SULIT
4531/1
PHYSICS
Paper 1
August
2010
$1\frac{1}{4}$ jam

JABATAN PELAJARAN NEGERI TERENGGANU

PEPERIKSAAN PERCUBAAN SIJIL PELAJARAN MALAYSIA 2010

PHYSICS

PAPER 1

1 Hour 15 minutes

DO NOT OPEN THIS BOOKLET UNTIL YOU HAVE BEEN TOLD TO DO SO

All candidates are advised to refer to the given information on page 2.

Disediakan oleh:
AKRAM NEGERI TERENGGANU

Dibiayai oleh:
KERAJAAN NEGERI TERENGGANU

TERENGGANU ANJUNG ILMU

Dicetak oleh:
Percetakan Yayasan Islam Terengganu Sdn. Bhd.
Tel: 609-666 8611/6652/8601 Faks: 609-666 0611/0063

Kertas soalan ini mengandungi 30 halaman bercetak

MAKLUMAT UNTUK CALON

1. *Kertas soalan ini mengandungi 50 soalan.*

2. *Jawab* **semua** *soalan.*

3. *Jawab dengan menghitamkan ruangan yang betul pada kertas jawapan.*

4. *Bagi setiap soalan hitamkan satu ruangan sahaja.*

5. *Sekiranya anda hendak menukarkan jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.*

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

7. *Senarai rumus disediakan di halaman 3.*

8. *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.*

INFORMATION FOR CANDIDATES

1. *This question paper consists of 50 questions.*
2. *Answer* ***all*** *questions.*
3. *Answer each question by blackening the correct space on the answer sheet.*
4. *Blacken only* ***one*** *space for each question.*
5. *If you wish to change your answer, erase the blackened mark that you have made. Then blacken the space for the new answer.*
6. *The diagrams in the question provided are not drawn to scale unless stated.*
7. *You may use a non-programmable scientific calculator.*
8. *A list of formula is provided on page 5.*

Maklumat berikut mungkin berfaedah. Simbol-simbol mempunyai makna yang biasa.

1. $a = \frac{v-u}{t}$

2. Momentum = mv

3. $F = ma$

4. Gravitational potential energy = mgh

5. $\rho = \frac{m}{v}$

6. Pressure, $p = \frac{F}{A}$

7. Pressure, $p = h\rho g$

8. Heat, $Q = mc\theta$

9. $\frac{pV}{T}$ = constant

10. $E = mc^2$

11. $v = f\lambda$

12. $\lambda = \frac{ax}{d}$

13. $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$

14. $n = \frac{\sin i}{\sin r}$

15. $V = IR$

16. $g = 10 \text{ m s}^{-2}$

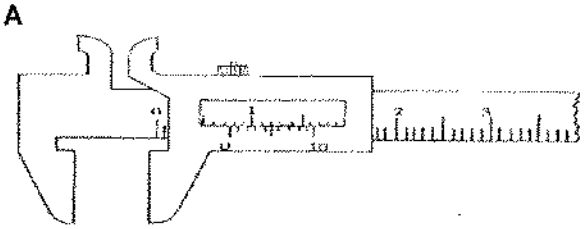
1 Which of the following is a unit for a derived quantity?
Antara yang berikut, manakah unit bagi kuantiti terbitan?

A Watt,W
B Metre, m
C Ampere, A
D Kilogram, kg

2 Diagram shows a beaker
Rajah menunjukkan sebuah bikar

Which of the measuring instruments is suitable for measuring internal diameter of the beaker?
Alat pengukur yang manakah sesuai untuk mengukur diameter dalam bikar itu?

A



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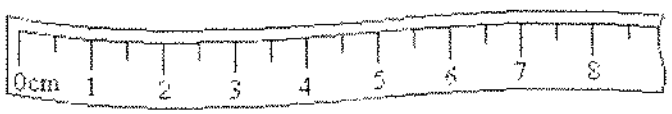

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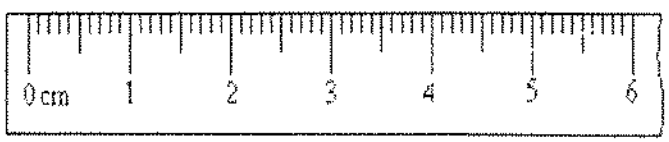

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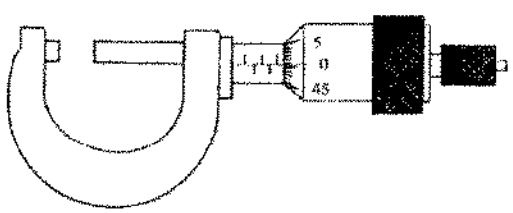
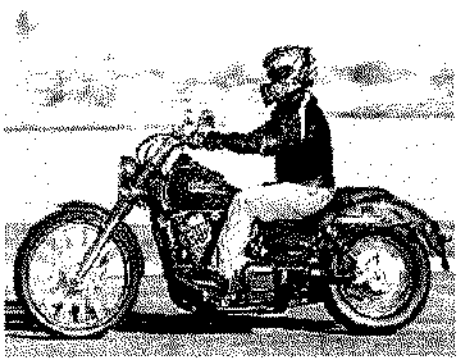


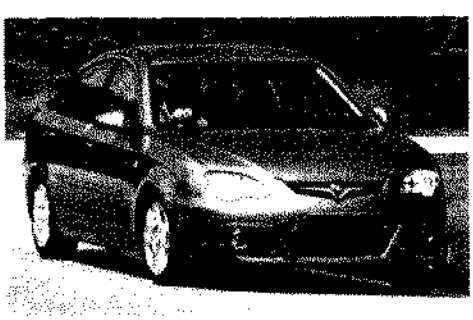
3 Which quantity is a scalar quantity ?
Kuantiti manakah adalah kuantiti skalar ?

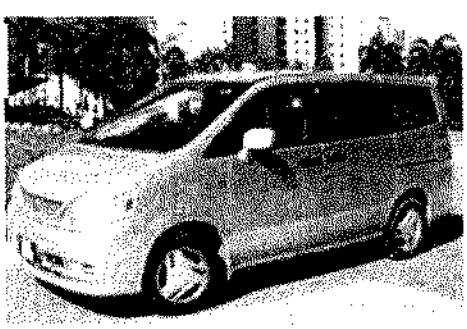
A Force
Daya
B Density
Ketumpatan
C Momentum
Momentum
D Acceleration
Pecutan

4 Which vehicle has the smallest inertia?
Kenderaan manakah mempunyai inersia yang paling kecil?

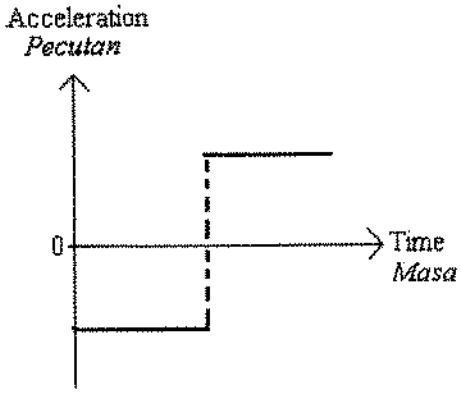
A 

B 

C 

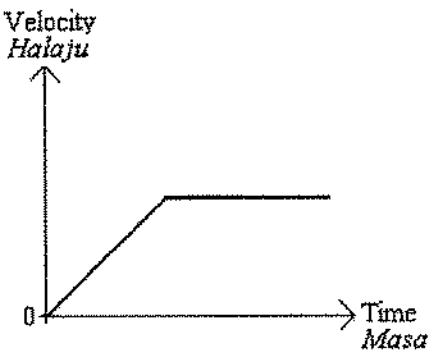
D 

5 Diagram shows the acceleration – time graph for a motion of an object.
Rajah menunjukkan graf pecutan – masa bagi gerakan suatu objek.



Which velocity-time graph represents the motion of the object?
Graf halaju-masa yang manakah mewakili gerakan objek itu?

A



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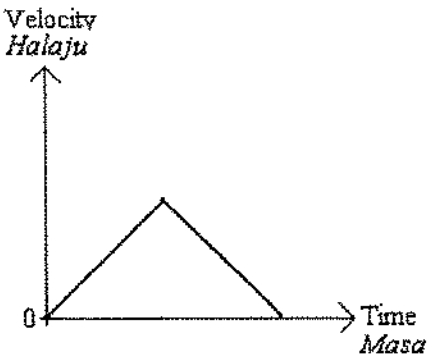

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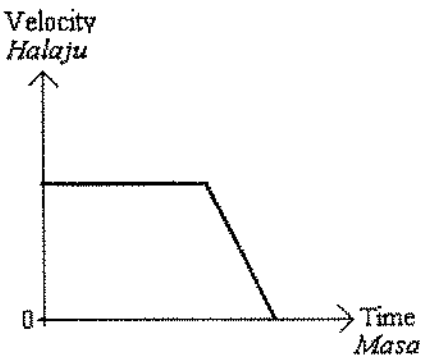

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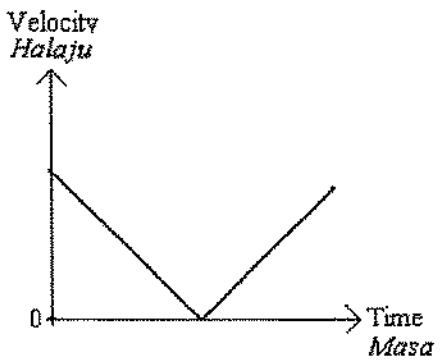
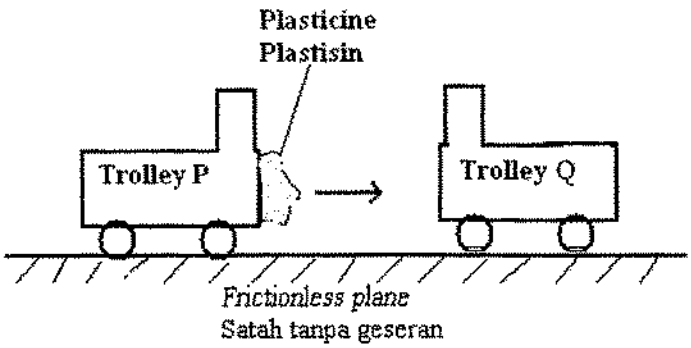


6 Diagram shows two trolleys, P and Q on a frictionless plane. Trolley P moves and collides with the stationary trolley Q.
Rajah menunjukkan dua troli, P dan Q di atas satah tanpa geseran. Troli P bergerak dan melanggar troli Q yang pegun.



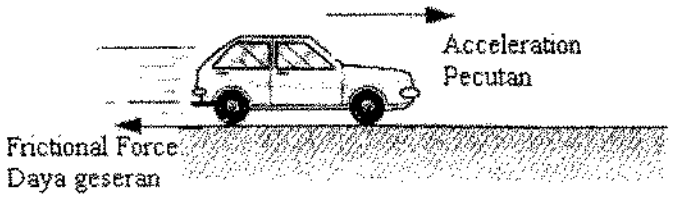
Which of the following statement about the total momentum and the total kinetic energy of both trolleys after collision is true?
Pernyataan yang manakah benar tentang jumlah momentum dan jumlah tenaga kinetic bagi kedua-dua troli selepas perlanggaran?

	Total Momentum ***Jumlah Momentum***	**Total Kinetic energy** ***Jumlah tenaga kinetik***
A	Increases *Bertambah*	Decreases *Berkurang*
B	Decreases *Berkurang*	Unchanged *Tidak berubah*
C	Unchanged *Tidak berubah*	Decreases *Berkurang*
D	Unchanged *Tidak berubah*	Unchanged *Tidak berubah*

7 Impulse can be defined as the change in momentum. The unit for impulse is
Impuls boleh ditakrifkan sebagai perubahan momentum. Unit bagi impuls ialah

A N
B $N\ s^{-1}$
C $kg\ m\ s^{-1}$
D $kg\ m\ s^{-2}$

8 Diagram shows a car with a mass 1 200 kg moving with an acceleration of 2.5 m s^{-2}. There is a force of 3 800 N exerted by the engine of the car.
Rajah menunjukkan sebuah kereta berjisim 1 200 kg sedang bergerak dengan pecutan 2.5 m s^{-2}. Daya yang dikenakan oleh enjin kereta itu ialah 3 800 N.



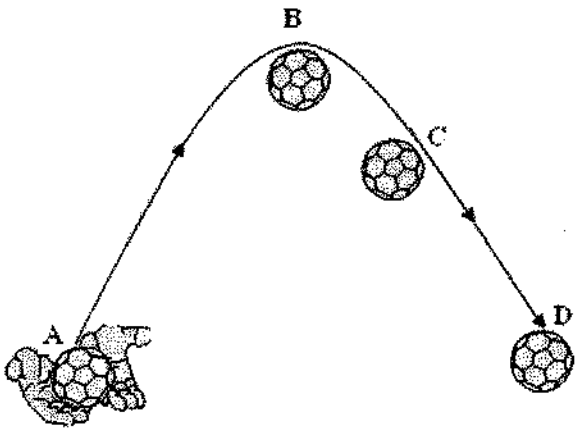
What is the frictional force acting on the car ?
Berapakah daya geseran yang bertindak ke atas kereta itu?

A 9 500 N
B 3 800 N
C 3 000 N
D 800 N

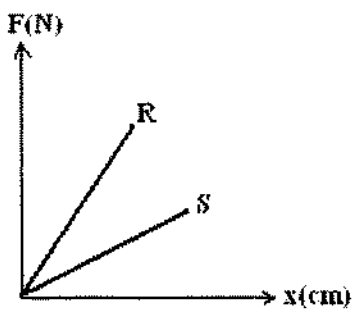
9 Which of the following phenomena experiences forces in equilibrium?
Antara berikut, fenomena manakah mengalami daya-daya dalam keseimbangan?

A A rocket accelerates upwards
Sebuah roket memecut ke atas
B A durian falling from a tree
Sebiji buah durian jatuh dari pokok
C A ship floating at rest in the sea
Sebuah kapal terapung pegun di laut
D A car descending a hill at an increasing velocity
Sebuah kereta menuruni bukit dengan halaju bertambah

10 Diagram shows a ball is thrown upwards achieved a maximum height before changing its direction and falls. At which position **A, B, C** or **D** does the ball have minimum kinetic energy?
*Rajah menunjukkan sebiji bola dilontar ke atas mencapai tinggi maksimum sebelum menukar arahnya dan jatuh. Antara **A, B, C** dan **D**, di kedudukan manakah bola itu mempunyai tenaga kinetik yang minimum?*



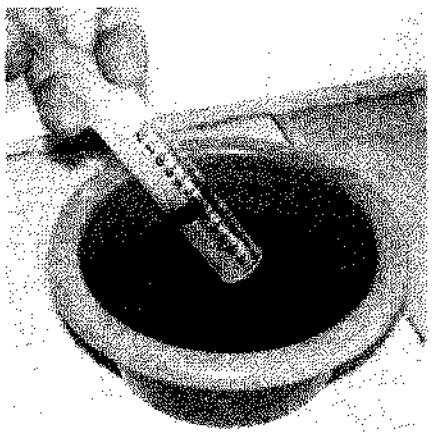
11 Diagram shows a graph of stretching force, F against extension, x for spring R and S. Both spring are made of same material and have the same thickness.
Rajah menunjukkan graf daya regangan, F melawan pemanjangan, x bagi spring R dan S. Kedua-dua spring dibuat dari bahan yang sama dan mempunyai ketebalan yang sama.



Which of the following statements about spring S and spring R is correct?
Pernyataan berikut yang manakah benar mengenai spring S dan spring R?

A Spring S has a greater diameter of wire of spring than spring R
Spring S mempunyai diameter dawai spring yang lebih besar daripada spring R
B Spring S has a smaller coil diameter than spring R
Spring S mempunyai diameter gelung yang lebih kecil daripada spring R
C Spring S has a smaller stiffness than spring R
Spring S mempunyai kekerasan lebih kecil daripada spring R
D Spring S has a larger force constant, k than spring R
Spring S mempunyai pemalar daya, k yang lebih besar daripada spring R

12 Diagram shows a syringe is used to suck a little water from a basin.
Rajah menunjukkan sebuah picagari digunakan untuk menyedut sedikit air dari sebuah basin.



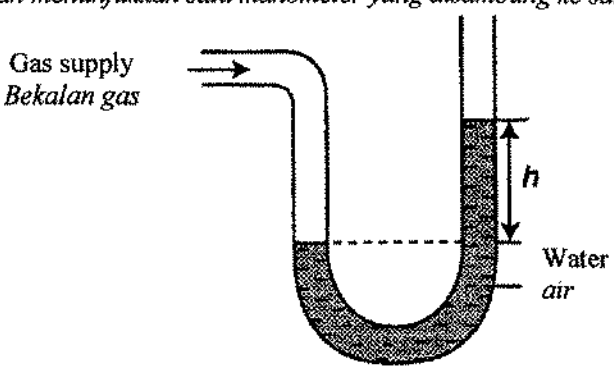
A water in the basin is forced into the cylinder of the syringe because the atmospheric pressure is
Air dari dalam basin ditolak masuk ke dalam silinder picagari kerana tekanan atmosfera

A equal to the pressure inside the syringe
adalah sama dengan tekanan dalam picagari
B less than to the pressure inside the syringe
adalah kurang daripada tekanan dalam picagari
C more than to the pressure inside the syringe
adalah lebih daripada tekanan dalam picagari

13 What is the pressure of sea water at depth 25 m ?
Berapakah tekanan air laut pada kedalaman 25 m?
[Density of sea water = 1 200 kg m^{-3}]
[*Ketumpatan air laut = 1 200 kg* m^{-3}]

A 48 N m^{-2}
B 1225 N m^{-2}
C 30 000 N m^{-2}
D 300 000 N m^{-2}

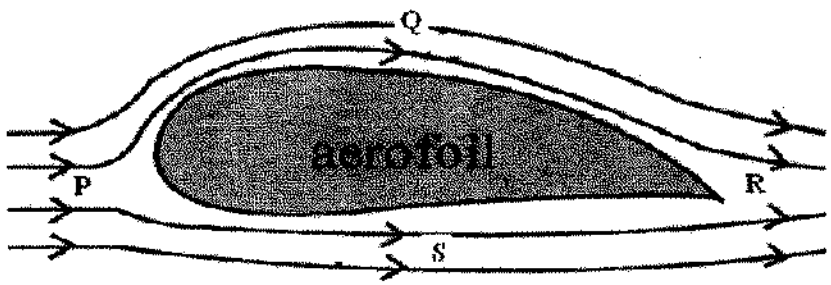
14 Diagram shows a manometer is connected to a gas supply.
Rajah menunjukkan satu manometer yang disambung ke satu bekalan gas.



The difference in height, *h* will increase if
Beza pada ketinggian, h akan bertambah jika

A the pressure of the gas supply is decreased.
tekanan bekalan gas dikurangkan.
B the diameter of the manometer is decreased
diameter bagi manometer dikurangkan
C the water is replaced with a liquid of smaller density
air diganti dengan cecair yang kurang tumpat
D the manometer is placed at a region of higher atmospheric pressure.
Manometer itu diletak pada kawasan yang tekanan atmosfera lebih tinggi.

15 Diagram shows an aerofoil.
Rajah menunjukkan satu aerofoil



Which part of the aerofoil has the highest pressure ?
Bahagian manakah pada aerofoil mempunyai tekanan yang paling tinggi?

A P
B Q
C R
D S

16 Which statement is correct about the upthrust?
Pernyataan manakah yang betul mengenai daya tujah?

A The upthrust is influenced by the density of the object
Daya tujah dipengaruhi oleh ketumpatan objek

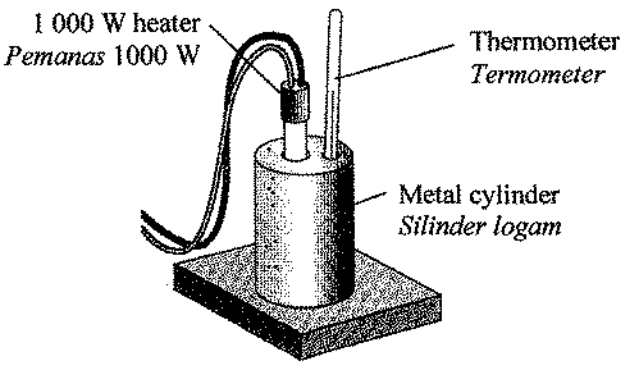
B An object that sinks to the bottom does not experience any upthrust
Objek yang tenggelam ke dasar tidak mengalami sebarang daya tujah

C As the density of the object increases, the upthrust on the object will also increase.
Apabila ketumpatan objek bertambah, daya tujah juga akan bertambah

D An object will float on the surface of the water when the upthrust is same as its weight
Objek akan terapung di permukaan air apabila daya tujah sama dengan berat objek.

