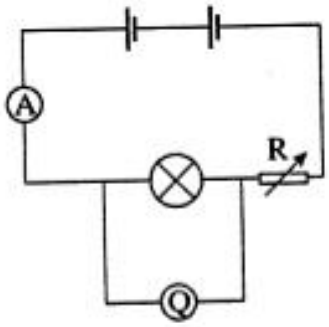
KOLEKSI SOALAN-SOALAN KERTAS 2 FIZIK PERCUBAAN SPM 2024
BAB 3 TINGKATAN 5: ELEKTRIK / *ELECTRICITY*

1. TERENGGANU 2024

1. Rajah 1.1 di bawah menunjukkan sebuah litar elektrik.
Diagram 1.1 *below shows an electric circuit.*



Rajah 1.1
Diagram 1.1

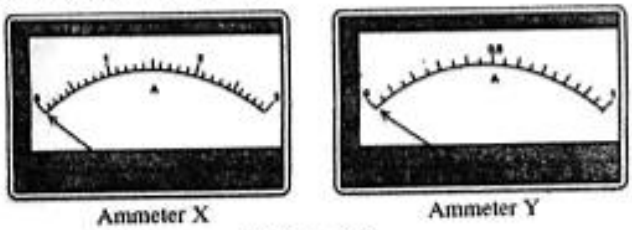
(a) (i) Namakan alat Q.
Name instrument Q.

.....
[1 *markah*]
[1 *mark*]

(ii) Apakah fungsi R dalam litar?
What is the function of R *in the circuit?*

.....
[1 *markah*]
[1 *mark*]

(b) Rajah 1.2 di bawah menunjukkan dua jenis ammeter, X dan Y, yang boleh digunakan dalam litar pada Rajah 1.1 di atas.
Diagram 1.2 *below shows two types of ammeters,* X *and* Y, *that can be used in the circuit in Diagram* 1.1 *above.*



Rajah 1.2
Diagram 1.2

(i) Manakah ammeter yang lebih peka?
Which ammeter is more sensitive?

.....

[1 *markah*]
[1 *mark*]

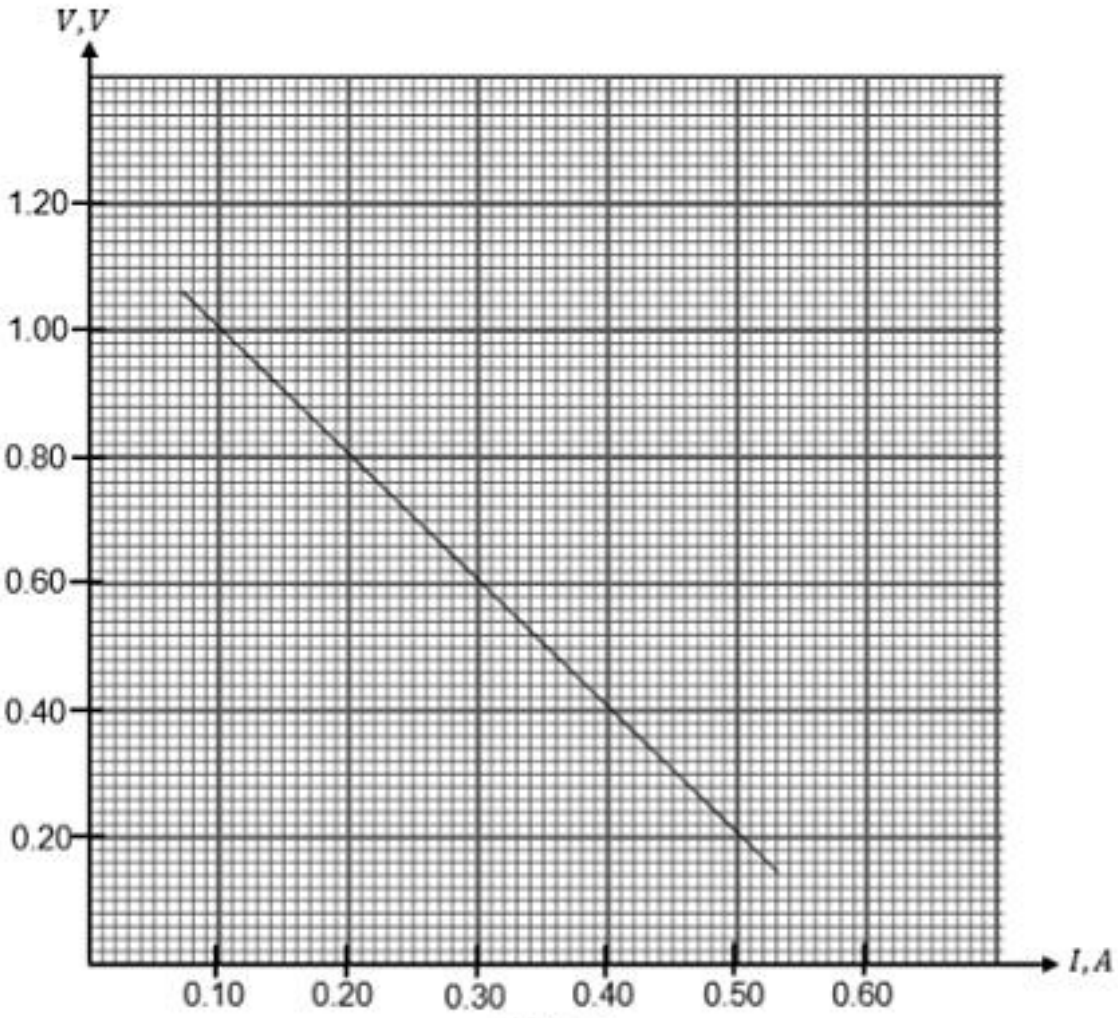
(ii) Nyatakan **satu** sebab bagi jawapan di (b)(i).
*State **one** reason for your answer in* (b)(i).

.....

[1 *markah*]
[1 *mark*]

MELAKA 2024

1 Rajah 1 menunjukkan keputusan eksperimen bagi menentukan hubungan antara beza keupayaan merentasi sel kering, V dengan arus yang mengalir, I.
Diagram 1 shows a result of an experiment to determine the relationship between the potential difference across the dry cell, V and the current flowing, I.



Rajah 1
Diagram 1

(a) Berdasarkan Rajah 1,
Based on Diagram 1,

(i) apakah yang berlaku pada beza keupayaan, V apabila arus, I meningkat.
what happens to the potential difference, V when the current, I increases.

.....

[1 *markah*]
[1 *mark*]

(ii) tentukan nilai *V* apabila *I* = 0.00 A.
Tunjukkan bagaimana nilai *V* ditentukan pada graf dalam Rajah 1.
determine the value of V of when I = 0.00 A.
Show how the value of V is determined on the graph in Diagram 1.

V = ...*V*

[2 *markah*]
[2 *marks*]

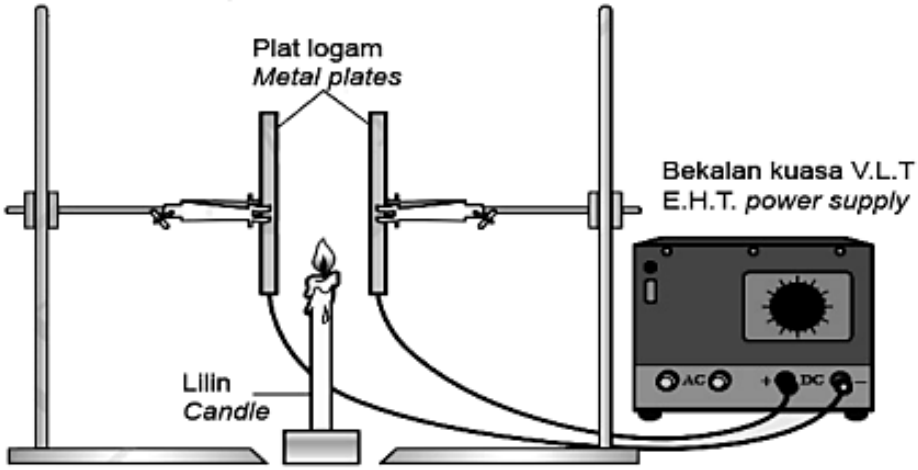
(b) Apakah yang berlaku kepada kecerunan graf apabila bilangan sel kering ditambah dan dipasang secara bersiri.
What happens to the slope of the graph when the number of dry cells is added and connected in series.

.....

[1 *markah*]
[1 *mark*]

KELANTAN 2024

4 Rajah 4.1 menunjukkan susunan radas untuk mengkaji kelakuan zarah bercas di dalam suatu medan elektik.
Diagram 4.1 *showing the arrangement of apparatus to study the behavior of charged particles in an electric field.*



Rajah 4.1
Diagram 4.1

(a) Apakah yang dimaksudkan dengan kekuatan medan elektrik?
What is meant by the electric field strength?

.....

.....

[1 *markah*]
[1 *mark*]

(b) Berdasarkan Rajah 4.1, terangkan apakah yang akan berlaku kepada nyalaan lilin apabila bekalan kuasa voltan lampau tinggi, V.L.T. dihidupkan?
Based on the Diagram 4.1, *explain what will happen to the candle flame when the extra high tension voltage,* E.H.T *is turn on*?

.....

.....

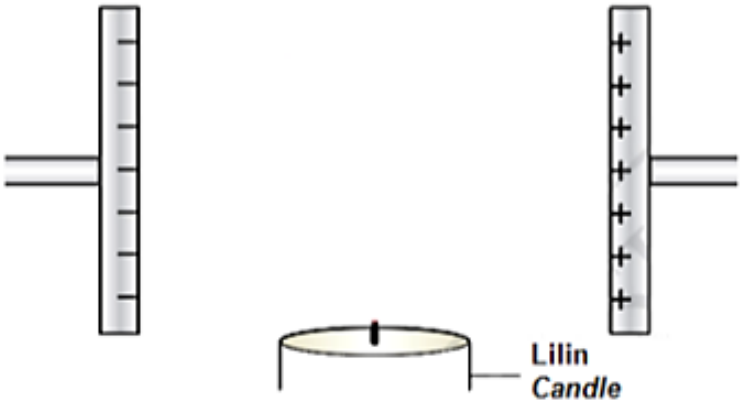
.....

