

This question paper consists of two sections: **Section A** and **Section B**.  
 Kertas soalan ini mengandungi dua bahagian: **Bahagian A** dan **Bahagian B**.

**Section A**  
**Bahagian A**

[28 marks]  
 [28 markah]

Answer **all** question from this section.  
 Jawab **semua** soalan daripada bahagian ini.

1 A student carries out an experiment to investigate the relationship between density of liquid and different level of coloured water.

The arrangement of the apparatus is shown in Diagram 1.1.

Seorang murid menjalankan satu eksperimen untuk menyiasat hubungan antara ketumpatan cecair dengan perbezaan aras air berwarna.

Susunan radas ditunjukkan dalam Rajah 1.1.

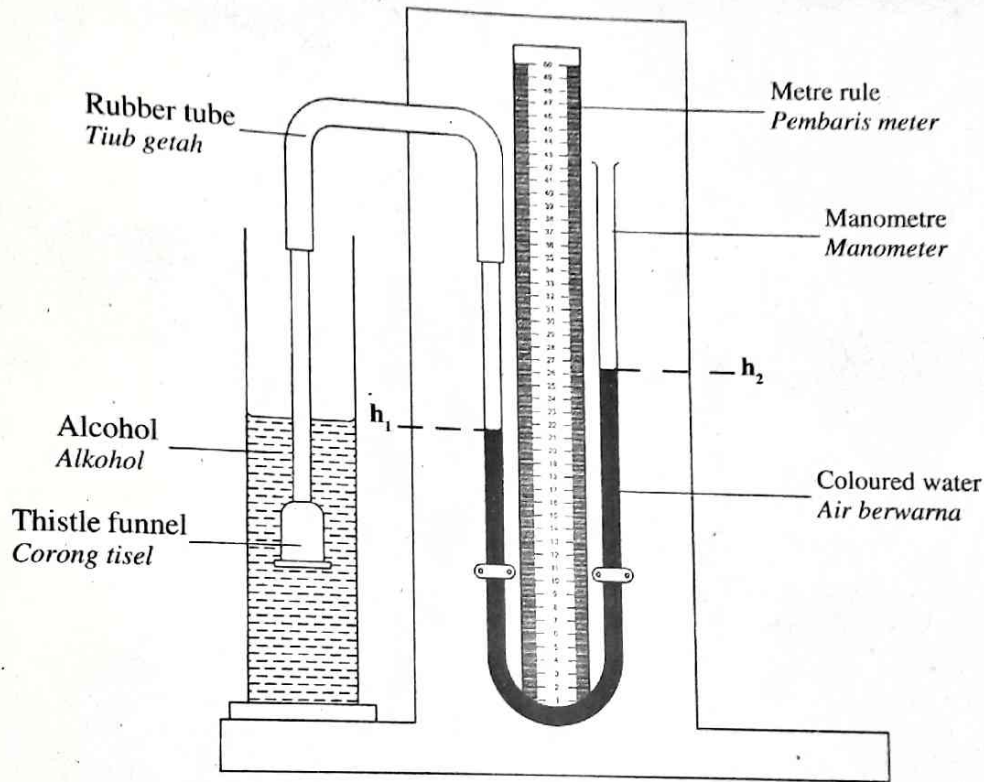


Diagram 1.1  
 Rajah 1.1

The student starts the experiment by using alcohol with density  $0.8 \text{ g cm}^{-3}$  as shown in Diagram 1.2. The level of coloured water  $h_1$  and  $h_2$  is measured and recorded. The student also calculate the value of  $h$  using  $h = h_2 - h_1$ .

The experiment is repeated by using oil, water, glycerine and sugar solution at same depth of immersion. The corresponding readings for  $h_1$  and  $h_2$  are shown in Diagram 1.3, 1.4, 1.5 and 1.6 on pages 322, 323 and 324.

Murid itu memulakan eksperimen menggunakan alkohol dengan ketumpatan  $0.8 \text{ g cm}^{-3}$  seperti ditunjukkan dalam Rajah 1.2. Aras air berwarna  $h_1$  dan  $h_2$  diukur dan direkodkan. Murid itu menghitung nilai  $h$  menggunakan  $h = h_2 - h_1$ .

