Nama: .....

NO. KAD PENGENALAN

ANGKA GILIRAN

PERSIDANGAN KEBANGSAAN PENGETUA
SEKOLAH MENENGAH MALAYSIA (CAWANGAN MELAKA)

PEPERIKSAAN PERCUBAAN SIJIL PELAJARAN MALAYSIA 2012 4531/1
PHYSICS

Kertas1
Ogos/Sept.
1 ¼ Jam **Satu jam lima belas minit**

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas soalan ini adalah dalam dwibahasa.*
2. *Calon dikehendaki membaca maklumat di halaman bawah.*

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. *This question paper consists of **50** questions.*
   Kertas soalan ini mengandungi 50 soalan.
2. *Answer **all** questions.*
   *Jawab **semua** soalan.*
3. *Answer each question by blackening the correct space on the answer sheet.*
   Jawab setiap soalan dengan menghitamkan ruangan yang betul pada kertas jawapan.
4. *Blacken only **one** space for each question.*
   *Hitamkan **satu** ruangan sahaja bagi setiap soalan.*
5. *If you wish to change your answer, erase the blackened mark that you have made. Then blacken the space for the new answer.*
   Sekiranya anda hendak menukar jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.
6. *The diagrams in the questions provided are not drawn to scale unless stated.*
   Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan.
7. *You may use a non-programmable scientific calculator.*
   Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.
8. *A list of formulae is provided on page 2.*
   Satu senarai rumus disediakan di halaman 3.

Kertas soalan ini mengandungi 29 halaman bercetak.

The following information may be useful. The symbols have their usual meaning.

1. $a = \frac{v - u}{t}$
2. $v^2 = u^2 + as$
3. $s = ut + at^2$
4. Momentum $= mv$
5. $F = ma$
6. Kinetic energy $= \frac{1}{2}mv^2$
7. Potential energy $= mgh$
8. Elastic potential energy $= \frac{1}{2}Fx$
9. $\rho = \frac{m}{v}$
10. Pressure, $p = h\rho g$
11. Pressure, $P = \frac{F}{A}$
12. Heat, $Q = mc\theta$
13. Heat, $Q = ml$
14. $\frac{pV}{T} =$ constant
15. $E = mc^2$
16. $v = f\lambda$
17. Power, $P = \frac{energy}{time}$
18. $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$
19. linear magnification $= \frac{image\ size}{object\ size}$
20. $\lambda = \frac{ax}{D}$
21. $n = \frac{Sin\ i}{Sin\ r}$
22. n $= \frac{real\ depth}{apparent\ depth}$
23. $Q = It$
24. $V = IR$
25. Power, $P = IV$
26. $\frac{N_s}{N_p} = \frac{V_s}{V_p}$
27. Efficiency $= \frac{I_s V_s}{I_p V_p}$ x 100%
28. $g = 10\ ms^{-2}$

1. Which measurement is the shortest?

Ukuran manakah yang paling pendek?

A 3.56×10^{3} mm
B 3.56×10^{-2} mm
C 3.56×10^{3} cm
D 3.56×10^{-4} m

2. Which quantity is a vector quantity?

Kuantiti manakah ialah kuantiti vektor?

A Speed
Laju
B Pressure
Tekanan
C Work
Kerja
D Displacement
Sesaran

3 Diagram 1 shows an investigation about the effect of force on the motion of objects. Trolleys of different masses are pushed by the same amount of force.

Rajah 1 menunjukkan satu penyiasatan tentang kesan daya terhadap gerakan objek. Troli yang berlainan jisim ditolak oleh jumlah daya yang sama.

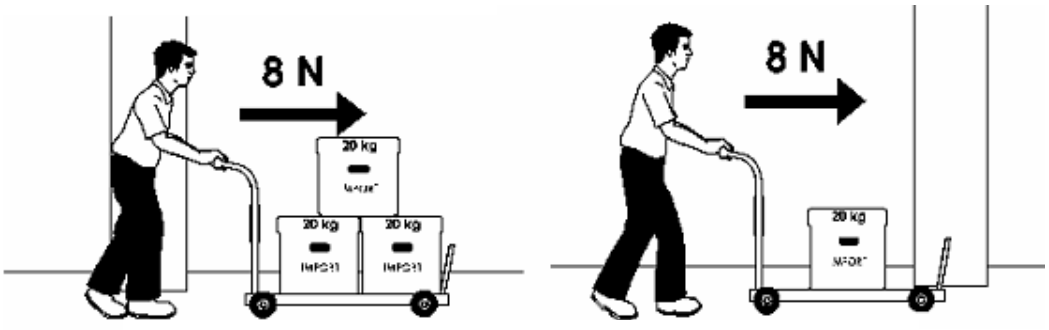


Diagram 1
Rajah 1

Which of the following variables are correct?
Antara pembolehubah berikut, yang manakah betul?

	Manipulated variable ***Pembolehubah dimanipulasikan***	**Responding variable** ***Pembolehubah bergerak balas***	**Constant variable** ***Pembolehubah dimalarkan***
A	Mass *Jisim*	Force exerted *Daya dikenakan*	Acceleration *Pecutan*
B	Force exerted *Daya dikenakan*	Mass *Jisim*	Acceleration *Pecutan*

	C	Acceleration *Pecutan*	Force exerted *Daya dikenakan*	Mass *Jisim*
	D	Mass *Jisim*	Acceleration *Pecutan*	Force exerted *Daya dikenakan*

4 Diagram 2 shows a velocity-time graph for a motion of an object.
Rajah 2 menunjukkan graf halaju-masa bagi gerakan suatu objek

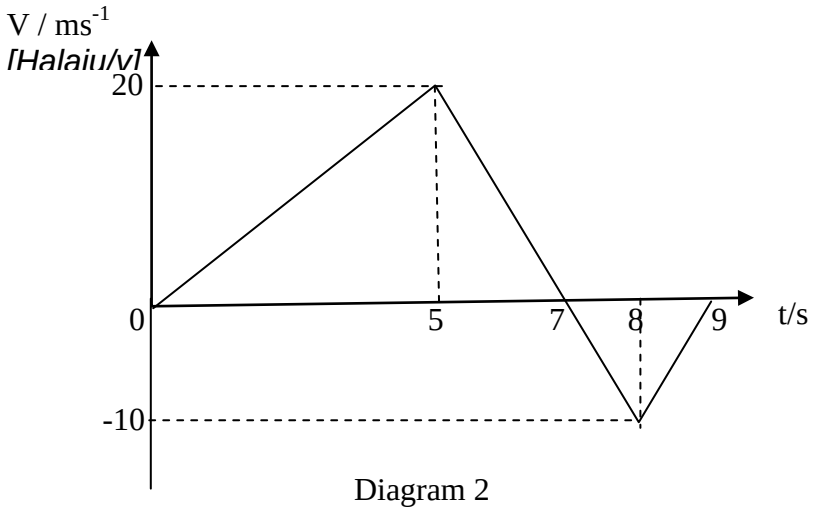


Diagram 2
Rajah 2

Calculate the displacement of the object.
Hitungkan sesaran objek itu.

A 10 m

B 60 m

C 70 m

D 80 m

5 Diagram 3 shows a coin is placed on a cardboard.
Rajah 3 menunjukkan sekeping syiling diletakkan di atas sekeping kadbod.

Diagram 3
Rajah 3

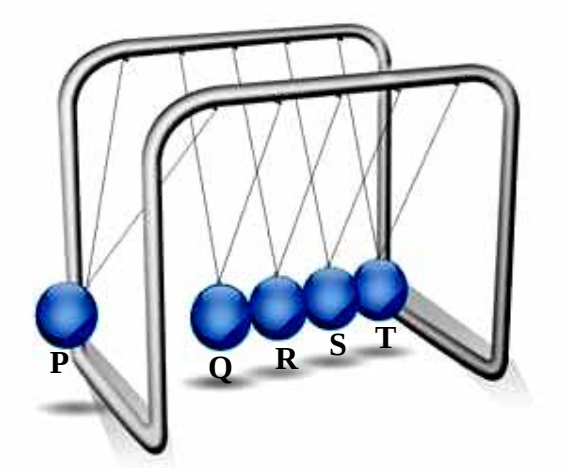
	What happens to the coin when the cardboard is jerked horizontally? *Apakah yang berlaku pada syiling itu apabila kadbod disentap secara mendatar?* **A** The coin is momentarily pushed up from the cardboard. *Syiling terangkat ke atas dari kadbod.* **B** The coin remains at rest on the cardboard *Syiling itu kekal pegun di atas kadbod* **C** The coin drops down into the glass *Syiling jatuh ke dalam gelas.* **D** The coin drops outside the glass *Syiling jatuh di luar gelas*
6	Diagram 4 shows five identical steel balls P, Q, R, S and T hung on a stand. *Rajah 4 menunjukkan lima biji bola keluli P, Q, R ,S dan T yang serupa digantung pada satu pemegang.*  Diagram 4 *Rajah 4* What will happen to if ball P is pulled and released ? *Apakah yang akan berlaku apabila bola P ditarik dan dilepaskan?* **A** P, Q, R, S dan T will move together to the right. *P, Q, R, S dan T akan gerak bersama-sama ke kanan.* **B** P, Q, R and S are at rest, T will move to the right. *P, Q, R dan S adalah pegun, T akan bergerak ke kanan.* **C** P, Q and R are at rest , S and T move to the right. *P, Q dan R adalah pegun, S dan T akan bergerak ke kanan.* **D** P rebounce to the left, while Q, R, S and T stay at rest. *P melantun ke kiri, manakala Q, R, S dan T adalah pegun.*
7	Diagram 5 shows an athlete of mass 65 kg jumping over a horizontal bar. *Rajah 5 menunjukkan seorang atlit berjisim 65 kg melompat melepasi palang.*

Diagram 5
Rajah 5

Calculate the impulsive force acting on the mattress if the velcocity of the athlete just before he touches the mattress is 10 ms^{-1} and the time of impact 0.5 s.
Hitungkan daya impuls yang bertindak pada tilam jika halaju atlit itu sebelum ia sentuh tilam ialah 10 ms^{-1} dan masa tindakan ialah 0.5 s.

A 110 N
B 150 N
C 325 N
D 1300 N

8 Diagram 6 shows a photo frame of weight, W= 20 N hanging on a wall. Tension acting on both strings are T.

Rajah 6 menunjukkan satu bingkai foto yang beratnya, W = 20 N digantung pada dinding. Tegangan yang bertindak pada kedua-dua tali ialah T.

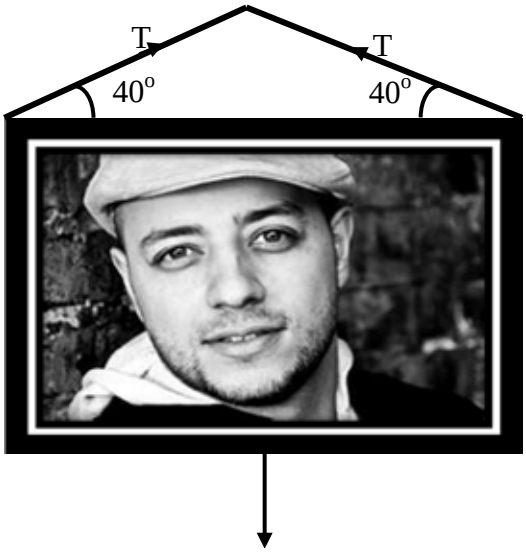
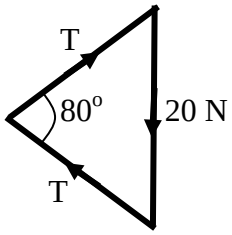


Diagram 6
Rajah 6

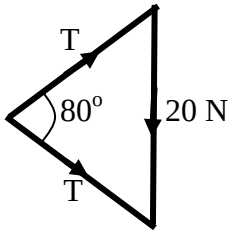
Which of the following vector diagrams represents the situation in Diagram 6?

Antara rajah vector berikut, yang manakah mewakili situasi dalam Rajah 6?

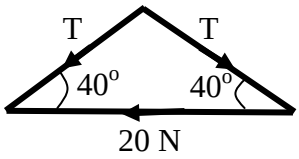
A



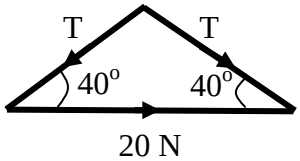
B



C



D



9 Diagram 7 shows an archer aiming an arrow to a target board.

Rajah 7 menunjukkan seorang pemanah sedang mengacu anak panah pada papan sasaran.

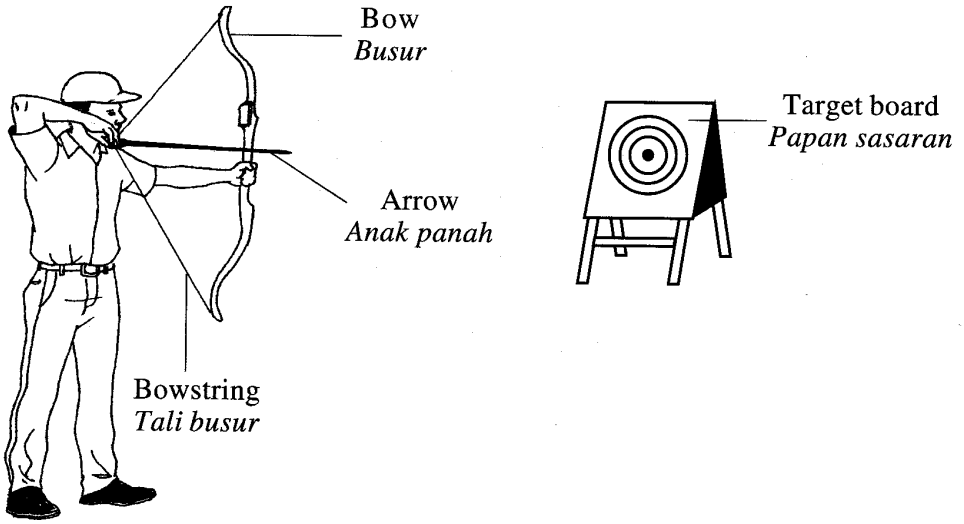


Diagram 7

Rajah 7

The position of the aiming arrow is higher compared to the centre of the target Board. This is due to ……..

Kedudukan anak panah yang diacukan lebih tinggi berbanding kepada pusat papan Sasaran. Ini disebabkan oleh……..

	A Inertia of the arrow. *Inertia anak panah* **B** Gravitational force acts on the arrow *Daya tarikan graviti bertindak ke atas anak panah* **C** Elasticity of the arrow. *Kekenyalan anak panah* **D** The speed of the arrow is slowing down. *Halaju anak panah yang semakin berkurangan*
10	Which situation shows that no work being done? *Situasi manakah yang menunjukkan tiada kerja dilakukan?* **A**  Lifting a weight *Mengangkat beban* **B**  Lifting boxes *Mengangkat kotak* **C**  Pushing a car *Menolak kereta* **D**  Pushing a wall *Menolak dinding*
11	Diagram 8 shows two arrangements of identical springs, P and Q, which are stretched using similar loads. *Rajah 8 menunjukkan dua ususan spring P dan Q yang dibuat daripada spring yang serupa. P dan Q di regang menggunakan pemberat yang serupa.*

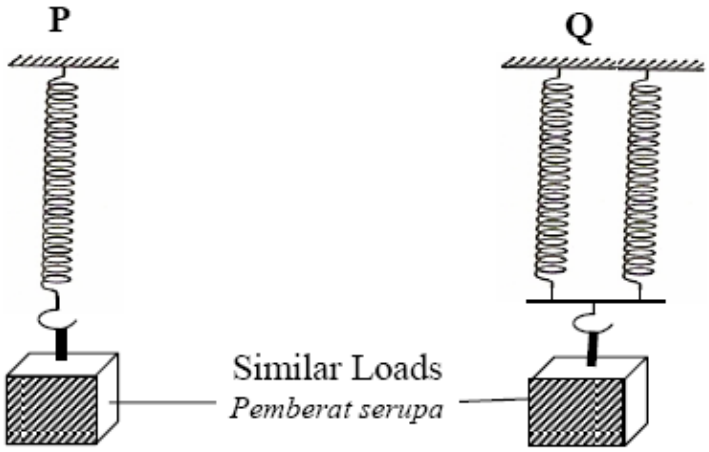
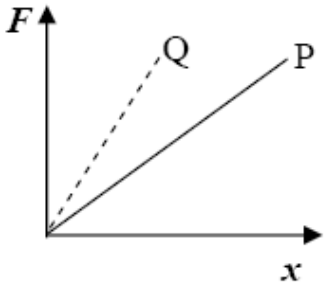


Diagram 8
Rajah 8

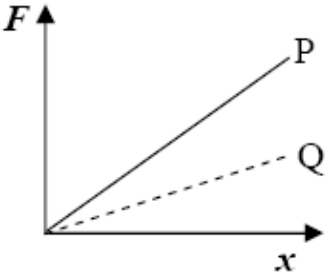
Which graph shows the relationship between the load weight, *F* and the extension of spring, *x*, for P and Q?

Graf manakah menunjukkan hubungan antara berat pemberat, F dan pemanjangan spring, x, untuk P dan Q?

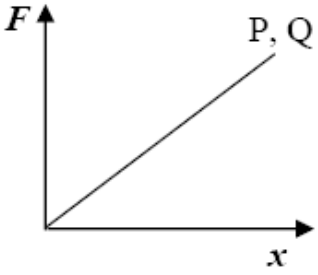
A



B



C



12 Diagram 9.1 and 9.2 show two identical block pressing the plasticine

Rajah 9.1 dan 9.2 menunjukkan dua blok yang serupa menekan plastisin.

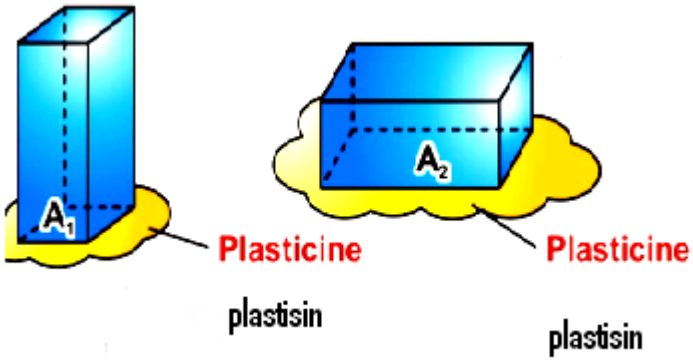


Diagram 9.1
Rajah 9.1

Diagram 9.2
Rajah 9.2

Surface area A_1 is smaller than surface area A_2 and both block has same mass. Which of the following is correct about it?

Luas permukaan A_1 lebih kecil daripada luas permukaan A_2.Antara pernyataan berikut yang manakah benar?

A.Both blocks exert the same pressure.

Kedua-dua blok mengenakan tekanan yang sama.

B .Block in Diagram 9.1 exerts greater pressure.