.....

[3 *markah*]
[3 *mark*]

(c) Berdasarkan Rajah 4.1,
Based on Diagram 4.1,

(i) lakar bentuk nyalaan lilin pada Rajah 4.2.
sketch the shape of candle flame in Diagram 4.2.



Rajah 4.2
Diagram 4.2

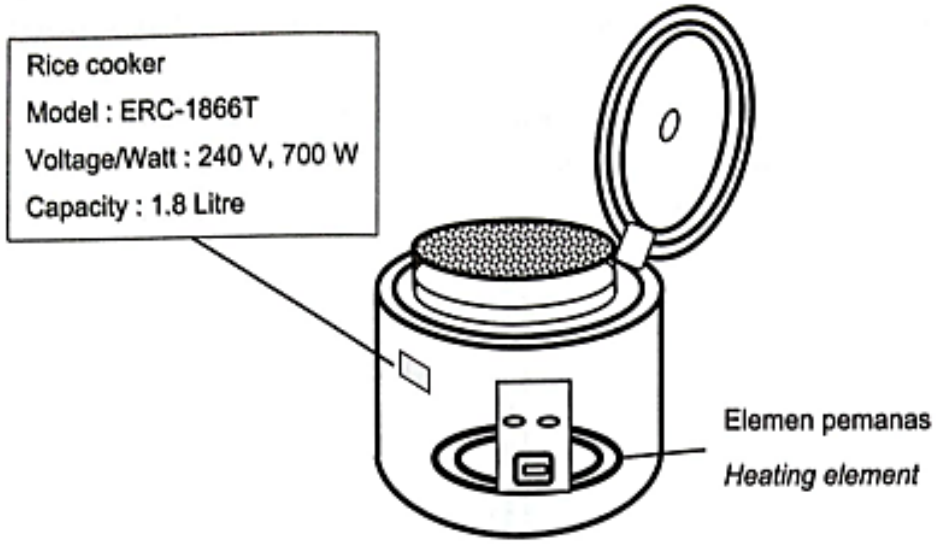
[2 *markah*]
[2 *mark*]

(ii) Satu cas 2 C diletakkan dalam satu medan elektrik dan mengalami daya elektrik 0.0032 kN.
Hitung kekuatan medan elektrik yang bertindak ke atas cas itu?
A 2 C *charge is placed in an electric field and experiences an electric force of* 0.0032 kN.
Calculate the strength of the electric field acting on the charge?

[3 *markah*]
[3 *mark*]

KEDAH 2024

4 Rajah 4 menunjukkan sebuah periuk nasi elektrik dengan label kadar kuasa.
Diagram 4 shows a rice cooker with the power rating label.



Rajah 4
Diagram 4

(a) Apakah yang dimaksudkan dengan 240 V, 700 W pada label periuk nasi elektrik itu?
What is meant by 240 V, 700 W on the label of the rice cooker?

.....

[1 markah]
[1 *mark*]

(b) (i) Nyatakan perubahan tenaga yang berlaku dalam periuk nasi elektrik tersebut.
State the energy changes that occur in the rice cooker.

.....

[1 markah]
[1 *mark*]

(ii) Berikan **satu** cara untuk meningkatkan tenaga haba yang dihasilkan oleh elemen pemanas.
*Give **one** way to increase the heat energy produced by the heating element.*

.....

[1 markah]
[1 *mark*]

(c) (i) Periuk nasi elektrik dalam Rajah 4 digunakan setiap hari selama 1 jam.
Hitung tenaga yang digunakan dalam tempoh 30 hari dalam unit kW j.
The rice cooker in Diagram 4 is used every day for 1 hour.
Calculate the energy consumption in 30 days in unit kW h.

[3 markah]
[3 *marks*]

(ii) Diberi kos penggunaan tenaga ialah RM 0.218 seunit.
Hitung kos penggunaan periuk nasi elektrik digunakan selama 30 hari.
Given the cost of energy consumed is RM 0.218 per unit.
Calculate the cost of energy consumed by the rice cooker in 30 days.

[2 markah]
[2 *marks*]

(d) Berikan **satu** cadangan untuk menjimatkan penggunaan tenaga semasa menggunakan alat dalam Rajah 4 di atas.
***Give one** suggestion to save energy consumption when using the tool in Diagram 4 above.*

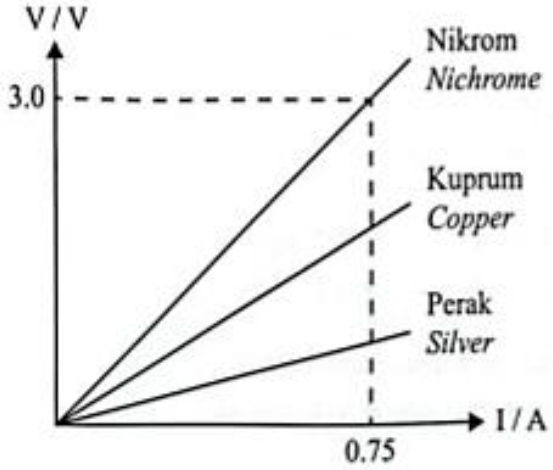
.....

[1markah]
[1 *mark*]

SELANGOR (MODUL PINTAS) SET 1 2024

5 Seorang murid telah menjalankan satu eksperimen untuk mengkaji hubungan antara beza keupayaan, V dan arus, I bagi konduktor yang berbeza. Graf V melawan I yang diplotkan daripada data eksperimen adalah ditunjukkan dalam Rajah 5.

A student has conducted an experiment to study the relationship between potential difference, V and current, I for different conductors. A graph of V against I plotted from the experimental data is shown in Diagram 5.



Rajah 5
Diagram 5

(*a*) Apakah maksud beza keupayaan?
What is meant by potential difference?

.....

.....

[1 *markah*]
[1 *mark*]

(*b*) Berdasarkan Rajah 5, hitung rintangan bagi nikrom.
Based on Diagram 5, calculate the resistance for nichrome.

[2 *markah*]
[2 *marks*]

(c) Berdasarkan Rajah 5,
Based on Diagram 5,

(i) bandingkan kecerunan graf V melawan I dan rintangan bagi nikrom, kuprum dan perak.
compare the gradient of V *against* I *graph and the resistance for nichrome, copper and silver.*

.....

.....

[2 *markah*]
[2 *marks*]

(ii) tentukan konduktor yang mempunyai kerintangan yang paling rendah.
determine the conductor with the lowest resistivity.

.....

[1 *markah*]
[1 *mark*]

(d) Berdasarkan jawapan di 5(*c*), nyatakan hubungan antara:
Based on the answer in 5(*c*), *state the relationship between*:

(i) kecerunan graf V melawan I dan rintangan.
the gradient of V *against* I *graph and the resistance.*

.....

[1 *markah*]
[1 *mark*]

(ii) kerintangan dan rintangan.
the resistivity and the resistance.

.....

[1 *markah*]
[1 *mark*]

(e) Berdasarkan jawapan di 5(*d*), konduktor manakah yang paling sesuai dijadikan sebagai elemen pemanas dalam periuk nasi?
Based on the answer in 5(*d*), *which conductor is most suitable to be used as a heating element in rice cooker?*

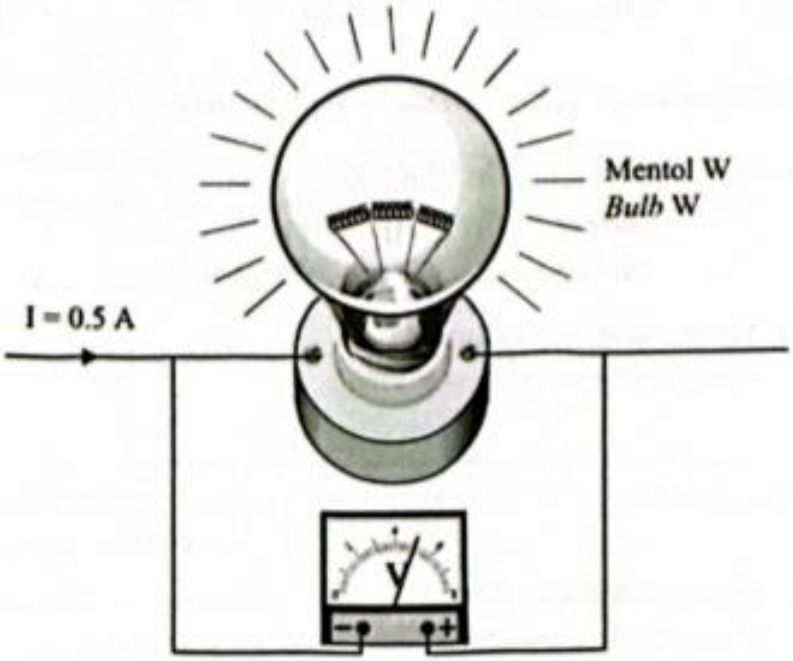
.....