Eksperimen diulang dengan menggunakan minyak, air, gliserin dan larutan gula pada kedalaman rendaman yang sama. Bacaan yang sepadan untuk  $h_1$  dan  $h_2$  ditunjukkan pada Rajah 1.3, 1.4, 1.5 dan 1.6 di halaman 322, 323 dan 324.

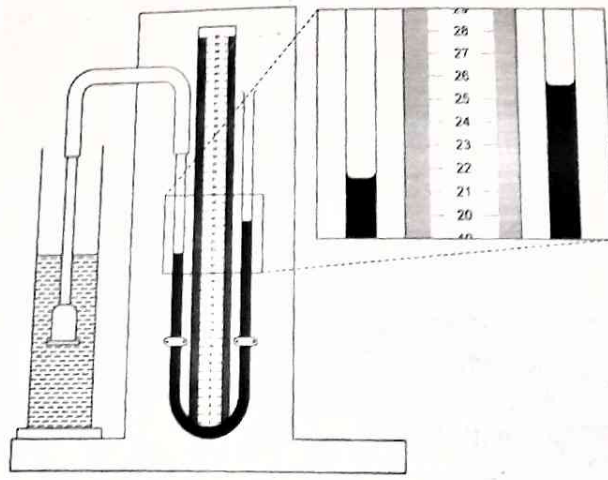


Diagram 1.2

Rajah 1.2

Density of alcohol,  $\rho = 0.80 \text{ g m}^{-3}$   
*Ketumpatan alkohol*

$h_1 = \dots\dots\dots \text{ cm}$

$h_2 = \dots\dots\dots \text{ cm}$

$h = \dots\dots\dots \text{ cm}$

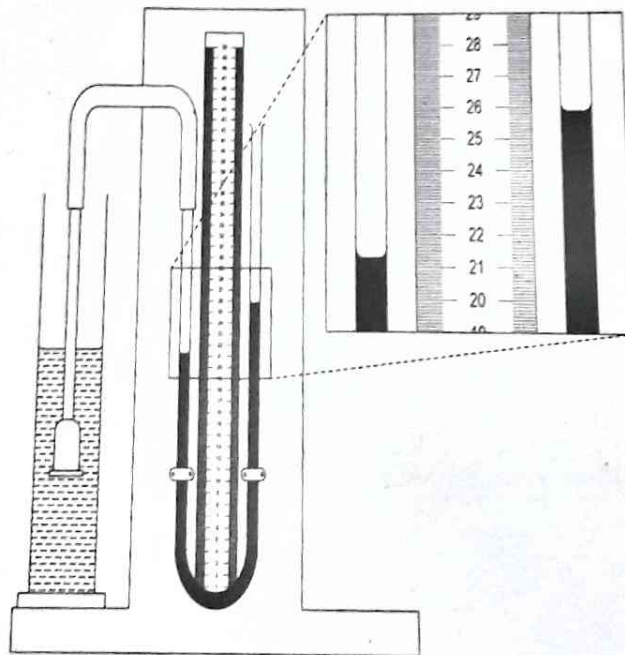


Diagram 1.3

Rajah 1.3

Density of oil,  $\rho = 0.915 \text{ g m}^{-3}$   
*Ketumpatan minyak*

$h_1 = \dots\dots\dots \text{ cm}$

$h_2 = \dots\dots\dots \text{ cm}$

$h = \dots\dots\dots \text{ cm}$

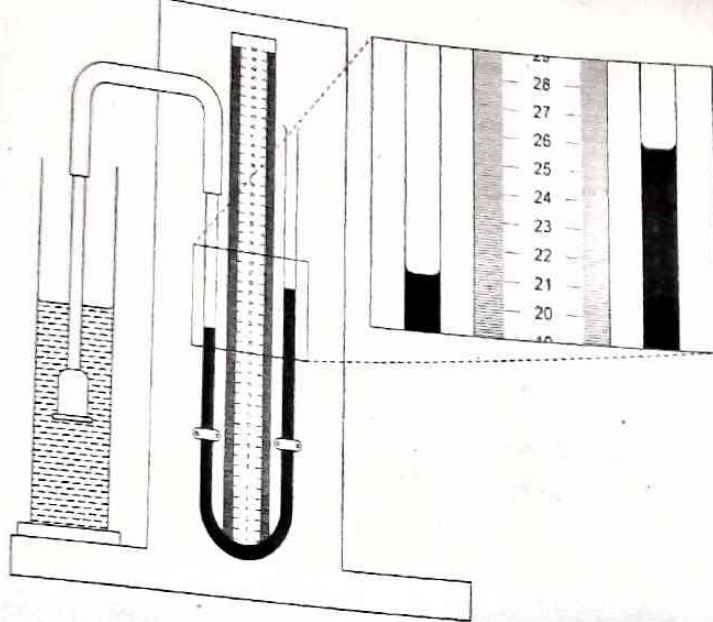


Diagram 1.4  
Rajah 1.4

Density of water,  $\rho = 1.0 \text{ g m}^{-3}$   
Ketumpatan air

$h_1 = \dots\dots\dots \text{ cm}$

