

SULIT



**PERSIDANGAN KEBANGSAAN PENGETUA-PENGETUA
SEKOLAH MENENGAH MALAYSIA**

CAWANGAN KELANTAN

**SIJIL PELAJARAN MALAYSIA
PEPERIKSAAN PERCUBAAN 2009
PHYSICS
Kertas 1
Sept/Oct
1 ¼ jam**

4531/1

Satu jam lima belas minit

JANGAN BUKA KERTAS SOALANINI SEHINGGA DIBERITAHU

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

Kertas soalan ini mengandungi 47 halaman bercetak dan ___ halaman tidak bercetak.
Maklumat berikut mungkin berfeadah. Simbol-simbol mempunyai makna yang biasa.

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

1. $a = \frac{v-u}{t}$
2. $v^2 = u^2 + 2as$
3. $s = ut + \frac{1}{2}at^2$
4. Momentum = mv
5. $F = ma$
6. Kinetic energy = $\frac{1}{2}mv^2$
(Tenaga kinetik)
7. Potential energy = mgh
Tenaga keupayaan
8. Elastic potential energy = $\frac{1}{2}F_x$
(Tenaga keupayaan kenyal)
9. $\rho = \frac{m}{V}$
10. Pressure, $P = hpg$.
Tekanan
11. Pressure, $P = \frac{F}{A}$
Tekanan
12. Heat, $Q = mc\theta$
Haba
13. $\frac{PV}{T} = \text{Constant (pemalar)}$
14. $E = mc^2$
15. $v = f\lambda$
16. Power, $P = \frac{\text{energy/tenaga}}{\text{time/masa}}$
17. $V = IR$
18. Power, $P = IV$
kuasa
19. $\frac{N_s}{N_p} = \frac{V_s}{V_p}$
20. Efficiency = $\frac{I_s V_s}{I_p V_p} \times 100\%$
(kecekapan)
21. $g = 10 \text{ ms}^{-2}$
22. $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$
23. $n = \frac{\sin i}{\sin r}$
24. $n = \frac{\text{Real depth /dalam nyata}}{\text{Apparent depth/dalam ketara}}$
25. $\lambda = \frac{ax}{D}$
26. $Q = It$
27. $g = 10 \text{ ms}^{-2}$

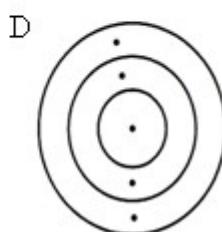
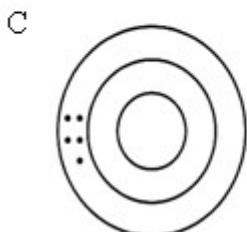
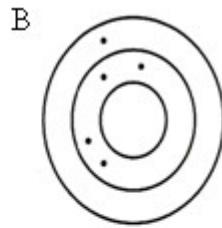
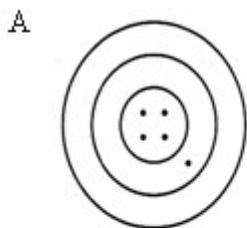
- 1 Which of the following values is equal to 30 mHz?

Antara nilai berikut,yang manakah sama dengan 30 mHz?

- A 3×10^{-5} Hz
- B 3×10^{-4} Hz
- C 3×10^{-3} Hz
- D 3×10^{-2} Hz

- 2 A,B,C, and D show the shooting marks on a target. Which of the following show the highest precision?

A,B,C, dan D merupakan kesan tembakan pada papan sasar. Antara berikut yang manakah menunjukkan kepersisan yang paling tinggi?



- 3 Table 1 shows the results obtained from an experiment resistivity of a wire.

Jadual 1 menunjukkan keputusan yang diperolehi daripada eksperimen kerintangan wayar.

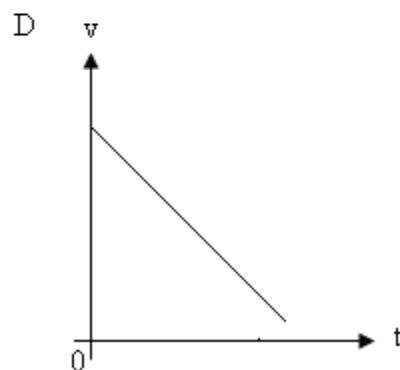
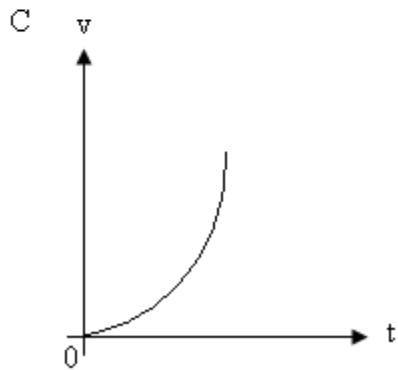
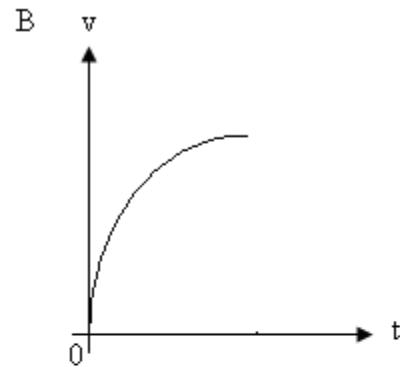
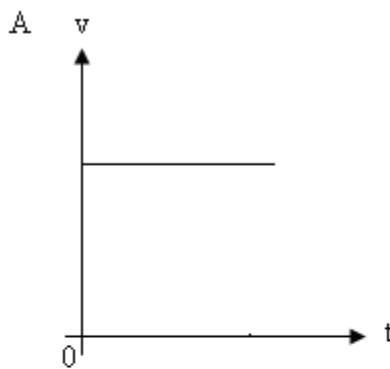
Diameter of wire /mm <i>Diameter wayar/mm</i>	Current/A <i>Arus elektrik/A</i>	Potential Diference/V <i>Beza keupayaan/V</i>
0.20	0.34	3.4
0.60	0.39	3.6
1.00	0.53	4.3
1.40	0.70	4.8
1.80	0.86	5.0

Table 1
Jadual 1

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

*Manakah antara pernyataan berikut adalah **benar** tentang eksperimen?*

- A The current is the manipulated variable
Arus elektrik adalah pembolehubah manipulasi
- B The smallest scale on the ammeter is 0.02 A
Skala paling kecil pada ammeter adalah 0.02 A
- C The smallest scale on the voltmeter is 0.01 V
Skala paling kecil pada voltmeter ialah 0.01 V
- D The diameter of the wire is measured using micrometer screw gauge
Diamater wayar diukur dengan menggunakan tolok skru mikrometer
- 4 Which of the following graph shows the object moving with decreasing acceleration?
Antara graf berikut, yang manakah menunjukkan objek bergerak dengan pecutan berkurang?



- 5 Diagram 1 shows a coconut falling from a tree.

Rajah 1 menunjukkan sebiji buah kelapa sedang jatuh dari pokoknya.

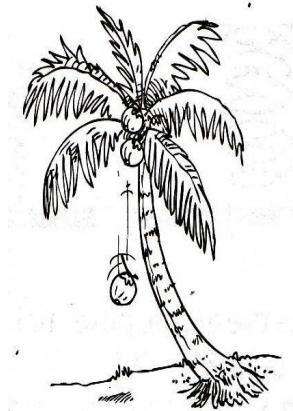


Diagram 1

Rajah 1

What is the physical quantity of the coconut is constant?

Apakah kuantiti fizik yang malar bagi buah kelapa itu?

- A Potential energy

Tenaga keupayaan

- B Kinetic energy

Tenaga kinetik

- C Acceleration

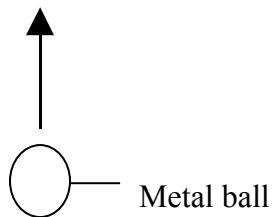
Pecutan

- D Velocity

Halaju

- 6 Diagram 2 shows a metal ball is thrown vertically upwards.

Rajah 2 menunjukkan sebiji bola logam dilontar tegak ke atas.



Which of the following statements is true about the momentum of the ball before it reaches the maximum height?

Antara pernyataan berikut, yang manakah benar mengenai momentum bagi bola itu sebelum ia

mencapai tinggi maksima?

A Decrease
Berkurang

B Increase
Bertambah

C Constant
Malar

- 7 Which of the following has the highest net force?
Antara berikut, yang manakah mempunyai daya bersih paling tinggi?

A



B



C



D



- 8 Diagram 2 shows a wooden block being pulled by a horizontal force, F and tension, T.

Rajah 2 menunjukkan sebuah blok kayu ditarik oleh satu daya, F dan tegangan, T.

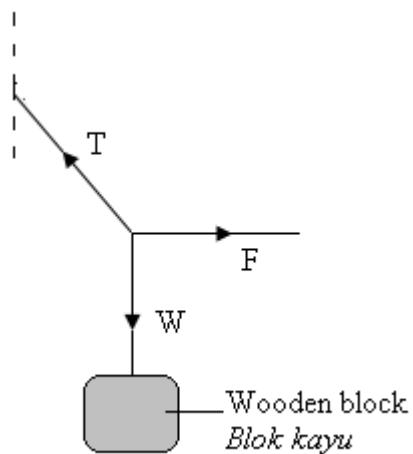
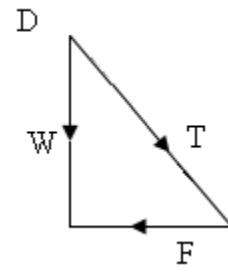
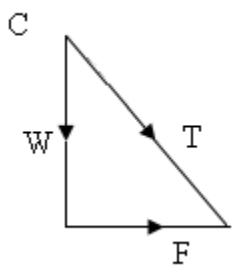
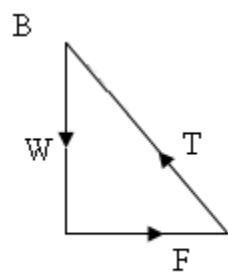
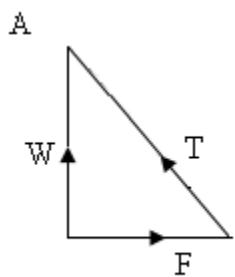


Diagram 2

Rajah 2



- 9 Diagram 3 shows a car is moving at zero acceleration.

Rajah 3 menunjukkan sebuah kereta sedang bergerak dengan pecutan sifar.

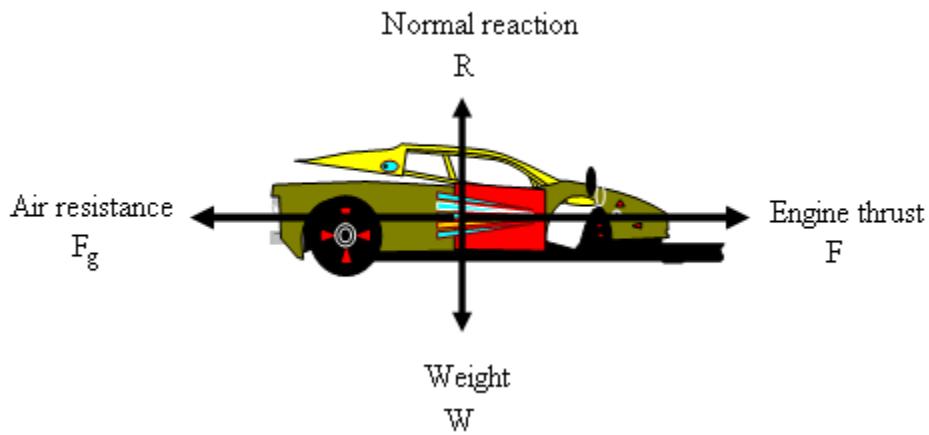


Diagram 3

Rajah 3

Which relationship of the forces is correct ?

Hubungan daya yang manakah benar ?

A $F > Fg$

B $F = Fg$

C $F < Fg$

D $W > R$

- 10 Diagram 4 shows two marbles A and B of different masses is being released at the same time in a vacuum cylinder.

Rajah 4 menunjukkan dua biji guli A dan guli B yang berlainan jisim dijatuhkan serentak dalam satu silinder.

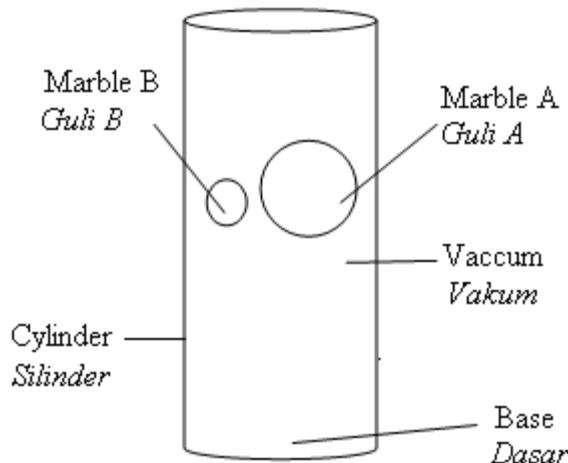


Diagram 4

Rajah 4

Which observation is correct?

Antara pernyataan berikut yang manakah benar ?

- A Marble B will reach at the base earlier
Guli B sampai ke dasar tiub lebih awal

- B Marble A will reach at the base earlier
Guli A sampai ke dasar tiub lebih awal

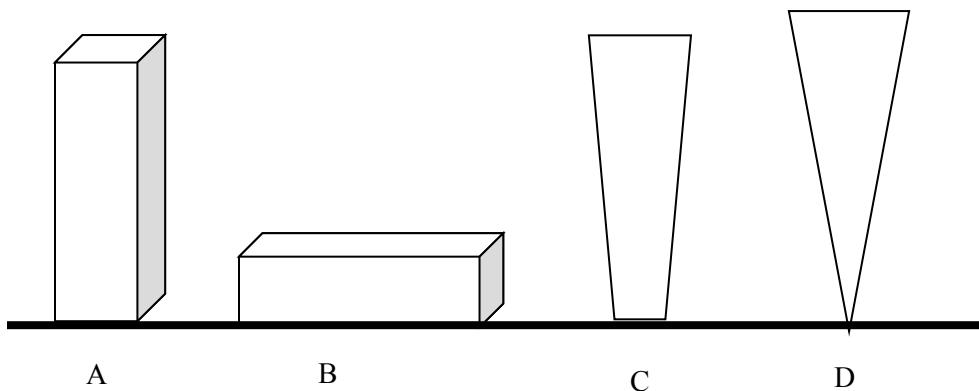
- C Marble A and B will reach at the base at the same time
Guli A dan B sampai ke dasar tiub serentak

- D Marble A and B float in the tube

Guli A dan B terapung dalam tiub

- 11 Which of the following wooden rod exert the highest pressure on the floor?
Each rod has the same mass.

*Manakah antara rod kayu berikut mengenakan tekanan yang paling besar terhadap lantai.
Setiap rod mempunyai jisim yang sama.*



12. Diagram 5 shows a cylinder containing cooking oil.
Rajah 5 menunjukkan sebuah silinder yang mengandungi minyak masak.

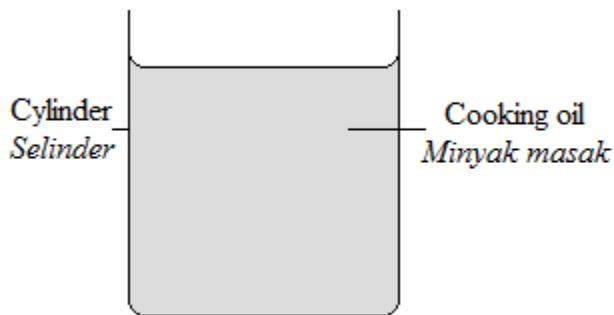


Diagram 5
Rajah 5

The density of cooking oil is 800 kg m^{-3} . The pressure exerted by the cooking oil at the base is $2.4 \times 10^3 \text{ Pa}$. What is the height of oil in the container?

Ketumpatan minyak masak ialah 800 kg m^{-3} . Tekanan yang dikenakan oleh minyak masak pada dasar bekas $2.4 \times 10^3 \text{ Pa}$. Berapakah ketinggian minyak di dalam bekas?

- A 24 cm
- B 30 cm
- C 80 cm
- D 2400 cm

- 13 The density of substance X is 200 kgm^{-3} . In which liquid will substance X floats?
Ketumpatan bagi bahan X ialah 200 kgm^{-3} . Didalam cecair yang manakah bahan X akan terapung?

Liquid <i>Cecair</i>	Density (kgm^{-3}) <i>Ketumpatan (kgm^{-3})</i>
A P	150
B Q	170
C R	190
D S	220

- 14 Why the atmospheric pressure at higher altitude is lower?
Mengapa tekanan atmosfera semakin berkurang pada tempat yang semakin tinggi altitudnya ?

- A Temperature is decreasing
Suhu semakin berkurang
- B The layer of air is thinner
Lapisan udara semakin nipis
- C Density of air increasing
Ketumpatan udara meningkat.
- D The volume of air does not change
Isipadu udara tidak berubah

- 15 Diagram 6 shows a hydraulic pump.
Rajah 6 menunjukkan sebuah pam hidraulik.

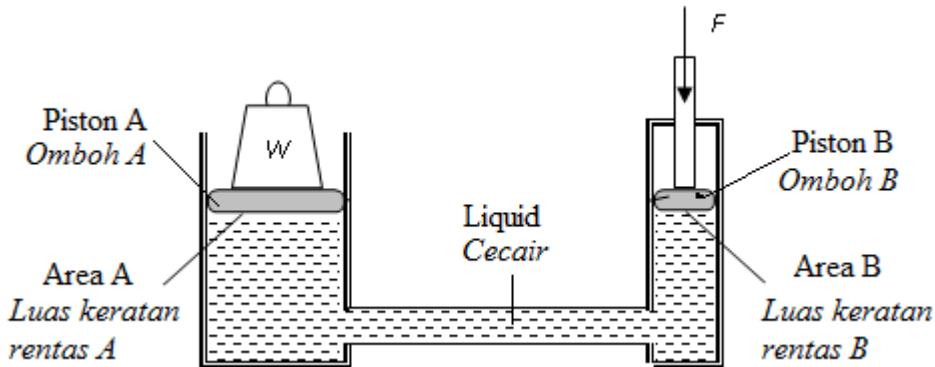


Diagram 6
Rajah 6

Which of the following is true about hydraulic pump?

Antara berikut, yang manakah benar tentang pam hidraulik?

- A Weight of load, W equivalent to force applied, F .
Berat beban, W sama dengan daya yang digunakan, F .
- B The most suitable type of liquid used is water.
Jenis cecair yang paling sesuai digunakan ialah air.
- C Pressure on Piston A is bigger than pressure on Piston B.
Tekanan pada omboh A lebih besar daripada tekanan pada omboh B.
- D The bigger the surface area of piston A, the bigger the weight of load, W can be put on.
Semakin bertambah luas permukaan omboh A, semakin bertambah berat beban, W dapat diletakkan.

- 16 Diagram 7 shows a ship full with load floating on the surface of sea water.

Rajah 7 menunjukkan sebuah kapal yang penuh dengan beban terapung di atas permukaan air laut.

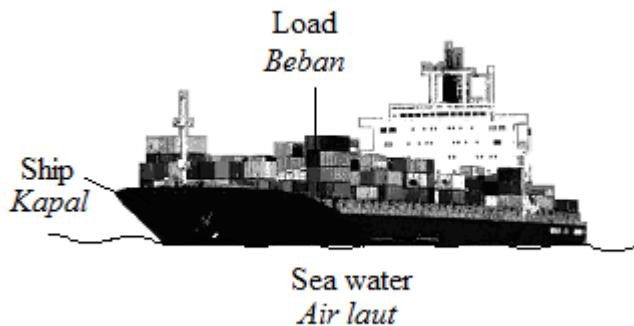


Diagram 7
Rajah 7

If the water displaced by the ship is 350 m^3 , what is the buoyant force acted on the ship?

[Density of sea water = 1030 kgm^{-3}]

Jika air yang tersesar oleh kapal ialah 350 m^3 , berapakah daya tujah yang bertindak ke atas kapal?

[Ketumpatan air laut = 1030 kgm^{-3}]

- A $3.6 \times 10^5 \text{ N}$
- B $3.6 \times 10^6 \text{ N}$
- C $3.6 \times 10^7 \text{ N}$
- D $3.6 \times 10^8 \text{ N}$

- 17 Diagram 8 shows four identical container are filled with same amount of different liquid.

Rajah 8 menunjukkan empat bekas yang sama diisi dengan jumlah cecair yang sama tetapi berbeza ketumpatannya.



Liquid P
Cecair P



Liquid Q
Cecair Q

Density = 800 kgm^{-3}
Ketumpatan



Liquid R
Cecair R

Density = 1000 kgm^{-3}
Ketumpatan



Liquid S
Cecair S

Density = 1100 kgm^{-3}
Ketumpatan

Diagram 8
Rajah 8

Which container exerts the highest pressure at the bottom?

Bekas manakah yang menghasilkan tekanan pada bahagian dasar yang paling tinggi?

- A Liquid P

Cecair P

- B Liquid Q
Cecair Q
- C Liquid R
Cecair R
- D Liquid S
Cecair S

18 Diagram 9 shows a Bernoulli's tube. Air is blown from left to right.

Rajah 9 menunjukkan sebuah tiub Bernoulli. Udara ditiup dari arah kiri ke kanan.