[1 *markah*]
[1 *mark*]

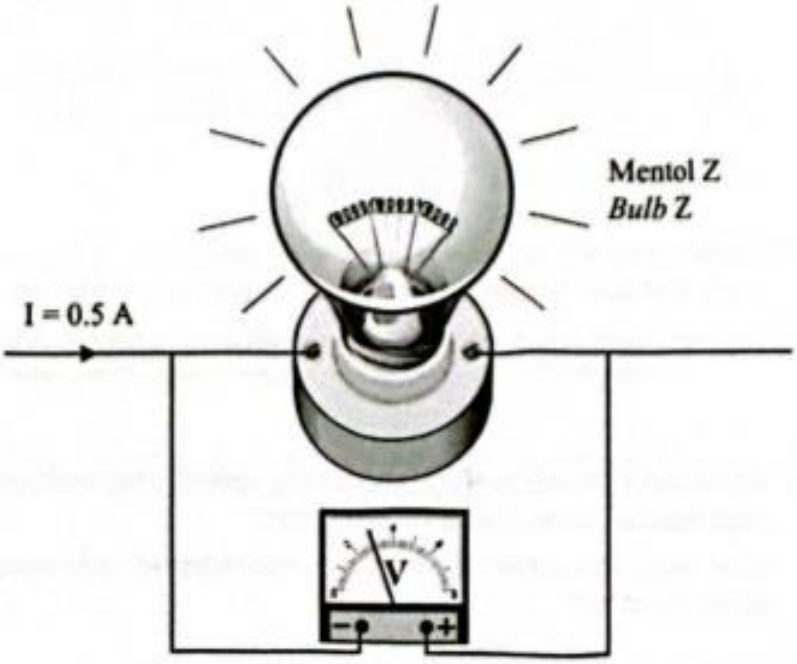
SELANGOR (MODUL PINTAS) SET 2 2024

5 Rajah 5.1 dan Rajah 5.2 menunjukkan kecerahan mentol W dan mentol Z apabila arus, I mengalir di dalamnya.

Diagram 5.1 and Diagram 5.2 show the brightness of bulb W and bulb Z when current, I flows in them.



Rajah 5.1
Diagram 5.1



Rajah 5.2
Diagram 5.2

(a) Apakah maksud arus?
What is meant by current?

.....

[1 markah]
[1 mark]

(b) Berdasarkan Rajah 5.1 dan Rajah 5.2, bandingkan:
Based on Diagram 5.1 and Diagram 5.2, compare:

(i) voltan merentasi mentol
the voltage across the bulb

.....

[1 markah]
[1 mark]

(ii) bilangan lilitan gegelung dawai filamen
the number of turns of coil of filament wire

.....

[1 markah]
[1 mark]

(iii) rintangan dawai filamen
the resistance of filament wire

.....

[1 markah]
[1 mark]

(iv) nyalaan mentol
the brightness of bulb

.....

[1 markah]
[1 mark]

(c) Berdasarkan jawapan dalam 5(b), hubung kaitkan
Based on the answer in 5(b), relate

(i) bilangan lilitan gegelung dawai filamen dengan rintangan dawai filamen
the number of turns of coil of filament wire to the resistance of filament wire

.....

[1 *markah*]
[1 *mark*]

(ii) rintangan dawai filamen dengan nyalaan mentol
the resistance of filament wire to the brightness of bulb

.....

[1 *markah*]
[1 *mark*]

(d) Diberi; Panjang dawai filamen mentol W = 2.0 m
Diameter dawai filamen mentol W = 3×10^{-4} m
Kerintangan dawai filamen mentol W = 5.6×10^{-8} Ω m

Hitung rintangan dawai filamen mentol W.

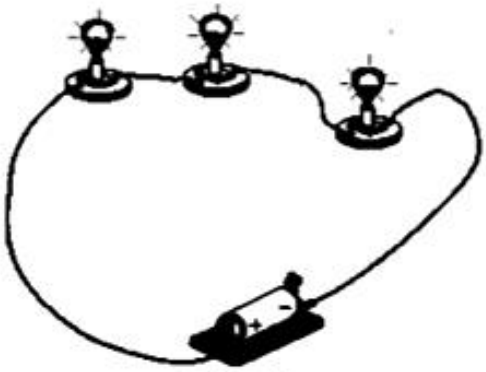
Given; *The length of filament wire of bulb* W = 2.0 m
The diameter of filament wire of bulb W = 3×10^{-4} m
The resistivity of filament wire of bulb W = 5.6×10^{-8} Ω m

Calculate the resistance of filament wire of bulb W.

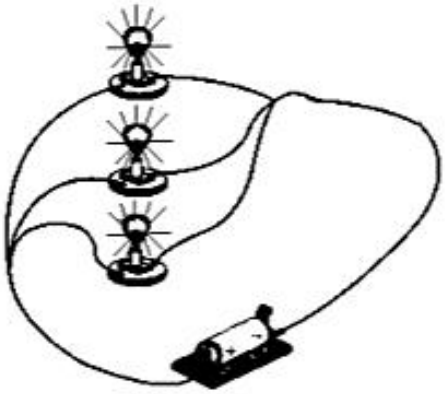
[2 *markah*]
[2 *marks*]

SMKA & SABK 2024

6. Mentol berfilamen yang serupa berlabel 3V, 6W disusun dalam dua cara yang berbeza dan disambungkan ke bateri 3V.
Similar filament bulbs labeled 3V, 6W *are arranged in two different ways and connected to* 3V *battery.*



Rajah 6.1
Diagram 6.1



Rajah 6.2
Diagram 6.2

(a) Apakah yang dimaksudkan dengan label 3V, 6W?
What does the label 3V, 6W mean?

.....

[1 *markah*]
[1 *mark*]

(b) Perhatikan Rajah 6.1 dan Rajah 6.2. Bandingkan,
Observe Diagram 6.1 *and Diagram* 6.2. *Compare,*

(i) jenis susunan litar
type of circuit arrangement

.....

[1 *markah*]
[1 *mark*]

(ii) kecerahan mentol-mentol
bulbs brightness

.....

[1 *markah*]
[1 *mark*]

(iii) rintangan litar
circuit resistance

.....

[1 *markah*]
[1 *mark*]

(c) Berdasarkan jawapan anda di 6(b)(i), 6(b)(ii) dan 6(b)(iii), hubungkaitkan
Based on your answer in 6(b)(i), 6(b)(ii) *and* 6(b)(iii), *relate*

(i) jenis susunan litar dengan kecerahan mentol-mentol
type of circuit arrangement and bulbs brightness

.....

[1 *markah*]
[1 *mark*]

(ii) kecerahan mentol-mentol dengan rintangan litar
bulbs brightness and circuit resistance

.....

[1 *markah*]
[1 *mark*]

(d) Rajah 6.3 menunjukkan sebuah inkubator mengeram telur.
Diagram 6.3 *shows an incubator incubating eggs.*

Rajah 6.3
Diagram 6.3

(i) Berdasarkan Rajah 6.1 dan Rajah 6.2, susunan mentol manakah yang paling sesuai digunakan oleh pelajar itu untuk memanaskan inkubator tersebut.
Based on Diagram 6.1 *and* 6.2, *Which arrangement of bulbs is most suitable for the student to use to heat the incubator.*

.....

[1 *markah*]
[1 *mark*]

(ii) Berikan **dua** sebab jawapan anda di (d)(i)
Give ***two*** *reason for your answer in* (d)(i)

.....

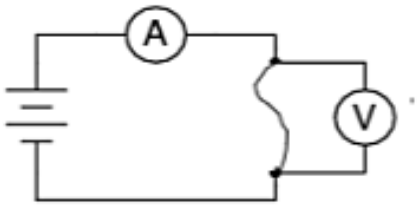
.....

[2 *markah*]
[2 *marks*]

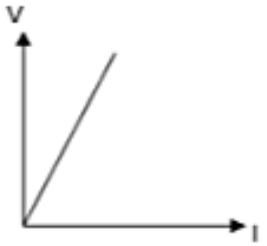
PERLIS 2024

6. Rajah 6.1 (a) dan 6.2 (a) menunjukkan dua susunan litar yang mengkaji hubungan antara beza keupayaan dengan arus dalam satu dawai pengalir. Rajah 6.1 (b) dan 6.2 (b) menunjukkan graf beza keupayaan melawan arus yang sepadan dengan Rajah 6.1 (a) dan 6.2 (a) masing-masing. Rintangan bagi dawai pengalir tersebut diwakili oleh kecerunan graf.

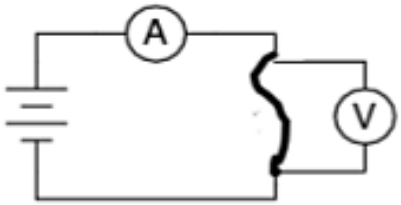
Diagram 6.1 (a) *and* 6.2 (a) *show two circuit set ups that investigate the relationship between potential difference and electrical current in a conductor wire. Diagram* 6.1 (b) *and* 6.2 (b) *show the graphs of potential difference against electrical current that matches with Diagram* 6.1 (a) *and* 6.2 (a) *respectively. The resistance of the conductor wire is represented by the gradient of the graph*



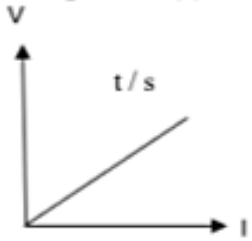
Rajah 6.1(a)
Diagram 6.1(a)



Rajah 6.1(b)
Diagram 6.1(b)



Rajah 6.2(a)
Diagram 6.2(a)



Rajah 6.2(b)
Diagram 6.2(b)

(a) Apakah maksud rintangan?
What is the meaning of resistance?

_____

[1 markah / *mark*]

(b) Berdasarkan Rajah 6.1 dan 6.2, bandingkan
Based on Diagram 6.1 *and* 6.2, *compare*

(i) ketebalan dawai pengalir
thickness of constantan wire

_____

[1 markah / *mark*]

(ii) rintangan bagi dawai pengalir

resistance of the conductor wire

_____

[1 markah / *mark*]

(c) Hubungkaitkan ketebalan dawai dengan rintangan.