$h_2 = \dots\dots\dots \text{ cm}$

$h = \dots\dots\dots \text{ cm}$

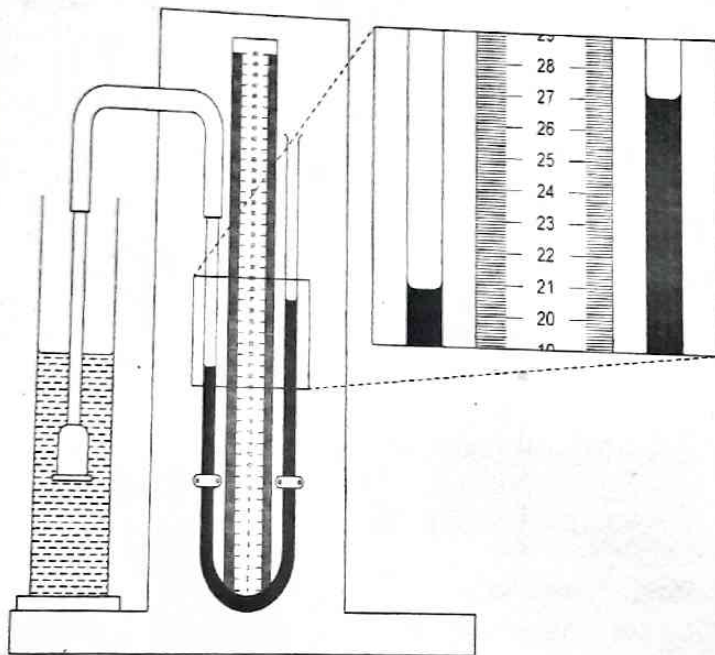


Diagram 1.5  
Rajah 1.5

Density of glycerin,  $\rho = 1.26 \text{ g m}^{-3}$   
Ketumpatan gliserin

$h_1 = \dots\dots\dots \text{ cm}$

$h_2 = \dots\dots\dots \text{ cm}$

$h = \dots\dots\dots \text{ cm}$

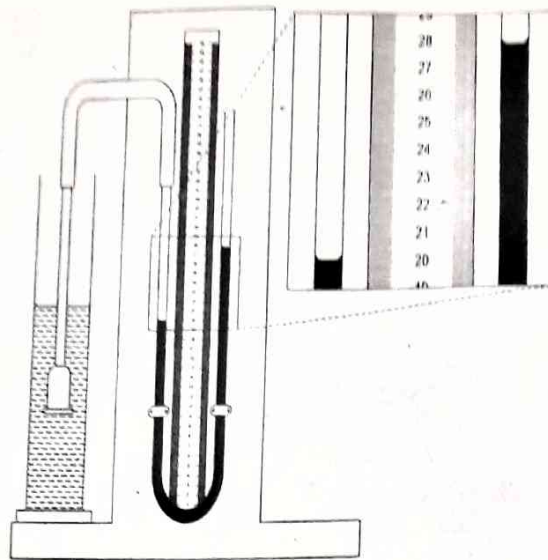


Diagram 1.6  
Rajah 1.6

Density of sugar solution,  $\rho = 1.55 \text{ g m}^{-3}$   
Ketumpatan larutan gula

$h_1 = \dots\dots\dots \text{ cm}$

$h_2 = \dots\dots\dots \text{ cm}$

$h = \dots\dots\dots \text{ cm}$

(a) For the experiment described on pages 321, 322, 323 and 324, identify:  
Bagi eksperimen yang diterangkan di halaman 321, 322, 323 dan 324, kenal pasti:

(i) The manipulated variable  
Pemboleh ubah dimanipulasikan

1(a)(i)

	1
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.....

