



*Success depend on your
mind and your will. You are
the one who decide it.*

PROVE IT!!

PHYSICS Workshop 2019

SMK SERI
MUTIARA

23 2019
AUG

1.

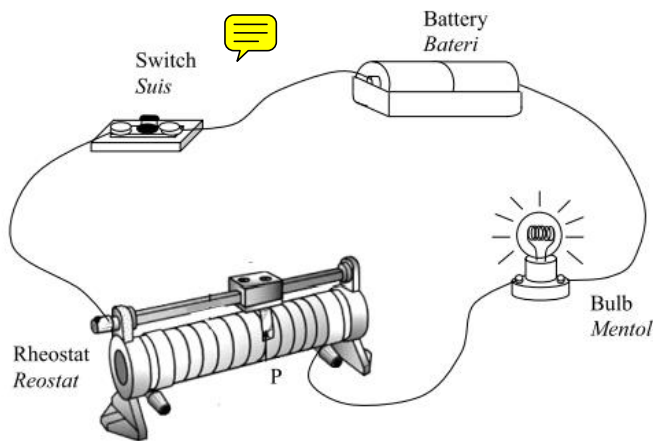


Diagram / Rajah 4.1

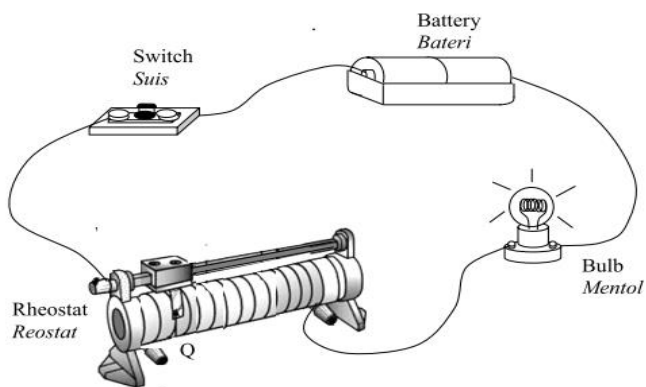


Diagram / Rajah 4.2

Diagram 4.1 shows a bulb lights up brighter when the slider of the rheostat is connected to point P.

Rajah 4.1 menunjukkan mentol menyala dengan terang apabila pelaras reostat disambungkan pada titik P.

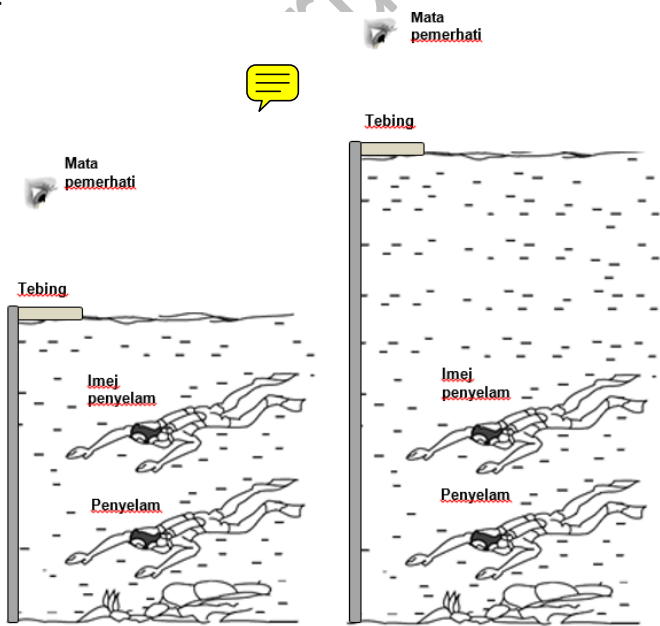
Diagram 4.2 shows the bulb lights up dimmer when the slider of the same rheostat is connected to point Q.

Rajah 4.2 menunjukkan mentol menyala dengan malap apabila pelaras rheostat disambungkan pada titik Q.

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

Dengan menggunakan alat radas seperti dawai konstantan, reostat, ammeter dan lain-lain radas yang sesuai, terangkan satu eksperimen untuk menyiasat hipotesis yang dinyatakan di 4(b).

2.



Rajah 3.1

Rajah 3.2

Diagram 3.1 shows an observer looking at the image of a diver in shallow pool. Rajah 3.1 menunjukkan seorang pemerhati sedang melihat kedudukan imej bagi seorang penyelam di kolam yang cetek.

