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PROVE IT!!

PHYSICS Workshop 2019

SMK SAS

8 Oktober 2019

1.

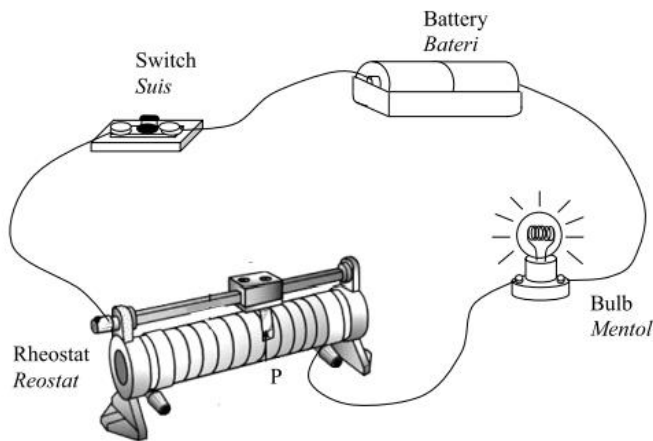


Diagram / Rajah 4.1

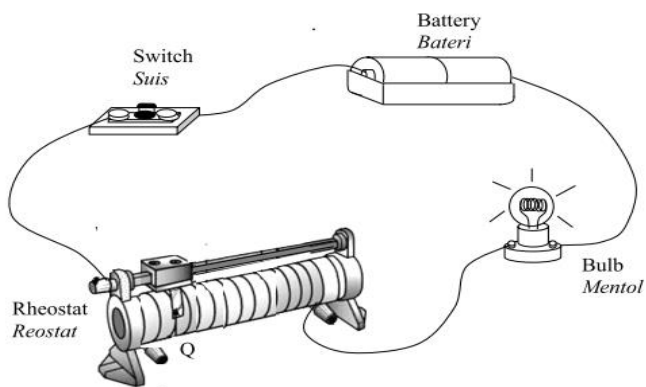


Diagram / Rajah 4.2

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.

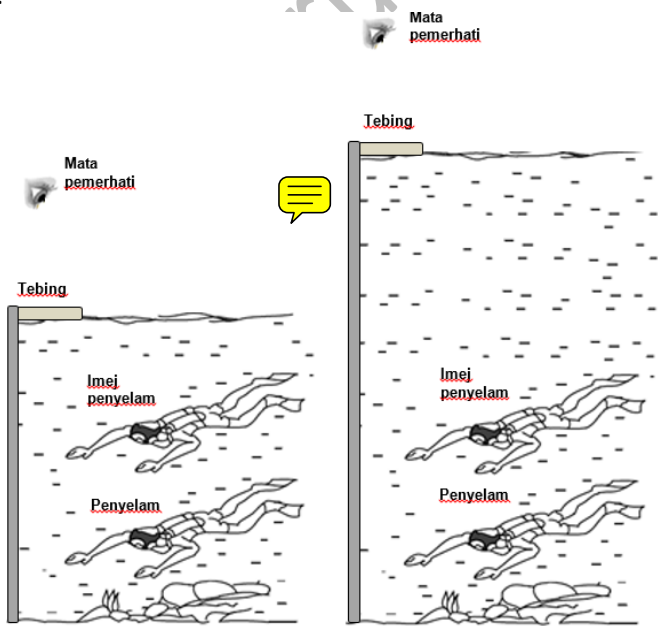
Rajah 4.2 menunjukkan mentol menyala dengan malap apabila pelaras rheostat disambungkan pada titik Q.

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.