Blok pada Rajah 9.1 mengenakan tekanan yang lebih besar dari Rrajah 9.2

C. Block in Diagram 9.1 exerts smaller pressure

Blok Rajah 9.1 mengenakan tekanan yang lebih kecil

13

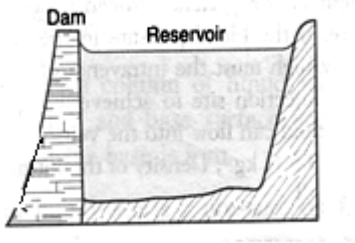
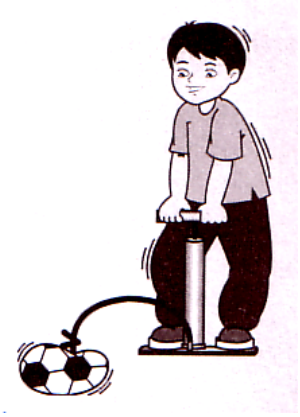
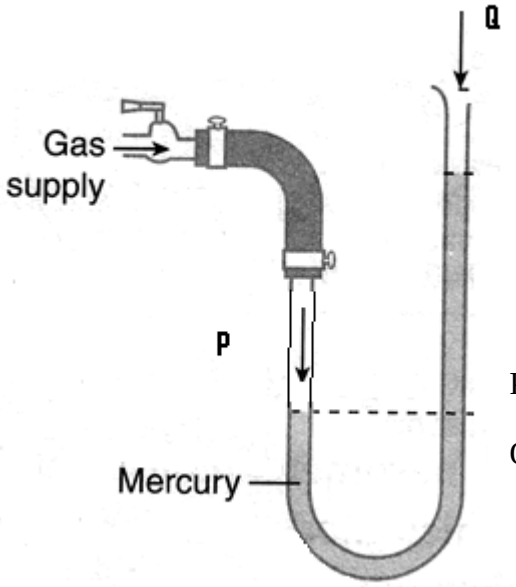


Diagram 10
Rajah 10

Diagram 13 shows water in a reservoir. The wall of the dam is thicker at the bottom because

Rajah 13 menunjukkan air di dalam kolam tadahan . Dinding empangan itu lebih tebal di bahagian bawah kerana

	A. pressure of water at the upper level is higher than pressure of water at the bottom level *Tekanan air di aras atas lebih tinggi berbanding tekanan di aras bawah* **B**.pressure of water at the upper level is lower than pressure of water at the bottom level *Tekanan air di aras atas lebih rendah berbanding tekanan air di aras bawah* **C**.pressure of water at the upper level is the same as than pressure of water at the bottom level *Tekanan air di aras atas sama dengan tekanan air di aras bawah.*
14	 Diagram 11 *Rajah 11* The diagram 14 shows a boy is pumping a ball. Gas pressure of the ball exists because the gas molecules *Rajah 14 menunjukkan seorang budak lelaki sedang mengepam sebiji bola. Tekanan gas bola itu wujud sebab molekul gas* **A.** move randomly and freely *bergerak secara rawak dan bebas.* **B.** move at the same velocity *bergerak pada halaju yang sama* **C.** collide with one another in elastic collisions and with the walls of the container . *berlanggar antara satu sama lain dengan perlanggaran kenyal dan dengan dinding bekas.* **D.** collides with the wall of the container produces change of momentum *berlanggar dengan dinding bekas menghasilkan perubahan momentum.*
15	Diagram 12 shows a manometer that is used to determine the pressure of a gas supply.

	Rajah 12 menunjukkan satu manometer yang digunakan untuk menentukan tekanan gas yang digunakan  P = pressure of the gas *Tekanan gas* Q = atmospheric pressure *Tekanan atmosfera* Diagram 12 *Rajah 12* Which comparison is correct about P and Q? *Perbandingan manakah adalah betul tentang P dan Q?* A. P > Q B. P = Q C. P < Q
16	The diagram 16 shows hydraulic fluid which is used as brake fluid. *Rajah 16 menunjukkan minyak hidraulik yang digunakan sebagai minyak brek*  Diagram 12 *Rajah 12*

When there are air bubbles in the hydraulic brake system, the transmission of pressure is slowed down because

Bila ada gelembung udara dalam sistem brek hidraulik, pemindahan tekanan menjadi perlahan disebabkan

A. The air is reduced when the brakes are applied.

Udara dikurangkan bila brek digunakan.

B. The air is compressed when the brakes are applied

Udara ditekan bila brek digunakan

C. The air reduces the viscosity of the fluid in the system

Udara mengurangkan kelikatan cecair dalam system itu

D. The air expands when the brakes are heated.

Udara mengembang bila brek dipanaskan.

17. Diagram 13 shows a hot air balloon floating at a constant height.
Rajah 13 menunjukkan sebuah belon udara panas terapung pada ketinggian yang tetap.

Diagram 13
Rajah 13

The upthrust exerted on the hot air balloon is equal to

Daya tujah ke atas belon udara panas itu adalah sama dengan

A the weight of the hot air balloon

berat belon udara panas itu

B the mass of the hot air balloon

jisim belon udara panas itu

C the density of the hot air balloon

ketumpatan belon udara panas itu

	D the volume of air displaced by the hot air balloon *isi padu udara yang disesarkan oleh belon udara panas itu*
18	Diagram 14 shows the readings of the spring balance when object is in the air and when it is fully immersed in water. *Rajah 14 menunjukkan bacaan neraca spring apabila objek berada di udara dan apabila ia di rendamkan sepenuhnya dalam air.*  Diagram 14 *Rajah 14* Calculate the volume of the object if its density is 2400 kgm^{-3}. *Hitungkan isipadu objek tersebut jika ketumpatannya ialah 2400 kgm^{-3}.* **A** $2.5 \times 10^{-4}\ m^3$ **B** $5.8 \times 10^{-4}\ m^3$ **C** $8.3 \times 10^{-4}\ m^3$ **D** $2.5 \times 10^{-3}\ m^3$
19	Diagram 19 shows two ping pong balls move towards each other when air is blown between them. *Rajah 19 menunjukkan dua bola ping pong bergerak ke arah satu sama lain apabila udara ditiup di antaranya.*

Diagram 15
Rajah 15

Which explains the above situation?
Manakah yang menerangkan situasi di atas?

A Pascal's Principle
Prinsip Pascal

B Bernoulli's Principle
Prinsip Bernoulli

C Archimedes' Principle
Prinsip Archimedes

D Newton's First law
Hukum Pertama Newton

20 Diagram 16 shows a bowl of hot soup

Rajah 16 menunjukkan sebuah mangkuk berisi sup yang panas..

Diagram 16
Rajah 16

What happens when the soup and the bowl reach thermal equilibrium?

Apakah yang berlaku apabila sup dan mangkul itu mencapai keseimbangan terma?

A The temperature of the soup is decreasing.

Suhu sup panas semakin menurun.

B The temperature of the bowl is increasing.

Suhu mangkuk semakin meningkat.

C There is a net het flow from the soup to the bowl.

Terdapat pengaliran haba bersih dari sup ke mangkuk.

D The net heat flow from the soup to the bowl is equal to zero.

Pengaliran haba bersih dari sup ke mangkuk adalah sama dengan sifar.

21 Diagram 17 shows an aluminium block and iron block that have the same mass and heated with same amount of heat energy in 20 minutes. The specific heat capacity, c, of each metal is different.

Rajah 17 menunjukkan satu blok aluminium dan blok besi yang mempunyai jisim yang sama dan dipanaskan dengan jumlah haba yang sama selama 20 minit. Muatan haba tentu, c, setiap logam adalah berbeza.

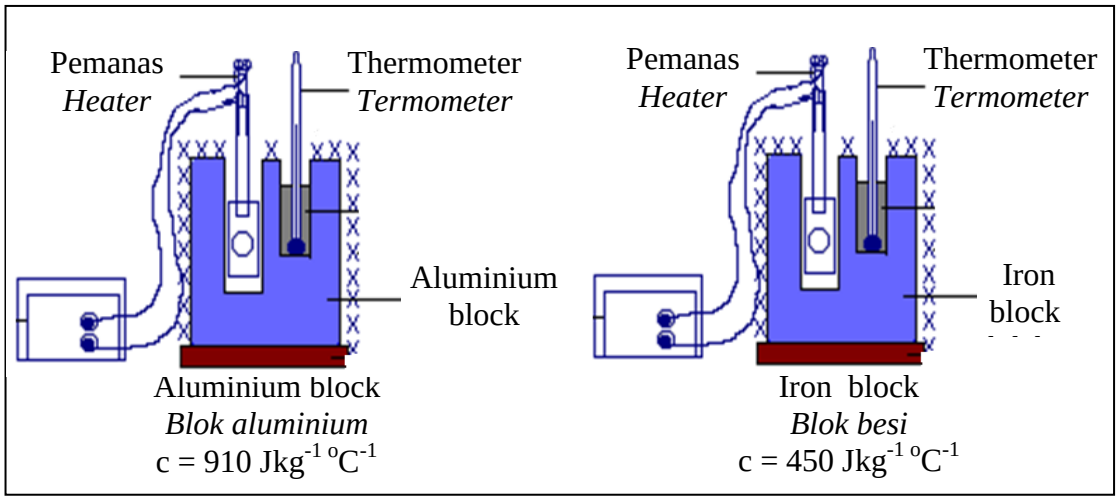


Diagram 17
Rajah 17

Which statement is correct at the end of the 20 minutes?

Pernyataan yang manakah adalah benar pada akhir 20 minit?

A The final temperature of the iron block is lower.

	Suhu akhir blok besi adalah lebih rendah. **B** The final temperature of the aluminium block is lower. *Suhu akhir blok aluminium adalah lebih rendah.* **C** The final temperature of aluminium block is equal to the iron block. *Suhu akhir blok aluminium adalah sama dengan blok besi.*
22	There is no rise in temperature when heat is supplied to change water to steam. Which of the following explains this observation? *Suhu tidak meningkat apabila haba dibekalkan untuk menukarkan air kepada stim. Antara yang berikut yang manakah menerangkan pemerhatian tersebut?* **A** The heat is used to exert pressure on molecules. *Haba digunakan untuk mengenakan tekanan pada molekul-molekul.* **B** The heat is used to increase the vibrations of molecules. *Haba digunakan untuk meningkatkan getaran molekul-molekul.* **C** The heat is used to increase the kinetic energy of molecules. *Haba digunakan untuk meningkatkan tenaga kinetik molekul-molekul.* **D** The heat is used to overcome the attractive forces between molecules. *Haba digunakan untuk mengatasi daya tarikan antara molekul-molekul.*
23	The air pressure in a car tyre is increased after the car has travelled a long distance because *Tekanan udara dalam tayar kereta bertambah selepas kereta itu bergerak dalam perjalanan yang jauh disebabkan* **A** the average velocity of the air molecules in the tyre has decreased. *purata kelajuan molekul udara dalam tayar telah berkurangan* **B**. the temperature of the air in the tyre has increased *suhu udara dalam tayar bertambah* **C.** the size of the air molecules in the tyre has increased. *saiz molekul udara dalam tayar bertambah*
24	Diagram 18 shows a phenomenon of light when striking on a plane surface PQ . *Rajah 18 menunjukkan satu fenomena chaayaapabila mengenai satu permukaan satah licin PQ*

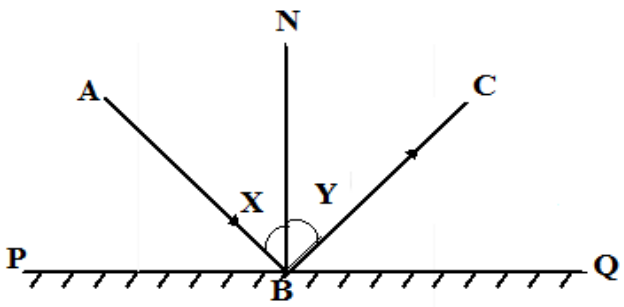


Diagram 18
Rajah 18

Which of the following statements is **true**?

*Antara pernyataan berikut yang manakah **benar***

A. Angle X and angle Y are equal

Sudut X dan sudut Y adalah sama

B. AB is the reflected ray

AB adalah sinar pantukan

C.Angle X is the angle of refraction

SudutX adalah sudut bias

D. AB, BC, and BN are not in the same plane.

AB, BC dan BN tidak berada dalam satu satah

25 An observer is able to see an image of a coin when the glass is filled with water as shown in Diagram 19

Seorang pemerhati dapat melihat imej sekeping duit syiling dalam sebuah gelas yang berisi dengan air seperti ditunjukkan dalam Rajah 19.

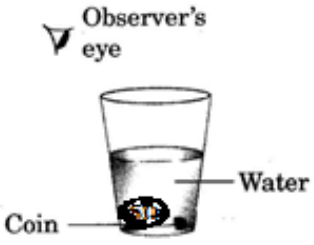
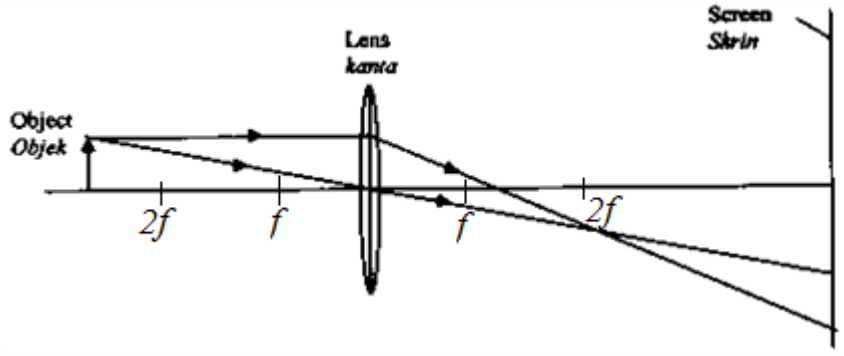
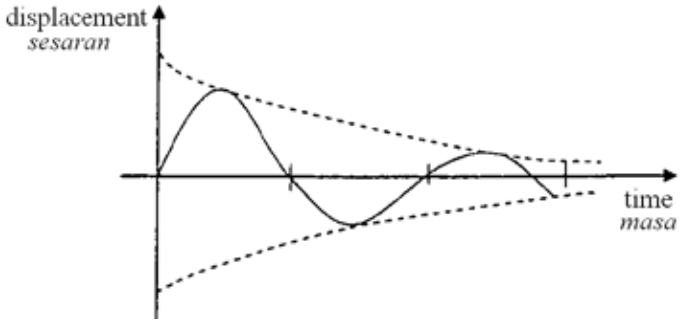
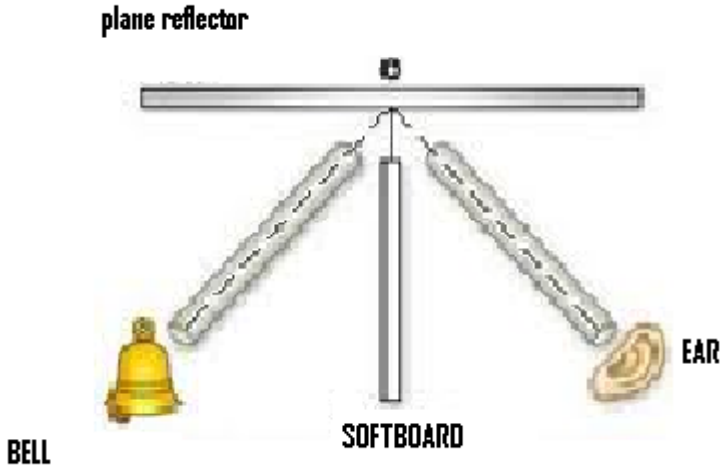


Diagram 19
Rajah 19

Which of the following characteristic of the image is not true?

	Manakah antara ciri-ciri imej itu yang tidak benar? **A.** the image is virtual *imej itu adalah maya* **B.** the image is bigger *imej itu lebih besar* **C.** the image is upright *imej itu tegak* **D.** the image is inverted *imej itu adalah songsang*
26	An object of 3 cm height is placed infront of a convex lens at distance of 15 cm. the focal length of the lens is 20 cm. What is the distance of the image at this arrangement? *Satu objek tingginya 3 cm diletakkan di hadapan sebuah kanta cembung pada jarak 15 cm. panjang fokus kanta cembung itu adalah 20 cm. Berapakah jarak imej yang terbentuk pada susunan ini?* **A.** 25 cm **B.** 30 cm **C.** 45 cm **D.** 60 cm
27	Diagram 20 shows an arrangement of apparatus to get a sharp image on the screen. *Rajah 20 menunjukkan susunan radas untuk menghasilkan satu imej yang tajam pada sebuah skrin.*  Diagram 20 *Rajah* 20

	Which of the following action will produce a sharp and bigger image on the screen? *Antara tindakan berikut yang manakah akan menghasilkan satu imej yang tajam dan besar pada skrin itu?* **A.** Move the screen towards the lens until at *f* *Gerakkan skrin mendekati kanta sehingga di f* **B.** Move the object further from the lens at more than 2*f* *Gerakkan objek itu lebih jauh daripada kanta pada 2f* ***C.*** Move the object until it is at the position between *f* and *2f* *Gerakkan objek sehingga ia berada pada kedudukan f* dan *2f* **D.** Replace the lens with with another concave lens of shorter focal length *Gantikan kanta dengan sebuah kanta cekung yang mempunyai jarak fokus lebih pendek*
28	Diagram 21 shows a graph of an oscillation system experiences damping. *Rajah 21 menunjukkan graf bagi satu sistem berayun yang mengalami pelembapan.*  Diagram 21 / *Rajah 21* What is decreasing? *Apakah yang semakin berkurang ?* A. Size of oscillation *Saiz ayunan* **B**. Amplitude of oscillation *Amplitud ayunan*

	C.Energy of oscillation *Tenaga ayunan* **D**.Period of oscillation *Tempoh ayunan*
29	The diagram 22 shows a sound wave directed to a plane reflector and then reflected. *Rajah 22 menunjukkan satu gelombang bunyi ditujukan ke pemantul satah dan kemudian dipantulkan.*  Diagram 22 *Rajah 22* Which comparison is correct about the reflected wave and the incident waves? *Perbandingan manakah yang betul tentang gelombang terpantul dan gelombang tuju?* **A.** The reflected wave has a shorter wavelength. *Gelombang terpantul mempunyai panjang gelombang yang pendek* **B.** The reflected wave has a smaller amplitude *Gelombang terpantul mempunyai amplitud yang lebih kecil*. **C.** The reflected wave has the same speed *Gelombang terpantul mempunyai laju yang sama* **D.** The reflected wave has a lower frequency *Gelombang terpantul mempunyai frekuensi yang rendah*

30 Diagram 23 shows a refraction of a water wave.

Rajah 23 menunjukkan pembiasan gelombang air.

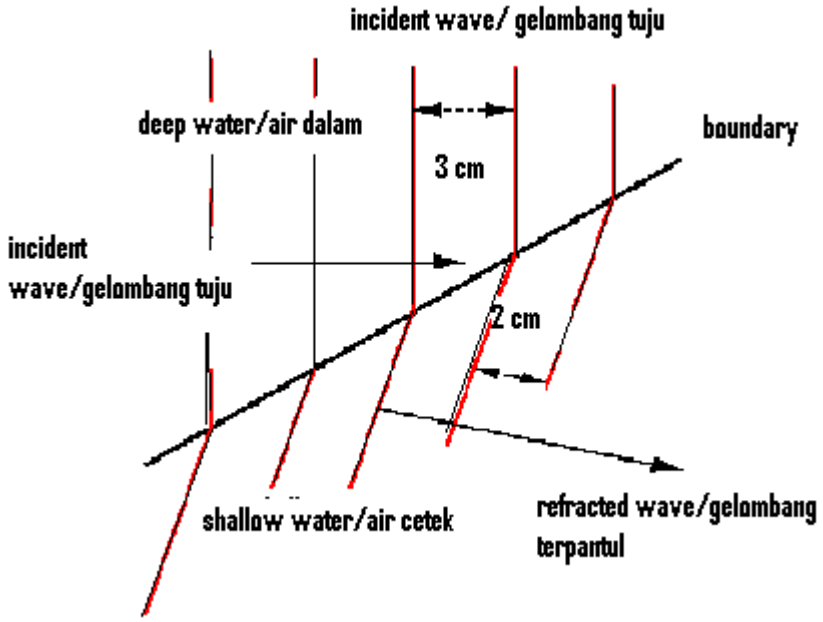


Diagram 23

Rajah 23

If the speed of the water wave in deep water region is 6 cms^{-1} , calculate the speed of the water wave in the region of shallow water.

Jika laju gelombang air di kawasan air dalam ialah 6 cms^{-1} kirakan laju gelombang air di kawasan air cetek.

A. 1.0 cms^{-1}
B. 4.0 cms^{-1}
C. 3.0 cms^{-1}
D. 5.0 cms^{-1}

31 The diagram 24 shows water is propagating through a gap.

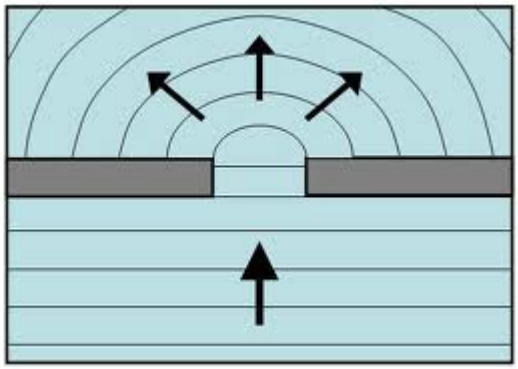


Diagram 24

What happens to the water waves after passing it?

