

*amaZiNg*  
**FIZIK!**

@amazingPhysics\_cgalinainanarif

# PHYSICS

BY CHAPTER F4 & F5

## F5 CH3: ELECTRICITY

COMPILATION OF **OBJECTIVE** QUESTIONS

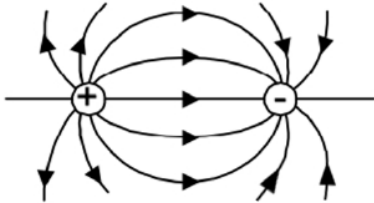


  
**DREAM BIG  
AIM HIGH  
NEVER GIVE UP**

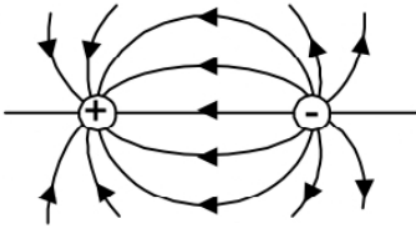
*alinainanarif*

- 1 Rajah yang manakah menunjukkan corak medan elektrik yang betul?  
Which diagram shows the **correct** electric field pattern?

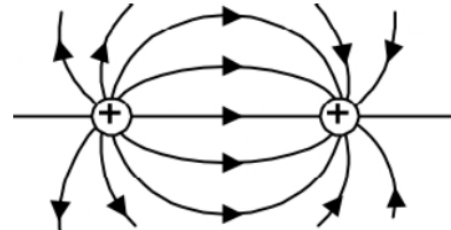
**A**



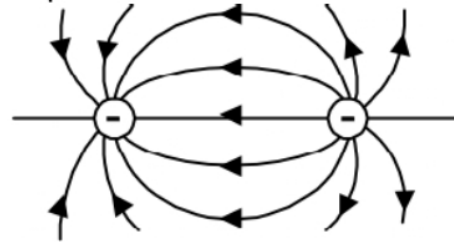
**B**



**C**



**D**



- 2 Dua kuantiti elektrik yang manakah diukur dalam volt?  
Which two electrical quantities are measured in volts?

**A** arus dan d.g.e.  
*current and e.m.f.*

**B** arus dan rintangan  
*current and resistance*

**C** d.g.e. dan beza keupayaan  
*e.m.f. and potential difference*

**D** beza keupayaan dan rintangan  
*potential difference and resistance*

- 3 Rajah 1 menunjukkan sfera pengalir bercas sedang berayun antara dua plat yang disambungkan kepada bekalan kuasa Voltan Lampau Tinggi (EVLTL).  
Diagram 1 shows a charged conducting sphere is oscillates between two plates which are connected to an Extra High Tension (EHT) power supply.

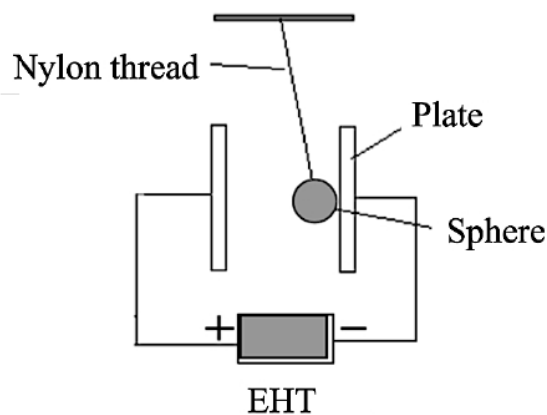


Diagram 1

Frekuensi ayunan sfera akan meningkat jika

*The frequency of the oscillation of the sphere will increase if*

- A jarak antara plat bertambah. / *the distance between the plates is increased.*
- B** voltan VLT dinaikkan. / *the voltage of the EHT is increased.*
- C panjang benang bertambah. / *the length of the thread is increased.*
- D saiz sfera bertambah. / *the size of the sphere is increased.*

- 4 Rajah 2 menunjukkan arus elektrik yang mengandungi tiga perintang yang serupa.  
*Diagram 2 shows an electric current that contains three similar resistors.*

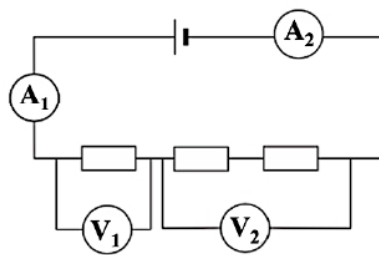


Diagram 2

Antara bacaan berikut, yang manakah **betul**?

*Which of the following readings is correct?*

- A**  $A_1 = A_2$
- B**  $V_1 = V_2$
- C**  $A_1 > A_2$
- D**  $V_1 > V_2$

- 5 Satu litar ringkas disediakan seperti yang ditunjukkan dalam Rajah 3. Kecerahan mentol berubah apabila reostat dilaraskan.