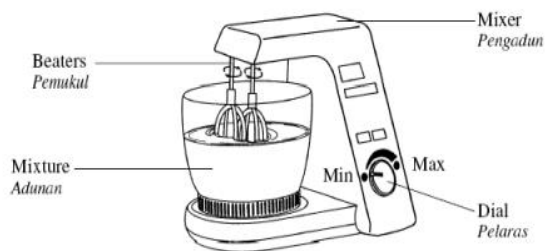


Diagram 4.1
Rajah 4.1

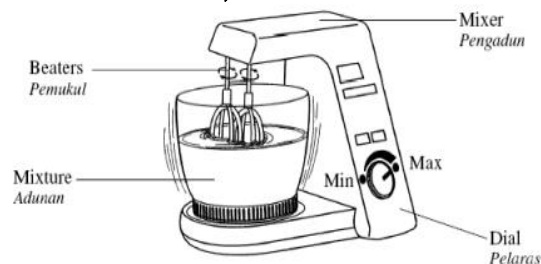


Diagram 4.2
Diagram 4.2

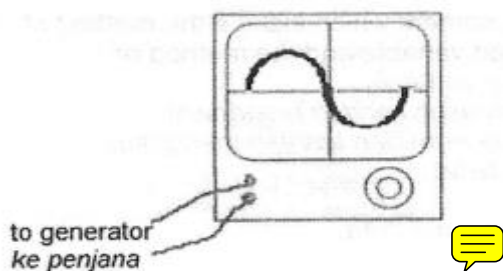
Diagram 4.1 and Diagram 4.2 show a mixer for making a chocolate cake. In Diagram 4.1, Salwa has rotated the dial at minimum current and the beaters are spinning. In Diagram 4.2, Salwa has rotated the dial at maximum current and the beaters spin faster. When the beaters spin faster, the force exerted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



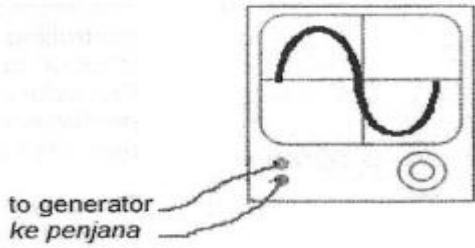
Daigram 4.2
Rajah 4.2
Wind speed : 25 km/h
Kelajuan angin : 25 km/j

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.

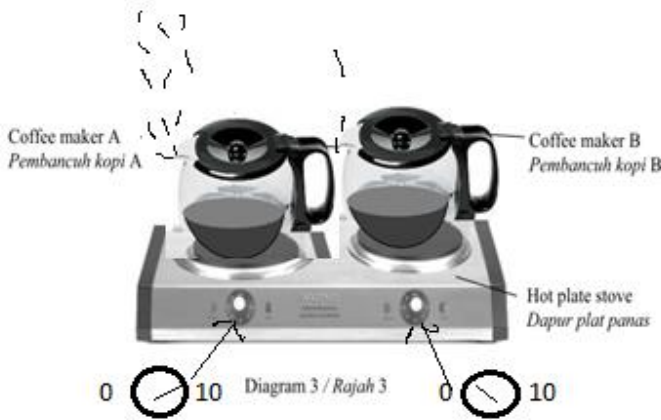


Diagram 3 shows two similar coffee maker A and B, containing same amount of coffee on similar hot plates stove. The coffee in both coffee makers are heated by turning on the power supply of different value on the hot plate. After few minutes, it was observed that the coffee in coffee maker A is hotter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

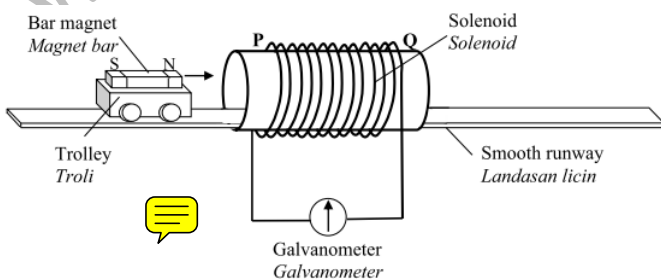


Diagram / Rajah 10.3

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
Rajah 10.1

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)/Rajah 10.2(a)

Diagram 10.2/Rajah 10.2(b)

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]

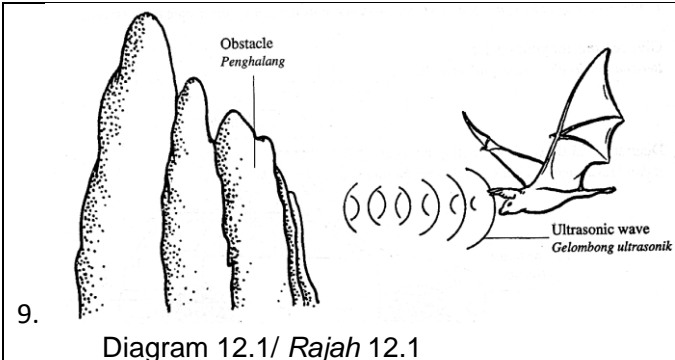


Diagram 12.1 shows a bat using ultrasonic waves to detect obstacle in front of it. *Rajah 12.1 menunjukkan seekor kelawar sedang menggunakan gelombang ultrasonik untuk mengesan penghalang di hadapannya.*

a) What is the meaning of ultrasonic waves?
Apakah yang dimaksudkan dengan gelombang ultrasonik?
 [1 mark/ 1 markah]