Diagram 3.2 shows an observer looking at the image of a diver in deep pool. Rajah 3.2 menunjukkan seorang pemerhati sedang melihat kedudukan imej bagi seorang penyelam yang sama di kolam yang dalam.

With the use of apparatus such as beake, pins and other suitable apparatus, describe one experiment to investigate the hypothesis stated in 4(b).

Dengan menggunakan alat radas seperti bikar, pin-pin dan lain-lain radas yang sesuai, terangkan satu eksperimen untuk menyiasat hipotesis yang dinyatakan di 3(b).

3.

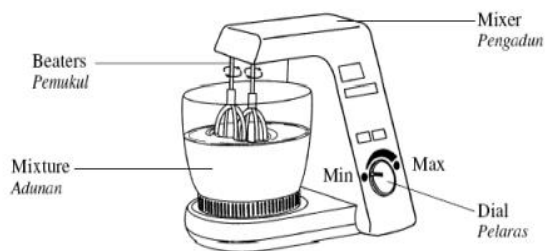


Diagram 4.1
Rajah 4.1

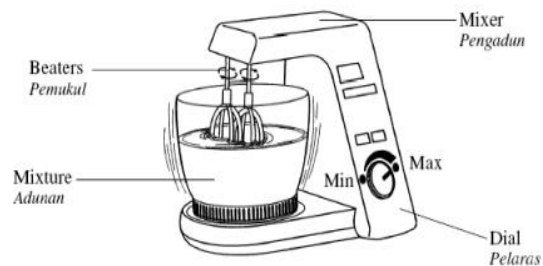


Diagram 4.2
Diagram 4.2

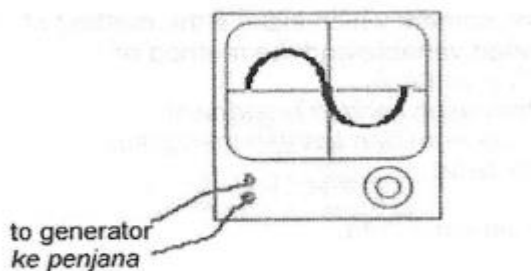
Diagram 4.1 and Diagram 4.2 show a mixer for making a chocolate cake. In Diagram 4.1, Salwa has rotated the dial at minimum current and the beaters are spinning. In Diagram 4.2, Salwa has rotated the dial at maximum current and the beaters spin faster. When the beaters spin faster, the force exerted on the mixture is greater.

Rajah 4.1 dan Rajah 4.2 menunjukkan satu pengadun untuk membuat kek coklat. Dalam Rajah 4.1, Salwa telah memutar pelarasnya pada arus yang minimum dan pemukul berputar. Dalam Rajah 4.2, Salwa telah memutar pelarasnya pada arus yang maksimum dan pemukul berputar lebih laju. Apabila pemukul berputar lebih laju, daya yang bertindak keatas adunan kek lebih besar.

With the use of apparatus such as such as d.c. power supply, magnadur magnets, U-shaped iron yoke, bare copper wire, sliding conductor and other apparatus, describe an experiment to investigate the hypothesis stated in 4 (b).

Dengan menggunakan radas seperti bekalan kuasa a.t., magnet kekal, dening besi berbentuk-U, dawai kuprum tak bertebat, konduktor boleh gelongsor dan radas-radas lain, terangkan satu eksperimen untuk menyiasat hipotesis yang dinyatakan di 4 (b).

4.



Daigram 4.2
Rajah 4.2
Wind speed : 25 km/h
Kelajuan angin : 25 km/j

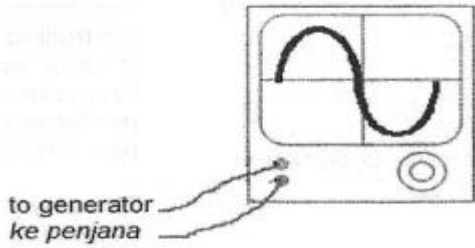


Diagram 4.1 shows windmills used to generate electricity in a windy region.

Rajah 4.1 menunjukkan kincir-kincir angin yang digunakan untuk menjana tenaga elektrik di satu kawasan yang berangin.

A students has conducted investigations on the relationship between the wind speed in the area and the electromotive force (e.m.f) generated. The student uses a cathode ray oscilloscope to measure the resulting e.m.f. Diagram 4.2 and 4.3 show the signal produced on the oscilloscope screen.