17 Diagram shows a metal cylinder of mass 5.0 kg and specific heat capacity 400 J kg^{-1} $°C^{-1}$.

Rajah menunjukkan satu silinder logam berjisim 5.0 kg *dan muatan haba tentu* 400 J kg^{-1} $°C^{-1}$.



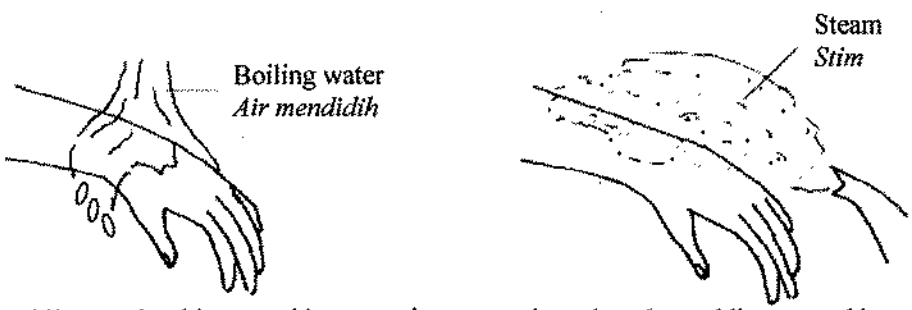
What is the temperature rise of the cylinder 10 seconds after the heater is switched on?

Berapakah kenaikan suhu silinder itu 10 saat selepas pemanas itu dihidupkan?

A 0.20 °C
B 0.80 °C
C 1.25 °C
D 5.00 °C

18 Diagram shows the arm of a person being splashed by boiling water and the arm of another person being exposed to steam. Both the hot water and steam have the same mass.

Rajah menunjukkan tangan seorang disimbah air panas and tangan seorang lain yang terdedah kepada stim. Kedua-dua air panas dan stim mempunyai jisim yang sama.



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

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

Q : steam has more heat content than boiling water
stim mengandungi lebih banyak haba daripada air mendidih

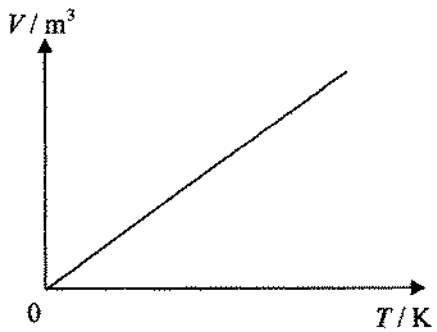
R : steam has a higher specific heat capacity than boiling water
stim mempunyai muatan haba tentu yang lebih tinggi daripada air mendidih

A P only
P *sahaja*
B Q only
Q *sahaja*
C P and Q only
P dan Q sahaja
D P, Q and R
P, Q dan R.

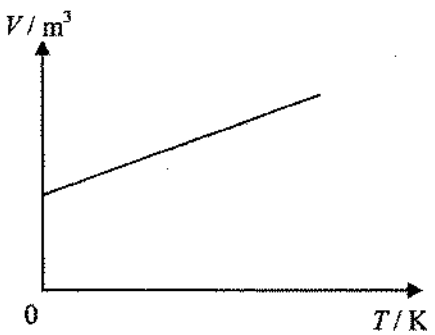
19 Which graph shows the relationship between the volume and absolute temperature of a fixed mass of gas at constant pressure?

Graf yang manakah menunjukkan hubungan antara isipadu dan suhu mutlak bagi satu jisim tetap gas pada tekanan malar?

A



B



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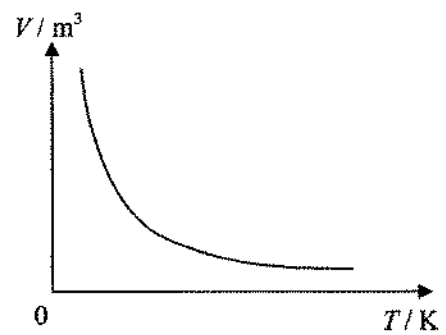

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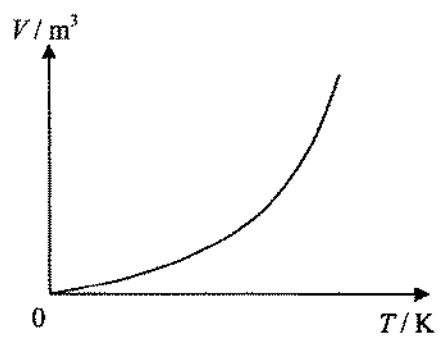


20 The temperature of 5 kg of water rises by 50 ^{0}C when heated. What is the temperature rise when 8 kg of water is heated by the same amount of heat energy?
Suhu bagi 5 kg air meningkat sebanyak 50 ^{0}C apabila dipanaskan. Berapakah peningkatan suhu apabila 8 kg air dipanaskan dengan jumlah tenaga haba yang sama?

A 20.75 ^{0}C
B 31.25 ^{0}C
C 40.00 ^{0}C
D 80.00 ^{0}C

21 More heat energy require to change 1 kg of water at 100 °C to steam than to totally melt 1 kg of ice because

Lebih banyak haba diperlukan antuk menukarkan 1 kg air pada 100 °C kepada stim daripada meleburkan sepenuhnya 1 kg ais kerana

A Specific heat capacity of water higher than specific heat capacity of ice.
Muatan haba tentu air lebih tinggi dari muatan haba tentu ais.

B Specific heat capacity of water lower than specific heat capacity of ice.
Muatan haba tentu air lebih rendah dari muatan haba tentu ais.

C Specific latent heat of vaporisation of water higher than specific latent heat of fusion of ice.
Haba pendam tentu pemgewapan air lebih tinggi dari haba pendam tentu perlakuran ais.

D Specific latent heat of vaporisation of water lower than specific latent heat of fusion of ice.
Haba pendam tentu pemgewapan air lebih rendah dari haba pendam tentu perlakuran ais.

22 A plane mirror is usually used as a rear view mirror of a car because the image formed is
Cermin satah sering digunakan sebagai cermin pandang belakang kerana imej yang terhasil adalah

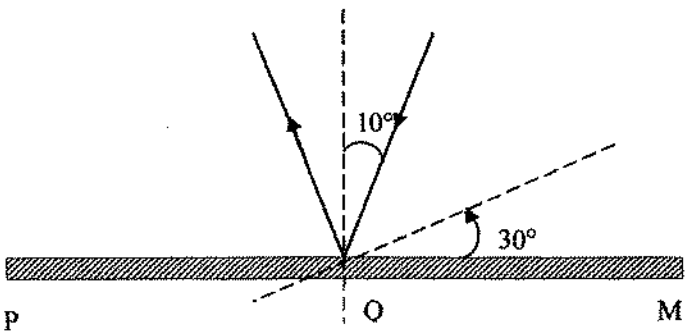
A magnified
dibesarkan

B diminished
mengecil

C real
nyata

D upright
tegak

23 Diagram shows a light ray being incident at an angle of 10° being reflected by a plane mirror PM. The mirror is then rotated anticlockwise through an angle of 30°.
Rajah menunjukkan sinar tuju pada sudut 10° dan dipantulkan oleh cermin satah PM. Cermin itu kemudiannya diputarkan arah lawan jam pada sudut 30°.

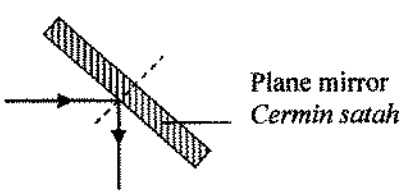


What is the new angle of reflection of this light ray?
Berapah sudut pantulan yang baru bagi sinar ini?

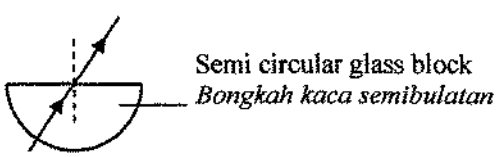
A 10°
B 40°
C 60°
D 80°

24 Which of the following shows the phenomena of total internal reflection?
Fenomena manakah yang menunjukkan pantulan dalam penuh?

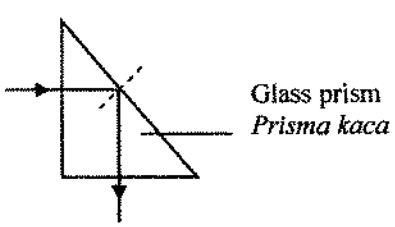
A



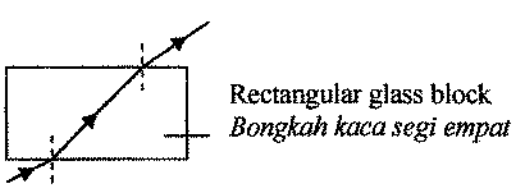
B



C



D

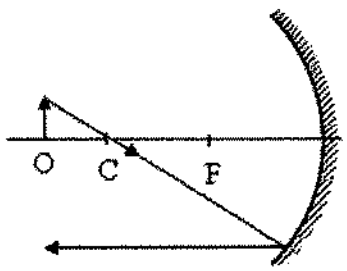


25 The critical angle for a glass-air surface is 38.1°. What is the index of refraction of the glass?
Sudut genting untuk permukaan kaca-udara ialah 38.1°. Apakah indeks biasan kaca tersebut?

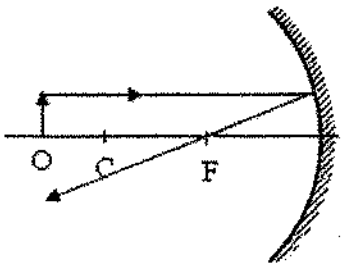
A 2.62
B 1.62
C 1.00
D 0.62

26 Which diagram shows the correct reflection of light by a concave mirror?
Rajah manakah yang menunjukkan pantulan cahaya yang betul oleh sebuah cermin cekung?

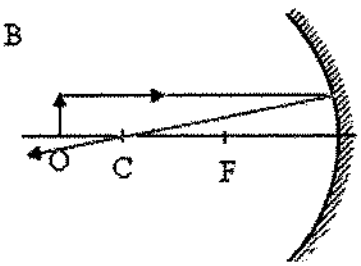
A



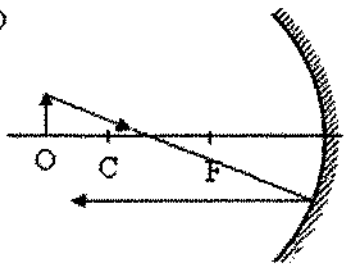
C



B

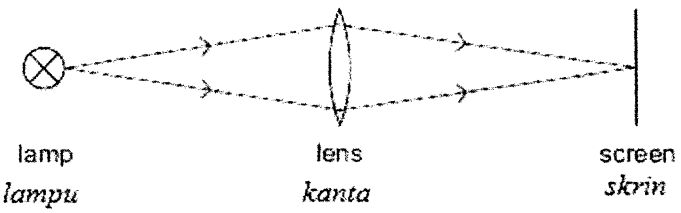


D

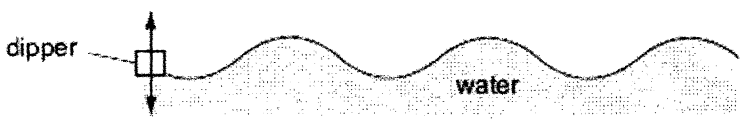


27 Which diagram shows an example of a longitudinal wave ?
Rajah yang manakah menunjukkan contoh gelombang membujur ?

A Light traveling from a lamp to a screen.
Cahaya merambat dari sebuah lampu ke skrin



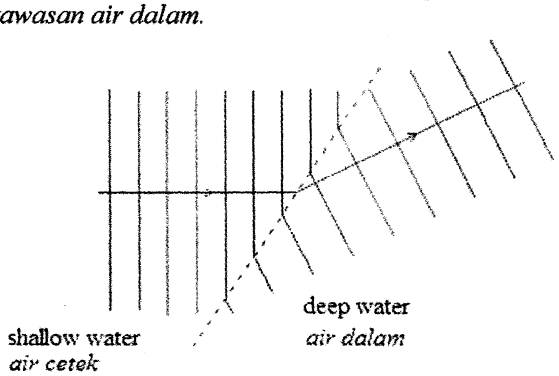
B A water ripple caused by a dipper moving up and down
Riak gelombang air dihasilkan oleh pencelup bergetar atas dan bawah.



C A spring pushed backwards and forwards
Spring digerakkan ke depan dan ke belakang

D A spring pushed up and down
Spring digerakkan ke atas dan ke bawah

28 Diagram shows water waves change direction when they move from shallow water to deep water.
Rajah menunjukkan arah gelombang air berubah apabila merambat dari kawasan air cetek ke kawasan air dalam.



What is the name of this phenomena ?
Apakah nama fenomena ini ?

A refraction
pembiasan

B reflection
pantulan

C diffraction
belauan

D interference
interferens

29 Which of the following statements is best explaining why sound is easily diffracted compared to light?
Manakah pernyataan berikut adalah paling baik menerangkan mengapa bunyi lebih mudah d belau berbanding cahaya?

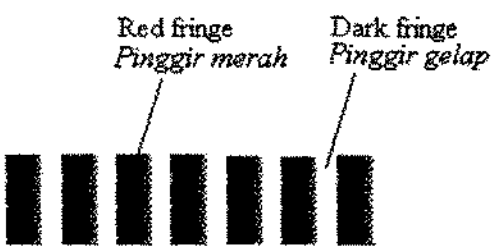
A Sound is a longitudinal wave.
Bunyi ialah gelombang membujur

B The speed of sound is slower than light.
Laju bunyi lebih lambat berbanding cahaya

C Sound needs medium for its propagation.
Bunyi memerlukan medium untuk perambatannya.

D The wavelength of sound is longer than light.
Panjang gelombang bunyi lebih panjang berbanding cahaya.

30 In a Young's double slit experiment using red light, the interference pattern produced on a screen is as shown in Diagram 19.
Dalam satu eksperimen dwicelah Young menggunakan cahaya merah, corak interferens yang terhasil di atas skrin adalah seperti dalam Rajah 19.



When red light is replaced by blue light, which of the fringes pattern is formed on the screen?
Apabila cahaya merah digantikan dengan cahaya biru, corak pinggir yang manakah akan terbentuk di atas skrin?

A

Blue
Biru

B

Blue
Biru

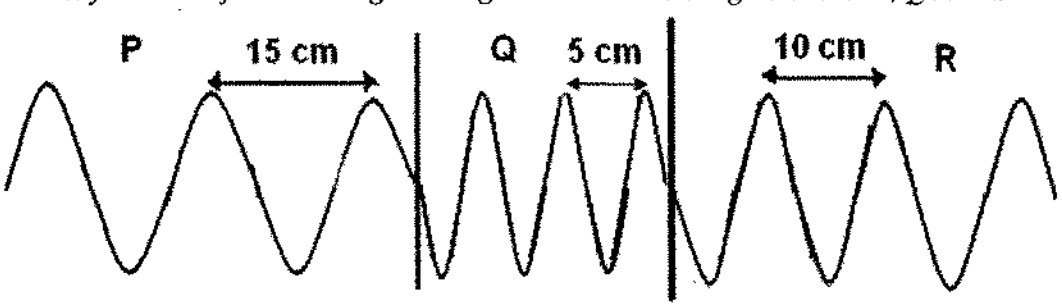
C

Blue
Biru

D

Blue
Biru

31 Diagram shows waves propagating through three regions P , Q and R .
Rajah menunjukkan suatu gelombang merambat melalui tiga kawasan P , Q dan R.



What is the wave speed in region R if the wave speed in region P is 6 m s^{-1} ?
Berapakah laju gelombang dalam kawasan R jika laju suatu gelombang dalam kawasan P ialah 6 m s^{-1}?

A 2 m s^{-1}

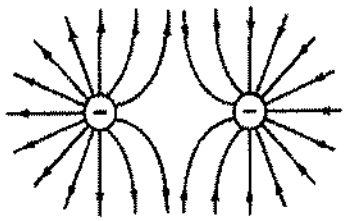
B 4 m s^{-1}

C 6 m s^{-1}

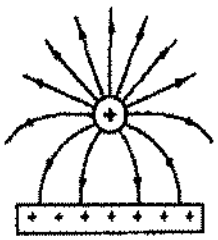
D 9 m s^{-1}

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

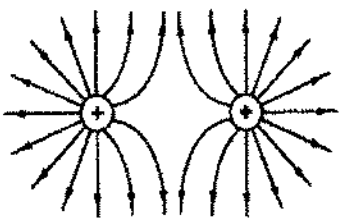
A



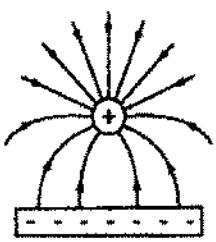
B



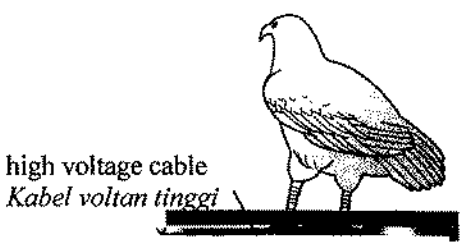
C



D



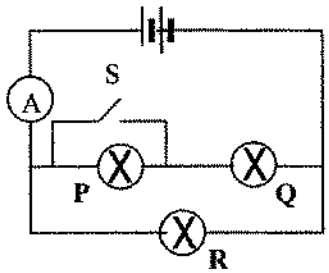
33 Diagram shows an eagle perching on a high voltage cable but it does not experience an electric shock.
Rajah menunjukkan seekor helang sedang hinggap pada kabel elektrik bervoltan tinggi tetapi ia tidak mengalami renjatan elektrik



The eagle does not experience an electric shock because
Burung helang tidak mengalami renjatan elektrik kerana

A the resistance of the cable is high
rintangan kabel adalah tinggi
B the voltage between its legs is low
voltan merentasi kakinya adalah rendah
C the bird is a good electric insulator
burung merupakan insulator elektrik yang baik
D most of the electricity is converted to heat
kebanyakan tenaga elektrik ditukar kepada haba

34 Diagram shows an electric circuit that contains three identical bulbs P, Q and R which are labelled " 6V, 8W ".
Rajah menunjukkan satu litar elektrik yang mempunyai tiga mentol serupa P, Q *dan* R *yang berlabel " 6V, 8W ".*

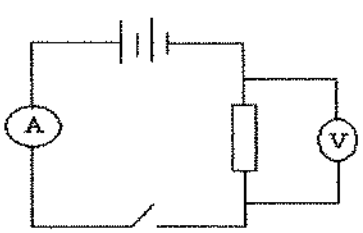


What will happen to the reading of the ammeter and the brightness of the bulb Q when the switch is on?
Apakah yang terjadi pada bacaan ammeter dan keterangan mentol Q *bila suis ditutup?*

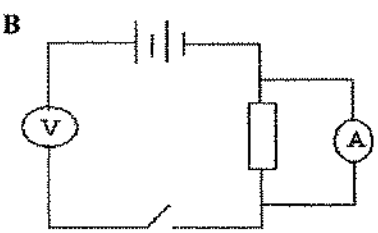
	Reading of the ammeter ***Bacaan ammeter***	**Brightness of the bulb Q** ***Keterangan mentol Q***
A	increase *bertambah*	remain unchanged *tidak berubah*
B	increase *bertambah*	increase *bertambah*
C	Remain unchanged *tidak berubah*	increase *bertambah*
D	Remain unchanged *tidak berubah*	remain unchanged *tidak berubah*

35 Which circuit can be used to determine the electromotive force of a battery?
Litar yang manakah boleh digunakan untuk menentukan daya gerak elektrik sebuah bateri.

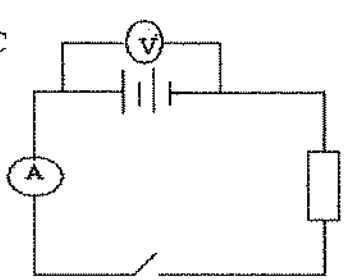
A



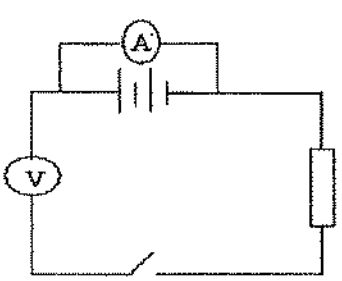
B



C

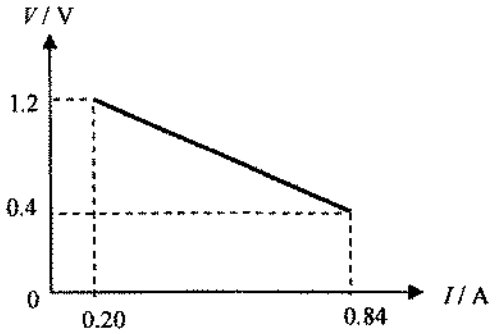


D



36 Diagram shows a graph between the potential difference, *V*, across the terminals of a cell changes with the current, *I*, through the cell.