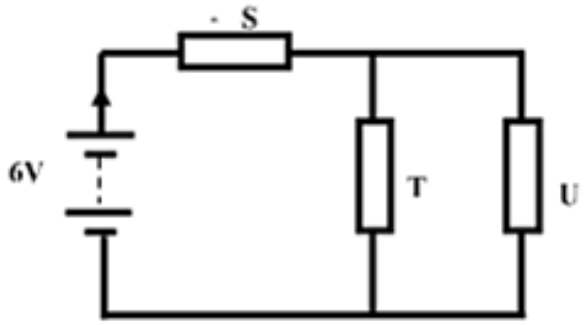
Relate the thickness of conductor wire with resistance.

_____

[1 markah / *mark*]

(d) Rajah 6.3 menunjukkan tiga perintang S, T dan U dengan nilai rintangan setiap satu ialah 20 Ω yang disambungkan ke satu sel kering 6 V membentuk satu litar lengkap.

Diagram 6.3 *shows three resistors* S, T *and* U *with resistance* of 20 Ω *each that are connected to a* 6 V *dry cell forming a complete circuit.*



Rajah / *Diagram* 6.3

Berdasarkan Rajah 6.3, hitung / *Based on Diagram* 6.3, *calculate*

(i) rintangan berkesan litar itu. / *effective resistance of the circuit.*

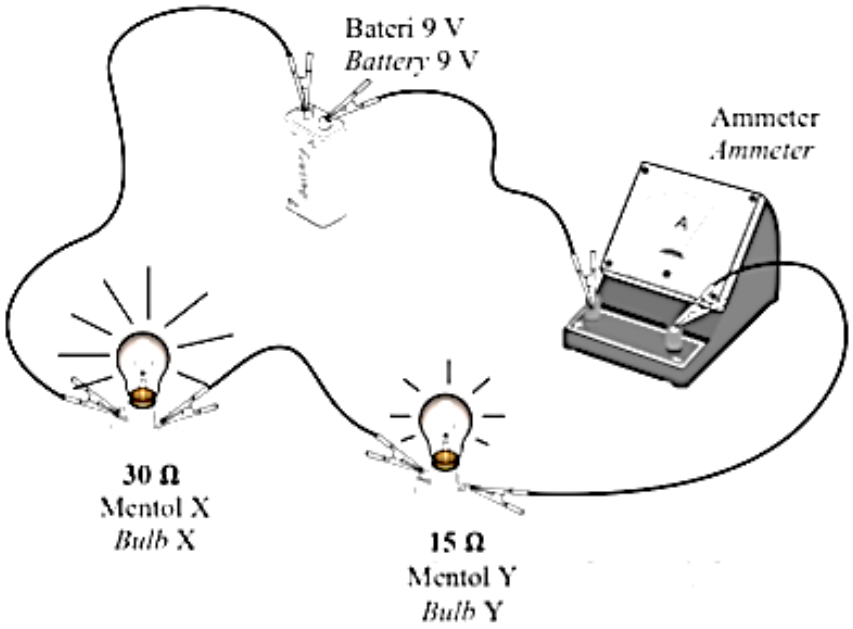
[2 markah/ *marks*]

(ii) kuasa yang dilesapkan oleh perintang S / *power dissipated by resistor* S

[3 markah/ *marks*]

PAHANG JUJ SET 1 2024

6 Rajah 6 menunjukkan satu litar elektrik mengandungi dua mentol X dan Y yang berbeza rintangan.
Diagram 6 shows an electric circuit that consists of two bulbs X *and* Y *of different resistance.*



Rajah 6/ *Diagram* 6

(a) Namakan jenis sambungan litar dalam Rajah 6.
Name type of connection of the circuit in Diagram 6.

.....

[1 markah / 1 *mark*]

(b) Berdasarkan Rajah 6,
Based on Diagram 6,

(i) Hitung bacaan ammeter tersebut.
Calculate the ammeter reading.

[2 markah / 2 *mark*]

(ii) Tentukan kadar pengaliran cas dalam mentol X dalam unit C s^{-1}.
Determine the rate of charge flow in bulb X *in* C s^{-1} *unit.*

.....

[1 markah / 1 *mark*]

(c) Perhatikan mentol X dan mentol Y dan bandingkan
Observe bulb X *and bulb* Y *and compare*

(i) rintangan mentol
resistance of the bulbs

.....

[1 markah / 1 *mark*]

(ii) kecerahan mentol.
brightness of the bulbs.

.....

[1 markah / 1 *mark*]

(iii) kuasa yang terlesap pada setiap mentol.
power dissipated by each bulb.

.....

[1 markah / 1 *mark*]

(d) Berdasarkan jawapan anda dalam **6**(c).
Based on your answer in **6**(c).

(i) hubungkaitkan hubungan antara kecerahan mentol dan rintangan.
relate the relationship between the brightness of the bulb and resistance.

.....

[1 markah / 1 *mark*]

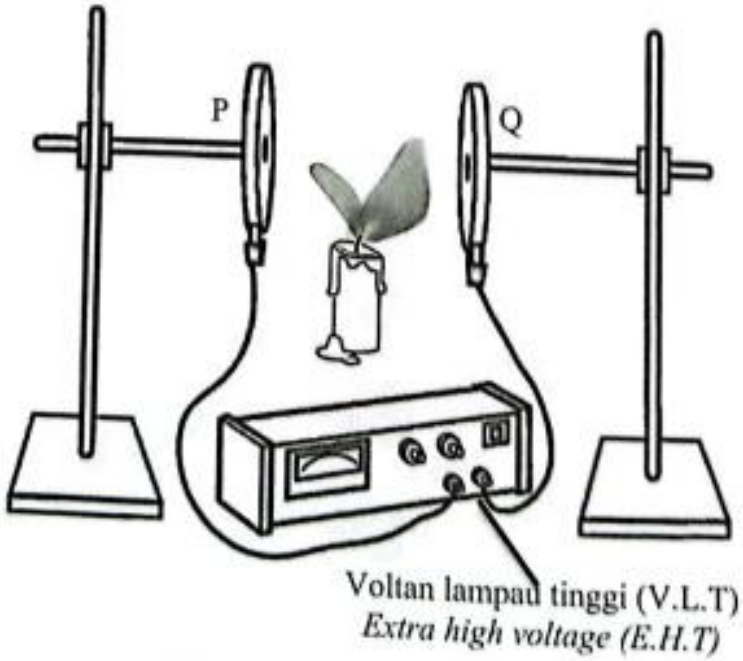
(ii) deduksi hubungan antara rintangan mentol dan kuasa yang terlesap.
deduce the relationship between the resistance of the bulb and power dissipated.

.....

[1 markah / 1 *mark*]

JOHOR 2024

7 Rajah 7.1 menunjukkan dua plat logam P dan Q disambungkan kepada bekalan voltan lampau tinggi, 2000 V Apabila suis dihidupkan, satu medan elektrik terhasil di antara dua plat tersebut dan nyalaan lilin tersebar.
Diagram 7.1 shows two medal plates P and Q connected to extra high voltage supply, 2000 V. When the switch is turned on, an electric force is produced between two plates and the candle flame spread out.



Rajah 7.1 / *Diagram 7.1*

(a) Apakah yang dimaksudkan dengan medan elektrik?
What is the meaning of electric field?

.....

[1 markah/ 1 *mark*]

(b) Tandakan (✓) pada jawapan yang betul
Tick (✓) for the correct answer

Cas plat P ialah ...
Charge plate P *is* ...

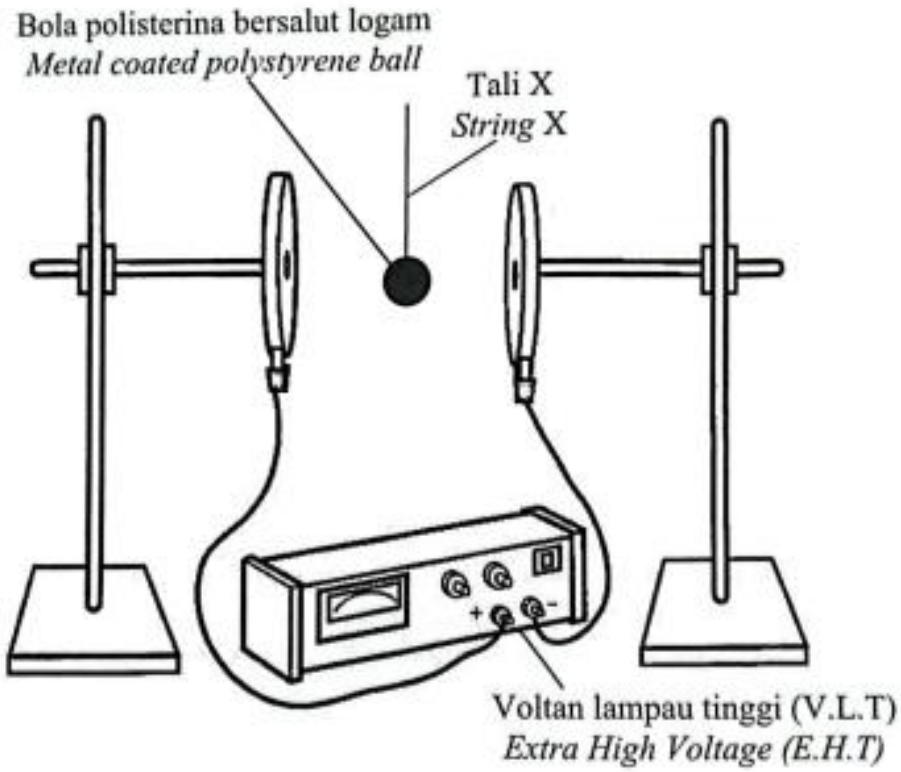
Positif *Positive*	
Negatif *Negative*	

1 markah/ 1 *mark*]

(c) Jika jarak di antara dua plat ialah 30 cm, hitung kekuatan medan elektrik yang dihasilkan di antara dua plat tersebut
If the distance between two plates is 30 cm, *calculate the strength of the electric field produced between two plates.*

[2 markah/ 2 *marks*]

(d) Rajah 7.2 menunjukkan satu bola polisterina bersalut logam digantung di antara dua plat logam. Apabila suis dihidupkan, bola polisterina berayun di antara dua plat logam tersebut.
Diagram 7.2 shows a polystrene ball coated with metals hanging between two plates. When the switch is turned on, the polystyrene ball oscillates between the two metals.