*A simple circuit is set up as shown in the Diagram 3. The brightness of the light bulb changes as the rheostat is adjusted.*

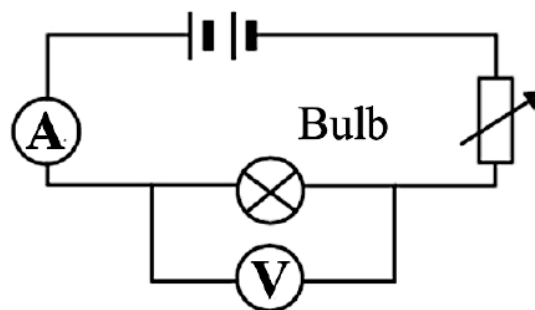
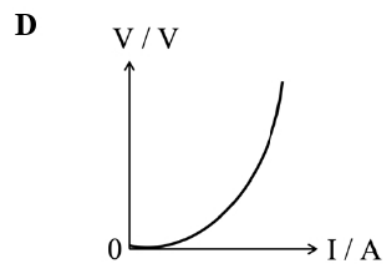
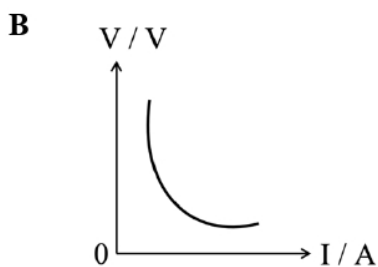
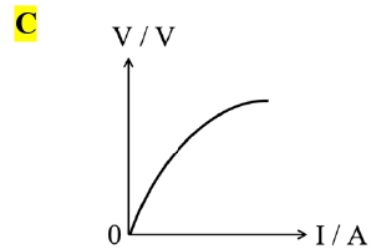
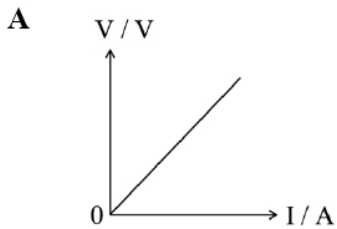


Diagram 3

TING. 5: BAB 3 ELEKTRIK (ELECTRICITY)

Graf yang manakah paling sesuai mewakili hubungan antara beza keupayaan,  $V$  merentasi mentol dan arus,  $I$  yang mengalir melaluinya?

*Which graph best represents the relationship between potential difference,  $V$  across the bulb and current,  $I$  that flows through it?*



- 6 Rajah 4 menunjukkan tiga perintang disambungkan dalam litar.  
*Diagram 4 shows three resistors connected in a circuit.*

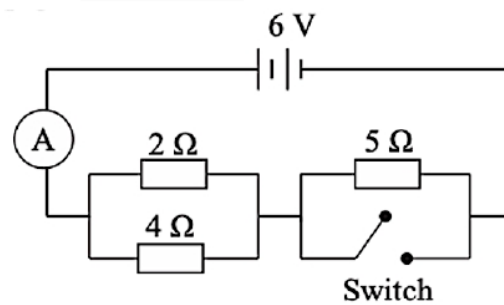


Diagram 4

Berapakah bacaan ammeter apabila suis ditutup dan kemudian dibuka?

*What is the reading of the ammeter when the switch is closed and then opened?*

	Suis ditutup <i>Switch closed</i>	Suis dibuka <i>Switch opened</i>
<b>A</b>	4.50 A	0.95 A
<b>B</b>	4.55 A	0.55 A
<b>C</b>	5.70 A	0.95 A
<b>D</b>	8.00 A	1.83 A



TING. 5: BAB 3 ELEKTRIK (ELECTRICITY)

Antara berikut, yang manakah memberikan perbandingan yang betul antara  $I_X$  dan  $I_Y$ ?  
 Which of the following gives the **correct** comparison between  $I_X$  and  $I_Y$ ?

- A  $I_X < I_Y$
- B**  $I_X > I_Y$
- C  $I_X = I_Y$

- 10 Rajah 7 menunjukkan litar yang boleh digunakan untuk menentukan daya gerak elektrik (e.m.f.),  $E$ , dan rintangan dalam,  $r$ , sel.  
 Diagram 7 shows a circuit that can be used to determine the electromotive force (e.m.f.),  $E$ , and internal resistance,  $r$ , of a cell.

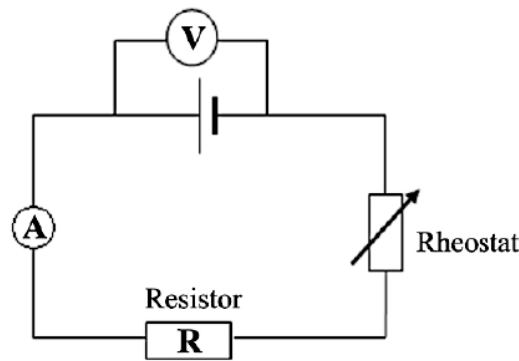
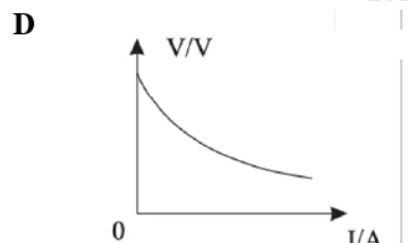
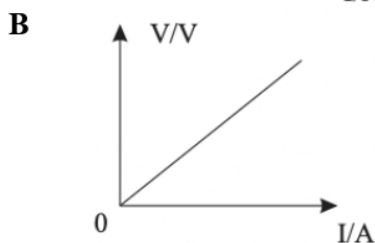
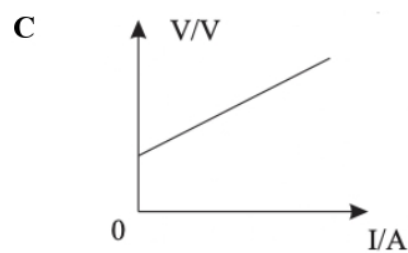
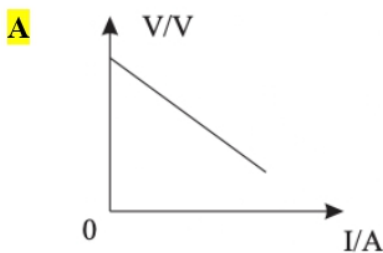


Diagram 7

Manakah antara beza keupayaan berikut,  $V$  melawan arus, graf  $I$  digunakan untuk menentukan nilai  $E$  dan  $r$  sel itu?

