

NO. KAD PENGENALAN

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ANGKA GILIRAN

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Sains  
Kertas 2  
Ogos  
2007

JABATAN PELAJARAN NEGERI SELANGOR

1 ½ jam

PROGRAM PENINGKATAN PRESTASI SAINS  
PENILAIAN MENENGAH RENDAH 2007

Bahagian	No. Soalan	Markah penuh	Markah diperoleh
A	1	6	
	2	7	
	3	6	
	4	7	
	5	6	
	6	8	
B	7	8	
	8	12	
JUMLAH		60	

Sains  
Kertas 2  
Satu jam tiga puluh minit  
JANGAN BUKA KERTAS SOALAN INI  
SEHINGGA DIBERITAHU

- Kertas ini mengandungi 8 soalan.
- Jawab semua soalan.
- Jawapan hendaklah ditulis dalam ruangan yang disediakan.
- Rajah tidak dilukis mengikut skala kecuali dinyatakan.
- Markah maksimum yang diperuntukkan ditunjukkan dalam kurungan pada hujung tiap-tiap soalan atau bahagian soalan.

Kertas soalan ini mengandungi 33 halaman bercetak

## INFORMATION FOR CANDIDATES

1. This question paper consists of two sections: Section A and Section B.
2. Write your answers in the spaces provided in the question paper.
3. Show your working, it may help you to get marks.
4. If you wish to cancel any answer, neatly cross out the answer.
5. The diagrams in the questions provided are not drawn to scale unless stated.
6. Marks allocated for each question or part question are shown in brackets..
7. The time suggested to complete Section A is 60 minutes and Section B is 30 minutes.
8. You may use a non-programmable scientific calculator.
9. Hand in all your answer sheets at the end of the examination

## MAKLUMAT UNTUK CALON

1. Kertas soalan ini mengandungi dua bahagian: Bahagian A dan Bahagian B.
2. Tulis jawapan anda dalam ruang yang disediakan dalam kertas soalan.
3. Tunjukkan kerja kira mengira, ini membantu anda mendapat markah..
4. Sekiranya anda hendak membatalkan sesuatu buat garisan diatas jawapan itu.
5. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
6. Markah yang diperuntukkan bagi setiap soalan atau ceraiian soalan ditunjukkan dalam kurungan.
7. Masa yang dicadangkan untuk menjawab Bahagian A ialah 60 minit dan Bahagian B ialah 30 minit.
8. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.
9. Serahkan semua kertas jawapan di akhir peperiksaan.

Section A  
[40 marks]  
Answer all questions.

The time suggested to answer this section is 60 minutes.

1. (a) Figure 1 shows K and L in two states of matter.

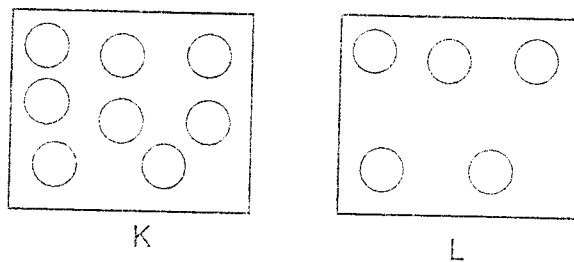


FIGURE 1

Based on Figure 1, name K and L using the following words.

Gas	Solid	Liquid
-----	-------	--------

K: \_\_\_\_\_

L: \_\_\_\_\_

[2 marks]

- (b) Suggest one way how L can change to state K.

\_\_\_\_\_

[1 mark]

- (c) Suggest another way how K can change to state L.

\_\_\_\_\_

[1 mark]

- (d) State one difference between K and L, other than the arrangement of the particles.

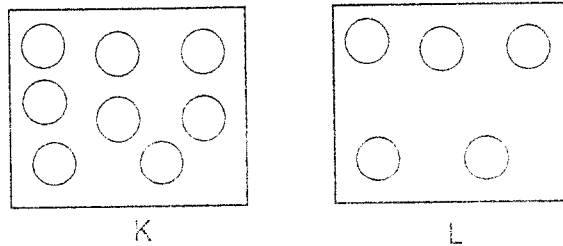
K	L

[2 mark]

Bahagian A  
[40 markah]  
Jawab semua soalan.

Masa dicadangkan untuk menjawab bahagian ini ialah 60 minit.

1. (a) Rajah 1 menunjukkan K dan L dalam dua rupabentuk jirim.



RAJAH 1

Berdasarkan Rajah 1, namakan K dan L menggunakan perkataan-perkataan berikut.

Gas	Pepejal	Cecair
-----	---------	--------

K: \_\_\_\_\_

L: \_\_\_\_\_ [2 markah]

- (b) Cadangkan **satu** cara bagaimana rupabentuk L boleh ditukar menjadi rupabentuk K.

\_\_\_\_\_ [1 markah]

- (c) Cadangkan **satu** cara lain bagaimana K boleh ditukar ke rupabentuk L.

\_\_\_\_\_ [1 markah]

- (d) Nyatakan **satu** perbezaan antara K dan L selain daripada susunan zarah-zarah.

K	L

[2 markah]

2.

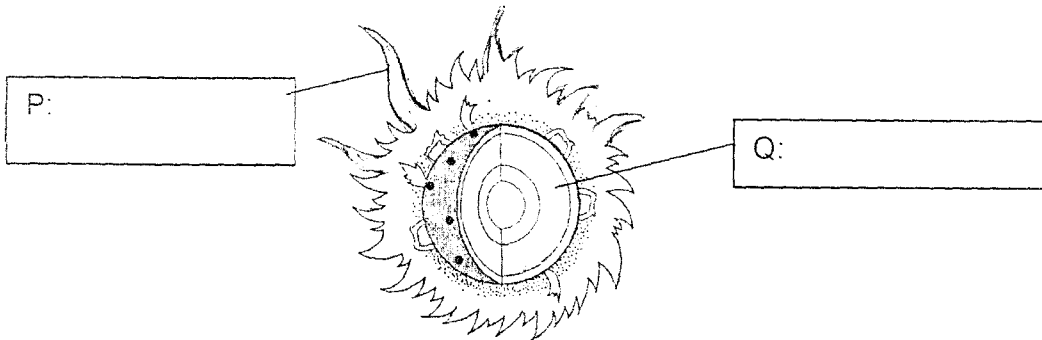


FIGURE 2

- (a) Label structures P and Q in Figure 2 using the following words.

Sunspot	Photosphere	Prominence
---------	-------------	------------

[2 marks]

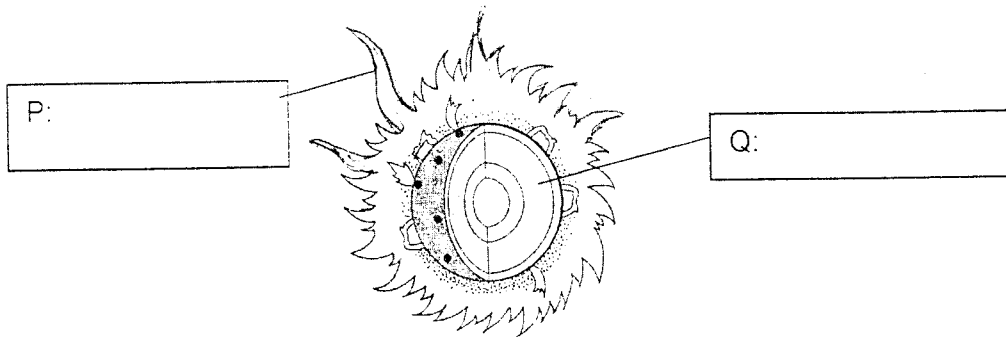
- (b) Sunspots and prominences are two phenomena that occur on the surface of the sun. Name another phenomenon that occurs on the surface of the sun.

