NAMA : …………………………………… TING : ……………

ANGKA GILIRAN : …………………………………

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

SIJIL PELAJARAN MALAYSIA   4531/1

PEPERIKSAAN PERCUBAAN 2010

PHYSICS
Kertas 1
Sept/Oct
1 ¼ jam   **Satu jam lima belas minit**

 JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Kertas soalan ini adalah dalam dwibahasa.

2. Soalan dalam bahasa inggeris mendahului
soalan 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

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

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

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

2. $v^2 = u^2 + 2as$

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 $= \frac{1}{2} Fx$
   Tenaga keupayaan kenyal

9. $\rho = \dfrac{m}{v}$

10. Pressure, $P = h\rho g$
    Tekanan

11. Pressure, $P = \dfrac{F}{A}$
    Tekanan

12. Quantity of heat, $Q = mc\theta$
    Kuantiti haba

13. $\dfrac{PV}{T} = $ constant *(pemalar)*

14. $E = mc^2$

15. $v = f\lambda$

16. $V = IR$

17. Power, $P = \dfrac{energy}{time}$

    Kuasa, $P = \dfrac{tenaga}{masa}$

18. Power, $P = IV$
    Kuasa

19. $\dfrac{N_s}{N_p} = \dfrac{V_s}{V_p}$

20. Efficiency $= \dfrac{I_s V_s}{I_p V_p} \; x \; 100\,\%$

    Kecekapan

21. $g = 10 \text{ ms}^{-2}$

22. $\dfrac{1}{f} = \dfrac{1}{u} + \dfrac{1}{v}$

23. $n = \dfrac{\sin i}{\sin r}$

24. $n = \dfrac{real\ depth}{apparent\ depth}$

    $n = \dfrac{dalam\ nyata}{dalam\ ketara}$

25. $\lambda = \dfrac{ax}{D}$

26. $Q = It$

27. $E = I(R + r)$

28. $eV = \frac{1}{2} mv^2$

Answer all questions. Each question is followed by either three or four options.
Choose the best option for each question then blacken the correct space on the answer sheet.

Jawab semua soalan. Tiap – tiap soalan diikuti oleh sama ada tiga atau, empat pilihan jawapan.
Pilih satu jawapan yang terbaik bagi setiap soalan dan hitamkan ruangan yang sepadan pada kertas
*jawapan objektif anda.*

1. Which of the following base quantities has a correct SI unit?

    Antara kuantiti-kuantiti asas berikut, yang manakah mempunyai unit SI yang betul?

	Base Quantity *Kuantiti asas*	SI Unit *Unit SI*
A	Mass *Jisim*	g
B	Time *Masa*	h *j*
C	Electric Current *Arus Elektrik*	mA
D	Temperature *Suhu*	K

2. In a shooting competition, Ali has won the competition because his shots were very **accurate and consistent**. Which of the following target boards shows the shots made by Ali?

    *Dalam sebuah pertandingan menembak, Ali telah memenangi pertandingan tersebut kerana tembakannya yang sangat **jitu dan persis**. Antara papan-papan sasaran berikut, yang manakah menunjukkan tembakan yang telah dilakukan oleh Ali ?*

    A

    B

C

D
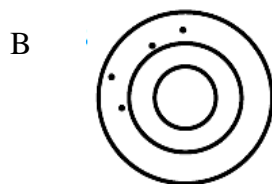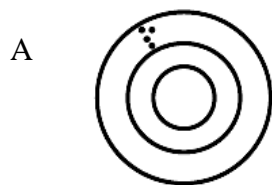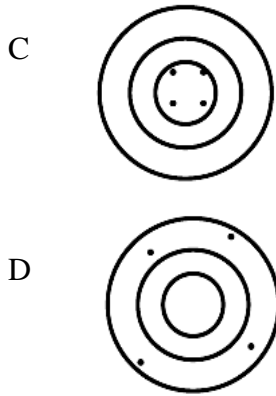
3. Diagram 1 shows the reading of a micrometer screw gauge.

