PEPERIKSAAN PERCUBAAN BERSAMA SIJIL PELAJARAN MALAYSIA 2011

ANJURAN
MAJLIS PENGETUA SEKOLAH MALAYSIA (MPSM)
CAWANGAN PERLIS

PHYSICS

Kertas 1

Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas soalan ini adalah dalam dwibahasa.*
2. *Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.*
3. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

Kertas soalan ini mengandungi **40** halaman bercetak

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 graviti* $= mgh$
8. Elastic potential energy / *Tenaga keupayaan kenyal* $= \frac{1}{2}Fx$
9. $\rho = \frac{m}{V}$
10. Pressure / *Tekanan*, $p = h\rho g$
11. Pressure / *Tekanan*, $p = \frac{F}{A}$
12. Heat / *Haba*, $Q = mc\theta$
13. Heat / *Haba*, $Q = ml$
14. $\frac{pV}{T} =$ constant / *pemalar*
15. $E = mc^2$
16. $v = f\lambda$
17. Power, $P = \frac{\text{energy}}{\text{time}}$ *Kuasa*, $P = \frac{tenaga}{masa}$
18. $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$
19. $\lambda = \frac{ax}{D}$
20. $n = \frac{\sin i}{\sin r}$
21. $n = \frac{\text{real depth}}{\text{apparent depth}}$ $n = \frac{dalam\ nyata}{dalam\ ketara}$
22. $Q = It$
23. $V = IR$
24. Power / *Kuasa*, $P = IV$
25. $\frac{N_S}{N_P} = \frac{V_S}{V_P}$
26. Efficiency / *Kecekapan* $= \frac{I_S V_s}{I_P V_p} \times 100\%$
27. $g = 10\ \text{ms}^{-2}$
28. $c = 3.0 \times 10^8\ \text{m s}^{-1}$

1 Which of the following power factor and its prefix is correct?
Antara berikut pasangan faktor kuasa dan imbuhan yang manakah benar?

	Power factor **Faktor kuasa**	**Prefix** **Imbuhan**
A	10^{6}	Mega *Mega*
B	10^{-3}	centi *senti*
C	10^{-2}	hecto *hekto*
D	10^{-9}	deca *deka*

2 The Perlis FM channel broadcasts radio waves at a frequency of 102.9 MHz. What is the frequency of the radio wave in Hz?
Gelombang radio Perlis FM bersiaran pada frekuensi 102.9 MHz. *Apakah frekuensi gelombang radio dalam* Hz*?*

A 1.029×10^{6}

B 1.029×10^{8}

C 1.029×10^{4}

D 1.029×10^{9}

3 Diagram 1 show a micrometer screw gauge used to measure the diameter of a glass rod.

Rajah 1 *menunjukkan satu tolok skru mikrometer digunakan untuk mengukur diameter sebatang rod kaca.*

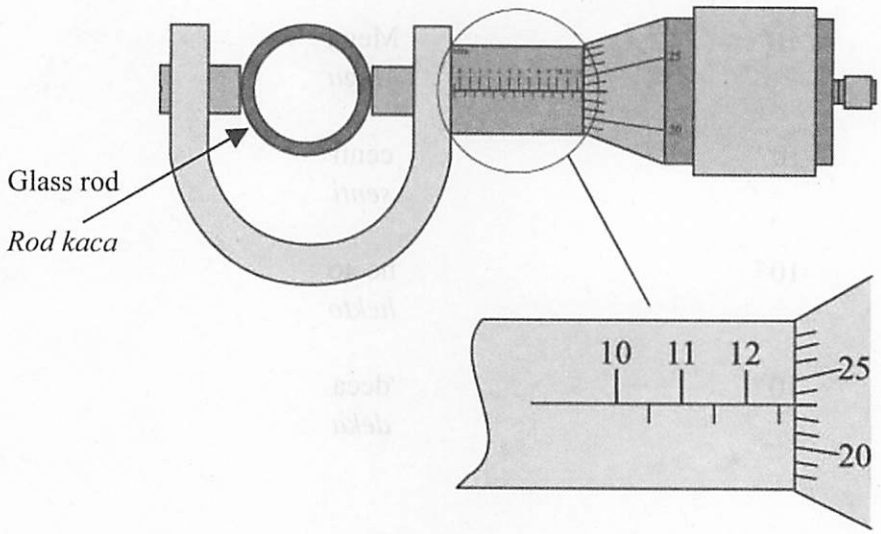


Diagram 1/*Rajah* 1

What is the diameter of the glass rod?

Berapakah diameter rod kaca?

A 12.25 mm

B 12.23 mm

C 12.73 mm

D 12.75 mm

4 Diagram 2 shows one trolley moving down on a track.
Rajah 2 menunjukkan sebuah troli menuruni landasan.

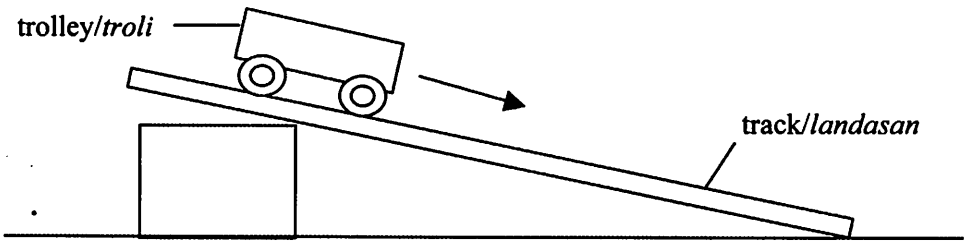


Diagram 2/*Rajah* 2

How can we reduce the acceleration of the trolley?
Bagaimanakah caranya mengurangkan pecutan troli?

A Use a longer track
Gunakan landasan yang lebih panjang

B Increase the number of trolley
Tambahkan bilangan troli

C Decrease the gradient of the track
Kurangkan kecerunan landasan

D Use a smoother track
Gunakan landasan yang licin

5 Diagram 3 shows the velocity-time graph of the moving object.
Rajah 3 menunjukkan graf halaju-masa bagi pergerakan suatu objek

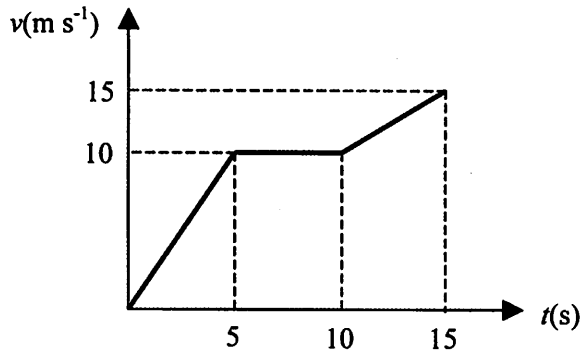
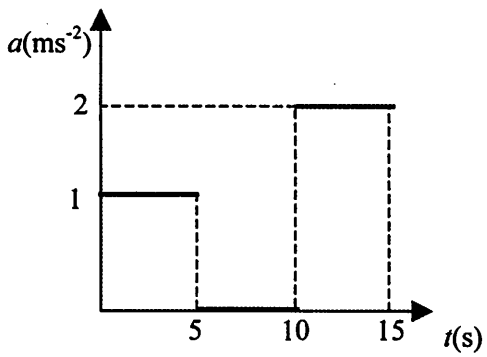


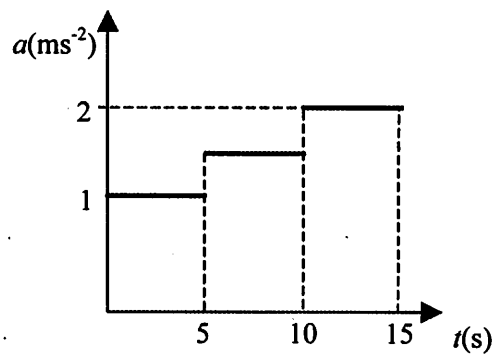
Diagram 3/*Rajah* 3

Which graph shows the correct relationship between acceleration, a of a moving object with time, t?
Graf yang manakah menunjukkan hubungan antara pecutan, a bagi pergerakan objek dengan masa, t?

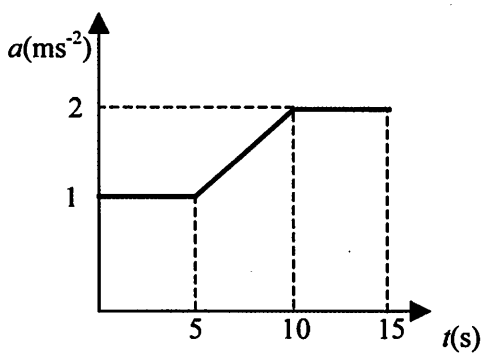
A



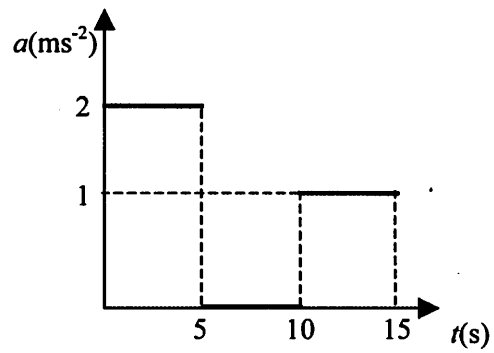
B



C



D



6 Which statement is **correct** about inertia?
*Pernyataan yang manakah yang **betul** mengenai inersia ?*

A Inertia depends on the size of an object
Inersia bergantung kepada saiz objek

B Inertia of the same object is greater on earth compare to its inertia on the moon.
Inersia objek yang sama lebih besar di bumi berbanding dengan di bulan.

C Object with small mass is easier to move.
Objek yang berjisim kecil senang untuk digerakkan.

D Object that easy to move is difficult to stop
Objek yang senang digerakkan, sukar untuk dihentikan.

7 Diagram 4 shows 2 kg block move with acceleration of 4 m s^{-2}, when it is pulled by 10 N force on a rough surface.
Rajah 4 menunjukkan bongkah 2 kg bergerak dengan pecutan 4 m s^{-2} bila ditarik dengan daya 10 N di atas permukaan kasar.

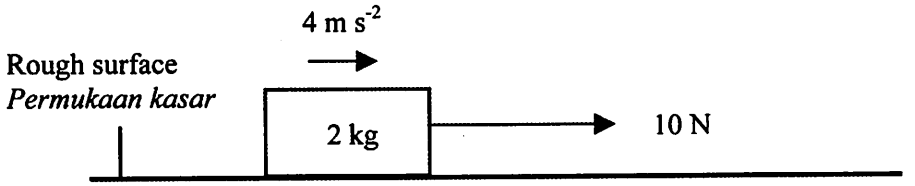


Diagram 4/*Rajah 4*

What is the acceleration of the block, when its pulled by 6 N force?
Berapakah pecutan bongkah bila ditarik dengan daya 6 N?

A 0 m s^{-2}

B 1 m s^{-2}

C 2 m s^{-2}

D 3 m s^{-2}

8 Two eggs were released from the same height, one to the hard surface and another one to the soft surface. Which of physical quantity is the same in both situations?
Dua biji telur dilepaskan dari ketinggian yang sama, satu ke atas permukaan keras dan satu lagi ke atas permukaan lembut. Manakah kuantiti fizikal yang sama dalam kedua-dua situasi?

A Impulse
Impuls

B Impulsive force
Daya impuls

C Time impact
Masa pelanggaran

9 Which of the physical quantity below depends on gravitational force?
Mana di antara kuantiti di bawah bergantung kepada daya tarikan graviti?

A Temperature
Suhu

B Pressure in liquid
Tekanan cecair

C Gas Pressure
Tekanan gas

D Inertia
Inersia

10 Diagram 5 shows an object hanging by two ropes. The tension of both ropes is 5 N.
Rajah 5 menunjukkan objek digantung menggunakan dua tali. Ketegangan kedua-dua tali ialah 5 N.

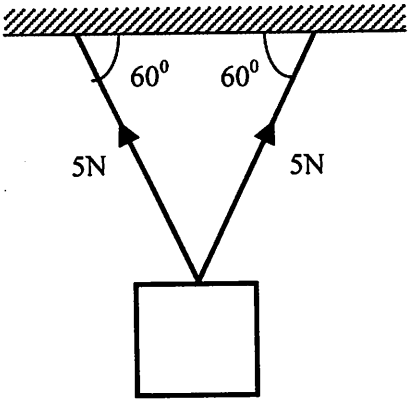


Diagram 5/*Rajah* 5

If one of the ropes have been cut, what is the tension of the other rope?
Jika salah satu tali telah dipotong, berapa ketegangan tali yang satu lagi?

A 4.33 N

B 5.00 N

C 7.50 N

D 8.66 N

11 Efficiency of an electric motor increases, when
Kecekapan motor elektrik bertambah apabila

A Output power increases
Kuasa output bertambah

B Input power increases
Kuasa input bertambah

C Both input power and output power increases.
Kedua-dua kuasa input dan kuasa output bertambah

D Both input power and output power decreases.
Kedua-dua kuasa input dan kuasa output berkurangan

12 Diagram 6 shows two identical bricks X and Y placed with two different ways on a sandy ground.
Rajah 6 menunjukkan dua ketul bata yang serupa X dan Y diletakkan dengan dua cara yang berbeza di atas tanah berpasir.

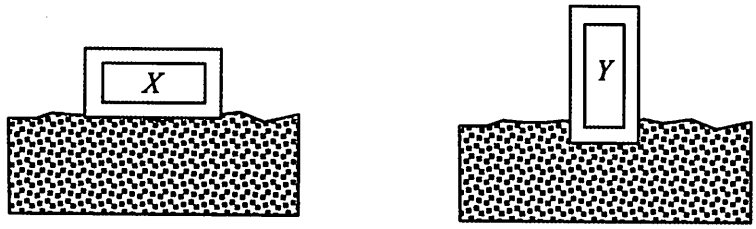


Diagram 6/*Rajah* 6

What is the factor that causes brick Y to sink more into the sand?
Apakah faktor yang menyebabkan Y tenggelam lebih dalam di dalam pasir?

A Weight
Berat

B Pressure
Tekanan

C Force
Daya

D Density
Ketumpatan

13 Figure 7 shows a school bag.
Rajah 7 menunjukkan sebuah beg sekolah

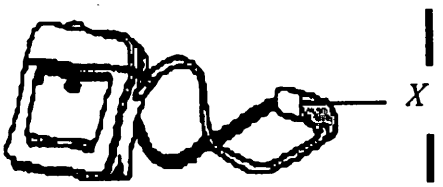


Diagram 7/*Rajah 7*

What is the function of X ?
Apakah fungsi X?

A To increase weight and to increase pressure
Untuk menambahkan berat dan menambahkan tekanan

B To increase surface area and to decrease pressure
Untuk menambahkan luas permukaan dan mengurangkan tekanan

C To decrease weight and to decrease pressure
Untuk mengurangkan berat dan mengurangkan tekanan

D To decrease surface area and to increase weight
Untuk mengurangkan luas permukaan dan menambahkan berat

14 Diagram 8.1 and diagram 8.2 show a fisherman when he is at sea and in the river.
Rajah 8.1 *dan Rajah* 8.2 *menunjukkan seorang nelayan ketika beliau berada di laut dan di sungai.*

At sea

Diagram 8.1/*Rajah* 8.1

In the river

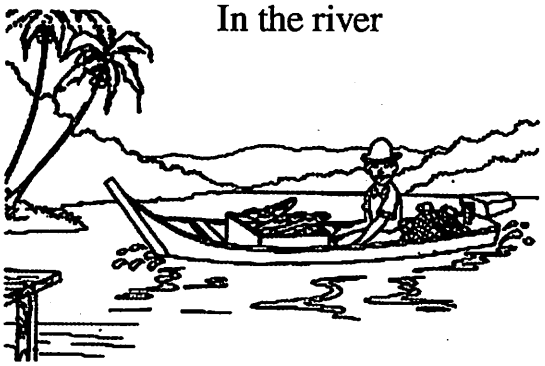


Diagram 8.2/*Rajah* 8.2

Which of the following is TRUE?
Antara berikut yang manakah BENAR?

A The buoyant force acting on Diagram 8.1 is more than in Diagram 8.2.
Daya julangan yang bertindak dalam Rajah 8.1 *lebih daripada dalam Rajah* 8.2

B The water level of boat Diagram 8.1 equal to that in Diagram 8.2
Paras permukaan air pada bot dalam Rajah 8.1 *sama dengan Rajah* 8.2

C The physics principle that explains the above situation is Pascal's Principle
Prinsip fizik yang menerangkan situasi di atas ialah Prinsip Pascal

D The volume of water displaced by the boat in Diagram 8.1 is less than in Diagram 8.2.
Isipadu air yang disesarkan oleh bot dalam Rajah 8.1 *kurang daripada Rajah* 8.2

15 Diagram 9 shows a cylinder containing water.
Rajah 9 menunjukkan satu silinder yang mengandungi air.

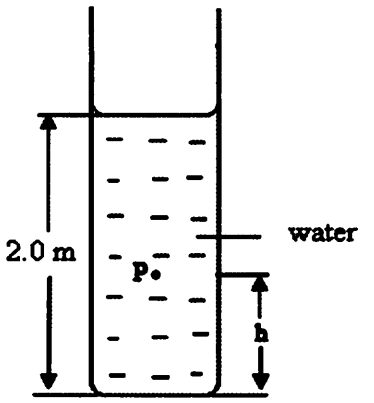


Diagram 9/*Rajah* 9

If the height of h is 0.8 m, Calculate the pressure at point P?
Jika tinggi h ialah 0.8 *m, hitung tekanan pada titik P?*

[the density of the water = 1000 kg m^{-3}]
[*Ketumpatan air* = 1000 kg m^{-3}]

A 10 000 N m^{-2}

B 12 000 N m^{-2}

C 11 500 N m^{-2}

D 12 500 N m^{-2}

16 Diagram 10 shows a application of Pascal's Principle.
Rajah 10 *menunjukkan aplikasi berdasarkan Prinsip Pascal.*

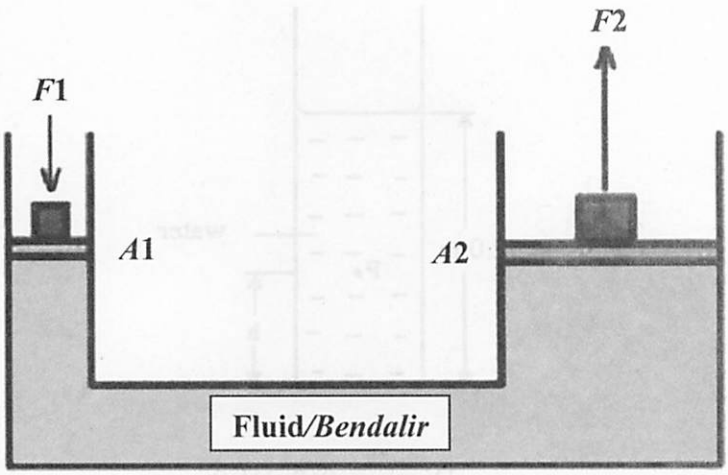


Diagram 10/*Rajah* 10

Which of the following equation shows the right relationship between ***F1, F2, A1*** and ***A2***?
Manakah di antara persamaan berikut menunjukkan hubungan yang betul bagi ***F1, F2, A1*** *dan* ***A2****?*

A $\frac{F1}{A1} = \frac{F2}{A2}$

B $F1(A1) = F2\ (A2)$

C $\frac{F2}{F1} = \frac{A1}{A2}$

D $\frac{A2}{F1} = \frac{F1}{F2}$

17 Diagram 11 shows a card and a glass of water.
Rajah 11 *menunjukkan kad dan segelas air.*

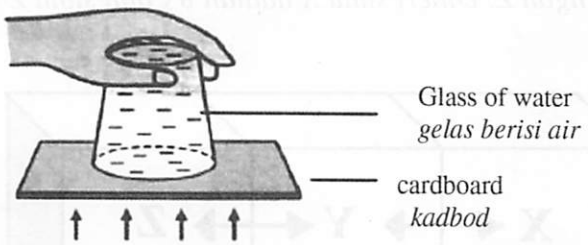


Diagram 11/*Rajah* 11

When the hand is released, water does not flow out from the glass. What is physic concept involved in the above situation?
Apabila tangan dialihkan, air tidak mengalir keluar daripada gelas. Apakah konsep fizik yang terlibat dalam situasi di atas?

A Liquid pressure
Tekanan cecair

B Atmospheric pressure
Tekanan atmosfera

C Gas pressure
Tekanan gas

D Boyle Laws
Hukum Boyle

18 In Diagram 12, *X* is in thermal equilibrium with *Y* and *Y* is in thermal equilibrium with Z. Given the temperature of X is θ_X and the temperature of *Z* is θ_Z,
Dalam Rajah 12 , *X adalah dalam keseimbangan terma dengan Y dan Y adalah dalam keseimbangan terma dengan Z. Diberi suhu X adalah* θ_X *dan suhu Z adalah* θ_Z

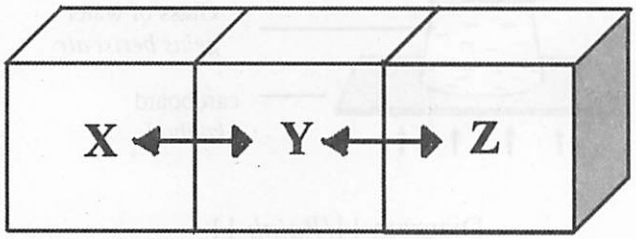


Diagram 12 / *Rajah* 12

Which of the following statements is correct?
Pernyataan berikut yang manakah adalah benar?