Rajah menunjukkan graf antara beza keupayaan, V, merentasi terminal sebuah sel berubah dengan arus, I, melalui sel itu



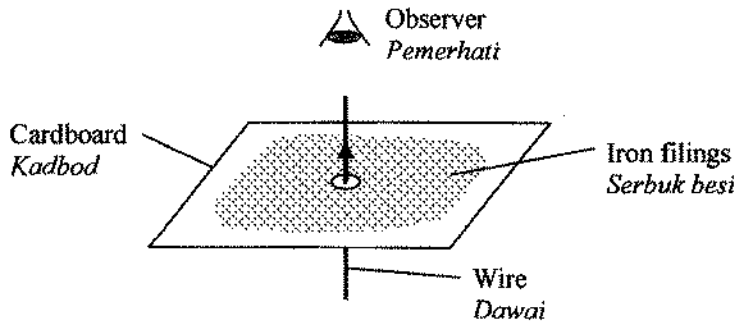
What is the internal resistance of the cell?

Berapakah rintangan dalam sel itu?

A 0.80 Ω
B 1.16 Ω
C 1.25 Ω
D 1.43 Ω

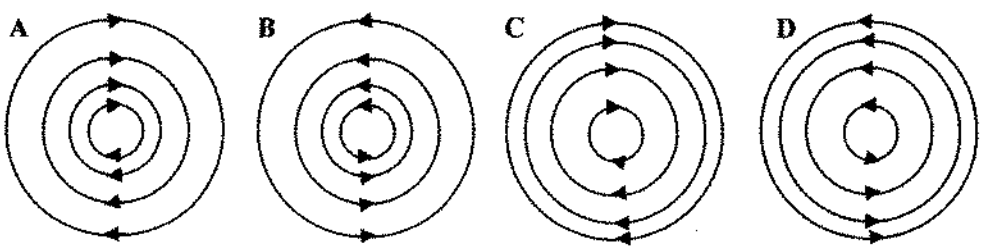
37 Diagram shows the set up of the apparatus to study the pattern of the magnetic field produced by the current in a straight wire

Rajah menunjukkan susunan radas bagi mengkaji pola medan magnet yang dihasilkan oleh arus yang mengalir dalam satu dawai lurus.

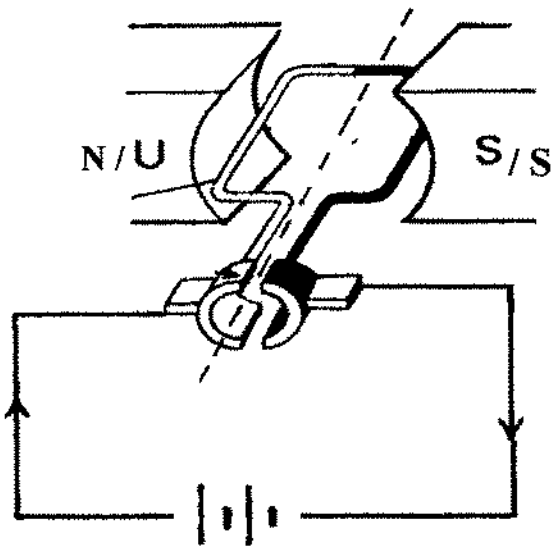


Which diagram shows the correct pattern and direction of the magnetic field that will be seen by the observer?

Rajah manakah menunjukkan pola serta arah yang betul bagi medan magnet yang akan dilihat oleh pemerhati itu?

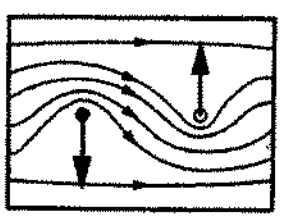


38 Diagram shows current carrying coil in a magnetic fields.
Rajah menunjukkan gegelung membawa arus dalam medan magnet

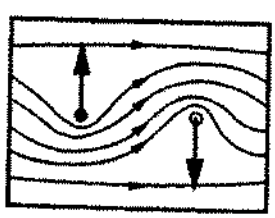


Which of the following is correct.
Antara berikut yang manakah benar .

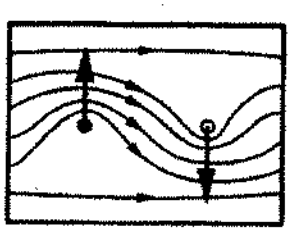
A



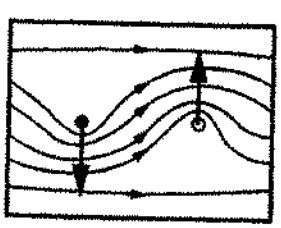
C



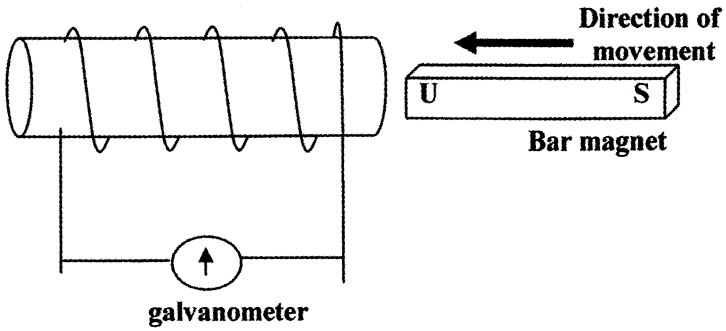
B



D



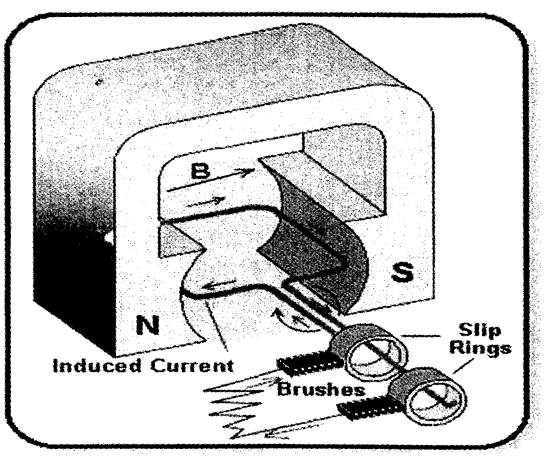
39 The diagram shows a bar magnet moving towards a solenoid.
Rajah menunjukkan magnet bar bergerak ke arah solenoid.



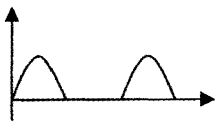
Which of these actions will **not** increase the deflection of the galvanometer pointer?
Tindakan manakah yang tidak akan menambah pesongan jarum galvanometer?

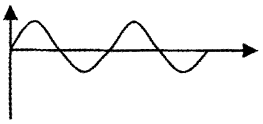
A Reversing the polarity of the magnet
Menukar kutub magnet
B Increasing the number of coils in the solenoid
Menambah lilitan solenoid
C increasing the speed of the bar magnet
Menambah halaju magnet bar
D increasing the number of magnets used
Menambah bilangan magnet

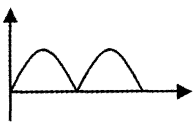
40 The diagram shows a dynamo connected to a cathode ray oscilloscope.
Rajah menunjukkan sebuah dinamo disambung kepada sebuah osiloskop sinar katod.

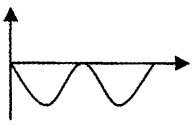


Which trace represents the e.m.f induced in the generator when the coil is generated at constant speed?
Surihan yang manakah mewakili d.g .e yang teraruh dalam dinamo apabila gegelung diputarkan pada kelajuan yang seragam?

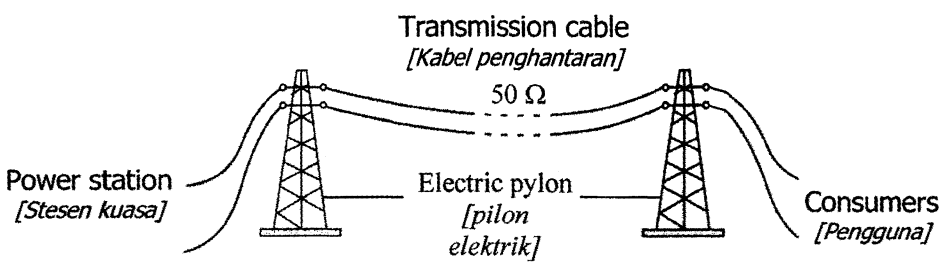
A 

B 

C 

D 

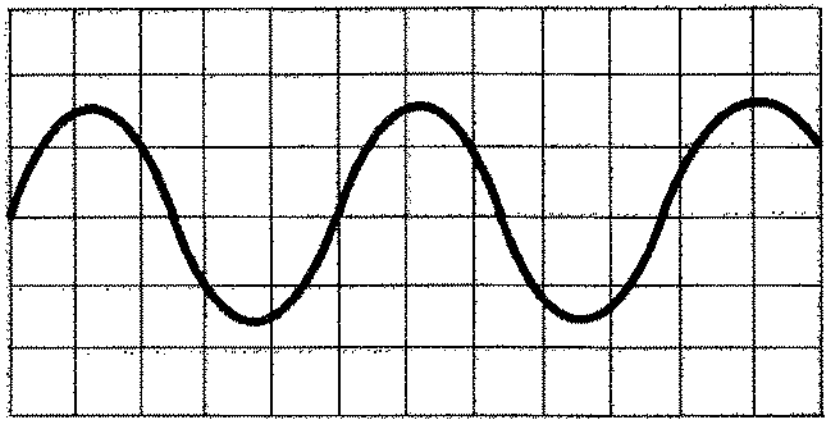
41 Diagram shows the transmission of electrical energy from a power station to the consumers with current supplied 20 A.
Rajah menunjukkan penghantaran tenaga elektrik dari stesen kuasa kepada pengguna dengan bekalan arus elektrik 20 A.



Calculate the loss of power in the cable if the total resistance of the cable is 50 Ω .
Hitung kuasa yang hilang di dalam kabel jika jumlah rintangan dalam kabel tersebut ialah 50 Ω ?

A 2.42×10^6 W
B 2.20×10^5 W
C 2.42×10^4 W
D 2.00×10^4 W

42 The graph shows trace on a Cathode Ray Oscilloscope (CRO) screen.
Graf menunjukkan surih di atas skrin Osiloskop Sinar Katod (OSK).



The Y-gain and the time-base are set at 3 volt / division and 5 ms / division respectively. What is the peak voltage and the frequency of the alternating current supply that connected to the C.R.O?
Gandaan-Y dan dasar masa telah disetkan pada 3 volt / bahagian dan 5 ms / bahagian masing-masing. Apakah voltan puncak dan frekuensi arus ulang alik yang disambungkan ke OSK?

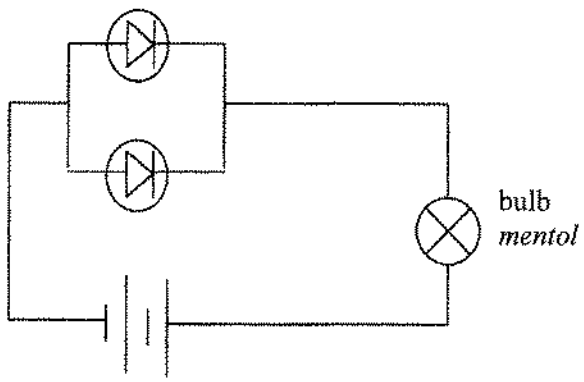
	Peak voltage / V *Voltan puncak / V*	**Frequency / Hz** *Frekuensi / Hz*
A	9.0	40
B	6.0	40
C	4.5	40
D	9.0	80

43 What is the function of diode ?
Apakah fungsi diod?

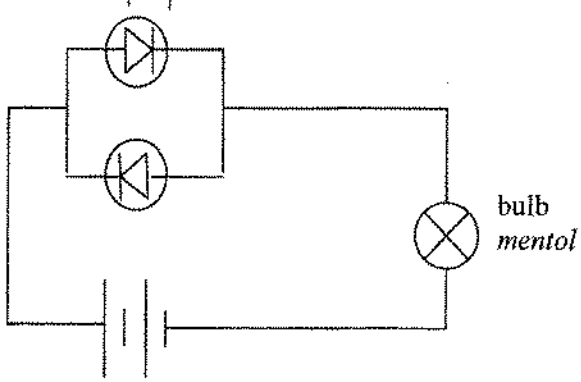
A To convert direct current to alternating current.
Menukarkan arus terus ke arus ulang-alik.
B To convert alternating current to direct current.
Menukarkan arus ulang-alik ke arus terus.
C To raise the potential different of alternating current.
Membesarkan beza keupayaan arus ulang-alik.
D To raise the potential different of direct current.
Membesarkan beza keupayaan arus terus.

44 Which of the following circuits will light up the bulb?
Antara sambungan litar-litar berikut, yang manakah akan menyalakan mentol ?

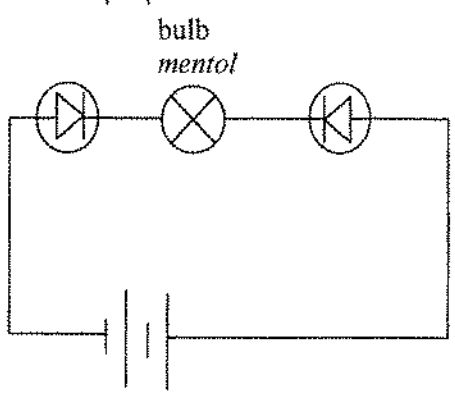
A



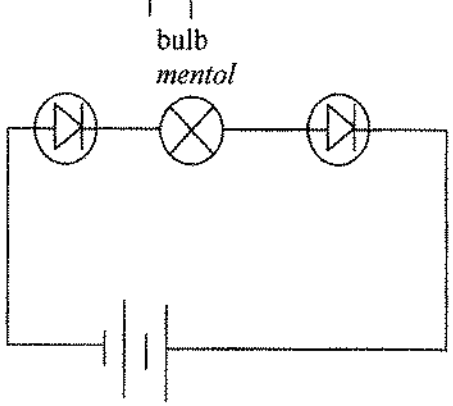
B



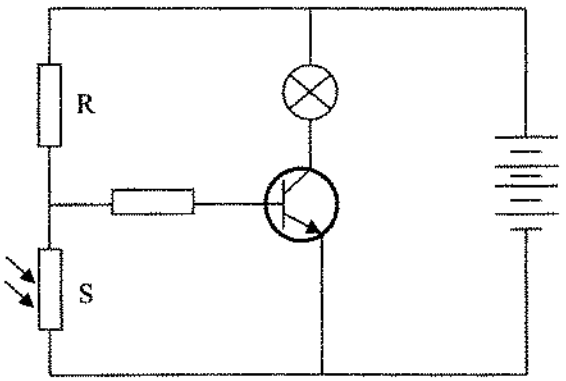
C



D



45 Diagram shows a transistor switching circuit with a light dependent resistor.
Rajah menunjukkan litar pensuisan transistor dengan sebuah perintang peka cahaya.



The bulb will light up when
Mentol akan menyala apabila

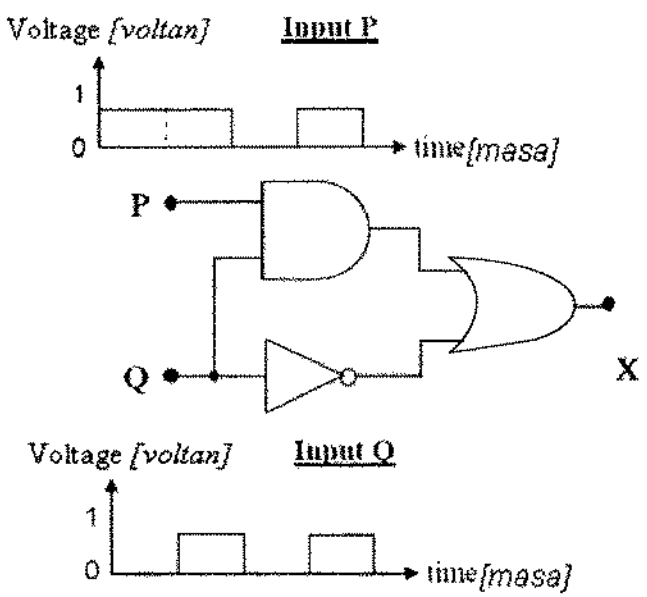
A the resistor R is disconnected
perintang R *ditanggalkan*

B the terminals of the battery are reversed
apabila terminal bateri disongsangkan

C the surrounding is bright
persekitaran adalah terang

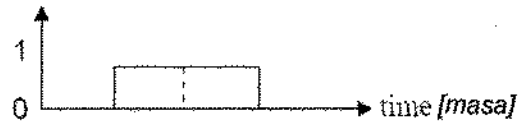
D the surrounding is dark
persekitaran adalah gelap

46 Diagram shows the input signals P and Q.
Rajah menunjukkan isyarat input P dan Q.

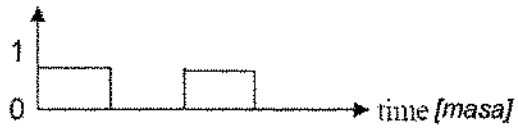


Which of the following shows the output signal X?
Antara berikut yang manakah menunjukkan isyarat output X?

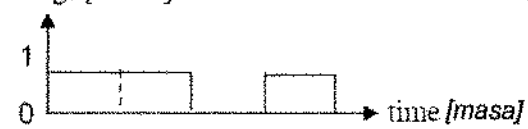
A Voltage *[voltan]*



B Voltage *[voltan]*



C Voltage *[voltan]*



D Voltage *[voltan]*

47 The equation below represents a nuclear reaction.
Persamaan di bawah mewakili satu tindak balas nuklear

$$ {}^{2}_{1}H + {}^{P}_{1}H \rightarrow {}^{Q}_{0}n + {}^{4}_{2}He + \text{energy} $$

tenaga

In the nuclear reaction, the values of P and Q are
Dalam tindak balas nuklear itu, nilai-nilai P dan Q adalah

	P	*Q*
A	3	1
B	2	1
C	4	2
D	3	2

48 The following equation shows the process of disintegration of uranium 238.
Persamaan berikut menunjukkan proses penyepaian uranium 238

$$ {}^{238}_{92}\mathbf{U} \rightarrow {}^{234}_{90}\mathbf{Th} \rightarrow {}^{234}_{91}\mathbf{Pa} \rightarrow {}^{234}_{92}\mathbf{U} \rightarrow {}^{230}_{90}\mathbf{Th} $$

Determine the radioactive rays that are emitted at each stage.
Tentukan sinar radioaktif yang dipancarkan bagi setiap peringkat

A α, β, α, α

B α, γ, γ β

C β, α, α, β

D α, β, β, α

49 The half-life of a radioactive substance is 3 days. How much time is required for 10 g of the substance to decay until 1.25 g is left?
Setengah hayat suatu jenis bahan radioaktif ialah 3 hari. Berapakah masa yang perlu untuk 10 g bahan ini reput hingga tertinggal 1.25 g?

A 3 days
3 hari

B 6 days
6 hari

C 9 days
9 hari

D 12 days
12 hari

50 Which of the following is the most appropriate radioisotope substance to be used as a medical tracer to detect a tumor?
Antara berikut yang manakah bahan radioisotop yang paling sesuai untuk digunakan sebagai penyurih untuk mengesan tumor?

	Isotope *Isotop*	**Type of emmision** *Jenis pancaran*	**Half life** *Separuh Hayat*
A	Radon-222 *Radon-222*	α	3.8 days *3.8 hari*
B	Sulfur-35 *Sulfur-35*	β	*97 days* *97 hari*
C	Cobalt-60 *Cobalt-60*	γ	5.3 years *5.3 tahun*
D	Technitium -99 *Technitium-99*	γ	6 hours *6 jam*

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

Name : ..... Form : .....

4531/2
PHYSICS
Paper 2
August
2010
$2\frac{1}{2}$ Hours

JABATAN PELAJARAN NEGERI TERENGGANU

PEPERIKSAAN PERCUBAAN SIJIL PELAJARAN MALAYSIA 2010

PHYSICS

PAPER 2

Two hours and thirty minutes

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Write your* **name** *and* **form** *in the space provided.*
2. *Kertas soalan ini adalah dalam dwibahasa*
3. *Candidate is required to read information on page 2.*

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			

Disediakan oleh:
AKRAM NEGERI TERENGGANU

Dibiayai oleh:
KERAJAAN NEGERI TERENGGANU

TERENGGANU ANJUNG ILMU

Dicetak oleh:
Percetakan Yayasan Islam Terengganu Sdn. Bhd.
Tel: 609-666 8611/6652/8601 Faks: 609-666 0611/0063

Kertas soalan ini mengandungi 25 halaman bercetak

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. *This question paper consists 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**. *Tulis jawapan bagi* **Bahagian A** *dalam ruang yang disediakan dalam kertas soalan*

3. *Answer* **one** *question from* **Section B** *and* **one** *question from* **Section C**. *Write your answers for* **Section B** *and* ***Section C*** *on the lined pages at the end of this question paper. Answer questions in* **Section B** *and* **Section C** *in detail. You may use equations, diagrams, tables, graphs and other suitable methods to explain your answer.*
Jawab **satu** *soalan daripada* **Bahagian B** *dan satu soalan daripada* **Bahagian C**.*Tuliskan jawapan bagi* **Bahagian B** *dan* **Bahagian C** *pada halaman bergarisdi bahagian akhir kertas soalan ini. Jawab* **Bahagian B** *dan* **Bahagian C** *dengan terperinci. Anda boleh menggunakan. persamaan, gambar 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 cancel any answer, neatly cross out the answer.*
Sekiranya anda hendak membatalkan sesuatu jawapan, buat garisan di atas jawapan itu

6. *The diagram in the question provided are not drawn to scale unless stated.*
Gambarajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan.