Which of the following potential difference,  $V$  against current,  $I$  graph is used to determine the values of  $E$  and  $r$  of the cell?



TING. 5: BAB 3 ELEKTRIK (ELECTRICITY)

- 11 Antara berikut, manakah merupakan faktor-faktor yang mempengaruhi rintangan sesuatu dawai?  
*Among the following, which are the factors that affect the resistance of an electrical conductor?*

- I Warna dawai / *Colours of wire*
- II Panjang dawai / *Length of wire*
- III Kerintangan dawai / *Resistivity of wire*
- IV Luas keratan rentas dawai / *Cross sectional area of wire*

- A II dan III sahaja                      C I, II, dan III sahaja  
B II dan IV sahaja                      **D** II, III dan IV sahaja

- 12 Rajah 8 menunjukkan sebuah seterika yang mempunyai spesifikasi 240V, 2200W digunakan untuk menggosok pakaian.

*Diagram 8 shows an iron with a specification of 240V, 2200W used to iron clothes.*

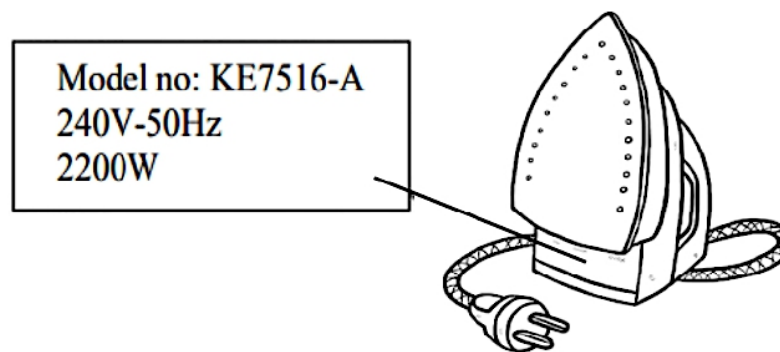


Diagram 8

Jika seterika itu digunakan selama 15 minit, hitung bilangan cas yang mengalir di dalam seterika  
*If the iron is used for 15 minutes, calculate the amount of charges flowing in the iron.*

- A 138 C                                      C 3600 C  
B 147 C                                      **D** 8253 C

- 13 Sebuah cerek elektrik berlabel 240 V, 2200 W.  
*An electric kettle labelled 240 V, 2200 W.*

Berapakah tenaga haba yang terhasil pada cerek dalam masa dua minit?  
*What is the heat energy produced in the kettle in two minutes?*

- A 4.4 kJ                                      C 528 kJ  
**B** 264 kJ                                      D 1056 kJ



- 14 Rajah 9 menunjukkan graf V melawan I bagi dawai tungsten sebagai filamen dalam sebuah mentol.  
*Diagram 9 shows a V against I graph for a tungsten wire as a filament in a bulb.*

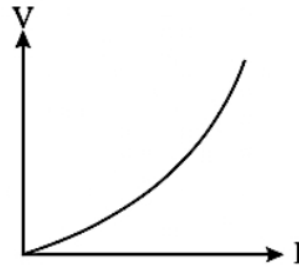


Diagram 9

Dawai tungsten tidak mematuhi hukum Ohm kerana ...  
*The tungsten wire did not obey Ohm's law because ...*

- A Dawai tungsten bergegelung  
*The tungsten wire is coiled.*
  - B** Rintangan dawai tungsten bertambah.  
*The resistance of tungsten wire is increasing.*
  - C Dawai tungsten membebaskan banyak haba.  
*Tungsten wire releases a lot of heat.*
  - D Kerintangan dawai tungsten tinggi.  
*The resistivity of the tungsten wire is high.*
- 15 Rajah 10 menunjukkan satu litar elektrik.  
*Diagram 10 shows an electric circuit.*

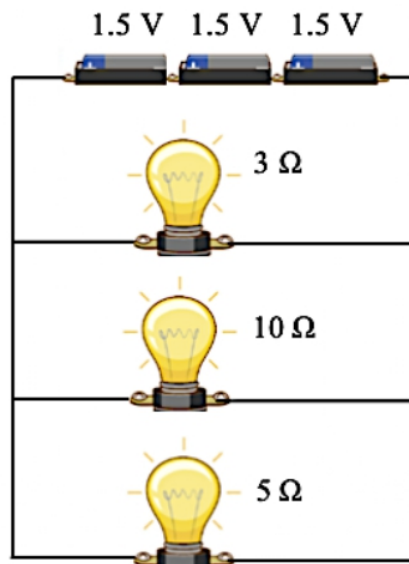
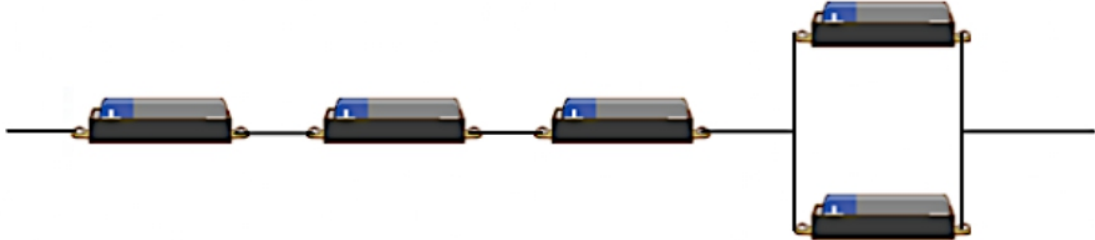