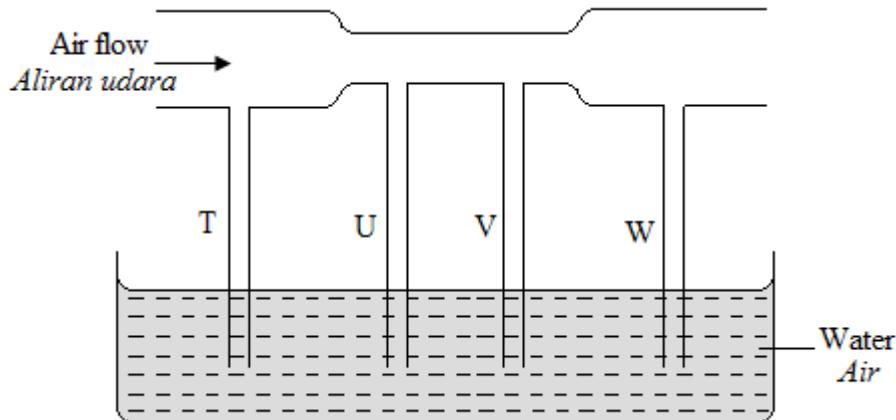
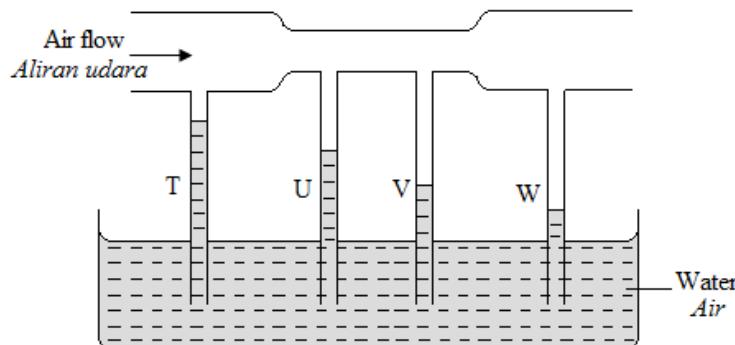


Diagram 9
Rajah 9

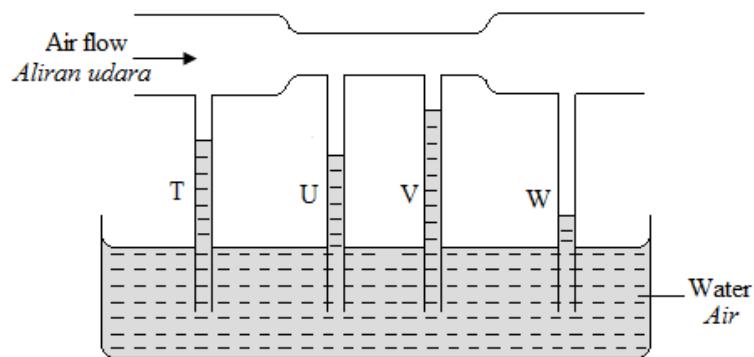
Which of the following diagram shows the correct level of water in tube T, U, V and W?

Rajah yang manakah menunjukkan aras air yang betul pada tiub T, U, V dan W?

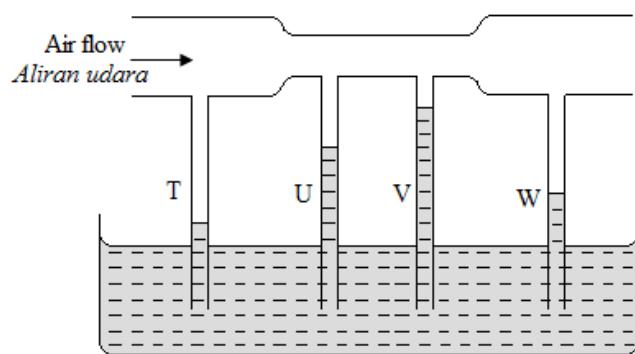
A.



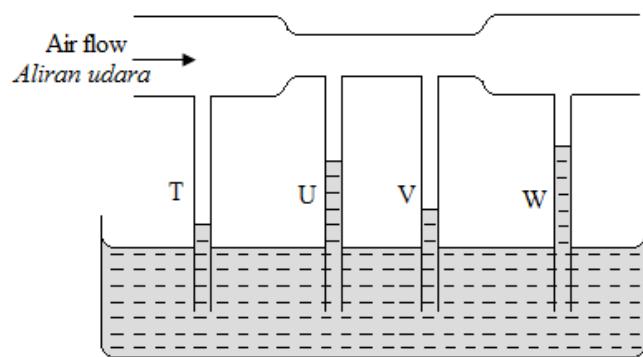
B.



C.



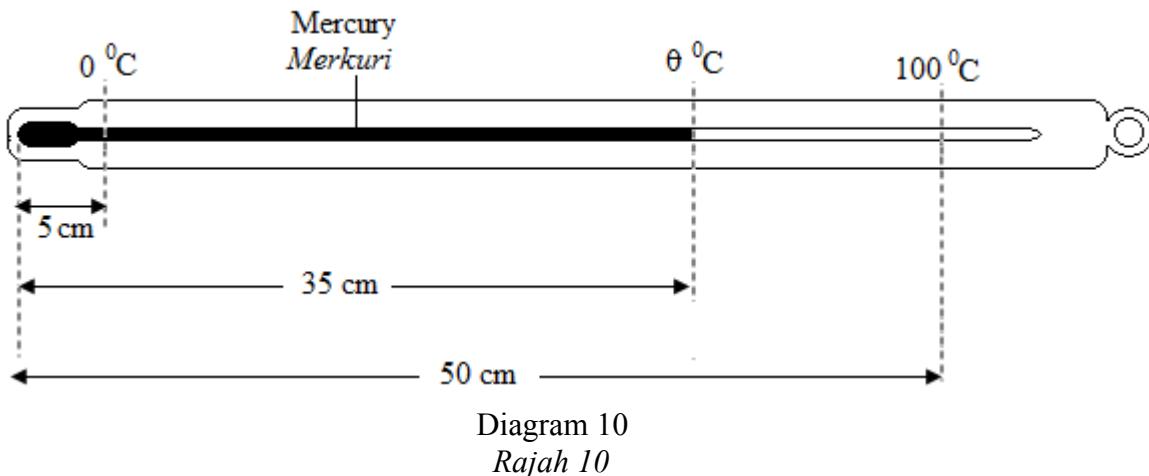
D.



- 19 Diagram 10 shows a mercury thermometer which has not been calibrated. The length

of mercury column in the thermometer is 5 cm at 0°C and 50 cm at 100°C .

Rajah 10 menunjukkan sebuah termometer merkuri yang belum ditentukur. Panjang turus merkuri pada thermometer ialah 5 cm pada 0°C dan 50 cm pada 100°C .



When the thermometer is placed in hot water, the length of the mercury column is 35 cm.

What is the temperature of hot water.

Apabila termometer itu dimasukkan ke dalam air panas, panjang turus merkuri menjadi 35 cm. Berapakah suhu air panas?

- A 35.0°C
- B 40.0°C
- C 66.7°C
- D 70.0°C

20. The temperature of 5 kg of water rises by 50°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°C apabila dipanaskan. Berapakah peningkatan suhu apabila 8 kg air dipanaskan dengan jumlah tenaga haba yang sama?

- A 20.75°C
- B 31.25°C
- C 40.00°C
- D 80.00°C

- 21 Diagram 11 shows the cooling curve of a substance.

Rajah 11 menunjukkan lengkung penyejukan suatu bahan.

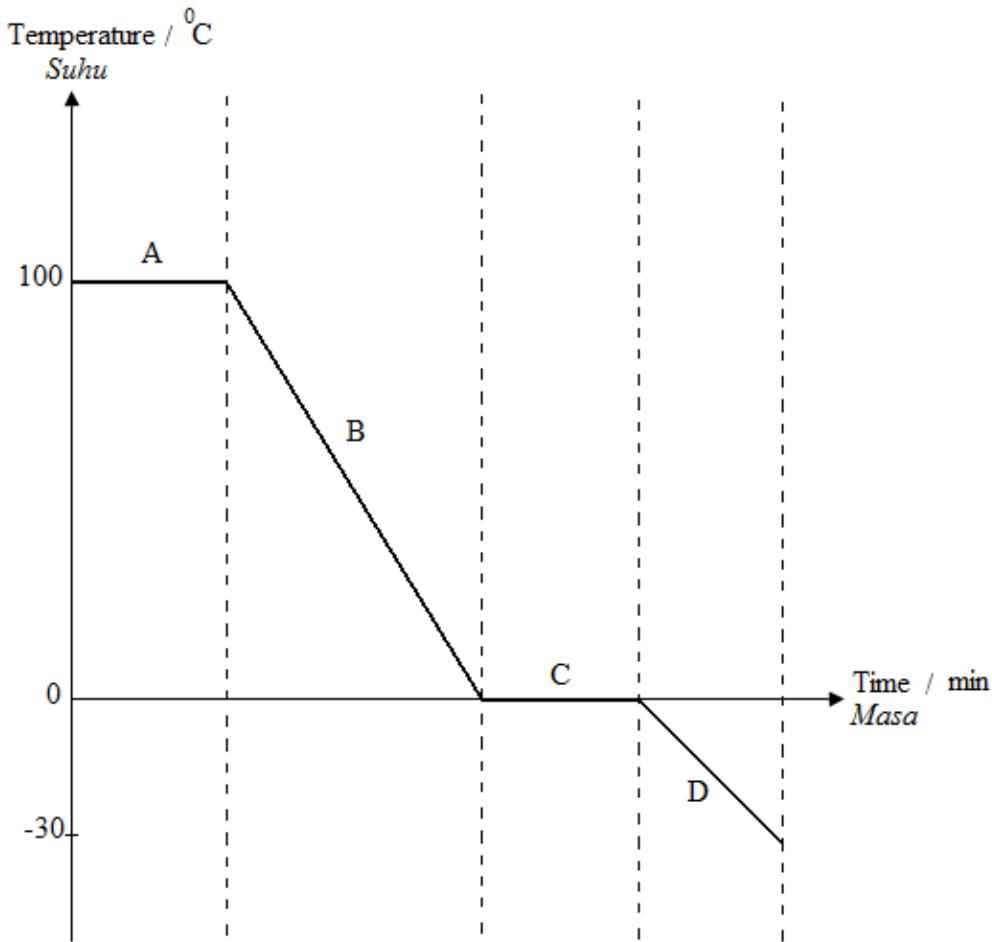


Diagram 11
Rajah 11

At which phase is the substance in solid and liquid at the same time?
Pada fasa manakah bahan itu dalam keadaan pepejal dan cecair pada masa yang sama?

- 22 Diagram 12 shows a scuba diver released 10 cm³ volume of an air bubble at the depth of H under sea water.

Rajah 12 menunjukkan seorang penyelam membebaskan satu gelembung udara berisipadu 10 cm³ pada kedalaman H didalam air laut.

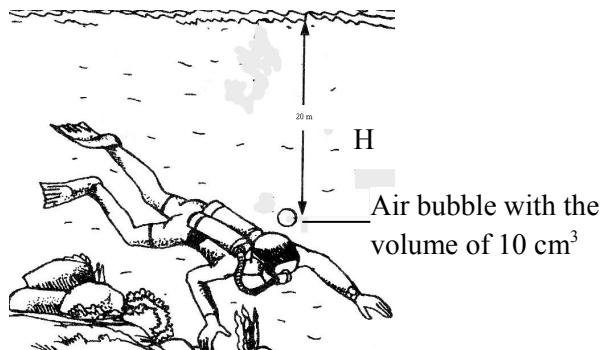


Diagram 12

Rajah 12

What is the value of H if the volume of air bubble at surface of water is 30 cm^3 ?

[Atmospheric pressure = 10 m of sea water]

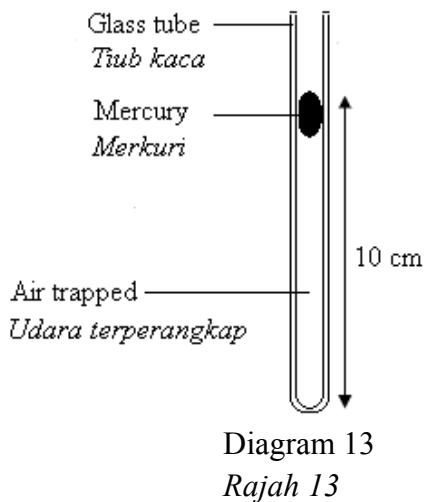
Berapakah nilai H jika isipadu gelembung udara itu apabila sampai ke permukaan laut ialah 30 cm^3 ?

[Tekanan atmosfera = 10 m air laut]

- A 20 m
- B 30 m
- C 40 m
- D 50 m

- 23 Diagram 13 shows a glass tube contains 10 cm length of air column trapped at 27°C .

Rajah 13 menunjukkan satu tiub kaca mengandungi 10 cm panjang turus udara yang terperangkap pada suhu 27°C .



What is the temperature of air trapped when the length of air is 10.5 cm?

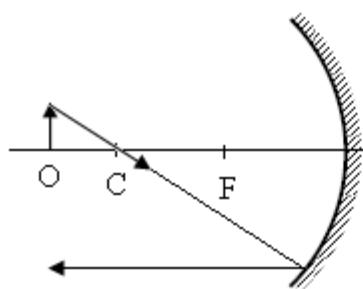
Berapakah suhu udara yang terperangkap itu bila panjang turus udara menjadi 10.5 cm?

- A 28.4°C
- B 42.0°C
- C 48.0°C
- D 52.0°C

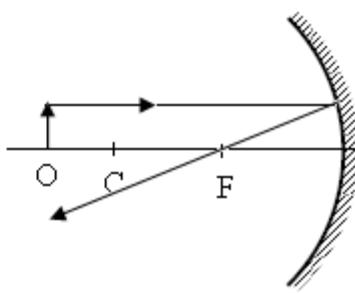
- 24 Which diagram shows the correct reflection of light by a concave mirror?

Rajah manakah yang menunjukkan pantulan cahaya yang betul oleh sebuah cermin cekung?

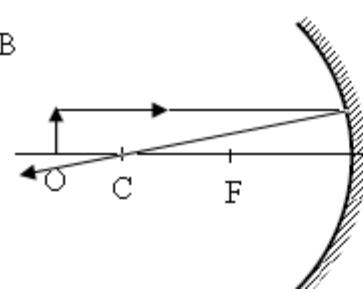
A



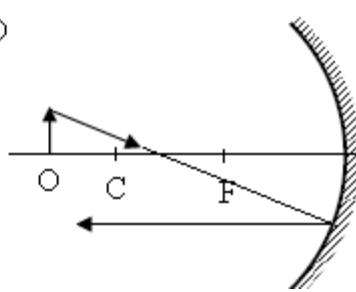
C



B



D



25 Table 1 shows the refractive indices of water and perspex.

Jadual 1 menunjukkan indeks biasan bagi air dan perspek.

Medium <i>Medium</i>	Refractive index, n <i>Indeks biasan, n</i>
Water <i>Air</i>	1.33
Perspex <i>Perspek</i>	1.49

Table 1
Jadual 1

Based on the information in Table 1, which light ray in Diagram 14 is correct?

Berdasarkan maklumat dalam Jadual 1, sinar cahaya yang manakah dalam Rajah 14 adalah betul?

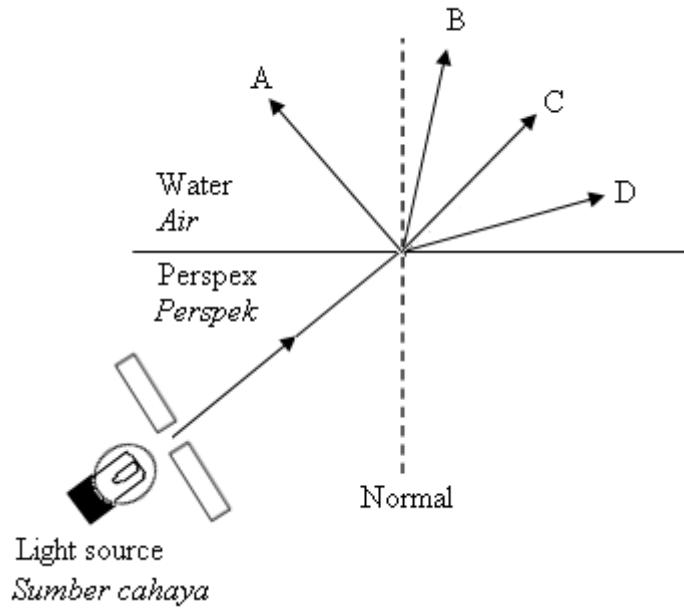


Diagram 14
Rajah 14

- 26 Diagram 15 shows light ray travels through an optical fibre.

Rajah 15 menunjukkan sinar cahaya bergerak melalui sebuah gentian optik.

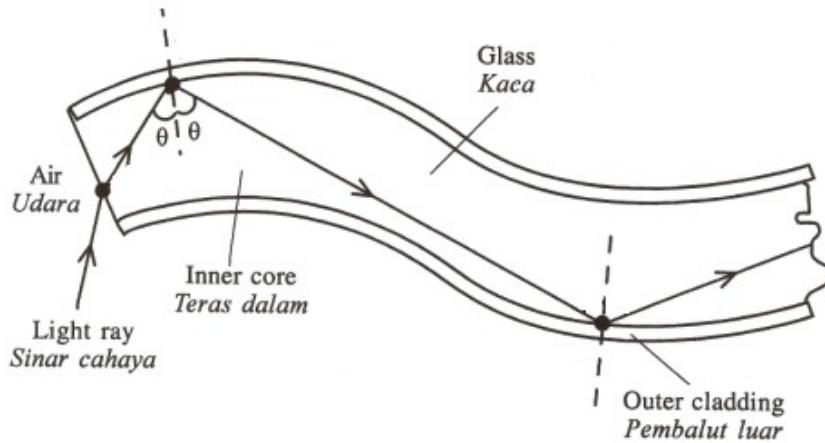


Diagram 15
Rajah 15

Which statement is correct?

Pernyataan yang manakah betul?

- A Angle of θ is smaller than critical angle of inner core.
Sudut θ lebih kecil dari sudut genting teras dalam.
- B Angle of θ is smaller than critical angle of outer cladding.
Sudut θ lebih kecil dari sudut genting pembalut luar.
- C The inner core is denser than the outer cladding.
Teras dalam lebih tumpat dari pembalut luar.
- D The outer cladding is denser than the inner core.
Pembalut luar lebih tumpat dari teras dalam.

- 27 Diagram 16 shows an arrangement of a simple astronomical telescope at normal adjustment.
Rajah 16 menunjukkan binaan sebuah teleskop astronomi ringkas pada pelarasan normal.

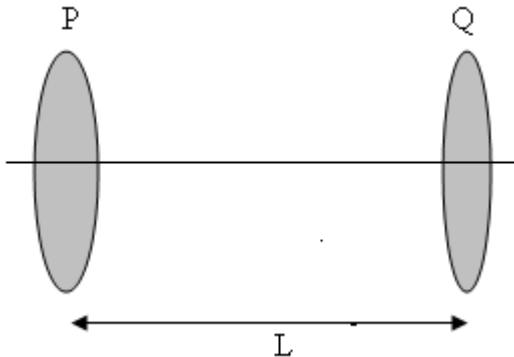


Diagram 16

Rajah 16

The focal length of objective lens, Q and the eyepiece, P are f_Q and f_P respectively. Which of the following is correct?

Panjang fokus kanta mata, Q dan kanta objektif, P masing-masing ialah f_Q dan f_P . Yang manakah berikut adalah betul?

- A $L = f_Q + f_P$
- B $L > f_Q + f_P$
- C $L > f_Q - f_P$

- 28 Diagram 17 shows a ray diagram of a convex lens with focal length, f .
Rajah 17 menunjukkan rajah sinar sebuah kanta cembung yang mempunyai panjang fokus, f .

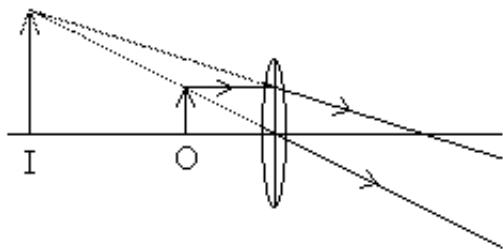


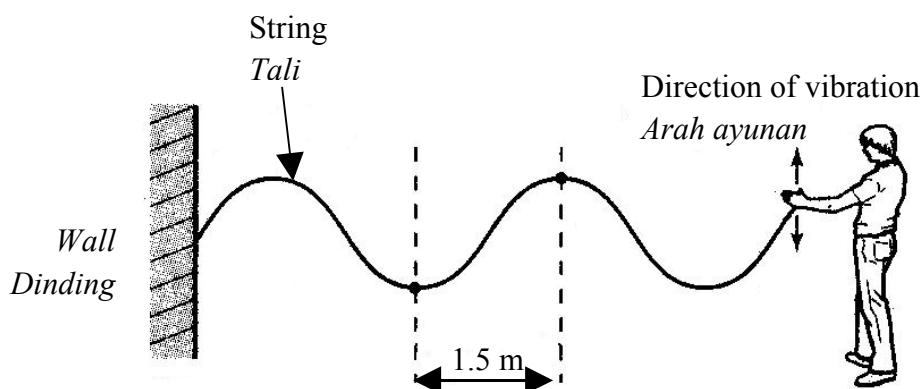
Diagram 17

Rajah 17

Which statement is correct to explain the diagram?