7. *A list of formulae is provided on page 3.*
Satu senarai rumus disediakan di halaman 3.

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. *The time suggested to answer* ***Section A*** *is* **90** *minutes,* ***Section B*** *is* 30 *minutes and* ***Section C*** *is* 30 *minutes.*
Masa yang dicadangkan untuk menjawab **Bahagian A** *ialah* 90 *minit,* **Bahagian B** *ialah* 30 *minit dan* ***Bahagian C*** *ialah* 30 *minit.*

10. *You may use a non-progmammable scientific calculator.*
Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh deprogram. Walau bagaimanapun, langkah mengira perlu ditunjukkan.

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

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

1. $a = \dfrac{v-u}{t}$
2. Momentum = mv
3. $F = ma$
4. Gravitational potential energy = mgh
5. Kinetic energy = $\dfrac{1}{2}mv^2$
6. $\rho = \dfrac{m}{v}$
7. Preasure, $p = \dfrac{F}{A}$
8. Preasure, $p = h\rho g$
9. Heat, $Q = mc\theta$
10. $\dfrac{pV}{T}$ = constant
11. $E = mc^2$
12. $v = f\lambda$
13. $\dfrac{1}{f} = \dfrac{1}{u} + \dfrac{1}{v}$
14. $n = \dfrac{\sin i}{\sin r}$
15. $V = IR$
16. $v^2 = u^2 + 2as$
17. $s = ut + \dfrac{1}{2}at^2$
18. Power, $P = \dfrac{energy}{time}$
19. $\lambda = \dfrac{ax}{D}$
20. $n = \dfrac{H}{h}$
21. $Q = It$
22. Power, $P = IV$
23. $g = 10 \text{ m s}^{-2}$

1. $a = \dfrac{v-u}{t}$
2. Momentum = mv
3. $F = ma$
4. Tenaga keupayaan = mgh
5. Tenaga kinetic = $\dfrac{1}{2}mv^2$
6. $\rho = \dfrac{m}{v}$
7. Tekanan, $p = \dfrac{F}{A}$
8. Tekanan, $p = h\rho g$
9. Haba, $Q = mc\theta$
10. $\dfrac{pV}{T}$ = pemalar
11. $E = mc^2$
12. $v = f\lambda$
13. $\dfrac{1}{f} = \dfrac{1}{u} + \dfrac{1}{v}$
14. $n = \dfrac{\sin i}{\sin r}$
15. $V = IR$
16. $v^2 = u^2 + 2as$
17. $s = ut + \dfrac{1}{2}at^2$
18. Kuasa, $P = \dfrac{tenaga}{masa}$
19. $\lambda = \dfrac{ax}{D}$
20. $n = \dfrac{H}{h}$
21. $Q = It$
22. Kuasa, $P = IV$
23. $g = 10 \text{ m s}^{-2}$

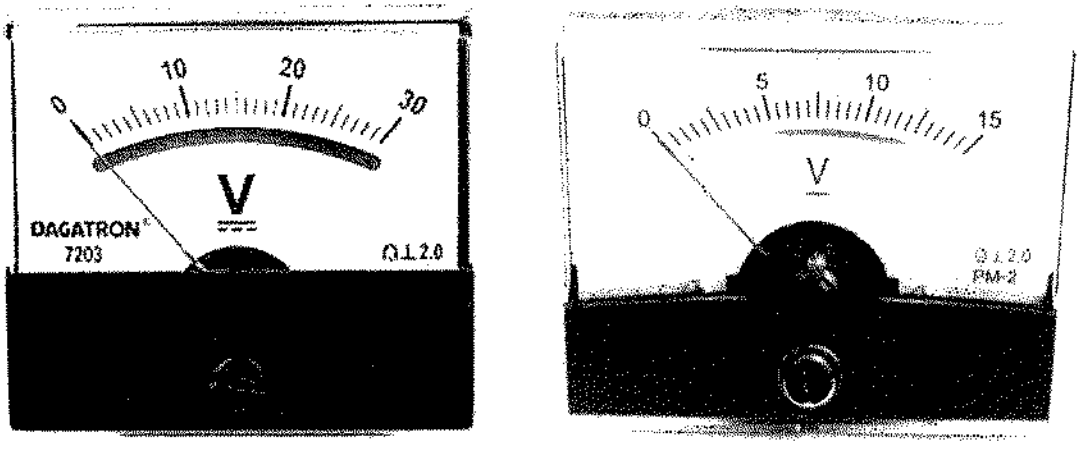
Section A

[60 *marks*]

Answer **all** *questions in this section*

The time suggested to answer this section is **90** *minutes.*

1 Diagram 1 shows two measurement instrument X and Y.
Rajah 1 menunjukkan dua alat pengukur X dan Y.



X Y

Diagram 1
Rajah 1

(a) Name the physical quantity measured by the measurement instruments above.
Namakan kuantiti fizik yang disukat oleh alat pengukur di atas.

.....
[1 *mark*]

(b) What is the value of the smallest division of measurement instrument Y.
Berapakah nilai satu bahagian terkecil bagi alat pengukur Y

.....
[1 *mark*]

(c) Which measurement instrument is more sensitive ?
Alat pengukur manakah lebih sensitif ?

.....
[1 *mark*]

(d) Complete the following sentence by ticking (√) the correct box.
Lengkapkan ayat berikut dengan menandakan (√) dalam kotak yang betul.

The measurement instrument Y is connected
Alat pengukur Y disambungkan

series in a circuit. ☐
sesiri dalam suatu litar.

parallel in a circuit. ☐
selari dalam suatu litar.

[1 *mark*]

2 Diagram 2 shows a watermelon fall off a table and drop on to the floor surface. The watermelon of mass 1.5 kg experienced the change of momentum while falling.
Rajah 2 menunjukkan sebiji tembikai terjatuh dari meja ke atas permukaan lantai. Tembikai yang berjisim 1.5 kg itu mengalami perubahan momentum ketika jatuh.

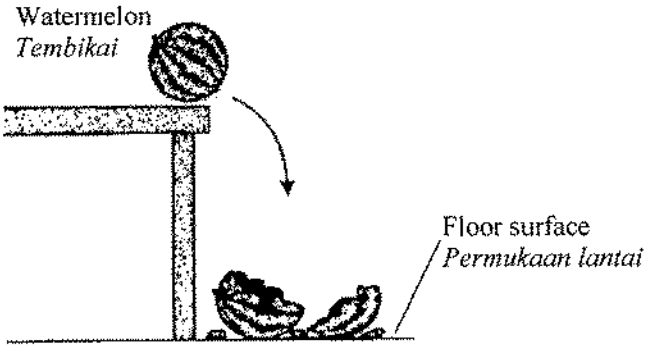


Diagram 2
Rajah 2

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

.....

[1 *mark*]

(b) Velocity of the watermelon when hitting the floor surface is 2 m s^{-1}. Calculate the momentum of the watermelon at the moment.
Halaju tembikai itu ketika menghentam permukaan lantai ialah 2 m s^{-1}. Hitungkan momentum tembikai pada ketika itu.

[2 *marks*]

(c) (i) Mark with a (√) for the correct statement about the impact time between the watermelon and the floor surface.
Tandakan dengan (√) bagi pernyataan yang betul mengenai masa tindakan di antara tembikai itu dengan permukaan lantai.

☐ The impact time is longer.
Masa tindakan adalah panjang.

☐ The impact time is shorter.
Masa tindakan adalah singkat.

[1 *mark*]

(ii) Why the watermelon is broken when hitting the floor surface?
Mengapakah tembikai itu pecah apabila menghentam permukaan lantai?

.....

[1 *mark*]

3 Diagram 3.1 shows a 600 W electric heater being used to heat a beaker of water on a compression balance.
Rajah 3.1 menunjukkan suatu pemanas elektrik 600 W digunakan untuk memanaskan satu bikar air di atas neraca mampatan.

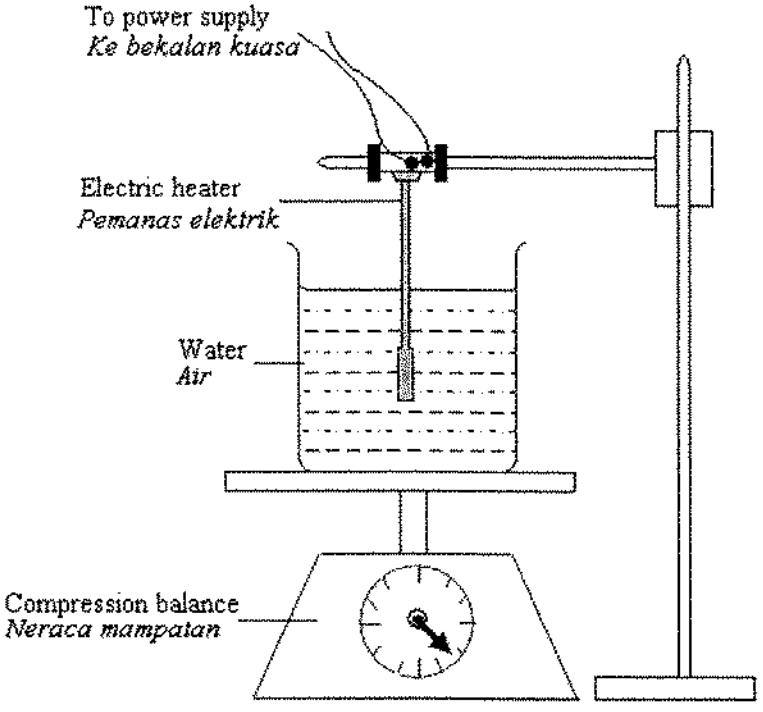


Diagram 3.1
Rajah 3.1

(a) State the energy change involved when using the heater to heat the water.
Nyatakan perubahan tenaga yang terlibat ketika pemanas itu digunakan untuk memanaskan air.

.....

[1 *mark*]

(b) The mass of water is 0.5 kg and specific heat capacity of water is 4200 J kg^{-1} $°C^{-1}$. The initial temperature of water is 28 ^{0}C.
Calculate the energy absorbed by the water to reach its boiling point.

Jism air ialah 0.5 kg dan muatan haba tentu bagi air ialah 4200 J kg $^oC^{-1}$. Suhu awal air ialah 28 ^oC.
Hitung tenaga yang diserap oleh air itu untuk mencapai takat didih.

[2 *marks*]

(c) When the water is boiling, the reading of the compression balance decreases by 0.04 kg in 160 s.
Calculate the specific latent heat of vaporization of the water.

Ketika air mendidih, bacaan neraca mampatan berkurang sebanyak 0.04 kg dalam masa 160 s.
Hitung haba pendam tentu pengewapan bagi air itu.

[2 *marks*]

(d) Explain why at the boiling point, the temperature of water remain unchanged.
Terangkan mengapa pada takat didih, suhu air tidak berubah.

.....

.....

.....

.....

[2 *marks*]

4 Table 4 shows five different waves with their wavelengths respectively.
Jadual 4 menunjukkan lima gelombang yang berlainan dengan panjang gelombang masing-masing.

Wave	Wavelength (m)
Sound	5×10^{-1}
Radio	1×10^{3}
Micro	1×10^{-2}
Light	5.5×10^{-7}
X-ray	5×10^{-9}

Table 4
Jadual 4

(a) State the type of sound waves.
Nyatakan jenis gelombang bunyi.

.....

[1 *mark*]

(b) (i) Which of the following waves has the highest frequency ?
Manakah di antara gelombang itu mempunyai frekuensi tertinggi?

.....

[1 *mark*]

(ii) State a reason for your answer in 4 (b) (i).
Nyatakan sebab untuk jawapan anda dalam 4 (b)(i).

.....

[1 *mark*]

(c) Sound waves are used to determine the depth of a lake. The frequency and wavelength of the sound waves are 2 500 Hz and 0.5 m respectively. The reflected sound wave is received after 2.0 s transmitted into the lake.

Gelombang bunyi digunakan untuk menentukan kedalaman sebuah tasik. Frekuensi dan panjang gelombang bagi gelombang bunyi masing-masing ialah 2 500 Hz dan 0.5 m. Gelombang bunyi yang terpantul telah diterima semula selepas 2.0 s dihantar ke dalam tasik.

Calculate
Hitungkan

(i) the velocity of the sound wave
halaju gelombang bunyi

[2 *marks*]

(ii) the depth of the lake
kedalaman tasik

[2 *marks*]

5 Diagram 5.1 shows a water jet spurts out from a hole in a tall vessel at a distance , d_1.
Diagram 5.2 shows an oil jet spurts out from a hole at the same depth in a tall vessel at a distance , d_2.
Rajah 5.1 menunjukkan suatu pancutan air keluar dari satu lubang pada satu bekas tinggi sejauh d_1.
Rajah 5.2 menunjukkan suatu pancutan minyak keluar dari satu lubang pada satu bekas tinggi pada kedalaman yang sama sejauh d_2.

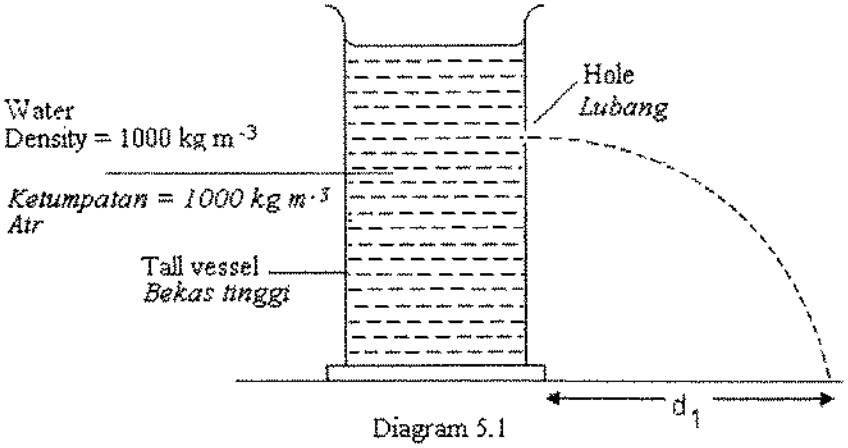


Diagram 5.1
Rajah 5.1

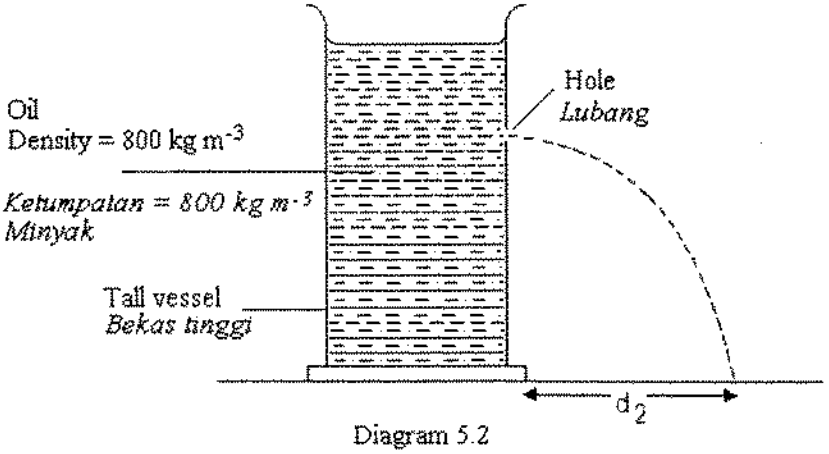


Diagram 5.2
Rajah 5.2

(a) What is the meaning of density?
Apakah yang dimaksudkan dengan ketumpatan?

.....

[1 *mark*]

(b) Observe Diagram 5.1 and Digaram 5.2.
Perhatikan Rajah 5.1 dan Rajah 5.2.

Compare:
Bandingkan:

(i) Density of water and oil.
Ketumpatan air dan minyak.

.....

[1 *mark*]

(ii) The distance d_1 and d_2.
Jarak d_1 dan d_2.

.....

[1 *mark*]

(iii) The pressure produced by the water jet and the oil jet.
Tekanan yang dihasilkan oleh pancutan air dan pancutan minyak itu.

.....

[1 *mark*]

(c) Based on your answer in (b), state the relationship between the density and the pressure of liquid.
Berdasarkan jawapan anda di (b), nyatakan hubungan antara ketumpatan dan tekanan cecair.

.....

[1 *mark*]

(d) Diagram 5.3 shows the location of a house water tank.
Rajah 5.3 menunjukkan kedudukan tangki air pada sebuah rumah.

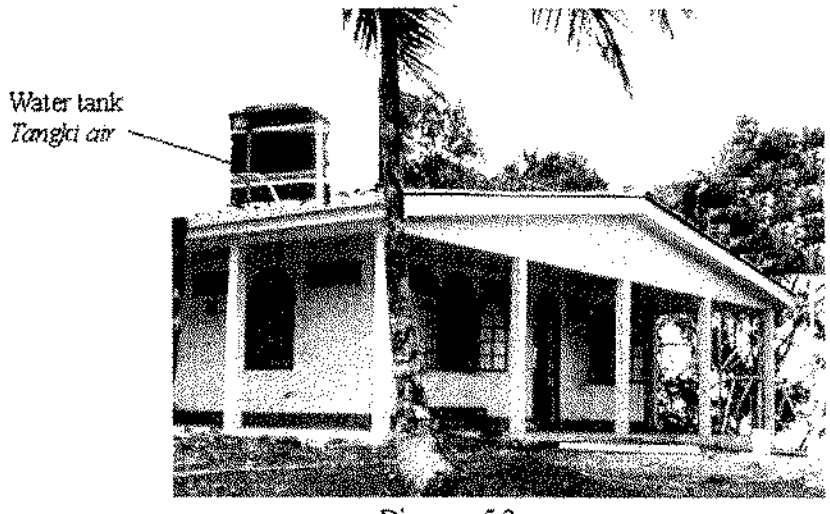


Diagram 5.3
Rajah 5.3

Explain why the water tank should be located on top of the roof.
Terangkan mengapa tangki air diletakkan di atas bumbung rumah.

.....

.....

.....

.....

[3 marks]

6 Diagram 6.1 a shows circuit contains a dry cell , switch ,ammeter , voltmeter and a bulb. Diagram 6.2 shows a new circuit for Diagram 6.1 when an identical bulb is added to the circuit.
Rajah 6.1 menunjukkan suatu litar elektrik terdiri daripada satu sel kering, ammeter, voltmeter dan sebuah mentol.
Rajah 6.2 menunjukkan satu litar baru untuk Rajah 6.1 apabila sebuah mentol yang serupa ditambah ke dalam litar itu.

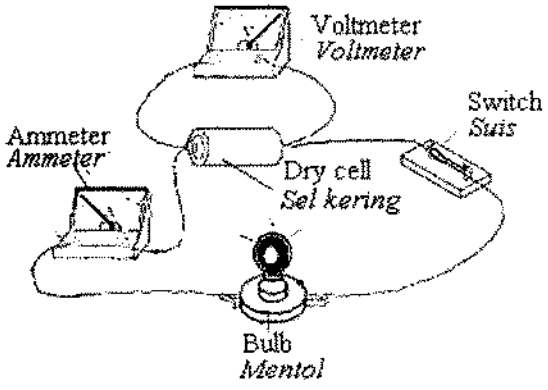


Diagram 6.1
Rajah 6.1

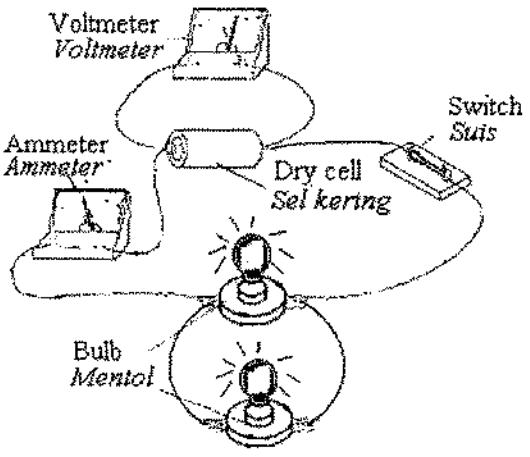


Diagram 6.2
Rajah 6.2

(a) Using Diagram 6.1 and 6.2
Menggunakan Rajah 6.1 dan 6.2

(i) What is the physical quantity shows by the reading of the voltmeter?
Apakah kuantiti fizik yang ditunjukkan oleh bacaan voltmeter itu?