Seorang pelajar telah menjalankan penyiasatan mengenai hubungan antara kelajuan angina di kawasan tersebut dengan daya gerak elektrik (d.g.e.) yang



Daigram 4.3
Rajah 4.3
Wind speed : 35 km/h
Kelajuan angin : 35 km/j

dihasilkan. Pelajar tersebut menggunakan osiloskop sinar katod untuk mengukur d.g.e. yang terhasil. Rajah 4.2 dan 4.3 menunjukkan isyarat yang terhasil pada skrin osiloskop tersebut.

By using the apparatus such a bar magnet, a coil of copper wire and other apparatus, describe one experiment to investigate the hypothesis stated in 4(b).

Dengan menggunakan radas seperti magnet bar, ge gelung wayar kuprum dan lain-lain radas, terangkan satu eksperimen untuk menyiasat hipotesis yang dinyatakan di 4(b).

5.

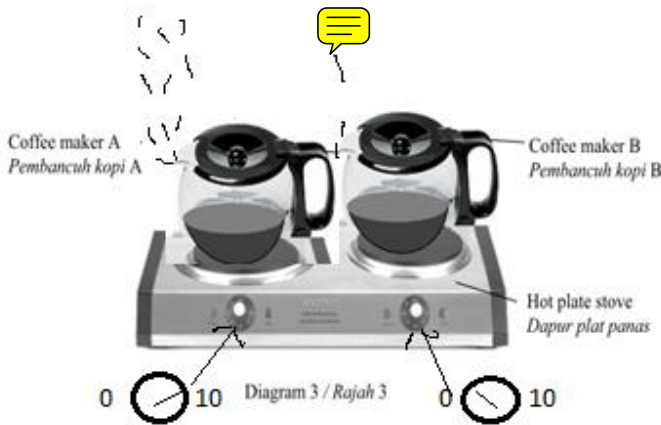


Diagram 3 shows two similar coffee maker A and B, containing same amount of coffee on similar hot plates stove. The coffee in both coffee makers are heated by turning on the power supply of different value on the hot plate. After few minutes, it was observed that the coffee in coffee maker A is hotter than the coffee in coffee maker B.

Rajah 3 menunjukkan dua pembancuh kopi serupa A dan B, mengandungi jumlah kopi yang sama di atas dapur plat panas yang serupa. Kopi di dalam kedua-dua pembancuh kopi dipanaskan dengan menghidupkan bekalan kuasa pada nilai yang berbeza pada plat panas. Selepas beberapa minit, didapati kopi dalam pembancuh kopi A adalah lebih panas daripada kopi dalam pembancuh kopi B.

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

Dengan menggunakan radas seperti bikar, termometer dan lain-lain radas, terangkan satu eksperimen untuk menyiasat hipotesis yang dinyatakan di 3(b).

6.

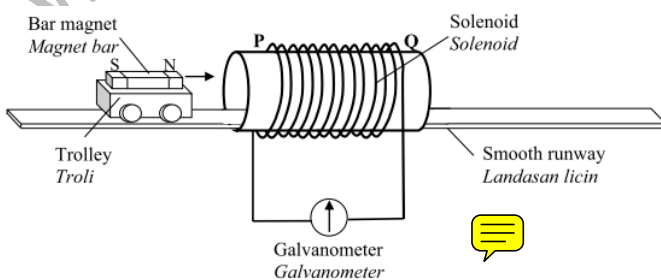


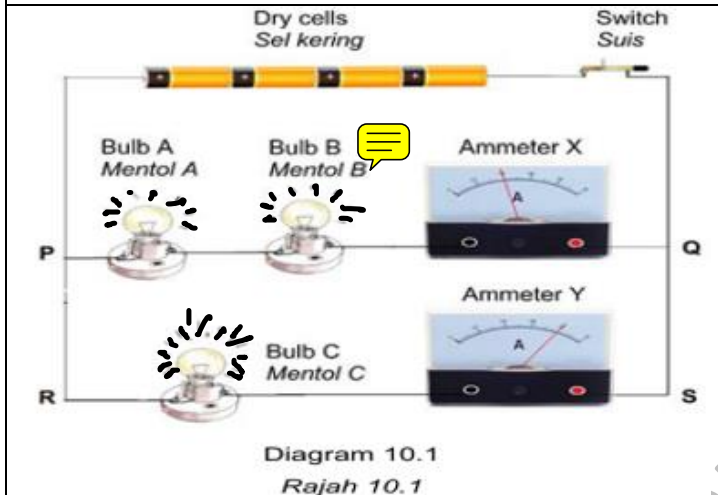
Diagram / Rajah 10.3

Diagram 10.3 shows a bar magnet attached on a trolley. The trolley moves with a constant velocity on a smooth runway into a solenoid which is connected to a galvanometer.