Diagram 10





- 17 Rajah 12 menunjukkan susunan lima sel kering yang serupa dengan spesifikasi  $1.5\text{V}$ ,  $r = 0.2\Omega$ .  
*Diagram 12 shows 5 identical dry cells with specifications  $1.5\text{V}$ ,  $r = 0.2\Omega$ .*

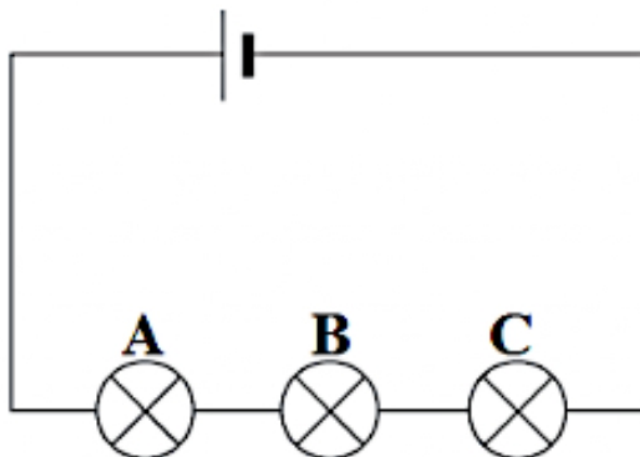


**Diagram 12**

Berapakah jumlah d.g.e dan rintangan dalam bagi sel kering tersebut?  
*What is the total emf and internal resistance by the dry cells?*

	<b>d.g.e. e.m.f.</b>	<b>Rintangan dalam Internal resistance</b>
<b>A</b>	6.0 V	0.7 $\Omega$
<b>B</b>	7.5 V	1.0 $\Omega$
<b>C</b>	6.0 V	1.0 $\Omega$
<b>D</b>	7.5 V	0.7 $\Omega$

- 18 Rajah 13 menunjukkan tiga mentol yang berlainan rintangan dan kuasa disambung secara bersiri.  
*Diagram 13 shows three bulbs of difference resistance and power are connected in series.*



**Diagram 13**

Pernyataan manakah adalah betul?

*Which statement is correct?*

- A** Arus yang melalui setiap mentol adalah sama  
*Current passing through each bulb is the same*
- B** Beza keupayaan merentasi setiap mentol adalah sama  
*Potential difference across each bulb is the same*
- C** Kuasa dilesapkan oleh setiap mentol adalah sama  
*Power dissipated by each bulb is the same*
- D** Tenaga elektrik yang digunakan oleh setiap mentol adalah sama  
*Electrical energy used by each bulb is the same*

- 19 Rajah 14 menunjukkan tiga buah perintang disusun secara bersiri dan selari. Arus yang mengalir melalui ammeter  $A_1$ ,  $A_2$  dan  $A_3$  diwakili oleh  $I_1$ ,  $I_2$  dan  $I_3$  masing-masing.  
*Diagram 14 shows three resistors that are arranged in series and in parallel. The current that flows through ammeter  $A_1$ ,  $A_2$  and  $A_3$  are represented by  $I_1$ ,  $I_2$  and  $I_3$  respectively.*

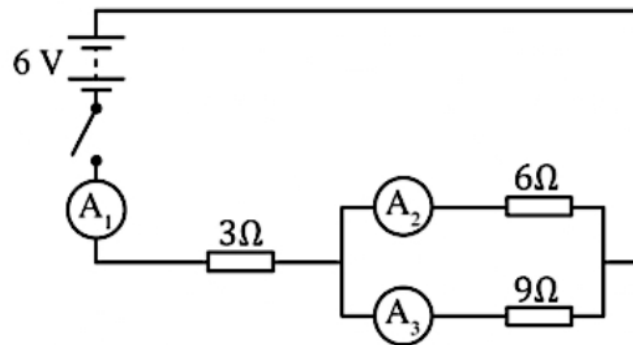


Diagram 14

Yang manakah berikut betul?