.....
[1 mark]

(ii) Compare the reading of the voltmeters.
Bandingkan bacaan voltmeter-voltmeter itu.

.....
[1 mark]

(iii) Compare the brightness of the bulb.
Bandingkan kecerahan mentol-mentol itu.

.....
[1 mark]

(iv) Compare the reading of the ammeters.
Bandingkan bacaan ammeter-ammeter itu.

.....
[1 mark]

(b) Based on your answer in (a) (ii) and in (a) (iv) state the relationship between the ammeter reading and the voltmeter reading.
Berdasarkan jawapan anda di (a) (ii) dan di (a) (iv) nyatakan hubungan antara bacaan ammeter dan bacaan voltmeter.

.....
[1 mark]

(c) The switch, the ammeter and the bulb are removed from the circuit in Diagram 6.1.
Suis, ammeter dan mentol ditanggalkan daripada litar di dalam Rajah 6.1.

(i) What happens to the reading of the voltmeter?
Apakah yang terjadi kepada bacaan voltmeter tersebut?

.....

[1 mark]

(ii) Give the reason for your answer in (c) (i).
Berikan sebab untuk jawapan anda di (c)(i)

.....

.....

.....

[2 marks]
[2 *markah*]

7 Diagram 7.1 shows the rate of decay of radioisotope Iodine-131.
Rajah 7.1 menunjukkan kadar pereputan bagi radioisotop Iodin-131.

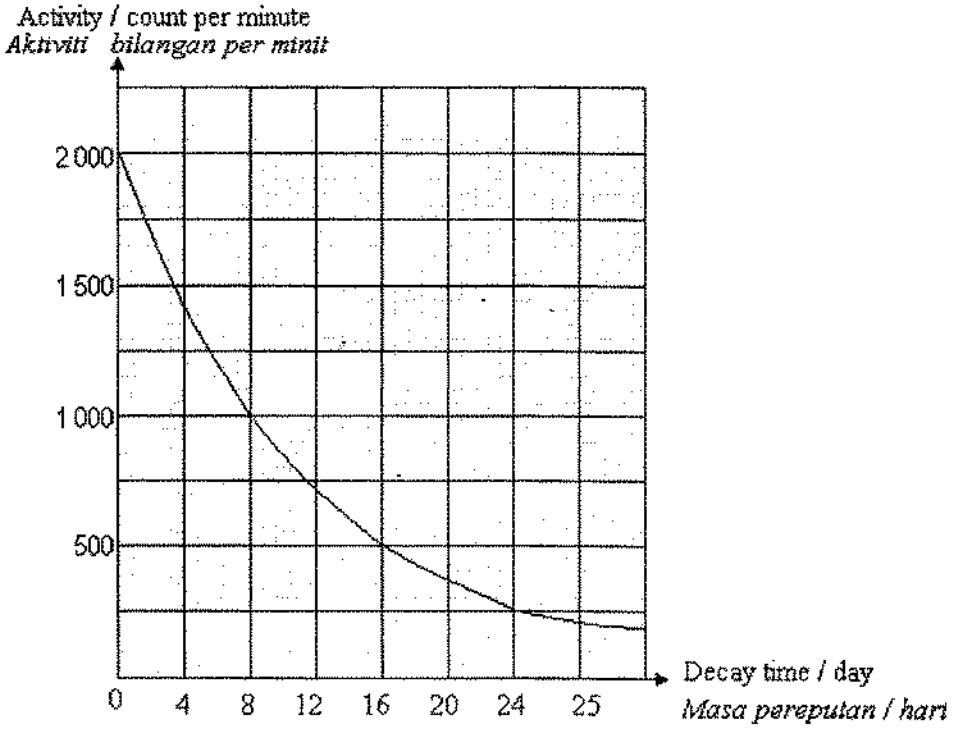


Diagram 7.1
Rajah 7.1

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

.....

[1 *mark*]

(b) Based on Diagram 7.1, what is the half life of Iodine-131?
Berdasarkan Rajah 7.1 berapakah separuh hayat Iodin-131?

.....

[1*mark*]

(c) What happen to the activity of Iodine-131 after 24 days?
Apakah yang terjadi kepada aktiviti Iodin selepas 24 hari?

.....

[1*mark*]

(d) When Iodine-131 decays, it produces a beta particle and Xenon-131(Xe).
Apabila Iodin -131 mereput, Iodin menghasilkan zarah beta dan Xenon -131 (Xe)
Complete the following equation for the decay of Iodine-131.
Lengkapkan persamaan berikut untuk pereputan Iodin-131.

$$^{131}_{53}\mathrm{I} \longrightarrow \text{-----}\ \mathrm{Xe} + \text{-----}$$

[2 *marks*]

(e) Diagram 7.2 shows a man moves the Geiger Muller tube which is connected to the ratemeter to detect leakage of underground water pipe. A little substance of radioisotope is dissolved in the water that flows in the pipes. The man must detect the leakage of the pipe accurately to prevent the consumers from being exposed to dangerous side effect of radioisotope.

Rajah 7.2 menunjukkan tiub Geiger Muller yang disambungkan kepada meter kadar untuk mengesan kebocoran paip air bawah tanah. Sedikit bahan radioisotop dilarutkan ke dalam air dan disalurkan melalui paip. Lelaki itu mesti mengesan kebocoran paip dengan tepat untuk menghalang pengguna terhadap pendedahan kepada bahaya kesan sampingan radioisotop.

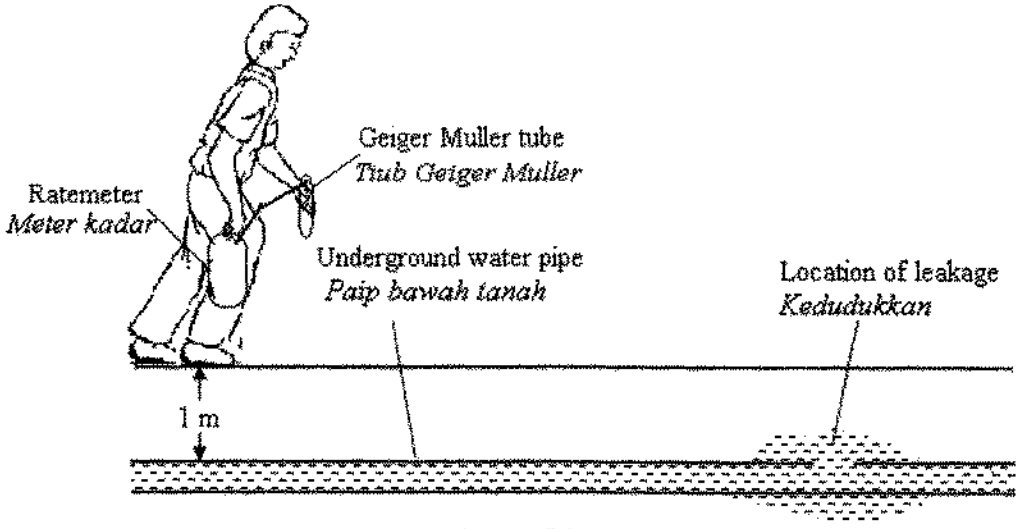


Diagram 7.2
Rajah 7.2

Table 7.3 shows the readings of ratemeter when the Geiger-Muller tube located at the different location.
Jadual 7.3 menunjukkan bacaan meter kadar apabila tiub Geiger Muller diletakkan pada kedudukan yang berlainan.

Location of Geiger-Muller tube *Kedudukan Tiub Geiger Muller*	P	Q	R	S
Reading of the ratemeter / counts per minute *Bacaan meter kadar Bilangan/minit*	600	295	784	372

Table 7.3
Rajah 7.3

(i) The water is safe to be used by the consumer when the radioaofctivity in every liter of water is not more than 25 counts per minute. The half life of radioisotope is 5 hours has an initial activity 200 counts per minute.
Calculate the time when the water is safe to be used by the consumer

Air itu selamat untuk digunakan oleh pengguna apabila radioaktiviti pada setiap liter air tidak melebihi 25 bilangan per minit. Separuh hayat radioisotop ialah 5 jam dan mempunyai aktiviti asal 200 bilangan per minit.
Hitungkan masa air itu selamat digunakan oleh pengguna.

[2 marks]

(ii) Base on Table 7.3, state the location on the pipe where the leakage takes place.
State reason for your answer.
Berdasarkan Jadual 7.3, nyatakan bahagian paip yang mengalami kebocoran.
Berikan sebab bagi jawapan anda.

.....

.....

.....

[2 marks]

(iii) The ratemeter shows the reading before the Geiger Muller tube is moved above the underground water pipe.
Suggest one method so that the ratemeter shows the actual reading when it is moved above the underground water pipe at different locations.
Meter kadar menunjukkan bacaan sebelum tiub Geiger Muller digerakkan di atas paip air bawah tanah.
Cadang satu kaedah supaya meter kadar menunjukkan bacaan sebenar apabila ia digerakkan di atas paip bawah tanah pada kedudukkan yang berbeza

.....

[1*mark*]

8 Diagram 8 shows an object, O placed at the front of a convex lens, W. The focal length of the convex lens is 5 cm. The light rays of the object passing through the convex lens using the phenomenon of refraction.
Rajah 8 menunjukkan suatu objek, O diletakkan di depan satu kanta cembung, W. Panjang fokus kanta cembung itu ialah 5 cm. Sinar cahaya dari objek itu melalui kanta cembung tersebut menggunakan fenomena pembiasan.

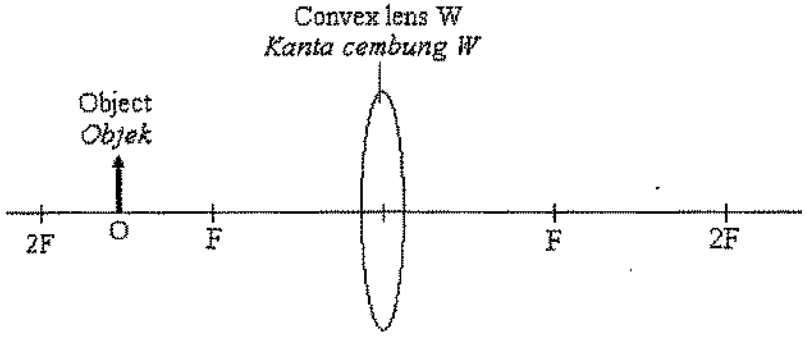


Diagram 8
Rajah 8

(a) State the meaning of refraction of light.
Nyatakan maksud pembiasan cahaya.

.....

.....

[1 *mark*]

(b) In Diagram 8, draw the ray diagram of the object to form an image.
Dalam Rajah 8, lukiskan gambarajah sinar objek itu untuk membentuk imej.

[3 *marks*]

(c) State the characteristics of the image formed.
Nyatakan ciri-ciri imej yang terbentuk.

.....

[1 *mark*]

(d) Table 8 shows characteristics of three convex lenses X, Y and Z.
Jadual 8 menunjukkan ciri-ciri tiga kanta cembung X, Y dan Z.

Convex Lens	**Focal length / cm**	**Linear magnification,** $m = \frac{f_o}{f_e}$	**Diameter / cm**
X	20		15
Y	50		10
Z	100		20

Table 8
Jadual 8

Convex lenses X, Y or Z can be used as an objective lens to pair with convex lens W as an eyepiece lens to build an astronomical telescope.
Kanta cembung X, Y atau Z boleh digunakan sebagai satu kanta objektif untuk dipasangkan dengan kanta cembung W sebagai satu kanta mata untuk membina sebuah teleskop astronomi.

(i) Fill in the blanks column in Table 8, by calculates linear magnification of the telescope for each lens as an objective lens.
Isikan lajur kosong dalam Jadual 8, dengan mengira pembesaran linear teleskop itu bagi setiap kanta sebagai satu kanta objektif.

[3 *marks*]

(ii) Choose **two** lenses as an objective lens that can produce larger image.
*Pilih **dua** kanta sebagai kanta objektif yang dapat menghasilkan imej lebih besar.*

.....

[1 *mark*]

(iii) Choose **two** lenses as an objective lens that can produce clearer image.
Pilih dua kanta sebagai kanta objektif yang dapat menghasilkan imej lebih jelas.

.....

[1 *mark*]

(e) (i) Which lens is most suitable to be used as an objective lens of the telescope?
Kanta manakah yang paling sesuai digunakan sebagai satu kanta objektif teleskop itu?

.....

[1 *mark*]

(ii) Give a reason for your choice in (e)(i).
Berikan sebab untuk pilihan anda dalam (e)(i).

.....

[1 *mark*]

Section B

[20 *marks*]

Answer any **one** *question from this section.*

The time suggested to answer this section is **30** *minutes.*

9 Diagram 9.1 shows a hydraulic lift used to raise loads Q and R.
Rajah 9.1 menunjukkan satu pengangkat hidraulik digunakan untuk mengangkat beban Q dan R

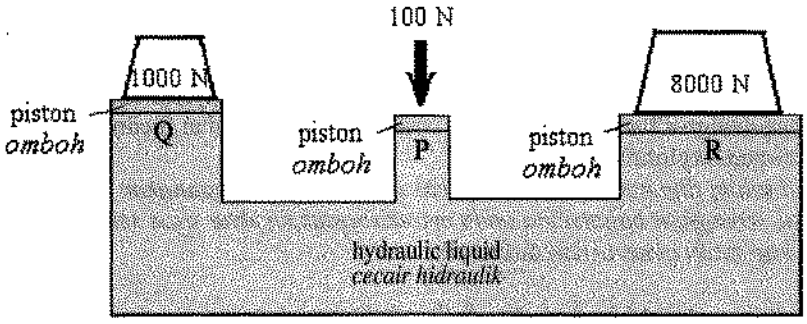


Diagram 9.1
Rajah 9.1

(a) (i) What is meant by pressure?
Apakah maksud tekanan?

[1 *mark*]

(ii) A force of 100 N is used to push down piston P and able to raise piston Q and piston R. With reference to Diagram 9.1 compare the pressure acted on piston Q and R, the cross sectional area and the force produced at the piston Q and piston R.

Satu daya 100 N digunakan untuk menolak omboh P ke bawah dan boleh mengangkat omboh Q dan omboh R. Merujuk kepada Rajah 9.1, bandingkan tekanan yang dikenakan pada omboh Q dan omboh R, luas keratan rentas dan daya yang terhasil pada omboh Q dan R.

Relate the cross sectional area of the pistons with the force produced on the pistons. Name a physics principle relating the cross sectional area and the force exerted on pistons Q and R.

Hubungkaitkan luas keratan rentas omboh dengan daya yang terhasil pada omboh. Namakan satu prinsip fizik yang menghubungkan luas keratan rentas dan daya yang bertindak pada omboh Q dan R.

[5 *marks*]

(b) Diagram 9.2 shows a cross section of an aeroplane wing. The wing help the aeroplane to be lift up when the plane speeding along the runaway.
Rajah 9.2 menunjukkan keratan rentas sayap kapal terbang. Sayap ini membantu kapal terbang terangkat apabila memecut di sepanjang landasan terbang.

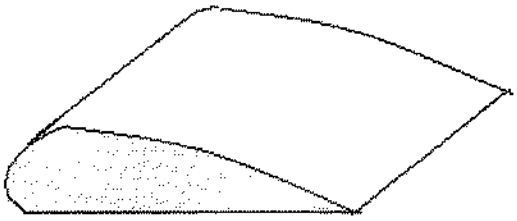


Diagram 9.2
Rajah 9.2

Name the shape in Diagram 9.2 and explain how the aeroplane can be lifted up to the air.
Namakan bentuk dalam Rajah 9.2 dan terangkan bagaimana kapal terbang boleh terangkat ke udara.

[4 *marks*]

(c) Submarine is used to move underwater. Using suitable physics concepts, explain how you can design a basic structure of a small submarine so that it can be used for an underwater exploration.
Kapal selam digunakan untuk bergerak dalam air. Menggunakan konsep fizik yang sesuai, terangkan bagaimana anda merekabentuk struktur asas sebuah kapal selam kecil bagi kegunaan penerokaan dalam air.

The design should include the following aspects:
Reka bentuk hendaklah meliputi aspek-aspek berikut:

i. the material and thickness of the wall,
bahan dan ketebalan dinding kapal selam,

ii. shape of the submarine,
bentuk kapal selam,

iii. able to submerge,
kebolehan untuk menyelam,

iv. the equipments to detect underwater obstacles and depth,
peralatan untuk mengesan halangan dalam air dan kedalaman.

[10 *marks*]

10 Diagram 10.1 shows a transistor circuit. Diagram 10.2 and Diagram 10.3 show the transistor circuit with different microammeter reading and milliammeter reading.
Rajah 10.1 menunjukkan satu litar transistor. Rajah 10.2 dan Rajah 10.3 menunjukkan litar bertransistor itu dengan bacaan mikroameter dan bacaan miliameter yang berbeza.

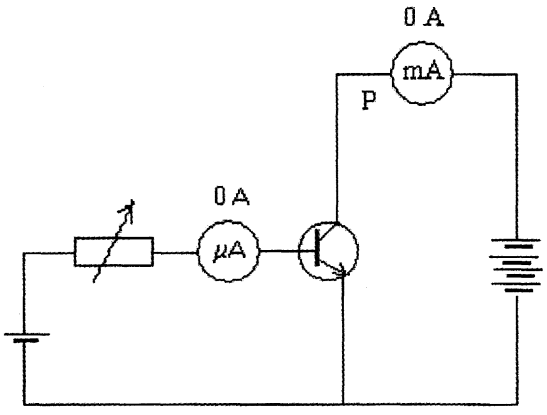


Diagram 10.1

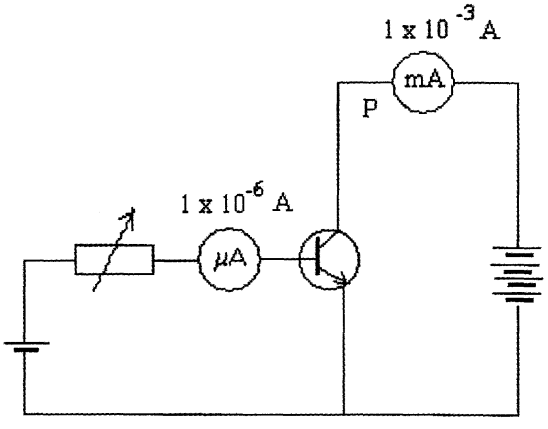


Diagram 10.2

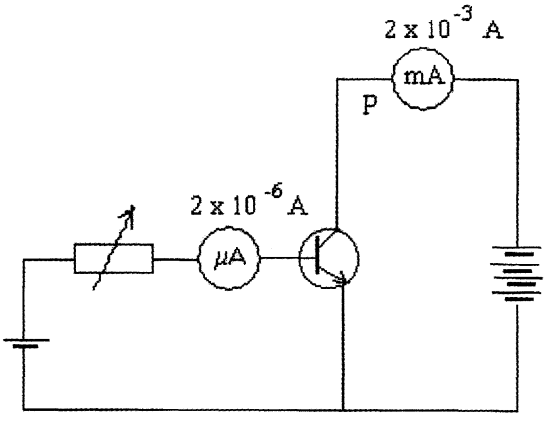


Diagram 10.3

(a) What is the meaning of transistor circuit?
Apakah yang dimaksudkan dengan litar bertransistor?

[1 *mark*]

(b) (i) Using Diagram 10.1, compare the microammeter reading and the milliammeter reading.
Menggunakan Rajah 10.1, bandingkan bacaan microammeter dan bacaan milliammeter.

(ii) Using Diagram 10.2, compare the microammeter reading and the milliammeter reading.
Menggunakan Rajah 10.2, bandingkan bacaan microammeter dan bacaan milliammeter.

(iii) Using Diagram 10.2 and Diagram 10.3, compare the change in microammeter reading and the change in milliammeter reading.
Menggunakan Rajah 10.2 dan Rajah 10.3, bandingkan perubahan bacaan mikroammeter dan perubahan bacaan milliammeter.

(iv) Relate the microammeter reading, milliammeter reading and deduce a physics concept for base current , I_b and collector current, I_c in a transistor circuit.
Hubungkaitkan bacaan milliammeter dengan bacaan mikroammeter untuk merumuskan hubungan antara arus tapak, I_b dengan arus pemungut, I_c dan perubahan arus tapak, I_b dengan perubahan arus pemungut, I_c dalam litar transistor.

[5 *marks*]

(c) Diagram 10.5 shows a transistor circuit is used to light up a bulb at night.
Rajah 10.5 menunjukkan litar transistor yang digunakan untuk menyalakan mentol pada waktu malam.