	Velocity	Wavelength	amplitude
A	Increases	Decrease	No change
B	Decreases	Increases	Increases
C	No change	No change	Decreases
D	No change	No change	No change

32 The diagram 25 shows the continuous lines represent crests while the doted lines represent troughs of water waves produced by two coherent sources of water waves S_1 and S_2.
At which point does constructive interference occur?

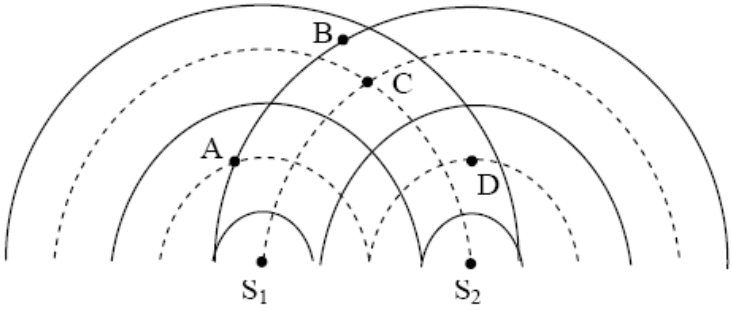
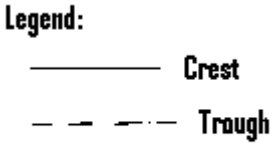


Diagram 25



33 Diagram 26 shows two identical microphones is connected to an audio generator. Both microphones is facing towards an area.

Rajah 26 menunjukkan dua pembesar suara yang serupa disambungkan kepada sebuah penjana audio. Kedua-dua penmbesar suara dihala ke kawasan lapang.

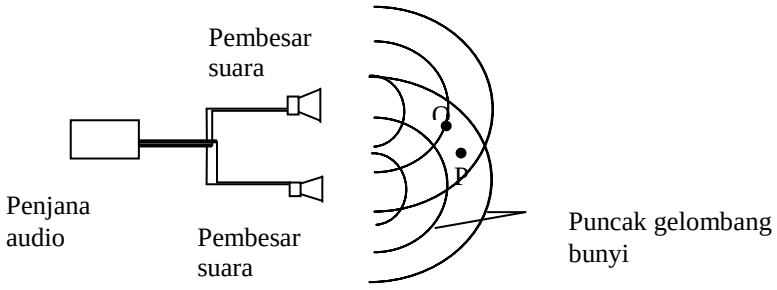


Diagram 26
Rajah 26

	Which of the following statement not correct about audio generator? *Antara pernyataan berikut, manakah tidak benar apabila penjana audio itu dihidupkan*? A. Soft sound heart at point P *Bunyi yang lemah kedengaran di titik P* B. Destructive interferens occur at Q *Interferens pemusnah berlaku di Q* C. Both microphones is coherent source *Kedua-dua pembesar suara itu merupakan sumber bunyi yang Koheren* D. When the microphones is closer each other, the distance between two loud sound increases. *Apabila pembesar suara itu dirapatkan, jarak di antara kedudukan bunyi kuat berturutan bertambah*
34	Diagram 27 shows a type of wave. *Rajah 27 menunjukkan satu jenis gelombang.*  Diagram 27 *Rajah 27* Which of the following statements is true about the type of wave? *Antara pernyataan yang berikut, manakah benar tentang gelombang itu?* **A** Vibration of particles in medium is parallel to the direction of the propagation of wave. *Getaran zarah-zarah dalam medium adalah selari dengan arah perambatan gelombang.* **B** Vibration of particles is perpendicular to the direction of the propagation of the wave. *Getaran zarah-zarah adalah bersudut tegak dengan arah perambatan gelombang* **C** Vibration of particles is at acute angles to the direction of the propagation of the wave. *Getaran zarah-zarah adalah bersudut tirus dengan arah perambatan gelombang.* **D** Vibration of particles is at obtuse angles to the direction of the propagation of the wave. *Getaran zarah-zarah adalah bersudut cakah dengan arah perambatan gelombang.*

35 Diagram 28 shows part of an electromagnetic spectrum.

Rajah 28 menunjukkan sebahagian daripada spektrum elektromagnet.

Microwave *Gelombang mikro*	*x*	Visible light *Cahaya nampak*	*y*	*z*

Diagram 28
Rajah 28

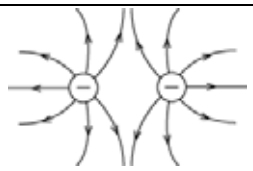
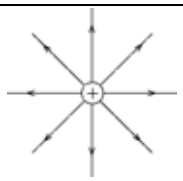
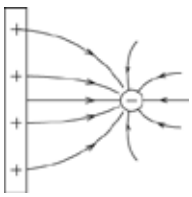
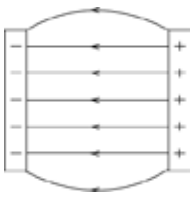
What do *x*, *y* and *z* represent?

Apakah yang x, y, dan z mewakili?

	x	*y*	*z*
A	Infrared ray *Sinar inframerah*	Ultra-violet *Sinar ultraungu*	*X*-ray *Sinar-X*
B	*X*-ray *Sinar-X*	Ultra-violet *Sinar ultraungu*	Infrared ray *Sinar inframerah*
C	Radio wave *Gelombang radio*	Infrared ray *Sinar inframerah*	Ultra-violet *Sinar ultraungu*
D	Gamma ray *Sinar gama*	*X*-ray *Sinar-X*	Infrared ray *Sinar inframerah*

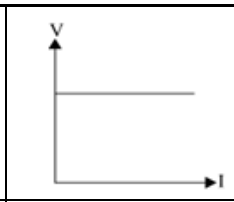
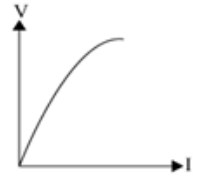
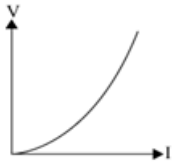
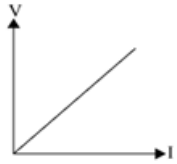
36 Which of the following diagrams does **not** show the pattern of an electric field correctly?

*Antara rajah yang berikut, manakah **tidak** menunjukkan corak medan elektrik yang betul?*

A		C	
B		D	

37 Which of the following graphs is true for a conductor that obey Ohm's law?

Antara graf yang berikut, manakah betul untuk konduktor yang mematuhi Hukum Ohm?

		A		C	
		B		D	

38 Diagram 29 shows three resistors which are connected in series.

Rajah 29 menunjukkan tiga perintang yang disambung secara bersiri.

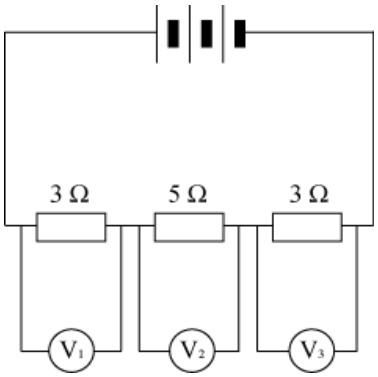


Diagram 29

Rajah 29

Which of the following is correct?

Antara berikut, yang manakah betul?

A $V_3 > V_2 > V_1$
B $V_1 = V_3 > V_2$
C $V_1 = V_2 = V_3$
D $V_1 = V_3 < V_2$

39 Diagram 30 shows three identical cells are connected in parallel in a circuit.

Rajah 30 menunjukkan tiga sel serupa disambung secara selari dalam satu litar.

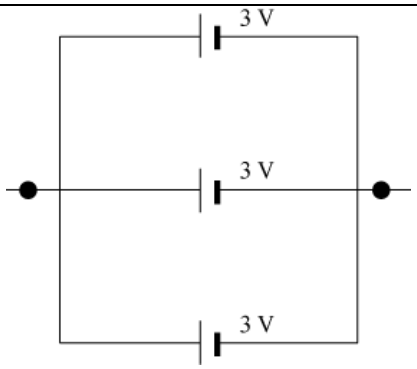


Diagram 30
Rajah 30

Given that each cell has an e.m.f. of 3 V with an internal resistance of 0.5 Ω, what are the total e.m.f. and total internal resistance for the circuit?

Diberikan bahawa setiap sel mempunyai d.g.e. 3 V dengan rintangan dalam 0.5 Ω, berapakah jumlah d.g.e. dan jumlah rintangan dalam bagi litar itu?

	Total e.m.f. *Jumlah d.g.e.*	Total internal resistance *Jumlah rintangan dalam*
A	3 V	0.17 w
B	3 V	0.50 w
C	9 V	0.17 w
D	9 V	1.50 w

40 An electric iron is rated 240 V, 8 A. What is the power rating?

Sebuah cerek elektrik berlabel 240 V, 8 A. Berapakah kuasa bagi cerek tersebut?

A. 30 W
B. 240 W
C. 1920 W
D. 2000 W

41 When the switch in the circuit is closed, paper clips are attracted to the soft iron rod as shown below.
Apabila suis dalam litar di bawah ditutup,klip kertas akan tertarik kepada rod besi lembut.

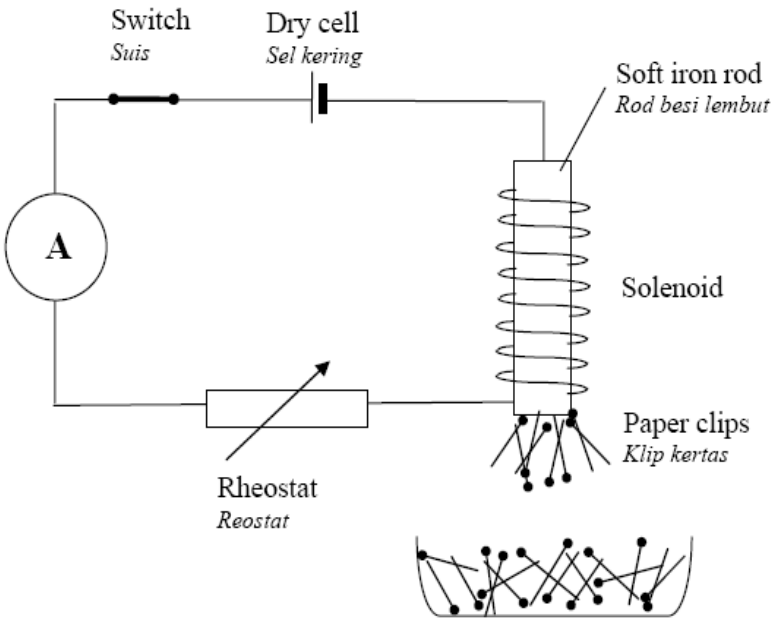


Diagram 31
Rajah 31

The number of paper clips attracted to the soft iron rod can be increased by
Bilangan klip kertas yang melekat pada ters besi lembut boleh ditingkatkan dengan

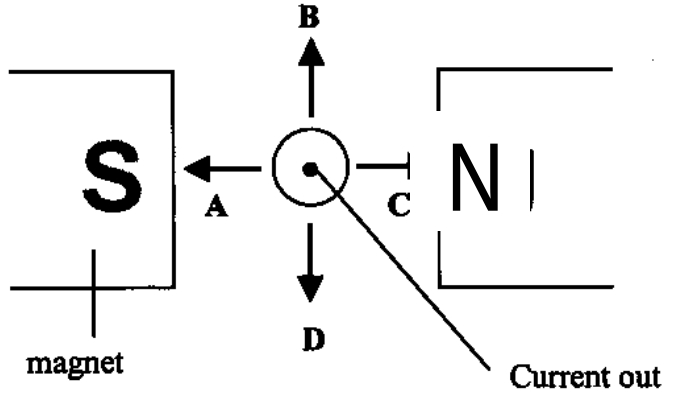
A Increasing the current in the circuit
Menambah arus di dalam litar

B Increasing the resistance in the rheostat
Menambah perintang rheostat

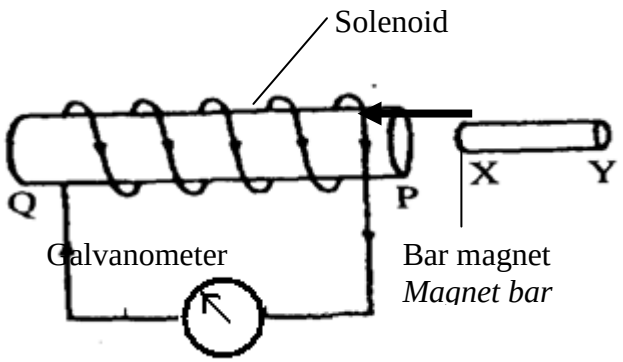
C Deceasing the number of turns in the solenoid
Mengurangkan bilangan lilitan solenoid

D Replacing the battery with alternating current.
Menggantikan bateri dengan arus ulang alik

42 Diagram 32 shows a current-carrying conductor placed between two magnetic poles.
Rajah 32 menunjukkan satu konduktor berarus di antara dua kutub magnet.



magnet *Arus keluar*

	Diagram 32 *Rajah 32* Of the marked directions **A**, **B**, **C** and **D**, which shows the direction of motion of the conductor? *Antara arah* **A, B, C** *and* **D**, *yang manakah adalah arah gerakan bagi konduktor tersebut?*
43	Diagram 33 shows the situation when a bar magnet moves towards a solenoid. The pointer of the galvanometer deflects to the left. Which of the following pairs of poles is correct? *Rajah 33 menunjukkan suasana bila sebatang magnet bar digerakkan masuk ke dalam solenoid. Penunjuk galvanometer terpesong ke kiri. Manakah pasangan kutub berikut yang benar?*  Diagram 33 / *Rajah 33* **A** P is north and X is south *P utara dan X utara* **B** P is south and X is south *P selatan dan X selatan* **C** P is north and X is north *P utara dan X utara* **D** Q is north and X is north *Q utara dan X utara*
44	. Diagram 34 shows a transformer used to change an input voltage of 240 V to 12 V. *Rajah 34 menunjukkan sebuah transformer digunakan untuk menukarkan voltan input 240 V kepada 12 V.*

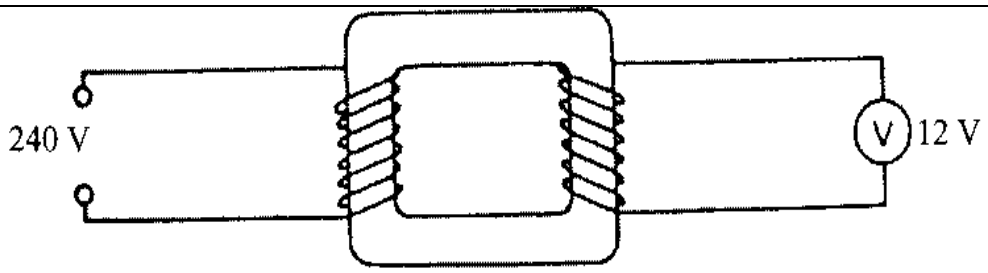
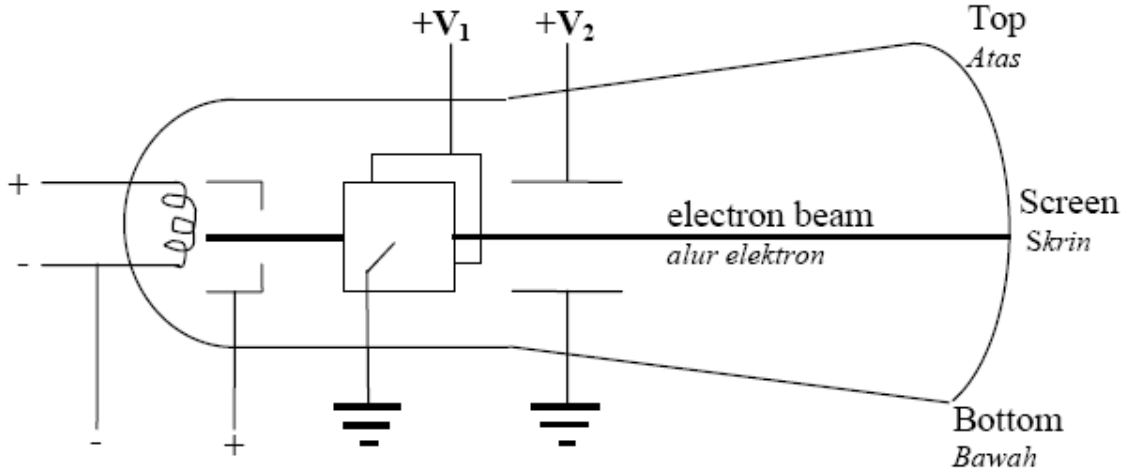


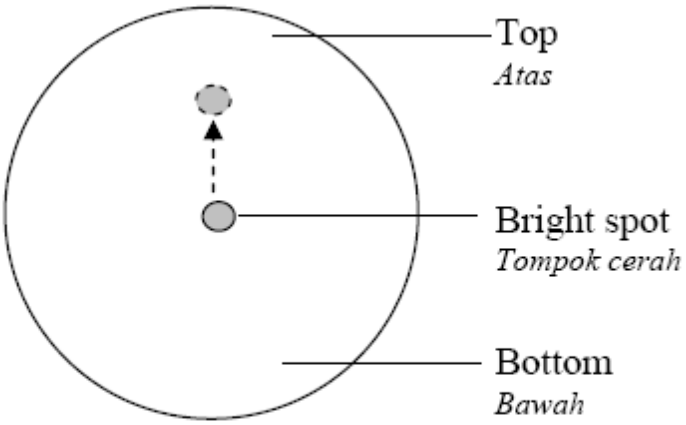
Diagram 34 / *Rajah34*

If the primary coil has 1 200 turns, how many turns must the secondary coil have?
Jika gegelung primer mempunyai 1 200 lilitan, berapakah bilangan lilitan yang diperlukan untuk gegelung sekunder?

A 24 000
B 12 000
C 600
D 60

45 Diagram 35 shows some of the important componets in a cathode-ray tube.
Rajah 35 menunjukkan sebahagian daripada komponen penting dalam sebuah tiub sinar katod.





Front View Of Screen
Pandangan Hadapan Skrin

Diagram 35
Rajah35

Which change in voltage would cause the bright spot on the screen to move upwards as shown in the above diagram?
Perubahan voltan manakah akan menyebabkan kedudukan tompok cahaya di skrin bergerak ke atas seperti ditunjukkan pada rajah di atas ?

A Decreasing V_1
Mengurangkan V1

B Increasing V_1
Menambah V1

C Decreasing V_2
Mengurangkan V2

D Increasing V_2
Menambah V2

46 Diagram 36shows two set of identical bulbs and diodes are connected in two circuits, *P* and *Q* separately.

Rajah 36 menunjukkan dua set mentol dan diod yang serupa disambung ke dalam dua litar, P dan Q secara berasingan.

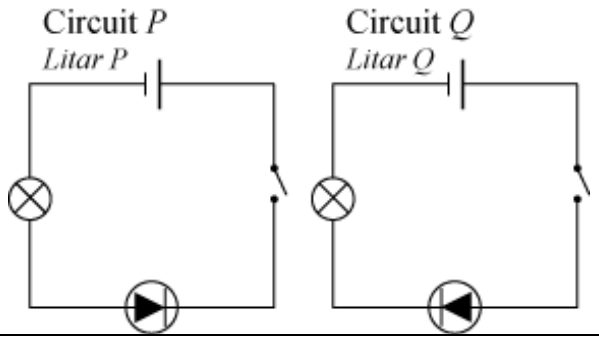


Diagram 36
Rajah 36

What will happen to the bulb when both of the switches are closed at same time?
Apakah akan terjadi kepada mentol apabila kedua-dua suis ditutupkan pada masa sama?

	Circuit *P* *Litar P*	Circuit *Q* *Litar Q*
A	Lights up *Menyala*	Lights up *Menyala*
B	Does not light up *Tidak menyala*	Does not light up *Tidak menyala*
C	Lights up *Menyala*	Does not light up *Tidak menyala*
D	Does not light up *Tidak menyala*	Lights up *Menyala*

47 Diagram 37 shows the inputs, *P* and *Q* of NAND gate vary with time, *t*.

Rajah 37 menunjukkan input P dan input Q bagi get TAK-DAN berbeza dengan masa, t.