[1 mark]

- (c) State one effect of the phenomena that occurs on the surface of the sun to the earth.

[1 mark]

2.



RAJAH 2

- (a) Labelkan struktur P dan Q dalam Rajah 2 dengan menggunakan perkataan-perkataan berikut.

Tompok matahari	Fotosfera	Prominen
-----------------	-----------	----------

[2 markah]

- (b) Tompok matahari dan prominens adalah dua fenomena yang berlaku pada permukaan matahari. Namakan satu fenomena lain yang berlaku pada permukaan matahari.

---

[1 markah]

- (c) Nyatakan satu kesan fenomena yang berlaku pada permukaan matahari terhadap Bumi.

---

[1 markah]

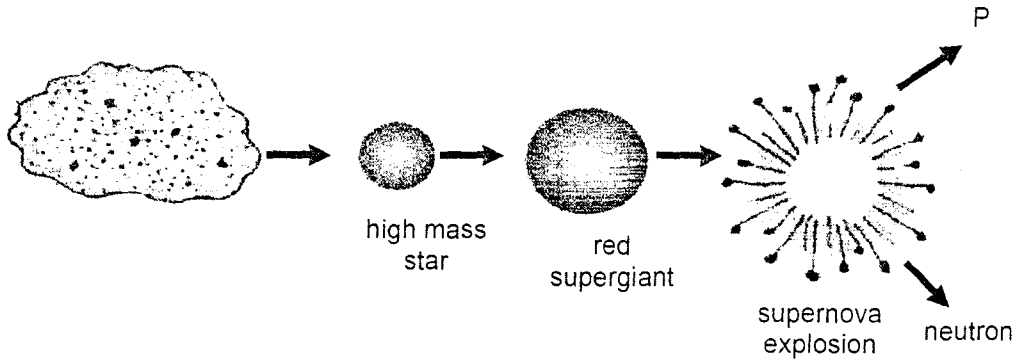


FIGURE 2.1

Figure 2.1 shows the sequence from the birth to the death of stars in the universe.

- (d) After a supernova explosion, two types of cosmic objects are formed depending on the size of the core. What is P ?

\_\_\_\_\_ [1 mark]

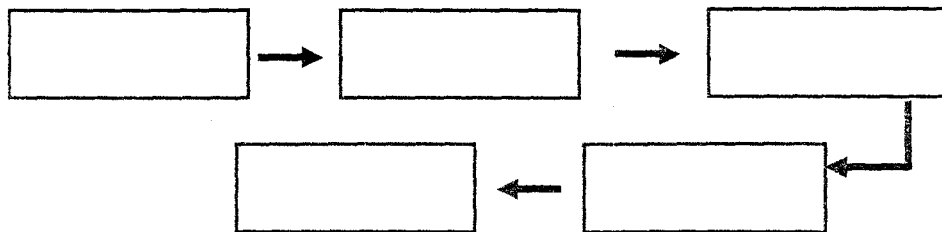
- (e) Describe one characteristic of P.

\_\_\_\_\_ [1 mark]

- (f) Stars are classified according to the colour of their surface temperature as shown in the information box below.

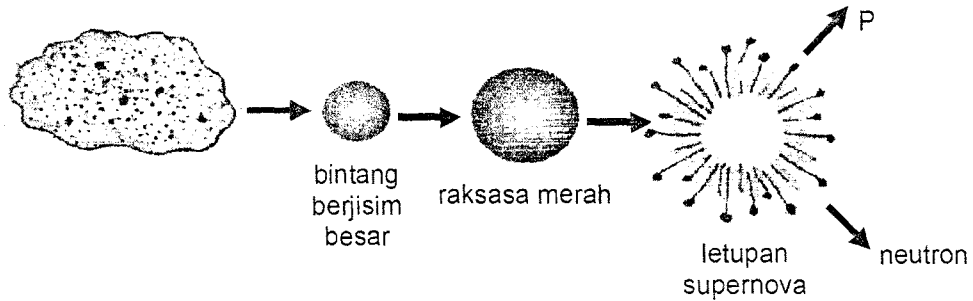
Yellow	Red	Blue	White	Orange
--------	-----	------	-------	--------

Arrange the colours of the stars in sequence, from the hottest star to the coldest star.



[1 mark]





RAJAH 2.1

Rajah 2.1 menunjukkan turutan kelahiran dan kematian bintang dalam alam semesta.

- (d) Selepas letupan supernova, dua jenis objek kosmik terbentuk bergantung kepada saiz terasnya. Apakah P?

\_\_\_\_\_ [1 markah]

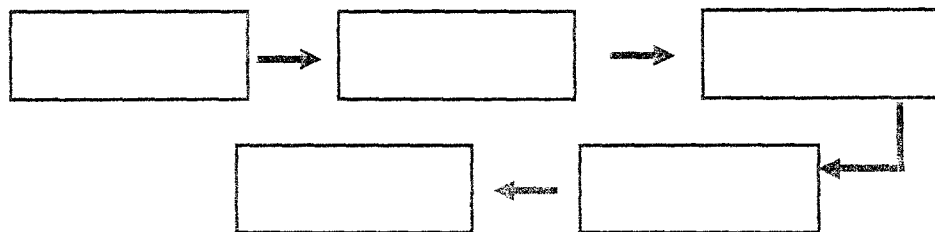
- (e) Terangkan satu ciri P.

\_\_\_\_\_ [1 markah]

- (f) Bintang dikelaskan berdasarkan warna suhu permukaan seperti ditunjukkan di dalam kotak maklumat di bawah.

Kuning	Merah	Biru	Putih	Oren
--------	-------	------	-------	------

Susun warna bintang mengikut turutan, dari bintang yang paling panas kepada bintang yang paling sejuk.



[1 markah]

3. Figure 3 shows the types of pollination P, Q and R.

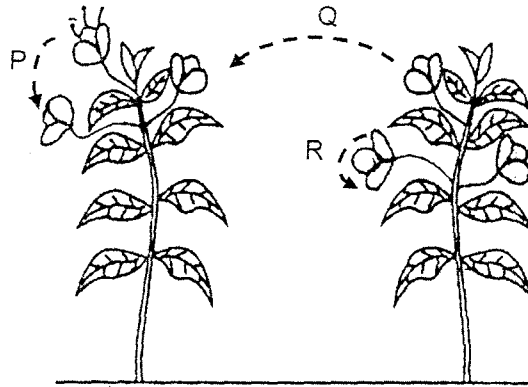


FIGURE 3

- (a) Which of the types can be classified as self pollination ?

\_\_\_\_\_ [2 marks]

- (b) i. Which type of pollination is beneficial to agriculture ?

\_\_\_\_\_ [1 mark]

- ii. State one reason for your answer in b(i).

\_\_\_\_\_ [1 mark]

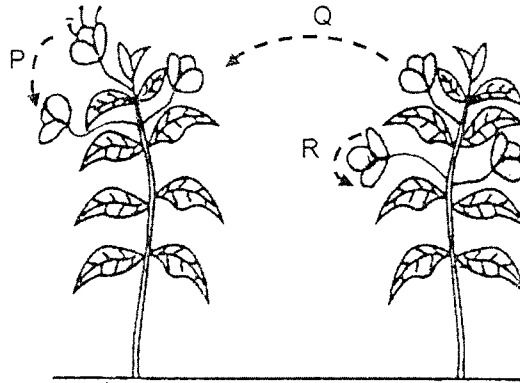
- (c) i. Suggest an agent of pollination for the hibiscus plant.