Pernyataan yang manakah betul untuk menerangkan rajah di atas?

- A The object distance is equal to f .
Jarak objek adalah kurang dari f .
 - B The object distance is equal to $2f$.
Jarak objek adalah sama dengan $2f$.
 - C The convex lens acts as a magnifying glass.
Kanta cembung bertidak sebagai kanta pembesar.
 - D The characteristics of image are real, magnified and upright.
Ciri-ciri imej yang terbentuk adalah sahih, lebih besar dan tegak.
- 29 Diagram 18 shows a boy producing a transverse wave along a long string by vibrating one end of the string.
Rajah 18 menunjukkan seorang budak sedang menghasilkan satu gelombang melintang di sepanjang satu tali dengan ayunan pada hujung tali itu.



If the boy's hand moves up-and-down of the transverse wave along the

Diagram 18
Rajah 18

cycles per second, what is the speed

Jika tangan budak itu bergerak naik-turun pada empat ayuan lengkap per saat, apakah laju gelombang melintang sepanjang tali itu?

- A 3 ms^{-1}
- B 6 ms^{-1}
- C 12 ms^{-1}
- D 14 ms^{-1}

- 30 What happens to the frequency and loudness of sound waves when it is reflected?
Apakah yang berlaku kepada frekuensi dan kekuatan bagi suatu gelombang bunyi apabila dipantulkan?

	Frequency <i>Frekuensi</i>	Loudness <i>Kekuatan</i>
A	Unchanged <i>Tidak berubah</i>	Decreases <i>Berkurang</i>
B	Increases <i>Bertambah</i>	Decreases <i>Berkurang</i>
C	Unchanged <i>Tidak berubah</i>	Increases <i>Bertambah</i>
D	Increases <i>Bertambah</i>	Unchanged <i>Tidak berubah</i>

- 31 Which of the following statements is best explaining why sound is easily diffracted compared to light?
Manakah kenyataan berikut adalah paling baik menerangkan mengapa bunyi lebih mudah dibelau berbanding cahaya?
- A Sound needs medium for its propagation.
Bunyi memerlukan medium untuk perambatannya.
 - B Sound is a longitudinal wave.
Bunyi ialah gelombang membujur.
 - C The speed of sound is slower than light.
Laju bunyi lebih lambat berbanding cahaya.
 - D The wavelength of sound is longer than light.
Panjang gelombang bunyi lebih panjang berbanding cahaya.
- 32 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 interferensi yang terhasil di atas skrin adalah seperti dalam Rajah 19.

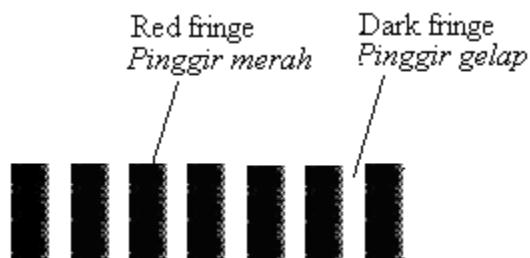


Diagram 19

Rajah 19

When red light is replaced by blue light, which of the fringes pattern is formed on the screen?

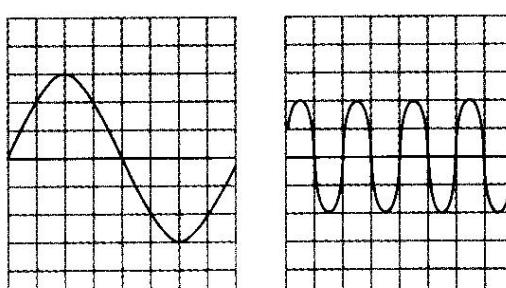
Apabila cahaya merah digantikan dengan cahaya biru, corak pinggir yang manakah akan terbentuk di atas skrin?



Bunyi X

Bunyi Y

- 33 Diagram 20 shows two waveforms on an oscilloscope (*oscilloskop*).
Rajah 20 menunjukkan dua bunyi yang dipaparkan pada osiloskop sina



being displayed using same cathode ray

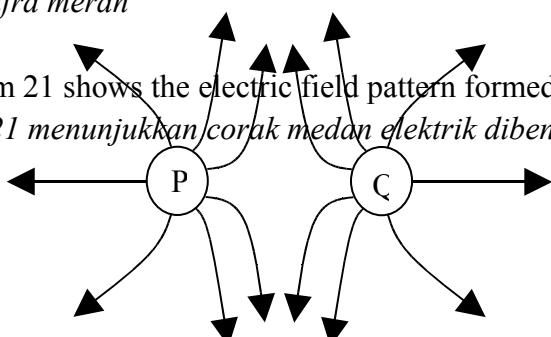
in Y which is applied on the screen

- A Sound Y is louder than sound X.
Bunyi Y lebih nyaring daripada bunyi X.
- B Sound Y has a higher pitch than sound X.
Bunyi Y lebih langsing daripada bunyi X.
- C Sound Y has a lower pitch than sound X.
Bunyi Y kurang langsing daripada bunyi X.

34 What type of electromagnetic waves is used on a remote control?
Apakah jenis gelombang elektromagnet yang digunakan dalam kawalan remote.

- A Gamma ray
Sinar gamma
- B Ultraviolet rays
Sinar ultra ungu
- C Microwaves
Gelombang mikro
- D Infrared rays
Infra merah

35 Diagram 21 shows the electric field pattern formed by two charged spheres P and Q.
Rajah 21 menunjukkan corak medan elektrik dibentuk oleh dua sfera bercas P dan Q.

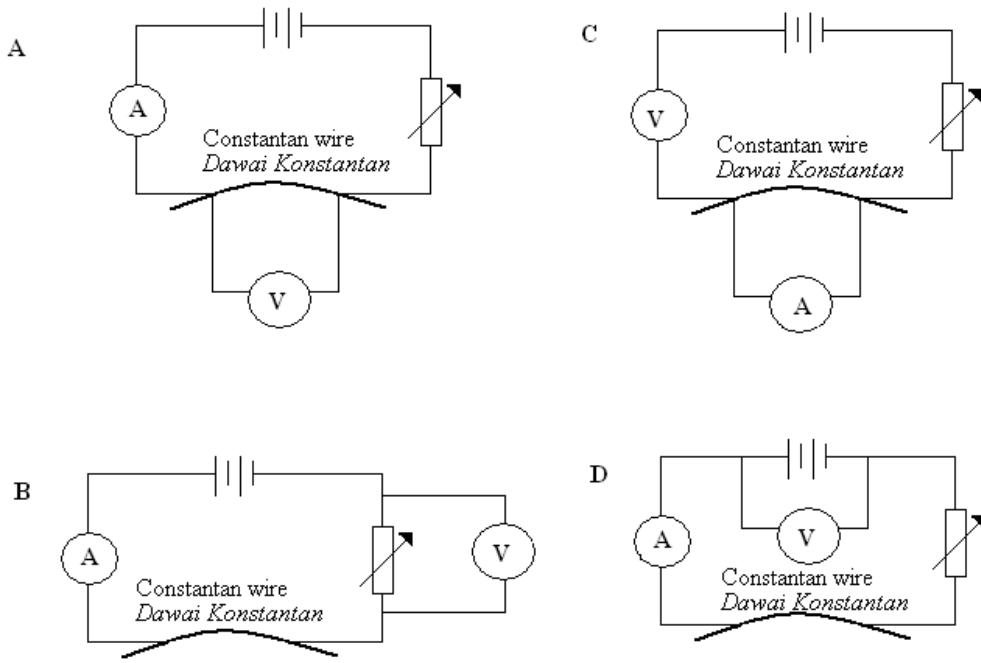


Which of the following explain the charge of P and Q?

Manakah yang berikut menerangkan cas pada P dan Q?

	P	Q
A	Negative <i>Negatif</i>	Negative <i>Negatif</i>
B	Negative <i>Negatif</i>	Positive <i>Positif</i>
C	Positive <i>Positif</i>	Negative <i>Negatif</i>
D	Positive <i>Positif</i>	Positive <i>Positif</i>

- 36 Which circuit can be used to determine the relationship between voltage and electric current of a constantan wire?
Litar manakah boleh digunakan untuk menentukan hubungan antara voltan dengan arus elektrik bagi satu dawai konstantan?



- 37 Diagram 22 shows 9 identical resistors are connected in 3 different circuit, P,Q and R respectively.

Which of the following is correct for I_p , I_q and I_r .

Rajah 22 menunjukkan 9 perintang yang serupa disambungkan dalam 3 litar yang berbeza, P,Q dan R masing-masing.

Antara berikut, yang manakah betul untuk I_p , I_q dan I_r .

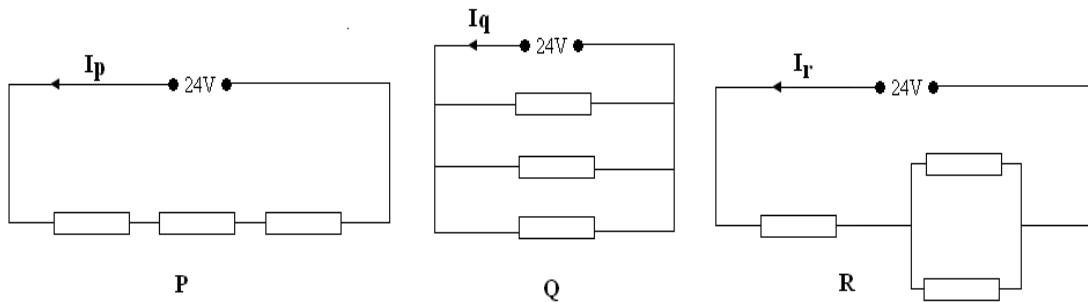


Diagram 22

Rajah 22

- A $I_p < I_q < I_r$
- B $I_p < I_r < I_q$
- C $I_q < I_p < I_r$
- D $I_q < I_r < I_p$

- 38 Diagram 23 shows an electric circuit consisting of three resistors and power supply 12 V.

Rajah 23 menunjukkan satu litar elektrik yang mengandungi tiga perintang dan bekalan kuasa 12V.

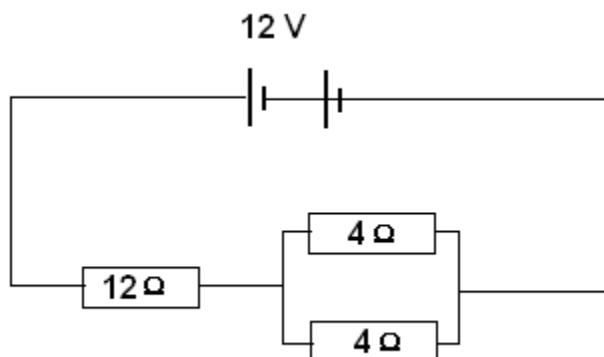


Diagram 23

Rajah 23

What is the power loss due to the resistors in the circuit?

Berapakah kuasa yang hilang disebabkan oleh perintang-perintang di dalam litar di atas?

- A. 1.5 W
- B. 3.0 W
- C. 10.3 W
- D. 12.0 W

- 39 Diagram 24 shows the galvanometer pointer deflects when a magnet is pushed into a coil of wire.

Rajah 24 menunjukkan jarum penunjuk sebuah galvanometer terpesong apabila sebatang magnet ditolak memasuki satu gelung dawai.

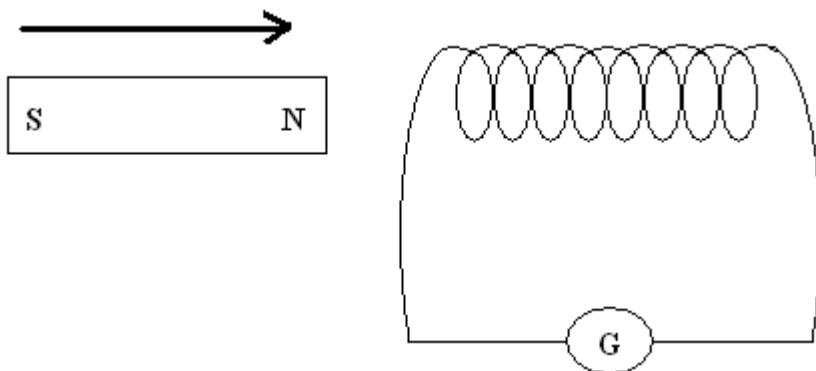


Diagram 24

Rajah 24

Which actions will cause the deflection of galvanometer increases?

Langkah yang manakah akan menyebabkan pesongan galvanometer bertambah?

- A increase the number of coils
menambah bilangan lilitan
- B push the magnet slower towards the coil
menolak magnet perlahan kearah gegelung.
- C use coil that is made from insulated wire
menggunakan gegelung yang dibuat daripada wayar bertebat.
- D reverse the magnetic pole of the magnet
menyongsangkan keikutinan magnet.

- 40 Diagram 25 shows a uninsulated copper rod is placed in a magnetic field.

In which direction the copper rod will deflect when the current is switched on?

Rajah 25 menunjukkan rod kuprum tidak bertebat di letakkan di dalam medan magnet. Pada arah manakah rod kuprum itu akan terpesong apabila arus dihidupkan?

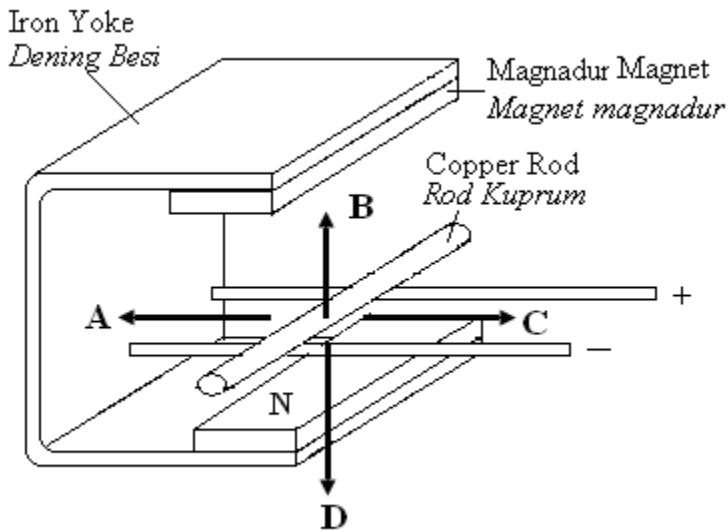
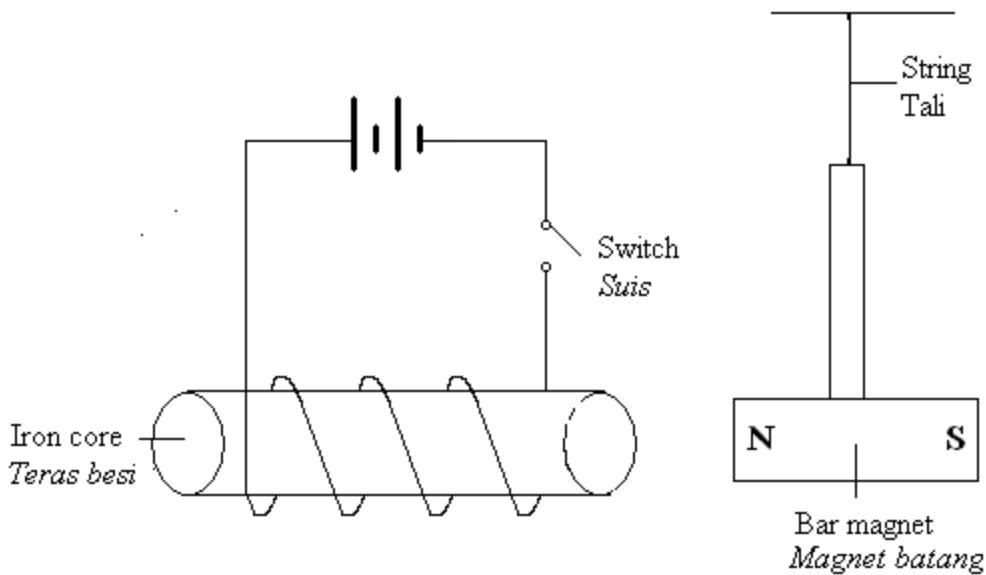


Diagram 25

Rajah 25

- 41 Diagram 26 shows an electric circuit consisting of a solenoid, an iron core and a switch.

Rajah 26 menunjukkan satu litar elektrik yang terdiri daripada satu solenoid, satu teras besi lembut dan satu suis.



What happens to the bar magnet when the switch is switched on?
Apa berlaku kepada magnet batang bila suis dihidupkan?

- A Does not move
Tidak bergerak
- B Move away from the solenoid
Tertolak menjauhi solenoid
- C Attract towards the solenoid
Tertarik mendekati solenoid.
- D Oscillate to the right and to the left
Berayun kekanan dan kekiri.

- 42 Which of the option is correct about the electricity transmission from the power station to the consumers?

Antara pilihan berikut yang manakah betul tentang sistem penghantaran tenaga elektrik dari stesen kuasa ke rumah pengguna?

- | Type of current
<i>Jenis arus</i> | Magnitude of voltage supply
<i>Magnitud voltan yang dihantar</i> |
|---------------------------------------|---|
| A Direct current
<i>Arus terus</i> | High voltage
<i>Voltan tinggi</i> |

- | | | |
|---|--|--------------------------------------|
| B | Alternating current
<i>Arus ulangalik</i> | High voltage
<i>Voltan tinggi</i> |
| C | Direct current
<i>Arus terus</i> | Low voltage
<i>Voltan rendah</i> |
| D | Alternating current
<i>Arus ulangalik</i> | Low voltage
<i>Voltan rendah</i> |

- 43 Diagram 27 shows a transformer that is used to light up a bulb.

Rajah 27 menunjukkan sebuah transformer yang digunakan untuk menghidupkan sebiji mentol.

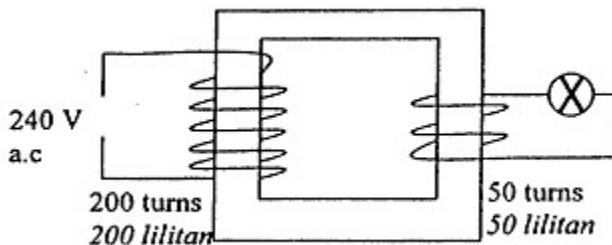


Diagram 27
Rajah 27

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

Antara pernyataan-pernyataan yang berikut, yang manakah benar tentang transformer itu?

- | | Type of transformer
<i>Jenis transformer</i> | Voltage across the bulb
<i>Voltan merentasi mentol</i> |
|---|---|---|
| A | Step-up
<i>Injak naik</i> | 480 V |
| B | Step-up
<i>Injak naik</i> | 960 V |
| C | Step-down
<i>Injak turun</i> | 50 V |
| D | Step-down
<i>Injak turun</i> | 60 V |
- 44 Diagram 28 shows a trace on the CRO screen when an alternating current power supply is connected to the Y-input of the CRO.
- Rajah 28 menunjukkan surihan pada skrin OSK apabila bekalan kuasa arus ulang alik disambungkan pada input-Y OSK.*

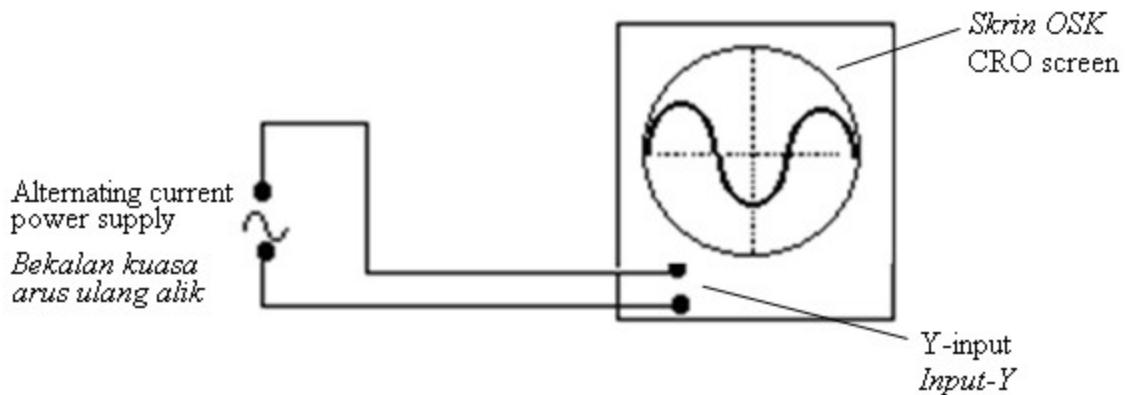


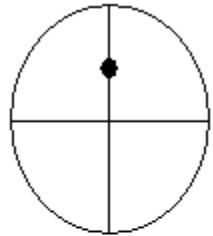
Diagram 28

Rajah 28

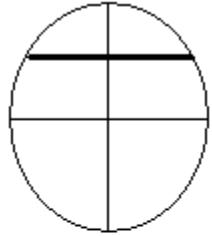
Which of the following traces form on the screen when the alternating current power supply is replaced by a dry cell?

Yang mana satu antara surihan-surihan berikut akan terbentuk di atas skrin apabila bekalan kuasa arus ulang alik digantikan dengan sel kering ?