Rajah 10.3 menunjukkan satu magnet bar yang diletakkan di atas satu troli. Troli itu bergerak dengan satu halaju malar di atas landasan licin ke dalam satu solenoid yang bersambung kepada galvanometer.

What happens to the pointer of galvanometer when the trolley moves into the solenoid? Explain your answer.

Apakah yang berlaku ke atas penunjuk galvanometer apabila troli bergerak ke dalam solenoid? Terangkan jawapan anda. [4 marks / markah]



7.

Diagram 10.1 shows an electrical circuit consist of three identical bulbs. Two bulbs and an ammeter are placed across PQ. A bulb and an ammeter are placed across RS. Assume the internal resistance of the dry cells is zero.

Rajah 10.1 menunjukkan litar elektrik mengandungi tiga mentol yang serupa. Dua mentol dan ammeter diletakkan merentasi PQ. Satu mentol dan ammeter diletakkan merentasi RS. Anggap rintangan dalam sel kering adalah sifar.

A piece of copper wire is connected across Bulb B in Diagram 10.1.
Seutas dawai kuprum disambung merentasi Mentol B dalam Rajah 10.1.

Explain what happens to the ammeter readings and brightness of the bulbs.
Terangkan apakah yang berlaku kepada bacaan ammeter dan kecerahan mentol. [4 marks]

8.

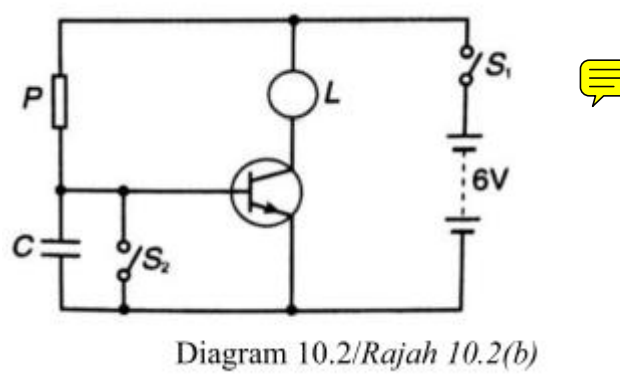
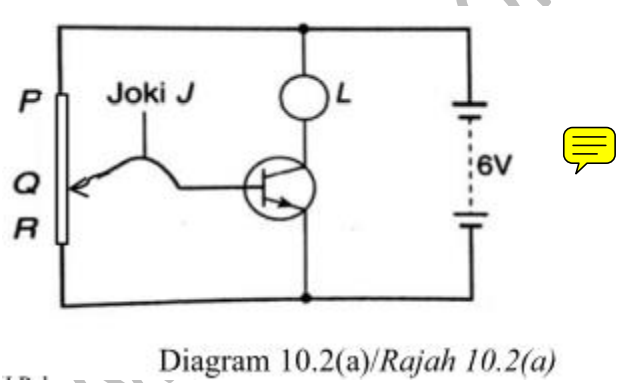


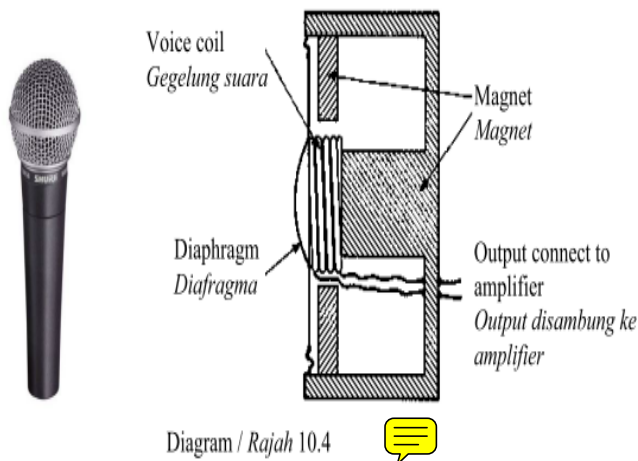
Diagram 10.2(a) show a transistor circuit. PQR is a resistance wire, J is a jockey and L is a lamp with label 6V,6W. When the jockey J is touched at Q, the lamp, L light up with normal brightness.