\_\_\_\_\_ [1 mark]

- ii. State one reason for your answer in c(i).

\_\_\_\_\_ [1 mark]

3. Rajah 3 menunjukkan jenis pendebungaan P, Q dan R.



RAJAH 3

- (a) Jenis yang manakah boleh dikelaskan sebagai pendebungaan sendiri ?

\_\_\_\_\_ [2 markah]

- (b) i. Jenis pendebungaan yang manakah memberi faedah kepada pertanian ?

\_\_\_\_\_ [1 markah]

- ii. Nyatakan satu sebab bagi jawapan anda dalam (b) (i).

\_\_\_\_\_ [1 markah]

- (c) i. Cadangkan satu agen pendebungaan pokok bunga raya.

\_\_\_\_\_ [1 markah]

- ii. Nyatakan satu sebab bagi jawapan anda dalam (c) (i).

\_\_\_\_\_ [1 markah]

4. Figure 4 shows a set-up of an apparatus to study the content of oxygen in inhaled air and exhaled air in the measuring cylinders P and Q. At the beginning of the activity, the level of water in each measuring cylinder is  $75 \text{ cm}^3$

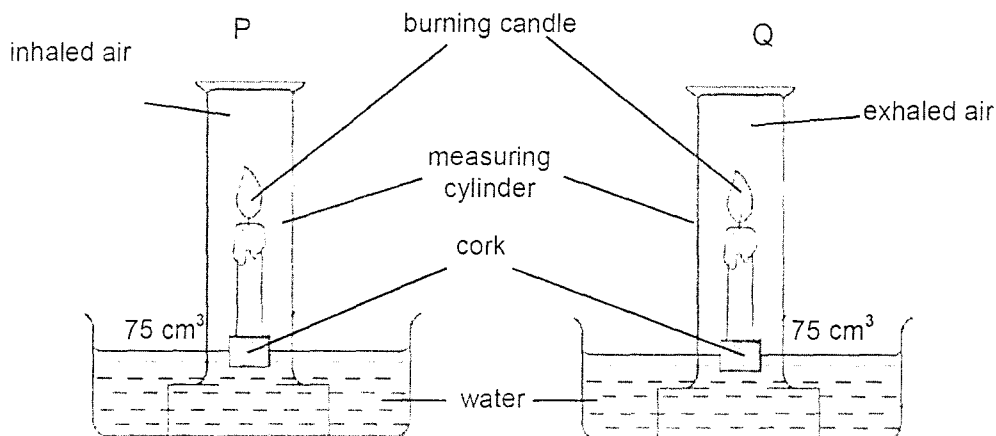


FIGURE 4

Table 2 shows the time taken for the candles to extinguish and the water level in each measuring cylinder at the end of the activity.

Measuring cylinder	Time / s	Water level in the measuring cylinder / $\text{cm}^3$
P	10	60
Q	8	63

TABLE 2

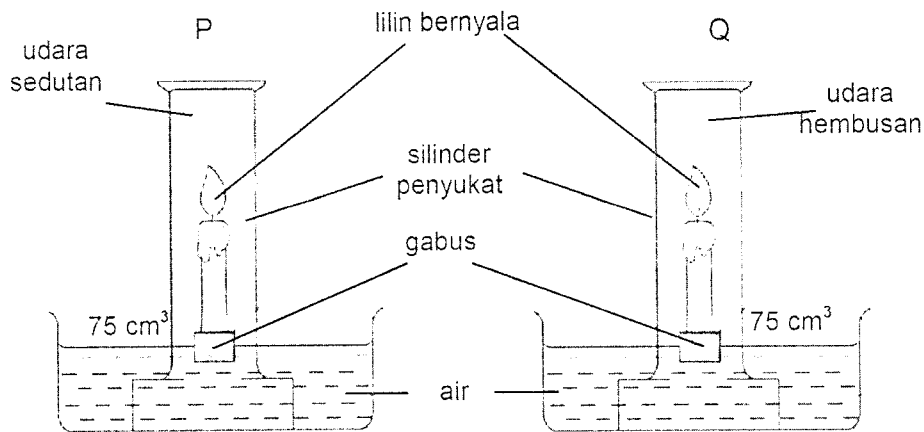
- (a) Name another gas that exists in inhaled air.

\_\_\_\_\_ [1 mark]

- (b) Why does the burning candle in measuring cylinder P take a longer time to extinguish?

\_\_\_\_\_ [1 mark]

4. Rajah 4 menunjukkan satu susunan radas untuk mengkaji kandungan oksigen dalam udara sedutan dan udara hembusan di dalam silinder penyukat P dan Q. Pada awal aktiviti, bacaan paras air di dalam silinder penyukat ialah  $75 \text{ cm}^3$ .



RAJAH 4

Jadual 2 menunjukkan masa yang diambil untuk lilin padam dan paras air di akhir aktiviti.

Silinder penyukat	Masa (s)	Paras air di dalam silinder penyukat ( $\text{cm}^3$ )
P	10	60
Q	8	63

JADUAL 2

- (a) Namakan gas lain yang wujud di dalam udara sedutan.

\_\_\_\_\_ [1 markah]

- (b) Mengapakah lilin yang bernyala di dalam silinder penyukat P mengambil masa yang lebih lama untuk padam?

\_\_\_\_\_ [1 markah]

- (c) Why is the level of water in measuring cylinder P higher than the level of water in measuring cylinder Q?

\_\_\_\_\_ [1 mark]

- (d) i. During the burning of the candle, which gas does not change in its volume?

\_\_\_\_\_ [1 mark]

- ii. Give **one** reason for your answer in (d) (i).

\_\_\_\_\_ [1 mark]

- (e) During the haze, the Air Pollutant Index is above 500 which is a sign that the air is bad for health.

- i. State one human activity that causes the haze.

\_\_\_\_\_ [1 mark]

- ii. Suggest what you should do if you have to go out of your house during the haze.

\_\_\_\_\_ [1 mark]

5. Figure 5 shows a reaction between solution X and dilute sodium hydroxide solution.

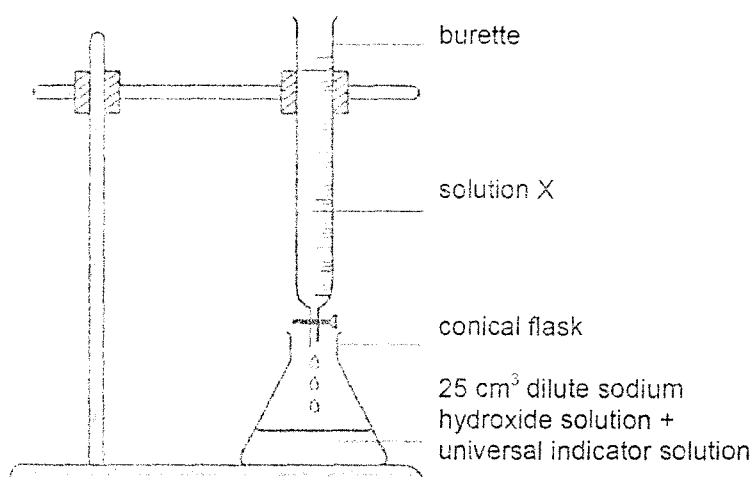


FIGURE 5

- (c) Mengapakah paras air di dalam silinder penyukat P lebih tinggi berbanding paras air di dalam silinder penyukat Q ?