[1 mark]  
[1 markah]

(ii) The responding variable  
Pemboleh ubah bergerak balas

1(a)(ii)

	1
--	---

.....

[1 mark]  
[1 markah]

(iii) The constant variable.  
Pemboleh ubah dimalarkan.

1(a)(iii)

	1
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.....

[1 mark]  
[1 markah]

(b) Based on Diagram 1.2, 1.3, 1.4, 1.5 and 1.6 on pages 322, 323 and 324:  
Berdasarkan Rajah 1.2, 1.3, 1.4, 1.5 dan 1.6 di halaman 322, 323 dan 324:

(i) Record the reading of  $h_1$  and  $h_2$  in the spaces provided on the diagrams.  
Rekod bacaan  $h_1$  dan  $h_2$  dalam ruang yang disediakan pada rajah.

1(b)(i)

	2
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[2 marks]  
[2 markah]

(ii) Calculate  $h$  for each value of  $t_1$  and  $t_2$ . Record all of the values of  $h$  in the column provided on the diagram. Hence, a line is drawn when  $t_1 = 0$  and  $t_2 = 0$ .

[2 marks] (2 marks)

Total  
 Candidate's  
 Total  
 [2]

(c) Tabulate your results for all values of  $\mu$ ,  $h$ ,  $t_1$  and  $t_2$  in the space below. Indicate the values of  $\mu$ ,  $h$ ,  $t_1$  and  $t_2$  clearly along every column.

[2 marks] (2 marks)

Total  
 [3]

(d) On the graph paper on page 326, draw a graph of  $h$  against  $\mu$ . Write below your equation for  $h$  against  $\mu$ .

[2 marks] (2 marks)

Total  
 [7]

(e) Based on the graph in (d), state the relationship between  $h$  and  $\mu$ . Write below your equation for  $h$  against  $\mu$ .

[1 mark] (1 mark)

Total  
 [8]

Total  
 A1

[10]

For  
Examiner's  
Use

2 A student carries out an experiment to determine the electromotive force (e.m.f) and the internal resistance,  $r$  of a dry cell.

The results of this experiment is shown in the graph of  $R$  against  $1/I$  in Diagram 2.1 on page 328, where  $R$  is the external resistance and  $I$  is the current flow in the circuit.

Seorang murid menjalankan satu eksperimen untuk menentukan daya gerak elektrik (d.g.e) dan rintangan dalam,  $r$  bagi suatu sel kering.

Keputusan eksperimen tersebut ditunjukkan pada graf  $R$  melawan  $1/I$  dalam Rajah 2.1 di halaman 328 di mana  $R$  ialah rintangan luar dan  $I$  adalah arus yang mengalir dalam litar.

(a) Based on the graph in Diagram 2.1:  
Berdasarkan graf pada Rajah 2.1:

(i) State the relationship between  $R$  and  $1/I$ .

Nyatakan hubungan antara  $R$  dengan  $1/I$ .

[1 mark]

[1 markah]

(ii) Determine the value of  $R$  when  $I = 0.25$  A.

Show on the graph, how you determine the value of  $R$ .

Tentukan nilai  $R$  bila  $I = 0.25$  A.

Tunjukkan pada graf, bagaimana anda menentukan nilai  $R$ .