Rajah 10.2(a) menunjukkan satu litar transistor. PQR ialah satu dawai perintang, J ialah sebatang joki dan L ialah sebuah lampu berlabel 6V,6W. Apabila joki J berada di Q, lampu L menyala dengan kecerahan normal.

(i) What happen to the bulb when jockey J is moved to position R? Give your reason.
Apa yang akan berlaku kepada mentol apabila joki J digerakkan ke kedudukan R? Berikan alasan anda. [2 Mark/2Markah]

(ii) Circuit in diagram 10.2(a) is changed to diagram 10.2(b), where C is an uncharged capacitor. Explain your observation when only switch S 1 is closed.
Litar pada rajah 10.2(a) diubah kepada rajah 10.2(b), di mana C ialah sebuah kapasitor yang belum dicaskan. Terangkan pemerhatian anda apabila hanya suis S 1 sahaja ditutup? [2 Marks/2Markah]

9.



Suggest and explain how to improve the moving coil microphone so that it can function effectively and generate a greater electric current based on the characteristics of the thickness and elasticity of diaphragm, the voice coil and the strength of magnet.

Cadangkan dan terangkan bagaimana untuk menambah baik mikrofon gegelung bergerak itu supaya ia dapat berfungsi dengan berkesan dan menghasilkan arus elektrik yang lebih besar berdasarkan ciri-ciri ketebalan dan kekenyalan diafragma, gegelung suara dan kekuatan magnet.

[10 marks]

Diagram 10.4 shows a moving coil microphone and its cross-section. Moving coil microphone converts the sound energy to electrical energy based on electromagnetic induction.

When a person speaks through the microphone, the diaphragm and voice coil vibrate. The coils move in and out from the magnet to produce a small alternating current at the frequency of the sound.

Rajah 10.4 menunjukkan satu mikrofon gegelung bergerak dan keratan rentasnya. Mikrofon gegelung bergerak menukarkan tenaga bunyi kepada tenaga elektrik berdasarkan aruhan elektromagnet.

Apabila seseorang bercakap melalui mikrofon, diafragma dan gegelung bergerak. Gegelung suara bergerak ke dalam dan ke luar magnet untuk menghasilkan satu arus elektrik ulang-alik yang kecil pada frekuensi bunyi.

Characteristics	Explanation
1.	
2.	
3.	
4.	
5.	

10.

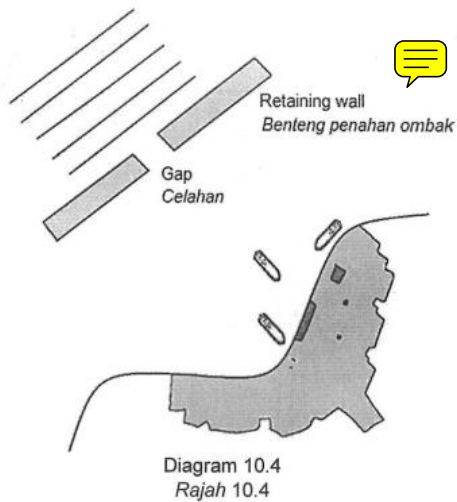


Diagram 10.4 shows the water wave moves toward a retaining wall near the harbour.
Rajah 10.4 menunjukkan gelombang air bergerak menuju ke benteng penahan ombak dekat dengan pelabuhan.

The design of the retaining wall in Diagram 10.4 is not suitable to protect the harbour from erosion due to high amplitude of water waves. Suggest and explain how to improve the retaining wall to reduce erosion on the surface of the wall, height of the wall, shape of the wall and size and number of the gap.
Rekabentuk dinding pemecah ombak pada Rajah 10.4 tidak sesuai untuk melindungi pelabuhan daripada hakisan disebabkan oleh amplitud ombak yang besar. Cadang dan terangkan bagaimana untuk meningkatkan dinding pemecah dalam mengurangkan hakisan melalui permukaan benteng, ketinggian benteng, bentuk benteng, saiz dan bilangan celah. [10 marks]

Characteristics	Explanation
1.	
2.	
3.	
4.	
5.	