[1 markah]

- (d) i. Semasa lilin bernyala, gas yang manakah tidak berubah isipadunya ?

[1 markah]

- ii. Berikan satu alasan kepada jawapan anda di (d) (i).

[1 markah]

- (e) Semasa jerebu, Indeks Pencemar Udara adalah lebih dari 500. Ini adalah satu tanda bahawa udara boleh menjejaskan kesihatan.

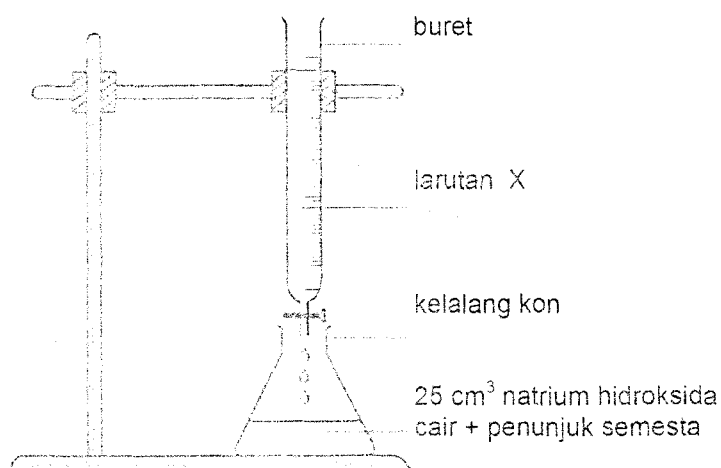
- i. Nyatakan satu aktiviti manusia yang menyebabkan jerebu.

[1 markah]

- ii. Cadangkan satu tindakan yang patut diambil jika anda perlu keluar dari rumah semasa jerebu.

[1 markah]

5. Rajah 5 menunjukkan tindak balas antara larutan X dan larutan natrium hidroksida cair.



RAJAH 5



The result of the experiment is recorded in Table 3.

Volume of solution X / cm <sup>3</sup>	5	10	15	20	25	30	35	40
pH	14	12	10	8	7	6	5	4

TABLE 3

(a) State two characteristics of solution X.

i. \_\_\_\_\_

ii. \_\_\_\_\_  
[2 marks]

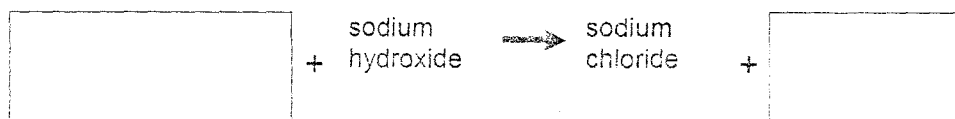
(b) State the volume of solution X needed to neutralise 25 cm<sup>3</sup> of dilute sodium hydroxide.

\_\_\_\_\_  
[1 mark]

(c) What is the colour of the universal indicator when 15 cm<sup>3</sup> of solution X is added into the dilute sodium hydroxide solution in the conical flask?

\_\_\_\_\_  
[1 mark]

(d) Complete the equation below.



[2 marks]



Keputusan eksperimen direkodkan dalam Jadual 3.

Isipadu larutan X / cm <sup>3</sup>	5	10	15	20	25	30	35	40
pH	14	12	10	8	7	6	5	4

JADUAL 3

(a) Nyatakan dua ciri larutan X.

i. \_\_\_\_\_

ii. \_\_\_\_\_

[2 markah]

(b) Nyatakan isipadu larutan X yang diperlukan untuk meneutralkan 25 cm<sup>3</sup> larutan cair natrium hidroksida.

\_\_\_\_\_

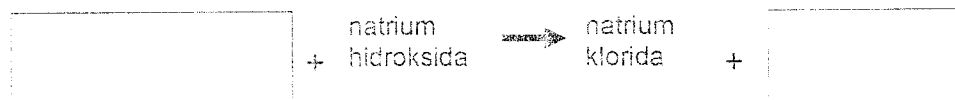
[1 markah]

(c) Apakah warna penunjuk semesta apabila 15 cm<sup>3</sup> larutan X dicampur kepada larutan cair natrium hidroksida cair dalam ketelang kon?

\_\_\_\_\_

[1 markah]

(d) Lengkapkan persamaan di bawah.



[2 markah]

6. Figure 6 shows a set-up of apparatus for an experiment to study the relationship between voltage and current. The ammeter and voltmeter readings are recorded. The experiment is repeated using two, three and then four dry cells connected in series.

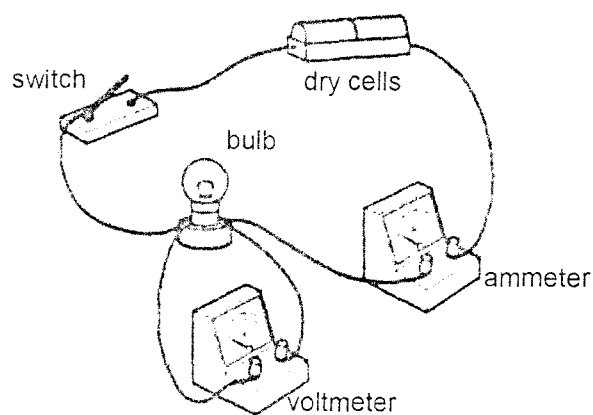


FIGURE 6

(a) Based on the diagram, state

- i. an observation from the experiment.

\_\_\_\_\_ [1 mark]

- ii. the change to the brightness of the bulb when the number of dry cells is increased.

\_\_\_\_\_ [1 mark]

- iii. the difference between the connection of the ammeter and voltmeter in the circuit.

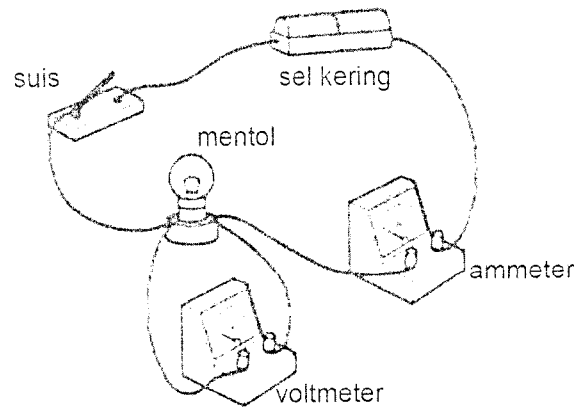
\_\_\_\_\_ [1 mark]

The results of the experiment are shown in Table 4.

Number of dry cells	Voltmeter reading / V	Ammeter reading / A
1	1.5	0.2
2	3.0	0.4
3	4.5	0.6
4	6.0	0.8

TABLE 4

6. Rajah 6 menunjukkan radas eksperimen untuk mengkaji hubungan antara voltan dan arus. Bacaan ammeter dan voltmeter direkodkan. Eksperimen diulangi dengan menggunakan dua, tiga dan empat sel kering yang disambung bersiri.



RAJAH 6

(a) Berdasarkan eksperimen, nyatakan

- i. suatu pemerhatian daripada eksperimen.

\_\_\_\_\_ [1 markah]

- ii. perubahan kecerahan mentol apabila bilangan sel kering bertambah.

\_\_\_\_\_ [1 markah]

- iii. perbezaan antara sambungan ammeter dan voltmeter dalam litar.

\_\_\_\_\_ [1 markah]

Keputusan eksperimen ditunjukkan dalam Jadual 4.