A $\theta_X = \theta_Z$

B $\theta_X > \theta_Z$

C $\theta_X < \theta_Z$

19 The specific heat capacity of copper is higher than lead. When heat is supplied at the same rate to two identical blocks of same mass, which of the following happens?
Muatan haba tentu kuprum adalah lebih tinggi daripada plumbum. Apabila kadar haba yang dibekalkan adalah sama pada kedua-dua blok yang mempunyai jisim yang sama, manakah antara berikut berlaku?

A The lead block will get heated up faster
Blok plumbum akan lebih cepat panas

B The lead block will expand faster than copper
Blok plumbum akan mengembang lebih cepat berbanding kuprum

C The copper block will expand faster than lead block
Blok kuprum akan mengembang lebih cepat berbanding plumbum

D The rate of temperature rise in the copper block is higher
Kadar kenaikan suhu dalam blok kuprum adalah tinggi

20 Calculate the heat energy required to raise the temperature of 2 kg of copper by 10°C?
Hitung tenaga haba yang diperlukan untuk menaikkan suhu 2 kg *kuprum sebanyak* 10°C*?*

The specific heat capacity of copper is 900 J $kg^{-1}°C^{-1}$.
Muatan haba tentu bagi copper ialah 900 J $kg^{-1}°C^{-1}$.

A 90 J

B 1800 J

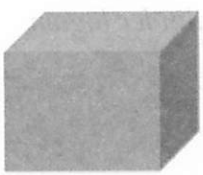
C 900 J

D 18000 J

21 Four metal blocks of same mass with their respective specific heat capacity. Same amount of heat is given to each block. Which of the following block will show the highest temperature?

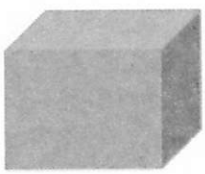
Empat blok logam yang sama jisim dengan muatan haba tentu yang berbeza. Sejumlah haba yang sama dibekalkan kepada setiap blok. Yang manakah antara blok tersebut akan menunjukkan suhu yang paling tinggi?

A



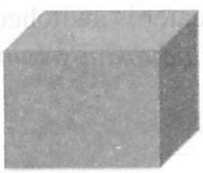
130 Jkg^{-1} $°C^{-1}$

B



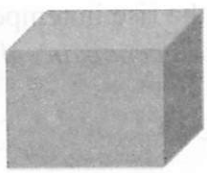
400 Jkg^{-1} $°C^{-1}$

C



900 Jkg^{-1} $°C^{-1}$

D



1200 Jkg^{-1} $°C^{-1}$

22 The scalding on the skin caused by steam is more serious than the scalding caused by boiling water because
Kelecuran kulit yang disebabkan oleh stim lebih serius daripada kelecuran kulit yang disebabkan oleh air mendidih sebab

A steam has a higher temperature than boiling water
stim mempunyai suhu yang lebih tinggi daripada air mendidih

B steam has a higher heat content than boiling water
stim mengandungi lebih banyak haba daripada air mendidih

C Specific latent heat of vaporization is higher than specific heat capacity of water
Haba pendam tentu pengewapan lebih besar dari muatan haba tentu air.

23 Diagram 13 shows a metal cylinder of mass 2.0 kg and specific heat capacity 1200 J kg^{-1} $°C^{-1}$ is heated with a heater of power 1 kW.
Rajah 13 *menunjukkan satu silinder logam yang berjisim* 2.0 *kg dan muatan haba tentu* 1200 J kg^{-1} $°C^{-1}$ *dipanaskan dengan pemanas yang berkuasa* 1 kW.

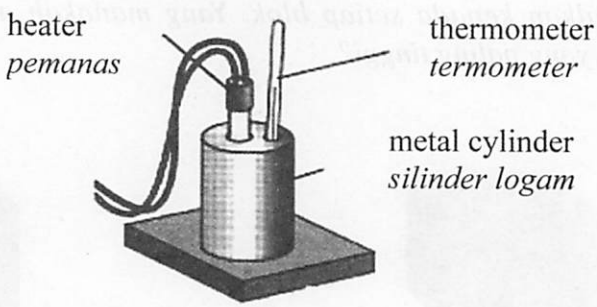


Diagram 13/*Rajah* 13

What is the rise in temperature of the cylinder if the heater is switched on for 2 minutes?
Berapakah kenaikan suhu silinder itu jika pemanas dihidupkan selama 2 *minit ?*

A 2° C

B 5° C

C 20° C

D 50° C

24 Diagram 14 shows the position of a man and a plane mirror.

Rajah 14 menunjukkan kedudukan seorang lelaki dan cermin satah.

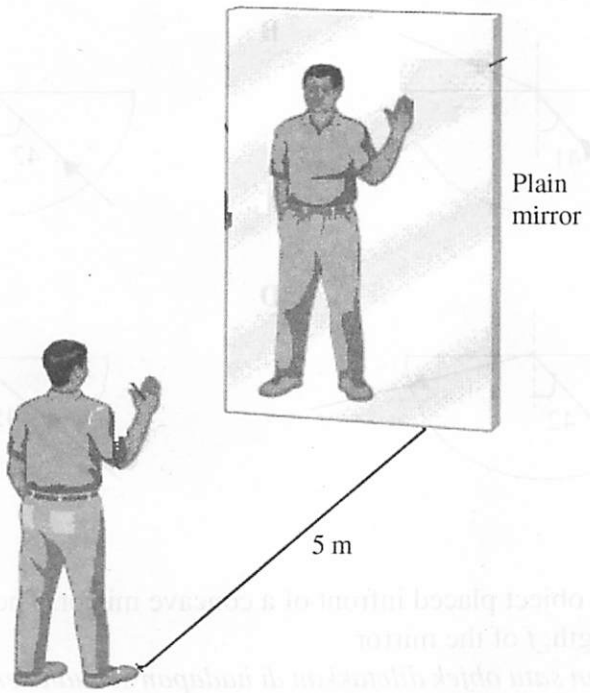


Diagram 14/*Rajah* 14

The man moves 1 m towards the mirror. Calculate the distance between the man and his image

Lelaki iu bergerak 1 m ke arah cermin. Hitung jarak di antara lelaki itu dan imejnya

A 4 m

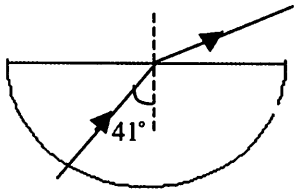
B 8 m

C 10 m

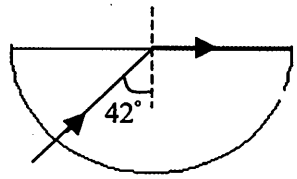
D 12 m

25 The critical angle of a semicircular glass block is 42°. Which diagram shows the total internal reflection?
Sudut genting bagi suatu bongkah kaca semibulatan ialah 42°. *Rajah manakah yang menunjukkan pantulan dalam penuh.*

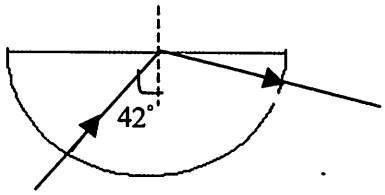
A



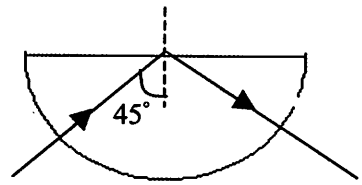
B



C



D



26 Diagram 15 shows an object placed infront of a concave mirror. The distance of the object is less than the focal length, *f* of the mirror
Rajah 15 *menunjukkan satu objek diletakkan di hadapan sebuah cermin cekung. Jarak objek itu adalah kurang daripada panjang focus f, cermin itu.*

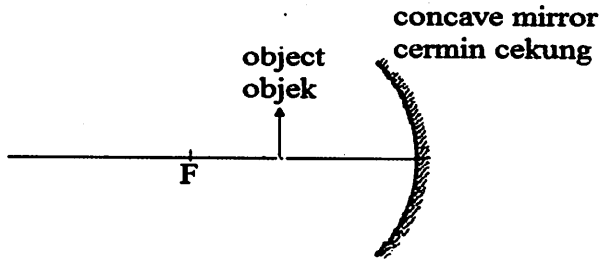


Diagram 15/*Rajah* 15

What are the characteristics of the image formed?
Apakah sifat imej imej yang terbentuk?

A Real, upright, bigger than object
Nyata, tegak, lebih besar daripada objek

B Real, inverted, smaller than object
Nyata, songsang, lebih kecil daripada objek

C Virtual, upright, bigger than object
Maya, tegak, lebih besar daripada objek

D Virtual, inverted, smaller than object
Maya, songsang, lebih kecil daripada objek

27 Diagram 16 shows a ray of light travelling from substance X to air.
Rajah 16 *menunjukkan satu sinar ditujukan dari bahan X ke udara.*

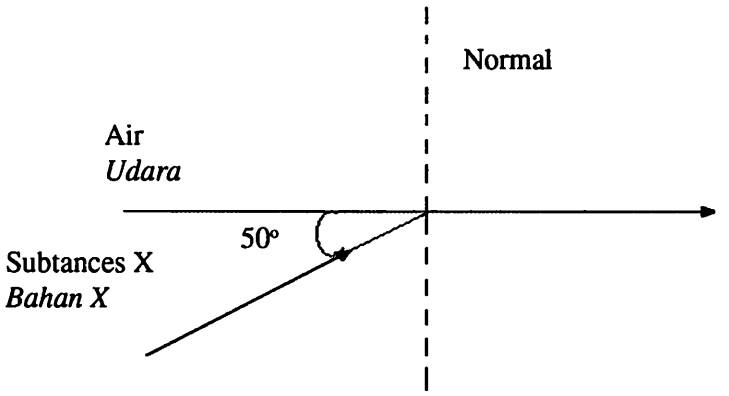


Diagram 16/*Rajah* 16

Calculate the refractive index of substance X
Hitungkan indeks pembiasan bagi bahan X

A 0.77

B 1.00

C 1.31

D 1.56

28 Diagram 17 shows a ray diagram
Rajah 17 menunjukkan satu rajah sinar

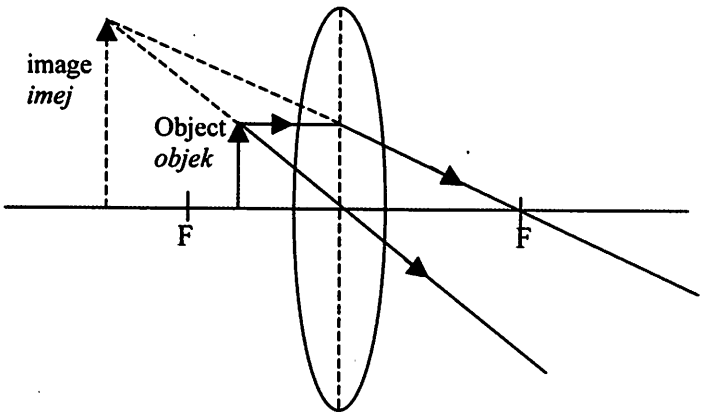


Diagram 17/*Rajah* 17

This is a ray diagram of a
Ini ialah sebuah rajah sinar bagi

A Phostostat machine
Mesin fofostat

B Projector
Projektor

C Magnifying glass
Kanta pembesar

D Telescope
Teleskop

29 Which of the following characteristic of waves will **not** change when the waves are move from deep water to shallow water
*Antara ciri gelombang berikut, yang manakah **tidak** akan berubah apabila gelombang merambat dari kawasan dalam ke kawasan cetek*

A Direction of propagation
Arah perambatan

B Frequency
Frekuensi

C Wavelength
Panjang gelombang

D Speed
Laju

30 Which of the following statements is **false** about electromagnetic waves
*Antara pernyataan berikut, yang manakah **tidak** benar mengenai gelombang electromagnet.*

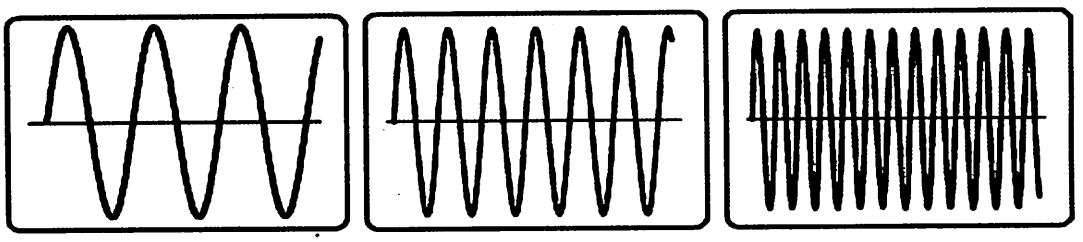
A They are tranverse waves
Gelombang melintang

B They did not need medium to travel
Gelombang yang tidak memerlukan medium untuk merambat

C They have both magnetic fields and electric fields
Terdiri daripada kedua-dua medan magnet dan medan elektrik

D The velocity of the waves is influenced by the wavelength
Halaju gelombang dipengaruhi oleh panjang gelombang

31 Diagrams 18 shows sound waves from a piano.
Rajah 18 *menunjukkan gelombang bunyi yang dihasilkan oleh piano*



X *Y* *Z*

Diagram 18/*Rajah* 18

Which of the following statements is **true**?
Manakah antara pernyataan berikut adalah ***benar****?*

A *X* has a higher pitch than *Y*
X lebih langsing daripada Y

B *Y* has a higher pitch than *Z*
Y lebih langsing daripada Z

C *Z* has the highest pitch
Z paling langsing

D *X*, *Y* and *Z* have the same pitch
X, Y, dan Z mempunyai kelangsingan yang sama

32 Diagram 19 shows a wave
Rajah 19 *menunjukkan satu gelombang*

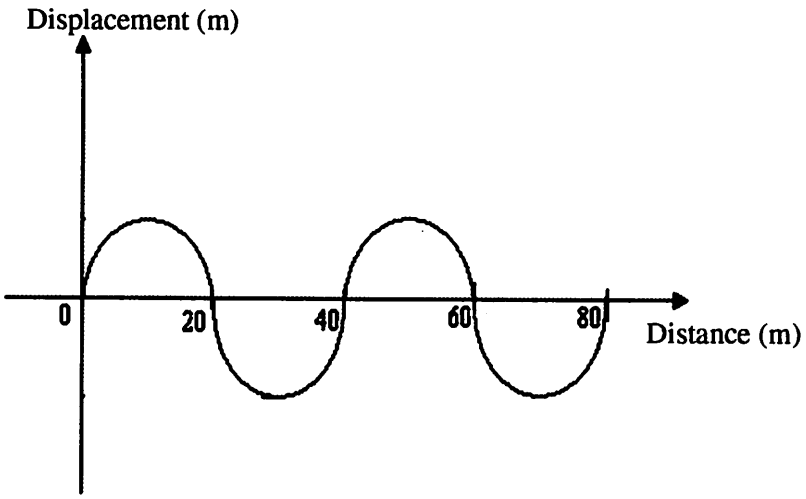


Diagram 19/*Rajah* 19

The speed of the wave is 10 m s^{-1}. What is the frequency of the wave.
Laju gelombang itu ialah 10 m s^{-1}. *Berapakah frekuensi gelombang itu.*

A 0.25 Hz

B 0.50 Hz

C 0.75 Hz

D 1.00 Hz

33 Diagram 20 shows a blue light source connected to power supply. After the light passes through Young's double-slit, red and dark fringes are observed on the screen.
Rajah 20 menunjukkan satu sumber cahaya merah disambungkan kepada bekalan kuasa. Selepas melalui dwicelah Young, pinggir-pingir merah dan gelap terbentuk pada skrin

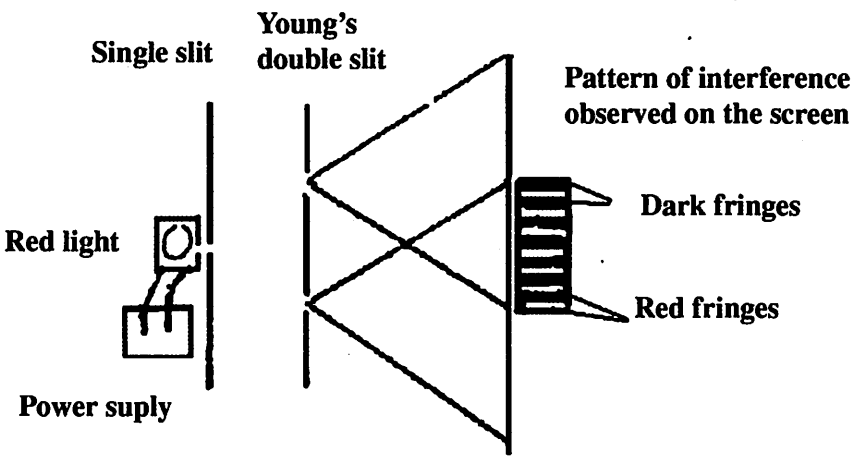


Diagram 20/*Rajah* 20

What will be observed if the red light source is replace by the blue light source?
Apakah yang akan diperhatikan jika cahaya merah digantikan dengan cahaya biru?

A Distances between fringes increases
Jarak antara pinggir akan meningkat

B Distance between fringes decreases
Jarak antara pinggir akan berkurang

C Number of fringes decreases
Bilangan pinggir akan berkurang

34 Diagram 21 shows an ultrasonic wave that is transitted by the fathometer in a ship. The wave is reflected at the seabed and is received by the receiver in the ship after 0.6 s.

Rajah 21 menunjukkan gelombang ultrasonic yang dipancarkan oleh alat fathometer sebuah kapal. Gelombang itu dipantulkan oleh dasar laut dan dikesan oleh alat penerima pada kapal selepas 0.6 s.

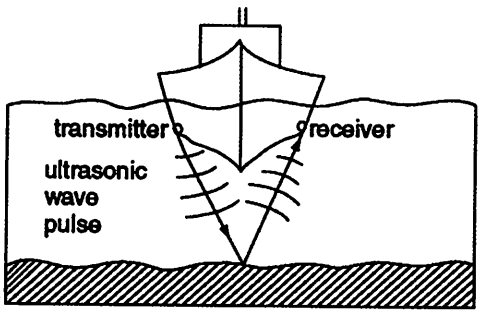


Diagram 21/*Rajah* 21

What is the depth of the sea if the speed of the ultrasonic wave in the water is 1500 m s^{-1}?
Apakah kedalaman laut jika diberi laju gelombang ultrasonic dalam air adalah 1500 m s^{-1}*?*

A 400 m

B 450 m

C 500 m

D 550 m

35 What is the name of the particles that carry charges in a metal wire?
Apakah nama zarah yang membawa cas di dalam wayar logam?

A Electron
Elektron

B Proton
Proton

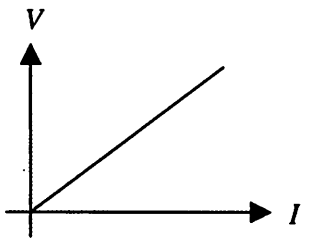
C Atom
Atom

D Neutron
Neutron

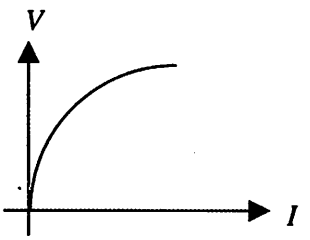
36 Which of the following graphs shows the relationship between the potential difference, *V*, and the current, *I*, for a conductor that obeys Ohm's Law?

Yang manakah antara graf berikut menunjukkan hubungan antara beza upaya, V, dengan arus, I, untuk pengalir yang mematuhi Hukum Ohm?

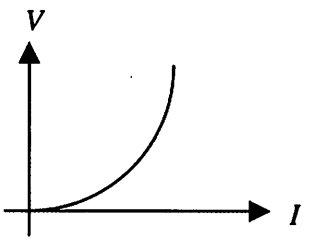
A



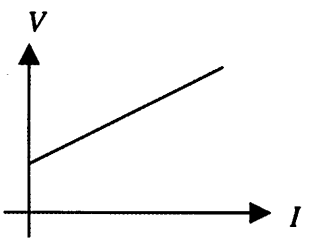
B



C



D



37 Diagram 22 shows a series of resistors connected to dry cells.
Rajah 22 menunjukkan beberapa buah perintang yang disambungkan ke sel kering.