Hots Questions

Topic	MV	RV	Hypothesis	Set up Diagram
Heat	mass	temperature		
	Heat supply 1. C 2. P 3.V	temperature		

Light	Real depth	Apparent depth		
Electricity	Length of wire	Resistance		
Electromagnetism	Height of magnet drop	Current induces		

Essay

1. waves interference-
2. electricity
3. Archimedes
4. Refraction of light
5. Half life

Paper 3 (Discussion on Part A No 2 questions.)

1 Syahfarhan carries out an experiment to investigate the relationship between the potential difference across a battery, V , and the current flow, I . He used ammeter, rheostat, and voltmeter which is connected as shown in the Diagram 2.1.

Syahfarhan menjalankan eksperimen untuk menyiasat hubungan antara beza keupayaan yang merentasi bateri V dengan arus yang mengalir I . Pelajar itu menggunakan ammeter, reostat dan voltmeter yang disambungkan seperti dalam Rajah 2.1

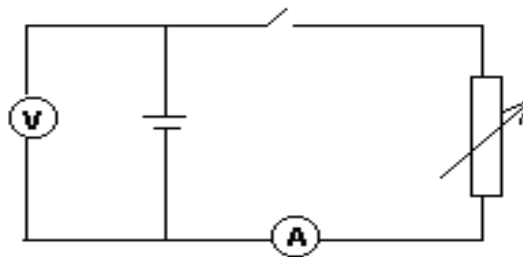


Diagram 2.1/ Rajah 2.1

The results of the experiment is shown in graph of V against I as shown in Diagram 2.2

Keputusan eksperimen ditunjukkan dalam graf V melawan I seperti ditunjukkan dalam Rajah 2.2

(a) Based on the graph in Diagram 2.2,

Berdasarkan graf dalam Rajah 2.2,

(i) What will happen to the value of V , if the current, I , increases?

Apakah yang akan berlaku terhadap nilai V , jika arus, I , bertambah?

..... [1 mark /markah]

(ii) Determine the value of V when $I = 0.00$ A

Show on the graph, how you determine the value of V .

Tentukan nilai V bila $I = 0.00$ A .

Tunjukkan di atas graf bagaimana anda menentukan nilai V

$V = \dots$ [2 marks /markah]

(iii) The gradient of the graph represent the internal resistance of the battery, r .

State how the resistance varies with current, I .

Kecerunan graf itu mewakili rintangan dalam sel itu, r .

Nyatakan bagaimana rintangan itu berubah dengan arus, I .

.....

[1 mark /markah]