Bilangan sel kering	Bacaan voltmeter / V	Bacaan ammeter / A
1	1.5	0.2
2	3.0	0.4
3	4.5	0.6
4	6.0	0.8

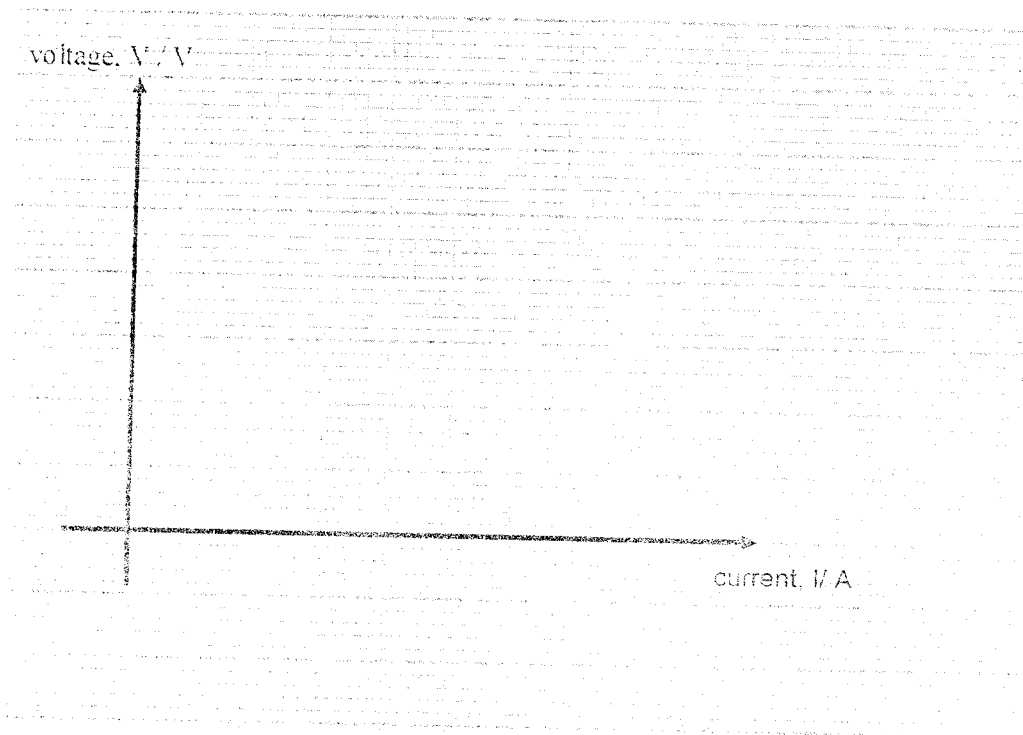
JADUAL 4

(b) Based on Table 4,

- i. describe the effect of the change in voltage on current.

[1 mark]

- ii. plot a graph of voltage (V) against current (I).



[1 mark]

- (c) i. Based on the graph in a (ii), state Ohm's Law.

[1 mark]

- ii. What is represented by the gradient of the graph?

[1 mark]

- (d) Suggest one reason why wires made of copper are used in the wiring system of buildings.

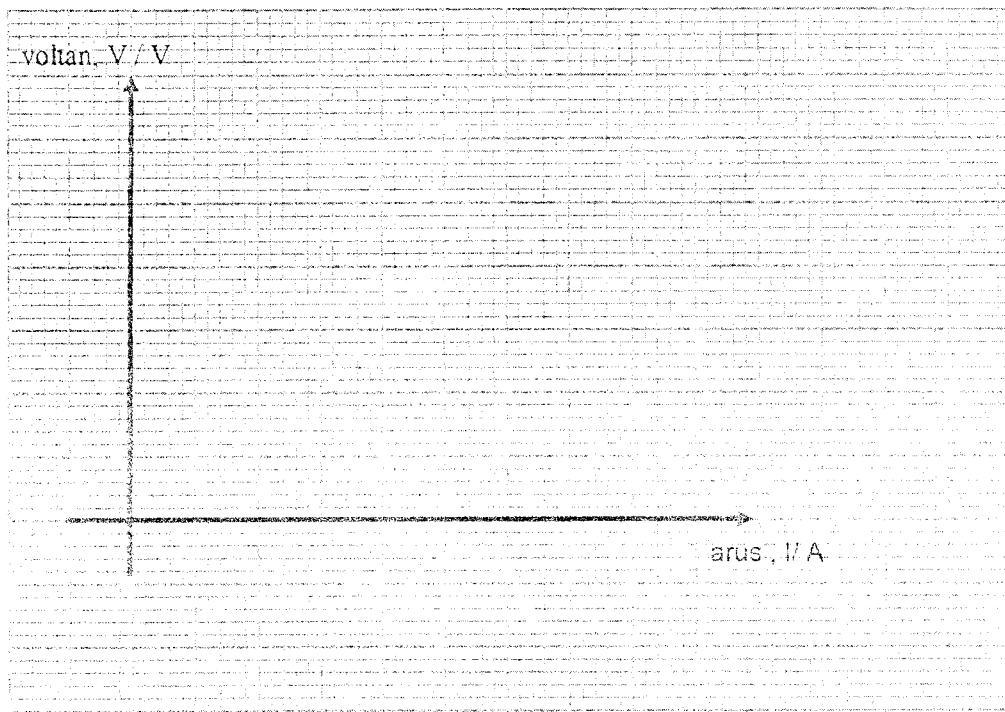
[1 mark]

(b) Berdasarkan Jadual 4,

- i. terangkan kesan perubahan voltan pada arus.

[1 markah]

- ii. plot satu graf voltan (V) lawan arus (I).



[1 markah]

(c) i. Berdasarkan graf di a (ii), nyatakan Hukum Ohm .

[1 markah]

- ii. Apakah yang diwakili oleh kecerunan graf?

[1 markah]

(d) Cadangkan satu sebab mengapa wayar yang diperbuat daripada kuprum digunakan dalam sistem pendawaian bangunan.

[1 markah]

Section 5  
[20 marks]  
*Answer all questions*

The time suggested to answer this section is 30 minutes.