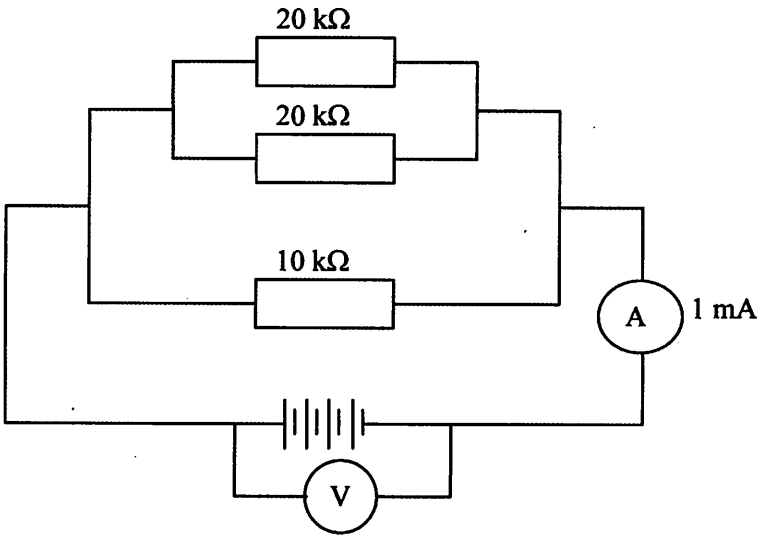


Diagram 22/*Rajah* 22

What is the reading of the voltmeter?
Apakah bacaan voltmeter tersebut?

A 2 V

B 3 V

C 4 V

D 5 V

38 Which of these statements **does not** show ways of increasing energy efficiency at home?
*Manakah antara berikut **tidak** menunjukkan cara-cara untuk meningkatkan kecekapan penggunaan tenaga di rumah?*

A Replace regular light bulb with filament with compact fluorescent light bulbs.
Gantikan mentol berfilamen dengan mentol berfloresen.

B Replaced or clean the filters of air conditioner monthly.
Ganti atau cuci penapis alat penghawa dingin setiap bulan.

C Run your washing machine at minimum load.
Jalankan mesin basuh pada muatan minimum.

D Choose a low energy rating label when buying electrical appliances.
Pilih label berjulat tenaga rendah apabila membeli peralatan elektrik.

39 Diagram 23 shows circuits I, II, III and IV nails being used to study suitable materials for making core of an electromagnet.
Rajah 23 *menunjukkan litar* I, II, III *dan* IV *paku digunakan untuk menguji bahan yang sesuai sebagai teras elektromagnet*

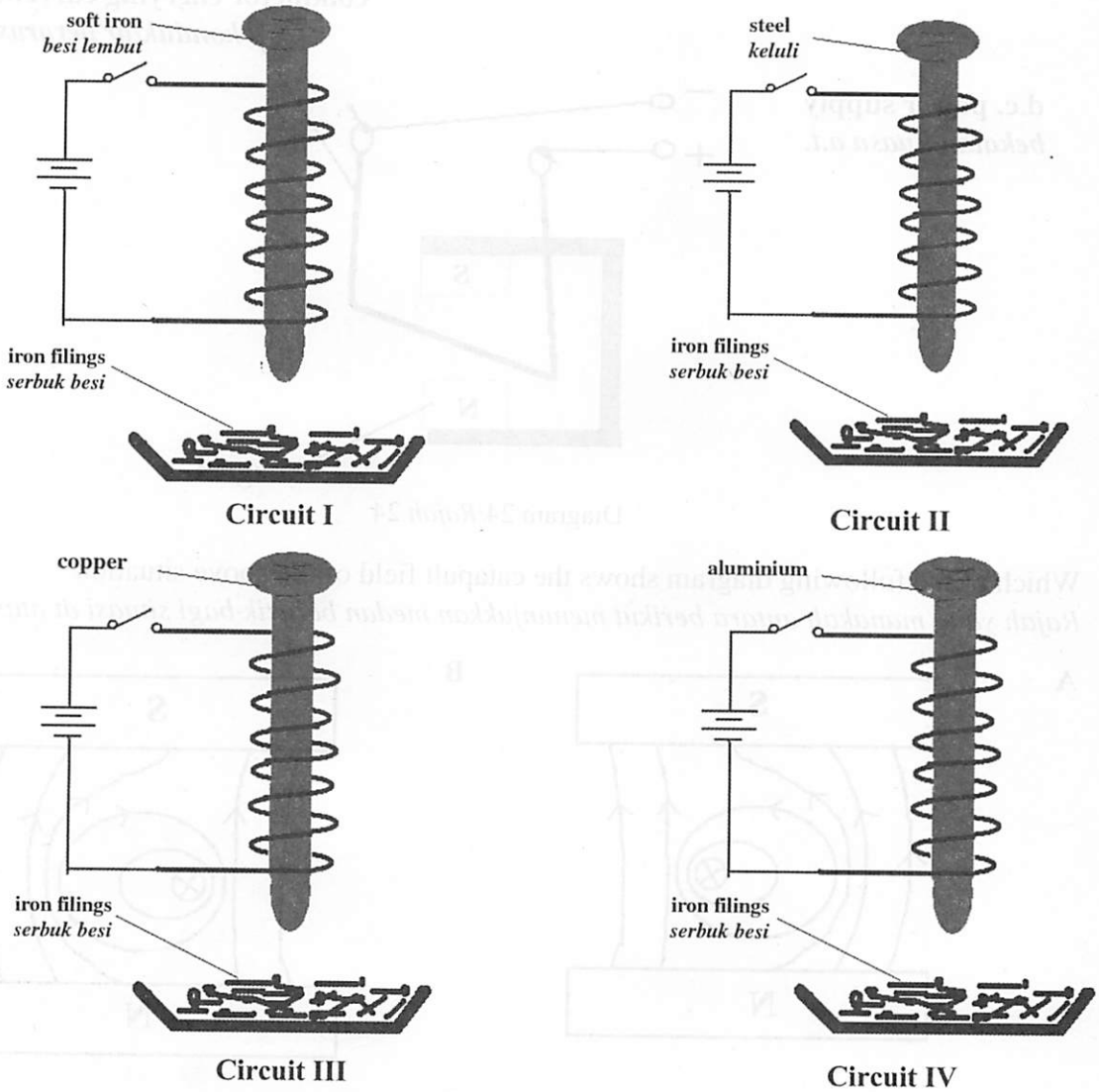


Diagram 23/*Rajah* 23

Which of the following circuits will attract iron filings to the nail when the circuit is closed.
Litar yang manakah antara berikut akan menyebabkan serbut besi tertarik kepada paku jika litar ditutup

A I
B I and II
C I, III and IV
D III and IV

40 Diagram 24 shows a current carrying conductor in a magnetic field
Rajah 24 menunjukkan konduktor berarus dalam medan magnet

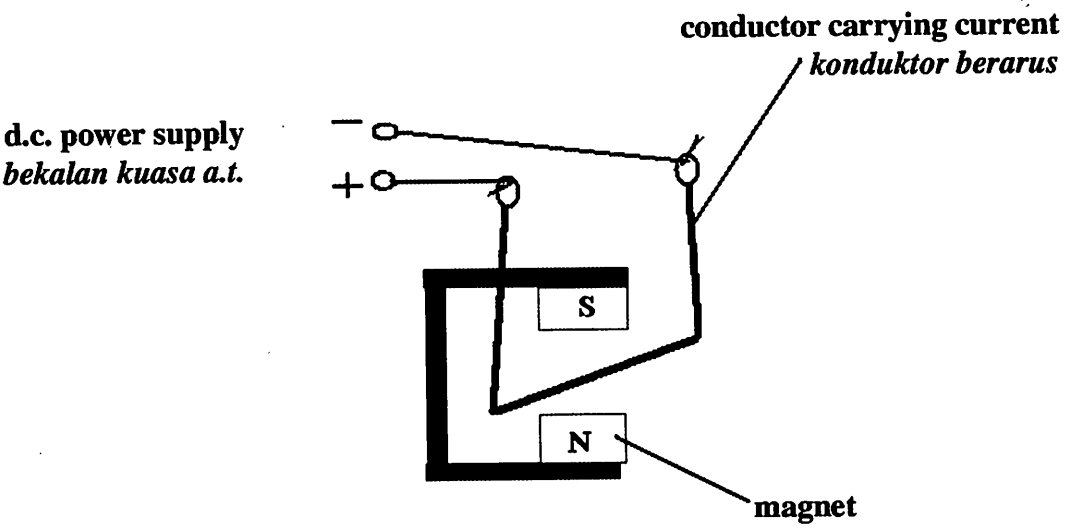
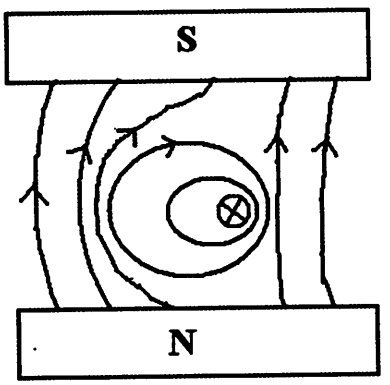


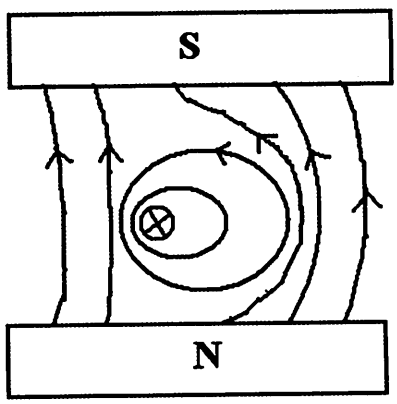
Diagram 24/*Rajah* 24

Which of the following diagram shows the catapult field of the above situation
Rajah yang manakah antara berikut menunjukkan medan balistik bagi situasi di atas

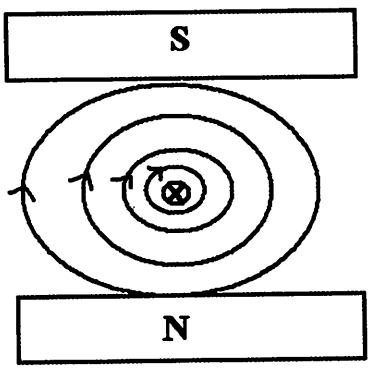
A



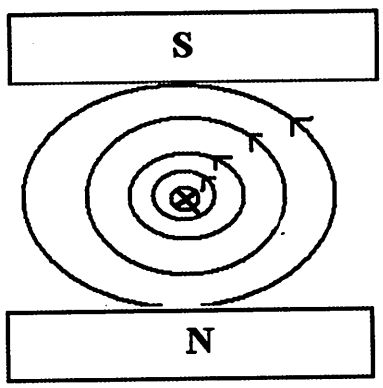
B



C



D



41 A transformer loses some heat energy to the surrounding when it is being used. The number of turns in the primary coil is greater than the number of turns in secondary coil.

Sebuah transformer kehilangan tenaga haba ke persekitaran semasa sedang digunakan. Bilangan lilitan primer lebih banyak daripada bilangan lilitan sekunder.

Which of the following the transformer is as stated.
Yang manakah antara berikut adalah transformer tersebut.

A Ideal transformer
Transformer unggul

B Step-up transformer
Transformer injak naik

C Step-down transformer
Transformer injak turun

42 Thermionic emission is a process which
Pemancaran termionik merupakan proses yang

A accelerates the electrons from cathode to anode
memecutkan electron dari katod ke anod

B releases electrons from hot metal surface
melepaskan electron daripada permukaan logam panas

C deflects the beam of electrons by the deflection plates
memesongkan sinar electron melalui plat pesongan

D produces light when the electron strikes the fluorescent screen
menghasilkan cahaya apabila electron menuju ke skrin fluorescent

43 Diagram 25 shows a bar magnet on a light trolley moving into a coil *PQ*.
Rajah 25 menunjukkan sebuah magnet bar bergerak ke arah gelung PQ.

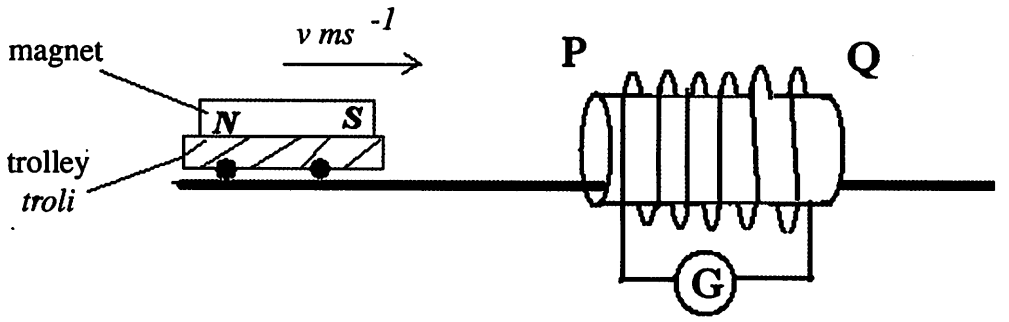


Diagram 25/ *Rajah* 25

Which of the following statement is true.
Yang manakah antara berikut adalah benar.

	Speed of trolley as it approaches P ***Kelajuan troli semasa menghampiri P***	**Polarity of pole P as trolley approaches coil** ***Kutub P semasa troli menghampiri gelung***	**Polarity of pole Q as trolley leaves the coil** ***Kutub Q semasa troli menjauhi gelung***
A	decreases *berkurangan*	becomes South pole *menjadi Kutub Selatan*	becomes South pole *menjadi Kutub Selatan*
B	increases *bertambah*	becomes North pole *menjadi Kutub Utara*	becomes South pole *menjadi Kutub Selatan*
C	No change *Tidak berubah*	becomes North pole *menjadi Kutub Utara*	becomes South pole *menjadi Kutub Selatan*
D	No change *Tidak berubah*	becomes South pole *menjadi Kutub Selatan*	becomes North pole *menjadi Kutub Utara*

44 Diagram 26 shows a circuit consisting of a diode and a bulb. When the switch is on, the bulb does not light up.
Rajah 26 menunjukkan satu litar yang terdiri daripada diod dan mentol. Apabila suis dibuka, mentol tidak menyala.

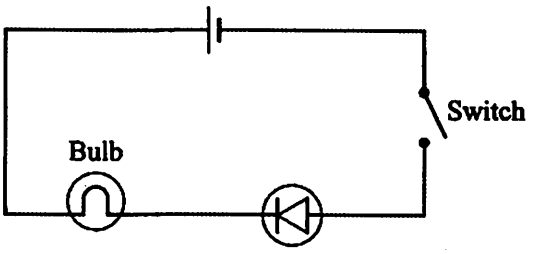


Diagram 26/*Rajah 26*

What should be done so that the bulb will light up?
Apakah yang patut dilakukan supaya mentol itu menyala?

A use a new bulb
menggunakan mentol baru

B increases the number of dry cells
menambahkan bilangan sel kering

C reverse the connection of the dry cells
songsangkan sambungan pada sel kering

D connect a resistor in series with the bulb
menyambung perintang secara bersiri dengan mentol

45 Diagram 27 is the symbol of a transistor
Rajah 27 adalah symbol kepada transistor

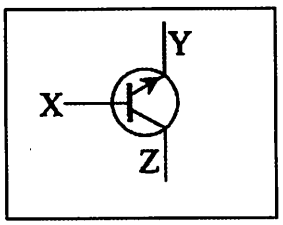


Diagram 27/*Rajah* 27

Which of the following identify the terminals X, Y and Z?
Manakah antara berikut menunjukkan terminal X, Y *dan* Z*?*

	X	Y	Z
A	Base *Tapak*	Collector *Pengumpul*	Emitter *Pengeluar*
B	Collectorl *Pengumpu*	Emitter *Pengeluar*	Base *Tapak*
C	Emitter *Pengeluar*	Base *Tapak*	Collector *Pengumpul*
D	Base *Tapak*	Emitter *Pengeluar*	Collector *Pengumpul*

46 Diagram 28 shows a combination of two logic gates.
Rajah 28 menunjukkan gabungan dua get logik.

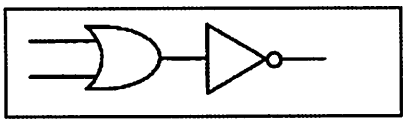


Diagram 28/*Rajah* 28

The arrangement of the logic gates is equivalent to
Susunan get logik tersebut bersamaan dengan

A a NOT logic gate
B a NAND logic gate
C a NOR logic gate
D an OR logic gate

47 Diagram 29 shows a logic gate circuit with the input signals at A and B of 1010 and 0110 respectively.
Rajah 29 menunjukkan satu sirkit get logik dengan isyarat input A dan B adalah 1010 dan 0110 masing-masing.

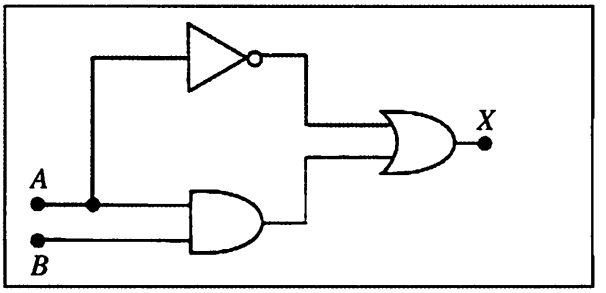


Diagram 29/*Rajah 29*

What is the output signal at X?
Apakah isyarat output pada X?

A 0001
B 0011
C 0110
D 0111

48 $^{27}_{13}Al$

Which of the following shows the correct number of particles of Aluminium atom?
Yang manakah antara berikut menunjukkan nombor jirim atom Aluminium yang betul?

	Proton	Nucleon	Neutron
A	13	27	14
B	13	14	27
C	27	13	14
D	27	14	13

49 The following equation shows the decay of a radioactive substance

Persamaan dibawah menunjukkan pereputan suatu bahan radioaktif

$$^{235}_{92}\mathrm{U} + {}^{1}_{0}\mathrm{n} \rightarrow {}^{92}_{36}\mathrm{Kr} + {}^{141}_{56}\mathrm{Ba} + a\,{}^{1}_{0}\mathrm{n}$$

What is the value of a?
Apakah nilai a?

A 2

B 3

C 1

D 4

50 A small amount of a radioactive isotope contains 40 billion unstable nuclei. The half-life of the isotope is 3 hours. How many unstable nuclei would remain after 12 hours?

Suatu jumlah kecil isotop radioaktif mengandungi 40 billion nuclei tak stabil. Separuh hayat isotop adalah 3 jam. Berapa banyak nuclei tak stabil yang tinggal selepas 12 jam?

A 10 billion

B 5 billion

C 2.5 billion

D 1.25 billion

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

BLANK PAGE
HALAMAN KOSONG

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consist of **50** questions.
Kertas soalan ini mengandungi **50** *soalan.*

2. Answer **all** questions.
Jawab ***semua*** *soalan.*

3. Each question is followed by either **three** or **four** options. Choose the best option for each question and blacken the correct space on the answer sheet.
Tiap-tiap soalan diikuti oleh sama ada **tiga** *atau* **empat** *pilihan jawapan. Pilih satu jawapan yang terbaik bagi setiap soalan dan hitamkan ruangan yang betul pada kertas jawapan anda.*

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 dilukis mengikut skala kecuali dinyatakan.

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

8. A list of formulae is provided on page 2.
Satu senarai formula disediakan di halaman 2.

NAMA	
TINGKATAN	

PEPERIKSAAN PERCUBAAN BERSAMA SIJIL PELAJARAN MALAYSIA 2011

ANJURAN
MAJLIS PENGETUA SEKOLAH MALAYSIA (MPSM)
CAWANGAN PERLIS

PHYSICS

Kertas 2

Dua jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Tulis nama dan tingkatan pada petak yang disediakan.*
2. *Kertas soalan ini adalah dalam dwibahasa.*
3. *Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.*
4. *Calon dibenarkan menjawab keseluruhan soalan atau sebahagian soalan sama ada dalam bahasa Inggeris atau bahasa Melayu.*
5. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

Untuk Kegunaan Pemeriksa			
Bahagian	Soalan	Markah Penuh	Markah Diperoleh
A	1	4	
	2	5	
	3	6	
	4	7	
	5	8	
	6	8	
	7	10	
	8	12	
B	9	20	
	10	20	
C	11	20	
	12	20	
Jumlah			

Kertas soalan ini mengandungi **32** halaman bercetak

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 graviti* $= mgh$
8. Elastic potential energy / *Tenaga keupayaan kenyal* $= \frac{1}{2}Fx$
9. $P = \frac{m}{V}$
10. Pressure / *Tekanan*, $P = h\rho g$
11. Pressure / *Tekanan*, $p = \frac{F}{A}$
12. Heat / *Haba*, $Q = mc\theta$
13. Heat / *Haba*, $Q = ml$
14. $\frac{pV}{T}$ = constant / *pemalar*
15. $E = mc^2$
16. $v = f\lambda$
17. Power, $P = \frac{\text{energy}}{\text{time}}$ *Kuasa*, $P = \frac{tenaga}{masa}$
18. $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$
19. $\lambda = \frac{ax}{D}$
20. $n = \frac{\sin i}{\sin r}$
21. $n = \frac{\text{real depth}}{\text{apparent depth}}$ $n = \frac{dalam\ nyata}{dalam\ ketara}$
22. $Q = It$
23. $V = IR$
24. Power / *Kuasa*, $P = IV$
25. $\frac{N_S}{N_P} = \frac{V_S}{V_P}$
26. Efficiency / *Kecekapan* $= \frac{I_S V_S}{I_P V_p} \times 100\%$
27. $g = 10\ \text{ms}^{-2}$

Section A
Bahagian A

[60 marks/*markah*]

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

1 Diagram 1 shows a metre rule being used to measure the diameters of glass tubes.
Rajah 1 *menunjukkan pembaris digunakan untuk mengukur diameter tiub kaca.*

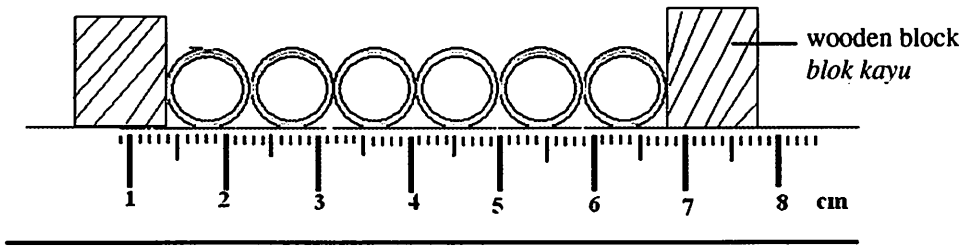


Diagram 1 / *Rajah* 1

Based on diagram 1 answer the following question.
Berdasarkan rajah 1 *jawab soalan-soalan berikut.*

(a) State the physical quantity that is being measured
Nyatakan kuantiti fizikal yang sedang diukur

.....

