stirrer, heater, capillary tube, sodium hydroxide (con),	1

	thermometer, metre rule, water,																			
(iv)	Arrangement of apparatus:	1																		
(v)	Procedure:																			
	1. The apparatus is set up as shown in the diagram above.	1																		
	2. Switch on the power supply so that the heater will heat the water.	1																		
	3. Read thermometer when the temperature reach 30°C.	1																		
	4. At the same time measure the length, t of air trapped inside the capillary tube. (The volume of air is comply to the length of the air trapped)	1																		
	5. Stir the water continuously, and repeat the experiment when the temperature reach 40°C, 50°C, 60°C and 70 °C.	1																		
(vi)	<table border="1"> <thead> <tr> <th>Temperature,T / °C</th> <th>Temperature,T / K</th> <th>Volume, V / cm³</th> </tr> </thead> <tbody> <tr><td>30</td><td></td><td></td></tr> <tr><td>40</td><td></td><td></td></tr> <tr><td>50</td><td></td><td></td></tr> <tr><td>60</td><td></td><td></td></tr> <tr><td>70</td><td></td><td></td></tr> </tbody> </table>	Temperature,T / °C	Temperature,T / K	Volume, V / cm ³	30			40			50			60			70			1
Temperature,T / °C	Temperature,T / K	Volume, V / cm ³																		
30																				
40																				
50																				
60																				
70																				
(vii)		1																		
	Volume of a fixed mass of gas is directly proportional to its temperature.																			
	TOTAL	12																		

4(a)	Inference : Period depend to the mass	1
(b)	Hypothesis: The increase of mass, the increase of period	1
(c)(i)	Aim : To investigate the relationship between period and mass MOZ@C	1
(ii)	Variables : Manipulated : mass	

	Responding : period Fixed : original length,spring constant	1 1												
(iii)	Apparatus : Spring, slotted weight,stop watch, retort stand,	1												
(iv)	Arrangement of apparatus: 	1												
(v)	Procedure: 1. The apparatus is set up as shown in the diagram above. 2. A 50 g slotted weight is attached to the lower end 3. The spring is then set to vibrate vertically and the time for 10 complete vibrations is measure by stop watch 4. Experiment is repeated with mass 100g,150g,200g and 250 g	1 1 1 1												
(vi)	<table border="1" data-bbox="247 968 925 1179"> <thead> <tr> <th>Mass/g</th> <th>Period /s</th> </tr> </thead> <tbody> <tr><td>50</td><td></td></tr> <tr><td>100</td><td></td></tr> <tr><td>150</td><td></td></tr> <tr><td>200</td><td></td></tr> <tr><td>250</td><td></td></tr> </tbody> </table>	Mass/g	Period /s	50		100		150		200		250		1
Mass/g	Period /s													
50														
100														
150														
200														
250														
(vii)		1												
	TOTAL	12												