Explain how the ultrasonic waves are used by the bat to detect the distance of the obstacle.
Terangkan bagaimana gelombang ultrasonik digunakan oleh kelawar untuk mengesan jarak penghalang itu.
 [4 marks/ 4 markah]

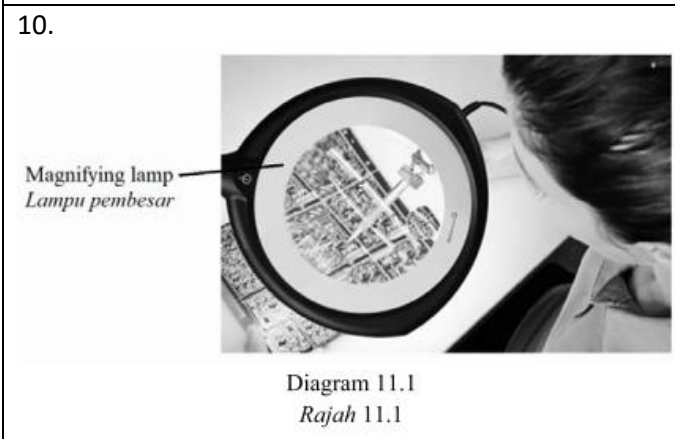


Diagram 11.1 shows a technician using a magnifying lamp to help him repairing a circuit board. The magnifying lamp uses a lens to magnify the image of the circuit.

Rajah 11.1 menunjukkan seorang juru teknik menggunakan lampu pembesar untuk membantunya memperbaiki sebuah papan litar. Lampu pembesar itu menggunakan sebuah kanta untuk memperbesarkan imej litar itu.

By using a diagram, explain how the image is formed. In your explanation, state the characteristics of the image.

Dengan menggunakan rajah, terangkan bagaimana imej terbentuk. Dalam penerangan anda, nyatakan ciri-ciri imej itu.
 [4 marks]

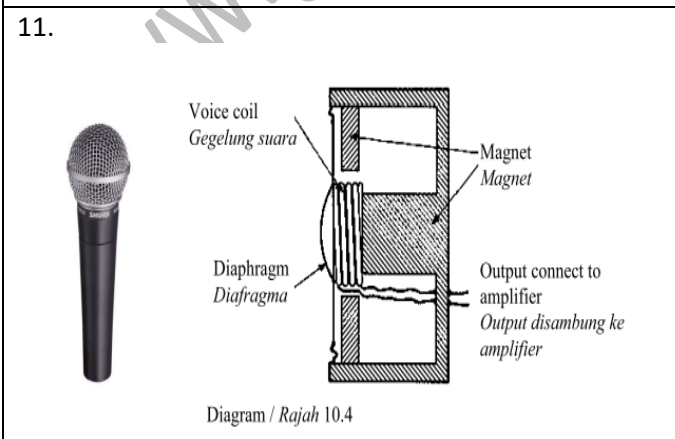


Diagram 10.4 shows a moving coil microphone and its cross-section. Moving coil microphone converts the sound energy to electrical energy based on electromagnetic induction.

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.

Suggest and explain how to improve the moving coil microphone so that it can function

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

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]

berdasarkan aruhan elektromagnet.

Apabila seseorang bercakap melalui mikrofon, diafragma dan gegelung bergetar. 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.	

Hots Questions

Essay

1. waves interference-
 2. electricity
 3. Archimedes
 4. Refraction of light
 5. Half life
- A. Heat, Light and electromagnetism.

Essay Part C.

12.

Diagram 11.2 shows two ropes supporting Ali Imran during a flying fox activity.
 Rajah 11.2 menunjukkan dua utas tali yang menyokong Ali Imran semasa aktiviti 'flying fox'.

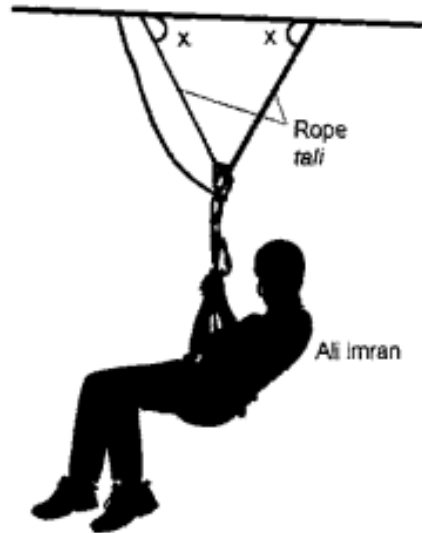




Diagram 11.2
 Rajah 11.2

You are required to investigate the characteristics of the rope as shown in Table 11.
 Anda dikehendaki menyiasat ciri-ciri tali seperti ditunjukkan dalam Jadual 11.