[1 mark/*markah*]

(b) What is the external diameter of one test tube?
Apakah diameter luar satu tabung uji?

.....

[1 mark/*markah*]

(c) Name a measuring instrument that is more accurate to measure the external diameter of a test tube.
Namakan alat pengukur yang lebih jitu untuk mengukur diameter luar satu tabung uji

.....

[1 mark/*markah*]

(d) Name one type of error that must be avoided when taking the readings
Namakan satu jenis ralat yang perlu dielakkan semasa mengambil bacaan.

.....

[1 mark/*markah*]

2 Diagram 2.1 shows two identical plasticine balls before being dropped from same height. Diagram 2.2 shows the situation when they hit a wood and a sponge.
Rajah 2.1 *menunjukkan dua ketul bebola plastisin yang serupa sebelum dilepaskan dari ketinggian yang sama. Rajah* 2.2 *menunjukkan keadaan plastisin itu apabila menghempap kayu dan span.*

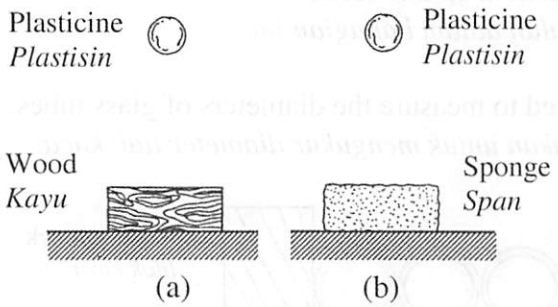


Diagram 2.1 / *Rajah* 2.1

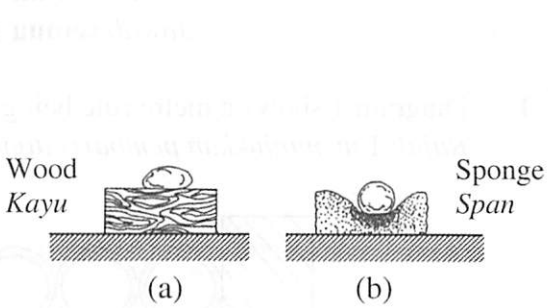


Diagram 2.2 / *Rajah* 2.2

(a) What is the meaning of impulsive force?
Apakah maksud dengan daya impuls?

.....

[1 mark/*markah*]

(b) (i) Which of Diagram 2.2 shows a smaller impulsive force?
Rajah 2.2 *yang manakah menunjukkan daya impuls yang paling kecil?*

.....

[1 mark/*markah*]

(ii) Which statement correctly describes the time of impact of plasticine. Mark (√) in the correct box.
Pernyataan manakah yang memerihalkan dengan betul tentang situasi masa hentaman plastisin tersebut. Tanda (√) pada kotak yang betul.

☐	Time of impact on wood greater than on sponge *Masa hentaman ke atas kayu lebih besar daripada span*
☐	Time of impact on sponge greater than on wood *Masa hentaman ke atas span lebih besar daripada kayu*

[1 mark/*markah*]

(c) A 0.35 kg hockey ball move from rest with velocity 15 m s^{-1} after been hitting. The time impact is 0.20 s. What is the impulsive force on hockey ball?
Sebiji bola hoki berjisim 0.35 kg *bergerak dari keadaan pegun dengan halaju* 15 m s^{-1} *selepas dipukul. Masa hentaman ialah* 0.20 s. *Berapakah daya impuls pada bola hoki?*

[2 marks/*markah*]

3 Diagram 3.1 shows a special two-layered box. On the inside, it is made from lead and the outside is wood.
Rajah 3.1 *menunjukkan sebuah kotak dua lapisan. Pada bahagian dalam, ia diperbuat daripada plumbum dan di bahagian luar daripada kayu.*

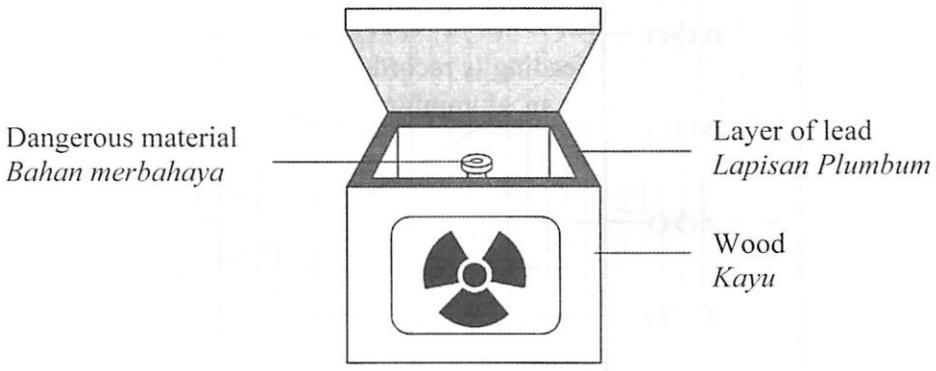


Diagram 3.1/*Rajah* 3.1

(a) (i) What dangerous material is being stored?
Apakah bahan berbahaya yang disimpan?

.....

[1 mark/*markah*]

(ii) Why is such material dangerous?
Mengapakah bahan tersebut berbahaya?

.....

.....

[1 mark/*markah*]

(iii) Why is lead used on the inside?
Mengapakah plumbum digunakan di bahagian dalam?

.....

[1 mark/*markah*]

(iv) How should one handle the material stored in this box?
Bagaimanakah sepatutnya mengendalikan bahan yang tersimpan di dalam kotak ini?

.....

.....

[1 mark/*markah*]

(b) The activity of a sample *X* is as shown by the graph in Diagram 3.2.
Aktiviti sampel X ditunjukkan oleh graf dalam Rajah 3.2.

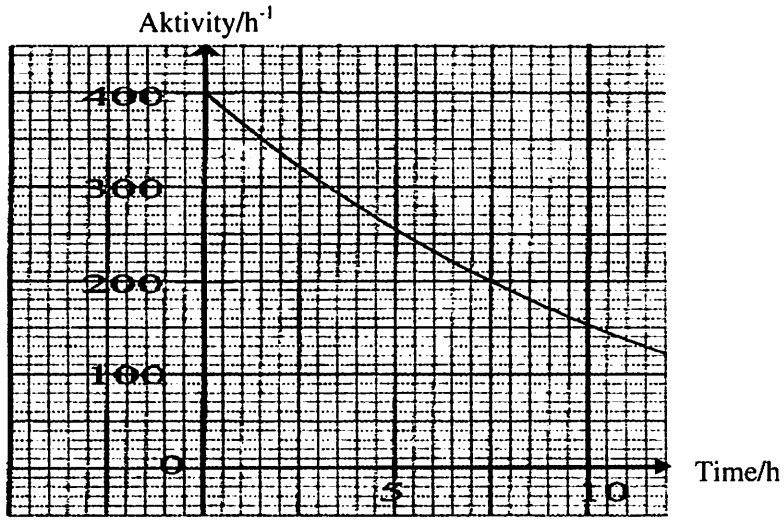


Diagram 3.2/ *Rajah* 3.2

Using the graph in Diagram 3.2, determine the half-life of sample *X*.
Dengan menggunakan graf dalam Rajah 3.2, *tentukan separuh hayat bagi sampel X.*

[2 marks/*markah*]

4 Diagram 4.1 shows a ray of light entering from air into water.
Rajah 4.1 *menunjukkan satu sinar cahaya bergerak dari udara ke dalam air.*

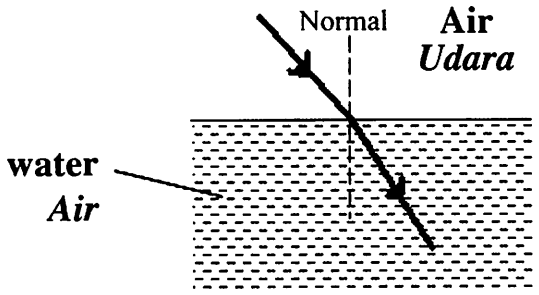


Diagram 4.1/*Rajah* 4.1

(a) (i) Compare the speed of light in water with the speed of light in air.
Banding laju cahaya dalam air dengan laju cahaya dalam udara.

.....

[1 mark/*markah*]

(ii) If the water replace with liquid *Y* which is denser than water, state the change in direction of bending of light in the liquid *Y*.
Jika air digantikan dengan cecair Y yang lebih tumpat dari air, nyatakan perubahan kepada arah pembengkokkan cahaya dalam cecair Y.

.....

.....

[1 mark/*markah*]

(iii) Name the phenomenon shown in Diagram 4.1.
Namakan fenomena yang ditunjukkan dalam Rajah 4.1

.....

[1 mark/*markah*]

Diagram 4.2 shows a coin at the base of the beaker which contains a liquid Z with the depth of 15 cm. The observer found the image of the coin appears to be 4 cm from the base of the beaker.

Rajah 4.2 *menunjukkan sekeping duit syiling yang berada pada dasar sebuah bikar yang mengandungi cecair* Z *dengan kedalaman* 15 cm. *Pemerhati mendapati imej duit syiling kelihatan berada* 4 *cm dari dasar bikar.*

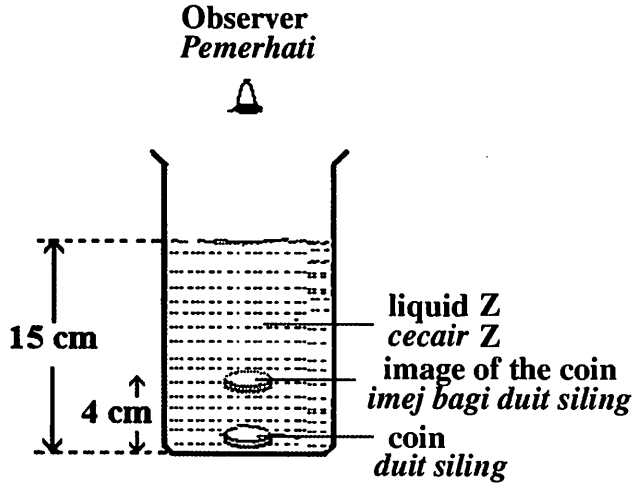


Diagram 4.2/ *Rajah* 4.2

(b) Calculate the refractive index of the liquid Z.
Hitungkan indeks biasan bagi cecair Z *tersebut.*

[2 marks/*markah*]

(c) The liquid Z is replace with a less dense liquid.
Cecair Z *itu kemudiannya digantikan dengan cecair yang kurang tumpat.*

(i) What happens to the image of the coin?
Apakah yang berlaku kepada imej duit syiling itu?

.....

[1 mark/*markah*]

(ii) Give one reason for your answer in (c) (i) base on the concept of apparent depth.
Berikan satu sebab bagi jawapan anda dalam (c) (i) berdasarkan konsep dalam ketara.

.....

.....

[1 mark/*markah*]

5 Diagram 5.1 shows hot tea in a glass while Diagram 5.2 show what happened to the tea after some ice is put in it.

Rajah 5.1 *menunjukkan minuman teh panas di dalam satu gelas sementara Rajah* 5.2 *pula menunjukkan apa yang berlaku apabila ais dimasukkan ke dalam minuman itu.*

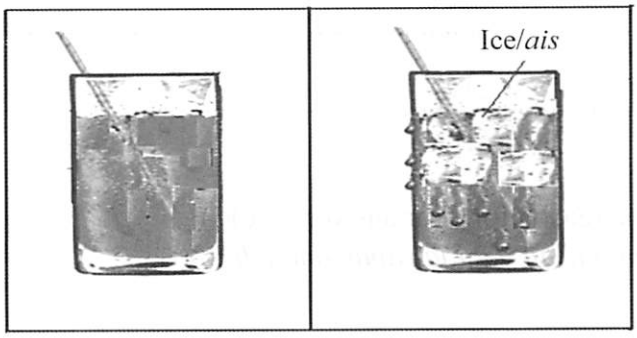


Diagram 5.1/*Rajah* 5.1 Diagram 5.2/*Rajah* 5.2

(a) What is thermal equilibrium?
Apakah maksud keseimbangan terma?

.....

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

(b) Based on diagram 5.1 and Diagram 5.2
Berdasarkan Rajah 5.1 *dan Rajah* 5.2

(i) Compare the temperature of the glass in Diagram 5.1 and Diagram 5.2.
Bandingkan suhu gelas dalam Rajah 5.1 *dan Rajah* 5.2.

.....

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

(ii) Compare the temperature of the glass in Diagram 5.2 with its surrounding
Bandingkan suhu gelas dalam Rajah 5.2 *dengan suhu persekitarannya*

.....

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

[Lihat halaman sebelah

(c) In Diagram 5.2, water droplets form on the surface of glass.
Dalam Rajah 5.2 titisan air terbentuk di atas permukaan gelas.

(i) Name the process that cause water droplets to be formed.
Namakan proses yang menyebabkan titisan air terbentuk.

.....

.....

[1 marks/*markah*]

(ii) Give the reason for your answer in (c)(i)
Berikan alasan bagi jawapan anda di (c)(i)

.....

.....

.....

[2 marks/*markah*]

(d) When Ahmad is driving in one morning, he observed that water vapour is formed in his car and water droplets formed on the inside part of his car windscreen. Give one action he should do to get rid of the water vapour. Explain your action.

Semasa memandu pada waktu pagi. Ahmad mendapati terdapat pembentukan wap air di dalam kereta dan titisan air pada permukaan cermin di bahagian dalam keretanya. Nyatakan satu langkah yang Ahmad boleh lakukan untuk menghilangkan wap air yang terbentuk pada cermin keretanya. Terangkan sebabnya.

.....

.....

[2 marks/*markah*]

6 Diagram 6.1 and 6.2 shows four identical bulbs, *W, X, Y* and *Z* connected to a battery.
Rajah 6.1 *dan* 6.2 *menunjukkan empat mentol, W, X, Y dan Z yang serupa disambungkan kepada sebiji bateri.*

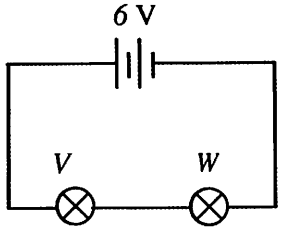


Diagram 6.1/*Rajah* 6.1

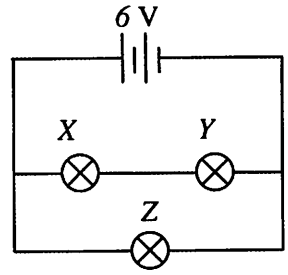


Diagram 6.2/*Rajah* 6.2

(a) States Ohm's Law?
Nyatakan Hukum Ohm?

.....

.....

[1 mark/*markah*]

(b) Observe diagram 6.1 and diagram 6.2. Compare the brightness of the bulbs.
Perhatikan rajah 6.1 *dan rajah* 6.2. *Bandingkan kecerahan mentol tersebut.*

(i) *V* and *W*
V dan W

.....

.....

[1 mark/*markah*]

(ii) *Y* and *Z*
Y dan Z

.....

.....

[1 mark/*markah*]

(iii) *V* and *X*
V dan X

.....

.....

[1 mark/*markah*]

[Lihat halaman sebelah

Four identical resistor, 5 Ω, were connected to 12V battery. Two measuring instruments, P and Q were connected as shown in Diagram 6.3.

Empat perintang yang serupa 5 Ω disambungkan ke bateri 12 V. Alat pengukuran P dan Q disambungkan seperti dalam rajah 6.3.

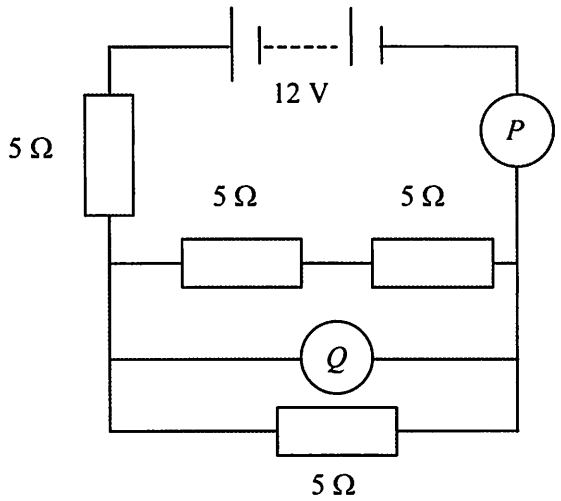


Diagram 6.3/*Rajah* 6.3

(c) (i) Name the suitable instrument for *P* and *Q*.

Namakan alat yang sesuai bagi P dan Q.

P : .....

Q : .....

[2 marks/*markah*]

(ii) Calculate the reading of *P*.

Hitung bacaan alat P.

[2 marks/*markah*]

7 Diagram 7.1 shows a logic gate circuit.
Rajah 7.1 menunjukkan sebuah litar get-logik.

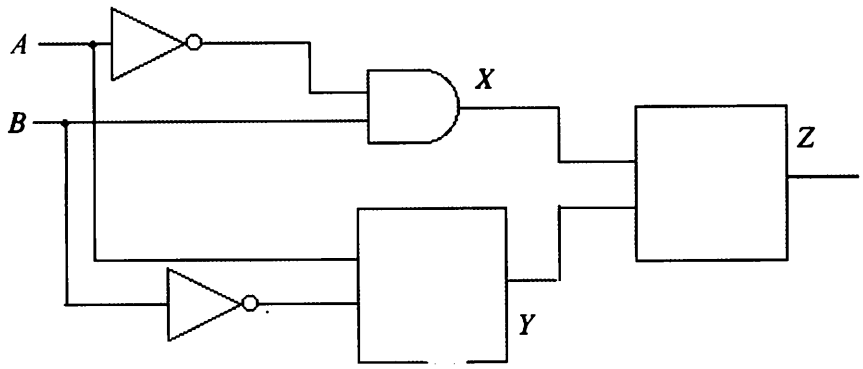


Diagram 7.1/*Rajah 7.1*

The truth table for the circuit is as shown in Table 7.1
Jadual kebenaran untuk litar tersebut ditunjukkan dalam Jadual 7.1

A	B	X	Y	Z
0	0	0	0	
0	1	1	0	
1	0	0	1	
1	1	0	0	

Table 7.1/ *Jadual 7.1*

(a) (i) Complete the circuit in Diagram 7.1 by drawing AND Gate and OR Gate in boxes *Y* and *Z*.

Lengkapkan litar pada rajah 7.1 *dengan melukis Get DAN dan Get ATAU dalam kotak Y dan Z.*

[2 marks/*markah*]

(ii) Complete the truth table in Table 7.1.

Lengkapkan jadual kebenaran di Jadual 7.1.

[2 marks/*markah*]

(b) Diagram 7.2 shows a full-wave rectifier circuit.
Rajah 7.2 menunjukkan litar rektifikasi gelombang-penuh.

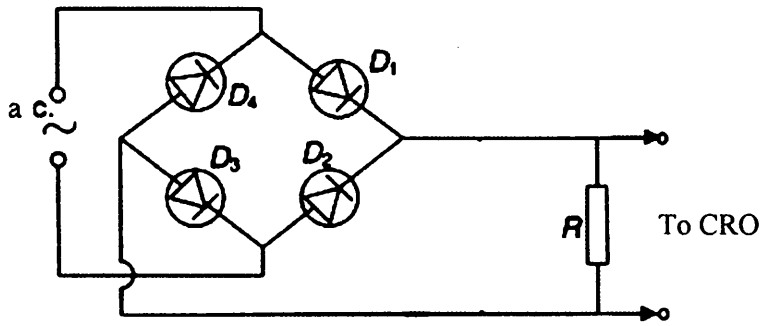


Diagram 7.2/*Rajah* 7.2

(i) What type of current that passes resistor R?
Apakah jenis arus yang mengalir di perintang R?

.....

[1 mark/*markah*]

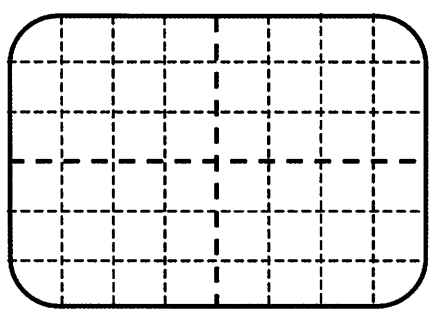
(ii) A capacitor is connected across *R* in parallel. What is the function of the capacitor in this circuit?
Sebiji kapasitor disambungkan di sebelah R secara selari. Apakah fungsi kapasitor pada litar ini?