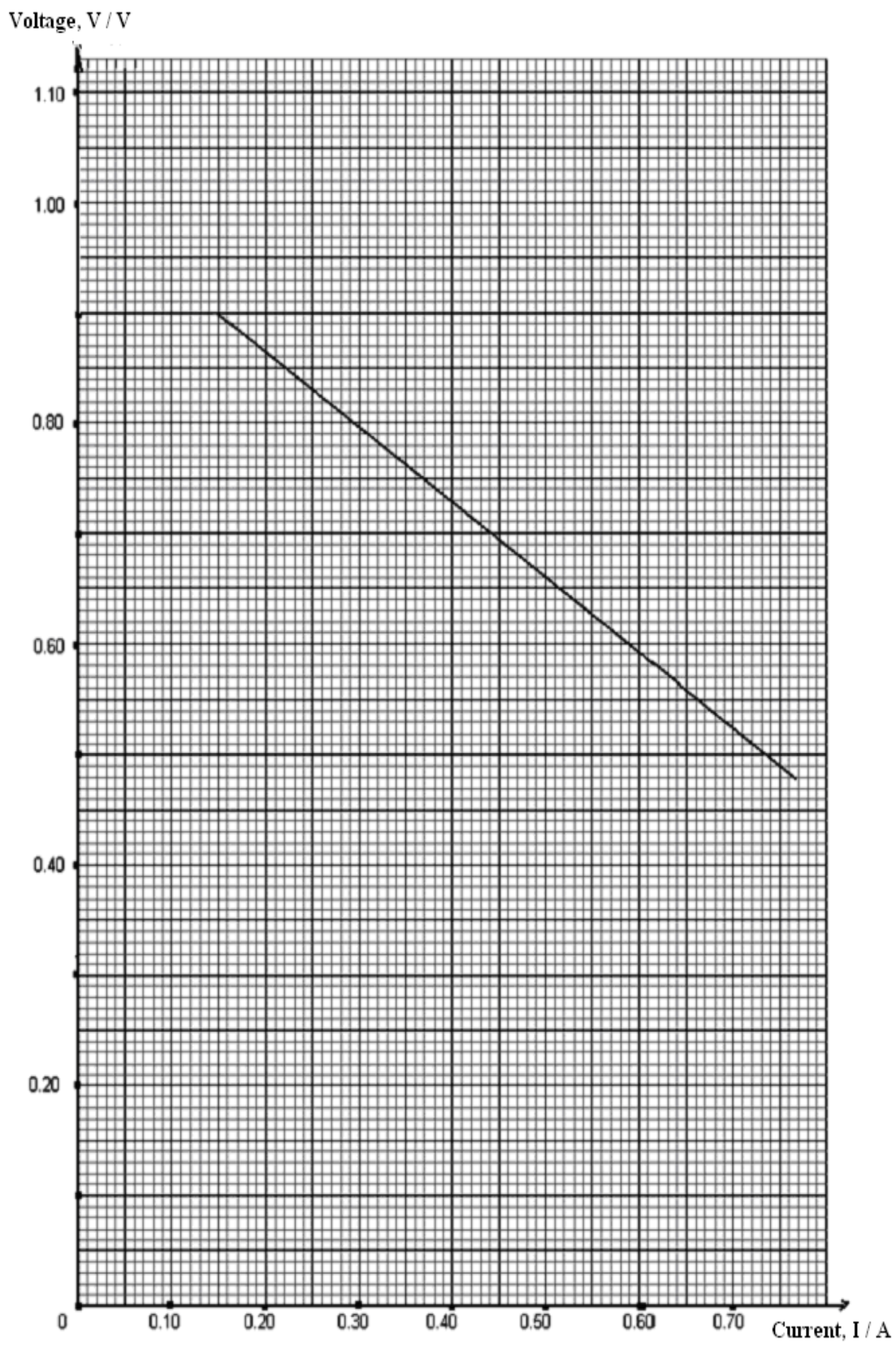


Diagram 2.2

Rajah 2.2

- (b) Name the physical quantity that represents the value in 2 a (ii).
Namakan kuantiti fizik yang mewakili nilai yang di 2a (ii).

.....

[1 mark /markah]

- (c) (i) Calculate the gradient of the graph, m .
 Show on the graph how you determine value of m .
Kirakan kecerunan graf, m .
Tunjukkan di atas graf bagaimana nilai m ditentukan

[3 marks /markah]

- (ii) The internal resistance, r of the dry cell is given by equation
Rintangan dalaman, r bagi sel kering itu diberi melalui persamaan

$$r = -m$$

where m is the gradient of the graph.
dimana m adalah kecerunan bagi graf itu.

Determine the value of internal resistance, r .
Tentukan nilai rintangan dalam, r .

$r =$

1 mark /markah]

- (d) Calculate the electromotive force, E of the battery using formula
Kirakan daya gerak elektrik bateri itu, E , dengan menggunakan formula

$$E = V + Ir$$

where r is gradient of the graph and V is voltage when the current, $I = 0.15$ A.
di mana r ialah kecerunan graf itu dan V ialah beza keupayaan apabila arus,
 $I = 0.15$ A.

$E =$ [2 marks /markah]


- (e) State one precaution that should be taken to improve the results of the experiment.
Nyatakan satu langkah berjaga-jaga yang perlu diambil untuk memperbaiki keputusan eksperimen

.....

[1 mark /markah]

Essay Part C.

1. Table 11 shows the characteristic of four designs of the aeroplane wings.
Jadual 11 menunjukkan ciri-ciri bagi empat rekabentuk sayap kapal terbang.

Wing Sayap	Shape of cross section of wing <i>Bentuk keratan rentas sayap</i>	Area of wing <i>Keluasan sayap</i> / m ²	Density of wing material <i>Ketumpatan bahan sayap</i> / kgm ⁻³	Difference in speed of air above and below the wing <i>Perbezaan laju udara di antara bahagian atas dan bawah sayap</i> / ms ⁻¹
W		38.0	2400	10.0




X		39.7	2300	21.8
Y		60.5	2000	20.0
Z		40.5	2050	15.5

Table 11/ *Jadual 11*

Study the characteristics of all four design of aeroplane wings.