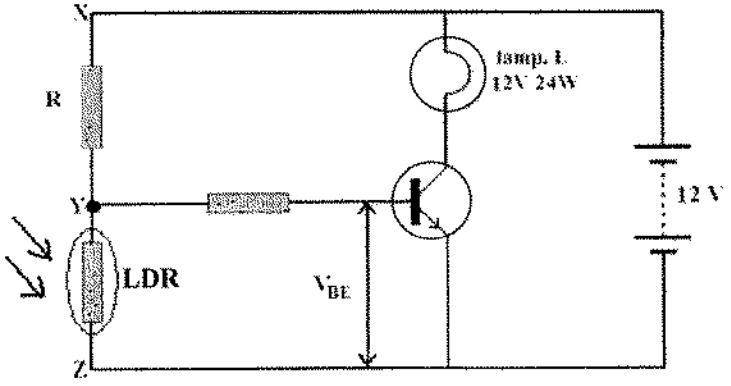


Diagram 10.5

Explain why the bulb light up at night.
Terangkan mengapa lampu menyala pada waktu malam.

[4 *marks*]

(d) Suggest the modifications need to be done to the circuit in Diagram 10.5 so that it can function as automatically fire alarm switch that needs high voltage.
Explain your suggestions base on the following aspects:

Cadangkan pengubahsuaian yang perlu dilakukan pada litar dalam Rajah 10.5 supaya ia boleh berfungsi sebagai suis amaran kebakaran yang memerlukan voltan tinggi
Terangkan cadangan anda berdasarkan aspek-aspek berikut :

(i) The electrical components that are needed to replace any components in the circuit
Komponen-komponen elektrik yang diperlukan untuk menggantikan mana-mana komponen dalam litar

(ii) The position of these components in the circuit
Kedudukan komponen-komponen elektrik dalam litar

(iii) The electrical components that is connected to the output transistor
Komponen elektrik yang perlu disambungkan kepada keluaran transistor

[10 *marks*]

Section C

[20 *marks*]

Answer any **one** *question from this section.*

The time suggested to answer this section is **30** *minutes.*

11 Diagram 11.1 shows a stamp collector examines a stamp using a magnifying glass.
Gambarajah 11.1 menunjukkan seorang pengumpul setem sedang meneliti sekeping setem menggunakan kanta pembesar.

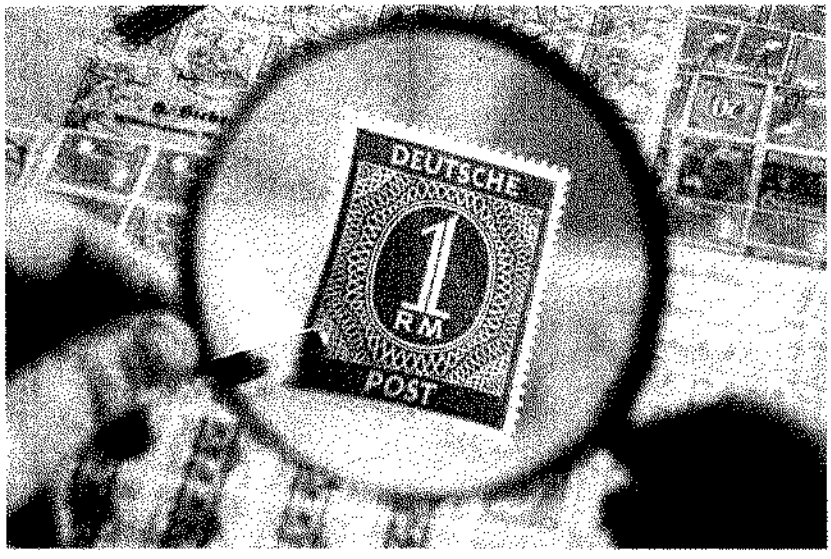


Diagram11.1
Rajah 11.1

Table 11 shows characteristics of four types of magnifying glass
Jadual 11 menunjukkan ciri-ciri bagi empat jenis kanta pembesar

Types of Magnifying glass *Jenis kanta pembesar*	Characteristics *Ciri-ciri*			
	Percentage of light transmitted *Peratus cahaya dipancarkan / %*	Type of lens *Jenis kanta*	Focal length *Jarak fokus / cm*	Diameter/*cm*
J	90	Convex *cembung*	5.0	15.0
K	95	Concave *cekung*	20.0	5.0
L	95	Convex *cembung*	20.0	15.0
M	85	Concave *cekung*	5.0	5.0

Table 11
Jadual 11

(a) What is meant by the focal length?
Apakah yang dimaksudkan dengan jarak fokus?

[1 *mark*]

(b) You are requested to choose the magnifying glass to be used by a stamp collector to examines the stamps.
Anda dikehendaki memilih kanta pembesar yang sesuai untuk digunakan oleh pengumpul setem untuk meneliti setemnya

By referring to the characteristics given in Table 11, explain the suitability of each characteristic and suggest the most suitable magnifying glass to be used by a stamp collector.
Dengan merujuk kepada ciri-ciri yang diberikan dalam Jadual 11, terangkan kesesuaian setiap ciri dan cadangkan kanta pembesar yang paling sesuai untuk digunakan oleh pengumpul setem tersebut.

[10 *marks*]

(c) A student is using a magnifying glass M to observe a small ant at a distance of 2 cm.
Seorang pelajar menggunakan kanta pembesar M untuk memerhati semut yang kecil pada jarak 2 cm.

(i) Calculate the image distance.
Kirakan jarak imej.

[2 *marks*]

(ii) Determine the linear magnification of the image of the ant.
Tentukan pembesaran linear bagi imej semut tersebut.

[2 *marks*]

(d) You are given a convex lens. Describe how the power of the lens can be determined. State the relationship between power and focal length of a lens.
Anda diberikan satu kanta. Huraikan bagaimana anda dapat menentukan kuasa kanta tersebut.
Nyatakan hubungan antara kuasa kanta dengan panjang fokus kanta.

[5 *marks*]

12 Diagram 12.1 shows a bulb labelled 12 V, 24 W is connected to the output of a transformer. The efficiency of the transformer is 40%.
Rajah 12.1 menunjukkan sebuah mentol berlabel 12 V, 24 W disambung kepada output sebuah transformer. Kecekapan transformer itu ialah 40%.

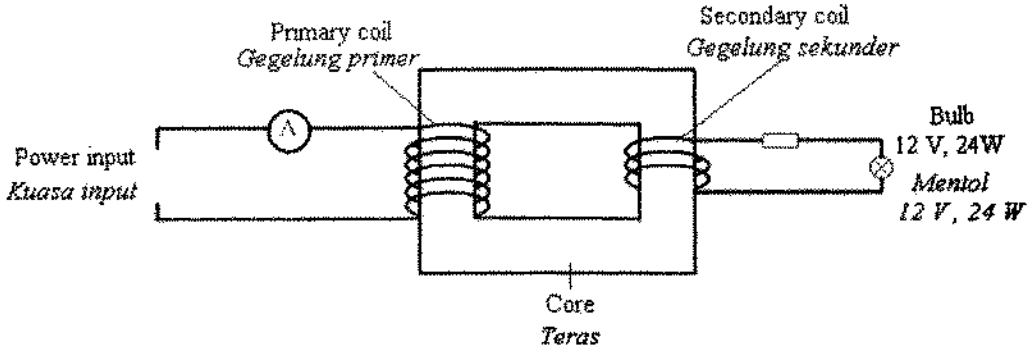


Diagram 12.1
Rajah 12.1

(a) (i) Name the type of transformer.
Namakan jenis transformer itu.

[1 mark]

(ii) Explain the working principle of the transformer.
Terangkan prinsip kerja transformer itu.

[4 marks]

(b) Calculate
Hitungkan

(i) the current flow in the secondary coil.
Arus yang mengalir di dalam gegelung sekunder.

(ii) power input in the primary coil.
Kuasa input pada gegelung primer.

[5 marks]

(c) You are asked to investigate the design and the characteristics of four transformers shown in Diagram 12.2.
Anda ditugaskan untuk mengkaji reka bentuk dan ciri-ciri bagi empat transformer seperti ditunjukkan dalam Rajah 12.2.

Transformer *Transformer*	Thickness of the coil *Ketebalan gegelung*	Material of the core *Bahan pada teras*	Type of the core *Jenis teras*	Distance between primary coil and secondary coil/cm *Jarak antara gegelung primer dengan gegelung sekunder/cm*
P	Thick *Tebal*	Soft iron *Besi lembut*	Laminated *Berlamina*	2
Q	Thick *Tebal*	Steel *Keluli*	Solid *Padat*	6
R	Thin *Nipis*	Soft iron *Besi lembut*	Laminated *Berlamina*	2
S	Thin *Nipis*	Steel Keluli	Solid *Padat*	6

Diagram 12.2
Rajah 12.2

Explain the suitability of each characteristic of the transformers and determine which transformer has the highest efficiency.
Give reasons for your choice
Terangkan kesesuaian setiap ciri transformer itu dan tentukan transformer yang mempunyai kecekapan paling tinggi.
Beri sebab bagi jawapan anda.

[10 marks]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

4531/3
PHYSICS
Paper 3
August
2010
$1\frac{1}{2}$ Hours

No. Kad Pengenalan :

Nama : .....

Tingkatan : 5 .....

JABATAN PELAJARAN NEGERI TERENGGANU

PEPERIKSAAN PERCUBAAN SIJIL PELAJARAN MALAYSIA 2010

PHYSICS
FIZIK

Paper 3
Kertas 3

One hour and thirty minutes
Satu jam tiga puluh minit

DO NOT OPEN THIS QUESTION PAPER UNTIL TOLD
JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Write your **name, identity card numbers** and form in the space provided
Tuliskan **nama, nombor kad pengenalan** *dan* **tingkatan** *anda pada ruang yang disediakan*

2 Candidate is required to read information on page 17.
Calon dikehendaki membaca maklumat di halaman 2 dan halaman 17.

Section	Question	Full marks	Marks obtain
A	1	16	
	2	12	
B	3	12	
	4	12	
Total			

Disediakan oleh:
AKRAM NEGERI TERENGGANU

Dibiayai oleh:
KERAJAAN NEGERI TERENGGANU

TERENGGANU ANJUNG ILMU

Dicetak oleh:
Percetakan Yayasan Islam Terengganu Sdn. Bhd.
Tel: 609-666 8611/6652/8601 Faks: 609-666 0611/0063

This question paper contain 17 printed pages
Kertas soalan ini mengandungi 17 halaman bercetak

Section A
Bahagian A

[28 marks]
[28 *markah*]

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

Time suggestion in this section is 60 minutes
Masa yang dicadangkan untuk menjawab bahagian ini ialah 60 minit.

1 A student carries out an experiment to investigate the relationship between the acceleration, *a* and the force, *F* for a trolley. Diagram 1.1 shows the arrangement of the apparatus for the experiment. The trolley is placed on the friction-compensented track and the string is attached to to the end of the cart and a mass hanger is tied to the other end of the string. At the beginning of the experiment, the force, *F* acted on the trolley used is 0.5 N.(Where *F* is weight of mass hanger and masses). The ticker-timer is switched and the trolley is then released. The ticker-tape is obtained is cut into 6 strips of 10-tick as shown on Diagram 1.2. The procedure is repeated with different forces, *F*: 1.0 N, 1.5 N, 2.0 N and 2.5 N. Diagrams 1.3, 1.4, 1.5 and 1.6 shows the cut-ticker-tapes obtained from experiment.

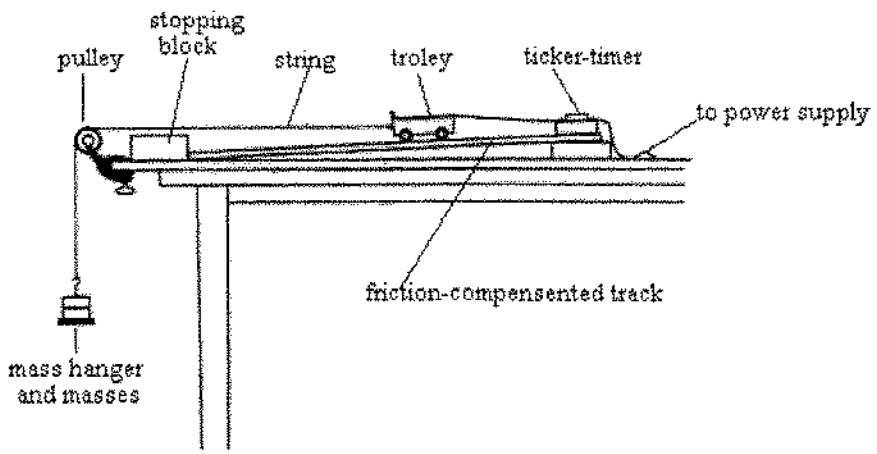


Diagram 1.1
Rajah 1.1

Seorang murid menjalankan satu eksperimen untuk mengkaji hubungan antara pecutan, a dan daya, F bagi sebuah troli. Rajah 1.1 menunjukkan susunan radas untuk eksperimen tersebut. Troli dietakkan di atas sebuah landasan yang diabaikan geserannya dan diikat dengan benang yang disambung pada penggantung dan jisimnya. Jumlah berat penggantung dan jisimnya ialah 0.5 N. Jangkamasa detik dihidupkan dan kemudian troli dilepaskan. Pita detik yang telah diperolehi dipotong kepada 6 jalur yang mengandungi 10 detik seperti yang ditunjukkan pada Rajah 1.2.

Eksperimen diulang dengan menggunakan daya-daya yang berlainan, F: 1.0 N, 1.5 N, 2.0 N and 2.5 N. Rajah-rajah 1.3, 1.4, 1.5, 1.6 dan 1.7 menunjukkan potongan pita detik yang diperolehi daripada eksperimen.

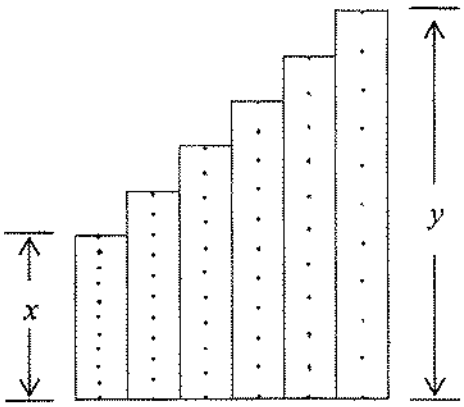


Diagram 1.2
Rajah 1.2

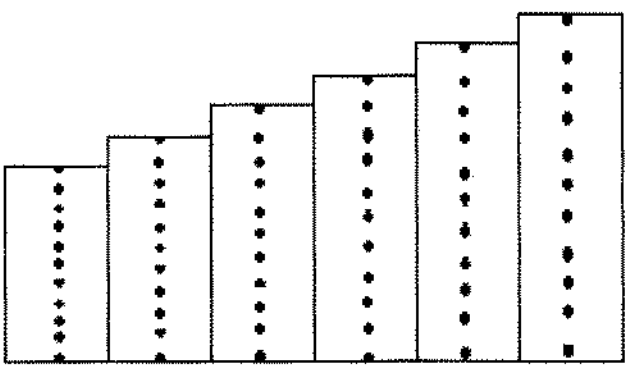


Diagram 1.3
Rajah 1.3
$F = 0.5$ N

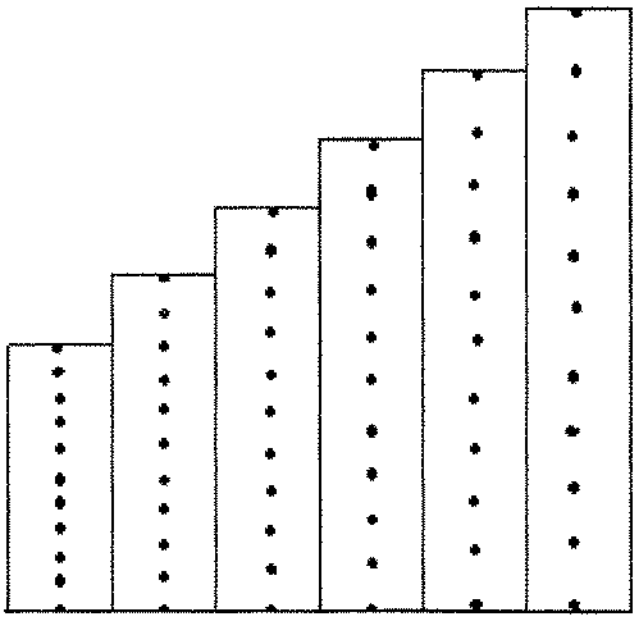


Diagram 1.4
Rajah 1.4
$F = 1.0$ N

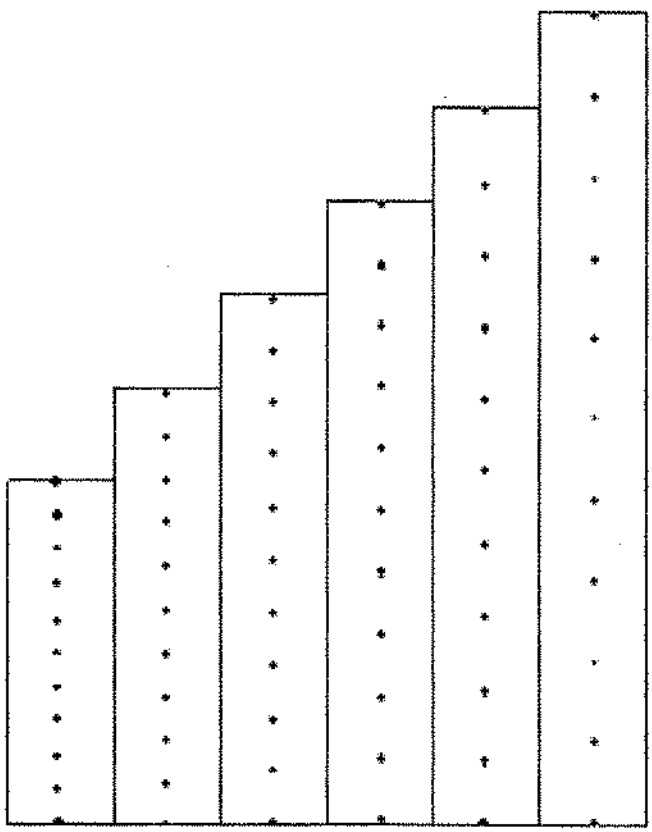


Diagram 1.5
Rajah 1.5
$F = 1.5$ N

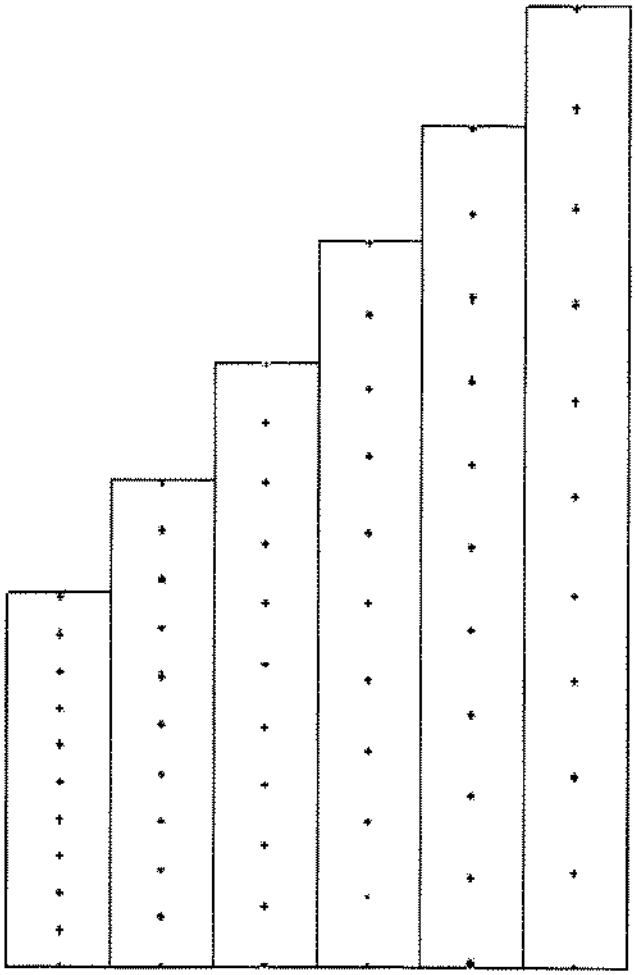


Diagram 1.6
Rajah 1.6
$F = 2.0$ N

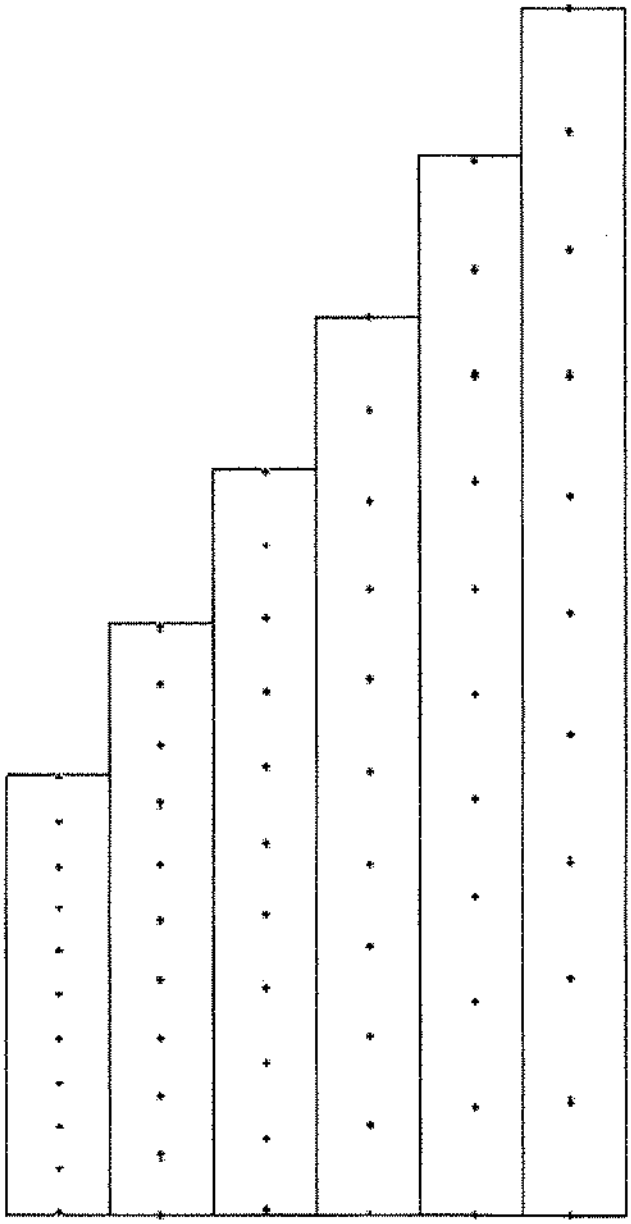


Diagram 1.7
Rajah 1.7
$F = 2.5$ N

(a) For the experiment described on page 2, identify:
Bagi eksperimen yang diterangkan di halaman 2, kenal pasti:

(i) The manipulated variable
Pembolehubah dimanipulasikan

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

(ii) The responding variable
Pembolehubah bergerak balas

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

(iii) The constant variable
Pembolehubah dimalarkan

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

(b) Based on Diagrams 1.3, 1.4, 1.5, 1.6 and 1.7 on page 3, 4 5 and 6:
Berdasarkan Rajah 1.3, 1.4, 1.5, 1.6 dan 1.7 di halaman 3, 4, 5 dan 6:

(i) Record the reading of each x, y with different force, F *and* calculate the values of acceleration, a;

Given $a = \dfrac{y-x}{0.2}$

Tabulate your results for F, x, y and a, in the space below.