[3 marks]

[3 markah]

2(a)(i)

1
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2(a)(ii)

3
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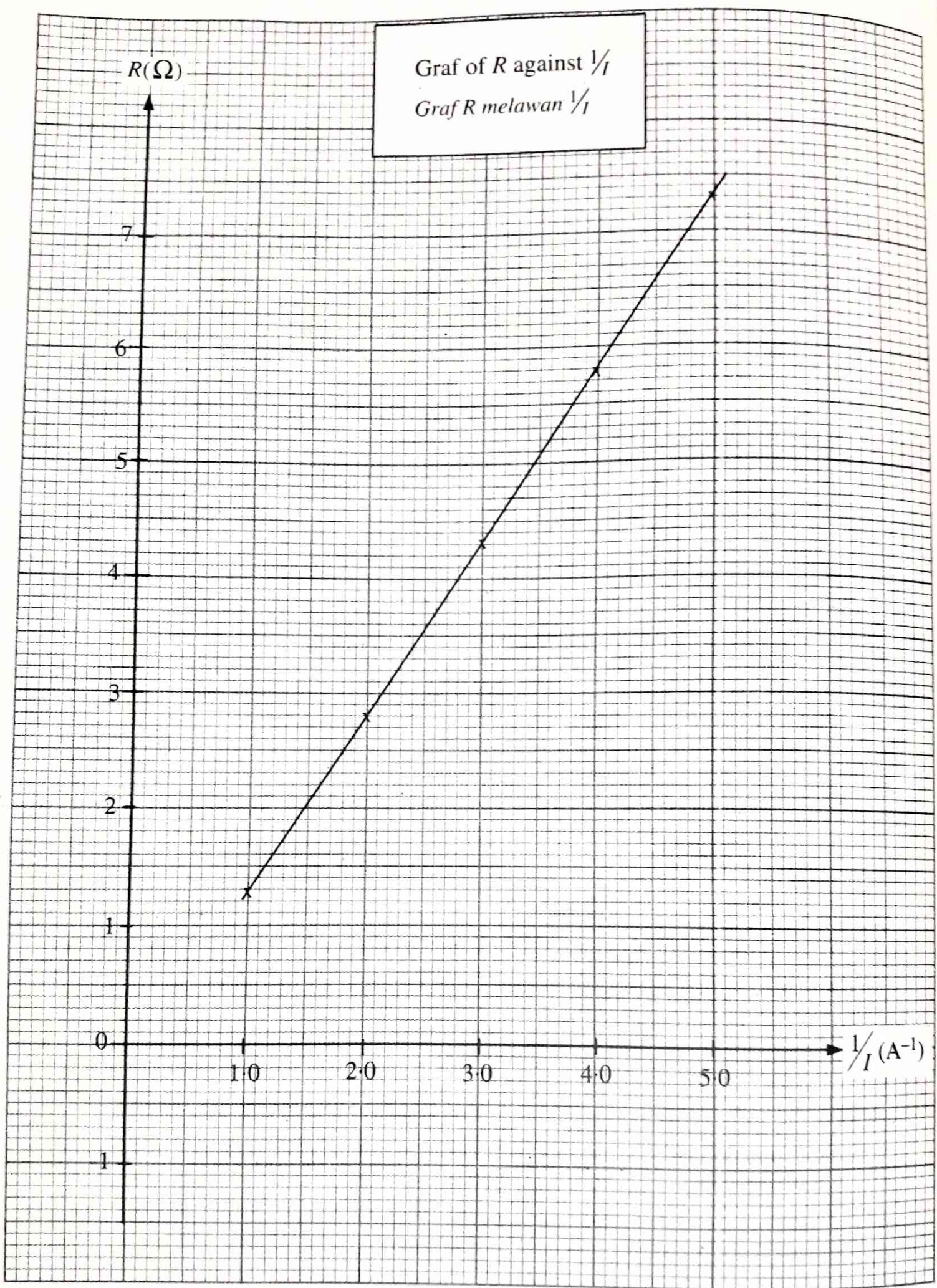


Diagram 2.1  
Rajah 2.1

(b) By using the formula:  
Dengan menggunakan rumus:

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

show on the graph, how you determine,  
tunjukkan pada graf, bagaimana anda menentukan,

(i) the internal resistance,  $r$  of the dry cell  
rintangan dalam,  $r$  sel kering itu.

[3 marks]  
[3 markah]

2(b)(i)

	3
--	---

(ii) the gradient,  $m$ , of the graph.  
kecerunan,  $m$ , bagi graf itu.

[3 marks]  
[3 markah]

2(b)(ii)

	3
--	---

(c) What is the physical quantity represented by the gradient of the graph in 2(b)(ii)?  
Apakah kuantiti fizik yang diwakili oleh kecerunan graf dalam 2(b)(ii)?