.....

[1 mark/*markah*]

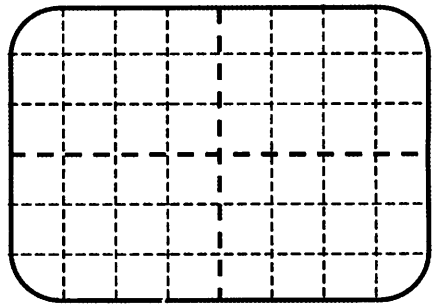
(iii) Sketch the display on the CRO for a full-wave rectifier circuit,
Lakarkan paparan di atas OSK untuk litar rektifikasi gelombang penuh,

(a) before the capacitor is connected.
sebelum kapasitor disambungkan.



[1 mark/*markah*]

(b) after the capacitor is connected.
selepas kapasitor disambungkan



[1 mark/*markah*]

(iv) Explain how the capacitor causes the output in the way that you have drawn in (iii)(b).

Terangkan bagaimana kapasitor tersebut menyebabkan keluaran seperti yang anda lukis dalam (iii)(b).

.....

.....

.....

[2 marks/*markah*]

8 Diagram 8.1 demonstrates the force acting on a current carrying conductor in a magnetic field.
Rajah 8.1 *menunjukkan daya yang bertindak pada satu konduktor yang membawa arus dalam medan magnet.*

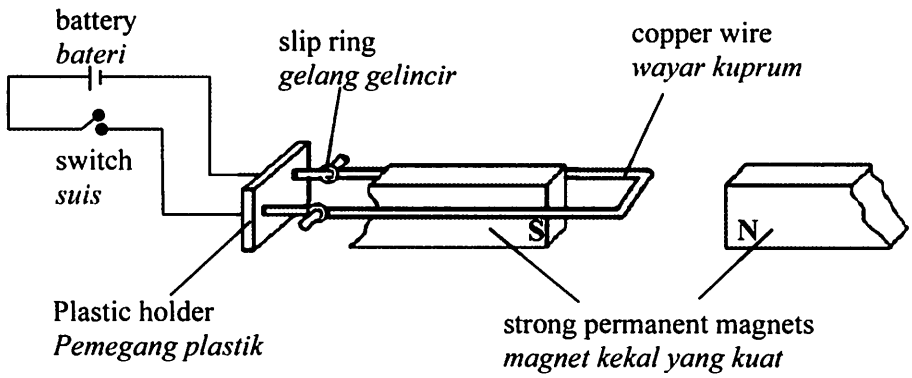


Diagram 8.1/*Rajah* 8.1

(a) (i) When the switch is closed, what observation can you make?
Apabila suis ditutup, apakah pemerhatian yang dapat anda buat?

.....

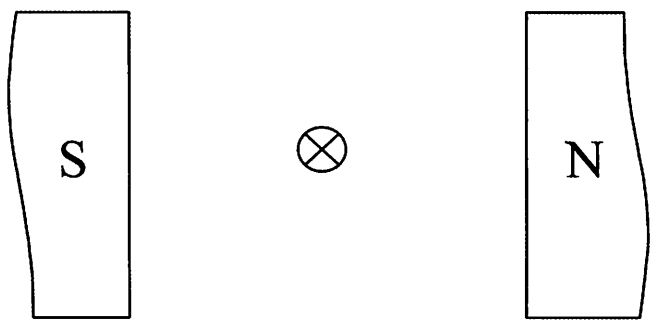
[1 mark/*markah*]

(ii) State the rule which can be used to determine the direction of motion of the copper wire?
Berikan nama peraturan yang digunakan bagi menentukan arah gerakan wayar kuprum tersebut?

.....

[1 mark/*markah*]

(iii) Draw the pattern of electromagnetic field (catapult field) in the diagram below.
Lukiskan corak medan elektromagnet (medan lastik) pada rajah di bawah.



[3 marks/*markah*]

(iv) How can the magnitude of the force be increased?
Bagaimanakah magnitud daya tersebut boleh dipertingkatkan?

.....

[1 mark/*markah*]

(b) Diagram 8.2 shows an electric motor which is supplied with a direct current.
Rajah 8.2 *menunjukkan sebuah motor elektrik menggunakan bekalan arus terus.*

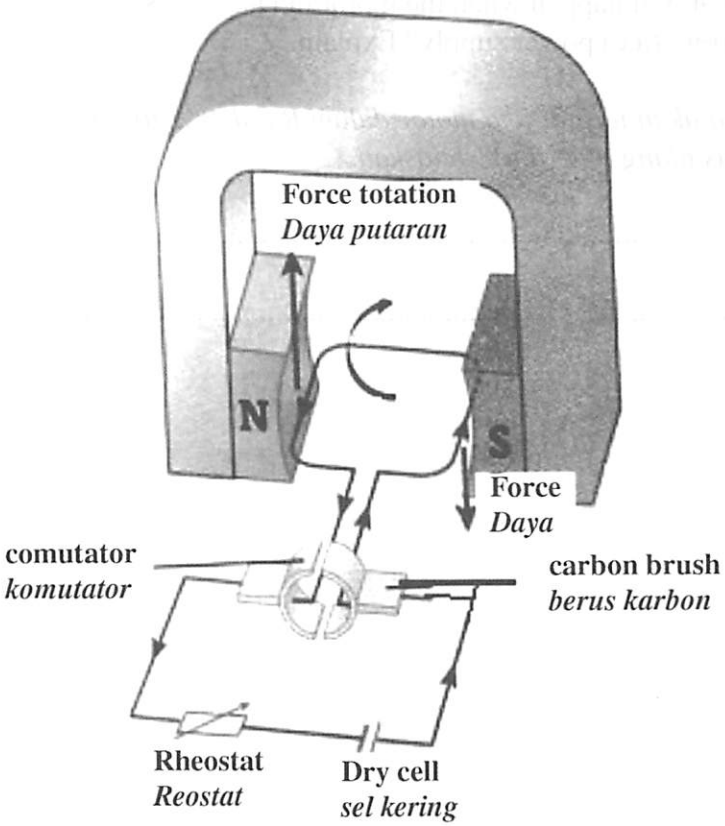


Diagram 8.2/*Rajah* 8.2

(i) Explain why the motor will rotate faster when the current increases.
Jelaskan mengapa motor akan berputar dengan lebih laju jika arus bertambah.

.....

.....

[2 marks/*markah*]

(ii) State **two** other ways to increase the speed of the motor.

*Nyatakan **dua** lagi cara untuk menambah laju putaran motor.*

.....

.....

[2 marks/*markah*]

(iii) What will happen when the motor in Diagram 8.2 is connected to the alternative current (a.c) power supply? Explain.

Apa akan terjadi jika motor dalam Rajah 8.2 *disambung dengan bekalan kuasa arus ulang alik (a.u)? Jelaskan.*

.....

.....

[2 marks/*markah*]

Section B
Bahagian B

[20 marks/*markah*]

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

9 Diagram 9.1 shows a stationary mortar on a ground surface.
Diagram 9.2 shows the mortar and bullet after the mortar has been launched by remote control.

Rajah 9.1 *menunjukkan sebuah mortar pegun di atas permukaan tanah.*
Rajah 9.2 *menunjukkan sebuah mortar dan peluru selepas dilancarkan secara kawalan jauh.*

Stationary mortar
Mortar pegun

Diagram 9.1 / *Rajah* 9.1

Bullet moves at high speed
Peluru bergerak dengan laju tinggi

Mortar recoils at lower speed
Mortar tersentak dengan laju yang lebih rendah

Diagram 9.2 / *Rajah* 9.2

(a) What is the meaning of momentum?
Apakah maksud dengan momentum?

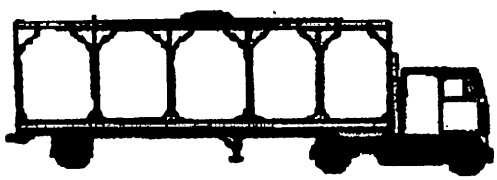
[1 mark/*markah*]

(b) Using Diagram 9.1 and Diagram 9.2, compare the total momentum before and after the bullet is launched.Using Diagram 9.2, compare the magnitude and direction of the momentum of the bullet and mortar. Name the physics principle that can be applied to the motion of the bullet and mortar.

Menggunakan Rajah 9.1 *dan Rajah* 9.2, *bandingkan jumlah momentum sebelum dan selepas peluru itu dilancarkan. Menggunakan Rajah* 9.2, *bandingkan magnitud dan arah momentum bagi peluru dan mortar. Nyatakan prinsip fizik yang boleh diaplikasi kepada gerakan peluru dan mortar itu.*

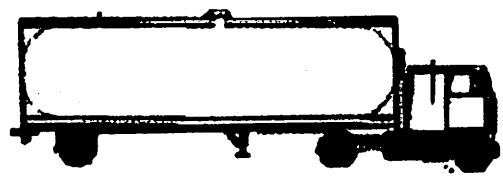
[5 marks/*markah*]

(c) Figure 9.3 and Figure 9.4 show tankers with the same capacity but built differently.
Rajah 9.3 *dan Rajah* 9.4 *menunjukkan lori tangki yang mempunyai kapasiti yang sama tetapi dibina berbeza.*



Tanker with 5 small tanks
Lori tangki dengan 5 tangki kecil

Figure 9.3 / *Rajah* 9.3



Tanker with 1 large tank
Lori tangki dengan 1 tangki besar

Figure 9.4 / *Rajah* 9.4

Which tanker is safer to be used. Relate your answer based on a physics concept for the above situation.

Lori tangki yang mana satukah yang lebih selamat digunakan. Hubungkaitkan jawapan anda berdasarkan konsep fizik yang digunakan pada situasi di atas.

[4 marks/*markah*]

(d) Diagram 9.5 shows a lorry.
Rajah 9.5 menunjukkan sebuah lori

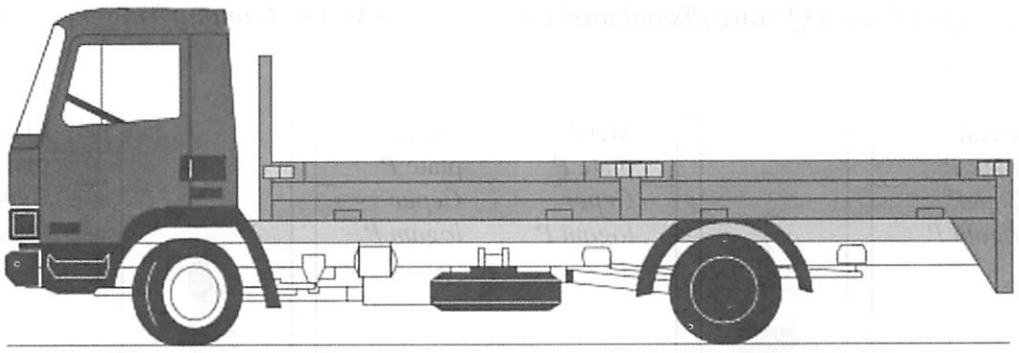


Diagram 9.5 / *Rajah* 9.5

You are required to give some suggestions to improve the design of the lorry so that it can be used as a tanker which can transport petroleum and safer. Using the knowledge on forces and motion and the properties of materials

Anda dikehendaki memberi beberapa cadangan untuk membaiki reka bentuk lori itu supaya boleh digunakan sebagai sebuah lori tangki yang mana boleh mengangkut petroleum dan selamat. Menggunakan pengetahuan tentang gerakan

(i) The type of brakes
Jenis brek

(ii) The number of tyres
Bilangan tayar

(iii) The size of the tanks
Saiz tangki

(iv) The material for making the tanks
Bahan yang digunakan untuk tangki

(v) The distance between the trailer and the tractor
Jarak antara treler dan kepala lori

[10 marks/*markah*]

10. Diagram 10.1 shows a lighted candle placed in between two metal plate *P* and plate *Q* connected to the Extra High Tension (E.H.T) power supply.

Rajah 10.1 *menunjukkan sebatang lilin yang bernyala dan diletakkan di antara ceper logam P dan ceper logam Q yang disambungkan ke bekalan Voltan Lampau Tinggi (V.L.T).*

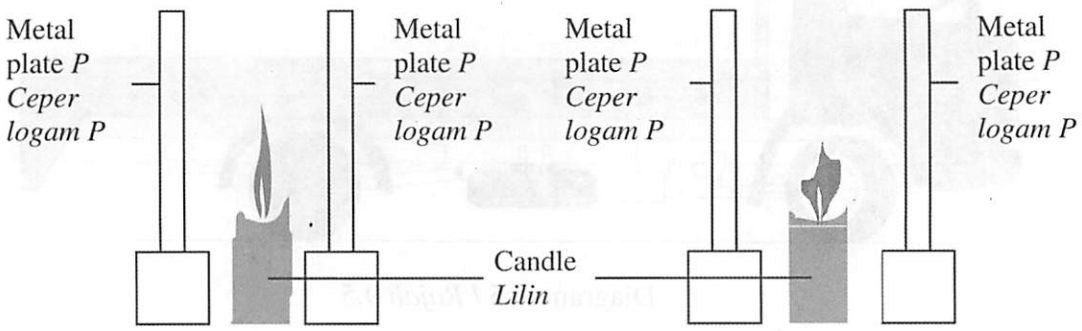


Diagram 10.1(a) E.H.T switched off
Rajah 10.1*(a) V.L.T. dimatikan*

Diagram 10.1(b) E.H.T. switched on
Rajah 10.1*(b) V.L.T. dihidupkan*

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

[1 mark/*markah*]

(ii) Observe Diagram 10.1(a) and 10.1(b). Compare the shape of the candle flame with its surrounding air. Hence, relate the shape of the candle flame with surrounding air.
Perhatikan Rajah 10.1*(a) dan* 10.1*(b). Bandingkan bentuk api lilin dengan udara sekitarnya. Berdasarkan keadaan tersebut, hubungkaitkan bentuk api lilin dengan udara sekitarnya.*

[5 marks/*markah*]

(b) The ratings for several electrical appliances are as shown as in Table 10.
Pengkelasan beberapa perkakasan elektrik adalah seperti di Jadual 10.

Electrical appliances/*Peralatan elektrik*	**Rating/*Tandaan***
Fluorescent lamp/*Lampu floresen*	240 V, 36 W
Television/*Televisyen*	240 V, 125 W
Hair dryer/*Pengering rambut*	240 V, 12 kW
Water heater/*Pemanas air*	240 V, 3.0 kW

Table 10/*Jadual* 10

(i) The fluorescent lamp is marked 240 V, 36 W. What exactly does this marking tells you about the lamp?

Lampu berfloresen dilabel sebagai 240 V, 36 W. *Apakah yang dimaksudkan dengan label tersebut pada lampu itu?*

[1 mark/*markah*]

(ii) Among the appliances stated in the table above, which one has the highest rate of energy consumption? State the reason for your answer.

Di antara perkakasan elektrik berikut, yang manakah yang mempunyai pelesapan tenaga yang paling tinggi? Nyatakan sebabnya.

[2 marks/*markah*]

(iii) How can we reduce the energy consumption by a television?

Bagaimanakah caranya untuk mengurangkan pelesapan tenaga oleh television?

[1 mark/*markah*]

(c) Diagram 10.2 shows a double storey house. Each of the rooms has lamps and air conditioners. The front porch has decorative string lamps. The bathrooms have water heaters. You are to design the electrical wiring system for this house. Each of the lamps in the rooms is rated as 220 V, 100 W. The air conditioners are each rated 220 V, 1.5 kW. The water heaters are each rated as 220 V, 2 kW.

Rajah 10.2 *menunjukkan sebuah rumah dua tingkat. Setiap bilik mempunyai lampu dan alat penghawa dingin. Anjung rumah mempunyai lampu gantung. Setiap bilik air mempunyai alat pemanas air. Kamu dikehendaki mereka sistem pendawaian elektrik untuk rumah ini. Setiap lampu bilik ditandakan sebagai* 220 V, 100 W, *alat penghawa dingin* 220V, 1.5 kW, *pemanas air* 220 V, 2 kW.

Diagram 10.2 / *Rajah* 10.2

Discuss how the wiring system will distribute to the various electrical equipment from the main supply which is 220 V a.c. In your discussion you are to emphasize the following:

Bincangkan bagaimana sistem pendawaian akan dilakukan supaya semua jenis perkakasan elektrik menerima bekalan elektrik 220 V a.u. Dalam perbincangan anda, titik beratkan beberapa perkara seperti berikut:

(i) types of connection, parallel or series,

jenis sambungan, selari atau sesiri,

(ii) fuse for the various circuits,

fius mengikut kepelbagaian litar,

(iii) earthing,

pembumian,

(iv) the manner in which the air conditioners and the water heaters are connected,

cara bagaimana alat penghawa dingin dan alat pemanas air disambungkan,

(v) the manner in which the lamps are connected,

cara bagaimana lampu-lampu disambungkan.

[10 marks/*markah*]

Section C
Bahagian C

[20 marks/*markah*]

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

11. Diagram 11.1 shows a container which is full of liquid *Y*. Its base area is **A** m^2 and its height is **h** m. The density of the liquid Y is ρ kg m^{-3}.
Rajah 11.1 *menunjukkan satu bekas diisi penuh dengan cecair* ***Y****. Luas tapak bekas itu adalah* **A** m^2 *dan tingginya* **h** m. *Ketumpatan cecair Y diberi sebagai* ρ kg m^{-3}.

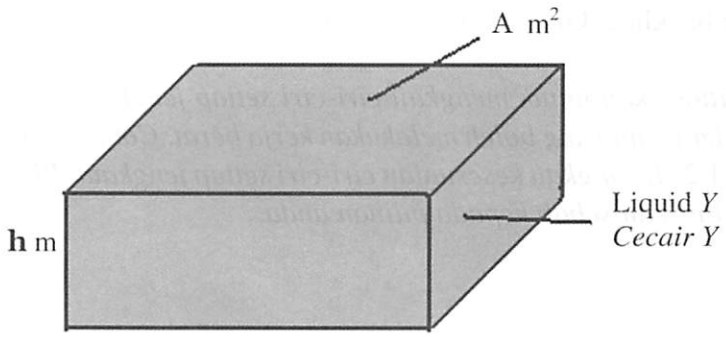


Diagram 11.1 / *Rajah* 11.1

(a) What is meant by pressure?
Apakah yang dimaksudkan dengan tekanan

[1 mark/*markah*]

(b) Write a formula for each of the following quantities.
Tuliskan formula untuk setiap kuantiti berikut.

(i) Volume of the liquid *Y*
Isipadu cecair Y

[1 mark/*markah*]

(ii) Mass of liquid *Y*
Jisim cecair Y

[1 mark/*markah*]

(iii) Force which acts on the base of the container
Daya yang bertindak pada dasar bekas air itu

[1 mark/*markah*]

(c) By using the formulae in (b), derive the SI unit for pressure
Dengan menggunakan formula daripada (b), terbitkan unit SI untuk tekanan

[3 marks/*markah*]

[Lihat halaman sebelah

(d) A small submarine can withstand a maximum water pressure of 3.0×10^5 N m^{-2}. Find the greatest depth that can be descended by the submarine.
(Density of water = 1.0×10^3 kg m^{-3})

Sebuah kapal selam kecil dapat menampung tekanan air maksima 3.0×10^5 N m^{-2}. *Tentukan kedalaman air maksima yang dapat dimasuki oleh kapal selamitu.*
(*Ketumpatan air* = 1.0×10^3 kg m^{-3})

[2 marks/*markah*]

(e) You are asked to investigate the characteristics of each backhoes in table 11 and choose a backhoe that can do heavy works, an example of a backhoe is shown in diagram 11.2. Explain the suitability of the characteristics each backhoes. Determine the most suitable backhoe. Give reason for your choice

Anda ditugaskan untuk mengkaji ciri-ciri setiap jengkaut dalam jadual 11 *dan pilih sebuah jengkaut yang boleh melakukan kerja berat. Contoh jengkaut diberikan dalam Rajah* 11.2. *Terangkan kesesuaian ciri-ciri setiap jengkaut. Pilih jengkaut yang paling sesuai. Berikan sebab kepada pilihan anda.*

Diagram 11.2/ *Rajah* 11.2

Type of Backhoe *Jenis jengkaut*	Characteristics of Backhoe				
	Size of tyre *Saiz tayar*	**Fluids used in hydraulic system** *Bendalir yang digunakan dalam sistem hidraulik*	**Mass** *Jisim*	**Base area** *Luas tapak*	**Centre of gravity** *Pusat graviti*
M	Large *Besar*	Liquid *Cecair*	Large *Besar*	Large *Besar*	Low *Rendah*
N	Large *Besar*	Liquid *Cecair*	Small *Kecil*	Large *Besar*	Low *Rendah*
P	Large *Besar*	Gas *Gas*	Large *Besar*	Small	High *Tinggi*
Q	Medium *Sederhana*	Liquid *Cecair*	Large *Besar*	Medium *Sederhana*	Low *Rendah*
R	Large *Besar*	Liquid *Cecair*	Large *Besar*	Medium *Sederhana*	High *Tinggi*

Table 11/*Jadual* 11

[10 marks/*markah*]

12. Diagram 12.1 and diagram 12.2 show the same of number of wire coils connected to the galvanometer.
Rajah 12.1 *dan rajah* 12.2 *menunjukkan bilangan gegelung dawai yang sama disambungkan kepada galvanometer*

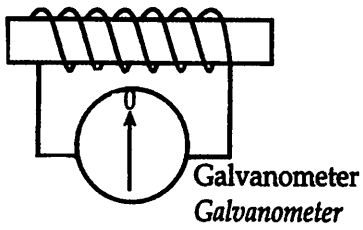


Diagram 12.1/ *Rajah* 12.1

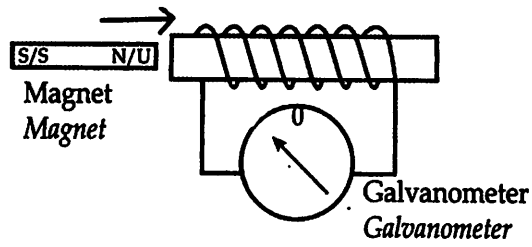


Diagram 12.2/ *Rajah* 12.2

When a magnet moves towards solenoid, the galvanometer indicator is deflected. If a magnet at stationary,the galvanometer indicator shows no deflection

Apabila magnet bergerak ke arah solenoid, penunjuk galvanometer terpesong. Jika magnet pegun, penunjuk galvanometer tidak terpesong

(a) (i) What is meant by electromagnetic induction?