Dapatkan bacaan x dan y bagi berat, F yang berlainan dan hitungkan nilai-nilai pecutan, a;

Diberi $a = \dfrac{y-x}{0.2}$

Jadualkan keputusan anda bagi F, x, y dan *a pada ruang di bawah.*

[7 marks]
[7 markah]

(c) On the graph paper on page 9, plot a graph of a against F.

Pada kertas graf di halaman 9, lukis graf a melawan F.

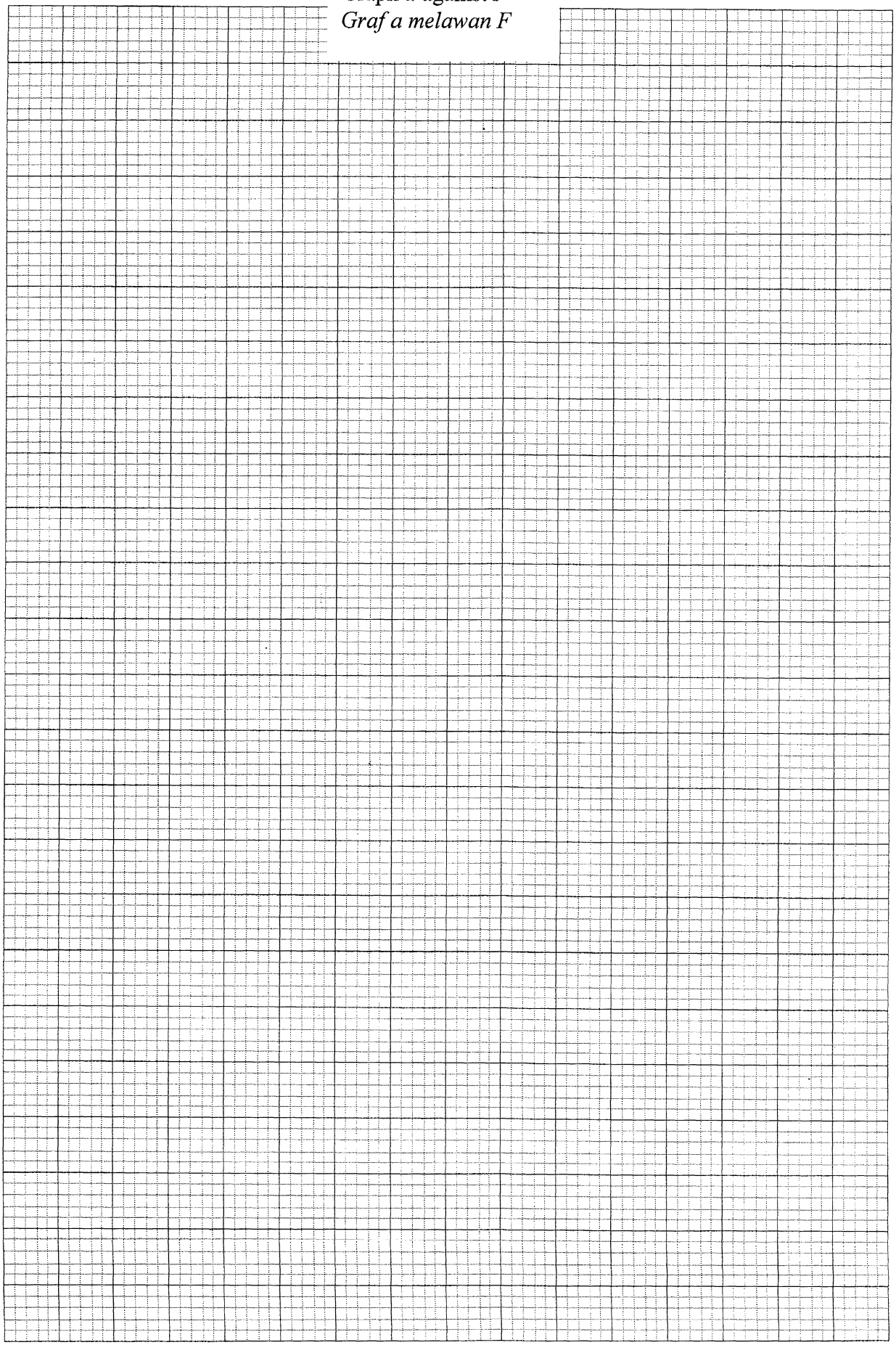
[5 marks]
[5 markah]

(d) Based on your graph in 1(c), state the relationship between a against F.

Berdasarkan graf anda di 1(c), nyatakan hubungan antara a melawan F.

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

Graph *a* against *F*
Graf a melawan F



2 A student carries out an experiment to investigate the relationship between potential differeence V across the terminal of the battery and the current, I. The result of the experiment is shown in the graph of V against I below.
Seorang pelajar menjalankan ujikaji untuk menyiasat hubungan antara beza keupayaan, V yang merentasi terminal sebuah bateri dengan arus, I. Keputusan ujikaji ditunjukkan dalam graf V melawn I di bawah.

Graph of V against I
Graf V melawan I

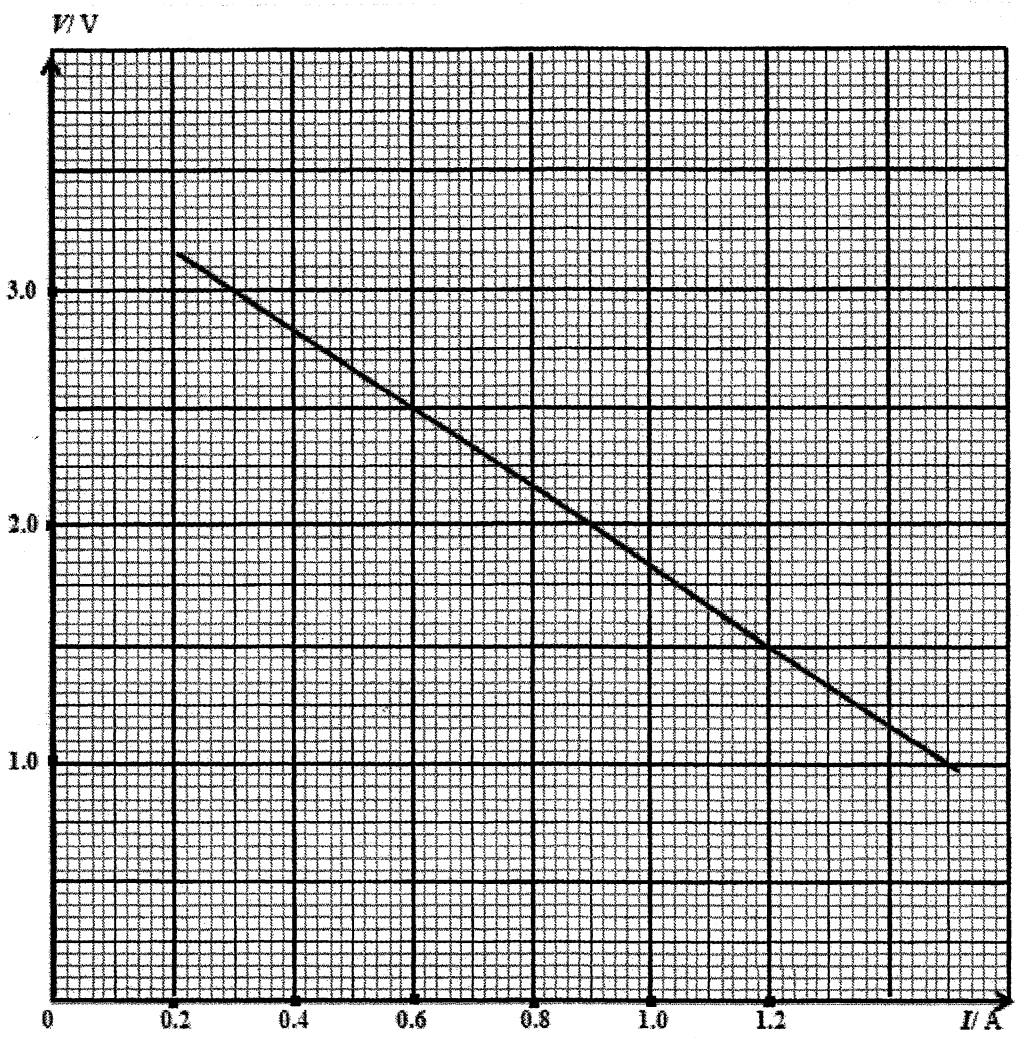


Diagram 2
Rajah 2

(a) Based on the graph in Diagram 2;
Berdasarkan graf pada Rajah 2

(i) State the relationship between V and I
Nyatakan hubungan antara V dan I

.....

[1 mark]
[1 markah]

(ii) Determine the value of E, when $I = 0.0$ A
Show on the graph how you obtained the value of E
Tentukan nilai E apabila $I = 0.0$ A
Tunjukkan pada graf itu bagaimana anda menentukan nilai E

.....

[2 marks]
[2 markah]

(iii) Name the physical quantity that is represented by the value of E in (a)(ii)
Namakan kuantiti fizik yang diwakili oleh nilai E dalam (a)(ii)

.....

[1 mark]
[1 markah]

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

r = ...

[3 marks]
[3 markah]

(c) From the graph, state the value of V when $I = 0.60$ A. Show on the graph how you obtained the value of V.
Daripada graf, nyatakan nilai V apabila $I = 0.60$ A. Tunjukkan pada graf bagaimana anda menentukan V.

.....

[2 marks]
[2 markah]

(d) The external resistance, R is given by the formula $E = I(R + r)$. By using the value of E in a(ii), r in (b) and $I = 0.60$ A, calculate the value of R.

Rintangan luar, R oleh formula $E = I(R + r)$ Dengan menggunakan nilai E dalam a(ii), r dalam (b) dan $I = 0.60$ A, hitung nilai R.

R = ...

[2 marks]
[2 markah]

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

.....

....

[1 *mark*]
[1 markah]

Section B
Bahagian B

[12 marks]
[12 markah]

Answer any **one** from this section
*Jawab mana-mana **satu** soalan dari bahagian in*

The time suggested to answer this section is 30 minutes.
Masa yang dicadangkan untuk menjawab bahagian ini ialah 30 minit.

3 Diagram 3.1 shows a diver is diving into the sea.
Diagram 3.2 shows a diver is diving into the swimming pool.
They are at the same depth but the diver in Diagram 3.1 feel that his ear was sick.

Rajah 3.1 menunjukkan seorang penyelam sedang menyelam di dalam kolam renang.
Rajah 3.2 pula seorang penyelam sedang menyelam ke dalam laut.
Mereka berada pada kedalaman yang sama tetapi penyelam di dalam Rajah 3.2 merasai telinganya sakit

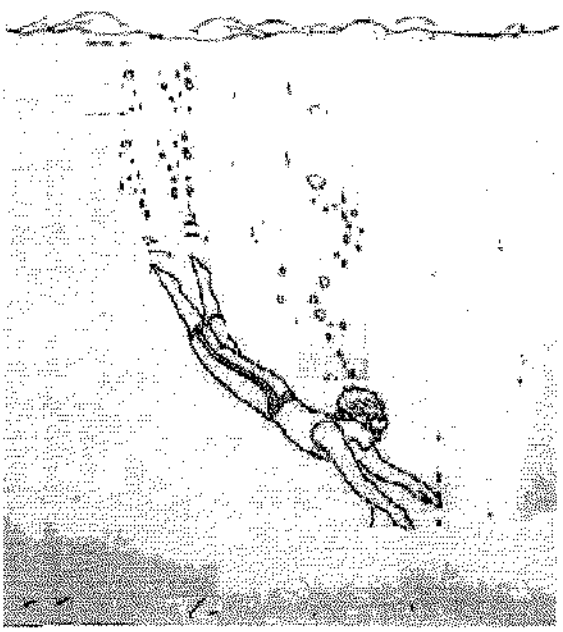


Diagram 3.1
Rajah 3.1

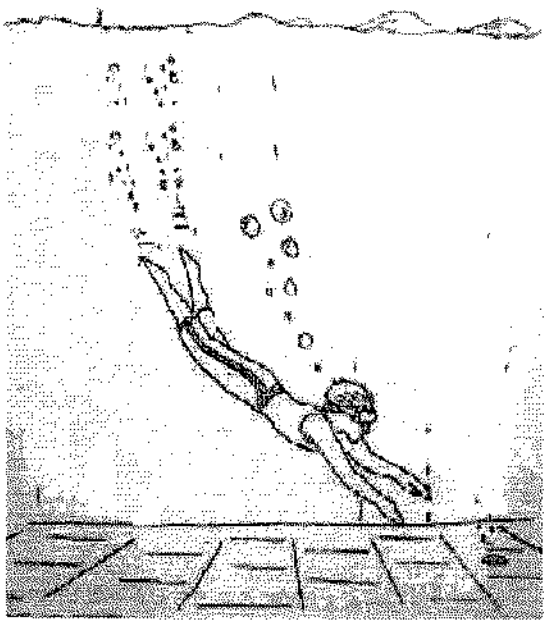


Diagram 3.2
Rajah 3.2

Based on the observation above and your knowledge of pressure in liquid;
Berdasarkan pemerhatian di atas dan pengetahuan anda mengena tekanan dalam cecair;

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

[1mark]
[1 markah]

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

[1mark]
[1 markah]

(c) With the use of apparatus such as thistle funnel, meter ruler and others describe an experiment framework to investigate the hypothesis stated in 4(b)

Dengan menggunakan radas seperti corong tisel, pembaris meter dan lain-lain, terangkan satu rangka kerja eksperimen untuk menyiasat hipotesis yang anda nyatakan dalam 4(b)

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

i) Aim of the experiment.
Tujuan eksperimen.

ii) Variables in the experiment.
Pembolehubah dalam eksperimen.

iii) List of apparatus and materials.
Senarai radas dan bahan

iv) Arrangement of the apparatus.
Susunan radas.

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

vi) The way you would tabulate the data.
Penjadualan data.

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

[10 marks]
[10 markah]

4 Diagram 4.1 and 4.2 shows the electric circuit consist with an electric bells, switch and battery. When the switch is closed, it is observes that the bell in Diagram 4.2 rings louder than the bell in Diagram 4.1. Both electric bells in each diagram are same.

Rajah 4.1 dan 4.2 menunjukkan litar elektrik mengandungi satu loceng elektrik , suis dan sel kering. Apabila suis ditutup, didapati loceng dalam Rajah 4.2 berdering lebih kuat daripada loceng dalam Rajah 4.1. Kedua-dua loceng adalah sama bagi setiap rajah.

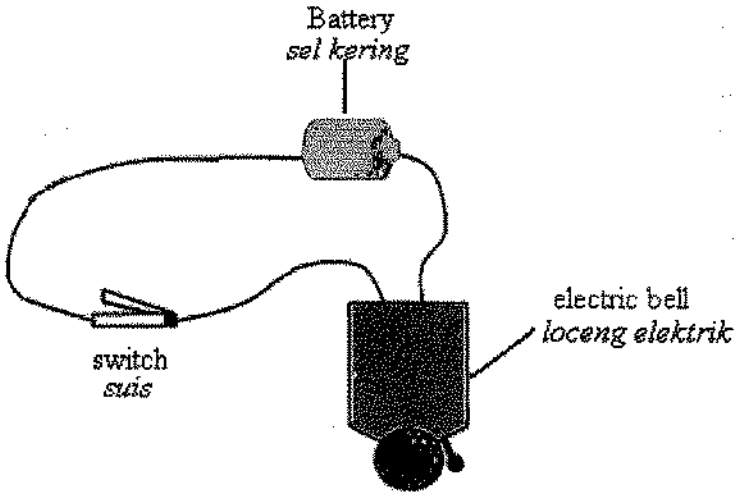


Diagram 4.1
Rajah 4.1

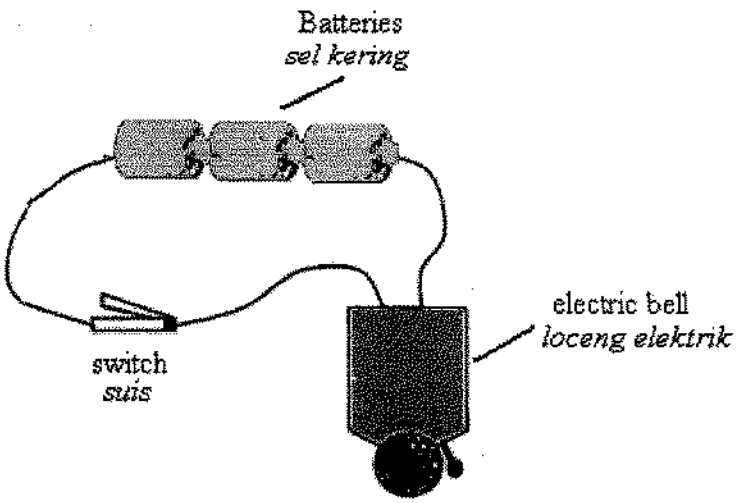


Diagram 4.2
Rajah 4.2

Based on the observation above and your knowledge of electromagnet;
Berdasarkan pemerhatian di atas dan pengetahuan anda mengena elektromagnet;

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

[1mark]
[1 markah]

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

[1mark]
[1 markah]

(c) With the use of apparatus such as solenoid, paper clips and others describe an experiment framework to investigate the hypothesis stated in 4(b)

Dengan menggunakan radas seperti solenoid, klip kertas dan lain-lain , terangkan satu rangka kerja eksperimen untuk menyiasat hipotesis yang anda nyatakan dalam 4(b)

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

i) Aim of the experiment.
Tujuan eksperimen.

ii) Variables in the experiment.
Pembolehubah dalam eksperimen.

iii) List of apparatus and materials.
Senarai radas dan bahan

iv) Arrangement of the apparatus.
Susunan radas.

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

vi) The way you would tabulate the data.
Penjadualan data.

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

[10 marks]
[10 markah]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

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

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

3 Answer **one** question from **Section B** and detail. You answer must clear and logic. You can use equations, diagrams, tables, graphs and other suitable methods to explain your answer.
Jawab satu *soalan daripada* **Bahagian B** dan terperinci. *Jawapan mestilah jelas dan logik. Anda boleh menggunakan persamaan, gambar rajah jadual graf dan cara lain yang sesuai untuk menjelaskan jawapan anda.*

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

5 The diagram in the question provided are not drawn to scale unless stated.
Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan.

6 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.

7 You may use a non-programmable scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik yang tidak diprogramkan. Walau bagaimanapun, langkah mengira perlu ditunjukkan.