*Which of the following is correct?*

- |                            |                            |
|----------------------------|----------------------------|
| <b>A</b> $I_1 = I_2 = I_3$ | <b>C</b> $I_1 > I_3 > I_2$ |
| <b>B</b> $I_1 > I_2 > I_3$ | <b>D</b> $I_1 > I_2 = I_3$ |
- 20 Sebuah periuk nasi elektrik dilabelkan 240 V, 1200 W. Hitung tenaga elektrik yang dibekalkan dalam masa 40 minit.  
*An electrical rice cooker is labelled 240 V, 1200 W. Calculate the electrical energy that is supplied for 40 minutes.*
- |                  |                  |
|------------------|------------------|
| <b>A</b> 0.8 kWh | <b>C</b> 3.2 kWh |
| <b>B</b> 1.6 kWh | <b>D</b> 4.8 kWh |

- 21 Apakah kesan rintangan dalam satu litar lengkap?  
*What is the effect of internal resistance in a complete circuit?*
- A Beza keupayaan merentasi terminal sel kering bertambah  
*The potential difference across the dry cell terminals increases*
  - B Arus mengalir dalam litar bertambah  
*Current flows in circuit increases*
  - C Kehilangan tenaga haba dalam perintang  
*Loss of heat energy in resistor*
  - D** Kehilangan tenaga haba dalam sel kering  
*Loss of heat energy in dry cell*
- 22 Apabila suatu titik cas  $5 \mu\text{C}$  diletakkan dalam suatu medan elektrik, ia mengalami suatu daya  $1.8 \text{ N}$  yang bertindak ke atasnya.  
 Berapakah kekuatan medan elektrik yang dialami oleh titik cas itu?  
*When a point charge of  $5 \mu\text{C}$  is placed in an electric field, it experiences a force of  $1.8 \text{ N}$  acting on it.*  
*What is the electric field strength experienced by the point charge?*
- A  $2.8 \times 10^{-6} \text{ N C}^{-1}$
  - B  $0.36 \text{ N C}^{-1}$
  - C**  $3.6 \times 10^5 \text{ N C}^{-1}$
  - D  $2.8 \times 10^6 \text{ N C}^{-1}$
- 23 Rintangan dawai kuprum dengan panjang  $L$  dan luas keratan rentas  $A$  ialah  $R$ .  
 Berapakah rintangan dawai aluminium yang mempunyai luas keratan rentas  $\frac{1}{2}A$  dan panjang  $2L$ ?  
 Didapati bahawa kerintangan aluminium adalah 1.5 kali kerintangan kuprum.  
*The resistance of copper wire of length  $L$  and cross-sectional area  $A$  is  $R$ . What is the resistance of aluminium wire having cross sectional area  $\frac{1}{2}A$  and length  $2L$ ? It is given that the resistivity of aluminium is 1.5 times the resistivity of copper.*
- A  $\frac{1}{2} R$
  - B  $2R$
  - C  $4R$
  - D**  $6R$

- 24 Rajah 15 menunjukkan satu bateri dengan d.g.e 5.0 V dan rintangan dalam 3.0  $\Omega$  yang disambungkan kepada dua perintang.  
 Diagram 15 shows a battery of e.m.f. 5.0 V and internal resistance 3.0  $\Omega$  connected to two resistors.

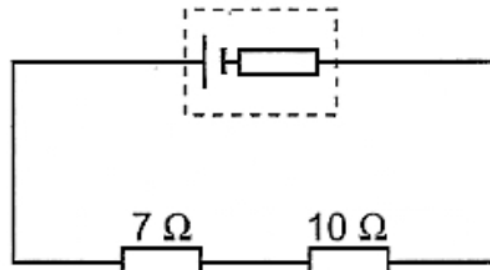


Diagram 15

Berapakah voltan terminal bagi litar ini?  
 What is the terminal voltage of this circuit?

- A 0.75 V  
 B 1.75 V  
 C 2.5 V  
 D 4.25 V
- 25 Rajah 16 menunjukkan satu litar elektrik. Bacaan ammeter dan bacaan voltmeter itu ialah 0.4 A dan 2.4 V masing-masing.  
 Diagram 16 shows an electrical circuit. The ammeter and voltmeter readings are 0.4 A and 2.4 V respectively.

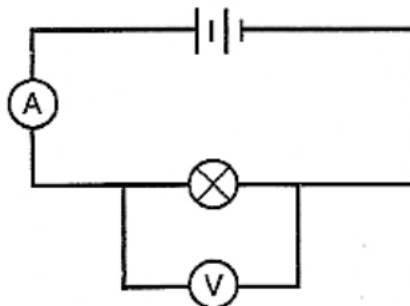


Diagram 16

Hitung tenaga elektrik lampu itu apabila ia dinyalakan selama 3 minit.  
 Calculate the electrical energy of the bulb when it is switched on for 3 minutes.

- A 0.96 J  
 B 2.88 J  
 C 84.40 J  
 D 172.80 J

- 26 Rajah 17.1 menunjukkan satu corak medan elektrik.  
Rajah 17.2 menunjukkan corak medan elektrik apabila jarak,  $d$  bertambah.  
*Diagram 17.1 shows an electric field pattern.*  
*Diagram 17.2 shows an electric field pattern when the distance,  $d$  increases.*

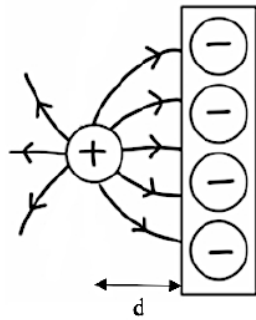


Diagram 17.1

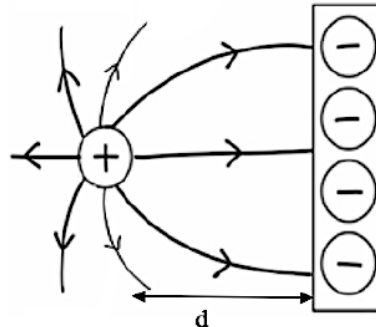
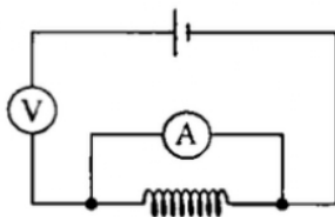