[1 mark]  
[1 markah]

2(c)

	2
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(d) State **one** precaution that should be taken to improve the accuracy of the result of this experiment.  
Nyatakan **satu** langkah yang perlu diambil untuk meningkatkan kejituan keputusan eksperimen ini.

[1 mark]  
[1 markah]

2(d)

	1
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For  
Examiner's  
Use



**Section B**  
**Bahagian B**

[12 marks]

[12 markah]

Answer any **one** question from this section.  
Jawab mana-mana **satu** soalan daripada bahagian ini.

**3** Diagram 3.1 and Diagram 3.2 show a father and his son sitting on two identical bird nest swing. The spring of swing are extended when sat by them.

Rajah 3.1 dan Rajah 3.2 menunjukkan seorang bapa dan anaknya duduk di atas dua buaian sarang burung yang serupa. Buaian itu telah memanjang apabila diduduki oleh mereka.

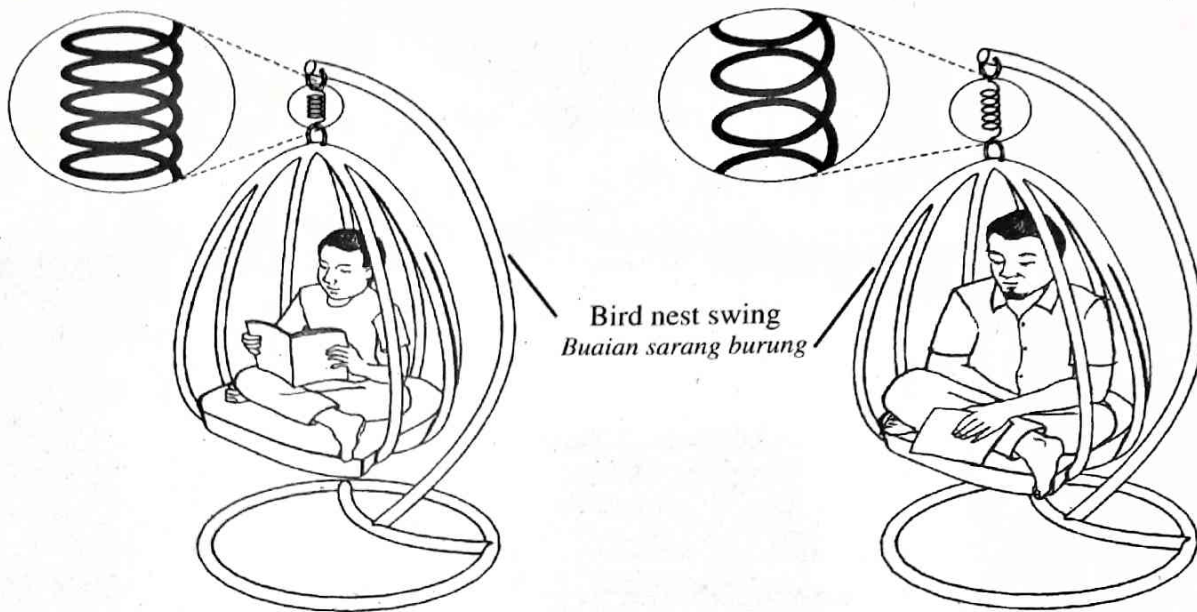


Diagram 3.1

Rajah 3.1

Diagram 3.2

Rajah 3.2

Based on the information and observation:

Berdasarkan maklumat dan pemerhatian:

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

Nyatakan **satu** inferens yang sesuai.

[1 mark]

[1 markah]

(b) State one suitable hypothesis.

Nyatakan **satu** hipotesis yang sesuai.

[1 mark]

[1 markah]

(c) With the use of apparatus such as spring, load and other suitable apparatus, describe **one** experiment to investigate the hypothesis stated in 3(b).

Dengan menggunakan radas seperti spring, pemberat dan lain-lain radas yang sesuai, terangkan **satu** eksperimen untuk meniasat hipotesis yang dinyatakan di 3(b).

In your description, state clearly the following:

Dalam penerangan anda, nyatakan dengan jelas perkara berikut:

(i) The aim of the experiment.

Tujuan eksperimen.

(ii) The variables in the experiment.