Rajah 7.2 / *Diagram 7.2*

Berdasarkan Jadual 7.1, tentukan kaedah yang paling sesuai untuk meningkatkan bilangan ayunan bola polisterina tersebut.
Based on Table 7.1, state the suitable method to increase the number of oscillation of the polystyrene ball.

Kaedah *Method*	**Jarak di antara dua plat** *Distance between two plates*	**Jenis Tali X** *Type of string X*
R	Jauh *Long*	Kuprum *Copper*
S	Jauh *Long*	Plastik *Plastic*
T	Dekat *Short*	Kuprum *Copper*
U	Dekat *Short*	Nilon *Nylon*

Jadual 7.1 / *Table 7.1*

(i) Jarak antara dua plat
Distance between two plates

.....

Sebab
Reason

.....

[2 markah/ 2 *marks*]

(ii) Jenis tali X
Type of X *string*

.....

Sebab
Reason

.....

[2 markah/ 2 *marks*]

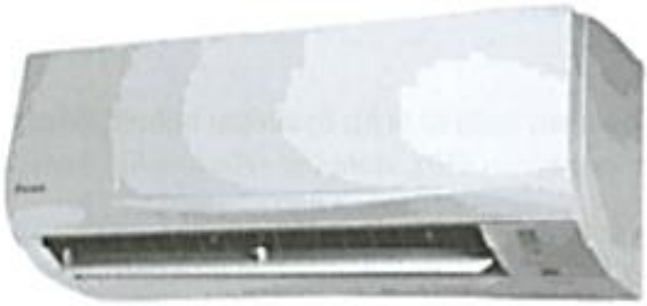
(e) Berdasarkan jawapan anda di **7(d)**, nyatakan kaedah yang paling sesuai untuk meningkatkan bilangan ayunan bola polisterina.
Based on your answer in **7(d)**, *state the most suitable method to increase the number of oscillation of the polystyrene ball.*

.....

[1 markah/ 1 *mark*]

MRSM 2024

7 Rajah 7.1 menunjukkan sebuah penyaman udara berlabel 240 V, 1500 W.
Diagram 7.1 shows an air conditioner labelled 240 V, 1500 W.



Rajah 7.1
Diagram 7.1

(*a*) Apakah maksud 240V, 1500W?
What is the meaning of 240V, 1500 W?

.....

.....

[1 markah]
[1 *mark*]

(*b*) Hitung arus elektrik yang mengalir melalui penyaman udara tersebut.
Calculate the electric current flows through the air conditioner.

[1 markah]
[1 *mark*]

(c) Jadual 1 menunjukkan perbandingan di antara tiga jenis penyaman udara.
Table 1 shows the comparison between three type of air conditioners.

Jenis ***Type***	**Sistem penyaman udara** ***Air conditioner system***	**Kuasa elektrik** ***Electrical power*** **(kW)**	**Penyesuai rangkaian** ***Network adapter***
P	Penyongsang *Inverter*	0.735	Wifi
Q	Bukan penyongsang *Non-inverter*	2.205	Tiada wifi *No wifi*
R	Penyongsang *Inverter*	3.675	Wifi

Jadual 1
Table 1

Berdasarkan Jadual 1, nyatakan ciri-ciri penyaman udara yang sesuai untuk digunakan dalam bilik yang besar dengan cekap
Based on Table 1, state the suitable characteristics of air conditioner to be used in a large room efficiently.

(i) Sistem penyaman udara.
Air conditioner system.

.....

Sebab
Reason

.....
[2 markah]
[2 *marks*]

(ii) Kuasa elektrik.
Electrical power.

.....

Sebab
Reason

.....
[2 markah]
[2 *marks*]

(iii) Penyesuai rangkaian.
Network adapter

.....

Sebab
Reason

.....

[2 markah]
[2 *marks*]

(*d*) Berdasarkan jawapan anda di 7(*c*), pilih penyaman udara yang paling sesuai.
Based on your answer in 7(*c*), *choose the most suitable air conditioner.*

.....

[1 markah]
[1 *mark*]

SARAWAK (BETONG) 2024

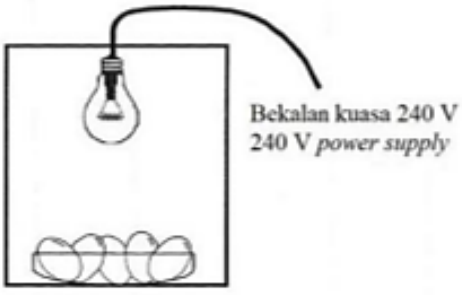
7 Rajah 7.1 menunjukkan sebuah mentol filamen berlabel 240 V, 40 W.
Diagram 7.1 shows a filament bulb labelled 240 V, 40 W.

Rajah 7.1/*Diagram 7.1*

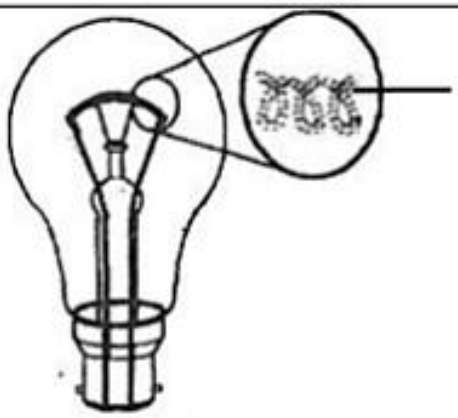
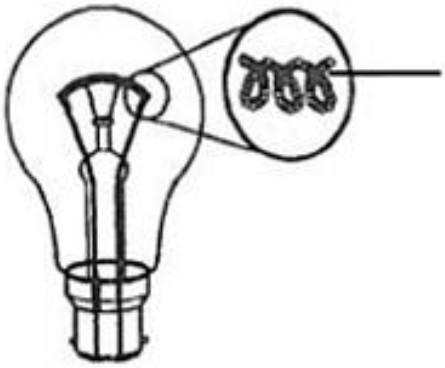
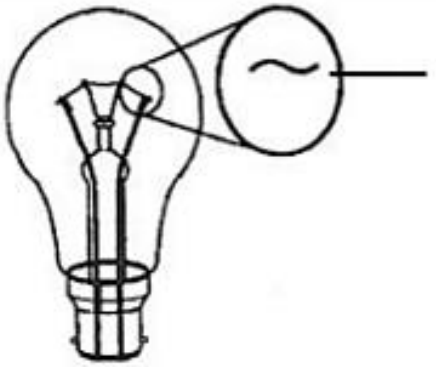
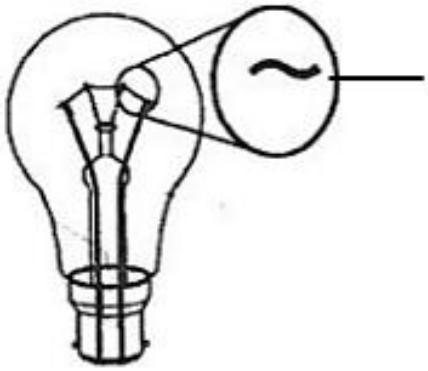
(a) Hitung tenaga haba yang dihasilkan dalam satu saat, jika kecekapan mentol itu ialah 80%.
Calculate the heat energy produced in one second, if the efficiency of the bulb is 80%.

[2 markah/*marks*]

(b) Rajah 7.2 menunjukkan mentol filamen itu digunakan dalam mesin inkubator penetasan telur. Inkubator itu menggunakan tenaga haba yang dihasilkan oleh filamen pemanas untuk mengeramkan telur.
Jadual 1 menunjukkan reka bentuk dan ciri-ciri bagi empat mentol filamen P, Q, R dan S.
Diagram 7.2 shows the filament bulb is used in an egg incubator. The incubator uses heat energy produced by the heating filament to incubate the eggs.
Table 1 shows the design and characteristics of four filament bulbs P, Q, R and S.



Rajah 7.2/*Diagram 7.2*

P	 Dawai tungsten, nipis dan bergegelung *Tungsten wire, thin and coiled*
Q	 Dawai kuprum, tebal dan bergegelung *Copper wire, thick and coiled*
R	 Dawai kuprum, nipis dan tidak bergegelung *Copper wire, thin and uncoiled*
S	 Dawai tungsten, tebal dan tidak bergegelung *Tungsten wire, thick and uncoiled*

Jadual 1/*Table 1*

Berdasarkan Jadual 1, nyatakan ciri yang sesuai bagi filamen pemanas itu.
Beri **satu** sebab bagi kesesuaian setiap ciri-ciri tersebut.
Based on Table 1, state the suitable characteristics of the heating filament.
*Give **one** reason for the suitability of each characteristics.*

(i) Jenis dawai
Type of wire

.....

Sebab
Reason

.....

[2 markah/*marks*]

(ii) Luas keratan rentas dawai
Cross-section area of wire

.....

Sebab
Reason

.....

[2 markah/*marks*]

(iii) Struktur dawai
Structure of wire

.....

Sebab
Reason

.....

[2 markah/*marks*]

(c) Berdasarkan jawapan di 7(b), tentukan mentol yang paling sesuai digunakan dalam alat pengeram.
Based on the answer in 7(b), determine the most suitable bulb used in the incubator.