Diagram 17.2

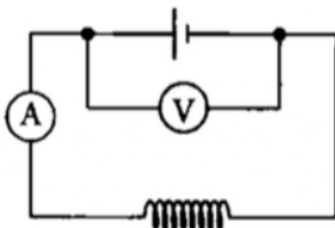
Mengapakah jarak antara garis-garis medan elektrik bertambah dalam Rajah 17.2?  
*Why the distance between electric field lines increases in Diagram 17.2?*

- |   |   |
|---|---|
| <p>A Daya elektrik bertambah.<br/><i>Electrical force increases.</i></p> <p>B Arus elektrik bertambah.<br/><i>Electric current increases.</i></p> | <p>C Beza keupayaan bertambah.<br/><i>Potential difference increases.</i></p> <p><b>D</b> Kekuatan medan elektrik berkurang.<br/><i>Strength of electric field decreases.</i></p> |
|---|---|
- 27 Satu litar elektrik digunakan untuk menentukan rintangan suatu gegelung dawai.  
Rajah manakah menunjukkan susunan yang betul bagi ammeter dan voltmeter dalam litar tersebut?  
*An electric circuit is used to determine the resistance of a coil of wire.*  
*Which diagram shows the correct arrangement of the ammeter and voltmeter in the circuit?*

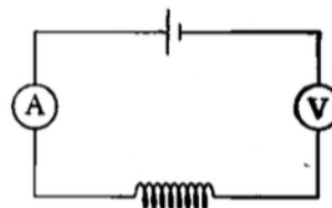
A



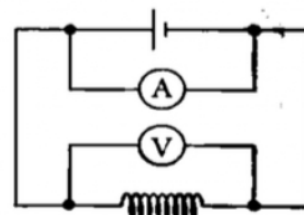
**B**



C



D



- 28 Rajah 18 ialah graf yang menunjukkan bagaimana beza keupayaan,  $V$ , merentasi terminal suatu sel berubah dengan arus,  $I$ , melalui sel.  
*Diagram 18 is a graph which shows how the potential difference,  $V$ , across the terminals of a cell changes with the current,  $I$ , through the cell.*

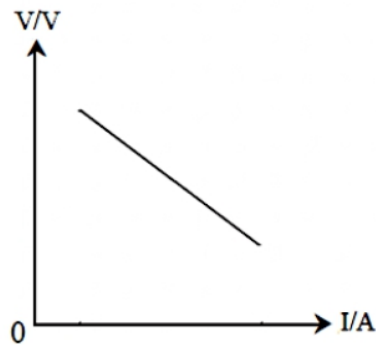


Diagram 18

Sekiranya graf ini di ekstrapolasi kepada paksi  $V$ , apakah nilai yang akan mewakili pintasan pada paksi  $V$  ?

*If this graph were extrapolated to the  $V$ -axis, what value would represent the intercept on the  $V$ -axis ?*

- |  |  |
|--|--|
| <p>A Rintangan dalam, <math>r</math><br/>Internal resistance, <math>r</math></p> <p><b>B</b> Daya gerak elektrik, <math>\epsilon</math><br/>Electromotive force, <math>\epsilon</math></p> | <p>C Arus elektrik, <math>I</math><br/>Electric current, <math>I</math></p> <p>D Kerintangan dawai, <math>\rho</math><br/>Resistivity of a wire, <math>\rho</math></p> |
|--|--|
- 29 Rajah 19 menunjukkan bentuk nyalaan lilin apabila lilin tersebut diletakkan di antara dua plat, X dan Y, yang disambung ke bekalan kuasa VLT.  
*Diagram 19 shows a shape of candle flame is put between plate X and Y connecting to power supply EHT.*

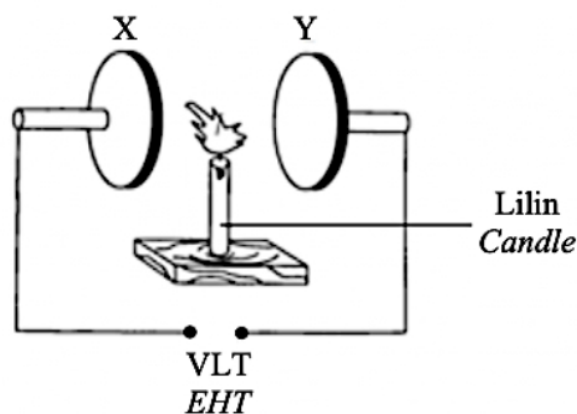


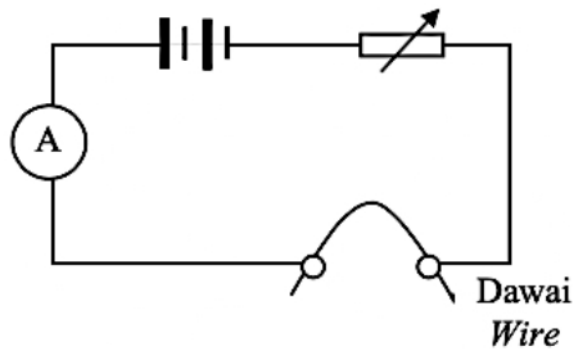
Diagram 19



Apakah cas-cas pada plat X dan plat Y?  
*What is the charge on plate X and plate Y?*