Explain the suitability of each characteristic and determine the most suitable wing to be mounted with the body of the aeroplane.

Give reasons for your choice.

Kaji ciri-ciri bagi keempat-empat rekabentuk sayap kapal terbang tersebut.

Terangkan kesesuaian setiap ciri dan tentukan sayap yang paling sesuai untuk dipasang bersama badan kapal terbang tersebut.

Beri sebab untuk pilihan anda.

[10 marks]
[10 markah]

- (e) Diagram 9.4 shows a bicycle pump which takes longer time to inflate the bicycle tyres
Rajah 9.4 menunjukkan sebuah pam basikal yang mengambil masa yang lama untuk mengembungkan tayar basikal.



Diagram 9.4/ *Rajah 9.4*

Using appropriate physics concepts, explain the usage of suitable parts to design the most convenience, safest pump that ready to pump whenever it is needed.

Menggunakan konsep fizik yang sesuai, terangkan penggunaan bahagian yang sesuai untuk merekabentuk pam basikal yang paling memudahkan dan selamat maka boleh digunakan bila-bila diperlukan.

2.

[10 marks]

PHYSICS Workshop 2019

Tips for Paper 3 No 1 and No 2

1. Identify the variable from the text and diagram.
 - (a) Manipulated variable
 - (b) Responding variable
 - (c) Fixed variable (can be measured)
---NOT TYPE OF SUBSTANCE
 - (d) Observe the diagram measurement
 - (e) Identify the value in table

- (f) Tabulate data with symbol and unit
 - (g) Plan your graph (unit and symbol)
 - (h) Determine the relationship from the graph
2. Read the question CAREFULLY
- (a) Extrapolate the graph and write the value next to it
 - (b) Plot biggest triangle and get closest value with unit
 - (c) Substitute the value correctly with 2 decimal places
 - (d) Place precaution
 - **Eye Observation perpendicular to the scale of (instrument) to prevent parallax errors**
 - Off the circuit when measurement is not taken to prevent heating of wires and cause systematic errors
 - Repeat the experiment for 3 times and determine the average to prevent systematic error (NO LONGER VALID)
3. **Tips Paper 3 no 3 and 4.**
- (a) Planning experiment is the BEST to do and EASY to score but it is also easy to differ from the main point.
 - (b) Identify variables from the questions from the statement, CIRCLE UP the variables involve and APPARATUS GIVEN in statement.
 - (c) Think what ???? experiment is using given apparatus as a HINTS. Plan and sketch the diagram of experiment step up.
 - (d) Write inference, hypothesis and aim FOLLOW FORMAT given.

Underline the variables of MV and RV from the diagram. Use the variables to substitute the format of Planning Experiment.

Procedure

1. State the initial measurement of MV.
2. State the ways of measurement of RV with apparatus and follow with formula (if necessary)
3. Repeat the experiment with 4 different MV values. a1,a2,a3 and a4.

Paper 2 Part B

1. Definition – don't state the formula of the define word
 - Write the definition in statement from the formula
2. Comparison questions – must use back the same diagram to compare in physics term comparison. Quote back the Diagram number, and compare with statement according to the marks provision.
3. Explanation on aspects given.

Must quote back the aspect given, don't divert the statement by explaining other statement of your ways.

Explain the characteristics of the statement given follow (1 marks) with explanation of the benefit and advantages of the characteristics stated. (1 marks)

More explanation are better, usually TWO are more than enough.

Part C

1. Usually calculation, and definition.

Please state formula, working and final results with minimum 2 decimal places and correct units.
2. Explanation of physics concepts, usually test your understanding of physics formula relationships.
3. Study specification on the aspects given and evaluate the pictures given to extract the answer from the information given. Quote the information of point of answer and elaborate the statement of characteristics with physics concept explanation.
4. Try to give TWO explanation of each characteristics in a statement. (4 points with 4 explanation) – 8 marks
5. Final 2 marks is the explanation of the BEST suitability and CHOOSE the BEST of the 4 or 5 given examples.
6. This characteristics and explanation can states in a table form. (THE BEST EVER ESSAY for 10 marks)
7. Choose the best essay than you can get the MOST marks.
8. Essay in Part B and Part C is usually ONE form 4 and ONE form 5. So DON'T SPOT QUESTION. Study all the physics concept.