Apakah yang dimaksudkan dengan aruhan electromagnet?

[1 mark/*markah*]

(ii) Explain why the galvanometer is deflected as shown in diagram 12.2

Terangkan mengapa jarum galvanometer terpesong seperti yang ditunjukkan dalam rajah 12.2

[2 marks/*markah*]

(iii) State one factor that affect the magnitude of induced current

Nyatakan satu faktor yang mempengaruhi magnitud arus aruhan

[1 mark/*markah*]

(b) Diagram 12.3 shows four transformers *W, X, Y* and *Z*. Each transformer is supplied by 240 V a.c.
Rajah 12.3 *menunjukkan empat transformer W, X, Y dan Z. Setiap transformer dibekalkan dengan* 240 V a.u.

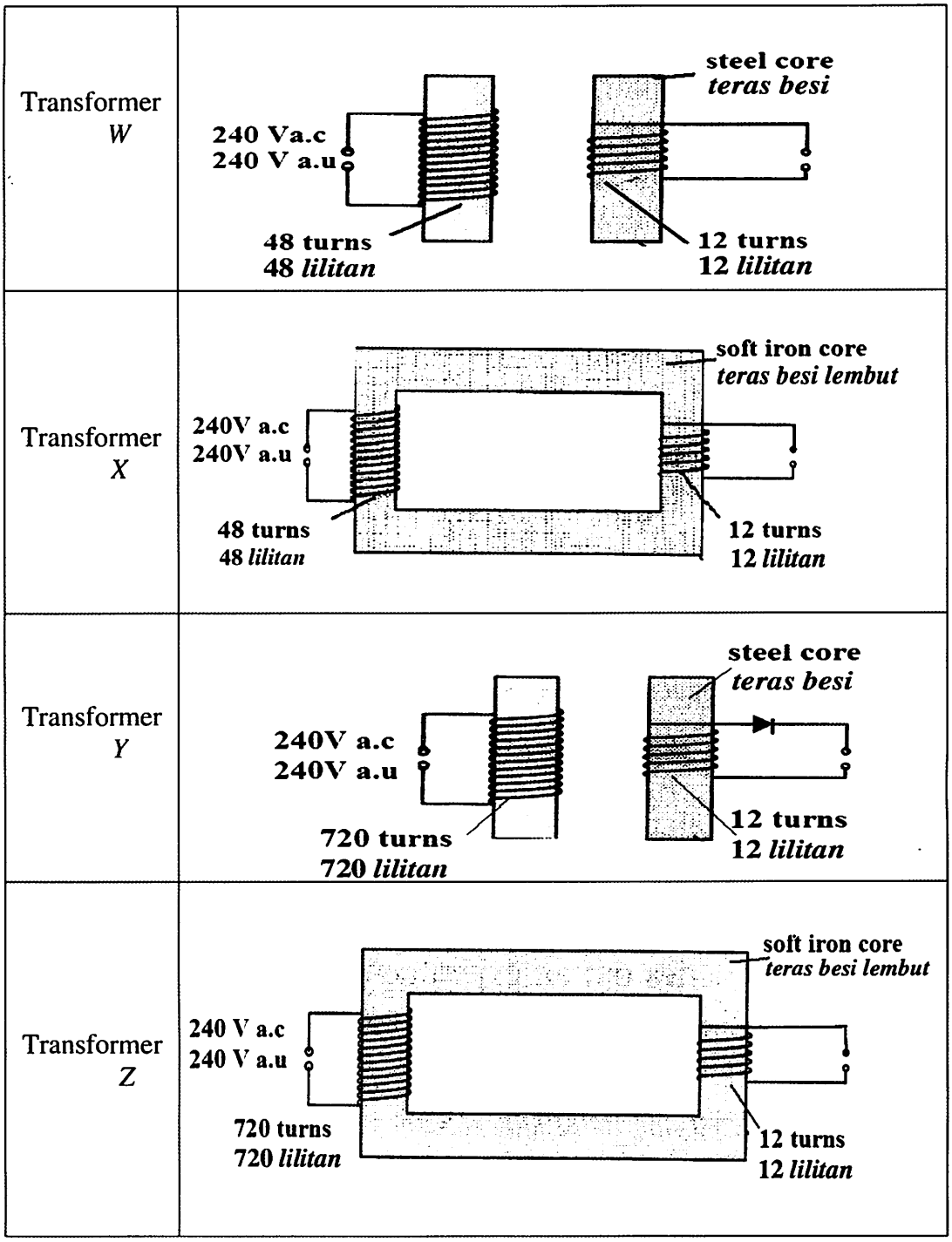


Diagram 12.3 / *Rajah* 12.3

You are required to determine the most suitable transformer that can be used as a component in a battery charger of a mobile phone. You may need to do some calculations.

Anda dikehendaki menentukan transformer yang paling sesuai untuk digunakan sebagai komponen dalam sebuah pengecas bateri telefon bimbit. Anda mungkin perlu melakukan pengiraan

Study the specification of all the four transformers based on the following aspects.

Kaji spesifikasi ke empat empat transformer itu berdasarkan aspek-aspek berikut:

(i) The number of turns of coil
Bilangan lilitan gegelung

(ii) The types of core
Jenis teras

(iii) The connection of terminal of secondary coil to mobile phone
Sambungan terminal gegelung sekunder kepada telefon bimbit

(iv) The shape of core
Bentuk teras

Explain the suitability of each aspect and then determine the most suitable transformer. Give a reason for your choice

Terangkan kesesuaian setiap aspek dan seterusnya tentukan transformer yang paling sesuai. Beri sebab untuk pilihan anda

[10 marks/*markah*]

(c) Diagram 12.4 shows a transformer
Rajah 12.4 menunjukkan satu transformer

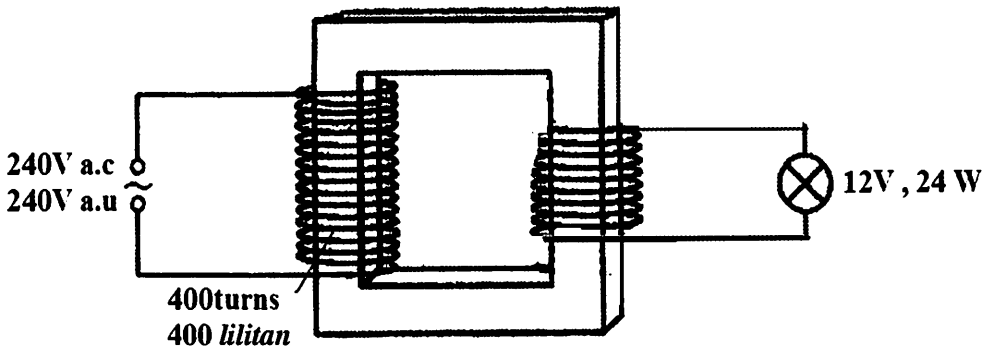


Diagram 12.4 / *Rajah* 12.4

A transformer with an a.c power supply of 240 V. A bulb 12 V, 24 W is connected to the secondary coil. The number of turns of primary coil is 400.

Transformer dengan sumber kuasa 240 V *dan satu mentol* 12 V, 24 W *yang disambungkan ke gegelung sekunder. Bilangan lilitan pada gegelung primer ialah* 400.

Calculate
Hitungkan

(i) The number of turns on the secondary coil if the bulb lighted up at normal rate
Hitung bilangan lilitan pada gegelung sekunder jika mentol menyala pada kadar normal

[2 marks/*markah*]

(ii) The current flows through the bulb
Arus yang mengalir melalui mentol

[2 marks/*markah*]

(iii) The current flows through the primary coil if the transformer is an ideal transformer
Arus yang mengalir melalui gegelung primer jika transformer tersebut adalah transformer unggul

[2 marks/*markah*]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consist of **three** sections: **Section A**, **Section B** and **Section C**.
*Kertas soalan ini mengandungi **tiga** bahagian: **Bahagian A**, **Bahagian B** dan **Bahagian C**.*

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 anda bagi **Bahagian A** hendaklah ditulis pada ruang yang disediakan dalam kertas soalan ini.*

3. Answer **one** question from **Section B** and **one** question from **Section C**. Write your answers for **Section B** and **Section C** on the extra answer sheets.
*Jawab **satu** soalan daripada **Bahagian B** dan **satu** soalan daripada **Bahagian C**. Jawapan anda bagi **Bahagian B** dan **Bahagian C** hendaklah ditulis dalam helaian tambahan.*

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

5. If you wish to change your answer, cross out the answer that you have done. Then write down the new answer.
Jika anda hendak menukar sesuatu jawapan, batalkan jawapan yang telah dibuat. Kemudian tulis jawapan yang baru.

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

7. A list of formulae is provided on page **2**.
*Satu senarai formula disediakan di halaman **2**.*

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

9. You are advised to spend 90 minutes to answer questions in **Section A**, 30 minutes for **Section B** and 30 minutes for **Section C**.
Anda dinasihati supaya mengambil masa 90 *minit untuk menjawab soalan dalam **Bahagian A**,* 30 *minit untuk **Bahagian B** dan* 30 *minit untuk **Bahagian C**.*

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

Physics
Kertas 3
September
2011
1½ jam

NAMA	
TINGKATAN	

PEPERIKSAAN PERCUBAAN BERSAMA SIJIL PELAJARAN MALAYSIA 2011

ANJURAN
MAJLIS PENGETUA SEKOLAH MALAYSIA (MPSM)
CAWANGAN PERLIS

PHYSICS

Kertas 3

Satu jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Tulis* **Nama** *dan* **Tingkatan** *anda pada petak yang disediakan.*
2. *Kertas soalan ini adalah dalam dwibahasa.*
3. *Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.*
4. *Calon dibenarkan menjawab keseluruhan soalan atau sebahagian soalan sama ada dalam Bahasa Inggeris atau Bahasa Melayu.*
5. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

Untuk Kegunaan Pemeriksa			
Bahagian	Soalan	Markah Penuh	Markah Diperoleh
A	1	16	
	2	12	
B	9	12	
	10	12	
Jumlah			

Kertas soalan ini mengandungi **16** halaman bercetak

Section A
Bahagian A

[28 marks]
[28 *markah*]

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

1 A student carries out an experiment to investigate the relationship between the angle of incidence, i and the angle of refraction, r by using the apparatus as shown in Diagram 1.1. A light ray is incident from air to a semicircular glass block.

Seorang pelajar menjalankan satu eksperimen untuk mengkaji hubungan di antara sudut tuju, i dengan sudut biasan, r dengan menggunakan radas-radas seperti yang ditunjukkan dalam Rajah 1.1. Sinar cahaya ditujukan dari udara ke sebuah blok kaca semibulatan.

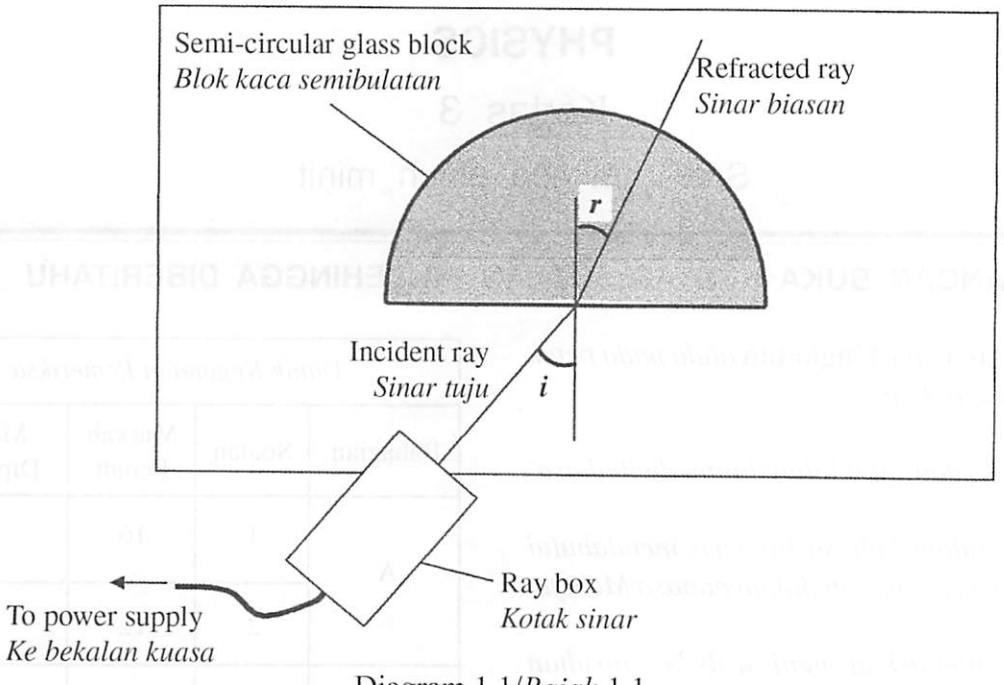


Diagram 1.1/*Rajah* 1.1

The ray box is adjusted so that a ray of light enters the semicircular glass block at an angle of incidence, $i = 15^o$.

The angle of refraction, r is measured with a protractor.

The experiment is repeated with angles of incidence, $i = 30^o, 45^o, 60^o$ and 75^o.

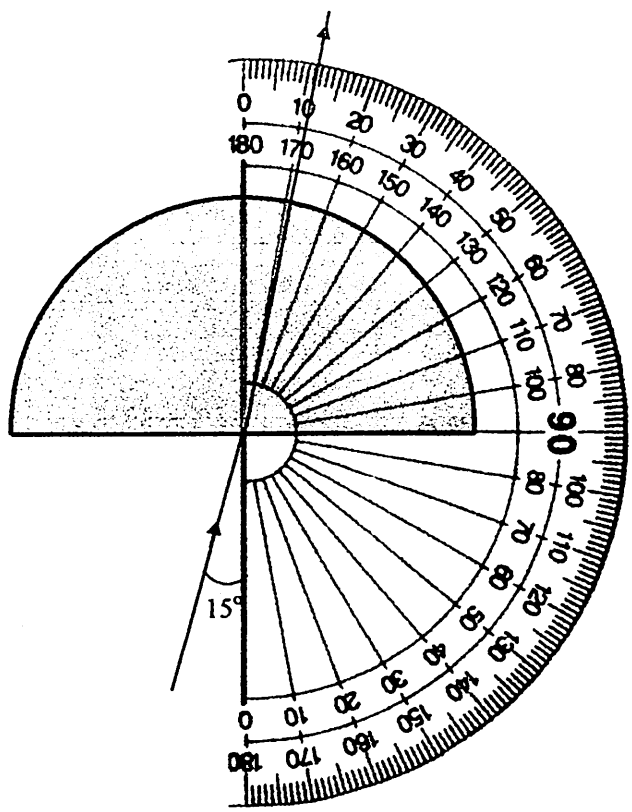
The corresponding measurements made by the protractor are shown in Diagram 1.2, 1.3, 1.4, 1.5 and 1.6.

Kotak sinar dilaraskan supaya satu sinar cahaya memasuki blok kaca semibulatan pada sudut tuju, $i = 15^o$.

Sudut biasan, r diukur menggunakan sebuah protraktor.

Eksperimen diulangi dengan sudut tuju, $i = 30^o, 45^o, 60^o$ *dan* 75^o.

Pengukuran sepadan yang dibuat oleh protraktor ditunjukkan pada Rajah 1.2, 1.3, 1.4, 1.5 *dan* 1.6.



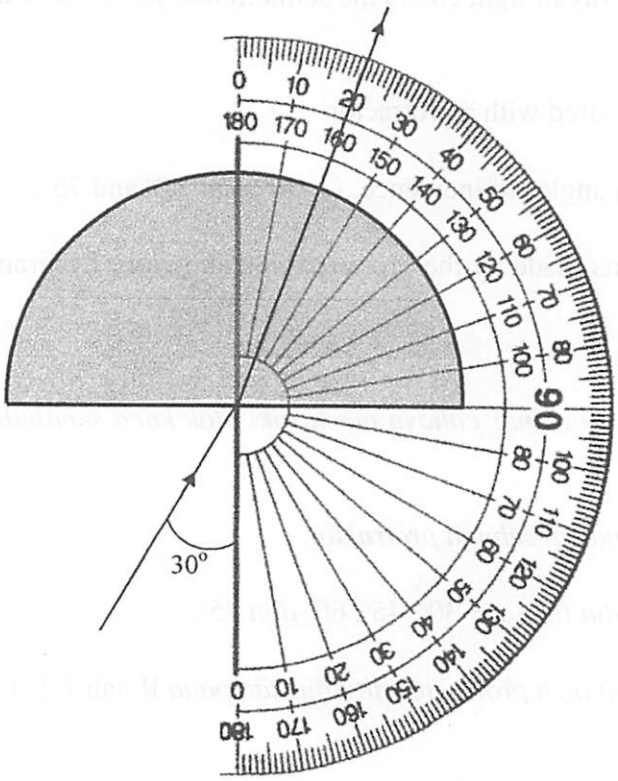
i = 15°

sin i = ...

r = ...

sin r = ...

Diagram 1.2 / *Rajah* 1.2



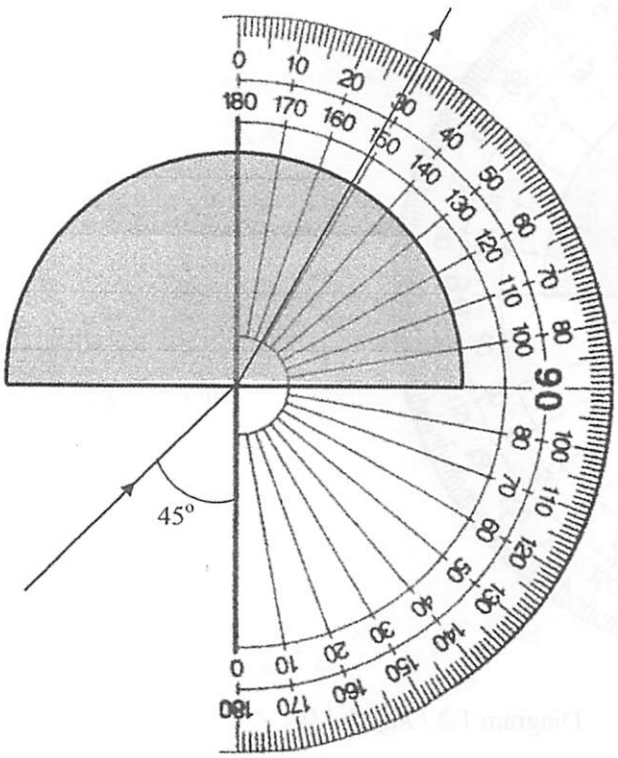
i = 30°

sin i = ...

r = ...

sin r = ...

Diagram 1.3 / *Rajah* 1.3



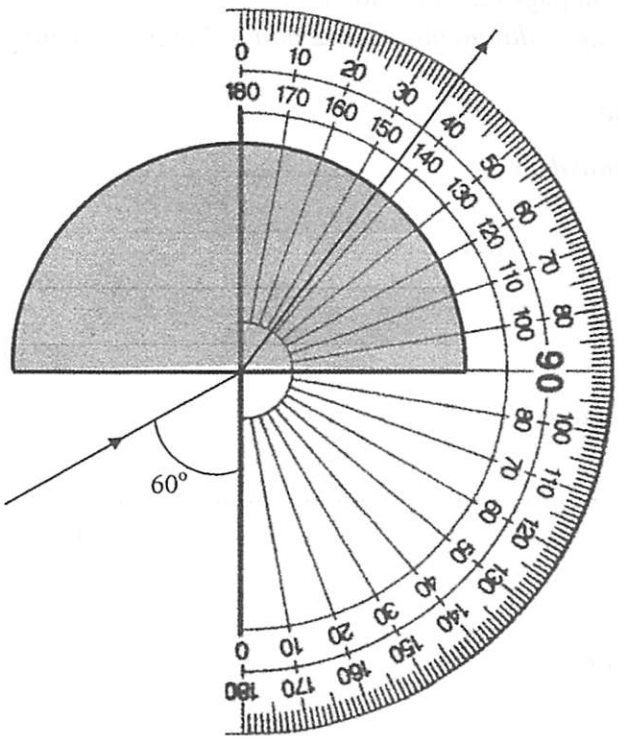
i = 45°

sin i = ...

r = ...

sin r = ...