	<b>X</b>	<b>Y</b>
<b>A</b>	Negatif <i>Negative</i>	Positif <i>Positive</i>
<b>B</b>	Negatif <i>Negative</i>	Negatif <i>Negative</i>
<b>C</b>	Positif <i>Positive</i>	Negatif <i>Negative</i>
<b>D</b>	Positif <i>Positive</i>	Positif <i>Positive</i>

30 Rajah 20 menunjukkan suatu litar elektrik.  
*Diagram 20 shows an electric circuit.*



**Diagram 20**

Perubahan manakah pada dawai yang akan menghasilkan bacaan tertinggi pada ammeter?  
*Which change in the wire will produce the highest reading on the ammeter?*

	<b>Panjang dawai</b> <i>Length of wire</i>	<b>Diameter dawai</b> <i>Diameter of wire</i>
<b>A</b>	Lebih panjang <i>Longer</i>	Lebih besar <i>Bigger</i>
<b>B</b>	Lebih panjang <i>Longer</i>	Lebih kecil <i>Smaller</i>
<b>C</b>	Lebih pendek <i>Shorter</i>	Lebih besar <i>Bigger</i>
<b>D</b>	Lebih pendek <i>Shorter</i>	Lebih kecil <i>Smaller</i>

- 31 Rajah 21 menunjukkan sebuah mentol yang mempunyai spesifikasi 240 V, 60 W.  
*Diagram 21 shows a light bulb with specification of 240 V, 60 W*

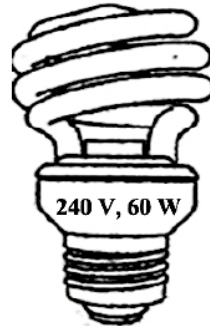


Diagram 21

Berapakah tenaga elektrik yang digunakan oleh mentol itu dalam masa 5 jam dalam unit kW j?  
*What is the electrical energy used by the bulb in 5 hours in kW h unit?*

- |          |                     |          |                       |
|----------|---------------------|----------|-----------------------|
| <b>A</b> | 0.3 kW j<br>0.3 kWh | <b>C</b> | 300 kW j<br>300 kWh   |
| <b>B</b> | 1.2 kW j<br>1.2 kWh | <b>D</b> | 1200 kW j<br>1200 kWh |
- 32 Rajah 22 menunjukkan sebuah litar elektrik.  
*Diagram 22 shows an electric circuit.*

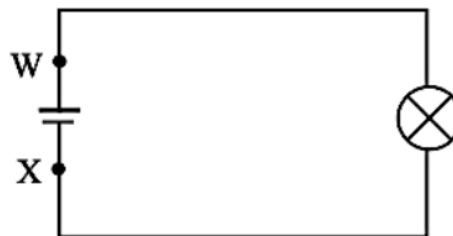


Diagram 22

Apabila sel kering yang sama disambungkan selari dengan WX, pengurangan akan berlaku kepada kecerahan mentol disebabkan oleh

*When the identical dry cells are connected parallel with WX, the brightness of light bulb will decrease because of*

- |            |   |
|------------|---|
| <b>I</b>   | jumlah d.g.e. sel kering / total e.m.f. of dry cell     |
| <b>II</b>  | jumlah arus dalam litar / total current flow in circuit |
| <b>III</b> | jumlah rintangan dalam sel / total internal resistance  |
- |          |           |          |               |
|----------|-----------|----------|---------------|
| <b>A</b> | I sahaja  | <b>C</b> | III sahaja    |
| <b>B</b> | II sahaja | <b>D</b> | I, II dan III |

- 33 Rajah 23 menunjukkan suatu litar elektrik.  
Diagram 23 shows an electrical circuit.

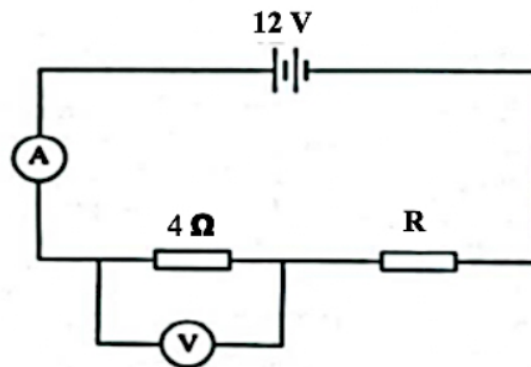


Diagram 23

Bacaan voltmeter ialah 8 V. Berapakah nilai arus yang mengalir melalui perintang R?  
The voltmeter reading is 8 V. What is the value of the current flowing through the resistor R?

- |          |       |          |       |
|----------|-------|----------|-------|
| <b>A</b> | 2.0 A | <b>C</b> | 4.0 A |
| <b>B</b> | 3.0 A | <b>D</b> | 5.0 A |
- 34 Beza keupayaan ialah  
Potential difference is
- A** kadar pengaliran cas.  
*the rate of flow of charge.*
  - B** kawasan di mana zarah bercas mengalami daya elektrik.  
*a region in which a charged particle experiences an electric force.*
  - C** daya elektrik yang bertindak pada cas positif di suatu titik.  
*the electric force acting on positive charge at a point.*
  - D** kerja yang dilakukan untuk menggerakkan 1 C cas di antara dua titik dalam suatu medan elektrik.  
*the work done in moving 1 C of charge between two points in an electric field.*
- 35 Mengapakah sel solar mesti disusun secara siri untuk membentuk satu panel solar?  
Why must solar cells be arranged in series to form a solar panel?
- A** Mengurangkan pengaliran arus / *To reduce the current flow*
  - B** Mengurangkan rintangan dalam / *To reduce the internal resistance*
  - C** Menghasilkan voltan yang tinggi / *To produce high voltage*
  - D** Menyerap lebih banyak tenaga haba / *To absorb more heat energy*