Rope Tali	Maximum tension of the rope/ N Tegangan maksimum tali / N	Material of the rope Bahan tali	Angle X Sudut X	Rate of the heat expansion of the rope Kadar pengembangan haba dalam tali
R	300	 Nylon Nilon	Low Rendah	2400
S	500	 Nylon Nilon	High Tinggi	2300

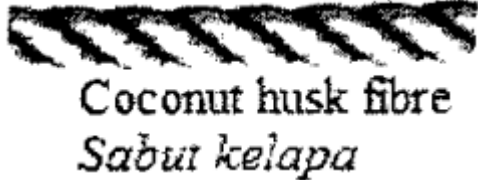
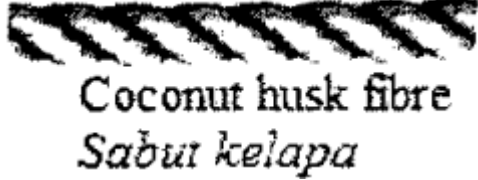
T	500		Low Rendah	2000
U	300		High Tinggi	2050

Table 11/ Jadual 11

Study the characteristics of all four characteristic of the rope.

Determine the most suitable rope which can support a heavy man for a longer time.

Give reasons for your choice.

Kaji ciri-ciri bagi keempat-empat rekabentuk ciri pada tali.

Tentukan tali yang paling sesuai untuk menyokong seorang lelaki yang berat dalam masa yang lama..

Beri sebab untuk pilihan anda.

[10 marks]

13.

- (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.

[10 marks]

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

Heat

$$Q = mc\theta$$

Archimedes Principle

$$F = \rho gV$$

Electromagnetism

Electric energy= Potential energy

Heat

Kettle

Charging handphone

www.guide.com

14. A professional baseball team trains their players by allowing them to go through hitting the ball drills that are ejected from a spring system in two initial state of compression as shown in Diagram 9.1 and Diagram 9.2. Both two springs have the same initial length. *Kumpulan bola lisut profesional telah melatih pemainnya dengan membenarkan mereka menghentam bola yang dilepaskan dari sistem spring dalam dua keadaan mampatan awal seperti yang ditunjukkan dalam Rajah 9.1 dan Rajah 9.2. Kedua-dua spring mempunyai panjang awal yang sama.*

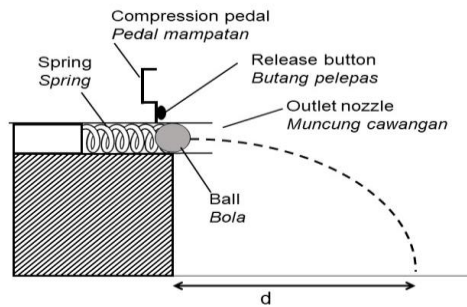


Diagram 9.1
Rajah 9.1

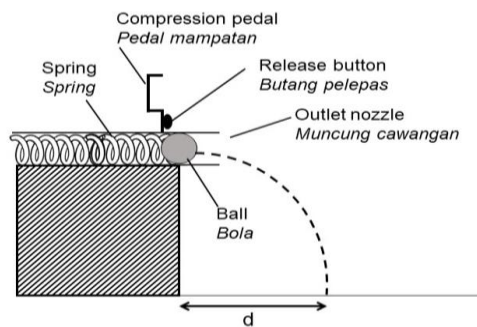



Diagram 9.2/ Rajah 9.2

A compression pedal are used to compress the spring. The target ball is then placed beside the compression spring. The release button will releases the compressed spring and the ball is ejected with a high speed for the base players to hit.

Pedal mampatan digunakan untuk memampatkan spring. Bola sasaran diletakkan bersebelahan dengan spring termampat. Butang pelepas akan melepaskan spring termampat dan bola dilepaskan dengan halaju tinggi supaya pemain boleh menghentam bola tersebut 

b) Based on Diagram 9.1 and Diagram 9.2,

Berdasarkan Rajah 9.1 dan Rajah 9.2,

i) compare the elastic potential energy in the spring, the speed of the ball after being ejected and the distance travelled, d by the ball after ejection.

bandingkan tenaga keupayaan kenyal dalam spring, halaju bola apabila dilepaskan dan jarak yang dilalui, d oleh bola apabila dilepaskan.

ii) relate the elastic potential energy in the spring with the speed of the ball after being ejected to make a deduction regarding the relationship between the distance travelled, d by the ball after ejection and the speed of the ball after being ejected.

hubungkaitkan tenaga keupayaan kenyal dalam spring dengan halaju bola apabila dilepaskan untuk membuat satu kesimpulan berkaitan hubungan antara jarak yang dilalui, oleh bola selepas dilepaskan dengan halaju bola apabila dilepaskan.