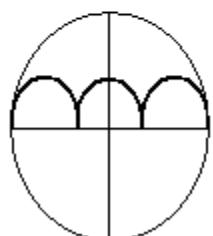
A



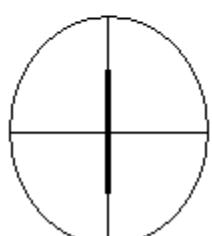
B



C



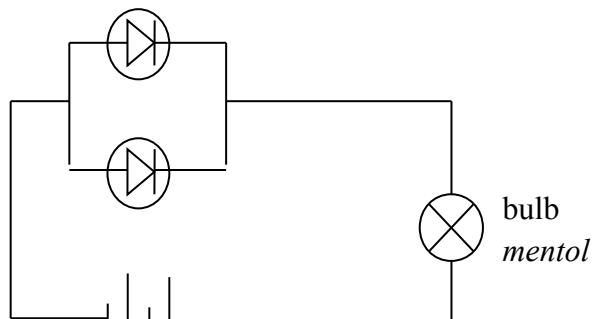
D

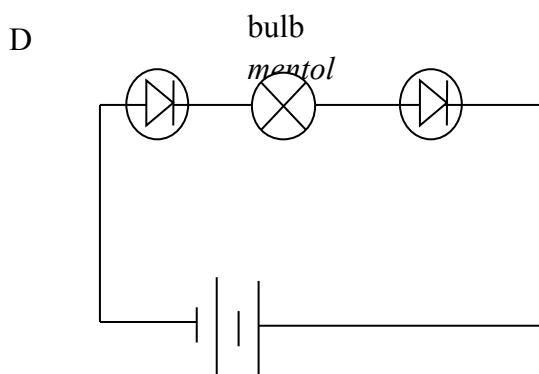
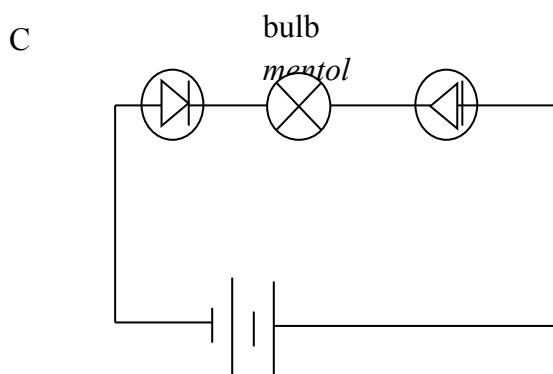
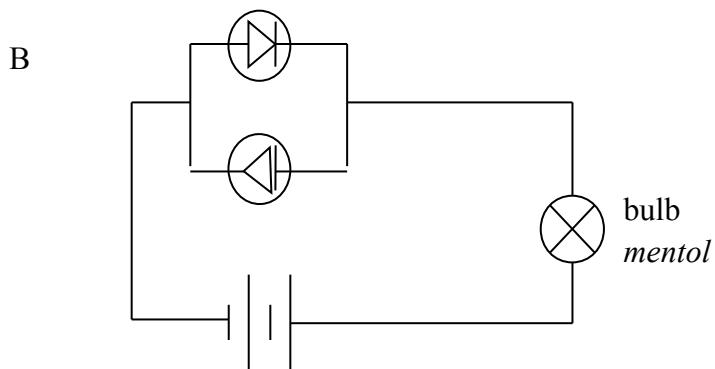


- 45 Which of the following circuits will light up the bulb?

Antara sambungan litar-litar berikut, yang manakah akan menyalaakan mentol ?

A





- 46 Diagram 29 shows a circuit consists of a transistor used to light up LED during dark. Unfortunately, the circuit does not work.

Rajah 29 menunjukkan satu litar yang mempunyai transistor digunakan untuk menyalaikan LED ketika gelap. Malangnya, litar itu tidak berfungsi,

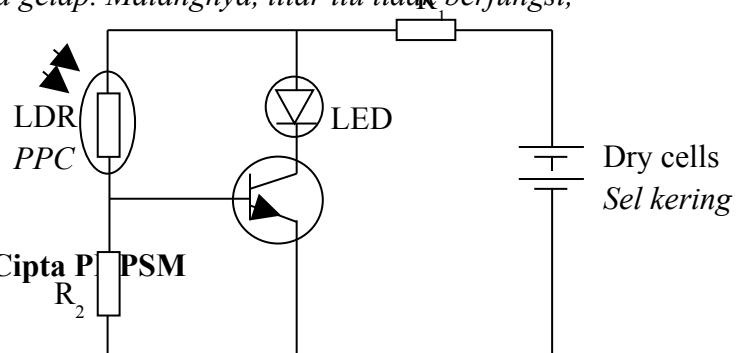


Diagram 29

Rajah 29

Which of the following would most likely rectify the fault in the circuit?

Yang manakah diantara berikut, yang besar kemungkinan boleh membetulkan kesilapan dalam litar tersebut?

- A Reconnect the dry cells with its terminals reversed
Sambung semula sel kering dengan terminalnya disongsangkan
- B Reconnect the LED with its terminals reversed
Sambung semula LED dengan terminalnya disongsangkan
- C Interchange the positions of the LDR and the resistor R_2
Saling tukar kedudukan LDR dan perintang R_2
- D Replaced the LDR with a thermistor
Ganti PPC dengan termistor

47 Diagram 30 shows a combination of three logic gates.

Rajah 30 menunjukkan kombinasi tiga get logik.

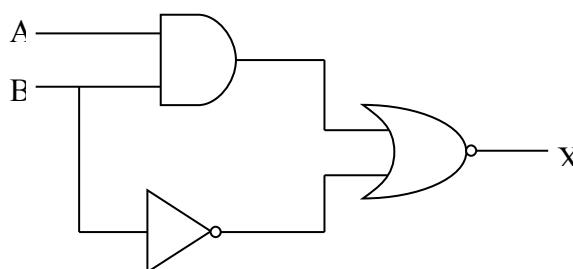


Diagram 30

Rajah 30

Which truth table is correct for the combination of the three logic gates ?

Jadual kebenaran yang manakah betul bagi kombinasi tiga get logik itu?

A	B	X
0	0	0
0	1	1
1	0	0

A B

A	B	X
0	0	1
0	1	0
1	0	1
1	1	1

A	B	X
0	0	1
0	1	1
1	0	0
1	1	0

C D

A	B	X
0	0	0
0	1	0
1	0	1
1	1	1

- 48 Diagram 31 shows the decay sequence from nucleus uranium-234 to radon-222.
Rajah 31 menunjukkan siri pereputan nukleas uranium-234 kepada radon-222.

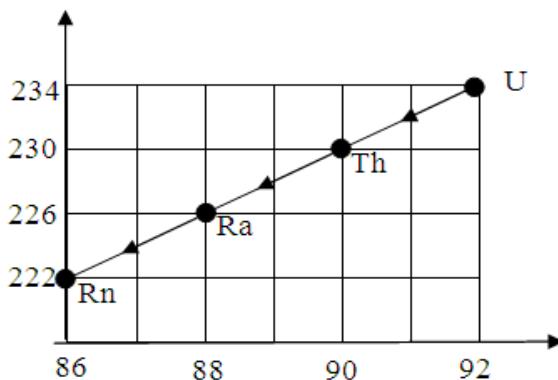


Diagram 31

Rajah 31

What are the numbers of alpha particles and beta particles that are emitted in this process ?
Berapakah bilangan zarah alfa dan zarah beta yang dibebaskan dalam proses ini ?

Number of alpha particles
Kadar zarah alfa
 Number of beta particles
Kadar zarah beta

A	1	2
B	2	1
C	3	0
D	0	3

- 49 Diagram 32 shows the radioactivity decay graph for a radioactive material.
Rajah 32 menunjukkan graf pereputan radioaktif bagi satu bahan radioaktif.

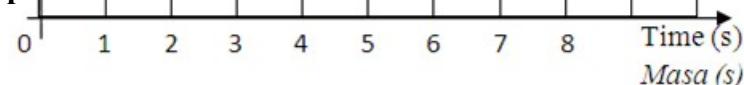


Diagram 32

Rajah 32

What is the half-life of the radioactive material?

Berapakah separuh hayat bahan radioaktif itu?

- A 1.0 s
- B 2.0 s
- C 3.0 s
- D 5.0 s

- 50 In a nuclear fission reaction, 0.005 u mass of a radioactive element is changed to nuclear energy.

Calculate the energy released.

[$1\text{u} = 1.7 \times 10^{-27} \text{ kg}$, speed of light = $3.0 \times 10^8 \text{ ms}^{-1}$]

Dalam proses penyusutan nuklear, 0.005 u.j.a. jisim telah ditukarkan kepada tenaga nuklear. Hitung tenaga yang dibebaskan.

[1 u.j.a. = $1.7 \times 10^{-27} \text{ kg}$, halaju cahaya = $3.0 \times 10^8 \text{ ms}^{-1}$]

- A $2.55 \times 10^{-21} \text{ J}$
- B $5.10 \times 10^{-19} \text{ J}$
- C $3.83 \times 10^{-13} \text{ J}$
- D $7.65 \times 10^{-13} \text{ J}$

SULIT

NAMA : TING :

ANGKA GILIRAN :



**ERSIDANGAN KEBANGSAAN PENGETUA-PENGETUA
SEKOLAH MENENGAH MALAYSIA**

GAWANGAN KELANTAN

**SIJIL PELAJARAN MALAYSIA
PEPERIKSAAN PERCUBAAN 2009**

4531/2

PHYSICS

Kertas 2

Sept/Oct

2 ½ jam

Dua jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Kertas soalan ini adalah dalam dwibahasa.
2. Soalan dalam bahasa inggeris mendahului soalan sepadan dalam bahasa Melayu
3. Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Inggeris atau bahasa Melayu.
4. Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini

Bahagian	Soalan	Markah Penuh	Markah Diperolehi
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			

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

1. $a = \frac{v-u}{t}$
2. $v^2 = u^2 + 2as$
3. $s = ut + \frac{1}{2}at^2$
4. Momentum = mv
5. $F = ma$
6. Kinetic energy = $\frac{1}{2}mv^2$
(Tenaga kinetik)
Tenaga keupayaan
7. Potential energy = mgh
Tenaga keupayaan
8. Elastic potential energy = $\frac{1}{2}Fx$
(Tenaga keupayaan kenyal)
9. $\rho = \frac{m}{V}$
10. Pressure, $\rho = hpg.$
Tekanan
11. Pressure, $\rho = \frac{F}{A}$
Tekanan
12. Heat, $Q = mc\theta$
Haba
13. $PV = \text{Constant (pemalar)}$
14. $E = mc^2$
15. $v = f\lambda$
16. Power, $P = \frac{\text{energy}}{\text{time}}$
17. $V = IR$
18. Power, $P = IV$
kuasa
19. $\frac{N_s}{N_p} = \frac{V_s}{V_p}$
20. Efficiency = $\frac{I_s V_s}{I_p V_p} \times 100\%$
(kecekapan)
21. $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$
22. $n = \frac{\sin i}{\sin r}$
23. $n = \frac{\text{Real depth}}{\text{Apparent depth}}$
24. $\lambda = \frac{ax}{D}$
25. $Q = It$
26. $E = I(R + r)$
27. $eV = \frac{1}{2}mv^2$
28. $g = 10 \text{ ms}^{-2}$

Section A

[60 marks]
[60 markah]

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

- Diagram 1.1 shows the reading of a measuring instrument when there is no object on it.
Rajah 1.1 menunjukkan bacaan satu alat pengukur apabila tiada objek diletakkan diatasnya.
Diagram 1.2 shows the reading of the measuring instrument when an object is placed on it.
Rajah 1.2 menunjukkan bacaan alat pengukur tersebut apabila satu objek diletakkan diatasnya.

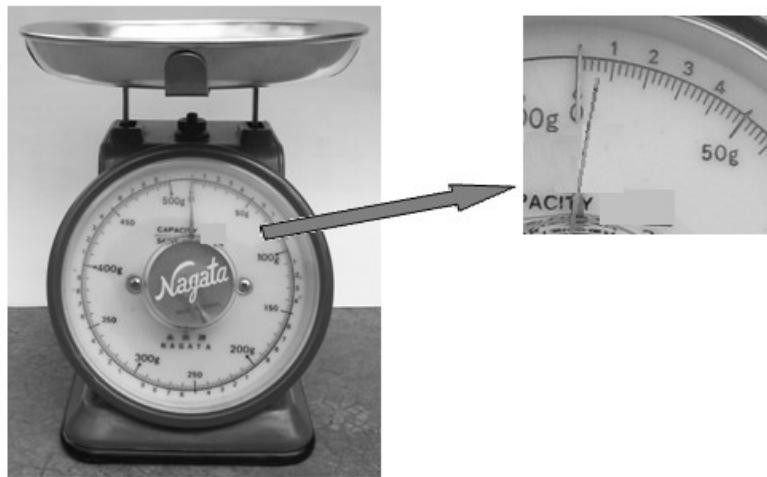


Diagram 1.1
Rajah 1.1

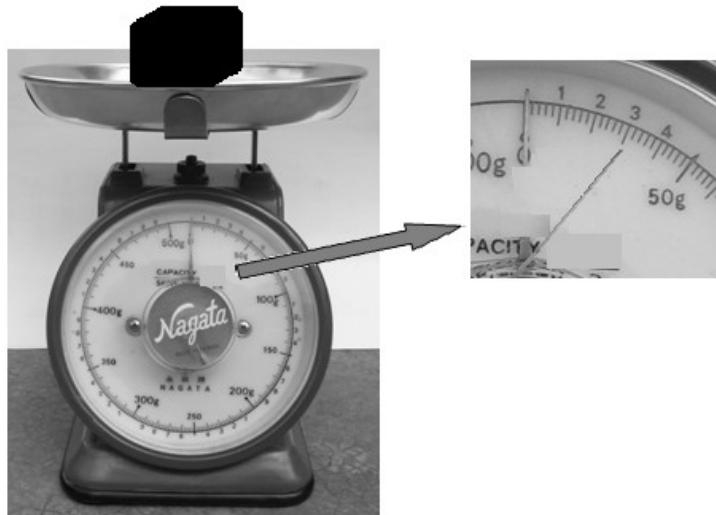


Diagram 1.2

Rajah 1.2

- (a) Name the physics quantity that can be measured by the measuring instrument in Diagram 1.1.

Namakan kuantiti fizik yang boleh diukur oleh alat pengukur pada Rajah 1.1.

.....

[1 mark]

- (b) Name the type of error produced in Diagram 1.1

Namakan jenis ralat yang terhasil dalam rajah 1.1

.....

[1 mark]

- (c) What is the value of error in Diagram 1.1

Berapakah nilai ralat yang terhasil dalam rajah 1.1

.....

[1 mark]

- (d) What is the actual reading of the physical quantity measured in Diagram 1.2?

Berapakah bacaan sebenar kuantiti fizik yang diukur dalam Rajah 1.2?

.....

[1 mark]

2. Diagram 2.1 shows a simple electromagnet.

Rajah 2.1 menunjukkan satu elektromagnet ringkas.

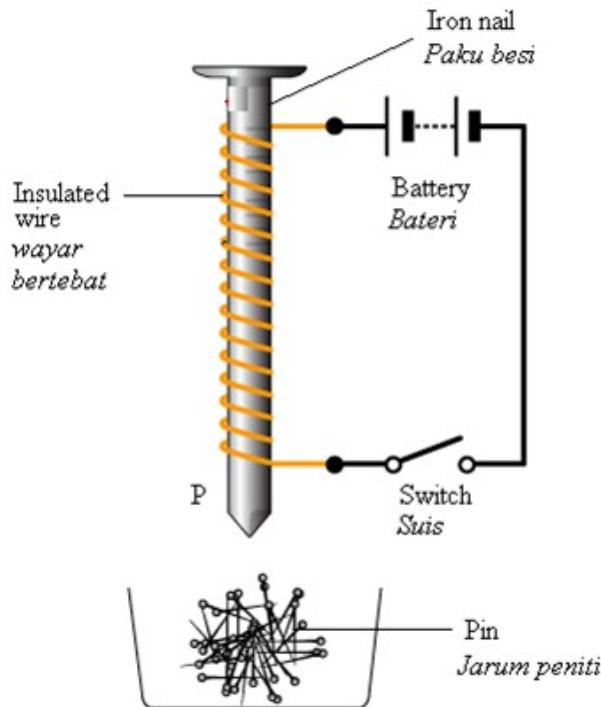


DIAGRAM 2.1
RAJAH 2.1

- (a) What is the meaning of electromagnet?
Apakah maksud elektromagnet?

.....
[1 mark]

- (b) When the switch is turned on ;
Bila suis dihidupkan ;

- (i) draw the pattern of magnetic field on Diagram 2.1
lukis corak medan magnet pada Rajah 2.1

[1 mark]

- (ii) state the magnetic pole at P
nyatakan kutub magnet pada P.

.....

[1 mark]

- (iii) state what happens to the pin.
nyatakan apa yang berlaku kepada pin itu.

..... [1 mark]

- (c) State **one** application of electromagnet.
*Nyatakan **satu** kegunaan elektromagnet.*

..... [1 mark]

3. Diagram 3 shows a wet towel is placed on the forehead of a boy who has high fever.
Rajah 3 menunjukkan tuala yang basah diletakkan di atas dahi seorang budak lelaki yang mengalami demam panas.



Diagram 3
Rajah 3

- (a) What is the meaning of **thermal equilibrium**?
*Apakah yang dimaksudkan dengan **keseimbangan terma**?*

..... [1 mark]

- (b) Explain how a thermal equilibrium is achieved in Diagram 3.
Terangkan bagaimana keseimbangan terma tercapai dalam Rajah 3.

..... [2 marks]

- (c) The mass of water used to wet the towel is 0.3 kg and the specific heat capacity for water is $4\ 200\ \text{J kg}^{-1}\ \text{C}^{-1}$. The initial temperature of the towel is 30°C and the

final temperature is 38°C . Find the amount of heat energy from the boy is removed by the wet towel.

Jisim air yang digunakan untuk membasahkan tuala adalah 0.3 kg dan muatan haba tentu air adalah $4200 \text{ J kg}^{-1} \text{ }^{\circ}\text{C}^{-1}$. Suhu awal tuala adalah 30°C dan suhu akhir adalah 38°C . Hitung jumlah tenaga haba yang telah dibebaskan daripada budak itu oleh tuala basah.

[2 marks]

- (d) What happens to the final temperature if the water used to wet the towel is mixed with ice cubes?

Apakah yang berlaku kepada suhu akhir jika air yang digunakan untuk membasahkan tuala dicampurkan dengan ketulan ais?

.....
.....
.....
.....
.....

[1 mark]

4. Diagram 4.1 shows a circuit used to investigate the relationship between current and potential difference across a constantan wire s.w.g. 24 with length of 10 cm.

Rajah 4.1 menunjukkan sebuah litar yang digunakan untuk menyiasat hubungan antara arus dan beza keupayaan yang merentasi dawai konstantan s.w.g. 24 dengan panjang 10 cm.

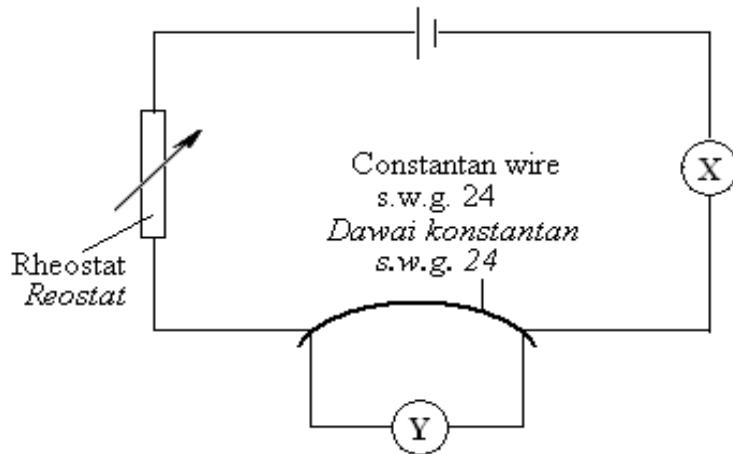


Diagram 4.1

Rajah 4.1

- (a) Name the measuring instruments labeled X and Y in Diagram 4.1.
Namakan alat pengukur yang berlabel X dan Y dalam Rajah 4.1.

X :

Y :

[2 marks]

- (b) (i) What is the relationship between the reading of the measuring instruments X and Y?

Apakah hubungan antara bacaan pada alat pengukur X dan Y ?

.....

[1 mark]

- (ii) State the physics' law involved in 4b(i).

Nyatakan hukum fizik yang terlibat dalam 4b(i).

.....

[1 mark]

- (c) The experiment is repeated by using a constantan wire s.w.g 36 with the same length. Diagram 4.2 shows the graph V against I for the experiment.

Eksperimen diulangi dengan menggunakan dawai konstantan s.w.g 36 dengan panjang yang sama. Rajah 4.2 menunjukkan graf V melawan I untuk eksperimen tersebut.