.....

[1 markah/*mark*]

NEGERI SEMBILAN 2024

7 Rajah 7 menunjukkan elemen struktur yang terdapat di dalam sebuah penggoreng elektrik dengan spesifikasi 240 V, 1.5 kW.
Diagram 7 shows a structure element an electric air fryer with a specification of 240 V, 1.5 kW.

Rajah 7
Diagram 7

(*a*) Apakah maksud label 240 V, 1.5 kW?
What is meant by the label 240 V, 1.5 kW*?*

.....

[1 markah]
[1 *mark*]

(*b*) Hitung jumlah tenaga elektrik jika penggoreng elektrik itu digunakan 90 minit sehari dalam masa 3 minggu?
Calculate the total electrical energy if the air fryer is used 90 *minutes per day in* 3 *weeks?*

[3 markah]
[3 *marks*]

(c) Jadual 1 menunjukkan empat jenis penggoreng elektrik Q, R, S dan T dengan spesifikasi yang berbeza.
Table 1 shows four types of air fryer Q, R, S and T with different specifications.

Penggoreng elektrik *Air fryer*	Bahan elemen pemanas *Material of heating element*	Bilangan bilah kipas *Number of fan blade*
Q	Kuprum *Copper*	12
R	Kuprum *Copper*	6
S	Nikrom *Nichrome*	12
T	Nikrom *Nichrome*	6

Jadual 1
Table 1

Berdasarkan Jadual 1, nyatakan ciri-ciri penggoreng elektrik yang sesuai digunakan supaya makanan cepat dimasak.
Based on Table 1, state the suitable characteristics of an air fryer so that the food is cooked quickly.

(i) Bahan elemen pemanas
Material of heating element

.....

Sebab
Reason

.....

[2 markah]
[2 *marks*]

(ii) Bilangan bilah kipas
Number of fan blade

.....

Sebab
Reason

.....

[2 markah]
[2 *marks*]

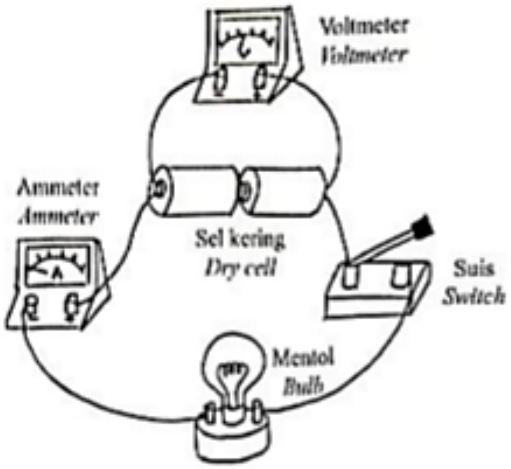
(*d*) Berdasarkan jawapan dalam 7(*c*)(i) dan 7(*c*)(ii), tentukan penggoreng elektrik yang paling sesuai.
Based on the answer in 7(*c*)(i) *and* 7(*c*)(ii), *choose the most suitable air fryer.*

.....

[1 markah]
[1 *mark*]

SARAWAK (BETONG) 2024

10 Rajah 10.1 menunjukkan susunan voltmeter, ammeter, sel kering, suis dan mentol dalam satu litar.
Diagram 10.1 shows the arrangement of voltmeter, an ammeter, dry cell, a switch and a bulb in a circuit.



Rajah 10.1/ *Diagram* 10.1

(a) Namakan kuantiti fizik yang diukur oleh voltmeter dalam litar.
Name the physical quantity measured by the voltmeter in the circuit.

[1 markah/*mark*]

(b) Apakah yang akan terjadi kepada bacaan voltmeter dan keadaan mentol apabila suis ditutup? Jelaskan jawapan anda.
What will happen to the voltmeter reading and the condition of bulb when the switch is closed? Explain your answer.

[4 markah/*marks*]

(c) Rajah 10.2 menunjukkan sebuah bank kuasa USB yang lazimnya digunakan untuk mengecas semula telefon bimbit apabila baterinya lemah. Kapasiti bank kuasa diukur dalam unit mA j. Ia merujuk kepada bilangan cas yang dapat dipindahkan kepada telefon bimbit dalam masa 1 jam.
Diagram 10.2 shows a USB power bank which is normally used to recharge a handphone when its battery runs low. The capacity of a power bank is measured in the unit of mA h. It refers to the amount of charge transferred to the handphone in an hour.

Rajah 10.2/ *Diagram 10.2*

Bank Kuasa ***Power bank***	**Kapasiti/ mA j** ***Capacity/ mA h***	**Ketumpatan/ g cm^{-3}** ***Density/ g cm^{-3}***	**Rintangan dalam /Ω** ***Internal resistance/ Ω***	**Jenis permukaan** ***Type of surface***
W	10 000	1.28	Rendah *Low*	Bertekstur *Textured*
X	10 000	2.45	Tinggi *High*	Licin *Smooth*
Y	20 000	1.28	Rendah *Low*	Bertekstur *Textured*
Z	20 000	2.48	Rendah *Low*	Licin *Smooth*

Jadual 4/ *Table 4*

Anda dikehendaki menentukan kesesuaian bank kuasa supaya pengecas telefon bimbit dapat dibuat dengan lebih cekap dan ia mudah dibawa.
You are required to determine the most suitable power bank that can recharge handphones more efficiently and is easy to carry around.

[10 markah/*marks*]

(d) Terminal output kuasa dalam Rajah 10.2 berlabel "3.85 V, 77 W"
Apabila ia disambungkan kepada sebuah telefon bimbit, hitung:
The output terminals of the power bank in Diagram 10.2 are labelled "3.85 V, 77 W".
When it is connected to a handphone, calculate:

(i) Arus yang mengalir melalui bank kuasa itu,
The current that flows through the power bank,

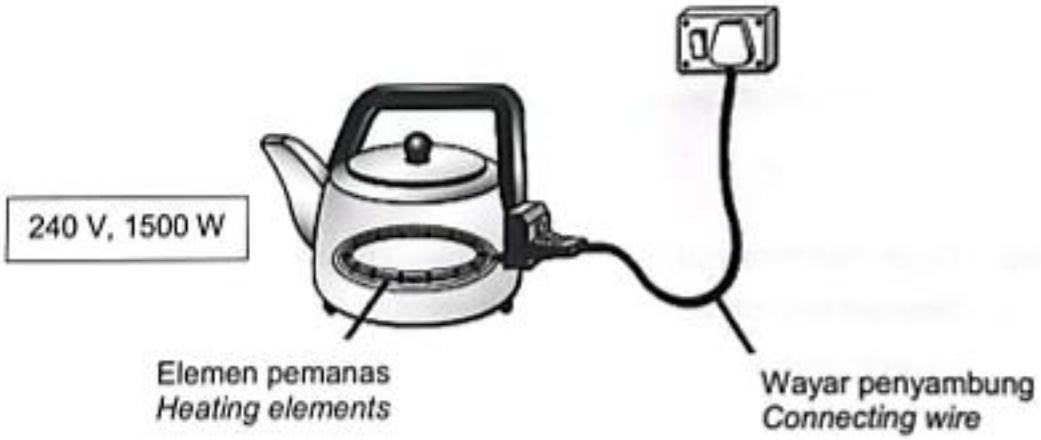
(ii) Tenaga elektrik yang hilang dalam masa 1 jam.
The electrical energy it loses in 1 hour.

[5 markah/*marks*]

PERAK 2024

10 Rajah 10.1 menunjukkan cerek elektrik berspesifikasi 240 V, 1500 W dan disambung bersama wayar penyambung.

Diagram 10.1 shows an electric kettle with specification of 240 V, 1500 W and connected with a connecting wire.



Rajah 10.1

Diagram 10.1

(a) Apakah yang dimaksudkan dengan spesifikasi 240 V, 1500 W?

What is meant by specification 240 V, 1500 W?

[1 markah / 1 *mark*]

(b) (i) Hitung jumlah tenaga elektrik yang dibekalkan dalam masa 70 minit dalam unit kWj.
Calculate the total electrical energy that is supplied for 70 minutes in unit kWh.

[3 markah / 3 *marks*]

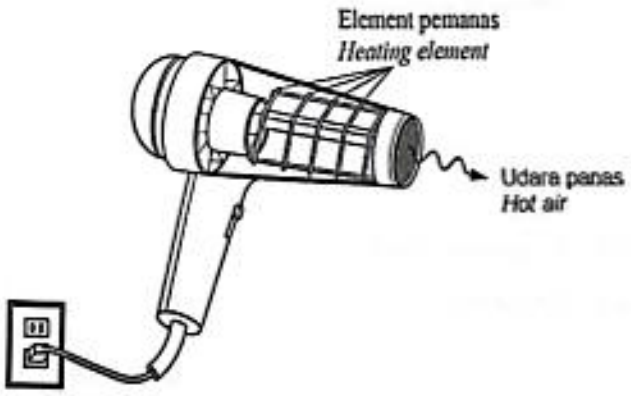
(ii) Berapakah kos penggunaan tenaga elektrik jika cerek elektrik itu digunakan 70 minit sehari selama 3 minggu?
[Tarif tenaga elektrik ialah 21.8 sen seunit]
What is the cost of electrical energy consumed if the electric kettle is used 70 minutes per day for 3 weeks?
[*Tariff of electrical energy is 21.8 cents per unit*]

[2 markah / 2 *marks*]

(c) Terangkan konsep yang digunakan pada wayar penyambung untuk memastikan cerek elektrik tersebut berfungsi dengan lebih cekap.
Explain the concept used in connecting wire to ensure the electric kettle can function more efficiently.

[4 markah / 4 *marks*]

(d) Rajah 10.2 menunjukkan elemen pemanas bagi sebuah pengering rambut.
Diagram 10.2 shows a heating element of a hair dryer.