- 36 Rajah 24 menunjukkan tiga perintang yang disambung secara sesiri.  
*Diagram 24 shows three resistors connected in series.*

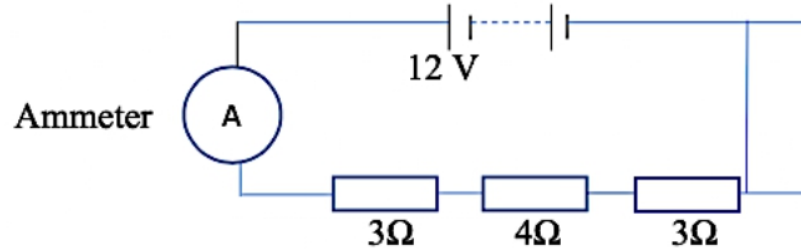


Diagram 24

Bacaan ammeter itu ialah  
*The reading of the ammeter is*

- |                |                 |
|----------------|-----------------|
| <b>A</b> 1.2 A | <b>C</b> 8.9 A  |
| <b>B</b> 5.9 A | <b>D</b> 11.0 A |
- 37 Rajah 25 menunjukkan sebuah mentol di mana filamennya dibuat daripada dawai tungsten bergegelung.  
*Diagram 25 shows a bulb in which the filament is made of coiled tungsten wire.*

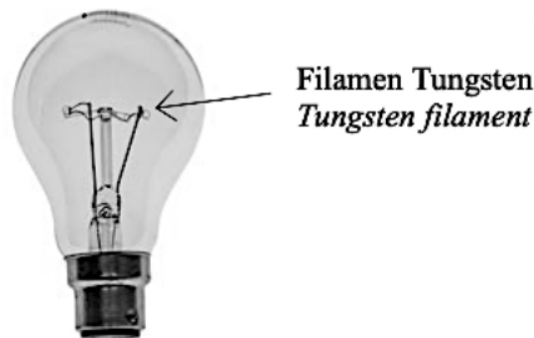


Diagram 25

Fungsi dawai tungsten bergegelung adalah untuk  
*The function of coiled tungsten wire is to*

- |   |  |
|---|--|
| <b>A</b> meningkatkan arus<br><i>increase the current</i>   | <b>C</b> meningkatkan rintangan<br><i>increase the resistance</i>    |
| <b>B</b> meningkatkan voltan<br><i>increase the voltage</i> | <b>D</b> meningkatkan kerintangan<br><i>increase the resistivity</i> |

- 38 Rajah 26 ialah graf yang menunjukkan hubungan antara beza keupayaan dengan arus bagi empat konduktor yang berlainan J, K, L dan M.  
 Diagram 26 is a graph which shows the relationship between the potential difference with current of four different conductors, J, K, L and M.

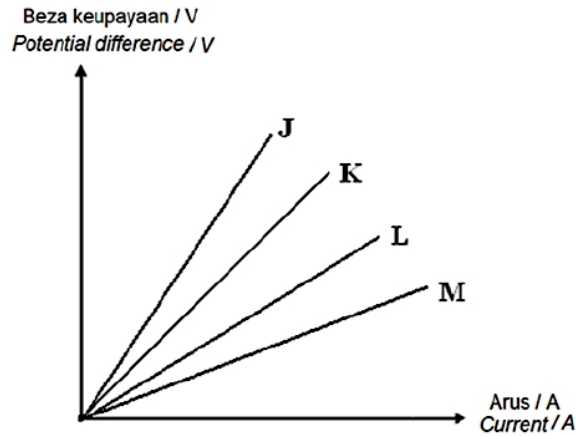


Diagram 26

Konduktor yang manakah mempunyai rintangan yang paling tinggi?  
 Which conductor has the highest resistance?

- |            |            |
|------------|------------|
| <b>A</b> J | <b>C</b> L |
| <b>B</b> K | <b>D</b> M |

- 39 Rajah 27 menunjukkan reostat X dan perintang Y yang disambung secara sesiri dengan dua bateri. Voltmeter  $V_1$  dan  $V_2$  masing-masing disambung merentasi reostat X dan perintang Y.  
 Diagram 27 shows a rheostat X and resistor Y are connected in series to two batteries. Voltmeter  $V_1$  and  $V_2$  are connected across the rheostat X and resistor Y respectively.

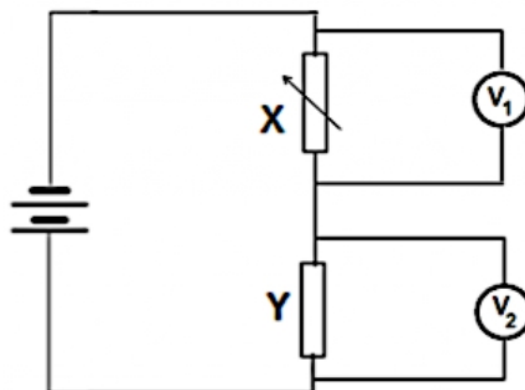


Diagram 27