7. Figure 7 shows the pictures of six animals P, Q, R, S, T and U.

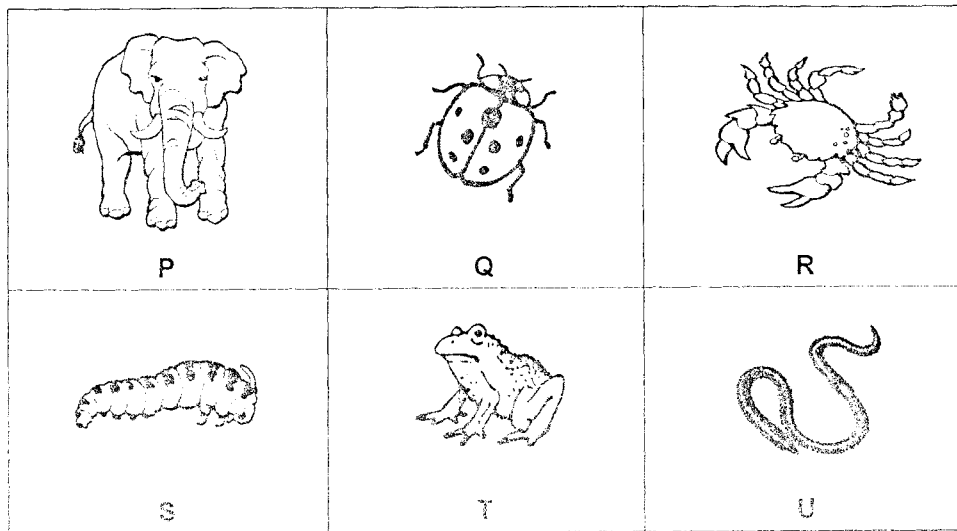


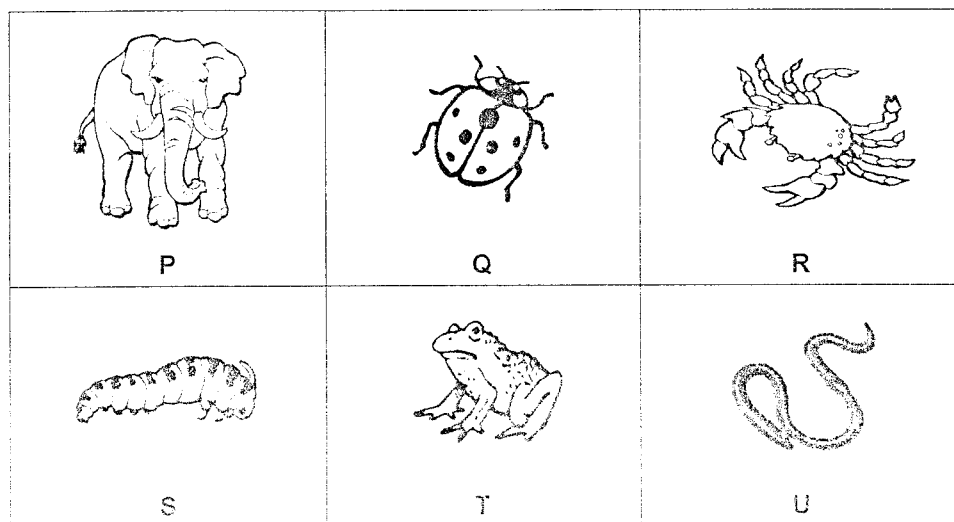
FIGURE 7

- (a) Study the animals shown in Figure 7. Based on their support system, classify them in Figure 7.1 and state an example for each group.

Bahagian B  
[20 markah]  
Jawab **semua** soalan

Masa dicadangkan untuk menjawab bahagian ini ialah 30 minit.

7. Rajah 7 menunjukkan gambar enam haiwan P, Q, R, S, T dan U.



RAJAH 7

- (a) Kaji haiwan-haiwan dalam Rajah 7. Kelaskan berdasarkan sistem sokongan mereka dalam Rajah 7.1 dan nyatakan satu contoh bagi setiap kumpulan.

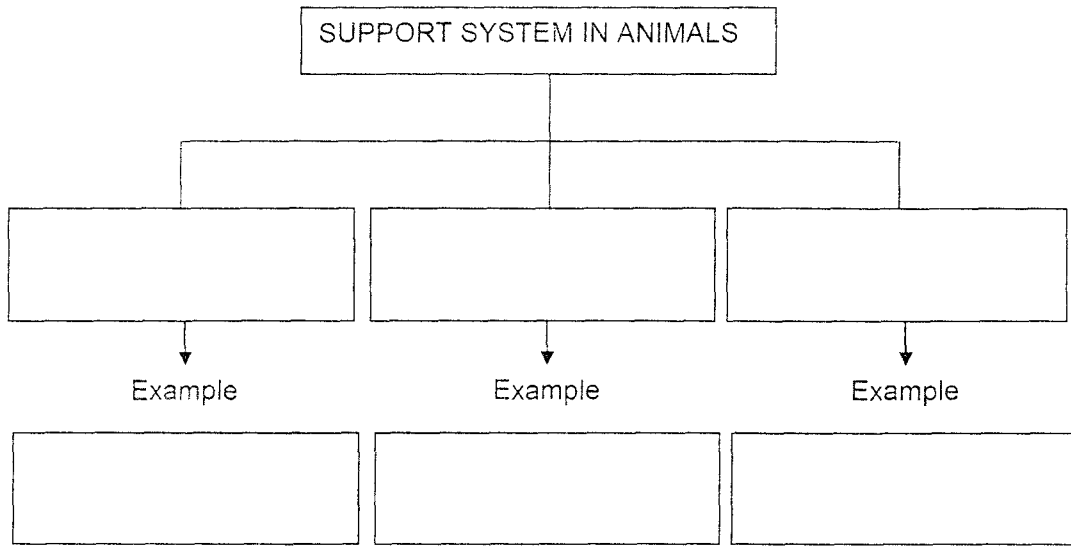


FIGURE 7.1

[6 marks]

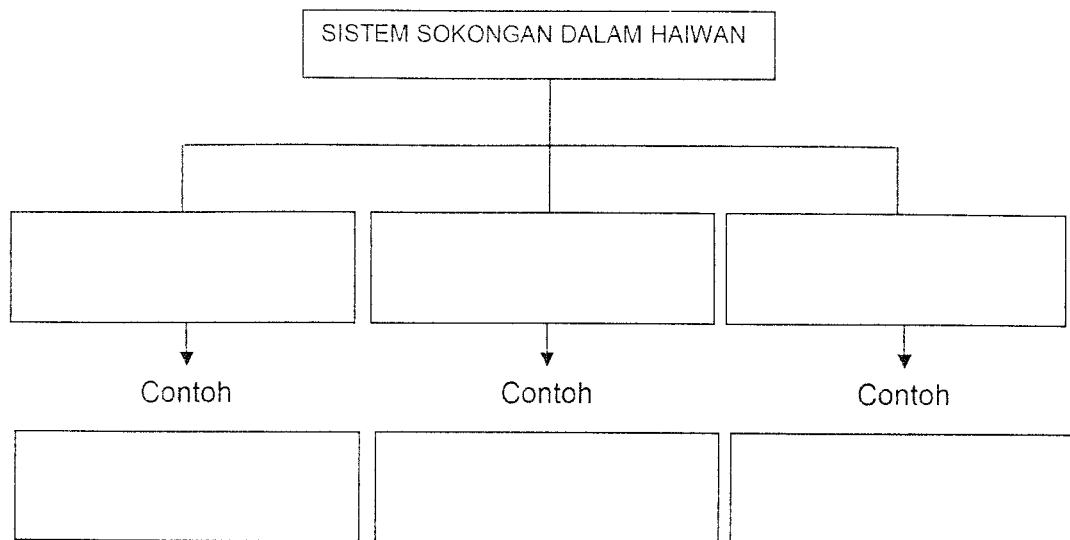
(b) Apart from the support system, state two other characteristics that can be used to classify the animals P, Q, R, S, T and U.

i. \_\_\_\_\_

ii. \_\_\_\_\_

[2 marks]





RAJAH 7.1

- (b) Selain daripada sistem sokongan, nyatakan dua ciri lain yang boleh digunakan untuk mengelaskan haiwan P, Q, R, S, T dan U. [6 markah]

i. \_\_\_\_\_

ii. \_\_\_\_\_

[2 markah]

8. Figure 8 shows an experiment to study the transfer of heat in different types of metals. A strip of pink cobalt chloride paper is wrapped at the end of each rod. The time taken for the pink cobalt chloride to turn blue is taken with a stopwatch as shown in Figure 8.1.