Rajah 10.2
Diagram 10.2

Jadual 4 menunjukkan empat jenis elemen pemanas O, P, Q dan R dengan spesifikasi yang berbeza.

Table 4 shows four types of heating elements O, P, Q and R with different specifications.

Jenis element pemanas ***Types of heating element***	**O**	**P**	**Q**	**R**
Kadar pengoksidaan *The rate of oxidation*	Rendah *Low*	Rendah *Low*	Tinggi *High*	Tinggi *High*
Bilangan lilitan unsur pemanas *The number of turns of heating element*	10	40	40	10
Takat lebur/ ^{0}C *Melting point/* ^{0}C	8500	8000	7000	6000
Ketumpatan / kg m^{-3} *Density/* kg m^{-3}	4000	2500	2500	6500

Jadual 4

Table 4

Anda dikehendaki untuk mengkaji ciri-ciri elemen pemanas yang ditunjukkan dalam Jadual 4. Jelaskan kesesuaian setiap ciri dan pilih elemen pemanas yang paling sesuai untuk mengeringkan rambut dalam masa yang singkat.

Beri sebab bagi pilihan anda.

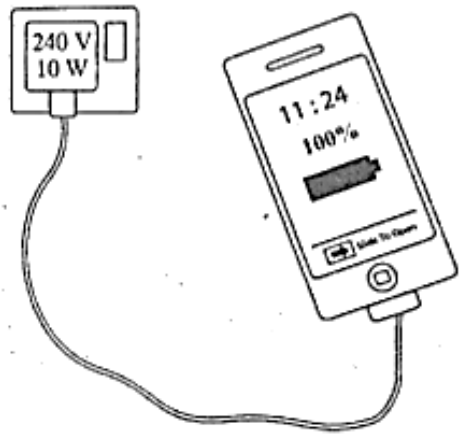
You are required to study the characteristics of the heating element as shown in Table 4. Explain the suitability of each characteristic and choose the most suitable heating element to dry hair in short time.

Give reasons for your choice.

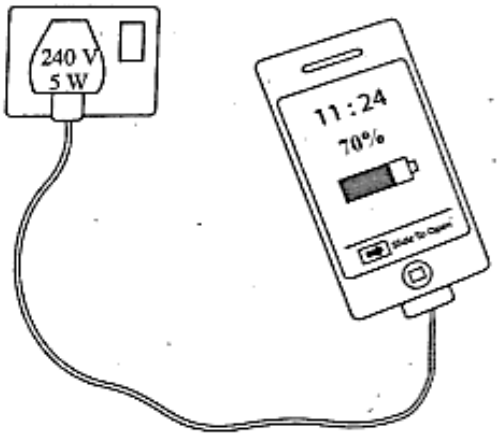
[10 markah / 10 *marks*]

PAHANG JUJ SET 2 2024

11. Rajah 11.1 dan Rajah 11.2 menunjukkan dua telefon bimbit yang serupa dicaskan dengan menggunakan dua pengecas yang berbeza selama 30 minit. Telefon bimbit Rajah 11.1 telah dicaskan sepenuhnya selepas 30 minit.
Diagram 11.1 *and Diagram* 11.2 *show two identical handphones being charged using two different chargers for* 30 *minutes. The handphones in Diagram* 11.1 *is fully charged after* 30 *minutes.*



Rajah 11.1
Diagram 11.1



Rajah 11.2
Diagram 11.2

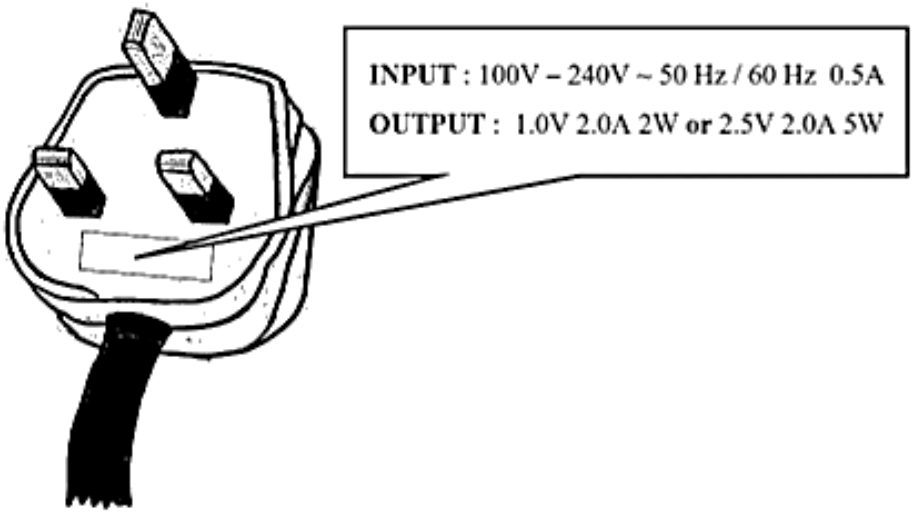
(a) Apakah yang dimaksudkan dengan 240 V, 10 W ?
What is the meaning of 240 V, 10 W ?

[1 markah]
[1 *mark*]

(b) Berdasarkan Rajah 11.1 dan Rajah 11.2, bandingkan kuasa, kadar pengaliran cas dan arus yang mengalir.
Hubungkaitkan antara kuasa dengan kadar pengaliran cas, seterusnya deduksikan hubungan antara kuasa dengan arus.
Based on Diagram 11.1 *and Diagram* 11.2, *compare the power, the rate of charge flow and the current flow.*
Relate the power and the rate of charge flow and then deduce the relationship between the power and the current.

[5 markah]
[5 *marks*]

(c) Rajah 11.3 menunjukkan spesifikasi pengecas telefon Rajah 11.2.
Diagram 11.3 *show the spesification* of *handphone charger in Diagram* 11.2.

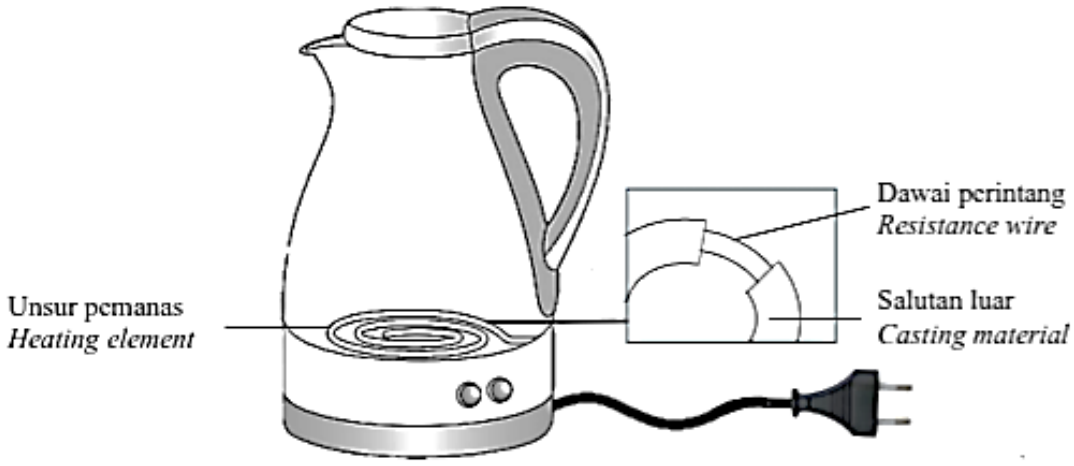


Rajah 11.3
Diagram 11.3

Pengecas telefon bimbit itu kemudiannya disambungkan pada soket bervoltan 120 V. Terangkan kesan terhadap voltan, arus dan masa pengecasan bagi pengecas telefon itu.
The handphone charger is then connected to a 120 V *socket.*
Explain the effects to the voltage, current and the time taken to charged for the handphone changer.

[4 markah]
[4 *marks*]

(d) Rajah 11.4 menunjukkan keratan rentas unsur pemanas di dalam sebuah cerek elektrik.
Diagram 11.4 *shows a heating element in an electric kettle.*



Rajah 11.4
Diagram 11.4

Anda dikehendaki untuk mengubahsuai cerek elektrik itu supaya dapat mendidihkan air dengan lebih cepat serta lebih selamat.
Nyatakan dan terangkan cadangan anda melibatkan aspek ciri-ciri dawai perintang, jenis bahan salutan luar dan keselamatan cerek elektrik tersebut.
You are required to modify the electric kettle so that it can boil the water faster and safer.
State and explain your proposal involving aspects the characteristics of resistance wire, type of casting material and the safety of the electric kettle.

[10 markah]
[10 *marks*]

SBP 2024

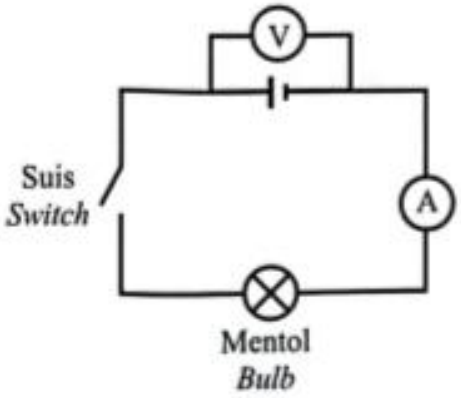
10 Rajah 10.1 menunjukkan satu sel kering yang mempunyai daya gerak elektrik sebanyak 3.7 V.
Diagram 10.1 *shows a dry cell that has an electromotive force of* 3.7 V.

Rajah 10.1
Diagram 10.1

(*a*) Apakah yang dimaksudkan dengan daya gerak elektrik?
What is meant by electromotive force?