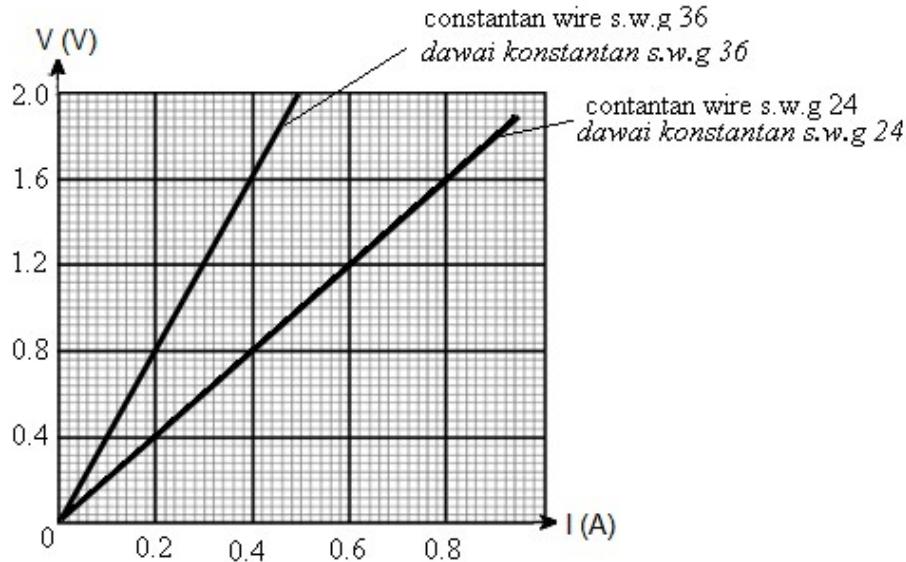


Diagram 4.2

Rajah 4.2

Based on graph in Diagram 4.2 ;
Berdasarkan graf pada Rajah 4.2 ;

- (i) What is the physical quantity represented by the gradient of the graph?
Apakah kuantiti fizik yang diwakili oleh kecerunan graf ?

..... [1 mark]

- (ii) Which of the constantan wire has the higher resistance ?
Dawai konstantan yang manakah mempunyai rintangan yang lebih tinggi ?

..... [1 mark]

- (iii) Explain your answer in 4c(ii)
Jelaskan jawapan anda di 4c(ii)

.....
[1 mark]

5. Diagram 5.1 and Diagram 5.2 show two balloons A and B exerted with the same force .
Rajah 5.1 dan Rajah 5.2 menunjukkan dua belon A dan B dikenakan daya yang sama.

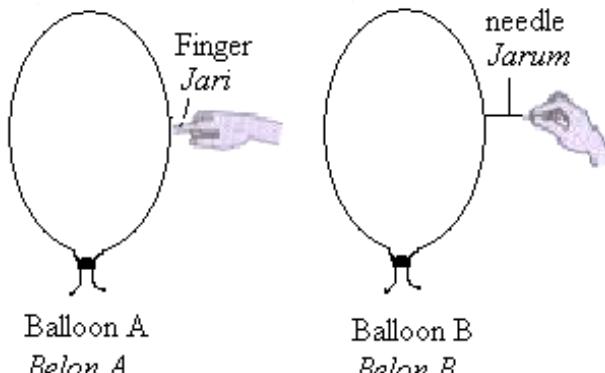


Diagram 5.1
Rajah 5.1

Diagram 5.2
Rajah 5.2

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

.....
[1 mark]

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

- (i) Which balloon will burst easily?
Belon manakah yang akan mudah pecah ?

.....
[1 mark]

- (ii) Compare the pressure exerted to the balloon
Bandingkan tekanan yang dikenakan ke atas belon.

..... [1 mark]

- (iii) Compare the surface area of finger and needle which in contact with the balloon.

Bandingkan luas permukaan jari dan jarum yang bersentuh pada belon

.....

..... [1 mark]

- (iv) Relate the pressure exerted on the balloon with the surface area

Hubungkaitkan antara tekanan yang dikenakan pada belon dengan luas permukaan

.....

..... [1 mark]

- (v) What happens to the pressure on the balloon if force exerted is increased?

Apakah yang akan berlaku kepada tekanan yang dikenakan ke atas belon, jika daya yang dikenakan bertambah ?

.....

..... [1 mark]

- (c) State the physics concept involved

Nyatakan konsep fizik yang terlibat dalam Rajah 5.1 dan Rajah 5.2

.....

..... [1 mark]

- (d) State **one** application of physics' concept in 5 (c) in our daily life

Nyatakan satu aplikasi konsep fizik dalam 5 (c) dalam kehidupan sehari-hari kita

.....

..... [1 mark]

6. Diagram 6.1 and Diagram 6.2 show the bright and dark fringes of the waves formed on the screen when a light rays pass through a double slit plate.

Rajah 6 menunjukkan pinggir cerah dan gelap bagi gelombang yang terbentuk pada tabir apabila satu sinar cahaya melalui plat dwicelah.

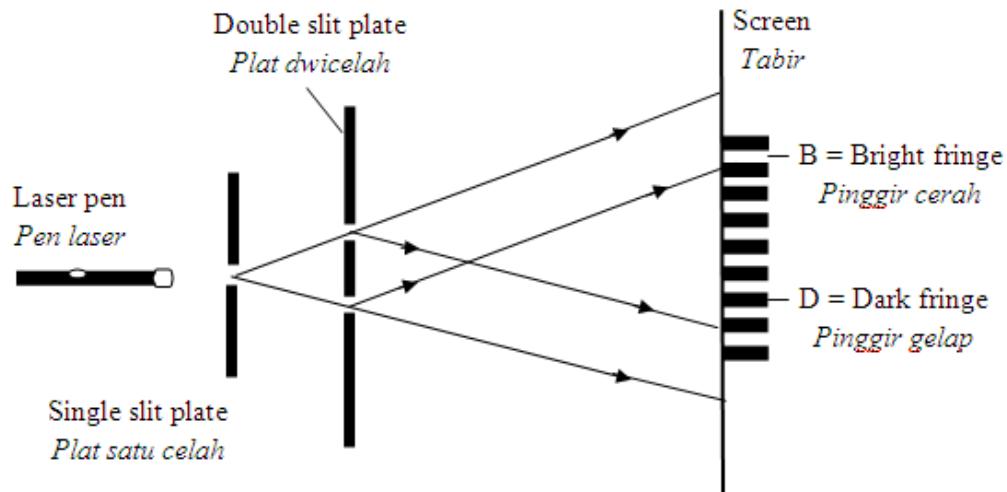


Diagram 6.1

Rajah 6.1

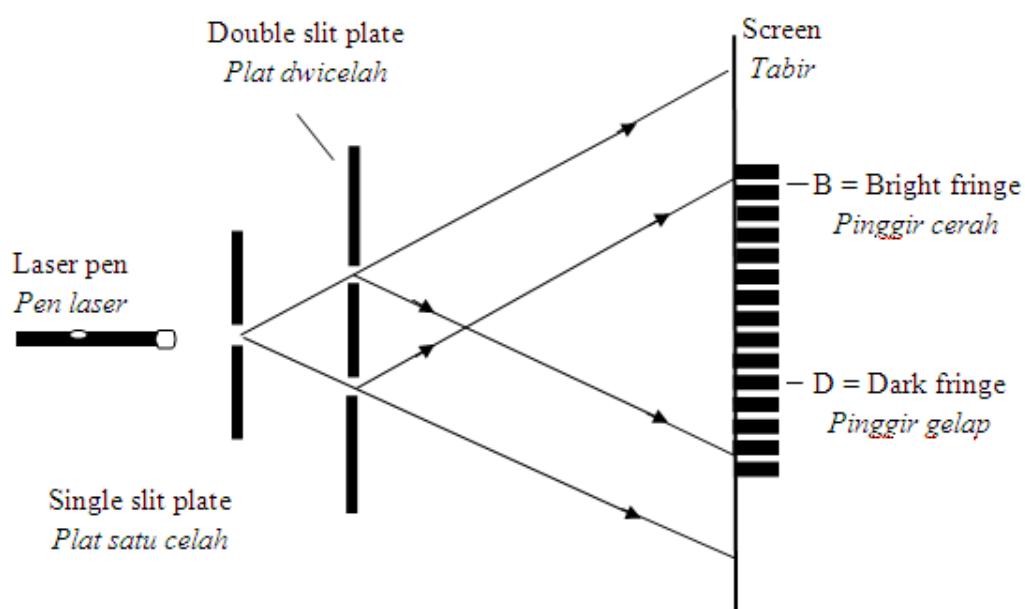


Diagram 6.2

Rajah 6.2

- (a) What is meant by a coherent source?
Apakah yang dimaksudkan dengan sumber koheren?

- [1mark]
- (b) Observe Diagram 6.1 and Diagram 6.2,
Perhatikan Rajah 6.1 dan Rajah 6.2,
- (i) Compare the distance between two slits
Bandingkan jarak antara dua celah
- [1 mark]
- (ii) Compare the distance between consecutive bright fringes
Bandingkan jarak antara pinggi-pinggir cerah berturutan
- [1 mark]
- (iii) Compare the distance between the double slit plate and the screen.
Bandingkan jarak antara plat dwicelah dengan tabir
- [1 mark]
- (c) (i) Relate the distance between the two slits with the distance
between consecutive bright fringes
*Hubungkaitkan jarak antara dua celah dengan jarak antara pinggir-
pinggir cerah berturutan*
- [1 mark]
- (ii) Name the wave phenomenon which forms the pattern of the fringes in
Diagram 6.1 and Diagram 6.2
*Namakan fenomena gelombang yang menghasilkan corak pinggir dalam
Rajah 6.1 dan Rajah 6.2*
- [1 mark]
- (d) (i) Explain how the formation of bright fringes and dark fringes occur.

Terangkan bagaimana pembentukan pinggir-pinggir cerah dan gelap terhasil.

.....
.....

[2 marks]

- (ii) Name the physics' principle used to explain your answer in 6d (i).
Namakan prinsip Fizik yang digunakan untuk menerangkan jawapan anda di 6d (i)
-

[1 mark]

- 7 . Diagram 7 shows a spring.
Rajah 7 menunjukkan satu spring.

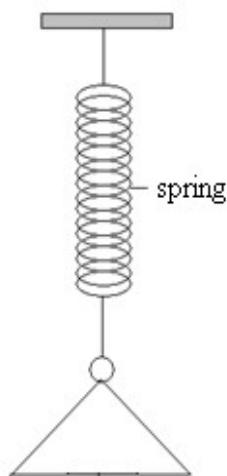


Diagram 7
Rajah 7

- (a) When a load is attached to the spring ;
Apabila satu beban dilekatkan pada spring ;

- (i) What happen to the length of the spring?
Apakah yang berlaku pada panjang spring?

.....
[1 mark]

- (ii) What is the energy stored in the spring?
Apakah tenaga yang tersimpan dalam spring?

.....
[1 mark]

- (iii) If the number of load is increased, what will happen to the
energy in
7 a(ii)?
*Jika bilangan beban ditambah, apakah yang akan berlaku kepada tenaga
di 7 a(ii)?*

.....
[1 mark]

- (b) The initial length of a spring is 15 cm. When a load with mass 300g is attached to
the spring, the length of the spring is 21 cm.
*Panjang asal spring adalah 15 cm. Apabila beban berjisim 300g dilekatkan pada
spring. panjang spring adalah 21 cm.*

What is the length of the spring if a load with mass 500g is attached to the spring?
Berapakah panjang spring jika beban berjisim 500g dilekatkan pada spring?

[3 marks]

- (c) The spring in Diagram 7 is not suitable to be used as a spring cradle.

Suggest modifications to be done based on the characteristics given below.

Spring dalam Rajah 7 tidak sesuai digunakan untuk buaian spring.

Cadangkan pengubahsuai-an-pengubahsuai-an yang perlu dilakukan berdasarkan ciri-ciri yang diberi di bawah.

- (i) Arrangement of the springs
Susunan spring

.....
[1 mark]

- (ii) Reason
Sebab

.....
[1 mark]

- (iii) Stiffness of the spring
Kekerasan spring

.....
[1 mark]

- (iv) Reason
Sebab

.....
[1 mark]

8. (a) Diagram 8.1 shows a relay used in an electrical circuit.
Rajah 8/1 menunjukkan satu geganti yang digunakan dalam satu litar elektrik.

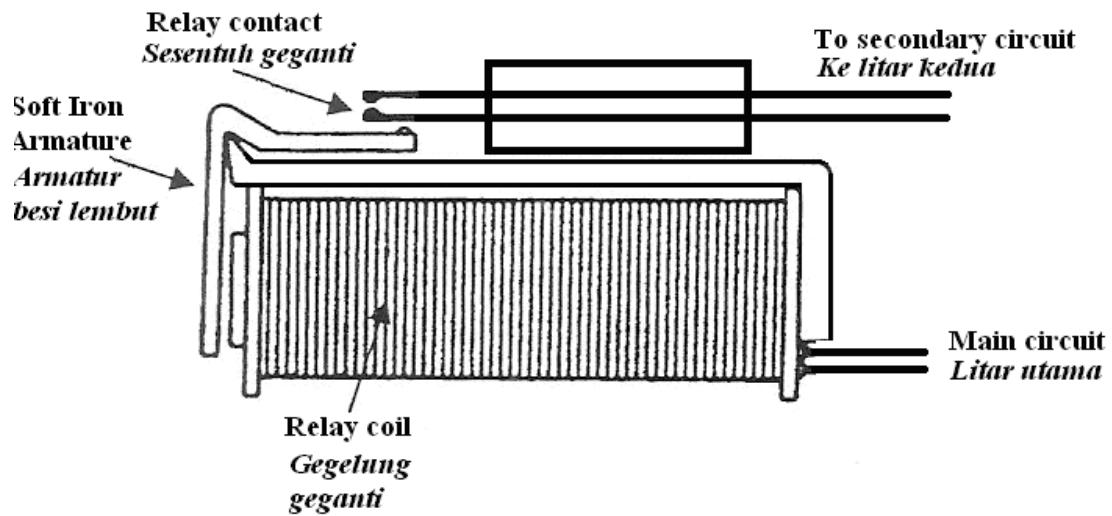


Diagram 8.1
Rajah 8.8

- (i) What is the function of a relay?
Apakah fungsi geganti?

.....
[1 mark]

- (ii) Explain what will happen when an electric current flows in the main circuit?
Terangkan apakah yang akan berlaku apabila arus elektrik mengalir dalam litar utama?

.....
.....
.....
[2 mark]

- (b) Diagram 8.2 shows a circuit consists of an automatic switch using a relay to switch on a street light at night.

Rajah 8.2 menunjukkan satu litar yang terdiri daripada suis automatik menggunakan geganti untuk menghidupkan satu lampu jalan pada waktu malam.

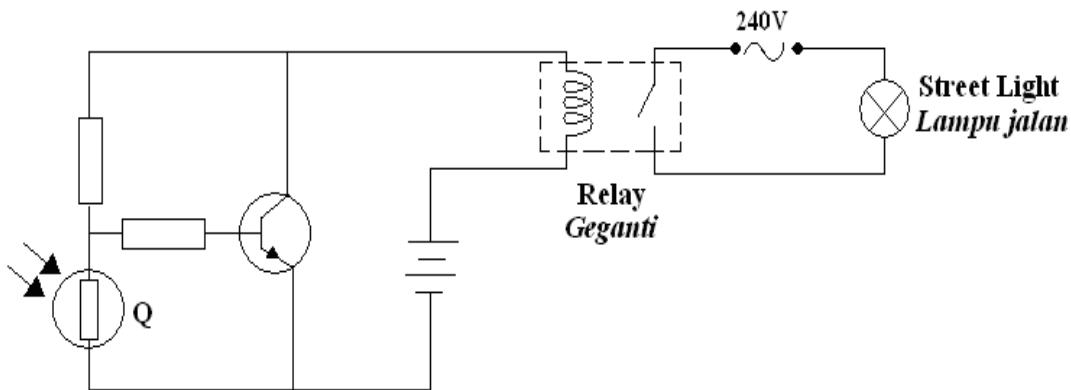


Diagram 8.2
Rajah 8.2

- (i) Name the component labeled Q.
Namakan komponen berlabel Q.

[1 mark]

- (ii) State the main characteristic for component Q.
Nyatakan ciri utama bagi komponen Q.

[1 mark]

- (iii) Explain how the component Q light up the street light.
Terangkan bagaimana komponen Q menghidupkan lampu jalan.

[3 marks]

- (c) Diagram 8.3 shows a simple tsunami control system used to detect an earthquake and eruption volcano at the sea bed which will produce tsunami.

Rajah 8.3 menunjukkan satu sistem kawalan tsunami ringkas yang digunakan untuk mengesan gempa bumi dan letusan gunung berapi di dasar laut yang akan menghasilkan tsunami.

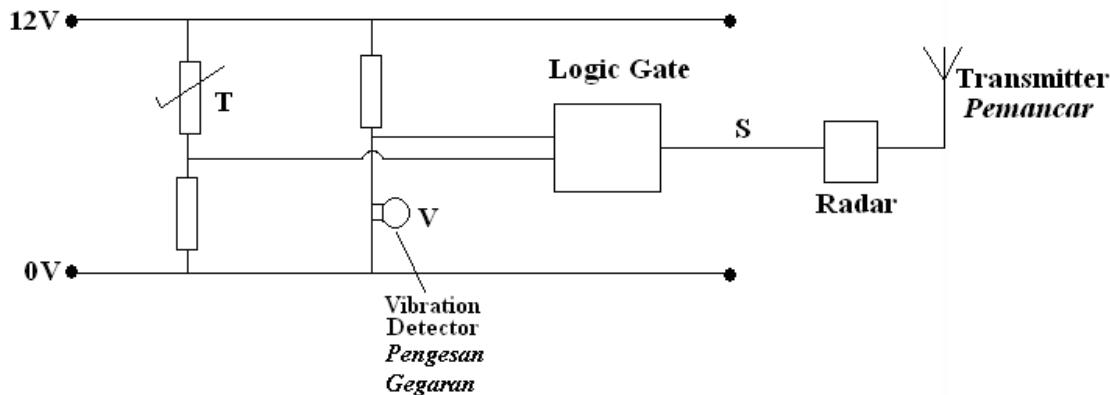


Diagram 8.3

Rajah 8.3

The circuit consists of vibration sensor, V, and water temperature sensor, T, at the sea bed. The vibration and increase in temperature detected will produce signals which will be sent to a logic gate and then to the tsunami operation detector room through the transmitter.

Litar adalah terdiri daripada pengesan gegaran, V, dan pengesan suhu air, T di dasar laut. Gegaran dan kenaikan suhu air yang dikesan akan menghasilkan isyarat yang akan dihantar kepada get logik dan seterusnya dihantar ke bilik operasi pengesan tsunami melalui pemancar.

Keys ;

Kekunci;

Vibration sensor, V	:	With vibration	Logic '1'
Pengesan gegaran, V	:	Dengan gegaran	Logik '1'

Vibration sensor, V	:	Without vibration	Logic '0'
Pengesan gegaran, V	:	Tiada gegaran	Logik '0'

Water temperature sensor, T	:	High temperature	Logik ‘1’
<i>Pengesan suhu air, T</i>	:	<i>Suhu tinggi</i>	<i>Logik ‘1’</i>
Water temperature sensor, T	:	Low temperature	Logik ‘0’
<i>Pengesan suhu air, T</i>	:	<i>Suhu rendah</i>	<i>Logik ‘0’</i>
Output S	:	Radar is activated	Logic ‘1’
<i>Output S</i>	:	<i>Radar diaktifkan</i>	<i>Logic ‘1’</i>
Output S	:	Radar is deactivated	Logic ‘0’
<i>Output S</i>	:	<i>Radar is tidak diaktifkan</i>	<i>Logic ‘0’</i>

Tsunami will occur when there is a vibration **or** change of high temperature at the sea bed.

Tsunami akan berlaku apabila terdapat gegaran atau perubahan suhu tinggi di dasar laut.

Table 8 is a truth table which shows the operation of the logic gate in the tsunami control system.

Jadual 8 adalah jadual kebenaran yang menunjukkan operasi get logik dalam sistem kawalan tsunami.

V	T	S
0	0	
0	1	
1	0	
1	1	

Table 8

Jadual 8

- (i) Using the keys given, complete Table 8.
Menggunakan kekunci yang diberikan, lengkapkan jadual 8.

[2 marks]

- (ii) Name the logic gate in the circuit in Diagram 8.3.
Namakan get logik dalam litar pada Rajah 8.3.

[1 mark]

- (iii) In the space below, draw the logic gate symbol in 8 c(ii).
Pada ruangan di bawah, lukis simbol get logik dalam 8 c(ii).

[1 mark]

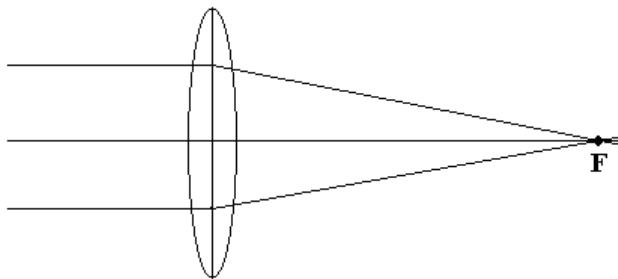
Section B
Bahagian B

[20 marks]
[20 markah]

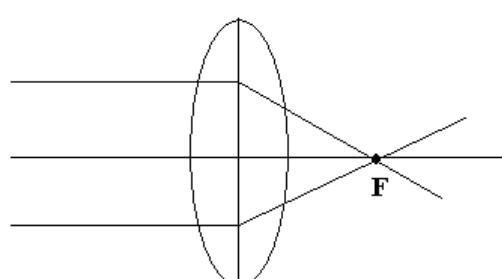
Answer any **one** question from this section
Jawab mana-mana **satu** soalan daripada bahagian ini

9. Diagram 9.1 and Diagram 9.2 show parallel rays are directed towards the lenses P and Q with focal point F.

Rajah 9.1 dan Rajah 9.2 menunjukkan sinar selari menuju permukaan kanta P dan Q dengan titik fokus F.