8 The time suggested to answer **Section A** is 60 minutes, **Section B** is 30 minutes.
Masa yang dicadangkan untuk menjawab **Bahagian A** *ialah 60 minit,* **Bahagian B** *ialah 30 minit.*

JABATAN PELAJARAN
TERENGGANU

PEPERIKSAAN PERCUBAAN SPM
2010

SKEMA FIZIK
KERTAS 1 (4531/1)
KERTAS 2 (4531/2)
KERTAS 3 (4531/3)

SCHEME PAPER 1 TRIAL SPM 2010
(4531/1)

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

MARKING SCHEME PHYSICS PAPER 2 FOR TRIAL SPM 2010

SECTION A

QUESTION 1	Mark	Answer	Note
(a)	1	***State the correct name of the physical quantity*** Potential difference // Voltage	
(b)	1	***State the correct smallest scale division*** 0.5 V	
(c)	1	***State the correct instrument*** Instrument Y	
(d)	1	***Tick the correct box*** Parallel in a circuit	

QUESTION 2	Mark	Answer	Note
(a)	1	***State the correct meaning of momentum*** The products of mass and velocity.	Reject: speed
(b)	1 1	***Correct substitution*** 1.5 x 2 ***Answer with the correct unit*** 3.0 kg m s^{-1}	
(c)	1	***Give the correct answer*** The impact time is shorter.	
(d)	1	***Give the reason correctly*** High **impulsive** force	
TOTAL	5		

QUESTION 3	Mark	Answer	Note
(a)	1	***State the change of energy involved correctly*** Electrical energy → Heat energy	
(b)	1 1	***Give the correct comparison regarding to density*** ***Q = 0.5x4200x(100-28)*** ***Answer with the correct unit*** 1.512 x 10^5 J	
(c)	1 1	***Give the correct substitution*** $\frac{(600)(160)}{0.04}$ ***Answer with the correct unit*** 2.4 x 10^6 J kg^{-1}	
(d)	1 1	***State what happen to the heat at boiling point*** Heat is used to overcome the attraction force between molecules ***State the relationship between temperature and kinetic energy molecules*** Kinetic energy of molecules unchanged , so the temperature unchanged	
TOTAL	7		

QUESTION 4	Mark	Answer	Note
(a)	1	***State type of sound waves correctly*** Longitudinal// mechanical wave	
(b)	1	***State the correct wave*** X-ray	
(c)	1	***State the correct relationship between f and λ*** f is inversely proportional with λ // λ smallest	
(d)(i)	1 1	***Correct substitution*** v = 2500 x 0.5 ***Answer with the correct unit*** = 1.25×10^3 m/s	
(d)(ii)	1 1	***Correct substitution*** d = ½ vt = ½(1.25 x 10^3 m/s)(2.0 s) ***Answer with the correct unit*** = 1.25×10^3 m	

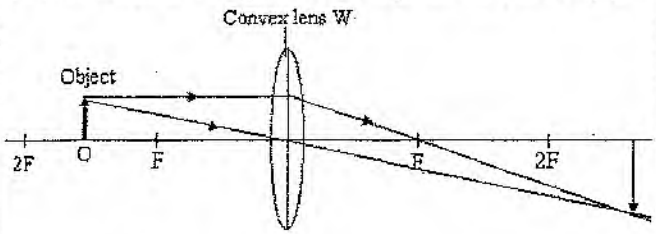
QUESTION 5	Mark	Answer	Note
(a)(i)	1	***Give the correct meaning of density*** Mass per volume // $\frac{\text{mass}}{\text{Volume}}$ // symbol	Define the symbol
(a)(ii)	1	***Give the correct comparison regarding to the density*** Density of water > oil // water > oil	Vice versa
(b)(ii)	1	***Give the correct comparison regarding to the distance*** $d_1 > d_2$	Vice versa
(b)(iii)	1	***Give the correct comparison regarding to the pressure*** Pressure of water > oil // water > oil	Vice versa
(c)	1	***Give the correct relationship between density and pressure*** As the density increases the pressure increases // directly proportional	
(d)	1 1 1	***State the correct relationship between depth and pressure*** The deeper the water the higher the pressure // P =hρg // P α h ***Give the correct comparison between the pressure in the tank and in the house (in the tap)*** The pressure in the tank > in the house (in the tap) ***State the relationship between pressure and force*** The difference pressure produce force to flow the water // F = PA	
TOTAL	**8**		

QUESTION 6	Mark	Answer	Note
(a)(i)	1	***State the correct physical quantity*** Potential difference across the cell	
(a)(ii)	1	***Give the correct comparison regarding to the voltmeter reading*** The voltmeter reading in 6.1 > 6.2 // 6.1 > 6.2	Vice versa
(a)(iii)	1	***Give the correct comparison regarding to the brightness of the bulbs*** The brightness of the bulbs in 6.2 > 6.1 // 6.2 > 6.1	Vice versa
(a)(iv)	1	***Give the correct comparison regarding to the ammeter reading*** The ammeter reading in 6.2 > 6.1 // 6.2 > 6.1	Vice versa
(b)	1	***Give the correct relationship between the ammeter reading and the voltmeter reading*** As the ammeter reading increases the voltmeter reading decreases // The larger the ammeter reading the smaller the voltmeter reading	
(c)(i)	1	***State the correct observation about the voltmeter reading*** The voltmeter reading shows the highest reading	
(c)(ii)	1 1	***Give the reason correctly*** The current not flow // open circuit // no load to the cell Voltmeter shows the e.m.f of the cell	
TOTAL	**8**		

QUESTION 7

Part	Mark	Answer	Note
(a)	1	Unstable isotope	
(b)	1	8 days	
(c)	1	Decrease	
(d)	1 1	$^{131}_{53}\text{I} \longrightarrow {}^{131}_{54}\text{Xe} + {}^{0}_{-1}\text{e}$	
(e)(i)	1 1	200 → 100 → 50 → 25 // 3T½ 15 hours	
(ii)	1	R	
(iii)	1 1	The highest reading // highest amount of radioactive is detected Minus the reading before moves the GM tube	

Total | **10**

QUESTION 8	Mark	Answer	Note
(a)	1	***State the correct meaning of refraction*** The changes of direction and speed of light when it crosses the boundary between two materials of different optical densities.	
(b)	1 1 1	***Complete the ray diagram correctly*** Line parallel principle axis bending through F, Straight from object pass through optical centre of the lens, Show / draw an image at correct position (intercept).  	
(c)	1	***State the correct characteristics*** Real, inverted and magnified.	State all three characteristics
(d)(i)	1 1 1	***Correct calculation or answer*** X: m = 4 Y: m = 10 Z: m = 20	
(d)(i)	1	***Give the correct choice*** Y and Z	
(d)(ii)	1	***Give the correct choice*** X and Z	
(e)(i)	1	***State the correct choice*** Lens Z	
(e)(ii)	1	***Give the correct reason*** Larger and clearer image.	
TOTAL	**12**		

SECTION B

<table>
<tr><th>QUESTION 9</th><th>Mark</th><th>Answer</th><th>Note</th></tr>
<tr><td>(a) (i)</td><td>1</td><td>Force per unit area</td><td></td></tr>
<tr><td>(ii)</td><td>1
1

1
1
1</td><td>Pressure on piston Q = pressure on piston R
Cross sectional area of piston Q < Cross sectional area of piston R
Force acted on piston Q < force acted on piston R
The greater the area, the greater the force
Pascal's principle</td><td></td></tr>
<tr><td>(b)</td><td>1
1

1

1</td><td>aerofoil shape
The air speed on the upper surface > the air speed on the lower surface.
The pressure on the lower surface > pressure on the upper surface.
Different in pressure produce lift force.</td><td></td></tr>
<tr><td>(c)</td><td>1,2

3,4

5,6
7,8

9,10

11,12
max 10</td><td>
<table>
<tr><th>Design</th><th>Reasons</th></tr>
<tr><td>Thick wall</td><td>Water pressure increase with depth</td></tr>
<tr><td>High density material</td><td>Increase mass / can submerge easily</td></tr>
<tr><td>Strong material</td><td>Does not break easily</td></tr>
<tr><td>Aerodynamic shape</td><td>Reduce water resistance</td></tr>
<tr><td>Ballast tank</td><td>To increase or reduce weight</td></tr>
<tr><td>Sonar transmitter and receiver</td><td>To estimate distance and depth</td></tr>
</table>
</td><td></td></tr>
<tr><td>Total</td><td>20</td><td></td><td></td></tr>
</table>

<table>
<tr><th>Part</th><th>Marks</th><th>Answer</th><th>Notes</th></tr>
<tr><td colspan="2">Question 10</td><td></td><td></td></tr>
<tr><td>(a)</td><td>1</td><td>Circuit consists transistor, resistor and cell</td><td rowspan="6"></td></tr>
<tr><td>(a) (i)</td><td>1</td><td>10.1 : Microammeter no reading // 0 A,
milliammeter no reading // 0 A</td></tr>
<tr><td>(ii)</td><td>1</td><td>10.2 : Microammeter has a reading // 1 x 10^{-6} A ,
milliammeter has a reading // 1 x 10^{-3} A</td></tr>
<tr><td>(iii)</td><td>1</td><td>Change in microammeter reading small, change in milliammeter reading is bigger</td></tr>
<tr><td>(iv)</td><td>1
1</td><td>I_b Increase, I_c increase // I_c depends on I_b
A small change in I_b caused a big change in I_c</td></tr>
<tr><td>(b)</td><td>1
1
1
1</td><td>At night resistance LDR increases
V_{BE} increases
I_b increases and switch on transistor
I_c increases and lights up bulb</td><td></td></tr>
<tr><td>(c)</td><td>1,2
3,4
5,6
7,8
9,10</td><td>
<table>
<tr><th>Modification</th><th>Explaination</th></tr>
<tr><td>Replace LDR with termistor</td><td>To detect heat when temperature is high</td></tr>
<tr><td>Replace bulb with siren / bell</td><td>To produce sound</td></tr>
<tr><td>Connect relay switch to output transistor</td><td>To switch on the siren</td></tr>
<tr><td>Interchange the position of resistor R and termistor</td><td>To increase base voltage / / voltage across R // base current</td></tr>
<tr><td>Use 240 V power supply</td><td>Siren is function at high voltage</td></tr>
</table>
</td><td>Accept any reasonable modification</td></tr>
<tr><td></td><td>20 marks</td><td></td><td></td></tr>
</table>

SECTION C

Bhg Soalan 11	Mrk	Jawapan	Catatan
(a)	1	The distance from the primary focus to the optical center	
(b)			
	1	It should be convex	
	2	The magnified image can be obtained	
	3	Percentage of light of the lenses should be high	
	4	The image would be brighter and clearer	
	5	Its focal length should be short	
	6	The power of lens will be high and can be focused at a short distance	
	7	diameter of lens should be large	
	8	it is gives a bigger display	
	9	the most suitable brand is **J**	
	10	type of lens is convex, percentage of light is high , focal length is short and size is bigger	
(c)			
(i)		1/f = 1/v + 1/u	
	1	1/5 = ½ + 1/v	
	2	v = - 3.33cm	
(ii)		magnification = v/u	
	1	3.33/2	
	2	1.67 times Or 5/3times	
(d)			
	1	The lens is directed to a distant object such as tree	
	2	The screen was adjusted behind the lens until a sharp image formed	
	3	the distance between the lens and the screen measured	
	4	The power of the lens are determined using 1/f	
	5	The shorter the focal length the more the power of lens.	
Total	20 M		

QUESTION 12

Part	Mark	Answer	Note
(a)(i)	1	Step-down	
(ii)	1	An alternating current flows through coil.	
	1	The soft -iron core is magnetized.	
	1	The magnet produced varies in magnitude and direction.	
	1	This causes a changing magnetic flux to pass through the secondary coil.	
	1	An induced e.m.f across the secondary coil is produced.	
		Max 4	
(b)	1	I = 24/12	
	1	= 2A (with unit)	
	1	Efficiency = $\frac{\text{Output power}}{\text{Input power}} \times 100\ \%$	
	1	$\frac{24 \times 100}{40}$	
	1	60W	
	1,2	Thick — Reduce the resistance of the coil	
	3,4	Soft iron — Reduce the hysteresis loss// can be magnetized and demagnetized easily// Little energy used to be magnetized and demagnetized .	
	5,6	Laminated — Make the iron core as insulation. Eddy current are not able to flow through the layers of insulation// reduce eddy current	
	7,8	Low// near//shorter — Reduce leakage of magnetic flux	
	9,10	Choose P because copper wire thick, soft iron core, laminated core and distance is low.	
Total	**20**		

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No	Mkh	Jawapan	
Soalan 1			
(a) (i)	1	Daya (***oleh terima ujikaji menggunakan tali kenyal)	
(ii)	1	pecutan	
(iii)	1	jisim troli / tinggi penggantung dan jisimnya dari lantai.	
(b) (i)			

F / N	x/cm	y/ cm	a/ cm s^{-2}
0.5	2.6	4.6	10.0
1.0	3.5	7.9	22.0
1.5	4.6	10.8	31.0
2.0	5.0	12.7	38.5
2.5	5.8	16.0	51.0

****(Perhatian untuk pemeriksa: sila ukur semula x dan y kerana kemungkinan saiz kertas berubah)**

Pengukuran (3 markah)

1 -semua bacaan x dan y diukur dgn betul

1 -minimum 3 set bacaan x dan y betul (terima jawapan tanpa tempat perpuluhan

1 - tekal pada 1 t.p

**pelajar tidak perlu tunjukkan pengiraan, lihat terus dalam jadual.

(c)

penjadualan (4 markah)

1 -rangka F / N, x/ cm , y/cm, a/ cm s^{-1} (simbol/nama) dpt 1 markah

1 -menyatakan unit bagi F, x, y dan a dgn betul dpt 1 markah

1 -semua nilai a dihitung dengan betul dpt 1 markah

1 -tekal dpt 1 markah

melukis graf (5 markah)

beri √ pada perkara berikut

-menyatakan unit pembolehubah dgn betul (ecf unit dpd jadual) √

-pembolehubah bergerakbalas (acceleration) pd paksi-x dan pembolehubah dimanipulasi (force) pd paksi-y √

-kedua-dua paksi mempunyai skala seragam dan genap √

-5 titik diplot dgn betul √

atau 3-6 titik diplot dgn betul (0-2 dapat 0 markah) √

-garis lurus penyesuaian terbaik (dari asalan) √

-saiz minimum 5X4 petak 2 cm x 2 cm √

Bilangan /	skor
7	5
5-6	4
3-4	3
2	2
1	1

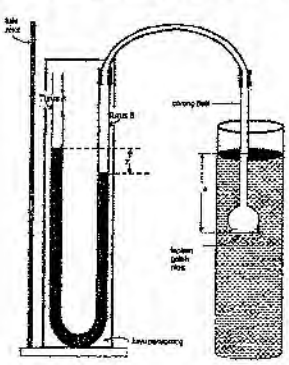
(d)

1 a berkadar langsung dgn F (berdasarkan graf dilukis)

Jumlah	**16**		

Question 2

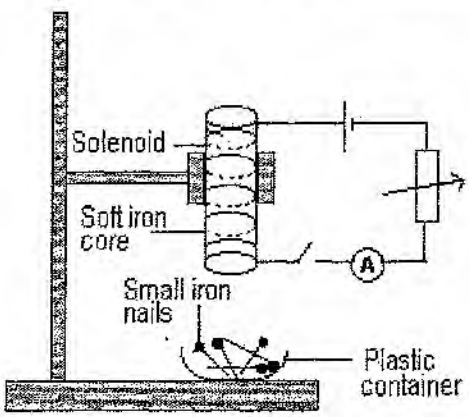
Section	Mark	Marking scheme
2 (a)(i)	1	V decreases linearly with I
(ii)	1	Extrapolate the graph
	1	3.5 V
(iii)	1	Electromotive force//e.m.f.//d.g.e.
(b)	1	Draw a sufficient large triangle (minimum size is 8 cm x 8 cm) * Correct substitution(follow candidate's triangle)
	1	$\frac{1.5-3.5}{1.2-0}$
(ii)	1	State the value /answer with unit 1.67 VA^{-1} / Ω
(c)	1	Show the vertical line from I = 0.60 A until touch the graph then horizontal line until it touches he V-axis
	1	V = 2.5 V
(d)		E = I(R+r)
	1	3.5 = 0.6(1.67 + R)
	1	R = 4.16 Ω
(d)	1	-Repeat the experiment and take average// -switch of the circuit when not taking any reading// -Eye position must be perpendicular to scale of meter ruler
total	12	

Question 3		
Mark	**Section**	**Answer**
1st	3 (a)	**State a suitable inference** The density of the water affects the pressure.
1st	(b)	**State relevant hypothesis (with direction)** as the density increase , the different level/pressure increase.
1	(c)	**Describe a complete and suitable experimental framework**
1st		**State the aim of the experiment** To investigate the relationship between the density of liquid and the pressure/ different level.
2nd		**State the manipulated variable and the responding variable** Manipulated variable : density Responding variable : pressure/ different level
3rd		**State the constant variable** Constant variable : Depth
4th		**List out the important apparatus and materials** Tall beaker, small thistle funnel, flexible tube, manometer, meter rule, retort stand, liquids.
5th		**State a function arrangement of the apparatus** A manometer is connected to thistle funnel with rubber tube 
6th		**State the method of controlling the manipulated variable** Insert the thistle funnel vertically down to the bottom of the beaker of liquid density of 1.2 gcm^{-3}
7th		**State the method of measuring the responding variable**

<table>
<tr><td></td><td></td><td>Measure the different level in manometer, l.</td></tr>
<tr><td>8th</td><td></td><td><u>Repeat the experiment at least 4 times with different values</u>
Repeat the experiment 4 time using another liquid with different density such as 1.5 gcm^{-3}. 2.0 gcm^{-3} .3.0 gcm^{-3} 3.5 gcm^{-3} and 4.0 gcm^{-3}</td></tr>
<tr><td>9th</td><td></td><td><u>Tabulate the data</u>
Records the data .
<table>
<tr><td>Density/ gcm^{-3}</td><td>Pressure (different level) ,l/Pa</td></tr>
<tr><td>1.2</td><td></td></tr>
<tr><td>1.5</td><td></td></tr>
<tr><td>2.0</td><td></td></tr>
<tr><td>3.0</td><td></td></tr>
<tr><td>3.5</td><td></td></tr>
</table></td></tr>
<tr><td>10th</td><td></td><td><u>State how data will be analysed (sketch graph/statement)</u>
Plot graph pressure against density.</td></tr>
<tr><td>Total</td><td>12</td><td></td></tr>
</table>

Question 4

Section	Mark	Answer
4 (a)	1	***State a suitable inference*** The electric current affects the loudness of the bell // The loudness of the bell depends on the electric current
4 (b)	1	***State relevant hypothesis (with direction)*** The strength of an electromagnet increases as the current increases
4(c)		***Describe a complete and suitable experimental framework (10 marks)***
4 c (i)	1	**State the aim of the experiment(M1)** To investigate the relationship between electric current and the strength of an electromagnet
4c (ii)	1 1	**State the manipulated variable and the responding variable(M2)** Manipulated variable : electric current Responding variable : strength of an electromagnet ***State the constant variable (M3)*** Constant variable : number of turn solenoid // soft iron core
4 c(iii)		***List out the important apparatus and materials (M4)***

<table>
<tr><td></td><td>1</td><td>Ammeter, connection wires, rheostat, retort stand, ,switch, d.c. supply , soft iron core, solenoid, small iron nails and plastic container.</td></tr>
<tr><td>4 c(iv)</td><td>1</td><td><u>State a functionable arrangement of the apparatus (M5)</u>
 
</td></tr>
<tr><td>4 c(v)</td><td>1</td><td><u>State the method of controlling the manipulated variable (M6)</u>
The switch is closed.
The reading of the ammeter is recorded = I
The end of the solenoid is dipped into the plastic container full of small iron nails.</td></tr>
<tr><td>4 c(vi)</td><td>1</td><td><u>State the method of measuring the responding variable (M7)</u>
The plastic container is removed and the number of nails attached to the electromagnet is counted = N</td></tr>
<tr><td>4c(vii)</td><td>1</td><td><u>Reapeat the experiment at least 4 times with different values (M8)</u>
The experiment is repeated 5 times with different value of current by adjusting the rheostat.</td></tr>
<tr><td>4c(viii)</td><td>1</td><td><u>Tabulate the data (M9)</u>
<table>
<tr><th>Current, I/A</th><th>Number of small iron nail,N</th></tr>
<tr><td>0.1</td><td></td></tr>
<tr><td>0.2</td><td></td></tr>
<tr><td>0.3</td><td></td></tr>
<tr><td>0.4</td><td></td></tr>
<tr><td>0.5</td><td></td></tr>
</table></td></tr>
<tr><td>4c(ix)</td><td>1</td><td><u>State how data will be analysed (sketch graph/statement)</u> (M10)
Plot graph N against I</td></tr>
<tr><td>TOTAL</td><td>12</td><td></td></tr>
</table>