Diagram 1.4 / *Rajah* 1.4



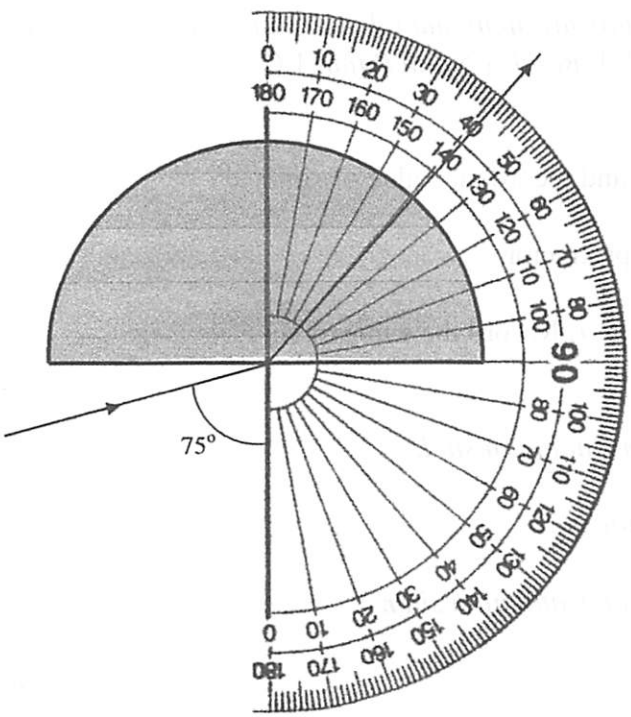
i = 60°

sin i = ...

r = ...

sin r = ...

Diagram 1.5 / *Rajah* 1.5



i = 75°

sin i = ...

r = ...

sin r = ...

Diagram 1.6 / *Rajah 1.6*

(a) For the experiment described on pages 2 and 3, identify:
Bagi eksperimen yang diterangkan dalam halaman 2 dan halaman 3, kenal pasti:

(i) The manipulated variable

Pembolehubah dimanipulasikan

.....

[1 mark/*markah*]

(ii) The responding variables

Pembolehubah bergerakbalas

.....

[1 mark/*markah*]

(iii) The constant variable

Pembolehubah dimalarkan

.....

[1 mark/*markah*]

(b) For this part of the question, write your answers in the spaces provided in the Diagram 1.2, Diagram 1.3, Diagram 1.4, Diagram 1.5 and Diagram 1.6.

Untuk bahagian soalan ini, tulis jawapan anda dalam ruang yang disediakan dalam Rajah 1.2, *Rajah* 1.3, *Rajah* 1.4, *Rajah* 1.5 *dan Rajah* 1.6.

For each value of i, calculate and record the value of sin i.

Record the readings, r of the protractor.

Calculate sin r for each value of r. Record the value of sin r.

Bagi setiap nilai i, hitung dan catat nilai sin i.

Catat bacaan, r bagi protraktor itu.

Hitung sin r untuk setiap nilai r. Catat nilai sin r.

[5 marks/*markah*]

(c) Tabulate your results for all values of i, sin i, r and sin r in the space below.
Jadualkan keputusan anda bagi semua nilai i, sin i, r dan sin r dalam ruang di bawah.

[2 marks/*markah*]

(d) On the graph paper on page 8, plot a graph of sin i against sin r
Pada kertas graf pada halaman 8, *lukis graf sin i melawan sin r*

[5 marks/*markah*]

(e) Based on your graph in 1(d), state the relationship between sin i and sin r.
Berdasarkan graf anda di 1(d), *nyatakan hubungan antara sin i dan sin r.*

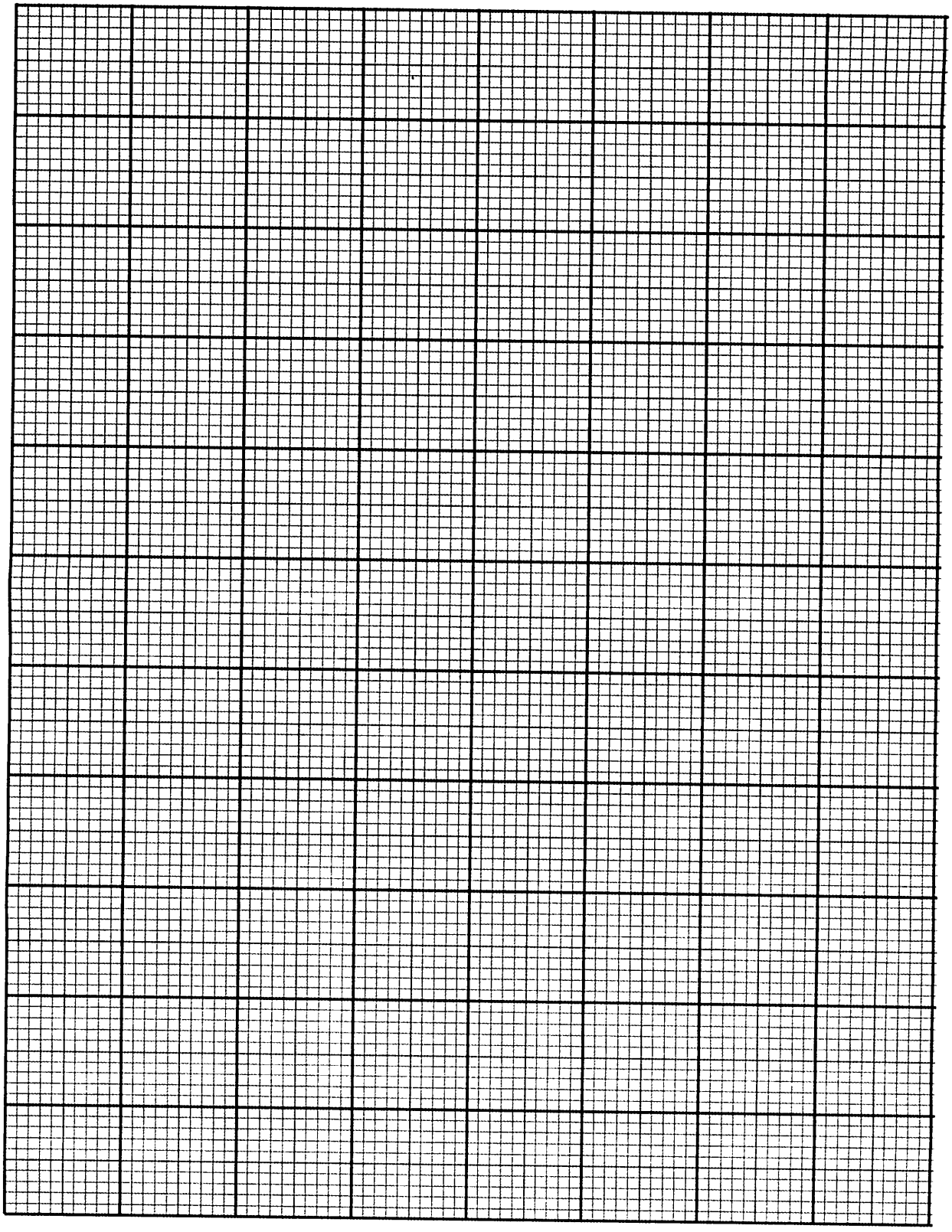
.....

.....

[1 mark/*markah*]

Graph of sin i against sin r

Graf sin i melawan sin r



2 A piece of wood is submerged in sea water,

A student carries out an experiment to investigate the relationship between pressure due to the sea water, P exerted on the wood and depth of water, h.

The results of this experiment are shown in the graph of P against h in Diagram 2.1

Seketul kayu ditenggelamkan dalam air laut.

Seorang pelajar menjalankan eksperimen untuk mengkaji hubungan antara tekanan disebabkan oleh air laut tersebut, P ke atas kayu yang ditenggelamkan pada kedalaman, h.

Keputusan eksperimen ini ditunjukkan oleh graf P melawan h dalam Rajah 2.1

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

(i) State the relationship between P and h
Nyatakan hubungan antara P dan h

.....

[1 mark/*markah*]

(ii) Determine the value of h when $P = 7$ N m^{-2}
Show on the graph, how you determine the value of h

Tentukan nilai h apabila $P = 7$ N m^{-2}
Tunjukkan pada graf bagaimana anda menentukan nilai h

h = ... m

[2 marks/*markah*]

(iii) Calculate the gradient, k, of the graph.
Show on the graph how you calculate k
Hitungkan kecerunan,k bagi graf itu.
Tunjukkan pada graf bagaimana anda menghitung k

k = ...

[3 marks/*markah*]

Graph of P against h
Graf P melawan h

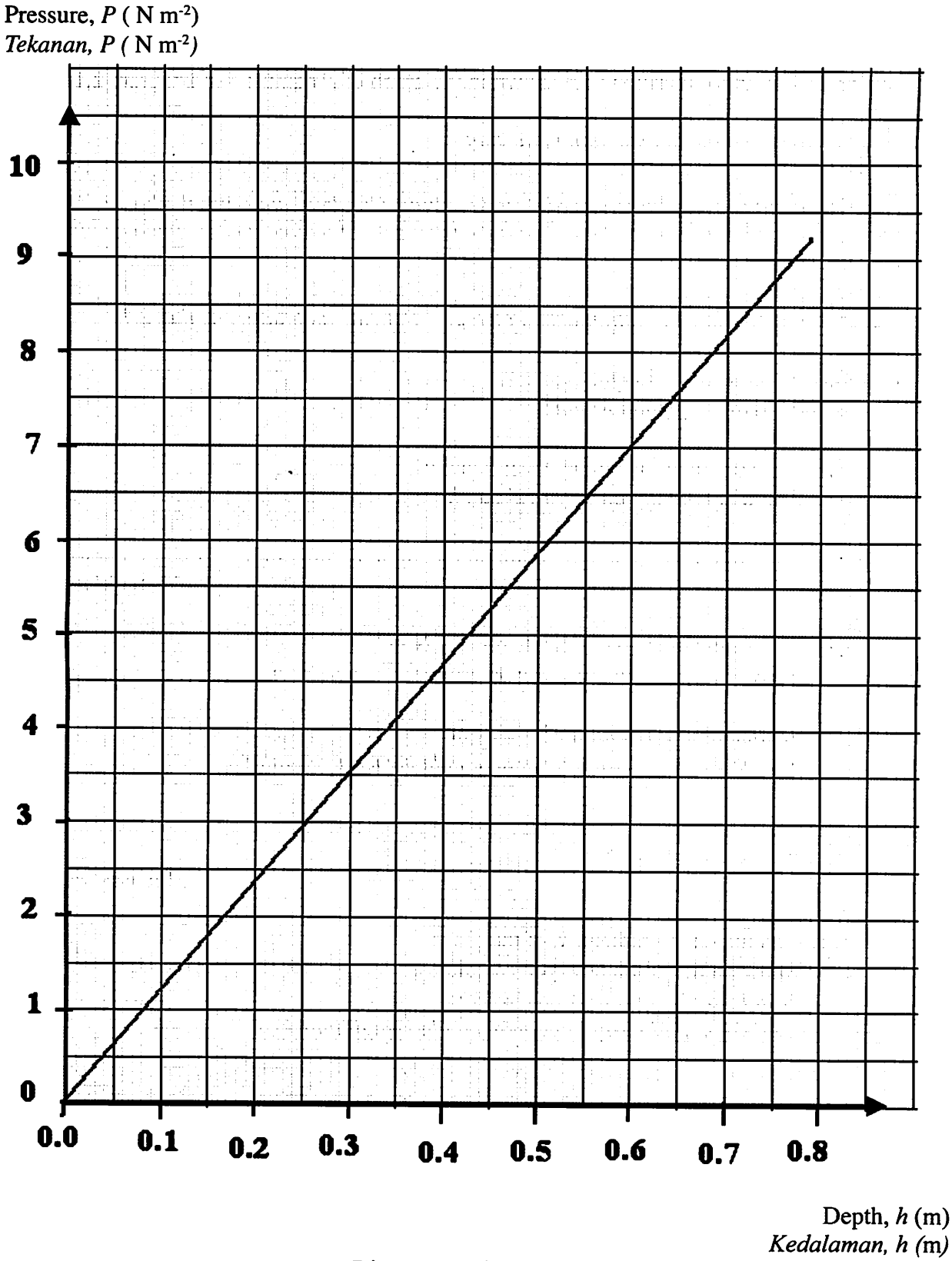


Diagram 2.1 / *Rajah* 2.1

(b) The density of sea water, d used can be determined using the formula

$$d = \frac{k}{g}$$

where , k is the gradient of graph and g is gravitational acceleration with value, $g = 10.0 \text{ m s}^{-2}$
Calculate the value of d

Ketumpatan air, d boleh ditentukan menggunakan rumus

$$d = \frac{k}{g}$$

Dimana, k ialah kecerunan graf dan g ialah pecutan graviti dengan nilai, $g = 10.0 \text{ m s}^{-2}$
Hitungkan nilai d

d = ...

[3 marks/*markah*]

(c) This experiment is repeated by using distilled water to replace sea water.
Eksperimen ini diulang menggunakan air suling untuk menggantikan air laut.

(i) What happens to the gradient of the graph
Apakah perubahan yang berlaku kepada kecerunan graf

.....

[1 mark/*markah*]

(ii) Give reasons for your answer in 2(c)(i)
Berikan alasan kepada jawapan anda dalam 2(c)(i)

.....

.....

[2 marks/*markah*]

Section B
Bahagian B

[12 marks]
[12 *markah*]

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

3 Diagram 3.1 shows a shaving cream in the bell jar. When the air in the bell jar suck out the swirl of cream grows from the **expansion of the air bubbles** trapped in the cream as shown in Diagram 3.2.

Rajah 3.1 *menunjukkan krim pencukur di dalam sebuah serkup kaca. Bila udara di dalam jar itu disedut keluar, didapati krim pencukur itu mengembang hasil daripada* ***pengembangan gelembung udara*** *yang terperangkap di dalam krim seperti yang ditunjukkan dalam Rajah* 3.2.

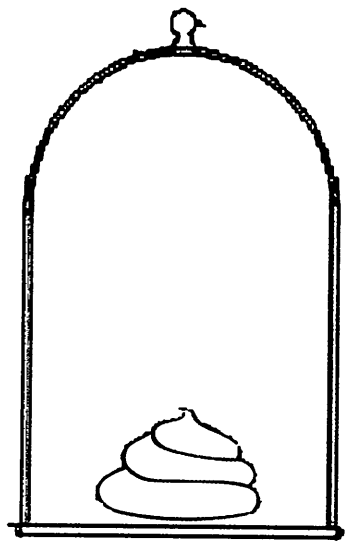


Diagram 3.1 / *Rajah* 3.1

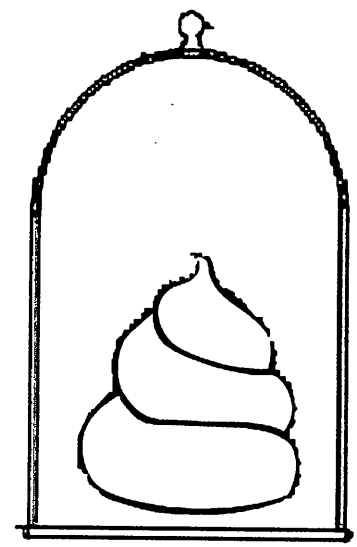


Diagram 3.2 / *Rajah* 3.2

Based on the information and observation:
Berdasarkan maklumat dan pemerhatian tersebut:

(a) State **one** suitable inference. [1 mark/*markah*]
Nyatakan **satu** *inferens yang sesuai.*

(b) State **one** suitable hypothesis. [1 mark/*markah*]
Nyatakan **satu** *hipotesis yang sesuai.*

(c) With the use of apparatus such as Bourdon Gauge and other apparatus, describe an experiment framework to investigate the hypothesis stated in 3(b).
Dengan mengunakan alat radas seperti Tolok Bardon dan lain-lain radas, terangkan satu rangka eksperimen untuk menyiasat hipotesis yang anda nyatakan di 3(b).

In your description, state clearly the following:
Dalam penerangan anda, jelaskan perkara berikut:

(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 manipulated variable and **one** method of measuring the responding variable.

Prosedur eksperimen yang mesti termasuk **satu** *kaedah mengawal pembolehubah dimanipulasikan dan* **satu** *kaedah mengukur pembolehubah bergerak balas.*

(vi) The way you tabulate the data.
Cara anda menjadualkan data.

(vii) The way you analyse the data.
Cara anda menganalisis data.

[10 marks/*markah*]

4 Before sports day, Azman helps Cikgu Ismail to prepare an audio system at the school field as in Diagram 4. When a coherent sound is played through the speaker, Azman run from point *X* to *Y* and he could hear the loud and soft sound alternately. When the position of both speakers is change to P and Q, Azman run again with the same speed from point *X* to *Y*. This time he could hear the loud and soft sound alternating more frequently.

Sebelum hari sukan, Azman telah membantu Cikgu Ismail memasang alat siaraya di padang sekolah seperti yang ditunjukkan dalam Rajah 4. *Apabila sumber bunyi yang koheren dimainkan melalui pembesar suara, Azman yang berlari dari X ke Y telah mendengar bunyi kuat dan perlahan silih berganti. Apabila pembesar suara diubah kedudukannya pada P dan Q, Azman yang berlari dengan kelajuan yang sama dari X ke Y, mendengar bunyi kuat dan perlahan yang silih berganti itu dengan lebih kerap.*

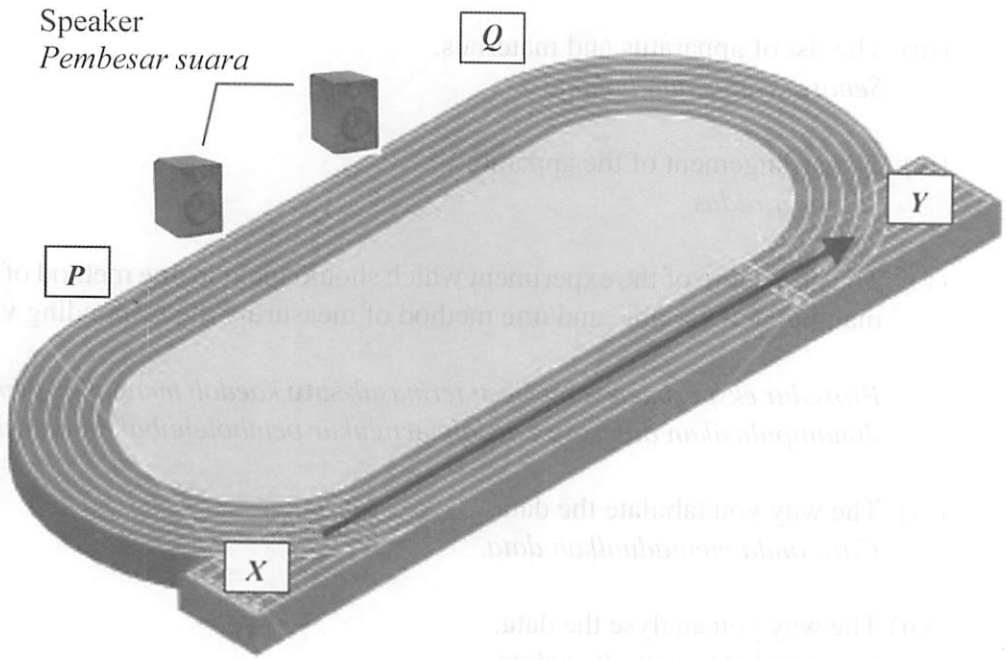


Diagram 4 / *Rajah* 4

Based on the information and observation:
Berdasarkan maklumat dan pemerhatian tersebut:

(a) State **one** suitable inference. [1 mark/*markah*]
Nyatakan **satu** *inferens yang sesuai.*

(b) State **one** hypothesis that could be investigate. [1 mark/*markah*]
Nyatakan **satu** *hipotesis yang sesuai.*

(c) With the use of apparatus such as audio signal generator, speaker and other apparatus, describe an experiment to investigate the hypothesis stated in 4(b)

Dengan menggunakan radas seperti penjana isyarat audio, pembesar suara dan radas lain, terangkan satu eksperiment untuk menyiasat hipotesis yang dinyatakan di 4(b).

In your description, state clearly the following:
Dalam penerangan anda, jelaskan perkara berikut:

(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 manipulated variable and **one** method of measuring the responding variable.

Presedur eksperimen yang mesti termasuk **satu** *kaedah mengawal pembolehubah dimanipulasikan dan* **satu** *kaedah mengukur pembolehubah bergerak balas.*

(vi) The way you tabulate the data.
Cara anda menjadualkan data.

(vii) The way you analyse the data.
Cara anda menganalisis data.