Convex lens P
Kanta cembung P



Convex lens Q
Kanta cembung Q

Diagram 9.1
Rajah 9.1

Diagram 9.2
Rajah 9.2

- (a) What is meant by focal point?
Apakah yang dimaksudkan dengan titik fokus?
[1 mark]
- (b) Using Diagram 9.1 and Diagram 9.2 , compare the thickness, the focal length and power of the lens. Relate the thickness of the lens with the focal length to make a deduction regarding the relationship between thickness of the lens and the power of lens.

Menggunakan Rajah 9.1 dan Rajah 9.2, bandingkan ketebalan, panjang fokus dan kuasa kanta tersebut. Hubungkaitkan ketebalan kanta dengan panjang fokus untuk membuat satu deduksi tentang hubungan antara ketebalan dengan kuasa kanta.

[5 marks]

- (c) Diagram 9.3 shows lens P is used as a magnifying glass.

Rajah 9.3 menunjukkan kanta P digunakan sebagai kanta pembesar.

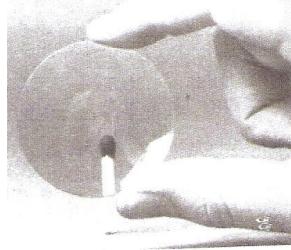


Diagram 9.3

Rajah 9.3

- (i) At which position the object should be placed so that lens P will acts as a magnifying glass?

Pada kedudukan manakah objek patut diletakkan supaya kanta P bertindak sebagai kanta pembesar?

- (ii) Draw a ray diagram to show the formation of image formed by lens P in Diagram 9.3.

Lukiskan rajah sinar untuk menunjukkan pembentukan imej yang terbentuk oleh kanta P dalam Rajah 9.3.

[4 marks]

- (d) Diagram 9.4 shows a compound microscope.

Rajah 9.4 menunjukkan sebuah mikroskop majmuk.



Diagram 9.4

Rajah 9.4

Using an appropriate physics concept, suggest and explain suitable modifications or ways to enable the microscope to increase its efficiency and to form a brighter and clear image. Your modifications can be emphasized on the following aspects;

Menggunakan konsep fizik yang sesuai, cadang dan terangkan pengubahsuaian atau cara yang boleh dilakukan untuk meningkatkan keberkesanannya bagi menghasilkan imej yang terang dan jelas .. Pengubahsuaian anda boleh berdasarkan kepada aspek-aspek berikut:

- The selection of lens as objective lens and as an eyepiece
pemilihan kanta sebagai kanta objek dan kanta mata
- The position of the object
kedudukan objek
- The position of the eye piece
kedudukan kanta mata
- The distance between the objective lens and eyepiece
jarak antara kanta objek dan kanta mata
- Condition of the place to store the microscope
Keadaan tempat penyimpan mikroskop

[10 marks]

10. Diagram 10.1 and Diagram 10.2 show the deflection of the galvanometer when a bar magnets are pushed into two identical solenoids.

Rajah 10.1 dan Rajah 10.2 menunjukkan pesongan galvanometer apabila magnet bar ditolak ke dalam dua solenoid yang serupa.

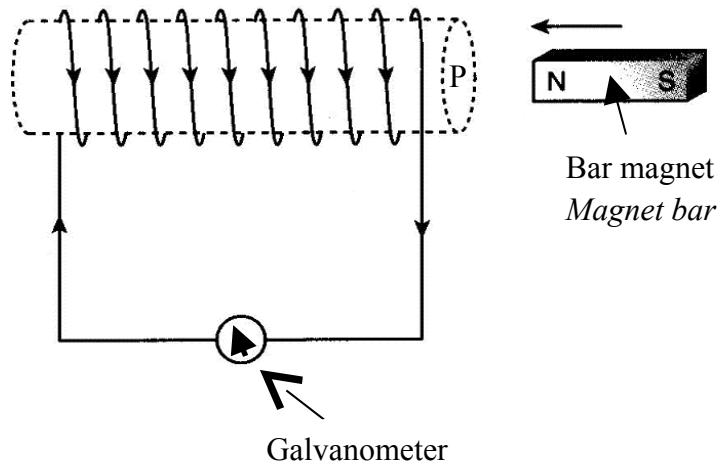


Diagram 10.1

Rajah 10.1

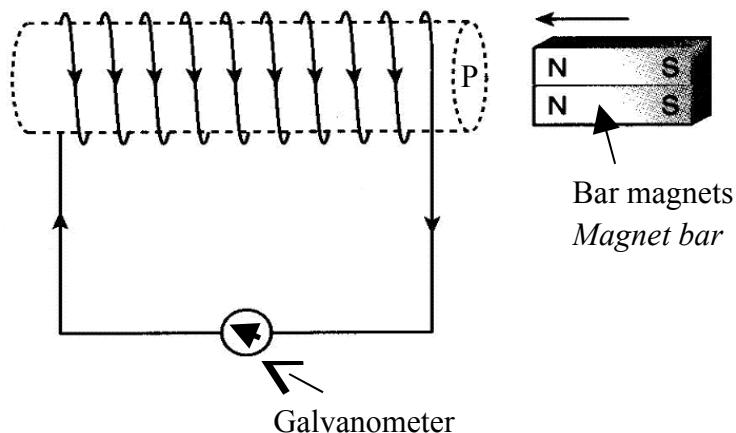


Diagram 10.2

Rajah 10.2

(a) What is meant by electromagnetic induction?

Apakah maksud aruhan electromagnet?

[1 mark]

(b) Using Diagram 10.1 and Diagram 10.2,

Menggunakan Rajah 10.1 dan Rajah 10.2,

- (i) state the magnetic pole at the end **P** when the bar magnets are pushed into the solenoids.

*nyatakan kutub magnet pada hujung **P** apabila magnet bar ditolak ke dalam solenoid.*

[1 mark]

- (ii) compare the number of bar the magnets and the deflection of the galvanometer.

bandingkan bilangan magnet bar dengan pesongan galvanometer.

[2 marks]

(c) State the relationship between

Nyatakan hubungan antara

- (i) the number of bar magnets and the strength of the magnetic field,
bilangan magnet bar dengan kekuatan medan magnet,

[1 mark]

- (ii) the strength of the magnetic field and the deflection of the galvanometer.
kekuatan medan magnet dengan pesongan galvanometer.

[1 mark]

(d) Diagram 10.3 shows an ideal transformer.

Rajah 10.3 menunjukkan satu transformator unggul.

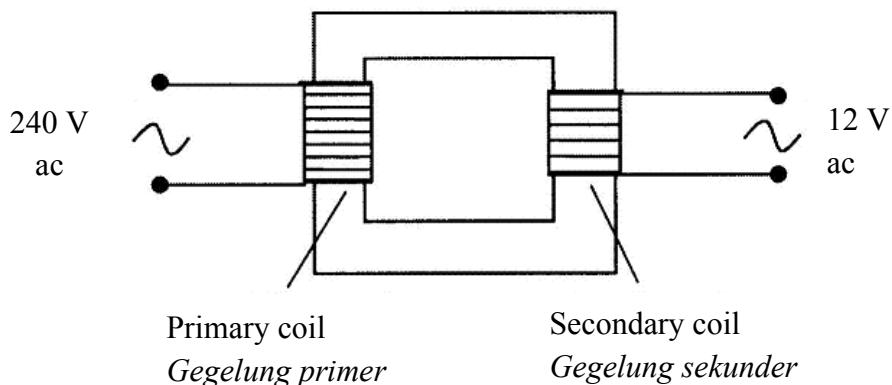


Diagram 10.3

Rajah 10.3

- (i) Name the type of transformer.

Namakan jenis transformer ini.

[1 mark]

- (ii) Explain how current is induced in the secondary coil?

Terangkan bagaimana arus diaruh di dalam gegelung sekunder?

[3 marks]

- (e) Diagram 10.4 shows an ac generator.

Rajah 10.4 menunjukkan sebuah penjana a.u.

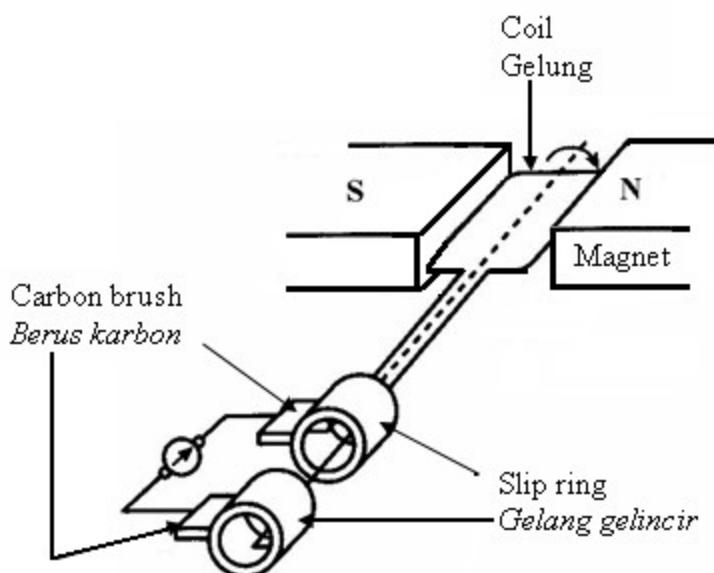


Diagram 10.4

Rajah 10.4

Suggest modifications that can be made to increase the output current to the generator in Diagram 10.4.

State and explain the modifications based on the following aspects:

Cadangkan pengubahan yang boleh dilakukan pada penjana dalam Rajah 10.4.

Nyatakan dan beri penerangan tentang pengubahan itu berdasarkan aspek-aspek berikut:

- (i) Strength of the magnet

Kekuatan magnet

- (ii) Shape of the magnet
Bentuk magnet
- (iii) Number of turns of the coil
Bilangan lilitan gegelung
- (iv) Diameter of the wire of the coil
Diameter dawai pada gelung
- (v) The speed of rotation
Laju putaran gelung

[10 marks]

Section C
Bahagian C

[20 marks]
[20 markah]

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

11. (a) What is the meant by **specific heat capacity**?
*Apakah yang dimaksudkan dengan **muatan haba tentu**?*

[1 mark]



Diagram 11.1
Rajah 11.1

- (b) Diagram 11.1 shows phenomenon which occur in our daily life. Using a physics concept,

*Rajah 11.1 menunjukkan fenomena yang berlaku dalam kehidupan sehari-hari kita.
Menggunakan konsep fizik,*

- (i) explain how the phenomenon occurs
terangkan bagaimana fenomena berlaku

[3 marks]

- (ii) Name the phenomenon that occurs
Namakan fenomena yang berlaku

[1 mark]

- (c) Diagram 11.2 shows a graph of temperature against time taken for heating 500 g of a liquid using an immersion heater of 48 W.

Rajah 11.2 menunjukkan graf suhu melawan masa yang diambil untuk memanaskan 500 g cecair dengan menggunakan pemanas rendam 48 W.

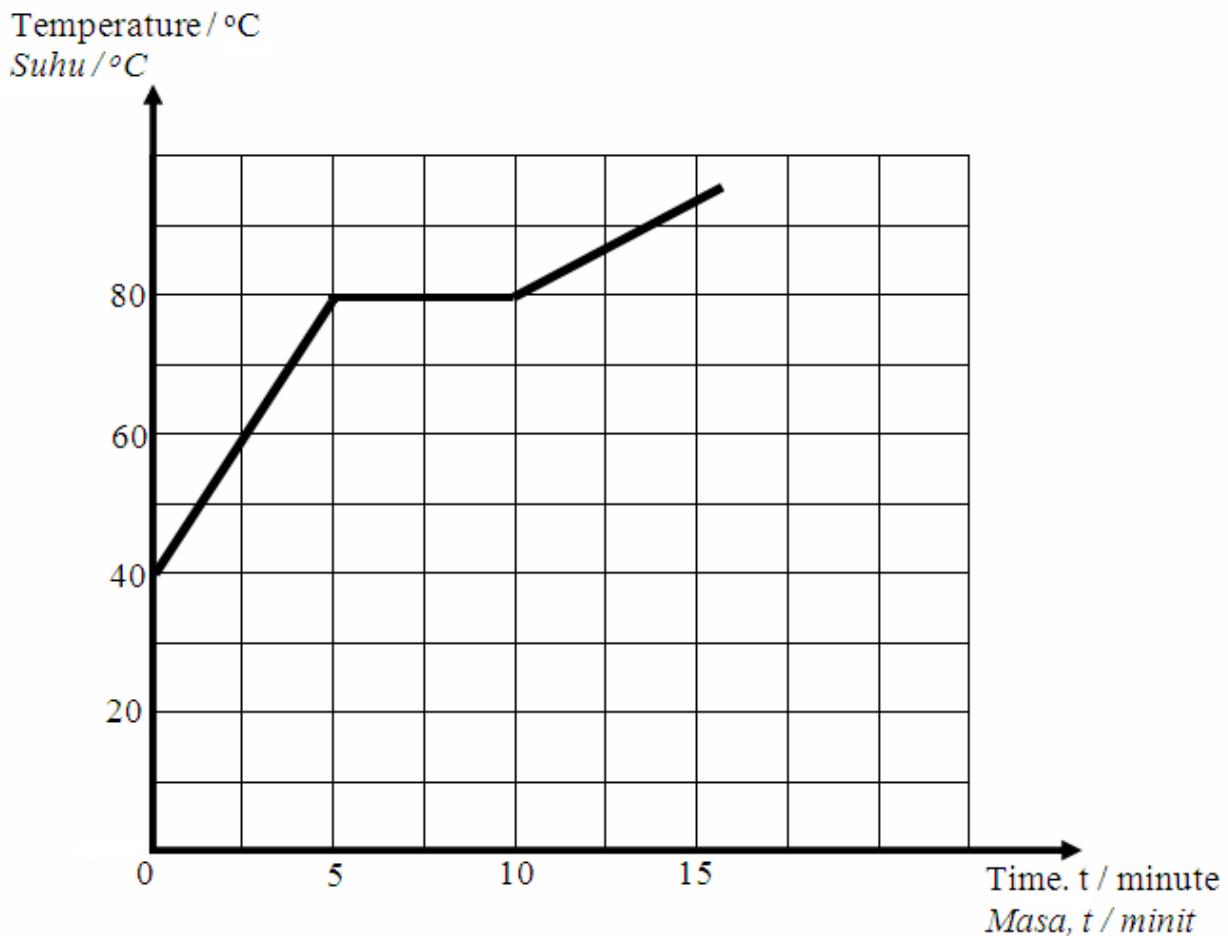


Diagram 11.2
Rajah 11.2

Calculate
Hitung

- (i) the specific heat capacity of the liquid
muatan haba tentu cecair itu

[3 marks]

- (ii) the final temperature of the mixture, if after 5 minutes of heating, the liquid is poured into a beaker that contains 1 kg of water at temperature of 25°C .

Suhu akhir campuran, jika selepas pemanasan selama 5 minit, cecair itu dituang ke dalam sebuah bikar yang mengandungi 1 kg air pada suhu 25°C .

[2 marks]

- (d) Diagram 11.3 shows the arrangement of the apparatus to determine the specific heat capacity of Aluminium block.

Rajah 11.3 menunjukkan susunan radas untuk menentukan muatan haba tentu bagi bongkah Aluminium.

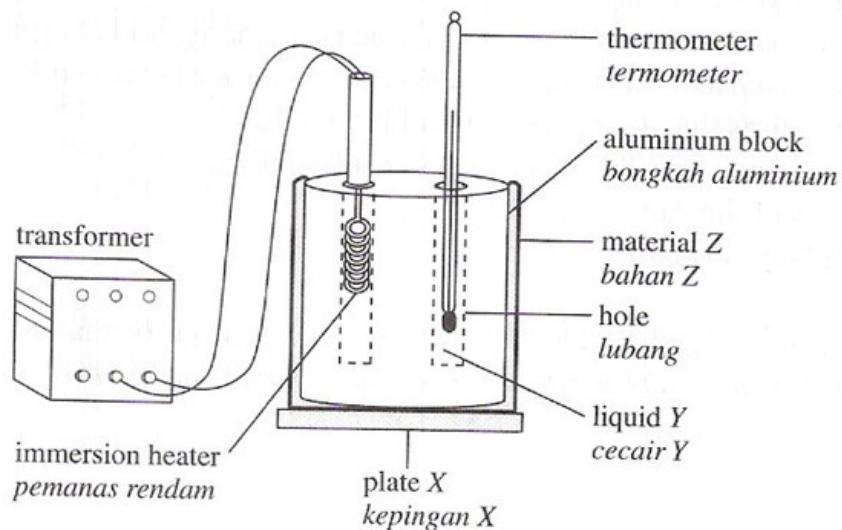


Diagram 11.3
Rajah 11.3

Table 11.1 shows the materials that are able to be used in the arrangement of the apparatus. You are assigned to investigate the materials shown in Table 11.1.

Jadual 11.1 menunjukkan bahan-bahan yang boleh digunakan dalam susunan radas itu. Anda ditugaskan untuk menyiasat bahan-bahan yang ditunjukkan dalam Jadual 11.1

Set of apparatus <i>Set radas</i>	Material <i>Bahan</i>				Power of immersion heater <i>Kuasa immersion heater</i>
	Plate X <i>Kepingan X</i>	Liquid Y <i>Cecair Y</i>	Material Z <i>Bahan Z</i>		
P	Wood <i>Kayu</i>	Water <i>Air</i>	Tissue <i>Kertas tisu</i>	12 W	
Q	Asbestos <i>Asbestos</i>	Alcohol <i>Alkohol</i>	Plain Paper <i>Kertas biasa</i>	48 W	
R	Wood <i>Kayu</i>	Oil <i>Minyak</i>	Plain Paper <i>Kertas biasa</i>	24 W	
S	Asbestos <i>Asbestos</i>	Oil <i>Minyak</i>	Tissue <i>Kertas tisu</i>	48 W	
T	Copper <i>Kuprum</i>	Water <i>Air</i>	Tissue <i>Kertas tisu</i>	24 W	

Table 11.1
Jadual 11.1

Explain the suitability of each material in Table 11.1, then determine the most suitable set of apparatus to be used to determine the specific heat capacity of Aluminium. State the reason for your answer.

Terangkan kesesuaian setiap bahan dalam Jadual 11.1 dan seterusnya tentukan set radas yang paling sesuai digunakan untuk menentukan muatan haba tentu pepejal Aluminium itu. Beri sebab untuk jawapan anda.

[10 marks]

12. As a researcher, you are assigned to investigate the characteristics of a certain radioactive *isotope* that could be used to detect the thickness of paper in paper factory.
Sebagai seorang penyelidik, anda ditugaskan untuk mengkaji ciri-ciri bagi beberapa isotop radioaktif untuk digunakan sebagai bahan pengesan ketebalan kertas di sebuah kilang kertas.

- a) What is meant by radioisotope mean?

Apakah yang dimaksudkan dengan isotop?

[1 mark]

- b) Table 12 below shows the characteristics of five radioisotopes.

Jadual 12 di bawah menunjukkan ciri-ciri bagi lima jenis radi isotop.

Radioisotope <i>Radioisotop</i>	Characteristics Of Isotope <i>Ciri-ciri Radioisotop</i>			
	State of matter <i>Keadaan jirim</i>	Emitted radiation <i>Radiasi Pancaran</i>	Half-life <i>Separuh hayat</i>	Penetrating power <i>Kuasa penembusan</i>
Strontium-90	Solid <i>Pepejal</i>	Beta <i>Beta</i>	28 years <i>28 tahun</i>	Medium <i>Sederhana</i>
Cobalt-60	Solid <i>Pepejal</i>	Gamma <i>Gama</i>	5 years <i>5 tahun</i>	High <i>Tinggi</i>
Xenon-133	Gas <i>Gas</i>	Beta <i>Beta</i>	5 days <i>5 hari</i>	High <i>Tinggi</i>
Water containing H-3	Liquid <i>cecair</i>	Beta <i>Beta</i>	12 years <i>12 tahun</i>	Medium <i>Sederhana</i>
Polonium-210	Solid <i>Pepejal</i>	Alpha <i>Alfa</i>	140 days <i>140 hari</i>	Low <i>Rendah</i>

Table 12

Jadual 12

Based on the table above;

Berdasarkan jadual di atas;

- i) Explain the suitable characteristics of the radioisotopes so that it can be used to detect the thickness of paper in a paper factory.

Terangkan kesesuaian ciri-ciri radio isotop boleh digunakan untuk mengesan ketebalan kertas di sebuah kilang kertas.

- (ii) Determine the most suitable radioisotope to be used and give your reason for your choice.

Tentukan radio isotop yang paling sesuai digunakan dan berikan sebab bagi pilihan anda.

[10 marks]

- (c) Explain the arrangement of the paper thickness detector apparatus and state how radioactivity is used to detect the thickness of the paper.