[1 *markah*]
[1 *mark*]

(*b*) Sel kering dalam Rajah 10.1 digunakan dalam suatu eksperimen. Susunan radas bagi eksperimen tersebut adalah seperti yang ditunjukkan dalam Rajah 10.2.
The dry cell in Diagram 10.1 *is used in an experiment. The arrangement of the apparatus for the experiment is as shown in Diagram* 10.2.



Rajah 10.2
Diagram 10.2

Apabila suis ditutup, bacaan voltmeter adalah 3.0 V manakala bacaan ammeter adalah 0.5 A.
When the switch is closed, the voltmeter reading is 3.0 V *while the ammeter reading is* 0.5 A.

(i) Bacaan voltmeter ketika suis ditutup tidak menunjukkan nilai yang sama dengan daya gerak elektrik yang dilabelkan pada sel kering tersebut.
Jelaskan.

The voltmeter reading when the switch is closed not show the same value as the electromotive force labelled on the dry cell.
Explain.

[4 *markah*]
[4 *marks*]

(ii) Hitung rintangan dalam, r bagi sel kering tersebut.
Calculate the internal resistance, r *of the dry cell.*

[2 *markah*]
[2 *marks*]

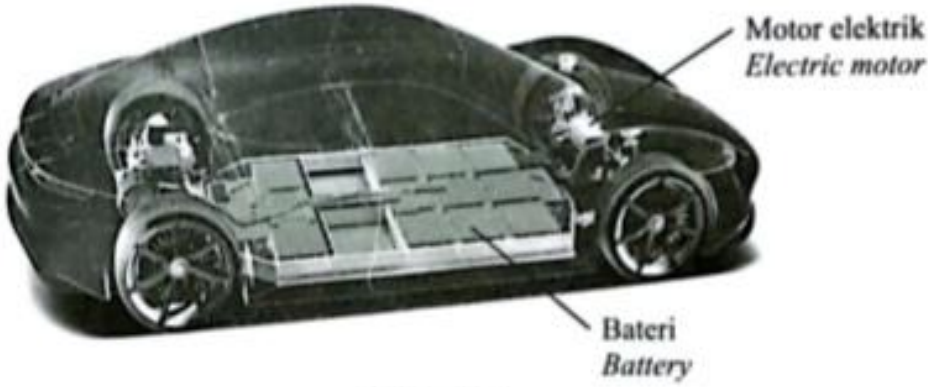
(iii) Hitung rintangan, R bagi mentol tersebut.
Calculate the resistance, R *of the bulb.*

[2 *markah*]
[2 *marks*]

(iv) Sebuah mentol yang serupa disambung secara selari dengan mentol dalam Rajah 10.2.
Nyatakan perubahan yang berlaku kepada bacaan ammeter.
An identical bulb is connected in parallel with the bulb in Diagram 10.2.
State the change that occurs to the ammeter reading.

[1 *markah*]
[1 *mark*]

(c) Rajah 10.3 menunjukan bateri dan motor elektrik yang ada di dalam sebuah kenderaan elektrik.
Diagram 10.3 *shows the battery and electric motor in an electric vehicle.*



Rajah 10.3
Diagram 10.3

Jadual 10 menunjukkan ciri-ciri empat set bateri untuk kenderaan elektrik tersebut.
Table 10 *shows the characteristics of four sets of batteries for the electric vehicle.*

Bateri *Battery*	Jenis bateri *Type of battery*	Daya gerak elektrik *Electromotive force*	Jisim bateri *Mass of battery*	Susunan bateri *Arrangements of battery*
R	Sel kering *Dry Cell*	400 V	900 kg	Selari *Parallel*
S	Sel basah *Wet Cell*	400 V	500 kg	Selari *Parallel*
T	Sel kering *Dry Cell*	800 V	500 kg	Bersiri *Series*
U	Sel basah *Wet Cell*	800 V	900 kg	Bersiri *Series*

Jadual 10
Table 10

Kaji setiap ciri bateri dan terangkan kesesuaian setiap ciri.
Tentukan bateri yang paling sesuai untuk menggerakkan kenderaan elektrik dengan laju dan cekap.
Beri sebab untuk pilihan anda.

Study each characteristic of the battery and explain the suitability of each characteristic.
Determine the most suitable battery to move the electric vehicle fast and efficiently.
Give reasons for your choice.

[10 *markah*]
[10 *marks*]

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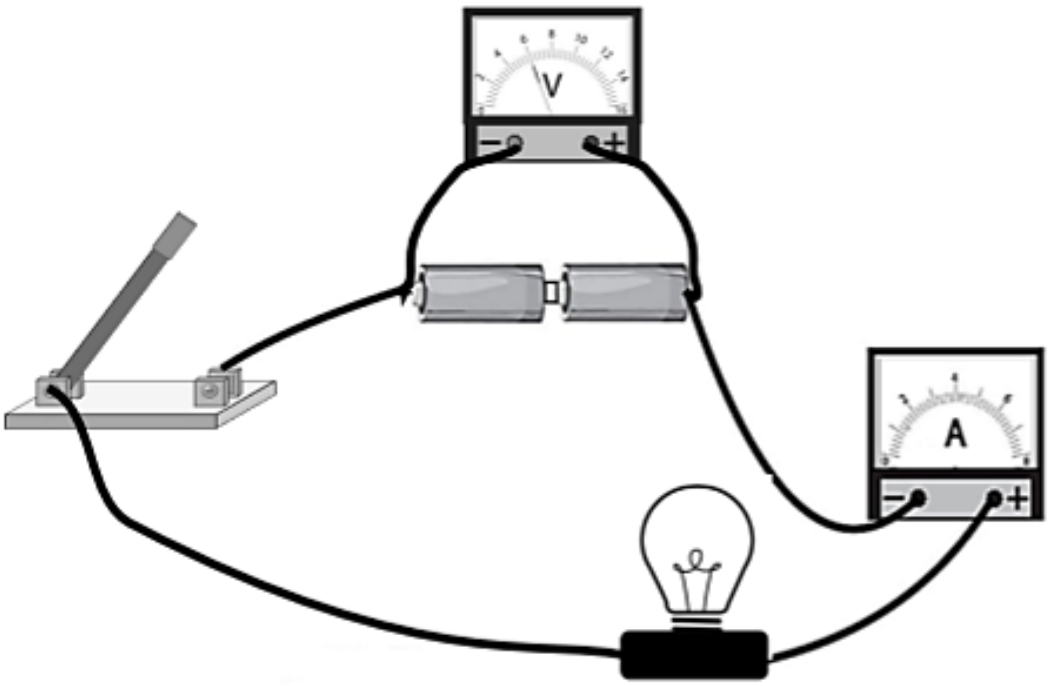
10. Rajah 10.1 menunjukkan susunan voltmeter, ammeter, sel kering, suis dan mentol di dalam litar.

Diagram 10.1 shows the arrangement of voltmeter, ammeter, dry cell, switch and bulb in the circuit.



Rajah 10.1 / *Diagram 10.1*

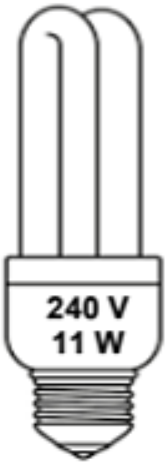
a) Apakah yang dimaksudkan dengan daya gerak elektrik (d.g.e)?
What is meant by electromotive force (e.m.f)?

[1 markah/1 *mark*]

b) Berdasarkan Rajah 10.1, terangkan apakah yang akan terjadi kepada bacaan voltmeter dan mentol apabila suis ditutup?
Based on Diagram 10.1, explain what will happen to the voltmeter and bulb readings when the switch is closed?

[4 markah/4 *marks*]

c) Rajah 10.2 menunjukkan sebuah mentol jimat tenaga. Apabila disambungkan kepada bekalan kuasa 240 V, mentol itu menghasilkan 10 joule per saat tenaga cahaya.
Diagram 10.2 shows an energy-saving light bulb. When connected a 240 V power supply, the bulb produces 10 joules per second of light energy.



Rajah 10.2 / *Diagram 10.2*

Hitungkan
Calculate

(i) arus yang mengalir melalui mentol
current flow through the bulb

[2 markah/2 *marks*]

(ii) tenaga haba yang hilang daripada mentol dalam 1 saat.
heat energy lost from the bulb in 1 second.

[1 markah /1 *mark*]

(iii) kecekapan mentol itu.
the efficiency of the bulb.

[2 markah/2 *marks*]

d) Jadual 10 menunjukkan ciri-ciri bagi empat jenis mentol berfilamen.
Table 10 shows the characteristics of four different types of filament bulb.

Mentol ***Bulb***	**Jenis dawai filamen** ***Type of filament wire***	**Ketebalan dawai filamen** ***Thickness of filament wire***	**Bentuk filamen** ***Filament shape***	**Jenis gas di dalam mentol** ***The type of gas inside the bulb***
J	Tungsten *Tungsten*	Rendah *Low*	Gegelung *Coil*	Gas nitrogen pada tekanan tinggi *Nitrogen gas at high pressure*
K	Kuprum *Copper*	Tinggi *High*	Gegelung *Coil*	Gas nitrogen pada tekanan rendah *Nitrogen gas at low pressure*
L	Tungsten *Tungsten*	Rendah *Low*	Gegelung *Coil*	Gas nitrogen pada tekanan rendah *Nitrogen gas at low pressure*
M	Kuprum *Copper*	Tinggi *High*	Lurus *Straight*	Gas nitrogen pada tekanan tinggi *Nitrogen gas at high pressure*

Jadual 10 /*Table 10*

Kaji spesifikasi keempat-empat mentol berfilamen tersebut.

Terangkan kesesuaian setiap spesifikasi dan tentukan mentol yang boleh menghasilkan cahaya yang paling cerah.

Study the specifications of the four filament bulb.

Explain the suitability of each specification and determine which the bulb that can produce the brightest light.

[10 markah/10 *marks*]