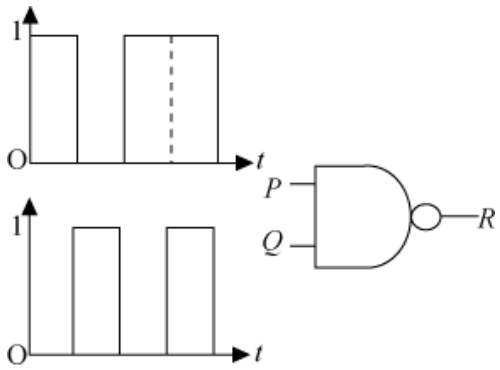
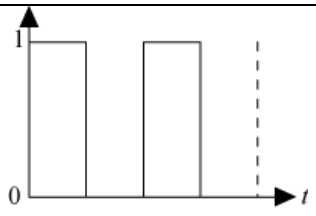
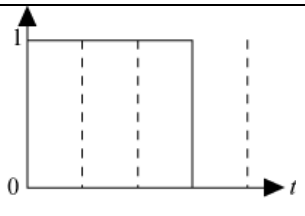
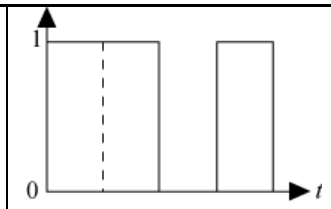
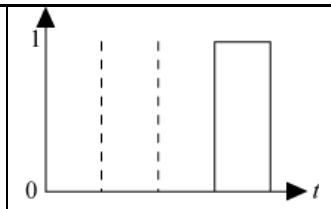


Diagram 37
Rajah 37

Which of the following graphs shows the output *R* varies with time correctly?
Antara graf yang berikut, manakah menunjukkan output R berbeza dengan masa yang betul?

A		C	

		B		D	

48 Which of the following nuclides does **not** have same number of protons and neutrons?

*Antara nuklid yang berikut, manakah **tidak** mempunyai bilangan proton dan neutron yang sama?*

A	$^{4}_{2}He$	C	$^{12}_{6}C$
B	$^{9}_{4}Be$	D	$^{16}_{8}O$

49 Diagram 38 shows a graph of nucleon number, *A* against proton number, *Z* for the decay of the nucleus of uranium-238 to radium-226.

Rajah 38 menunjukkan graf nombor nukleon, A melawan nombor proton, Z bagi reputan nukleus uranium-238 kepada radium-226.

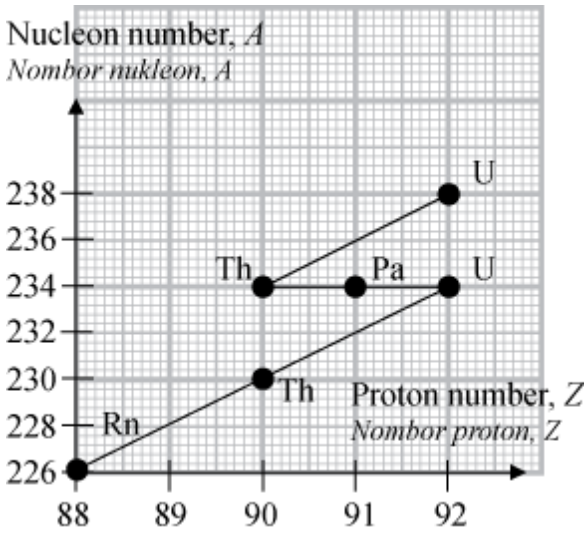


Diagram 38
Rajah 38

How many alpha and beta particles are emitted during the decaying process?

Berapakah zarah alfa dan zarah beta yang dikeluarkan semasa proses pereputan tersebut?

A 3 alpha particles, 1 beta particle
3 zarah alfa, 1 zarah beta
B 3 alpha particles, 2 beta particles

	3 zarah alfa, 2 zarah beta **C** 1 alpha particle, 3 beta particles *1 zarah alfa, 3 zarah beta* **D** 2 alpha particles, 3 beta particles *2 zarah alfa, 3 zarah beta*
50	Which of the following is **not** the use of radioactive radiations? *Antara yang berikut, manakah **bukan** kegunaan sinaran radioaktif?* A To detect and treat the brain tumour *Untuk mengesan dan mengubati tumor otak* B To determine the wear of engine parts *Untuk menentukan kehausan bahagian enjin* C To detect object under surface of sea *Untuk mengesan objek di bawah permukaan laut* D To detect leakage of underground water pipe *Untuk mengesan kebocoran paip air bawah tanah*

END OF QUESTIONS

NO. KAD PENGENALAN

4531/2
Physics
Kertas 2
Mei
2012

2 ½ jam

Nama: .....

Ting: .....

ANGKA GILIRAN

JABATAN PELAJARAN MELAKA

PEPERIKSAAN PERCUBAAN NEGERI MELAKA
SIJIL PELAJARAN MALAYSIA 2012

PHYSICS
Kertas 2
Dua jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas ini mengandungi tiga bahagian,* **Bahagian A, Bahagian B dan Bahagian C**
2. *Jawab semua soalan dalam* **Bahagian A**, *satu soalan daripada* **Bahagian B** *dan satu soalan daripada* **Bahagian C.**
3. *Jawapan kepada ketiga-tiga bahagian ini hendaklah diserahkan bersama.*
4. *Jawapan bagi* **Bahagian A** *hendaklah ditulis dalam ruang yang disediakan dalam kertas soalan. Langkah penting dalam kira mengira hendaklah ditunjukkan.*
5. *Jawapan bagi* **Bahagian B** *dan* **BahagianC** *hendaklah ditulis pada kertas tulis yang disediakan. Anda diminta menjawab dengan lebih panjang untuk* **Bahagian B** *dan* **Bahagian C** *tetapi jawapannya mestilah jelas dan logik. Dalam jawapan anda, persamaan, gambar rajah, graf dan cara lain yang sesuai untuk menjelaskan jawapan anda boleh digunakan.*
6. *Rajah tidak dilukis mengikut skala.*
7. *Markah maksimum yang diperuntukkan ditunjukkan dalam kurungan pada hujung tiap-tiap soalan atau bahagian soalan.*
8. *Penggunaan kalkulator saintifik yang* ***tidak*** *boleh diprogramkan adalah dibenarkan.*

Nama pemeriksa			
Bahagian	Soalan	Markah Penuh	Markah Diperolehi
A	1	4	
	2	5	
	3	6	
	4	7	
	5	8	
	6	8	
	7	10	
	8	12	
B	1	20	
	2	20	
C	3	20	
	4	20	
Jumlah			

Kertas soalan ini mengandungi 32 halaman bercetak

MAKLUMAT UNTUK CALON

1. *Kertas soalan mengandungi* **tiga** *bahagian* **: Bahagian A , Bahagian B** *dan* **Bahagian C.**

2. *Jawab semua soalan daripada* **Bahagian A.** *Jawapan kepada* **Bahagian A** *hendaklah ditulis dalam ruang yang disediakan dalam kertas soalan.*

3. *Jawab* **satu** *soalan daripada* **Bahagian B** *dan* **satu** *soalan daripada* **Bahagian C.** *Jawapan kepada* **Bahagian B** *dan* **Bahagian C** *hendaklah ditulis dalam kertas jawapan anda sendiri. Anda diminta menjawab dengan lebih terperinci untuk* **Bahagian B** *dan* **Bahagian C.** *Jawapan mestilah jelas dan logik. Persamaan, gambar rajah, graf dan cara lain yang sesuai untuk menjelaskan jawapan anda boleh digunakan.*

4. *Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan.*

5. *Markah yang diperuntukkan bagi setiap soalan atau ceraian soalan ditunjukkan dalam kurungan di hujung setiap soalan atau ceraian soalan.*

6. *Sekiranya anda hendak membatalkan sesuatu jawapan, buat garisan di atas jawapan itu.*

7. *Satu senarai rumus disediakan di halaman 3.*

8. *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.Walau bagaimanapun langkah mengira perlu ditunjukkan.*

9. *Masa yang dicadangkan untuk menjawab* **Bahagian A** *ialah 90 minit,* **Bahagian B** *ialah 30 minit dan* **Bahagian C** *ialah 30 minit.*

10. *Lekatkan semua kertas jawapan dan serahkan di akhir peperiksaan.*

The following information may be useful. The symbols have their usual meaning.
Maklumat berikut mungkin berfaedah (simbol-simbol mempunyai makna yang biasa)

1. $a = \frac{v - u}{t}$
2. $v^2 = u^2 + 2as$
3. $s = ut + \frac{1}{2}at^2$
4. Momentum $= mv$
5. $F = ma$
6. Kinetic energy / *Tenaga kinetik* $= \frac{1}{2}mv^2$
7. Gravitational potential energy /*Tenaga keupayaan* $= mgh$
8. $\rho = \frac{m}{V}$
9. Heat / *Haba* , $Q = mc\theta$
10. $\frac{PV}{T}$ = constant / *pemalar*
11. $E = mc^2$
12. $v = f\lambda$
13. Power / *Kuasa* $= \frac{Energy}{time} = \frac{Tenaga}{masa}$
14. $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$
15. $\lambda = \frac{ax}{D}$
16. $n = \frac{\sin i}{\sin r}$
17. $Q = It$
18. $g = 10\ ms^{-2}$
19. $P = \rho gh$
20. $F = kx$
21. $e = 1.6 \times 10^{-19}\ C$

Section A
Bahagian A
[60 markah]
[60 *marks*]

Answer all question in this section
*Jawab **semua** soalan dalam bahagian ini.*

1. Diagram 1 shows a heated metal bob is immediately immersed in water.
Rajah 1 *menunjukkan satu ladung logam yang telah dipanaskan dan direndam ke dalam air dengan serta merta*

Diagram 2 shows a heating curve graph for water molecule 34^0C/
Rajah 2 *menunjukkan lengkung pemanasan bagi molekul air.*

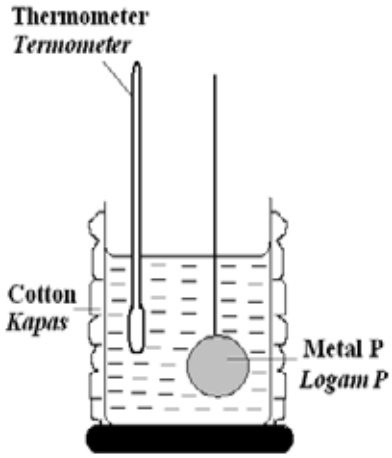


Diagram 1
Rajah 1

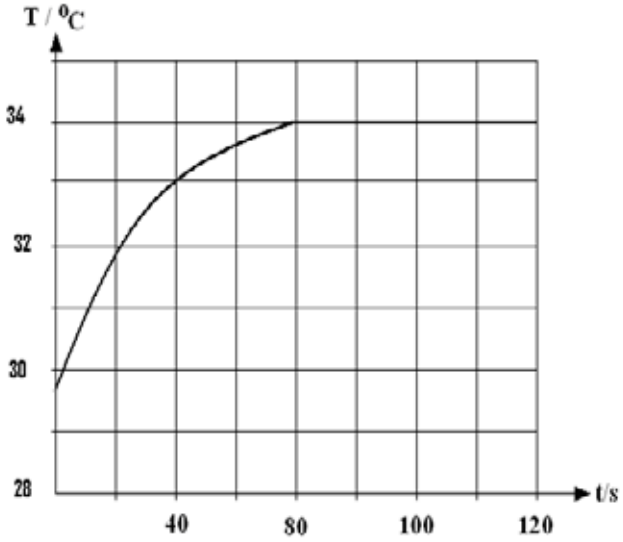


Diagram 2
Rajah 2

1(a)

(a) Name the physical quantity measured by the thermometer.
Namakan kuantiti fizikal yang diukur oleh thermometer itu.

.....

[1mark]
[1*mark*ah]

1(b)

(b) Choose the correct statement by ticking (√) in the box..
Pilih pernyataan yang betul dengan menanda tik (√) dalam kotak yang sepadan.

The water molecule released more heat than the metal bob ☐
Molekul air membebaskan haba yang lebih banyak.

The metal bob released more heat than the water molecule ☐
Bandul logam membebaskan lebih banyak haba dairpada molekul air

[1mark]

[1*markah*]

(c) Base on the graph of Diagram 2, how long does it take for the water molecule to reach the maximum temperature

Berdasarkan graf pada rajah 2, Berapakah masa yang diambil oleh molekul air untuk mencapai suhu maksimum?

.....

[1mark]
[1*markah*]

1(c)

1

(d) State a reason for the temperature of the water molecule remain constant when it reaches at 34° C.

Nyatakan satu sebab mengapa suhu air menjadi tetap selepas ia mencapai suhu 34° C.

.....

[1mark]
[1*markah*]

1(d)

1

Total

A1

4

2. Diagram 2 shows the speed limit and the load limit written on heavy vehicles.
Rajah 2 *menunjukkan had laju dan had beban yang tertulis di atas kenderaan berat.*

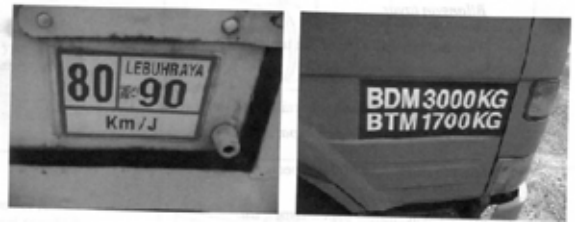


Diagram 2
Rajah 2

(a) Underline the correct answer in the bracket to complete the sentence below.
Garis jawapan yang betul dalam kurungan untuk melengkapkan ayat di bawah.

Speed limit is the (maximum, minimum) speed allowed for the vehicle.
Had laju adalah laju (maksimum, minimum) yang dibenarkan untuk kenderaan itu.

[1mark]
[1*markah*]

2(a)

1

(b) The speed of the vehicle is written as 90 km/h. State the speed in SI unit. Show your working in the space below.

Laju kenderaan itu ditulis sebagai 90 km/j. Nyatakan unit SI bagi laju ini. Tunjukkan jalan kerja anda pada ruangan di bawah

2(b)

2

[2marks]
[2*markah*]

(c) Calculate the momentum of the vehicle when it moves at the maximum speed of 90 km/h with load of 3000 kg.
Kirakan momentum kenderaan itu apabila ia bergerak dengan kelajuan 90 km/j dengan muatan 3000 kg

2(c)

2

Total

A2

5

[2marks]
[2*markah*]

3. Diagram 3 shows a set up apparatus used to investigate the relationship between pressure and temperature of air at fix volume and mass.

Rajah 3 menunjukkan pemasangan radas yang digunakan untuk menyiasat hubungan antara tekanan dan suhu udara pada isi padu dan jisim tetap.

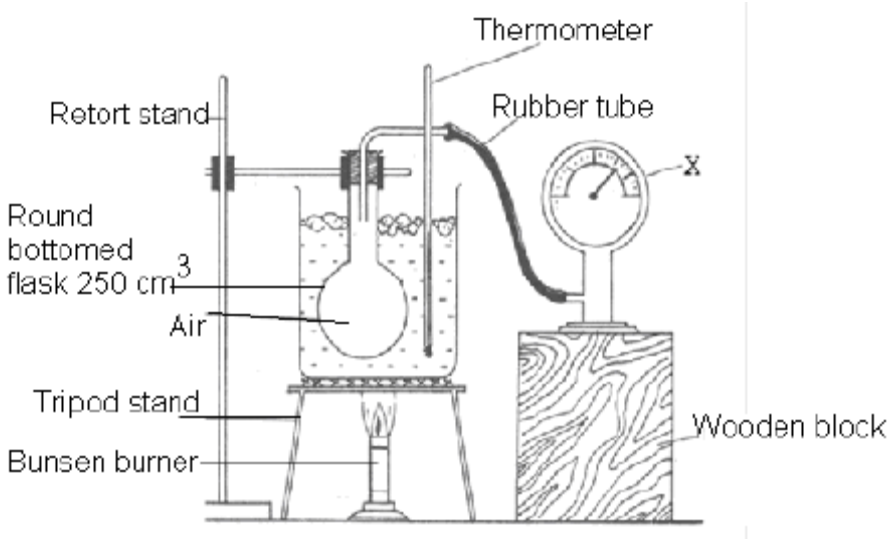


Diagram 3
Rajah 3

(a) What is the meaning of pressure?.
Apakah yang dimaksudkan dengan tekanan?

.....

[1mark]
[1*markah*]

3(a)
1

(b) By using the kinetic theory of molecule, explain how gas molecule exerted pressure on the walls of close container.

Dengan menggunakan teori kinetik molekul, terangkan bagaimana tekanan Dikenakan oleh gas pada dinding sebuah bekas yang tertutup,

.....

.....

.....

.....

[3mark]
[3*markah*]

3(b)
3

(c) A motorist blows up her car tyres to a pressure of 2.7 atm.in a cold morning when the temperature is -5^0C. What will be the pressure in the tyres on a hot day if the temperature is 27^0C?

Seorang penunggang motosikal mengisi angin tayar ke tekanan 2.7 atm pada waktu pagi bila suhunya -5°C . Berapakah tekanan tayar itu pada hari panas jika suhunya 27° C?

[2marks]
[2*markah*]

3(c)
2

Total
A3
6

4 Diagram 4 shows three students investigating a phenomenon of sound wave by standing at position L, M, and N . A signal generator and a speaker is set next to the corner of the building. The investigation is carried out by changing the frequency of the signal generator and the three students are assign to listen to the sound transmit by the speaker begin with a frequency of 586 Hz.

Rajah 4 *menunjukkan tiga orang pelajar sedang menyiasat satu fenomena gelombang bunyi dengan bediri pada kedudukan* L, M, and N. *Sebuah frekuensi audio yang disambungkan kepada pembesar suara diletakkan bersebelahan sudut bangunan tersebut. Penyiasatan itu dijalankan dengan menubah frekuensi dari penjana buyi dan ketiga-tiga pelajar itu ditugaskan untuk mendengar unyi yang dipancarkan dari pembesar suara tersebut bermula dengan frekuensi 586 Hz..*

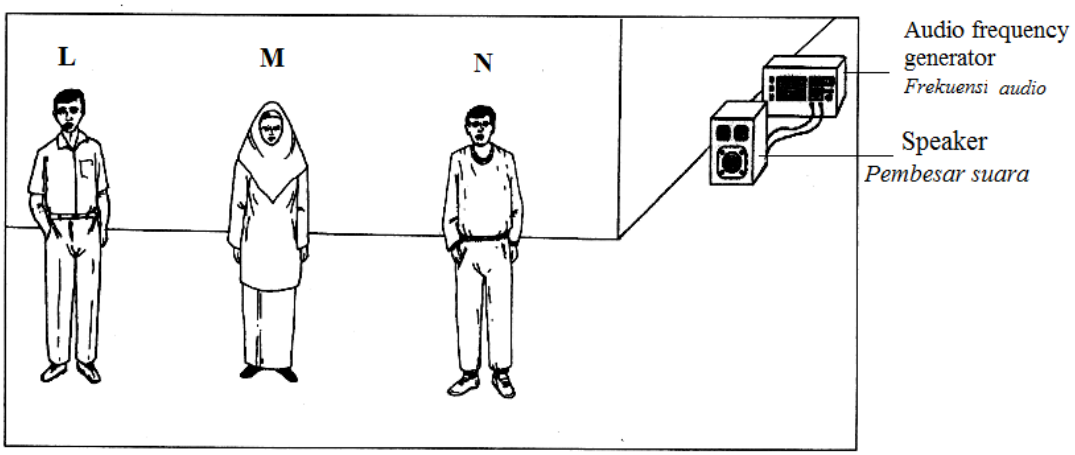


Diagram 4
Rajah 4

4(a) (i)

(a) (i) What type of wave is the sound wave?
Apakah jenis gelombang nya adalah gelombang bunyi?

.....

[1mark]
[1*markah*]

4(a) (ii)

(ii) As the frequency of the signal generator increases only one student can still hear the sound clearly. Which of the student is able to hear the sound clearly?

Apabila frekuensi audio bertambah frekuensinya hanya seprang pelajar sahaja yang masih boleh mendengar bunyi itu dengan jelas. Pelajar manakah yang masih boleh mendengar bunyi itu dengan jelas.

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

4(a) (iii)

(iii) Give one reason for your answer in a (ii)?
Beri satu sebab untuk jawapan anda dalam a (ii)?

.....