Terangkan satu susunan alat radas pengesan ketebalan kertas dan nyatakan bagaiman radioaktif digunakan untuk mengesan ketebalan kertas.

[4 marks]

- (d) Sketch a graph of activity against time to illustrate how radioactive materials decay.
Use your graph to explain how the half-life is determined.

Lakarkan satu graf aktiviti melawan masa bagi menunjukkan pereputan suatu bahan radioaktif. Gunakan graf anda untuk menerangkan bagaimana separuh hayat bahan itu dapat ditentukan.

[3 marks]

- d) The half-life of cobalt-60 is 5 years.

Calculate the time taken for the activity of this isotope to decay to 12.5% of its initial value.

Separuh hayat bagi kobalt-60 ialah 5 tahun.

Hitungkan masa yang diambil oleh isotop ini untuk menjadi 12.5% daripada nilai aktiviti asalnya

[2 marks]

SULIT

NAMA:TING :

ANGKA GILIRAN :



**PERSIDANGAN KEBANGSAAN PENGETUA-PENGETUA
SEKOLAH MENENGAH MALAYSIA
CAWANGAN KELANTAN**

**SIJIL PELAJARAN MALAYSIA
PEPERIKSAAN PERCUBAAN 2009
PHYSICS
Kertas 3
Sept/Oct
1 ½ jam**

4531/3

Satu jam tiga puluh minit

JANGAN BUKA KERTAS SOALANINI SEHINGGA DIBERITAHU

1. Kertas soalan ini adalah dalam dwibahasa.
2. Soalan dalam bahasa inggeris mendahului soalan sepadan dalam bahasa Melayu
3. Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Inggeris atau bahasa Melayu.
- 4 Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini

Untuk Kegunaan Pemeriksa			
Kod Pemeriksa :			
Bahagian	Soalan	Markah Penuh	Markah Diperolehi
A	1	16	
	2	12	
B	3	12	
	4	12	
Jumlah			

Kertas soalan ini mengandungi ____ halaman bercetak dan ____ halaman tidak bercetak.
Maklumat berikut mungkin berfaedah. Simbol-simbol mempunyai makna yang biasa.

Section A
Bahagian A

[28 marks]
[28 markah]

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

1. A student carries out an experiment to investigate the relationship between the diameter of wire , d and its resistance, R .

The arrangement of the apparatus is shown in Diagram 1.1. An ammeter , dry cells, a rheostat A switch and a piece of constantan wire are connected in series.

A voltmeter is used to measure the potential difference, V , across the constantan wire between X and Y.

Seorang pelajar menjalankan eksperimen untuk mengkaji hubungan antara diameter, d , dengan rintangan, R , bagi sebuah konduktor. Susunan radas ditunjukkan pada rajah 1.1. Sebuah ammeter, sel kering, reostat suis dan dawai konstantan disambung secara sesiri. Sebuah voltmeter digunakan untuk mengukur bezakeupayaan, V , merentasi dawai konstantan antara X dan Y.

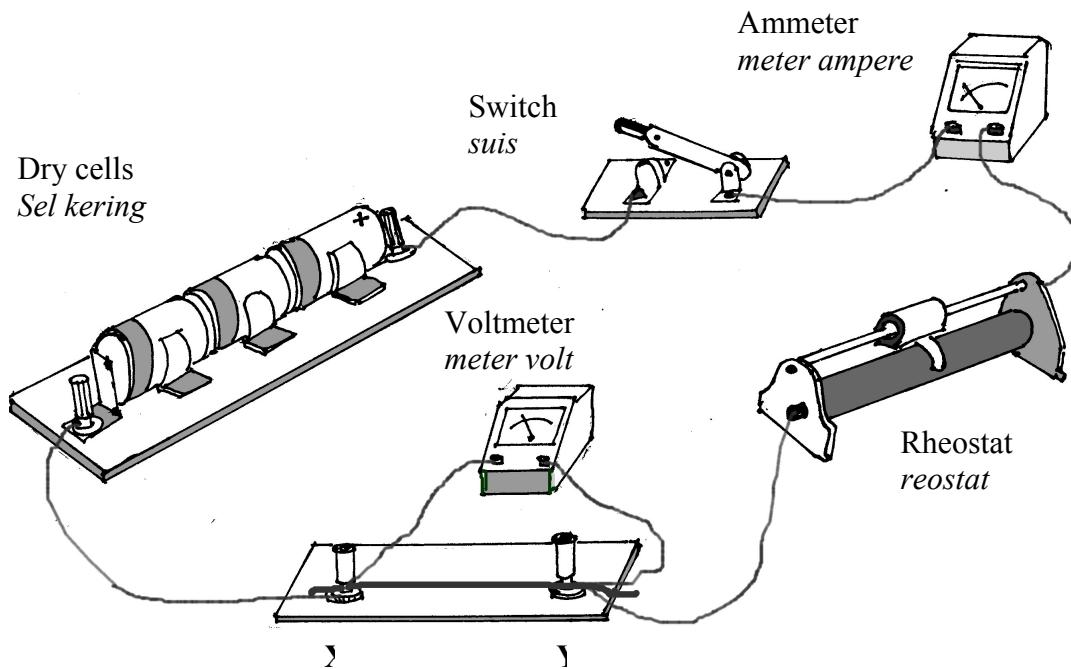


Diagram 1.1
Rajah 1.1

A constant wire of diameter, $d= 0.10$ mm with length $l = 20.0$ cm is connected Between X and Y. When the switch is on , the rheostat is adjusted until the ammeter reading is 0.3 A. The voltmeter reading, V , is as shown in Diagram 1.2.

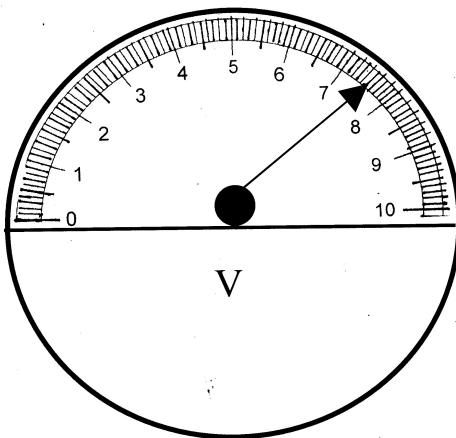
Dawai konstantan berdiameter 0.10 mm sepanjang 20 cm disambungkan di antara X dan Y. Apabila suis dihidupkan, reostat dilaraskan sehingga bacaan ammeter ialah 0.3 A. Bacaan voltmeter antara X dan Y ditunjukkan dalam Rajah 1.2.

The procedure is repeated with the same length of wires of diameter, $d = 0.10 \text{ mm}$, $d = 0.15 \text{ mm}$, $d = 0.20 \text{ mm}$, $d = 0.25 \text{ mm}$ and 0.30 mm .

The corresponding voltmeter reading across X and Y are shown in diagram 1.3, 1.4, 1.5, and 1.6.

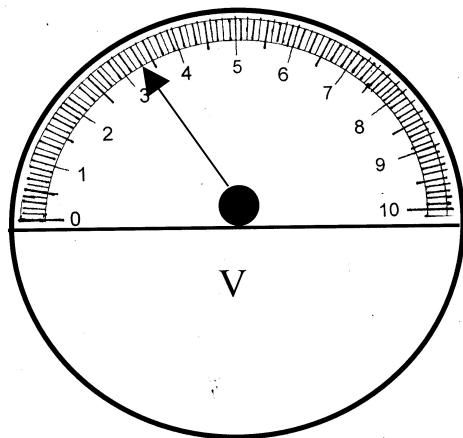
Prosedur di atas diulangi dengan dawai yang sama panjang berdiameter, $d = 0.1 \text{ mm}$, $d = 0.15 \text{ mm}$, $d = 0.20 \text{ mm}$, $d = 0.25 \text{ mm}$ dan 0.30 mm .

Bacaan voltmeter yang sepadan ditunjukkan dalam Rajah 1.3, 1.4, 1.5 dan 1.6.



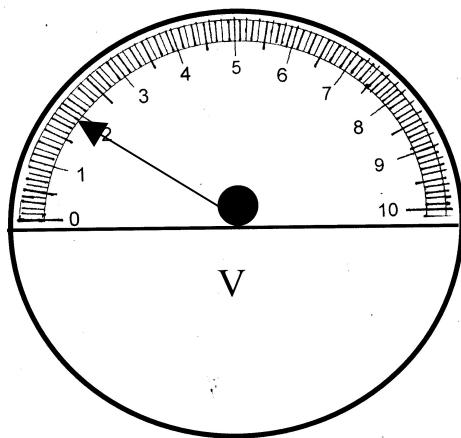
$V = \dots \text{V}$
Diameter of wire, $d = 0.10 \text{ mm}$
Diameter dawai, $d = 0.10 \text{ mm}$

Diagram 1.2
Rajah 1.2



$V = \dots \text{V}$
Diameter of wire, $d = 0.15 \text{ mm}$
Diameter dawai, $d = 0.15 \text{ mm}$

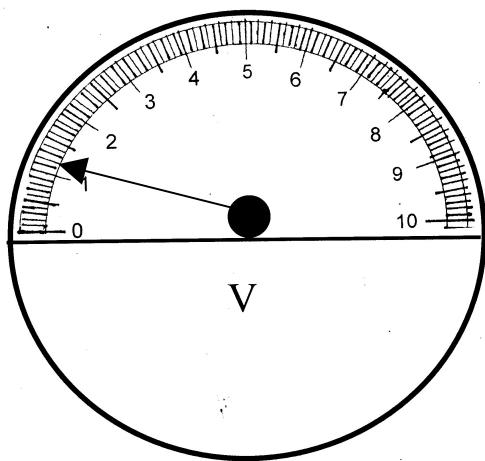
Diagram 1.3
Rajah 1.3



$$V = \dots \text{V}$$

Diameter of wire , $d = 0.20 \text{ mm}$
Diameter dawai , $d = 0.20 \text{ mm}$

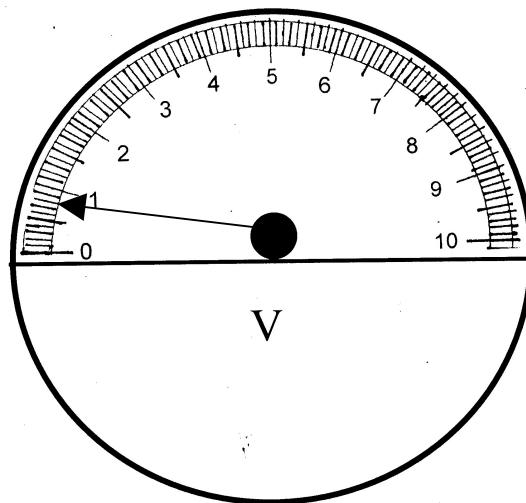
Diagram 1.4
Rajah 1.4



$$V = \dots \text{V}$$

Diamater of wire , $d = 0.25 \text{ mm}$
Diameter dawai , $d = 0.25 \text{ mm}$

Diagram 1.5
Rajah 1.5



$$V = \dots \text{V}$$

Diameter of wire, $d= 0.30 \text{ mm}$
Diameter dawai , $d = 0.30 \text{ mm}$

Diagram 1.6
Rajah 1.6

a) For the experiment described on pages ___, identify;
Bagi eksperimen yang diterangkan di halaman ___

(i) The manipulated variable
Pembolehubah dimanipulasikan

[1 mark]
[1 markah]

(ii) The responding variable
Pembolehubah bergerakbalas

[1 mark]
[1 markah]

(iii) The constant variable
Pembolehubah dimalarkan

[1 mark]
[1 markah]

b) Base on Diagram 1.2, 1.3, 1.4, 1.5, and 1.6 on page ___.
Berdasarkan Rajah 1.2, 1.3, 1.4, 1.5 and 1.6 di halaman ___.
.....

(i) Record the voltmeter reading, V, in the spaces provided on page ___.
Catat bacaan voltmeter, V, dalam ruangan yang disediakan di halaman ___.
.....

[2 marks]
[2 markah]

(ii) Calculate the values of R for each length of wire using the formula $R = \frac{V}{0.3}$

Hitung nilai-nilai R bagi setiap diameter dawai menggunakan $R = \frac{V}{0.3}$

[2 marks]
[2 markah]

(iii) Tabulate your results for d, V , $\frac{1}{d^2}$ and R for all values of d, in the space below.

Jadualkan keputusan anda bagi d, V, $\frac{1}{d^2}$, dan R untuk semua nilai d, pada ruang di bawah.

[3 marks]
[3 markah]

(c) On the graph paper on page ___, plot a graph of R against $\frac{1}{d^2}$.

Pada kertas graf di halaman ___, lukis graf R dengan $\frac{1}{d^2}$.

[5 marks]
[5markah]

(d) Base on graph in 1(c) , state the relationship between R and d .

Berdasarkan graf anda di 1 (c), nyatakan hubungan antara R dan d .

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

2. A student carries out an experiment to investigate the relationship between the emperature, θ , of a fixed mass of liquid and the time, t , it has been heated. This experiment is carried out using the same immersion heater to heat up 400 g of the liquid. The results of this experiment are shown in the graph of θ against t in Diagram 2.1.

Seorang murid menjalankan satu eksperimen untuk mengkaji hubungan antara suhu, θ , bagi suatu cecair yang berjisim tetap dengan masa, t , ia dipanaskan. Eksperimen ini dilakukan menggunakan pemanas rendam yang sama untuk memanas 400 g cecair tersebut.

Keputusan eksperimen ini ditunjukkan oleh graf θ melawan t pada Rajah 2.1.

- (a) Based on the graph in Diagram 2.1:

Berdasarkan graf pada Rajah 2.1:

- (i) what happens to θ as t increases?

Apakah yang berlaku pada θ apabila t bertambah?

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

- (ii) Determine the value of θ when $t = 0$ s.

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

Tentukan nilai θ apabila $t = 0$ s.

Tunjukkan pada graf itu bagaimana anda menentukan nilai θ .

$\theta = \dots\dots\dots\dots$

[2 marks]
[2 markah]

(ii) Calculate the gradient, k , of the graph.

Show on the graph how you determine k .

*Hitung kecerunan, k , bagi graf itu.
Tunjukkan pada graf itu bagaimana anda menentukan k .*

$$k = \dots\dots\dots\dots\dots$$

[3 marks]
[3 markah]

(a) (i) Specific heat capacity, c , of the liquid is given by the equation:

$$c = \frac{50}{mk}$$

Where m = mass of the liquid used in this experiment.

k = gradient of the graph.

Calculate the value of the specific heat capacity, c , of the liquid.

Muatan haba tentu, c , bagi cecair diberi oleh persamaan,

$$c = \frac{50}{mk}$$

Dimana m = jisim cecair yang diguna dalam eksperimen ini.

k = kecerunan graf.

Hitungkan nilai muatan haba tentu, c , cecair tersebut.

$$c = \dots\dots\dots\dots\dots$$

[3
marks]
[3
markah]

(ii) What is the value of c if 800 g of the liquid is used in the experiment?

Berapakah nilai c jika 800 g cecair tersebut digunakan dalam eksperimen ini?

$$c =$$

[1 mark]
[1 markah]

(b) State **two** precautions that should be taken to improve the results of this experiment.

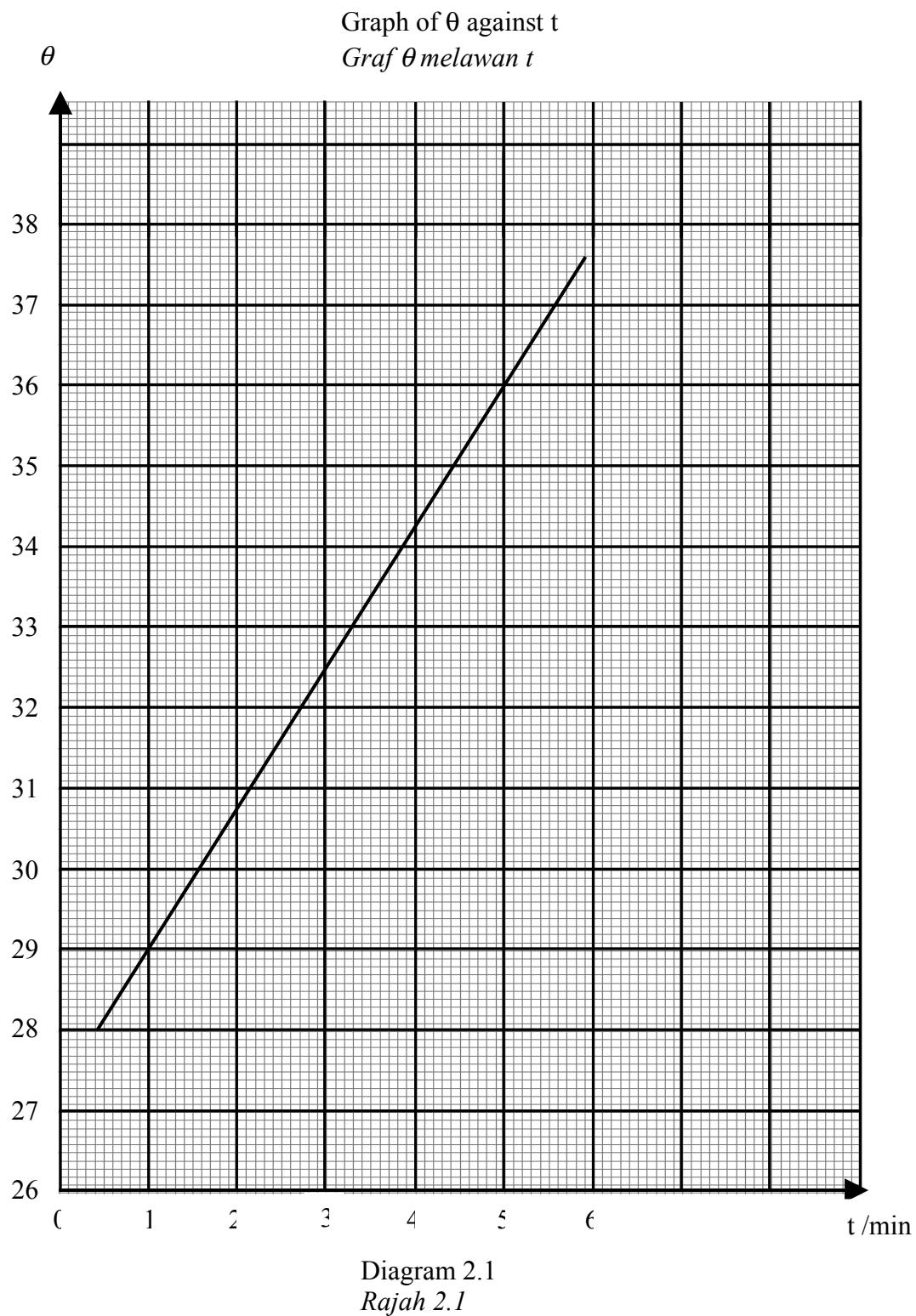
Nyatakan dua langkah berjaga-jaga yang perlu diambil untuk memperbaiki keputusan eksperimen ini.

.....
.....

marks]

[2 markah]

[2



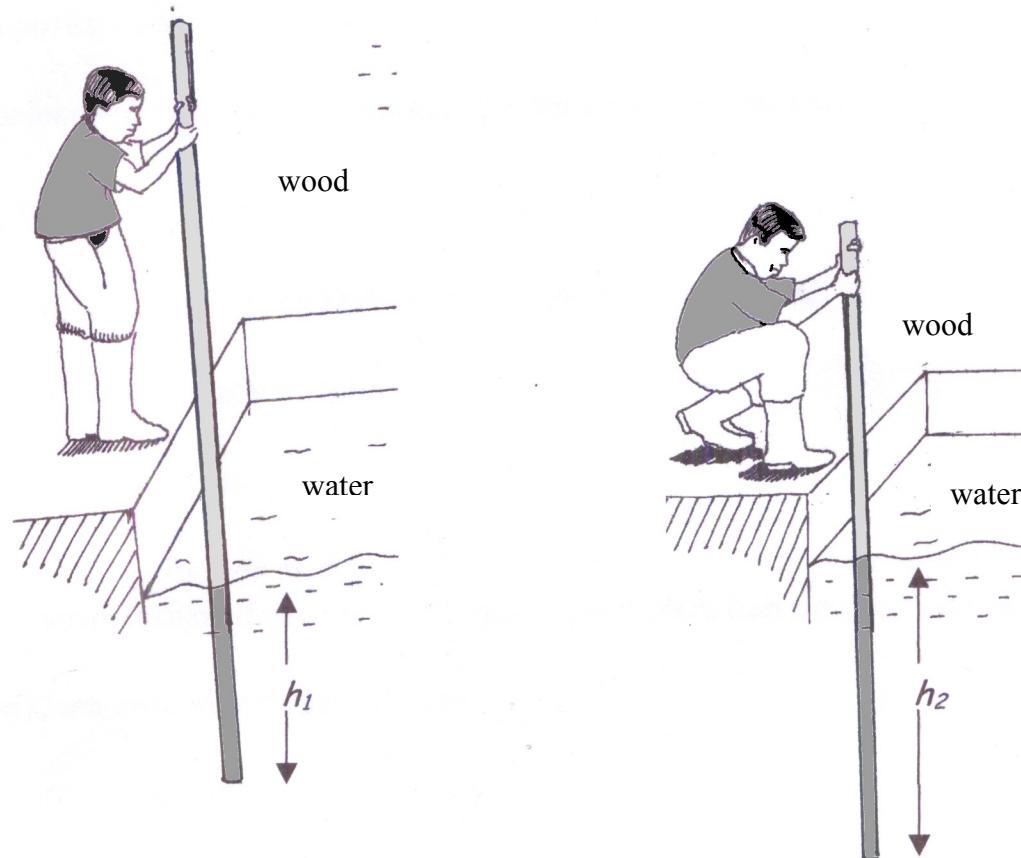
Section B
Bahagian B

[12 marks]
[12 markah]

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

3. Diagram shows a worker using a piece of straight long and uniform wood to determine to determine the depth of a hole filled with water.