[10 marks/*markah*]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consist 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 anda bagi **Bahagian A** hendaklah ditulis pada ruang yang disediakan dalam kertas soalan ini.*

3. Answer **one** question from **Section B**. Write your answers for **Section B** on the extra answer sheets. You may use equations, diagrams, tables, graphs and other suitable methods to explain your answers.
*Jawab **satu** soalan daripada **Bahagian B**. Jawapan anda bagi **Bahagian B** hendaklah ditulis dalam helaian jawapan tambahan. Anda boleh menggunakan persamaan, rajah, jadual, graf dan cara lain yang sesuai untuk menjelaskan jawapan anda.*

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

5. If you wish to change your answer, cross out the answer that you have done. Then write down the new answer.
Jika anda hendak menukar sesuatu jawapan, batalkan jawapan yang telah dibuat. Kemudian tulis jawapan yang baru.

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

7. The 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. You are advised to spend 60 minutes to answer questions in **Section A** and 30 minutes for **Section B**.
*Anda dinasihati supaya mengambil masa 60 minit untuk menjawab soalan dalam **Bahagian A** dan 30 minit untuk **Bahagian B**.*

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

PEPERIKSAAN PERCUBAAN BERSAMA SIJIL PELAJARAN MALAYSIA 2011

ANJURAN

MAJLIS PENGETUA
SEKOLAH MALAYSIA
(MPSM)
CAWANGAN PERLIS

PHYSICS

PERATURAN PEMARKAHAN

Peraturan pemarkahan ini mengandungi 13 halaman bercetak

PAPER 1

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

PAPER 2

Section A

NO	MARKING CRITERIA	MARK	
		SUB	TOTAL
1 (a)	Length	1	
(b)(i)	0.9 cm	1	
(ii)	Vernier calipers//Micrometer screw Gauge	1	
(c)	Parallax error	1	4
2 (a)	The rate of change of momentum	1	
(b)(i)	Diagram 2.2(b)	1	
(ii)	Time of impact on sponge greater than on wood	1	
(c)	$\frac{0.35(15-0)}{0.2}$	1	
	26.25 N	1	5
3(a)(i)	Radioactive material	1	
(ii)	It causes ionization of atoms in the cells of our body organ // kill our cells	1	
(iii)	A thick enough layer of lead will prevent any radiation from escaping into the surroundings	1	
(iv)	Use tongs when moving // picking it up	1	
(d)	7.5 hours	2	6

PEPERIKSAAN PERCUBAAN BERSAMA
SIJIL PELAJARAN MALAYSIA 2011

ANJURAN

MAJLIS PENGETUA
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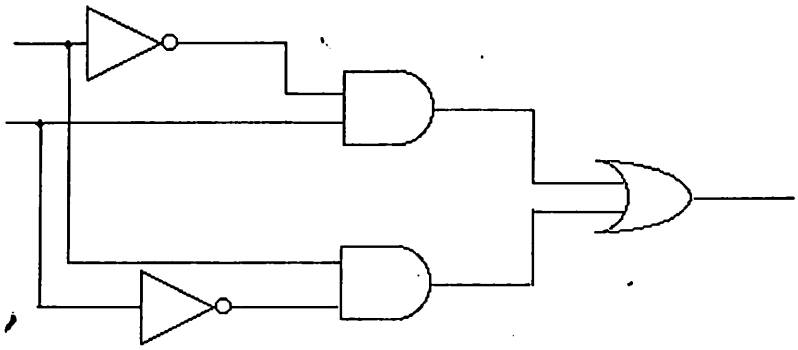
(MPSM)
CAWANGAN PERLIS

PHYSICS

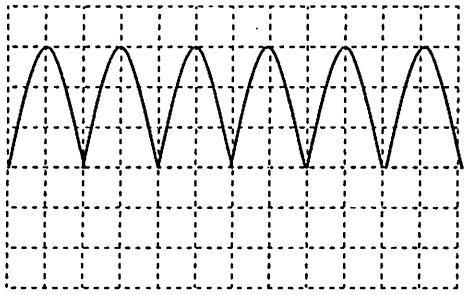
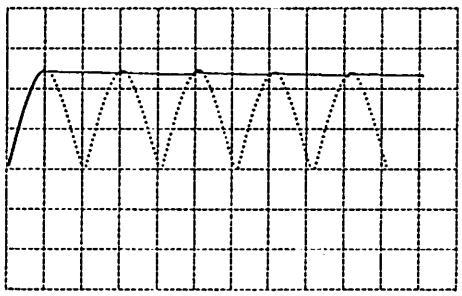
PERATURAN PEMARKAHAN

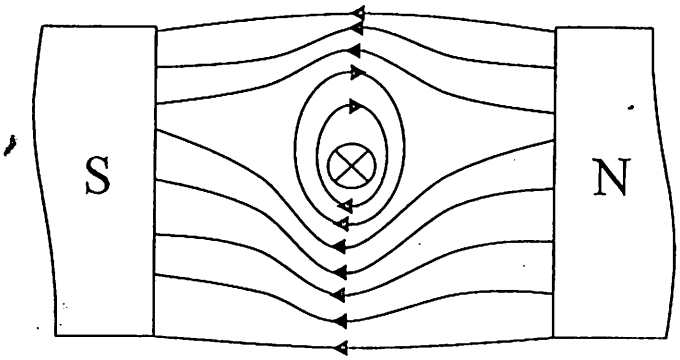
Peraturan pemarkahan ini mengandungi 13 halaman bercetak

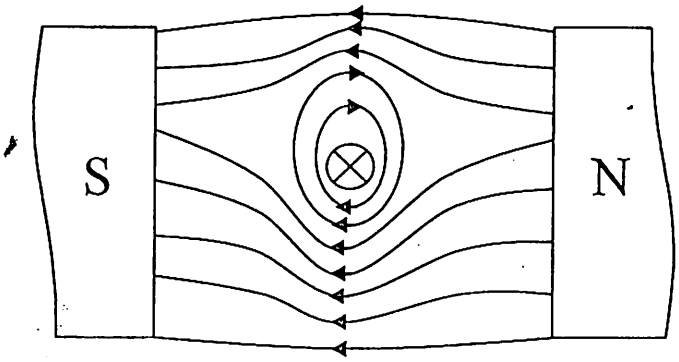
NO	MARKING CRITERIA	MARK	
		SUB	TOTAL
4(a)(i)	Speed of light is higher in air	1	
(ii)	The light ray will bend more towards the normal	1	
(iii)	refraction	1	
(b)	$\frac{15}{11}$	1	
	1.36	1	
(c)(i)	Distance from the base of the beaker decrease	1	
(ii)	Apparent depth increase	1	7
5 (a)	A condition in which there is no net heat flow between two objects that are in thermal contact with each other.	1	
(b)(i)	Temperature of glass in diagram 5.2 is lower than temperature of glass in diagram 5.1.	1	
(ii)	Temperature of surrounding is higher than the temperature of glass.	1	
(c)(i)	Condensation of water vapour // condensation.	1	
(ii)	Temperature of the glass is lower than the temperature of surrounding. Water vapour outside the glass condensed at the surface of the glass.	1 1	
(d)	Heated the windscreen // turn on the air conditioner. The temperature of the windscreen higher than the temperature of water vapour inside the car // temperature inside the car lower than temperature outside the car/windscreen.	1 1	8
6 (a)	Ohm's law states that the current flowing through an ohmic conductor is directly proportional to the potential difference across its ends provided that its temperature and the other physical conditions remain constant.	1	
(b)(i)	Same	1	
(ii)	Z is brighter than Y	1	
(iii)	Same	1	
(c)(i)	P: Ammeter Q: Voltmeter	1 1	
(ii)	$R_T = \frac{10x5}{10+5} + 5$	1	
	1.44 A	1	8

NO	MARKING CRITERIA	MARK SUB	MARK TOTAL
7(a)(i)		2	
(ii)			

A	B	X	Y	Z
0	0	0	0	**0**
0	1	1	0	**1**
1	0	0	1	**1**
1	1	0	0	**0**

		2	
(b)(i)	Direct current	1	
(ii)	To smooth the output	1	
(iii)(a)		1	
(b)		1	
(iv)	The charging of the capacitor by the power supply and the discharging of the capacitor through the resistor will smooth the output	2	**10**

NO	MARKING CRITERIA	MARK SUB	MARK TOTAL
8(a)(i)	Move upwards	1	
(ii)	Fleming's Left-Hand Rule	1	
(iii)			
	Direction of magnectic field of permanent magnet from north to south	1	
	Direction of magnectic field of straigth wire, clockwise	1	
	Correct pattern	1	
(iv)	Use strong magnet/increasing the strength of the magnetic field // increasing the current.	1	
(b)(i)	Turning force / force increases	1	
	Speed of the motor increases	1	
(ii)	Increasing the number of turns in the coil	1	
	Increasing the strength of the permanent magnet	1	
(iii)	The coil not moving	1	
	The current always change direction.	1	12

NO	MARKING CRITERIA	MARK	
		SUB	TOTAL
8(a)(i)	Move upwards	1	
(ii)	Fleming's Left-Hand Rule	1	
(iii)			
	Direction of magnectic field of permanent magnet from north to south	1	
	Direction of magnectic field of straigth wire, clockwise	1	
	Correct pattern	1	
(iv)	Use strong magnet/increasing the strength of the magnetic field // increasing the current.	1	
(b)(i)	Turning force / force increases	1	
	Speed of the motor increases	1	
(ii)	Increasing the number of turns in the coil	1	
	Increasing the strength of the permanent magnet	1	
(iii)	The coil not moving	1	
	The current always change direction.	1	12

SECTION B

NO	MARKING CRITERIA	MARK SUB	MARK TOTAL
9(a)	Product of mass and velocity / /momentum = mass x velocity	1	1
(b)	Total momentum = 0	1	
	Total momentum before the bullet is fired = total momentum after the bullet is fired.	1	
	Magnitude of the momentum of the bullet and mortar are equal	1	
	Direction of the momentum of the bullet and mortar correctly are opposite.	1	
	Principle of Conservation of Momentum	1	5
(c)	Figure 9.3	1	
	The small tanks with distributed mass	1	
	will have smaller inertia	1	
	This greatly reduces the inertia impact if the tanker stops suddenly	1	4
(d)	Type of brakes - using ABS	1	
	Prevent wheel lock for safer braking.	1	
	The number of tyres - more tyres	1	
	Can withstand strong pressure because the base area is large	1	
	The size of the tanks - split the tanks becomes small compartment	1	
	Smaller inertia // reduces the inertial impact	1	
	The material for making the tanks – did not react with petroleum.	1	
	Avoid from licking // long lasting.	1	
	Distance between the trailer and the tractor - far / further	1	
	Ensure that the trailer will not collide with the tractor	1	10
			20

NO	MARKING CRITERIA	MARK SUB	MARK TOTAL
10(a)(i)	Electric field is the region around an electric charge (or a charged object) in which other electric charges (or charged objects) are subjected to forces of either attraction or repulsion.	1	1
(ii)	▪ The shape of the flame is spread out in diagram 10.1(b)	1	
	▪ The portion of flame of one side is bigger than the other side	1	
	▪ The air surrounding the flame is ionized with positive and negative ions in diagram 10.1(b)	1	
	▪ Negative ions are attracted towards positive plate P. Positive ions are attracted towards negative plate Q.	1	
	▪ The movement of the ions towards the plates P and Q caused the flame to spread out.	1	5
(b)(i)	It indicates that it will use 36 joules of energy per second when it is connected to a 240 V power supply.	1	
(ii)	Water heater.	1	
	Because it has the highest power rating.	1	
(iii)	By switching on the television only when it is necessary // do not let the television running without watching it // buys television with lower rating power.	1	4
(c)(i)	All connections must be connected in parallel from the main supply.	1	
	Each unit can be switched on and off separately.	1	
	The main fuse used is at least 30A.	1	
	Able to carry all the current for all of the appliances if switched on simultaneously.	1	
	or the main supply goes into a fuse box which has several lower rated fuses connected in parallel.		
	A 2 m copper rod is buried in the ground and is connected to the earth wire.	1	
	All electrical appliances (electric equipment) must be earthed for safety reasons in case of a leak or short circuit.	1	
	Air conditioners and water heaters are high power equipment. They must be connected to a separate wire passing through a separately fuse in the fuse box.	1	
	Connecting in parallel enable to be switched on and off separately.	1	
	All the lamps are connected in parallel.	1	
	Need to be switched on and off separately.	1	10
			20

SECTION C

NO		MARKING CRITERIA	MARK SUB	MARK TOTAL
11	(a)	Perpendicular force per unit area acting on a surface // force per unit area.	1	1
	(b)(i)	$A \times h$	1	1
	(ii)	$\rho \times A \times h$ // ρAh // ρV	1	1
	(iii)	ρhAg // ρVg	1	1
	(c)	$P = \frac{\rho hAg}{A}$ // $P = \rho hg$ Unit : kg m^{-3} x m^2 x m s^{-2} kg m^{-1} s^{-2}	1 1 1	3
	(d)	$\frac{3.0 \times 10^5}{1 \times 10^3 \times 10}$	1	
		30 m (with unit)	2	3
	(e)	Size of the tyre is large Prevent backhoe from sinking into soft ground	1 1	2
		Fluids used in hydraulic system is liquid Not easy compress compared to the gases // high power	1 1	
		Large mass Avoid backhoe from moving	1 1	
		Large base area Ensure that the backhoe will not collide	1 1	
		Centre of gravity is low More stable	1 1	
		The most suitable backhoe is *M*. Large tyre, fluids use in hydraulic system is liquid, large mass, large base area and the centre of gravity is low.	1 1	
				20

NO		MARKING CRITERIA	MARK SUB	MARK TOTAL
12	(a)(i)	The production of an electric current in a conductor moving in a magnetic field.	1	1
	(ii)	Magnetic field cut by the moving solenoid. A current is induced in the conductor//solenoid.	1 1	2
	(iii)	The strength of magnetic field // the number of turn on the solenoid // the speed of magnet.	1	1
	(b)	**Number of turns of coil** - The number of turn in secondary coil less than the number of turn in primary coil - The mobile phone must use the low voltage for charging.	1 1	
		Types of the core - Soft iron core - Easily magnetised and demagnetised	1 1	
		Connection of terminal of secondary coil to mobile phone - Connecting with diode - Mobile phone must charging using direct current.	1 1	
		Shape of core - Using single core // not separated. - More magnetic field will be cut by secondary coil.	1 1	
		State most suitable choice of transformer and justification correctly - Transformer Z - Number of turn in secondary coil less than primary coil, use soft iron core, connecting secondary coil to mobile phone with diode and using single core.	1 1	10
	(c)(i)	$\frac{12 \times 400}{240}$	1	
		20	1	2
	(ii)	$\frac{24}{12}$	1	
		2 A (with correct unit)	1	2
	(iii)	$\frac{24}{240}$	1	
		0.1 A (with correct unit)	1	2
				20

PEPERIKSAAN PERCUBAAN BERSAMA
SIJIL PELAJARAN MALAYSIA 2011

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CAWANGAN PERLIS

PHYSICS

PERATURAN PEMARKAHAN

Peraturan pemarkahan ini mengandungi 13 halaman bercetak

PAPER 3

SECTION A

<table>
<tr><th>NO</th><th>MARKING CRITERIA</th><th colspan="2">MARK</th></tr>
<tr><th></th><th></th><th>SUB</th><th>TOTAL</th></tr>
<tr><td>1(a)(i)</td><td>Angle of incidence / i</td><td>1</td><td>1</td></tr>
<tr><td>(ii)</td><td>Angle of refraction / r</td><td>1</td><td>1</td></tr>
<tr><td>(iii)</td><td>Refractive index</td><td>1</td><td>1</td></tr>
<tr><td>(b)</td><td>State the values of sin i correctly
Diagram 1.2 : 0.2588
Diagram 1.3 : 0.5000
Diagram 1.4 : 0.7071
Diagram 1.5 : 0.8660
Diagram 1.6 : 0.9659
Note : All 5 values correct - 1 marks
3 or 4 values correct - 0 mark</td><td>1</td><td></td></tr>
<tr><td></td><td>Record the readings of r correctly
Diagram 1.2 : 11°
Diagram 1.3 : 20°
Diagram 1.4 : 29°
Diagram 1.5 : 36°
Diagram 1.6 : 41°
Note : All 5 values correct - 2 marks
3 or 4 values correct - 1 mark</td><td>2</td><td></td></tr>
<tr><td></td><td>State the values of sin r correctly
Diagram 1.2 : 0.1908
Diagram 1.3 : 0.3420
Diagram 1.4 : 0.4848
Diagram 1.5 : 0.5878
Diagram 1.6 : 0.6561
Note : All 5 values correct - 2 marks
3 or 4 values correct - 1 mark</td><td>2</td><td>5</td></tr>
<tr><td>(c)</td><td>
<table>
<tr><th>i</th><th>sin i</th><th>r</th><th>sin r</th></tr>
<tr><td>15°</td><td>0.2588</td><td>11°</td><td>0.1908</td></tr>
<tr><td>30°</td><td>0.5000</td><td>20°</td><td>0.3420</td></tr>
<tr><td>45°</td><td>0.7071</td><td>29°</td><td>0.4848</td></tr>
<tr><td>60°</td><td>0.8660</td><td>36°</td><td>0.5878</td></tr>
<tr><td>75°</td><td>0.9659</td><td>41°</td><td>0.6561</td></tr>
</table>
</td><td>1
1</td><td>2</td></tr>
</table>

NO	MARKING CRITERIA	MARK	
		SUB	TOTAL
(d)	sin i at the y-axis, sin r at the x-axis	1	
	Uniform scale at both axes	1	
	5 points plotted correctly	2	
	Note: 4 points plotted correctly award 1 mark		
	Straight line of best fit is drawn	1	5
(e)	sin i is directly proportional to sin r.	1	1
			16

NO	MARKING CRITERIA	MARK	
		SUB	TOTAL
2(a)(i)	P is directly proportional to h.	1	1
(ii)	Draws the interpolation line from $P = 7$ N m^{-2} to the graph and from the graph to the h - axis	1	
	$h = 0.6$ m (with correct unit)	1	2
(iii)	Draw large triangle	1	
	Showing the correct calculation	1	
	$k = 11.67$ N m^{-3} (with correct unit)	1	3
(b)(i)	$\frac{k^*}{10}$	1	
	$d = 1.167$ // 1.17	1	
	Correct unit : kg m^{-3}	1	3
(c)(i)	Decrease	1	1
(ii)	Density, d of distilled water less than sea water	1	
	Value of k (gradient) decrease as g constant.	1	2
			12

SECTION B

NO	MARKING CRITERIA	MARK SUB	MARK TOTAL
3(a)	Volume depends on pressure // pressure influences volume	1	1
(b)	When the pressure decrease, the volume increase. // When the volume decrease , the pressure increase	1	1
(c)(i)	To investigate the relationship between volume and pressure	1	
(ii)	Manipulated variable : Volume Responding variable : Pressure	1	
	Fixed variable : mass of gas // temperature	1	
(iii)	*List of appropriate apparatus and material* Syringe, clip , thick rubber tube, Bourdon gauge.	1	
(iv)	*Describing set up of the apparatus* Draws a labeled and functional diagram of the set up of the apparatus	1	
(v)	*State how the manipulated variable is controlled* The piston of the syringe is pushed in until the enclosed volume is 98 cm^3	1	
	State how the responding variable is measured The pressure on the Bourdon gauge is recorded.	1	
	State how the procedure is repeated to obtain at least 5 sets of results The steps is repeated for an enclosed volume, V = 96cm^3, 94cm^3, 92 cm^3 and 90cm^3/V_5	1	
(vi)	*Tabulating data*	1	
(vii)	*Analysing data* The graph of pressure against volume is drawn	1	10
	Note : Mark accordingly if the manipulated variable is pressure and responding variable is volume.		12

V / cm^3	Pressure / N m^{-2}
90	
92	
94	
96	
98	

NO	MARKING CRITERIA	MARK SUB	MARK TOTAL
4(a)	The distance between loud or soft sound depends on the distance between 2 loud speaker.	1	1
(b)	When the distance between two coherent sources of sound is increase, the distance between two consecutive constructive // destructive interference is decrease.	1	1
(c)(i)	To investigate the relationship between two coherent sources and the distance between two consecutive constructive // destructive interference.	1	
(ii)	Manipulated variable : Distance between two coherent sources, a Responding variable : Distance between two consecutive constructive // destructive interference, x	1	
	Fixed variable : Distance from the coherent sources, D.	1	
(iii)	*List of appropriate apparatus and material* Loud speaker, audio signal generator, connection wire, power supply, measuring tape.	1	
(iv)	*State a functional arrangement of the apparatus* Draws a labeled and functional diagram of the set up of the apparatus.	1	
(v)	*State how the manipulated variable is controlled* Set up the distance between two loud speaker, a = 1.0 m.	1	
	State how the responding variable is measured Measured the distance between two successive loud regions, x using measuring tape	1	
	State how the procedure is repeated to obtain at least 5 sets of results Repeat the experiment with a = 2.0 m, 3.0 m, 4.0 m and 5.0 m.	1	
(vi)	*Tabulating data*	1	
(vii)	*Analysing data* The graph of x against a is drawn	1	10
			12

a / m	x / m
1.0	
2.0	
3.0	
4.0	
5.0	

PERATURAN PEMARKAHAN TAMAT