.....[1mark]

[1*markah*]

(b) The speed of the sound wave in air is 330 m/s.
Calculate the wavelength of the sound wave.

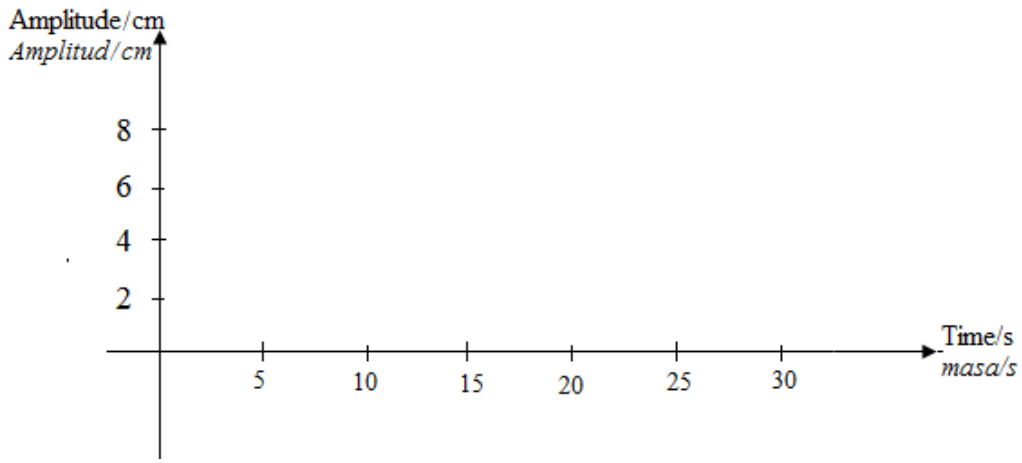
Halaju gelombang bunyi di udara ialah 330 m/s.
Hitung panjang gelombang bagi gelombang bunyi tersebut

4(b)

2

[2 marks]
[2 *markah*]

(c) On the space below sketch a graph to present a change of sound wave From high pic sound to low pic sound with constant loudness.
Pada ruang di bawah lakarkan satu graf yang mewakili satu perubahan gelombang bunyi dari bunyi yang kelangsingan tinggi ke bunyi yang kelangsingannya rendah dengan kenyaringan yang tetap.



4(c)

2

Total
A4

7

5. Diagram 5.1 and Diagram 5.2 show a phenomenon of light occurs when the light propagates between two mediums with different density. Medium B is denser than medium A.

Rajah 5.1 dan rajah 5.2 menunjukkan satu fenomena cahaya yang berlaku apabila cahaya merambat melalui dua medium yang berlainan ketumpatan. Medium B adalah lebih tumpat dari medium A

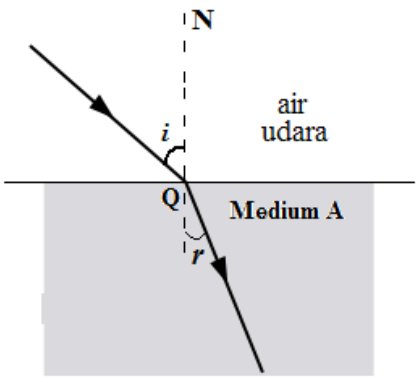


Diagram 5.1
Rajah 5.1

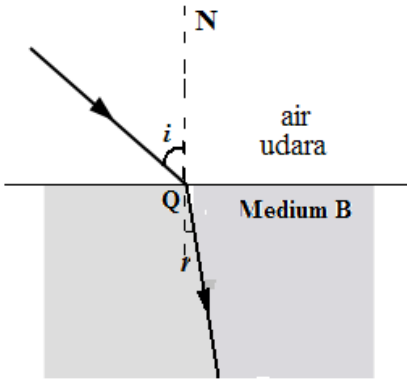


Diagram 5.2
Rajah 5.2

5(a)

(a) What is the name given to angle labeled *i*?
Apakah nama yang diberikan kepada sudut yang berlabel i

.....

[1mark]
[1*markah*]

5(b)

(b) Explain why angle *r* is smaller than angle *i*
Terangkan mengapa sudut r lebih kecil dari sudut i

.....

.....

.....

[1mark]
[1*markah*]

5(c)(i)

(c) Based on Diagram 5.1 and Diagram 5.2,
Berdasarkan Rajah 5.1 dan Rajah 5.2,

(i) compare the magnitude of angle *i*
bandingkan magnitud sudut i

.....

[1mark]

[1*markah*]

(ii) compare the magnitude of angle r
bandingkan magnitud sudut i

5(c)(ii)

.....

[1mark]
[1*markah*]

1

(iii) Relate between the angle of *r* and the density of an object
Kaitkan hubungan antara sudut r dengan ketumpatan suatu objek

5(c)(iii)

.....

.....

[1mark]
[1*markah*]

1

(iv) The refractive index, n is given as a ratio of sin *i* to sin *r* , compare the refractive index, n between medium A and medium B

Indeks biasan, n diberikan sebagai nisbah sin i terhadap sin r, bandingkan indeks, n antara medium A dan medium B

5(c)(iv)

.....

.....

[1mark]
[1*markah*]

1

(d) Base from your answers in 5(c) state an appropriate relation between the refractive index, n and the density of an object.

Berdasarkan jawapan kamu dalam 5(b) nyatakan satu hubungan yang sesuai antara indeks biasan, n dengan ketumpatan suatu bahan.

5(d)

.....

……

[1mark]
[1*markah*]

1

(e) Name the law of science involved in the phenomenon of light as shown on the Diagrams.
Namakan hukum yang terlibat dalam fenomena cahaya yang ditunjukkan pada Rajah tersebut.

5(e)

.....

[1mark]
[1*markah*]

1

Total
A5

8

6. Diagram 6.0 shows an apparatus set up to study a method of producing electricity. Diagram 6.1 and Diagram 6.2 show movements of a bar magnet in and out of the solenoid with the same force. A center zero galvanometer is used to detect the direction of the current flows.

Rajah 6.0 menunjukkan satu set radas yang digunakan untuk mengkaji satu kaedah penghasilan arus elektrik. Rajah 6.1 dan Rajah 6.2 menunjukkan gerakan sebatang bar magnet keluar dan masuk ke dalam solenoid tersebut dengan daya yang sama. Sebuah galvanometer berpusat sifar digunakan untuk mengesan arah pengaliran arus elektrik.

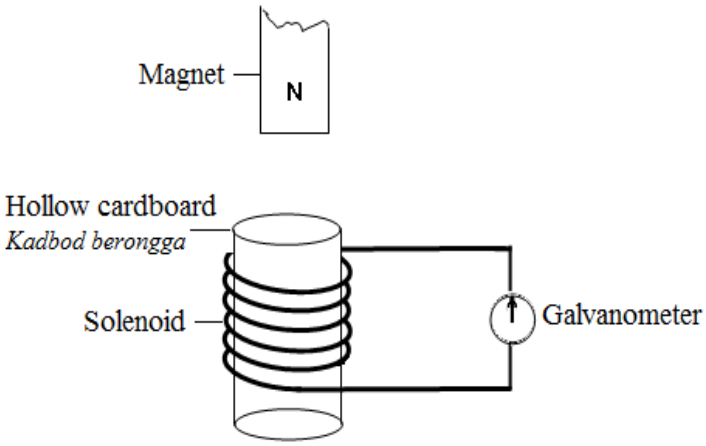


Diagram 6.0
Rajah 6.0

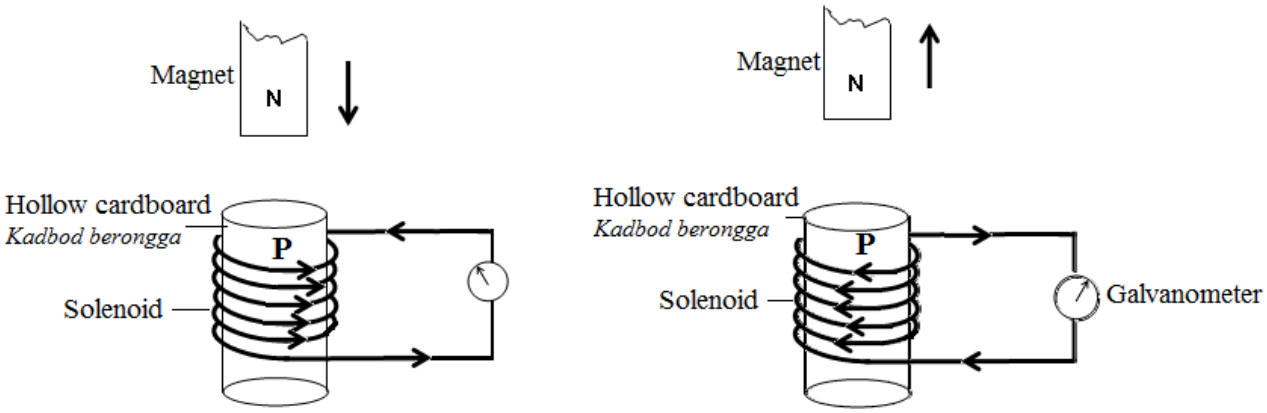


Diagram 6.1
Rajah 6 1

Diagram 6.2
Rajah 6.2

a) Underline the correct answer in the bracket to complete the answer below.

The method of producing electricity without the electrical supply is known as (electromagnet, electromagnetic induction, transformer). [1mark]

Garis jawapan yang betul dalam kurungan untuk melengkapkan ayat di bawah.
Kaedah penghasilan arus elektrik tanpa bekalan elektrik adalah dikenali sebagai (electromagnet, aruhan electromagnet, transformer) [1*markah*]

b) Observe Diagram 6.1 and Diagram 6.2,
Perhatikan Rajah 6.1 dan Rajah 6.2

i) Compare the direction of the current flow
Bandingkan arah pengaliran arus

.....

[1mark]
[1*markah*]

(ii) Compare the magnitude of current flows
Bandingkan magnitude arus yang mengalir

…….

[1mark]
[1*markah*]

(iii) Compare the polarity of magnet at P
Bandingkan kekutuba magnet di P

…….

[1mark]
[1*markah*]

(iv) Relate between the relative motion of the magnet to the polarity at P.
Hubungkaitkan antara gerakan relative magnet, kekutuban yang terbentuk di P.

……..

……..

[1mark]
[1*markah*]

c) State the physics law involved in b(iv)
Namakan hukum fizik yang terlibat.dalam b (iv)

……..

[1 mark]
[1 *markah*]

d). Base on the information and the diagram given above, explain term of energy changes involved in the system.
Berdasarkan maklumat dan rajah yang diberikan di atas, terangkan perubahan tenaga yang terlibat dalam sistem itu..

…….

[2 mark]
[2 *markah*]

Total
A6

8

7. Diagram 7.1 shows the use of a transistor in a circuit as an automatic switch.

Rajah 7.1 menunjukkan kegunaan sebuah transistor di dalam satu litar suis automatic.

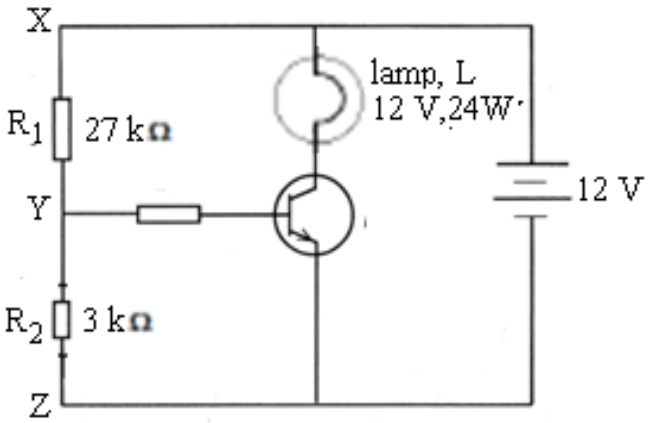


Diagram 7.1 / *Rajah 7.1*

(a) Name the type of transistor shown in Diagram 7.1.
Namakan jenis transistor yang ditunjukkan dalam Rajah 7.1.

.....

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

(b) Based on Diagram 7.1:
Merujuk pada Rajah 7.1:

(i) What is the potential difference across XZ?
Berapakah beza keupayaan merentasi XZ?

.....

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

(ii) What is the total resistance between point X and point Z?
Berapakah jumlah rintangan antara titik X dan Z?

.....

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

(iii) Using the answers from (b)(i) and b(ii), calculate the potential difference across XY.
Menggunakan jawapan anda dari b(ii) , hitung beza keupayaan merentasi XY

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

(iv) Tick (x) to show what will happen to the lamp,L, if the base-emitter potential difference, V_{BE} is 2 V?
Tandakan (x) untuk menunjukkan apakah yang berlaku kepada lampu jika beza keupayaan tapak-pengeluar, V_{BE} is 2 V?

Bulb / *Mentol*	
On	Off

[1 mark]
[1 *markah*]

(b) Diagram 7.2 shows a transistor is used to light up the lamp,L during the night. The resistor R_2 is replaced with a light dependent resistor.
Rajah 7.2 menunjukkan sebuah transistor yang digunakan untuk menyalakan sebuah lampu,L pada waktu malam. Perintang R_2 telah digantikan dengan perintang peka cahaya.

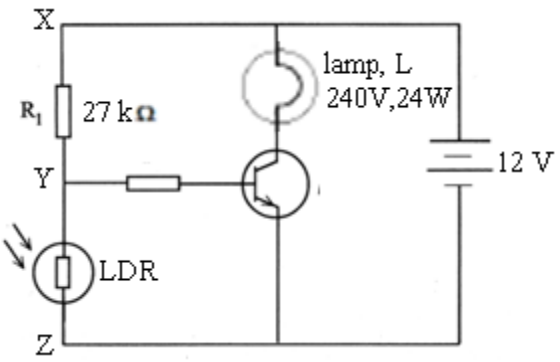


Diagram 7.2/ *Rajah 7.2*

Some modifications need to be done to the circuit in Diagram 7.2 so that the lamp can be automatically switched on during the day. State the suitable modification and give one reason for the modification.
Beberapa pengubahsuaian perlu dilakukan ke atas litar dalam Rajah 7.2 supaya lampu dapat dinyalakan secara automatic pada waktu siang. Nyatakan pengubahsuaian yang sesuai dan beri sebab untuk setiap pengubahsuaian.

(i) The position of LDR.
Kedudukan LDR:

.....

Reason / *Sebab:*

.....

[2 marks]
[2 *markah*]

(ii) An electrical component connected to lamp 240 V, 24 W.
Peranti electronic yang disambungkan pada lampu 240 V,24 W:

.....

Reason/ *Sebab*:

.....

[2 marks]
[2 markah]

Total
A7

10

8 Diagram 8 shows an electrical circuit. The power rating of bulb Z is 6V, 6W while bulbs X and bulb Y are identical with power rating of 2.4V, 3W.
Rajah 8 *menunjukkan satu litar elektrik. Kadaran kuasa mentol Z adalah* 6V, *6W manakala mentol X dan mentol Y adalah dua mentol yang serupa dengan kadaran kuasa 2.4V, 3W.*

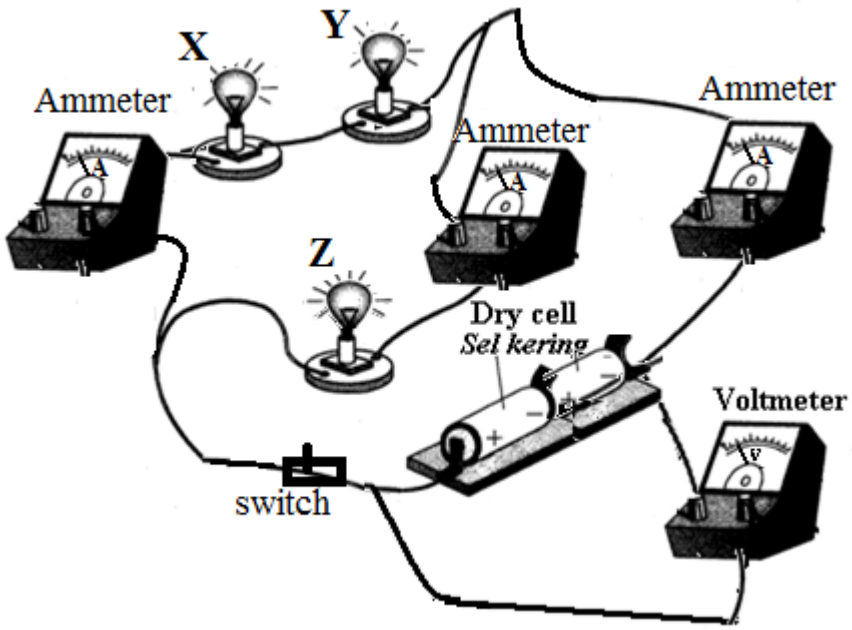


Diagram 8
Rajah 8

(a) What is the meaning of power rating of 6V, 6 W?
Apakah maksud kadaran kuasa 6V, 6 W?

.....

.....

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

(b) When the circuit is off the voltmeter reads 6.0 volt and when the switch is on the voltmeter shows a reading of 4.8 volt.
Bila litar itu dimatikan, voltmeter menunjukkan 6.0 Volt dan bila suis dihidupkan voltmeter menunjukkan bacaan 4.8 Volt.

8 (b)(i)

(i) How does bulb Z light up when the switch is on?
Bagaimanakah nyalaan mentol Z apabila suis dihidupkan?

1

……..

……

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

8(b)(ii)

(ii) Explain your answer in (b)(i)
Terangkan jawapan anda dalam (b)(i)

3

……

……

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

8 (c)

(c) The three bulbs in Diagram 8 are light up for 5 minutes.
Ketiga –tiga mentol dalamRajah 8 dibiarkan menyala selama 5 minit.
Calculate the heat energy dissipated in bulb Y
Hitung tenaga haba yang dilesapkan dalam mentol Y

3

[3 marks]
[3 *markah*]

(d) Base on apparatus on Diagram 8, you are assigned to set up an electrical circuit that will enable four bulbs to light up with normal brightness .Table 8 shows the specification of the bulbs and type of an electrical circuit arrangement.
Dengan menggunakan empat mentol , anda dikehendaki untuk memasang satu litar elektrik yang membolehkan keempat-empat mentol yang digunakan menyala dengan kecerahan normal.Jadual 8 *menunjukkan sdesifikasi mentol yang digunakan dan jenis susunan mentol-mentol itu.*

Bulbs's Specification	Arrangement of the bulbs
2 bulbs 6V,6W and 2 bulbs 2.4V,3W	Series and parallel
1 bulb 6V,6W and 3 bulbs 2.4V,3W	Parallel
4 bulbs of 6V,6W	Series
4 bulbs of 2.4V,3W	Series and parallel

Table 8
Jadual 8

Based on Table 8, state the suitable specification of the bulbs and type of Bulbs arrangement that y0u will set up to enable all the bulbs to light up with normal brightness.
Berdasarkan maklumat dari Jadual 8, nyatakan ciri –ciri yang sesuai bagi spesifikasi mentol dan jenis susunan litar elektrik yang anda akan susun untuk memastikan keempat-empat mentol itu menyala dengan kecerahan normal.

8(d)(i)

2

(i) Bulbs` specification
Spesifikasi mentol

…….

Reason
Sebab

…….
[2 marks]
[2 *markah*]

8(d)(ii)

2

(ii) Arrangement of the bulbs
Ssusunan mentol

……..

Reason
Sebab

……..
[2 marks]
[2 *markah*]

8(e)(i)

1

(e) Based on the arrangement of the electrical circuit on Diagram 8,

(i) State the name given to the voltage of the circuit when the switch is off.
Berdasarkan susunan litar elektrik pada Rajah 8, nyatakan nama voltan yang merentasi clitar itu apabila suis tidak dihidupkan?

.....

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

8(e)(ii)

1

(ii) Give one reason why the reading of the voltmeter is less when the switch is on.
Nyatakan satu sebab mengapa bacaan voltmeter berkurang apabila suis dihidupkan.

.....

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

Total
A8

12

Section B
Bahagian B
[20 *marks*]
[20 *markah*]

Answer any one question from this section.
Jawab mana-mana satu soalan daripada bahagian ini.

9. Diagram 9.1 shows a cross sectional structure of a hydraulic jack used to raise a load. A force, F_1 of 1000 N is exerted on to piston Q with cross sectional area of A_1 and able to raise a load, F_2 of 5000 N on piston R with cross sectional area of A_2.