    Rajah 1 menunjukkan bacaan satu tolok skru mikrometer.
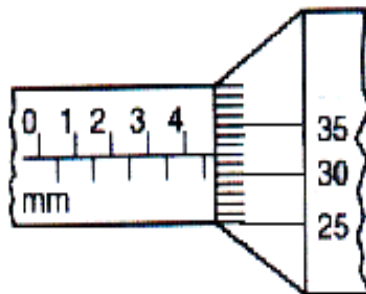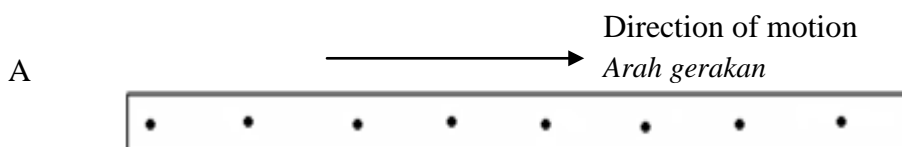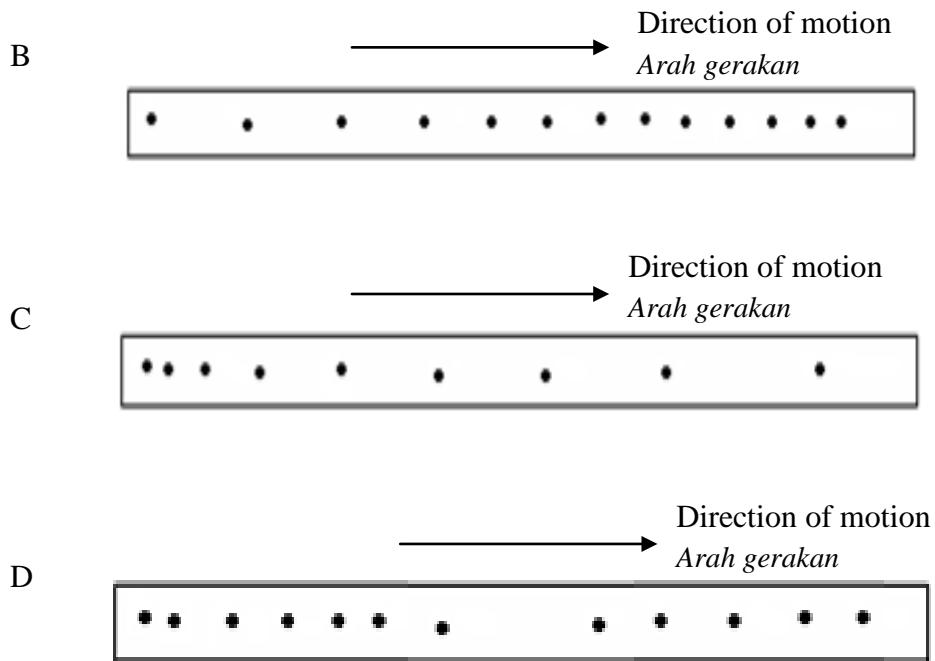

Diagram 1
Rajah 1

What is the reading of the micrometer screw gauge?

Berapakah bacaan tolok skru micrometer itu ?

A   4.38 mm

B   4.32 mm

C   4.78 mm

D   4.82 mm

4. Which of the following ticker tapes describes a motion with a deceleration?

    Antara pita-pita detik berikut, yang manakah menerangkan pergerakkan dengan nyahpecutan?

    Direction of motion
    Arah gerakan

A

B

Direction of motion
Arah gerakan

C

Direction of motion
Arah gerakan

D

Direction of motion
Arah gerakan

5. Diagram 2 shows two objects of different masses, P and Q is experiencing a state of free fall.

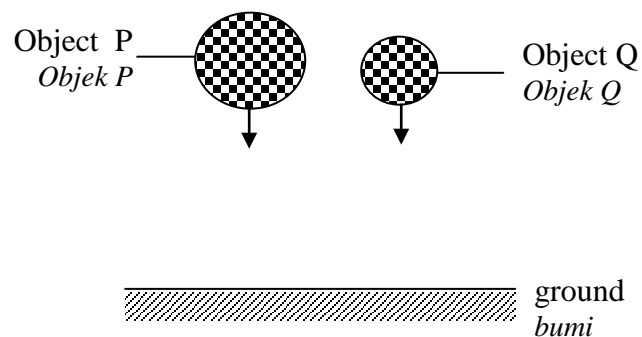*Rajah 2 menunjukkan dua objek yang berlainan jisim, P dan Q sedang mengalami keadaan jatuh bebas.*

Object P
Objek P

Object Q
Objek Q

ground
bumi

Diagram 2
Rajah 2

Which of the following statements is true?

Yang manakah antara pernyataan-pernyataan berikut adalah betul ?