Rajah menunjukkan seorang pekerja menggunakan sebatang kayu panjang yang seragam untuk menentukan kedalaman sebuah lubang yang dipenuhi air.



When the is pushed a bit into water as in Diagram 1 , he feel that a small force is needed, when the wood is pushed further down as in Diagram 2 , he found that a larger force is needed.

Semasa kayu itu ditolak sedikit ke dalam air seperti Rajah 1 beliau mendapati daya yang kecil diperlukan untuk menolaknya. Manakala apabila kayu ditolak semakin dalam seperti Rajah 2 beliau mendapati daya yang lebih besar diperlukan untuk menolaknya.

Based on your observation on the volume of air trapped in the beaker;

Berdasarkan pemerhatian ke atas isipadu udara terperangkap di dalam bikar;

- (a) State one suitable inference,

Nyatakan satu inferens yang sesuai

[1 mark]

- (b) State one appropriate hypothesis that could be investigated,

Nyatakan satu hipotesis yang boleh disiasat

[1 mark]

- (c) With use of apparatus such as a metal block , spring balance, beacker and other apparatus, describe an experiment to investigate the hypothesis stated in 3(b)

Dengan menggunakan radas seperti bonkah logami, neraca spring, bikar dan Lain-lain radas yang sesuai, terangkan satu eksperimen untuk menyiasat hipotesis yang dinyatakan di 3(b).

In your description, state clearly the following :

Dalam penerangan anda, jelaskan perkara berikut;

- (i) The aim of an experiment
Tujuan eksperimen

- (ii) The variable in experiment
Pembolehubah eksperimen

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

- (iv) The arrangement of the apparatus
Susunan alat radas

- (v) The procedure of the experiment.
Describes how to control and measure the manipulated variables and how to measure the responding variables.

Prosedur eksperimen.

Jelaskan bagaimana mengawal dan mengukur pembolehubah manipulasi dan Bagaimana mengukur pembolehubah bergerakbalas.

- (vi) The way to tabulate the data
Kaedah menjadual data

- (vii) The way to analyze the data
Kaedah menganalisa data

[10 marks]

- 4 .The figures 4.1 and 4.2 show two electric bells are connected to the similar batteries.
Rajah 4.1 dan Rajah 4.2 menunjukkan dua loceng elektrik disambungkan kepada bateri yang serupa.

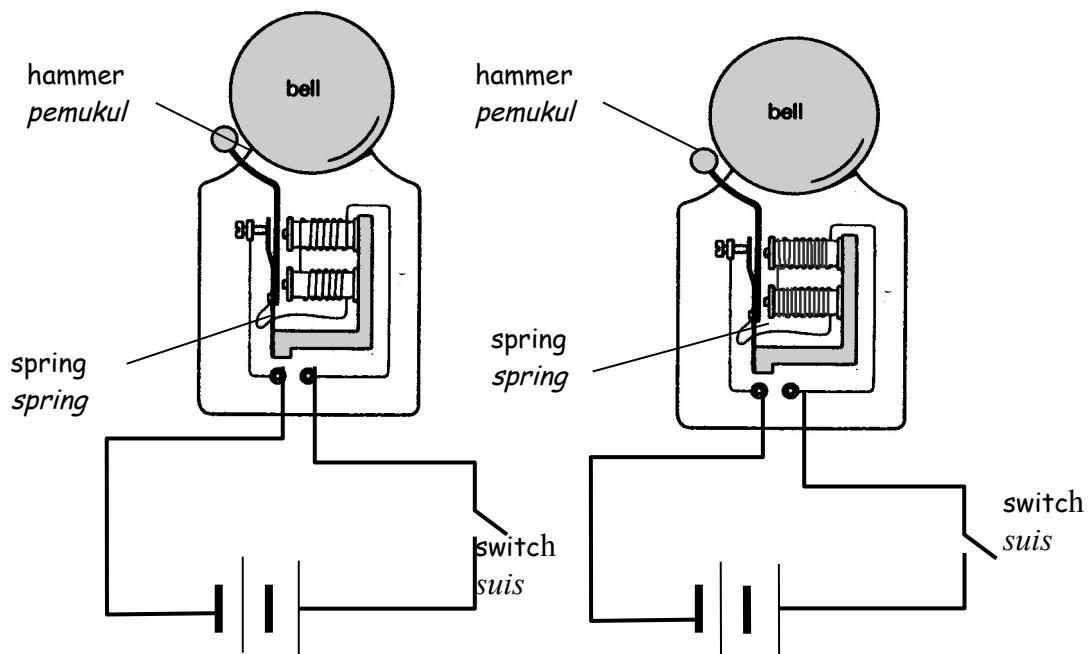


Figure 4.1
Rajah 4.1

Figure 4.2
Rajah 4.2

When the switches of the two bells are on, the bell in figure 4.2 rings louder than the bell in figure 4.1 .

Apabila suis kedua-dua loceng dihidupkan , loceng dalam Rajah 4.2 berbunyi lebih kuat daripada Rajah 4.1

Based on your observation on the loudness of the bell ring ;

Berdasarkan pemerhatian ke atas kenyaringan bunyi loceng;

- (a) State one suitable inference,

Nyatakan satu inferens yang sesuai

[1 mark]

- (b) State one appropriate hypothesis that could be investigated,

Nyatakan satu hipotesis yang boleh disiasat

[1 mark]

- (c) With the use of apparatus such as an insulated wire , a rheostat, an ammeter and other apparatus, describe an experiment to investigate the hypothesis stated in 3(b)

Dengan menggunakan radas seperti wayar bertebat, reostat , ammeter, dan radas lain sesuai, terangkan satu eksperimen untuk menyiasat hipotesis yang dinyatakan di 3(b).

In your description, state clearly the following :

Dalam penerangan anda, jelaskan perkara berikut;

- (i) The aim of an experiment

Tujuan eksperimen

- (ii) The variables in experiment

Pembolehubah dalam eksperimen

- (iii) The list of apparatus and materials

Senarai radas dan bahan

- (iv) The arrangement of the apparatus

Susunan radas

- (v) The procedure used in the experiment.

Describe how to control and measure the manipulated variables and how to measure the responding variables.

Prosedur yang digunakan dalam eksperimen.

Terangkan bagaimana mengawal dan mengukur pembolehubah dimanipulasikan dan bagaimana mengukur pembolehubah bergerakbalas.

- (vi) The way to tabulate the data

Kaedah untuk menjadual data

- (vii) The way to analyse the data

Kaedahuntuk menganalisa data

[10 marks]

**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** 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 ini.
3. Answer **one** question from **Section B** .Write your answers for Section B and Section C on the “
helaian tambahan” provided by the invigilators.You may use equation,diagrams,tables,graphs
and other suitable methods to explain your answers.
Jawab satu soalan daripada Bahagian B. Tulis jawapan bagi Bahagian B pada helaian tambahan yang dibekalkan oleh pegawas peperiksaan.Anda boleh menggunakan persamaan,rajah,jadual,graf dan cara lain yang sesuai untuk menjelaskan jawapan anda
4. Show your working, it may help you to get marks.
Tunjukkan kerja mengira, ini membantu anda mendapatkan markah.
5. If you wish to change your answer, neatly cross out the answer that you have done. Then write down the new answer.
Sekiranya anda hendak menukar sesuatu jawapan, batalkan dengan kemas jawapan yang telah dibuat, Kemudian tulis jawapan yang baru.
6. The diagrams in the questions provided are not drawn to scale unless stated.
Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
7. The marks allocated for each question or part question are shown in brackets.
Markah yang diperuntukkan bagi setiap soalan atau ceraian soalan ditunjukkan dalam kurungan.
8. The time suggested to answer **Section A** is 60 minutes and **Section B** is 30 minutes.
Masa yang dicadangkan untuk menjawab Bahagian A ialah 60 minit dan Bahagian B ialah 30 minit..
9. You may use a non-programmable scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh deprogram.

10. Detach **Section B** from this question paper. Tie the ‘helaian tambahan’ together with this question paper and hand in all your answer sheets at the end of the examination.
Ceraikan Bahagian B daripada kertas soalan ini. Ikat helaian tambahan bersama-sama kertas soalan ini dan serahkan semua kertas jawapan anda di akhir peperiksaan.

PEPERIKSAAN PERCUBAAN SPM KELANTAN 2009

PHYSICS

PAPER 1

ANSWER

1 .	D	11	D	21	C	31	D	41	B
2 .	C	12	B	22	A	32	C	42	B
3 .	D	13	D	23	B	33	B	43	D
4 .	D	14	B	24	C	34	D	44	C
5 .	C	15	D	25	D	35	D	45	B
6 .	D	16	B	26	C	36	A	46	C
7 .	B	17	D	27	A	37	D	47	A
8 .	C	18	C	28	C	38	C	48	C
9 .	B	19	C	29	C	39	A	49	C
1 0 .	C	20	B	30	A	40	A	50	D

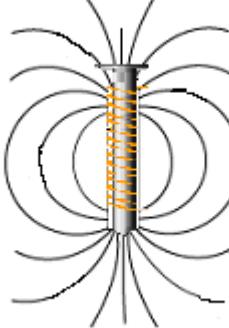
PAPER 2

TRIAL KELANTAN 2009

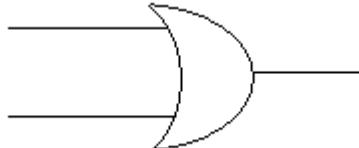
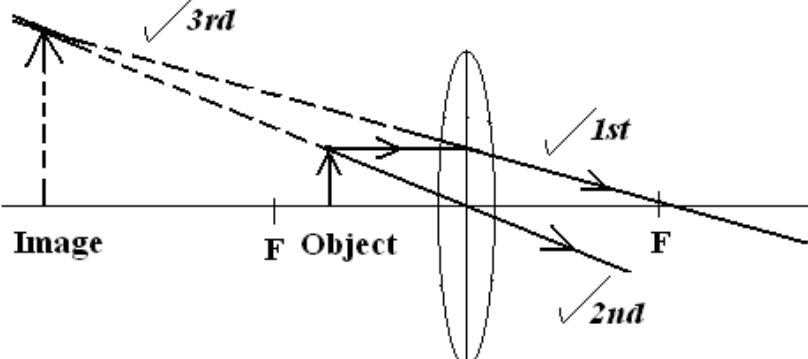
FIZIK PAPER 2

PERATURAN PEMARKAHAN

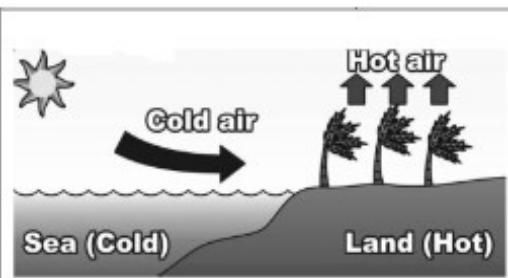
NO	MARKING CRITERIA	MARK	
		SUB	TOTAL
	QUESTION 1		
1. (a)	mass	1	
(b)	Zero error	1	
(c)	6 g	1	
(d)	24 g	1	4
	QUESTION 2		
2. (a)	A temporary magnet when there is a flow of electric current	1	

(b) (i)		1	
(ii)	South / S	1	
(iii)	Attracted to iron nail (electromagnet)	1	
(c)	Magnetic lifting machine / circuit breaker / electric bell / electric relay / ticker timer / magnetic levitated train / electronic card /parking machine /tape recorder.	1	5
QUESTION 3			
3. (a)	Net heat flow is zero / temperature is equal	1	
(b)	The initial temperature of cloth is lower than the body temperature Heat energy is transferred until temperature is equal / no heat loss	2	
(c)	Heat energy, $Q = m c \theta$ $= 0.3 (4200) (38 - 30)$ $= 10080 \text{ J (with unit)}$	2	
(d)	Decrease	1	6
QUESTION 4			
4. (a)	X : Ammeter Y: Voltmeter	1	
(b) (i)	Directly proportional	1	
(ii)	Ohm's Law	1	
(c) (i)	Resistance	1	
(ii)	Constantan s.w.g 36	1	
(iii)	Higher gradient	1	7
QUESTION 5			
5 (a)	Perpendicular force acting on a unit area/ $P(\text{Pressure}) = \text{Force, } F / \text{Area, } A$	1	
(b) (i)	Balloon B /diagram 5.2 is bigger	1	
(ii)	Pressure of needle is higher/greater than finger/vice versa	1	
(iii)	The surface area of needle is smaller than finger/ vice versa	1	
(iv)	As the pressure increases, the surface area decreases/ pressure is inversely proportional to surface area.	1	
(v)	Pressure increase	1	
(c)	Pressure depends on force and surface Area // pressure	1	
(d)	The handle of the bag has large area to reduce the pressure on the hand/the edge of knife's blade is small/the studs of football is small/skis have large area/ suitable item	1	8
QUESTION 6			

6. (a)	Coherence sources have same frequency, same amplitude and in phase./same phase different	1																
(b) (i)	Superposition / 2 sources / constructive region / destructive region	1																
(ii)	(Diagram 6.1) – Light waves : transverse / electromagnetic waves (Diagram 6.2) – Sound waves: longitudinal / mechanical waves	1																
(iii)	When crests or troughs of both waves coincide, Maximum amplitude of waves produces / constructive interference occur	1 1	8															
(iv)	Interference	1																
	$x = \frac{12}{6} \text{ mm} = 2 \text{ mm}$ $\lambda = \frac{ax}{D}$ $\lambda = \frac{(0.25 \times 10^{-3})(2 \times 10^{-3})}{3}$ $= 1.67 \times 10^{-7} \text{ m}$	1 1	8															
QUESTION 7																		
7(a) (i)	Length increases/ longer	1																
(ii)	Elastic potential energy	1																
(iii)	Increase	1																
(b)	Extension (21-15) cm = 6 cm 300g ----- 6 cm 100g ----- 2 cm 500g ----- 2 x 5 = 10 cm Length of spring = 15 + 10 = <u>25 cm</u>	3																
(c) (i)	Parallel	1																
(ii)	Load is shared equally among the spring / can support higher load	1																
(iii)	Stiffer/harder	1																
(iv)	Spring constant is higher/greater/bigger /. Not easily broken / able to support higher weight	1	10															
QUESTION 8																		
8.(a) (i)	As an automatic switch to switch on the second circuit	1																
(ii)	<ul style="list-style-type: none"> • Relay coil will be an electromagnet • attracts soft iron armature • second circuit will be operated (2 max)	1 1																
(b) (i)	LDR	1																
(ii)	The resistance of LDR is low when there is light // vice versa	1																
(iii)	At night, resistance Q is higher V_Q higher > V_{be} of battery I_b increase, I_c increase Relay is switch on	3																
(c) (i)		2																
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0	0	0																
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(ii)	OR Gate	1												
(iii)		1	12											
QUESTION 9														
9. (a)	Distance between optical centre and focal point	1												
(b)	Lens in Diagram 9.1 is thinner Focal length in Diagram 9.1 is longer Power of lens in Diagram 9.1 is lower The thinner the lens the longer the focal length The thinner the lens the higher the power of lens	1 1 1 1 1												
(c) (i)	At $u < f$	1												
(ii)		3												
(d)		10	20											
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	QUESTION 10														
10. (a)	The effect of producing emf /current, when there is a relative motion/cutting between conductor and magnetic field	1													
(b) (i)	North pole	1													
(ii)	The more the bar magnets, the greater/larger the deflection of the galvanometer	2													
(c) (i)	The more the bar magnets, the stronger the magnetic field strength. -	1													
(ii)	The stronger the magnetic field strength, the greater/larger the deflection of the galvanometer	1													
(d) (i)	Step down transformer	1													
(ii)	1. When an alternating current flows through the primary coil, a changing magnetic field will be produced. 2. The changing magnetic field will ‘cut’ through the secondary coil, An alternating emf /current of the same frequency to be induced in the coil.	2													
(e)	<table border="1"> <thead> <tr> <th>Modifications</th> <th>Explanations</th> </tr> </thead> <tbody> <tr> <td>Use strong magnet.</td> <td>Strong magnet produced strong magnetic field, when a conductor cutting through a strong magnetic field, high emf/current will be induced.</td> </tr> <tr> <td>Concave poles of magnet.</td> <td>Concave poles provide a radial field which ensures the cutting of the magnetic field is always maximum.</td> </tr> <tr> <td>Coil with more turns.</td> <td>More turns mean more conductor cutting through magnetic field, therefore more emf/current is induced.</td> </tr> <tr> <td>Larger area of coils.</td> <td>The larger the area of the coil, the more the magnetic field will be cut through, therefore more emf/current is induced.</td> </tr> <tr> <td>Wires are wound on a soft iron core which is called armature.</td> <td>The armature becomes magnetized and increases the strength of the magnetic field</td> </tr> </tbody> </table>	Modifications	Explanations	Use strong magnet.	Strong magnet produced strong magnetic field, when a conductor cutting through a strong magnetic field, high emf/current will be induced.	Concave poles of magnet.	Concave poles provide a radial field which ensures the cutting of the magnetic field is always maximum.	Coil with more turns.	More turns mean more conductor cutting through magnetic field, therefore more emf/current is induced.	Larger area of coils.	The larger the area of the coil, the more the magnetic field will be cut through, therefore more emf/current is induced.	Wires are wound on a soft iron core which is called armature.	The armature becomes magnetized and increases the strength of the magnetic field	10	20
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	QUESTION 11														
11. (a)	The amount of heat energy required to increase the temperature of 1 kg mass by 1°C	1													
(b) (i)	Land has a smaller specific heat capacity than sea // Land faster increase in temperature // Land is warmer than the sea Air above the land is heated up and rises Cooler air from the sea moves towards the land Or DIAGRAM	3													



Label Sea(cold), Land (Hot)
 Shows Hot air on land rises up
 Shows Cold air moves towards the sea

(ii)	Sea Breeze	1													
(c) (i)	$Q = Pt$ $= 48 \times 5 \times 60 // 14\,400 \text{ J}$ $Q = mc\theta$ $14\,400 = 500 \times 10^{-3} (c)(80 - 40)$ $c = 720 \text{ Jkg}^{-1}\text{C}^{-1} \text{ (with unit)}$	3													
(ii)	Heat supplied by liquid = Heat received by water $(500 \times 10^{-3})(4200)(80 - \theta) = (1)(4200)(\theta - 25)$ $\theta = 29.34^\circ\text{C} \text{ (with unit)}$	2													
(d)	<table border="1"> <thead> <tr> <th>Characteristics</th> <th>Explanation</th> </tr> </thead> <tbody> <tr> <td>Plate X - asbestos</td> <td>a good heat insulator</td> </tr> <tr> <td>Liquid Y – oil</td> <td>good heat contact between thermometer and the Aluminium block // to ensure thermal equilibrium between thermometer and aluminium block</td> </tr> <tr> <td>Material Z – tissue</td> <td>reduce / prevent heat lost to the surrounding</td> </tr> <tr> <td>Immersion heater has high power</td> <td>can increase the temperature faster // fast to heat // supply more heat energy</td> </tr> <tr> <td>S</td> <td></td> </tr> </tbody> </table>	Characteristics	Explanation	Plate X - asbestos	a good heat insulator	Liquid Y – oil	good heat contact between thermometer and the Aluminium block // to ensure thermal equilibrium between thermometer and aluminium block	Material Z – tissue	reduce / prevent heat lost to the surrounding	Immersion heater has high power	can increase the temperature faster // fast to heat // supply more heat energy	S			
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QUESTION 12															
12. (a)	The atoms of an element that contain the same number of protons but differing number of neutrons are called isotopes. The atom number is the same but the nucleon number is different.	1													
(b) (i) & (ii)	Isotope in the solid form is most suitable to be used as it is easily	10													

	<p>handled and does not make a mess.</p> <p>Beta principles that have medium penetration power are suitable to use as they are able to penetrate paper and less dangerous as compared to gamma rays.</p> <p>The half-life of the isotope must be long enough to ensure that the isotope can be used for a longer period of time.</p> <p>Strontium-90 is the most suitable isotope as it is a solid, it emits beta principles, has a half life of 28 years and has medium penetration power.</p>		
(c)	Radioactive materials and the radioactive ray detector are arranged as shown in the diagram. High readings from the diagrams indicate a thin paper where a low reading indicates a thick paper.	3	
(d)	<p style="text-align: center;">Activity</p>	3	
(e)	$ \begin{array}{ccccccc} 100\% & \rightarrow & 50\% & \rightarrow & 25\% & \rightarrow & 12.5\% \\ 5 \text{ years} & & 5 \text{ years} & & 5 \text{ years} & & \\ \text{Time} = 3(5 \text{ years}) & & & & & & \end{array} $	3	

= 15 years