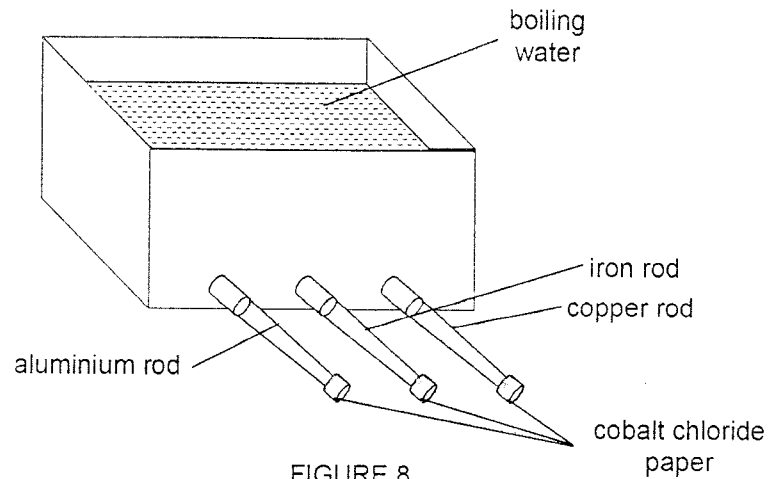


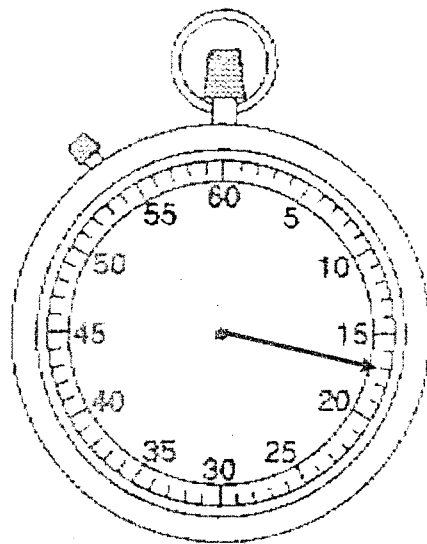
FIGURE 8

- (a) How is heat transferred from the hot water to the rods?

---

[ 1 mark ]

- (b) Based on the following figures, record the readings of the stopwatches in Table 5.

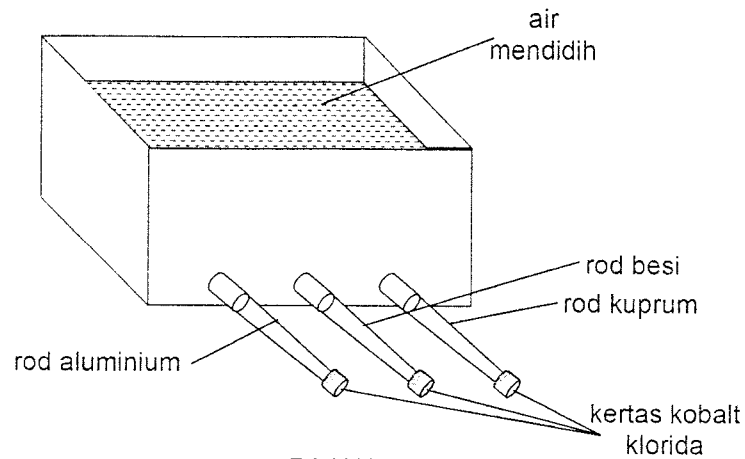


Copper rod

$t = 17.0$  seconds

FIGURE 8.1(i)

8. Rajah 8 menunjukkan satu eksperimen untuk mengkaji pemindahan haba dalam berbagai jenis logam. Satu jalur kertas kobalt klorida berwarna jambu merah dibalut di setiap hujung rod logam. Masa untuk perubahan warna kertas kobalt klorida merah jambu menjadi biru diambil dengan menggunakan jam randik. Bacaan jam randik ditunjukkan dalam Rajah 8.1.

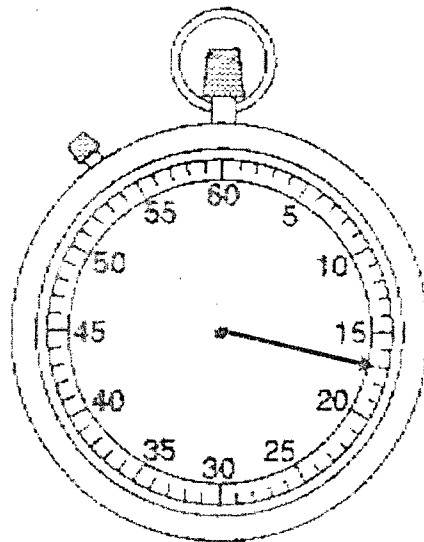


RAJAH 8

- (a) Bagaimanakah haba dipindahkan dari air panas kepada rod-rod logam?

[ 1 markah ]

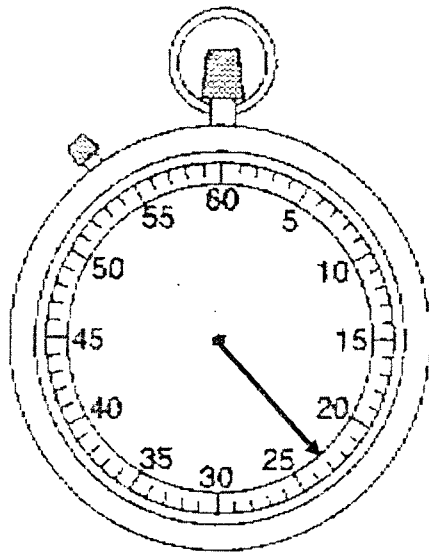
- (b) Berdasarkan rajah berikut, rekodkan bacaan jam randik di dalam Jadual 5.



Rod kuprum

$t = 17.0$  saat

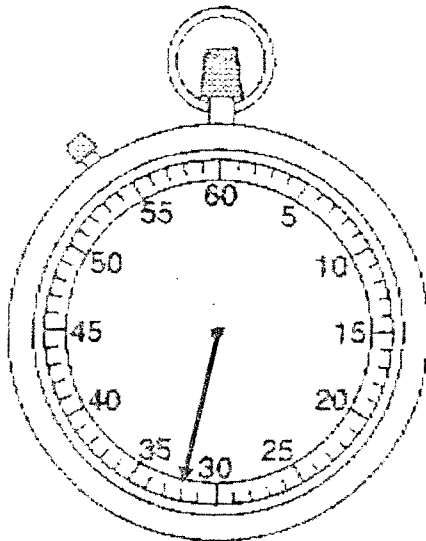
RAJAH 8.1(i)



Aluminium rod

$t_2 = \dots\dots\dots$  seconds

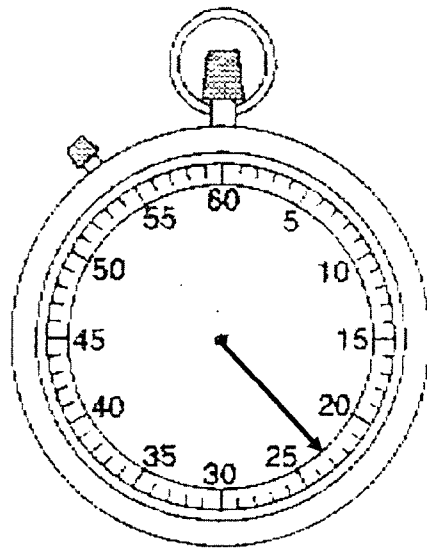
FIGURE 8.1(ii)



Iron rod

$t_3 = \dots\dots\dots$ seconds

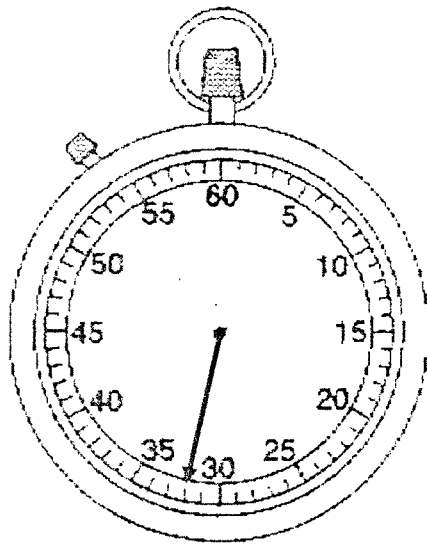
FIGURE 8.1 (iii)