[5 marks/ 5 markah]

(c) State two modifications that can be done to the spring in order to generate a higher speed for the ball. Give reasons for your answers.

Nyatakan dua perubahan yang boleh dilakukan kepada spring supaya bola boleh dilepaskan dengan halaju yang tinggi. Berikan sebab untuk jawapan anda.

[4 marks/ 4 markah]

15) Diagram 10.2 shows a potential difference, V , against, electric current, I graph for two electrical components, which are, a filament lamp and a constantan wire conductor.

Rajah 10.2 menunjukkan satu graf beza keupayaan, V , melawan arus elektrik, I , bagi dua komponen elektrik, iaitu, lampu filamen dan konduktor wayar konstantan.

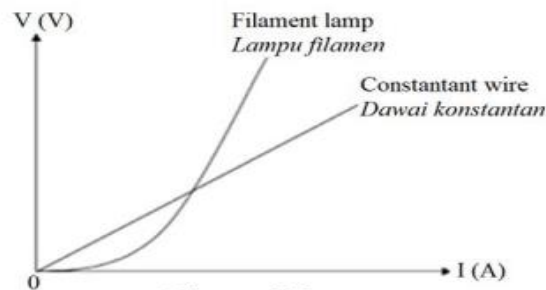


Diagram 10.2

Rajah 10.2

Based on Diagram 10.2, compare the shape of the graphs, the gradient of the graphs and the resistance of the filament lamp and the constantan wire conductor. Relate the shape of the graph and the resistance of the electrical components to make a deduction on which of the conductor is an Ohmic conductor. [5 marks]

16. a) Diagram 10.3 shows a filament lamp in an electrical wiring system in a house

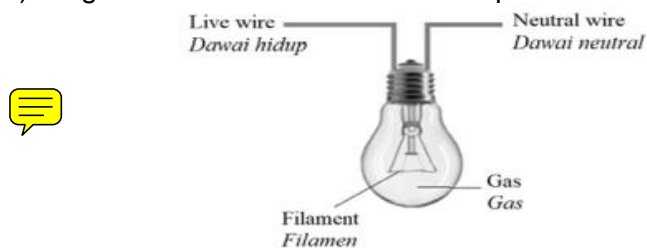


Diagram 10.3

Rajah 10.3 menunjukkan sebuah lampu filamen dalam sistem pendawaian elektrik di sebuah rumah.

It is observed that the filament lamp produces a dim light. As an electrical engineer at Power System Consulting, suggest modifications that can be made to the structure of the filament lamp in Diagram 10.3, so that it can produce a brighter light. State and explain the modifications based on the characteristics of the coil and the characteristics of the gas filled in the filament bulb.

Lampu filamen tersebut didapati menghasilkan cahaya yang malap. Sebagai jurutera elektrik di Power System Consulting, cadangkan pengubahsuaian yang boleh dibuat kepada struktur lampu filamen dalam Rajah 10.3, supaya ia boleh menghasilkan cahaya yang lebih cerah. Nyatakan dan terangkan pengubahsuaian berdasarkan ciri-ciri gegelung dan ciri-ciri gas yang diisi dalam mentol filamen tersebut. [10 marks]

PHYSICS Workshop 2019

Tips for Paper 3 No 1 and No 2

- Identify the variable from the text and diagram.
 - Manipulated variable
 - Responding variable
 - Fixed variable (can be measured)
---NOT TYPE OF SUBSTANCE
 - Observe the diagram measurement
 - Identify the value in table
 - Tabulate data with symbol and unit
 - Plan your graph (unit and symbol)
 - Determine the relationship from the graph
- Read the question CAREFULLY
 - Extrapolate the graph and write the value next to it
 - Plot biggest triangle and get closest value with unit
 - Substitute the value correctly with 2 decimal places
 - 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)**
- Tips Paper 3 no 3 and 4.
 - Planning experiment is the BEST to do and EASY to score but it is also easy to differ from the main point.
 - Identify variables from the questions from the statement, CIRCLE UP the variables involve and APPARATUS GIVEN in statement.
 - 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. a_1, a_2, a_3 and a_4 .

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.