Rajah 9.1 menunjukkan keratan rentas sebuah jek hidraulik yang digunakan untuk menaikkan suatu beban. Satu daya F_1, 1000 N dikenakan ke atas piston Q yang luas keratan rentasnya A_1 dan berupaya untuk mengangkat satu beban, F_2, 5000N di atas piston R yang luas keratan rentasnya A_2.

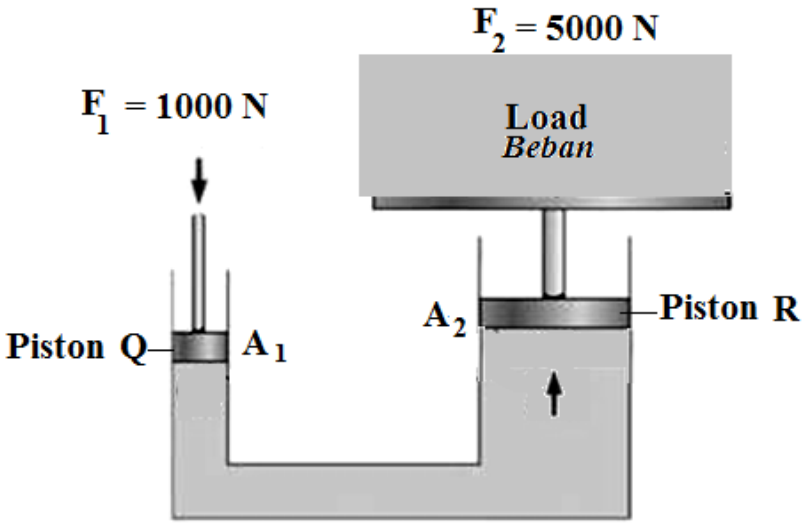


Diagram 9.1
Rajah 9.1

(a) What is the meaning of force? [1 mark]
Apakah maksud daya? [*1 markah*]

(b) Based on Diagram 9.1,
Berdasarkan Rajah 9.1,

(i) compare the surface area of piston Q, A_1 and piston R, A_2
bandingkan luas keratan rentas piston Q *A_1 dan* piston R, *A_2*

(ii) compare the forces F_1 and F_2 acting on the pistons
bandingkan daya F_1 dan F_2 yang bertindak pada piston-piston itu

(iii) compare the pressure exerted on the pistons
bandingkan tekanan yang bertindak pada piston-piston itu

(iv) relate the surface area and the force exerted on the pistons

hubungkait luas keratan rentas dan daya yang bertindak pada piston

(v) name the physics principle involved

namakan prinsip fizik yang terlibat

[5 marks]
[*5 markah*]

(c) Diagram 9.2 shows a siphon system.

Rajah 9.2 menunjukkan sebuah system sifon

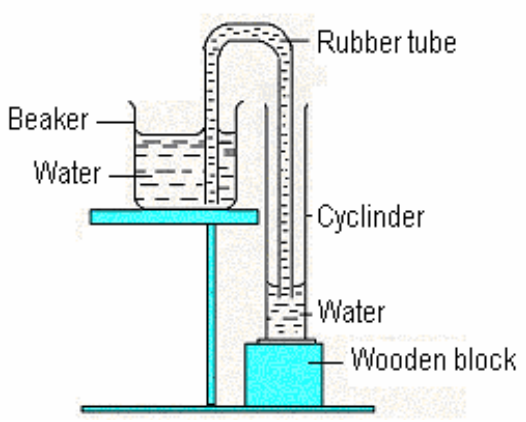


Diagram 9.2
Rajah 9.2

What is the function of the siphon?. Explain the working principle of the siphon system.
Apakah fungsi system sifon itu?Terangkan prinsip kerja system sifon tersebut.

[4 marks]
[4 markah]

(d) *An efficient hydraulic* brake system is very important in a car for safety purposes. Diagram 9.3 shows a car hydraulic brake system.

Sistem brek hidraulik yang effisien adalah sangat penting bagi sesebuah kereta untuk tujuan keselamatan.
Rajah 9.3 menunjukkan sebuah sistem brek hidraulik.

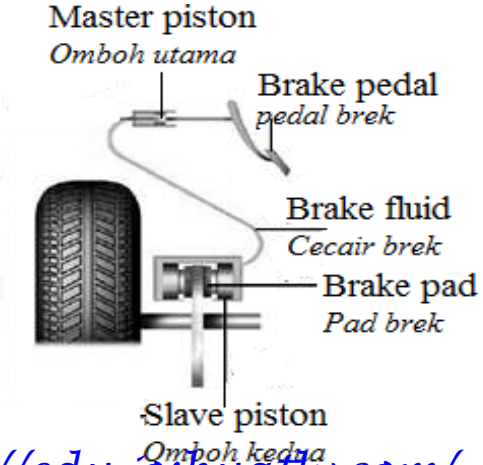


Diagram 9.3
Rajah 9.3

Suggest and explain the modification should be done on the system so that it can function effectively based on the following aspect :

Cadang dan terangkan pengubahsuaian yang perlu dibuat kepada sistem ini supaya ia dapat berfungsi dengan lebih berkesan berdasarkan aspek-aspek berikut:

(i) The type material of brake fluid. [2 marks]
Jenis bahan bendalir brek. [*2 markah*]

(ii) The characteristic of brake fluid. [2 marks]
Sifat bendalir brek. [*2 markah*]

(iii) The size of master piston [2 marks]
Saiz omboh utama [*2 markah*]

(iv) The size of slave piston. [2 marks]
Saiz omboh kedua. [*2 markah*]

(v) The type material of the fluid transmission pipe. [2 marks]
Jenis bahan yang digunakan untuk paip penghantaran bendalir. [*2 markah*]

10. Diagram 10.1 and Diagram 10.2 show the current flows in solenoid.
Rajah 10.1 dan Rajah 10.2 menunjukkan arus mengalir dalam solenoid.

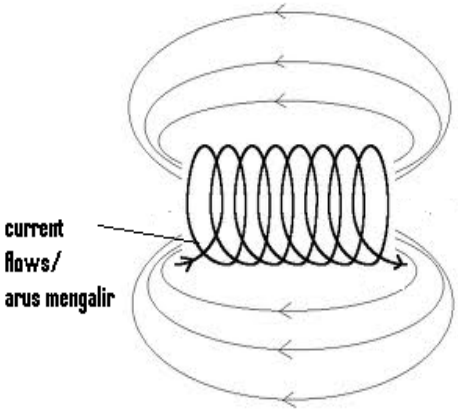


Diagram 10.1

Rajah 10.1

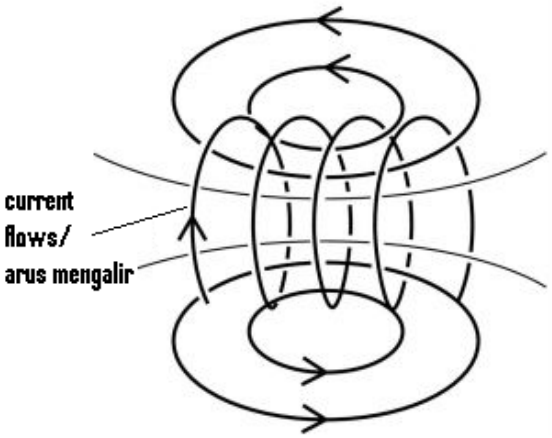


Diagram 10.2

Rajah 10.2

(a). What is the meaning of magnetic field? (1mark)

Apakah maksud medan magnet? *(1markah)*

(b) Using Diagram 10.1 and diagram 10.2
Menggunakan Rajah 10.1 dan Rajah 10.2

i) compare the number of turns of the solenoid and number of magnetic field lines and the strength of magnetic field
bandingkan bilangan lilitan solenoid, bilangan garis medan magnet dan kekuatan medan magnet

(3 marks)
(3 markah)

ii) state the relationship between the number of turns of the solenoid and
Nyatakan hubungan antara bilangan lilitan dan

a) the number of magnetic field lines
bilangan garis medan magnet

b) the strength of magnetic field.
Kekuatan medan magnet *(2 marks)*
(2 markah)

(c) Diagram 10.3 shows a lifting electromagnets are used to lift and move iron and steel object such as scrap iron from place to place. Explain how it works
Rajah 10.3 menunjukkan satu pengangkat electromagnet yang digunakan untk mengangkat dan menggerakkan objek besi seperti bsi buruk dari satu tempat ke satu tempat yang lain. Terangkan bagaimana ia bekerja

(4 marks)
(4 markah)

Diagram 10.3
Rajah 10.3

(d) Diagram 10.4 shows a simple motor to lift up the load.
Rajah 10.4 menunjukkan satu motor ringkas yang digunakan untuk mengangkat beban

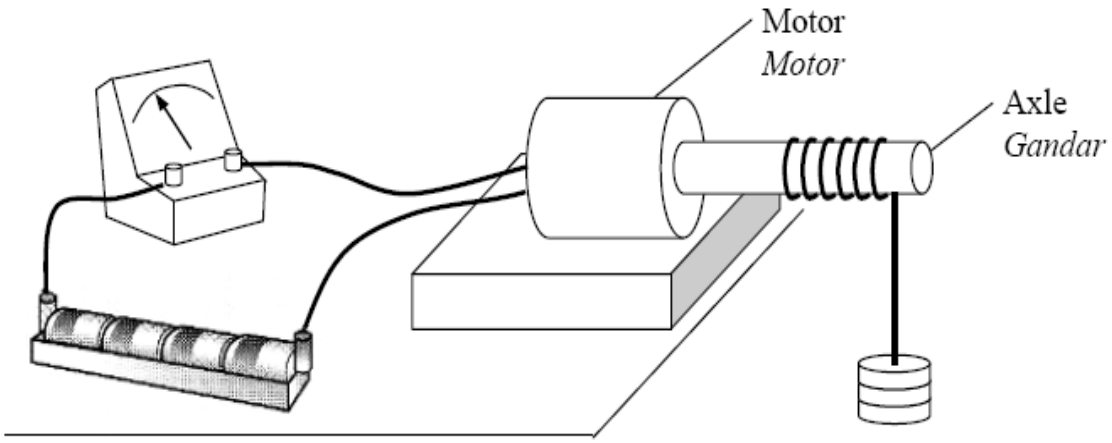


Diagram 10.4
Rajah 10.4

Using appropriate physics concept, explain the use of suitable equipments to design a motor which enable to move faster and to bring heavier load.Your answer should include the following aspects:

Menggunakan konsep fizik yang sesuai , terangkan dengan penggunaan perlatan yang sesuai untuk merekabentuk suatu motor yang membolehkan ia bergerak laju dengan membawa beban berat.Dengan menggunakan pengetahuan tentang kesan konduktor membawa arus dalam medan magnet, terangkan cadangan anda berdasarkan aspek berikut:

(i) The diameter of coil
Diameter lengkaran [2 marks]
[*2 markah*]

(ii) The thickness of wire
Ketebalan wire [2 marks]
[*2 markah*]

(iii) The strength of magnet
Kekuatan magnet [2 marks]
[*2 markah*]

(iv) The number of turns
Bilangan lilitan [2 marks]
[*2 markah*]

(v) The shape of magnet
Bentuk magnet [2 marks]
[*2 markah*]

Section C
Bahagian C

Answer any **one** question from this section.
*Jawab mana-mana **satu** soalan daripada bahagian ini.*

11.(a) Diagram 11.1 shows a bunsen burner used for heating purposes.
Rajah 11.1 menunjukkan sebuah penunu bunsen yang digunakan untuk tujuan pemanasan.

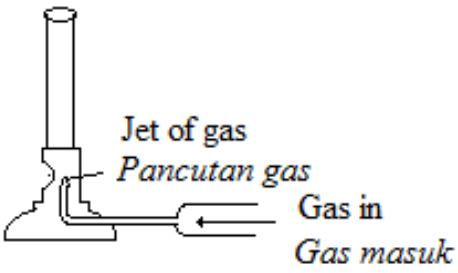


Diagram 11.1
Jadual 11.1

(a) What is meant by heat?
Apakah maksud haba

[1 mark]
[1 markah]

(b) Explain how the Bunsen burner able to produce high heated flame .

Terangkan bagaimana penunu Bunsen burner boleh mengeluarkan nyalaan yang panas dan kuat.

[4 marks]
[4 markah]

(c) Diagram 11.2 shows a racing car on the Formula 1 competition. Table 11.1 shows the spefications of four racing car, W ,X, Y and Z that can be used on the Formula 1 competion.

Rajah 11.2 menunjukkan satu kereta lumba dalam Pertandingan Formula 1. Jadual 11.1 menunjukkan spesifikasi empat buat kereta lumba W, X, Y dan Z yang digunakan dalam pertandingan Formula 1

Diagram 11.2
Rajah 11.2

You are required to investigate the characteristics of racing car as shown in table 11.
Anda dikehendaki menyiasat ciri-ciri kereta lumba seperti yang ditunjukkan di jadual 11

Racing car *Kereta lumba*	W	X	Y	Z
Size of spoiler *Saiz spoiler*	Bigger piece	Smaller piece	Bigger piece	Smaller piece
Shape of aerofoil *Bentuk aerofoil*	aerofoil	Rectangular shape *Bentuk segiempat*	aerofoil	Rectangular shape *Bentuk segiempat*
Wide of tyre *Lebar tayar*	Moderate *sederhana*	Smaller *Lebih kecil*	Wider *lebar*	Smaller *Lebih kecil*
Type of material *Jenis bahan*	Steel *keluli*	Aluminum *Aluminium*	Carbon fibre *Serabut karbon*	Copper *Kuprum*

Table 11.1
Jadual 11.1.

Explain the best racing car and the suitability of each characteristic in table 11.1. Determine the most suitable racing car to be used in racing competition. (10 marks)

Terangkan kereta lumba yang paling baik dan kesesuaian bagi setiap ciri dalam jadual 11.1 kereta lumba itu. Tentukan kereta lumba yang paling sesuai digunakan dalam Pertandingan Kereta Lumba

(10 markah)

(c) A racing car of mass 2000 kg accelerates from rest to a velocity of 800 ms^{-1} in 10 minutes

Sebuah kereta lumba berjisin 2000kg memecut dari pegun ke halaju 80 kmh^{-1} dalam 10 minit.

Calculate

Hitung

(i) the acceleration of the racing car. (3 marks)

pecutan kereta lumba itu. *(3 markah)*

(ii) the force acting on the racing car. (2 marks)

daya yang bertindak pada kereta lumba itu. *(2 markah)*

12. An engineer uses radioisotope to detect leakage of water pipe line as shown on Diagram 12.He is assigned to design a system to detect the thickness of card in a factory.

Seorang jurutera menggunakan radioisotop untuk mengesan kebocoran dalam saluran paip air seperti rajah 12. Dia juga ditugaskan untuk mereka bentuk satu sistem untuk mengesan ketebalan kad dalam satu kilang.

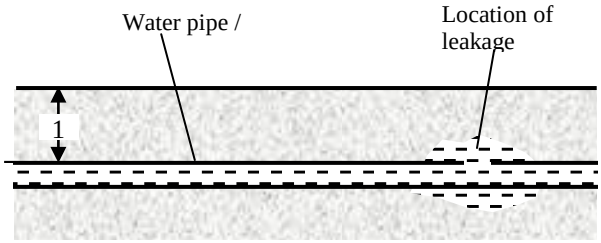


Diagram 12/*Rajah 12*

(a) What is meant by radioisotope ?
Apakah yang dimaksudkan dengan radioisotop?

[1 *mark / 1 markah*]

(b) Table 6 shows the characteristics of five different radioisotopes.
Jadual 6 menunjukkan ciri-ciri bagi lima radioisotop yang berbeza.

Radioisotopes *Radioisotop*	Characteristics of isotope *Ciri-ciri isotop*			
	Physical state *Keadaan fizik*	Radiation emitted *Sinaran yang dikeluarkan*	Penetrating power *Kuasa penembusan*	Half-life *Separuh hayat*
V	Gas *Gas*	Alpha *Alfa*	Low *Rendah*	30 days *30 hari*
W	Liquid *Cecair*	Beta *Beta*	Moderate *Sederhana*	8 months *8 bulan*
X	Liquid *Cecair*	Gamma *Gama*	High *Tinggi*	2 years *2 tahun*
Y	Solid *Pepejal*	Beta *Beta*	Moderate *Sederhana*	32 years *32 tahun*
Z	Solid *Pepejal*	Gamma *Gama*	High *Tinggi*	60 seconds *60 saat*

Table 12
Jadual 12

Based on Table 12, explain the suitable characteristics of the radioisotopes to be used to detect the thickness of card. Select the most suitable isotope to be used and give your reasons.
Berdasarkan Jadual 12, terangkan kesesuaian ciri-ciri radioisotop yang digunakan untuk mengesan ketebalan kad. Pilih isotop yang paling sesuai digunakan dan berikan sebab anda.

[10 *marks / 10 markah*]

(c) Explain the arrangement of the apparatus used to detect the thickness of card. State how radioactivity is used to detect the thickness of the card.

Terangkan susunan radas yang digunakan untuk mengesan ketebalan kad. Nyatakan bagaimana keradioaktifan digunakan untuk mengesan ketebalan kad.

[3 *marks / 3 markah*]

(d) Sketch activity against time graph to show the decay of a radioactive substance. Explain how the half-life is determine.
Lakarkan graf keaktifan melawan masa untuk menunjukkan pereputan bagi suatu bahan radioaktif. Terangkan bagaimana setengah hayat ditentukan.

[4 *marks / 4 markah*]

(e) The half-life of radon-22 is 4 days. Calculate the time taken for the activity of this isotope to decay to 6.25% its initial value.

Setengah hayat bagi radon-22 ialah 4 hari. Hitungkan masa yang diambil oleh keaktifan isotop itu untuk mereput kepada 6.25% nilai asalnya.

[2 *marks / 2 markah*]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

NAMA:_____ TINGKATAN:_____

4531/3
Fizik
Kertas 3
2012
1 ½ jam

PERSIDANGAN KEBANGSAAN PENGETUA SEKOLAH MENENGAH MALAYSIA (CAWANGAN MELAKA)

PEPERIKSAAN PERCUBAAN SIJIL PELAJARAN MALAYSIA TAHUN 2012

FIZIK

Kertas 3

Satu jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Tuliskan nama dan tingkatan anda pada ruang yang disediakan.

2. Calon dikehendaki membaca maklumat di halaman 2 .

Nama Pemeriksa			
Bahagian	Soalan	Markah Penuh	Markah diperolehi
A	1	16	
	2	12	
B	3	12	
	4	12	
Jumlah			

Kertas soalan ini mengandungi 14 halaman bercetak .

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of two sections : Section A and Section B.
   Kertas soalan ini mengandungi dua bahagian: ***Bahagian A*** *dan* ***Bahagian B.***

2. Answer all questions in Section A. Write your answers for Section A in the spaces provided in the question paper.
   Jawab ***semua*** *soalan dalam* ***Bahagian A.*** *Jawapan kepada* ***Bahagian A*** *hendaklah ditulis dalam ruang yang disediakan dalam kertas soalan.*

3. Answer one question from Section B. Write your answers for Section B on the lined pages provided at the end of this question paper. Answer questions in Section B in detail. You may use equations, diagrams, tables, graphs and other suitable methods to explain your answer.
   Jawab ***satu*** *soalan daripada* ***Bahagian B.*** *Jawapan kepada* ***Bahagian B*** *hendaklah ditulis pada kertas jawapan sendiri. Anda diminta menjawab dengan lebih terperinci. Jawapan mestilah jelas dan logik. Persamaan , gambar rajah, jadual, graf dan cara lain yang sesuai untuk menjelaskan jawapan anda boleh digunakan.*

4. Show your working, it may help you to get marks.
   Tunjukkan kerja mengira,ini membantu anda mendapatkan markah.

5. If you wish to cancel any answer, neatly cross out the answer.
   Sekiranya anda hendak membetulkan sesuatu jawapan, buatkan garisan di atas jawapan itu.

6. The diagrams in the questions are not drawn to scale unless stated.
   Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan.

7. Marks allocated for each question or part question are shown in brackets.
   Markah yang diperuntukkan bagi setiap soalan atau ceraian soalan ditunjukkan dalam kurungan.