Rod aluminium

$t_2 = \dots\dots\dots$  saat

RAJAH 8.1(ii)



Rod besi

$t_3 = \dots\dots\dots$  saat

RAJAH 8.1 (iii)

Type of rod	Reading on stopwatch / s
Copper	
Aluminium	
Iron	

[2 marks]

TABLE 5

(c) State the following variables:

i. Manipulated variable:

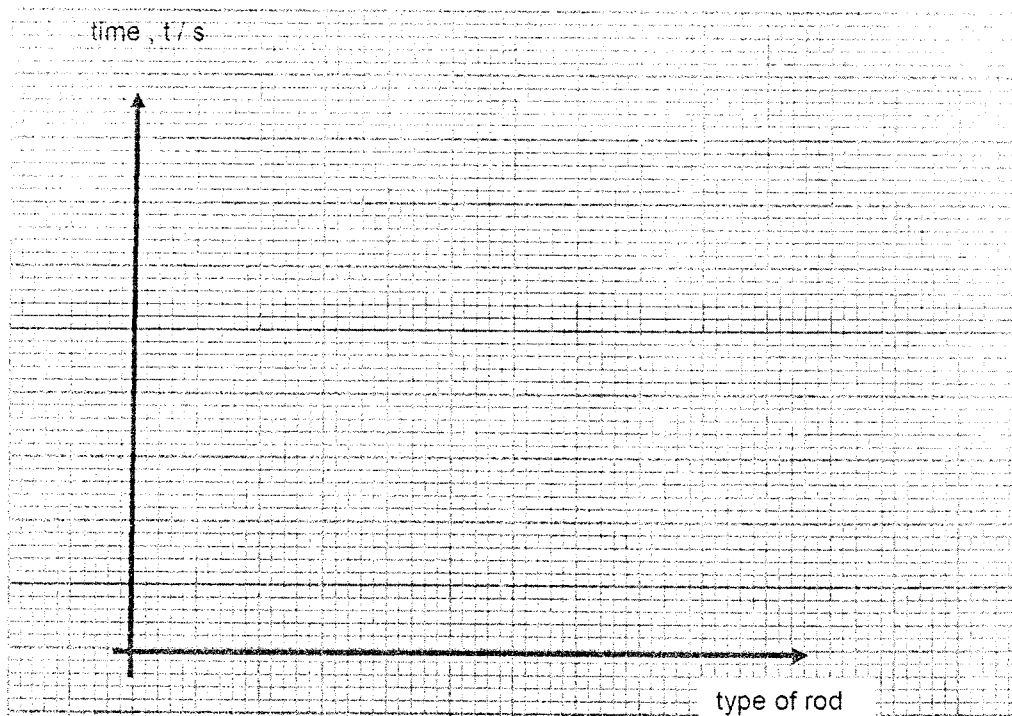
\_\_\_\_\_

ii. Responding variable:

\_\_\_\_\_

[2 marks]

(d) Draw a bar chart based on the readings in Table 5.



[2 marks]

Jenis rod	Bacaan jam randik / s
Kuprum	
Aluminium	
Besi	

[2 markah]

JADUAL 5

(c) Nyatakan pembolehubah berikut:

i. pembolehubah manipulasi:

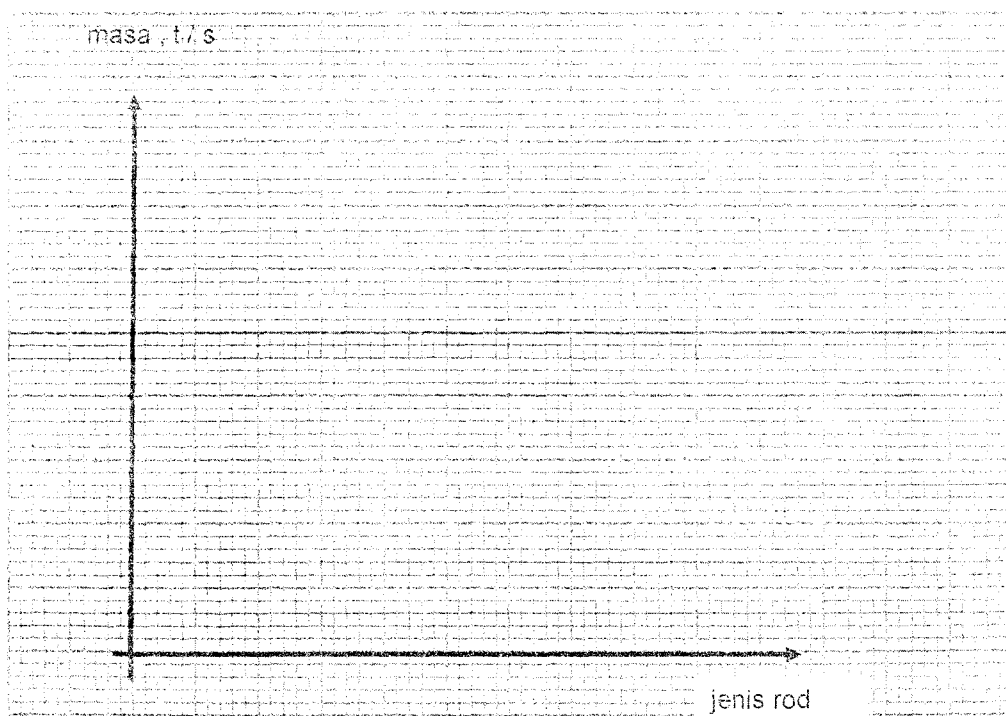
\_\_\_\_\_

ii. pembolehubah bergerak balas:

\_\_\_\_\_

[2 markah]

(d) Lukiskan satu carta bar berdasarkan bacaan dalam Jadual 5.



[2 markah]

- ( e ) Arrange the rods in descending order of their conductivity starting from the best heat conductor.



[1 mark]

- ( f ) From the bar chart drawn, what can be said about the conductivity of the rods?

\_\_\_\_\_ [1 mark]

- ( g ) Predict the time taken for the cobalt chloride paper to turn blue if a silver rod is used in this experiment.

\_\_\_\_\_ [1 mark]

- ( h ) State the relationship between the type of metal and the rate of heat conduction

\_\_\_\_\_ [1 mark]

- ( i ) Based on the activity, state the operational definition of heat conduction.

\_\_\_\_\_ [1 mark]



- ( e ) Susunkan rod-rod dalam turutan menurun bermula dari pengalir haba yang baik.



- ( f ) Dari carta bar yang dilukis, apakah yang boleh dinyatakan tentang kekonduksian haba dalam rod-rod? [1 markah]

\_\_\_\_\_ [1 markah]

- ( g ) Ramalkan masa yang diambil untuk warna kertas kobalt klorida bertukar ke biru jika rod kuprum digantikan dengan rod perak dalam eksperimen ini.

\_\_\_\_\_ [1 markah]

- ( h ) Nyatakan perhubungan di antara jenis logam dan kadar konduksi haba.

\_\_\_\_\_ [1 markah]

- ( i ) Berdasarkan aktiviti, nyatakan definisi operasi konduksi haba.

\_\_\_\_\_ [1 markah]