Pemboleh ubah dalam eksperimen.

(iii) The list of apparatus and materials.

Senarai radas dan bahan.

(iv) The arrangement of the apparatus.

Susunan radas.

- (v) The procedure of the experiment which include **one** method of controlling the manipulated variable and **one** method of measuring the responding variable.  
*Prosedur eksperimen termasuk **satu** kaedah mengawal pembolehubah dimanipulasikan dan **satu** kaedah mengukur pembolehubah bergerak balas.*
- (vi) The way to tabulate the data.  
*Cara untuk menjadualkan data.*
- (vii) The way to analyse the data.  
*Cara untuk menganalisis data.*

[10 marks]

[10 markah]

4 Diagram 4.1 and Diagram 4.2 show two identical handphones being charged by two different charger for 45 minutes. It is found that after 45 minutes, one of the handphone is fully charged.

*Rajah 4.1 dan Rajah 4.2 menunjukkan dua telefon bimbit yang serupa dicas dengan menggunakan dua pengecas yang berbeza selama 45 minit. Didapati bahawa selepas 45 minit, satu daripada telefon bimbit itu telah dicas sepenuhnya.*

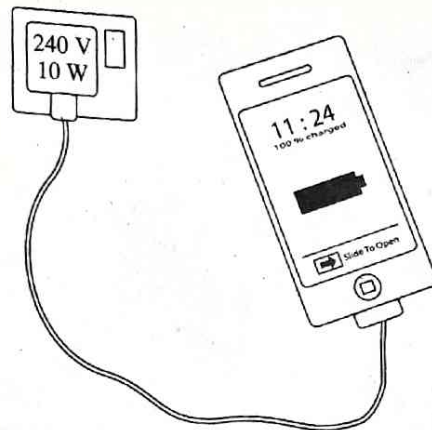


Diagram 4.1

Rajah 4.1

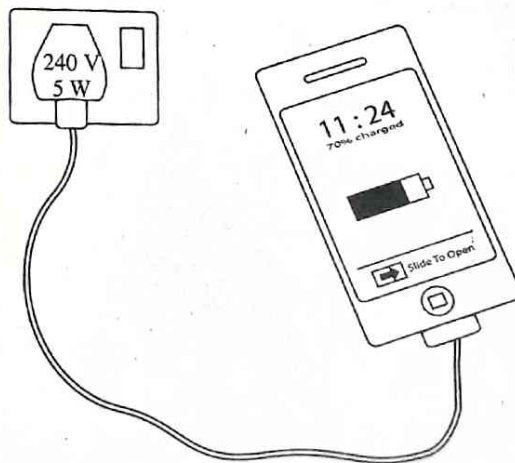


Diagram 4.2

Rajah 4.2

Based on information and observation:

*Berdasarkan maklumat dan pemerhatian:*

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

[1 mark]

[1 markah]

- (b) State **one** suitable hypothesis.  
*Nyatakan **satu** hipotesis yang sesuai.*

[1 mark]

[1 markah]

(c) With the use of apparatus such as ammeter, and other apparatus, describe **one** experiment to investigate the hypothesis stated in 4(b).

*Dengan menggunakan radas seperti ammeter, dan lain-lain radas, terangkan **satu** eksperimen untuk menyiasat hipotesis yang dinyatakan di 4(b).*

In your description, state clearly the following:

*Dalam penerangan anda, nyatakan dengan jelas perkara berikut:*

- (i) The aim of the experiment.  
*Tujuan eksperimen.*
- (ii) The variables in the experiment.  
*Pemboleh ubah dalam eksperimen.*
- (iii) The list of apparatus and materials.  
*Senarai radas dan bahan.*
- (iv) The arrangement of the apparatus.  
*Susunan radas.*
- (v) The procedure of the experiment which should include **one** method of controlling the manipulated variable and **one** method of measuring the responding variable.  
*Prosedur eksperimen mesti termasuk **satu** kaedah mengawal pemboleh ubah dimanipulasikan dan **satu** kaedah mengukur pemboleh ubah bergerak balas.*
- (vi) The way to tabulate the data.  
*Cara untuk menjadualkan data.*
- (vii) The way to analyse the data.  
*Cara untuk menganalisis data.*

[10 marks]

[10 markah]