8. A booklet of four-figure mathematical tables is provided.
   Buku sifir matematik empat angka disediakan.

9. You may use a non-programable scientific calculator.
   Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.

10. The time suggested to answer Sectin A is 60 minutes and Section B is 30 minutes.
    Masa yang dicadangkan untuk menjawab ***Bahagian A*** *ialah 60 minit dan* ***Bahagian B*** *ialah 30 minit.*

11. Hand in this question paper at the end of the examination.
    Serah kertas soalan ini di akhir peperiksaan.

Section A
Bahagian A

[28 marks]
[*28 markah*]

Answer **all** questions in this section
Jawab **semua** *soalan dalam bahagian ini.*

1. Experiment is carried out to study the refraction of light by a semicircular glass block. A light ray is directed at the centre of the semicircular glass block with an angle of incidence, $i = 20^o$. The refracted ray emerging from the glass block is marked with two pins at the point P_1 and P_2 as shown in Diagram 1.1

Suatu eksperimen dijalankan untuk mengkaji pembiasan cahaya menggunakan blok kaca semibulatan. . Cahaya ditujukan dibahagian tengah blok kaca semibulatan tersebut dengan sudut tuju, $i = 20^o$. Sinar yang terbias keluar daripada blok kaca ditandakan dengan dua pin pada titik P_1 dan P_2 seperti yang ditunjukkan dalam Rajah 1.1

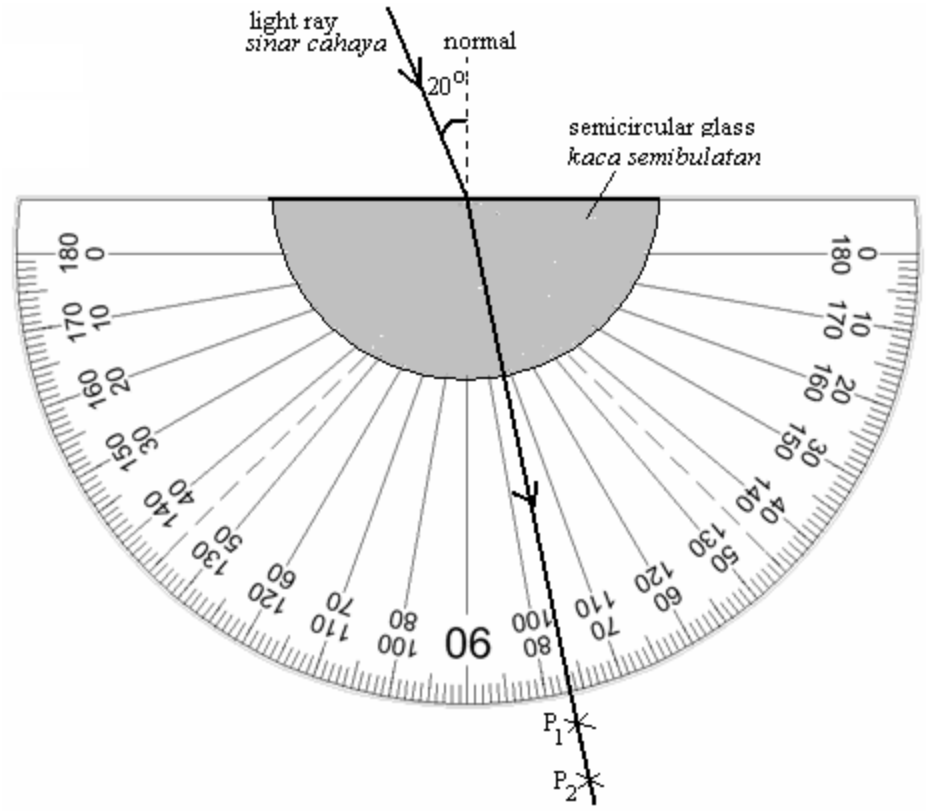


Diagram 1.1

Rajah 1.1

The experiment is repeated with the angle of incidence , i = 30^o , 40^o , 50^o , 60^o and 70^o The refracted ray emerging from the semicircular block are marked with pins at the point A_1 and A_2 , B_1 and B_2 , C_1 and C_2 , D_1 and D_2 and E_1 and E_2 respectively. Diagram 1.2 shows the marked points of the experiment.

Eksperimen diulang dengan sudut, i = 30^o , 40^o , 50^o , 60^o dan 70^o . Sinar yang terbias keluar daripada blok semibulatan ditandakan dengan pin pada titik A_1 dan A_2 , B_1 dan B_2 , C_1 dan C_2, D_1 dan D_2 dan E_1 dan E_2 masing-masing.Rajah 1.2 menunjukkan titik yang ditanda semasa menjalankan eksperimen.

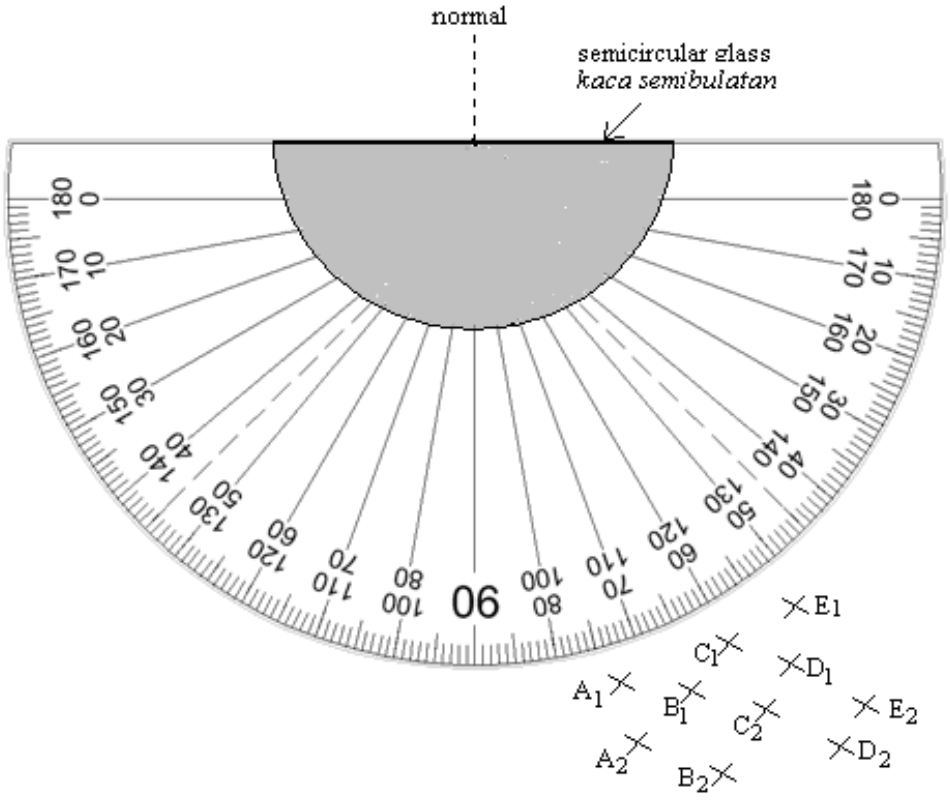


Diagram 1.2
Rajah 1.2

(a) Based on the description of the experiment, identify;
Berdasarkan eksperimen yang diterangkan , kenal pasti;

(i) the manipulated variable,
pembolehubah dimanipulasikan,

……..
[1 mark]
[1 *markah*]

(ii) the responding variable,
pembolehubah bergerak balas,

……..
[1 mark]
[1 markah]

(iii) the fixed variable.
satu pembolehubah dimalarkan.

……..
[1 mark]
[1 *markah*]

(b) On Diagram 1.2, draw straight lines to join the pair of points A_1 and A_2, B_1 and B_2, $C_1$and C_2 , D_1 and D_2 and E_1 and E_2 . Then determine the angle of refraction , *r* , for the glass block.

Pada Rajah 1.2, lukis garis lurus untuk menyambungkan pasangan titik A_1 dan A_2 , B_1 dan B_2 , C_1 dan C_2 , D_1 dan D_2 dan E_1 dan E_2 . Tentukan sudut biasan, r, bagi blok kaca.

Tabulate your results for *i, r* , sin *i* and sin *r* in the space provided below.

Jadualkan keputusan i, r, sin i dan sin r dalam ruang yang disediakan di bawah.

[7 marks]
[7 markah]

(c) Based on your table, draw a graph of sin *i* against sin *r* on the graph paper on page 7.

Berdasarkan jadual anda, lukis graf sin i melawan sin r di atas kertas graf pada muka surat 7.

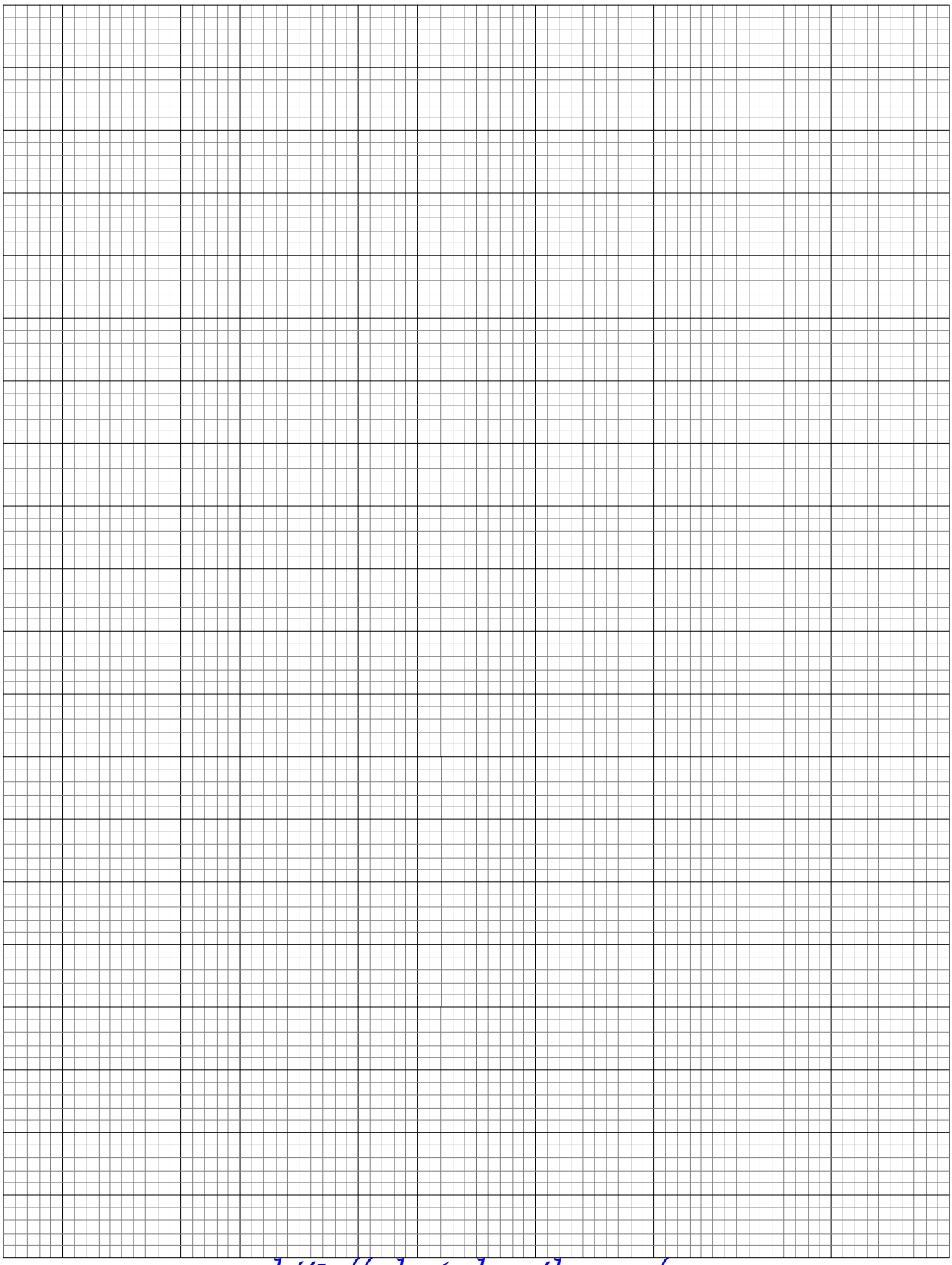
[5 marks]
[5 *markah*]

(d) Using your graph in (c), state the relationship between sin *i* and sin *r*.

Gunakan graf di (c), nyatakan hubungan sin i dengan sin r.

……

[1 mark]
[1 *markah*]



2. A student carries out an experiment to investigate the relationship between distance two consecutive loud sound, *x* and distance between two loud speaker, *a* in an interference of sound wave. The results of the experiment is shown in the graph of *x* against $\frac{1}{a}$ in Diagram 2.1.

Seorang murid menjalankan satu eksperimen untuk menyiasat hubungan antara jarak dua bunyi kuat berturutan, x dengan jarak antara dua pembesar suara, bagi interferens gelombang bunyi. Keputusan eksperimen ditunjukkan oleh graf x melawan $\frac{1}{a}$ pada *Rajah* 2.1.

(a) Based on the graph in Diagram 2.1,
Berdasarkan graf pada Rajah 2.1,

(i) State the relationship between x and $\frac{1}{a}$.
Nyatakan hubungan antara x and $\frac{1}{a}$.

…….....

[1 mark]
[1 *markah*]

(ii) Determine the value of *a* when *x* = 0.5 m
Show on the graph, how you determine the value of *a*.
Tentukan nilai a apabila x = 0.5 m
Tunjukkan pada graf bagaimana anda menentukan nilai a.

a = …….

[3 *marks*]
[3 *markah*]

(iii) Calculate the gradient, *m*, of the graph.
Show on the graph how you determine *m*.
Hitung kecerunan, m bagi graf itu.
Tunjukkan pada graf bagaimana anda menentukan m.

m = ...

[3 marks]

Graph of x against $\frac{1}{a}$ *[3 markah]*

Graf x melawan $\frac{1}{a}$

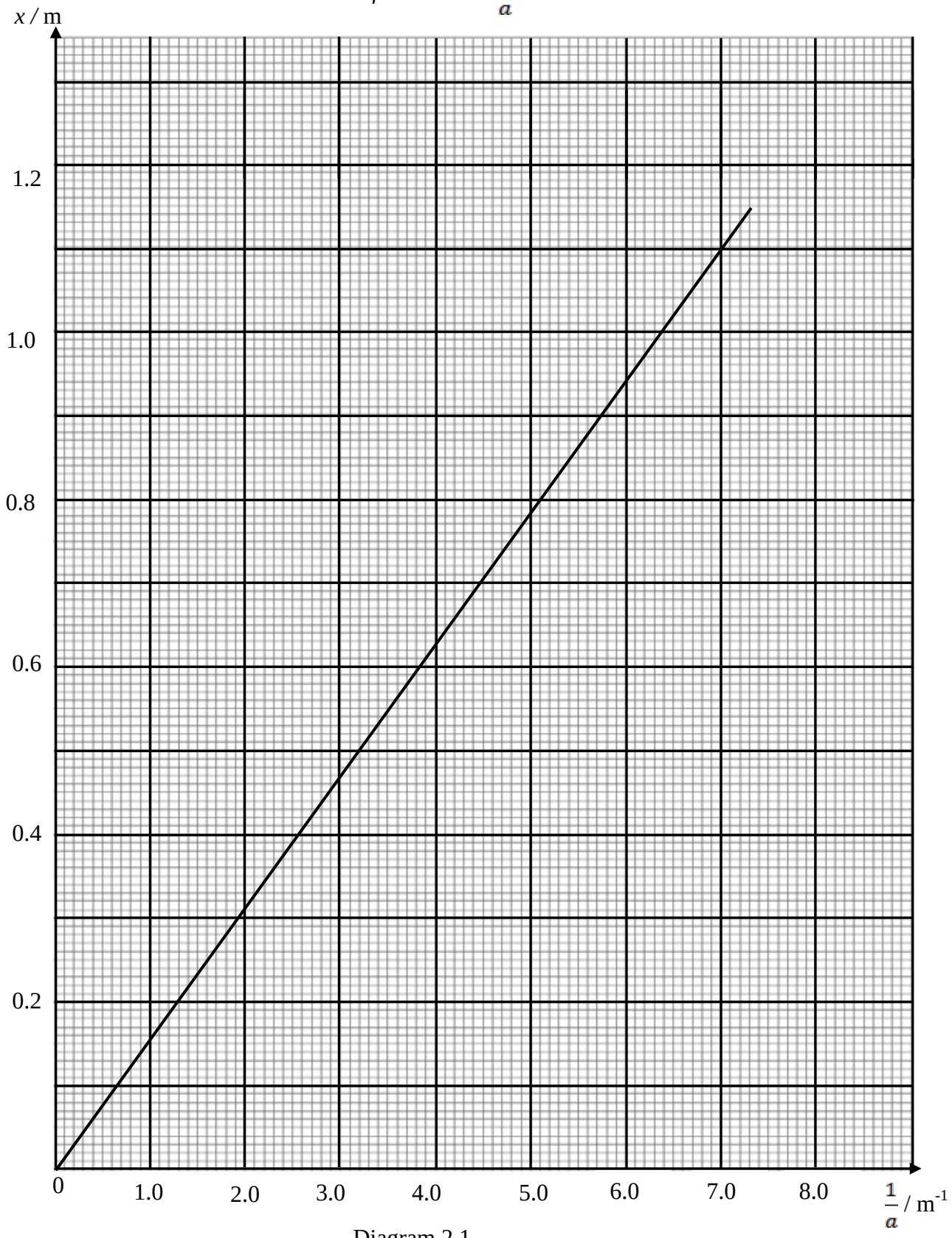


Diagram 2.1

Rajah 2.1

(b) The wavelength of sound wave, l is given by the formula

Jarak gelombang bunyi l diberi oleh formula

$$l = \frac{ax}{D}$$

where
di mana

a = distance between two loud speakers
jarak antara dua pembesar suara
x = distance between two consecutive loud sound
jarak antara dua bunyi kuat berturutan
D = perpendicular distance between a and theplane where x is measured
jarak antara a dan satah di mana x diukur

Using the formula given and the gradient you calculate in (a)(iii), calculate the value of l if D = 0.01m

Menggunakan formula yang diberi dan kecerunan graf yang anda kira dalam (a)(iii), kira nilai l *jika D = 0.01 m*

l = ... [3 *marks*]
[3 *markah*]

(c) State **two** precautions that should be taken to improve the accuracy of the result of this experiment.
*Nyatakan **dua** langkah berjaga-jaga yang perlu diambil untuk memperbaiki ketepatan bacaan dalam eksperimen ini.*

1 ……

……

2 ……

……
[2 marks]
[2 *markah*]

Section B
Bahagian B

[12 *marks*]
[12 *markah*]

Answer any **one** question from this section.
Jawab mana-mana **satu** *soalan daripada bahagian ini.*

3. Diagram 3 shows a man pushing a trolley. It is more difficult to push the trolley when it is full of stuff compared to when it is empty.

Rajah 3 menunjukkan seorang lelaki sedang menolak troli. Menolak troli yang penuh dengan barangan adalah lebih sukar berbanding troli yang kosong.

Diagram 3
Rajah 3

Based on the information and observation,
Berdasarkan maklumat dan pemerhatian itu,

(a) State **one** suitable inference.
Nyatakan ***satu*** *inferens yang sesuai*

[1 mark]
[1 markah]

(b) State **one** suitable hypothesis,
Nyatakan ***satu*** *hipotesis yang sesuai,*

[1 mark]
[1 markah]

(c) With the use of apparatus such as hacksaw blade, plasticine, G-clamp and other suitable apparatus, describe **one** experiment to investigate the hypothesis stated in 3(b).

*Dengan menggunakan radas seperti bilah gergaji besi, plastisin, pengapit G dan lain-lain radas yang sesuai, terangkan **satu** eksperimen untuk menyiasat hipotesis yang dinyatakan di 3(b).*

In your description, state clearly the following:
Di dalam penerangan anda, nyatakan dengan jelas:

(i) The aim of the experiment
Tujuan eksperimen

(ii) The variables in the experiment
Pembolehubah dalam eksperimen

(iii) The list of apparatus and materials
Senarai radas dan bahan.

(iv) The arrangement of the apparatus
Susunan radas,

(v) The procedure of the experiment which should include **one** method of controlling the manipulated variable and one method of measuring the responding variable.
Prosedur eksperimen yang mesti termasuk satu kaedah mengawal pembolehubah dimanipulasikan dan satu kaedah mengukur pemboleh ubah bergerak balas.

(vi) The way to tabulate the data.
Cara untuk menjadualkan data.

(vii) The way to analyse the data.
Cara untuk menganalisis data. [10 *marks*]
[10 *markah*]

4. Diagram 4.1 and Diagram 4.2 shows a table fan. In Diagram 4.1, the speed control is set at button 1 and the fan blade is rotates. In Diagram 4.2, the speed control is set at button 3 and the fan blade is rotates faster.

Rajah 4.1 dan 4.2 menunjukkan sebuah kipas meja. Dalam Rajah 4.1, kawalan laju ditetapkan pada butang 1 dan bilah kipas berputar. Dalam Rajah 4.2, kawalan laju ditetapkan pada butang 3 dan bilah kipas berputar dengan lebih cepat.

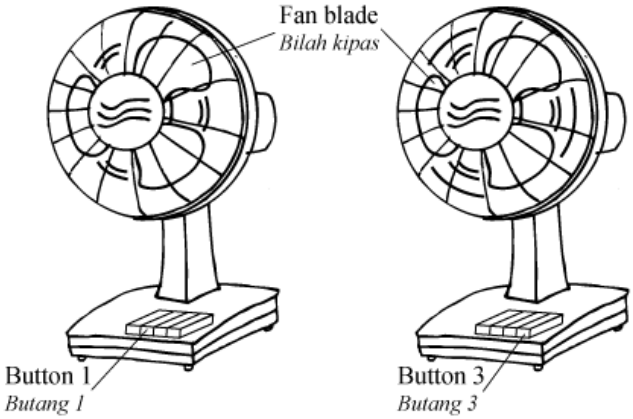


Diagram 4.1 Diagram 4.2
Rajah 4.1 *Rajah 4.2*

Based on the observation and applying your knowledge of magnetic effect of current:
Berdasarkan pemerhatian tersebut dan dengan menggunakan pengetahuan anda tentang kesan magnet bagi arus:

(a) State **one** suitable inference.
*Nyatakan **satu** inferens yang sesuai.*

[1 mark]
[1 markah]

(b) State **one** hypothesis that could be investigated.
*Nyatakan **satu** hipotesis yang boleh disiasat.*

[1 mark]
[*1 markah*]

(d) With the use of apparatus such as magnets, C-shaped iron yoke, bare copper wire, connecting wires, d.c. power supply, ammeter and other apparatus, describe **one** experiment to investigate the hypothesis stated in 4(b).

*Dengan menggunakan radas seperti magnet, dening besi berbentuk-C, dawai kuprum tidak berpenebat, wayar penyambung, bekalan kuasa a.t., ammeter dan radas lain, terangkan **satu** eksperimen untuk menyiasat hipotesis yang dinyatakan di 4(b).*

In your description, state clearly the following:
Dalam huraian anda, nyatakan yang berikut dengan jelas:

(i) The aim of the experiment.
Tujuan eksperimen.

(ii) The variables in the experiment.
Pemboleh ubah eksperimen.

(iii) The list of apparatus and materials.
Senarai radas dan bahan.

(iv) The arrangement of the apparatus.
Susunan radas.

(v) The procedure of the experiment which should include **one** method of controlling the manipulated variable and **one** method of measuring the responding variable.
*Prosedur eksperimen yang mesti termasuk **satu** kaedah mengawal pemboleh ubah dimanipulasikan dan **satu** kaedah mengukur pemboleh ubah bergerak balas.*

(vi) The way to tabulate the data.
Cara untuk menjadualkan data.

(vii) The way to analyse the data.
Cara untuk menganalisis data.

[10 marks]
[10 markah]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

ANSWER FOR PHYSICS PAPER 1 2012 TRIAL EXAMINATION MALACCA

1	B	26	D
2	D	27	C
3	D	28	B
4	B	29	C
5	C	30	B
6	B	31	C
7	D	32	C
8	A	33	A
9	A	34	A
10	D	35	A
11	A	36	A
12	B	37	D
13	B	38	D
14	C	39	A
15	A	40	C
16	B	41	A
17	A	42	B
18	A	43	C
19	B	44	D
20	D	45	D
21	B	46	D
22	D	47	C
23	B	48	B
24	A	49	B
25	D	50	C

Skema paper 2 trial Melaka 2012

No	Suggested answer	marks
1.	a) Temperature b) Metal bob released more heat than the water molecules c) 80 s d) No net flow of heat between metal bob and water // achieve thermal equilibrium // net flow of heat equal to zero	1 1 1 1
	Total	4
2	a) Maximum b) $\frac{90x100}{360}$ = 25 ms^{-1} c) 3000 x 25 = 75000 kgms^{-1}	1 1 1 1 1
	Total	5
3.	a) Force per unit area b) -The force exerted by the molecule hitting the wall and the molecule bounces off the wall of the container, - its direction is changed ,creating a change of momentum. - The rate of change of momentum of the gas molecule is the cause of the force on the wall which creates gas pressure. c) -5 + 273 = 268 K 27 + 273 = 300 K P = $\frac{2.7}{268}$ x 300 = 3.02 atm	1 1 1 1 1 1
	Total	6
4	a) (i)longitudinal waves (ii)N (iii) the wave can be diffracted with shorter wavelength b) 330/586 = 0.563 m c) Sketch to show frequency decreases but same amplitude.	1 1 1 2 2
	Total	7
5.	a) incident angle b) medium A and B denser than air c) i) same ii) angle i in Diagram 5.1 is bigger than in Diagram 5.2 iii) When the medium denser, the r will be smaller. iv) n in medium B bigger than medium A d) The denser the medium, n will be bigger e) Snell' s Law	1 1 1 1 1 1 1 1

	Total	8
6	(a) electromagnetic induction (b) (i) opposite direction // diagram 6.1 to left side and diagram 6.2 to right side (ii) current in diagram 6.1 is higher than current in diagram 6.2 // 6.1 > 6.2 // 6.1 higher than 6.2 (iii) polarity in diagram 6.1 is North but in diagram 6.2 is South // 6.1 North pole but 6.2 South pole // different pole (iv) When magnet moves toward/downward to solenoid, polarity at P is North/same pole with polarity of magnet // vice versa (c) Lenz (d) kinetic energy to electric energy	1 1 1 1 1 1 2
	Total	8
7	(a) npn (b) (i) 12 V (ii) 30 kΩ (iii) $V_{XY} = \frac{27x10^3}{27x10^3 + 3x10^3} \times 12$ $= 10.8$ V (iv) ON (c) (i) - between XY // replace with R_1 // change place with R_1 - resistance LDR is low / resistance R_1 is high so base voltage high enough to switch on transistor (ii) - relay switch - to switch on secondary circuit / collector circuit with high voltage	1 1 1 1 1 1 1 1 1 1
	Total	10

8	(a)		The bulb consumed electrical energy 6j every second when connected to a voltage of 6 volt from a power supply	1 1
	(b)	(i)	Dimly // not bright	1
		(ii)	It received 4.8 volt / voltage supply is less than 6 volt	1
	(c)		P = IV I = 3/2.4 A = 5/4A	1
			E = VIt = 2.4 x 5/4 x 5 x60 J	1
			= 900 J // $I^2Rt = (5/4)^2$ (1.92)(5x60)J	1
	(d)	(i)	2.4 V,3 W	1
			4 bulbs to be used and The emf of the cell is only 6 volt	1

		(ii)	Series and parallel	1 1	
			The total voltage for 2 bulbs in series is 4.8 volt		
	(e)	(i)	Emf / electromotive force		
		(ii)	Internal resistance		
					TOTAL
				Total	12

9	(a)		Force is action on an object that can result in changes like size, shape and direction.	1
	(b)		1. surface area A_1 is smallerr than A_2 2. forces F_1 is smaller than F_2 3. pressure P_1 is equal to P_2 4. when surface area is larger, the force exerted on the piston will increase. 5. Pascal's principle	5
	(c)		1. Function- to transfer water from beaker to cylinder. 2. The pressure at lowest point in cylinder is greater than the atmospheric pressure, the liquid flows out at lowest point in cylinder/at the end of rubber tube in cylinder. 3. The pressure in the rubber tube decreases as the water flows out and a partial vacuum is created. 4. The higher atmospheric pressure water into the tube.The water flows until the liquid surface in cylinder reaches the same level as in beaker.	4
	(d)			10

Modification/ suggestion	**Explanation**
Oil	Incompressible/ No air bubble
High boiling point/ Low density/ High viscosity	Does not change to gas state easily/ Does not evaporate easily Lighter/ Fluid does not flow easily
Small master piston	High pressure produced with a small force
Big slave piston	Produce bigger output force
Aluminium/ Steel	Strong/ Does not break easily/ Non corrosive/ Does not rust easily

<table>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td>Total</td><td>20</td></tr>
<tr><td>10</td><td>(a) region in which an experience electromagnetic force
(b) (i) - num. of turns in diagram 10.1 is higher than diagram 10.2 // 10.1 > 10.2
- num. of magnetic field lines in diagram 10.1 is higher than diagram 10.2 // 10.1 > 10.2
- strength of magnetic field in diagram 10.1 is higher than diagram 10.2 // 10.1 > 10.2
(ii) a) num. of turns increase, num. of magnetic field lines increase
b) num. of turns increase, strength of magnetic field increase
(c) 1) when switch on, current flows
2) produce greater strength of magnetic field
3) soft iron core is magnetized and large lifting force produced
4)attract iron and steel then separate them from other non-magnetic materials
(d)
<table>
<tr><th>Characteristics</th><th>Reason</th></tr>
<tr><td>Large diameter of coil</td><td>Low resistence // speed increase</td></tr>
<tr><td>Thick wire</td><td>Low resistance // current increase</td></tr>
<tr><td>High strength of magnet // strong</td><td>Current increase // speed increase // turning faster // easy to lift up heavy load</td></tr>
<tr><td>High num. of turns</td><td>Current increase</td></tr>
<tr><td>U-shaped // round // concave</td><td>Radial magnetic field // concentrated of magnetic field lines</td></tr>
</table></td><td>1
1
1
1
1
1
4
10</td></tr>
<tr><td></td><td>Total</td><td>20</td></tr>
<tr><td>11</td><td>(a) form of energy // energy transfer from hot object to cold object
(b) 1) high velocity flows in narrow jet
2) produce low pressure in narrow jet
3) atmospheric pressure from outside air is higher, velocity of air is slower
4) <u>completely combustion</u> // mixture of gas and air enable gas to <u>burn completely</u></td><td>1
4</td></tr>
</table>

(c)

Characteristics	Reason
Bigger spoiler	More stable// bigger downward force
Aerofoil	Move faster // faster travel longer distance // speed increase
Wider tyres	Produce low pressure acts on road // more stable
Carbon fibre	Lighter // move faster
Y	Because bigger spoiler, aerofoil, wider tyres and carbon fibre

10

(d) (i) $t = 10 \times 60 = 600$ s — 1

$v = u + at$

$800 = 0 + 600\ a$ — 1

$a = 800/600$

$= 1.33\ ms^{-2}$ — 1

(ii) $F = ma$

$= 2000 \times 1.33$ — 1

$= 2670$ N // 2.67 kN // 2.67×10^3 N — 1

Total 20

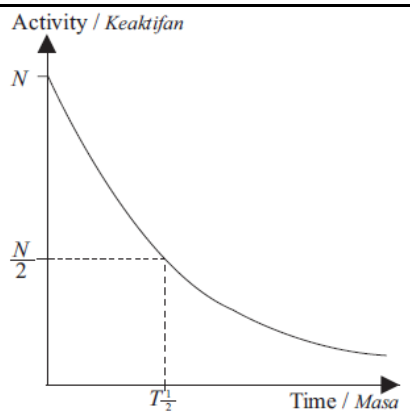
12

a) -unstable isotope — 1 1M

b)
-physical condition is solid — 1M
-easy to handle — 1M
-emits beta particle — 1M
-less dangerous — 1M
-moderate penetrating power — 1M
-can penetrate through the card and block by thicker card — 1M
-longer half-life — 1M
-can be used for longer time — 1M
- The best radioisotope is Y — 1M
- Because it is solid, emit beta, moderate penetrating power and has longer half-life — 1M 1 1 1

10

c)
- Radioisotope source is placed below the card. — 1M
- Geiger-Muller tube is placed vertically above the card. — 1M
- A high readings indicates that the card is thinner or low reading indicates the card is thicker. — 1M

		d)	 Mark 1 – correct label of axis Mark 2 – correct shape of graph (curved) Mark 3 – show N/2 at Y axis Mark 4 – show T½	4 1 1 1 1
		e)	100 à 50 à 25 à 12.5 3 t ½ = 3 x 4 = 12 days	1M 1M
			Total	20

SKEMA PEPERIKSAAN PERCUBAAN SPM
NEGERI MELAKA
PHYSICS PAPER 3
2012

1	(a)	(i)	Incidence angle // i	1
		(ii)	Refraction angle // r	1
		(iii)	Type of glass block // refractive index	1
	(b)			

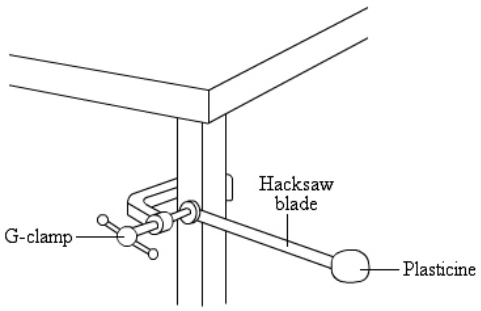
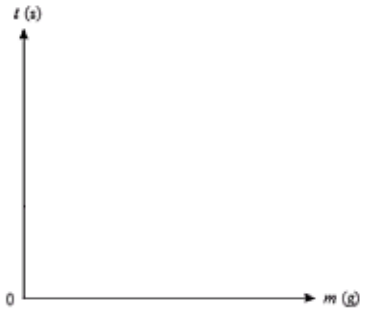
i (^{o})	r(^{o})	Sin i	Sin r
20	13	0.342	0.225
30	17	0.500	0.292
40	24	0.643	0.407
50	30	0.766	0.500
60	35	0.866	0.574
70	39	0.940	0.629

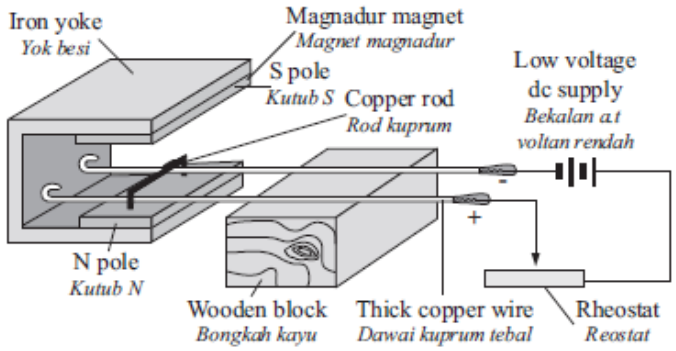
			1. label for all the quantities	1
			2. unit for i and r	1
			3. all value for r correct	2
			5 or 4 correct	1
			4. all value for sin i correct	1
			5. all value for sin r correct	1
			6. sin I and sin r consisten	1
				Total **7**
	(c)		1. sin i at axis-y and sin r at axis-x	√
			2 sin i and sin r without unit	√
			2. suitable scale – both axis start from zero	√
			3. all the values plotted correctly	√ √
			5 or 4 values plotted correctly	√
			4. best straight line 1	√
			5. size – min scale (10 x 8) cm	√
			7 ticks	5
			5-6 ticks	4
			3-4 ticks	3
			2 ticks	2
			1 tick	1
				Total **5**
	(d)		Sin i is directly proportional to sin r	1
				Total 16

2(a)(i)	x is directly proportional to $\frac{1}{a}$	1
(ii)	1. show on the graph	1
	2. $\frac{1}{a}$ = 3.2 m^{-1}	1
	3. a = 0.3125 m (with unit)	1

(iii)	1. Show the triangle (min: 4 x 4 of 2 cm) 2. Correct substitution : m = $\frac{1.1-0}{7-0}$ 3. m = 0.157 m^2 (with correct unit)	1 1 1
(b)	1. $\lambda D = ax$ 2. $\lambda(0.01) = 0.157\ m^2$ (correct substitution) 3. $\lambda = 15.7$ m (with correct unit)	1 1 1
(c)	(i) Repeat experiment and take the average reading (ii) The position of the eyes must be perpendicular to the scale of metre ruler.	1 1

Question 3		*Answer*	Marks
(a)		Inertia is affected by mass.	1
(b)		The larger the mass of the object is, the larger its inertia/period of oscillation	1
(c)	(i)	To investigate the relationship between the mass and its period of oscillation	1
	(ii)	Manipulated variable : Mass of plasticine. Responding variable : Period of oscillation of the hacksaw blade Constant variable : Length of the hacksaw blade.// Distance between plasticine and to where the blade is clamped//the stiffness of hacksaw blade	1 1

<table>
<tr><td></td><td>(iii)</td><td>List of appropriate apparatus and material
Plasticine, hacksaw blade, G-clamp, triple beam balance and stopwatch.</td><td>1</td></tr>
<tr><td></td><td>(iv)</td><td>Describing set up of the apparatus
 
</td><td></td></tr>
<tr><td></td><td>(v)</td><td>Stating the procedure of the experiment
1. A lump of plasticine with mass of 20 g is fixed at the end of the hacksaw blade.
2. The lump of plasticine is oscillated horizontally and the time taken for 10 oscillations is measured using a stopwatch.
3. The experiment is repeated with mass of plasticine, m = 40 g, 60 g, 80 g and 100 g.</td><td>1
1
1</td></tr>
<tr><td></td><td>(vi)</td><td>Tabulating data
<table>
<tr><th>Mass of plasticine, m (g)</th><th>Time for 10 oscillation</th></tr>
<tr><td>20</td><td></td></tr>
<tr><td>40</td><td></td></tr>
<tr><td>60</td><td></td></tr>
<tr><td>80</td><td></td></tr>
<tr><td>100</td><td></td></tr>
</table></td><td>1</td></tr>
<tr><td></td><td>(vii)</td><td>Analysing data
 
</td><td>1</td></tr>
</table>

4.	a)		Speed of the blade depends on the number of speed control of the fan	1
	b)		When the current is increased the distance of copper wire moved is increased	1
	c)	i)	To study the relationship between current, *I* and distance of copper wire pushed, *x*.	1
		ii)	Manipulated variable : current, I Responding variable : distance of wire pushed, x	1
			Fixed variable : stength of magnetic field	1
		iii)	Magnet bar, c shape iron yoke, bare copper wire, connecting wires, dc power supply, ammeter, meter rule.	1
		iv)	The list of apparatus and material.  	1
		v)	- set up the apparatus as shown above. - put the copper wire outside the iron yoke, turn on the switch - adjust the rheostat so that *I* = 0.1A. - put the copper wire between the yoke and measure the distance moved by the copper rod - repeat the experiment for I = 0.2A, 0.3A, 0.4A and 0.5A	1 1 1

<table>
<tr>
<td></td>
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<td>vi)</td>
<td>Tabulate data
<table>
<tr><th>Current,I/A</th><th>Distance of copper wire moved,x/cm</th></tr>
<tr><td>0.1</td><td></td></tr>
<tr><td>0.2</td><td></td></tr>
<tr><td>0.3</td><td></td></tr>
<tr><td>0.4</td><td></td></tr>
<tr><td>0.5</td><td></td></tr>
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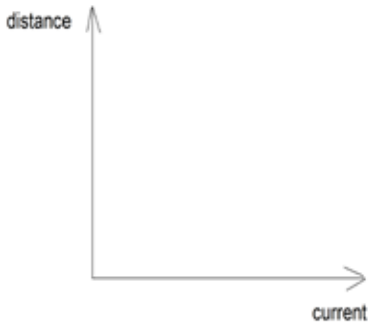
<td>vii)</td>
<td>Analyzing data.
Plot a graph of distance of copper wire moved against current
 
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