A. Gravitational attraction force of P = Gravitational attraction force of Q

Daya tarikan graviti P = Daya tarikan graviti Q

B. Momentum of P = Momentum of Q

Momentum P = Momentum Q

C.   Acceleration of P = Acceleration of Q

Pecutan P = Pecutan Q

D.   Velocity of P = Velocity of Q

Halaju P = Halaju Q

6.   Diagram 3 shows the velocity-time graph of the motion of an object.

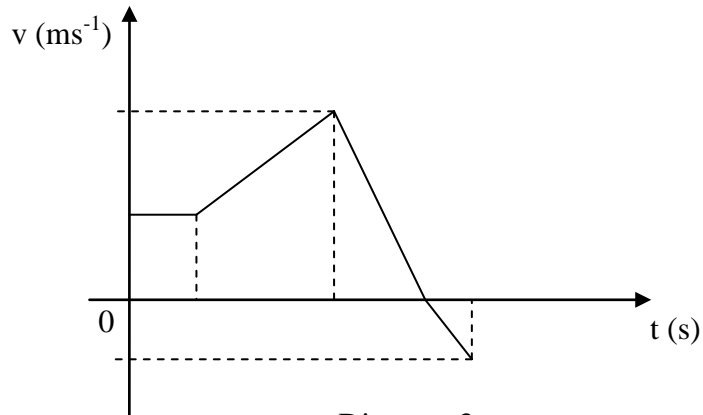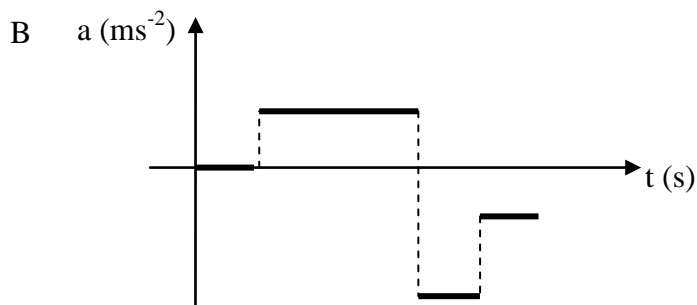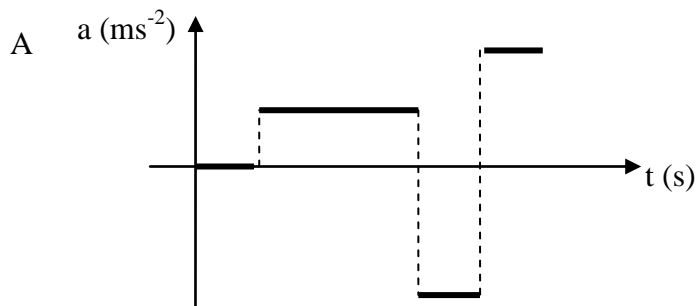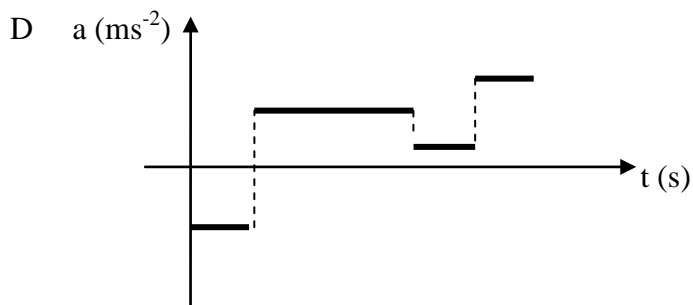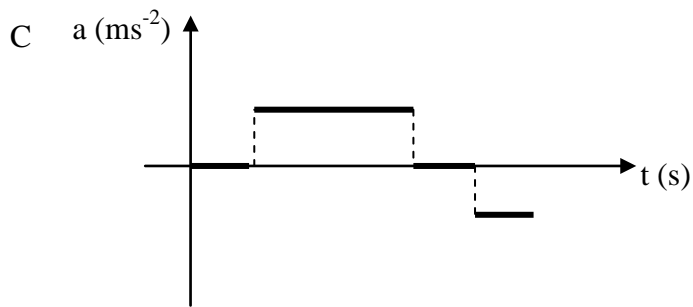*Rajah 3 menunjukkan graf halaju-masa bagi gerakan suatu objek.*

Diagram 3
Rajah 3

Which of the following acceleration-time graphs describes the motion of the object?

Yang manakah antara graf pecutan-masa berikut menerangkan gerakan objek itu?

A

B

C a (ms⁻²)

D a (ms⁻²)

7. Diagram 4 shows two identical trolleys, P and Q with masses of 1 kg on a frictionless plane. Trolley P is moving with a velocity of 10 ms^{-1} and trolley Q is moving with a velocity of 5 ms^{-1} in an opposite direction.

Rajah 4 menunjukkan dua troli yang serupa, P dan Q dengan jisim 1 kg, di atas suatu satah tanpa geseran. Troli P sedang bergerak dengan halaju 5 ms^{-1} dan troli Q sedang bergerak dengan halaju 10 ms^{-1} dalam arah yang berlawanan.

Trolley P
Troli P

v = 5 ms^{-1}

v = 10 ms^{-1}

Trolley Q
Troli Q

Frictionless plane
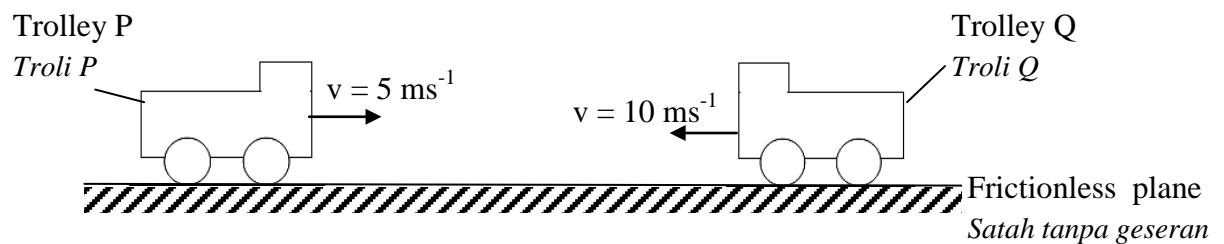*Satah tanpa geseran*

Diagram 4
Rajah 4

Trolley P and trolley Q collide with each other and then move together with a common velocity, v. What is the magnitude of v?

Troli P dan troli Q berlanggar dengan satu sama lain dan bergerak bersama-sama dengan halaju sepunya, v. Berapakah magnitud v?

A   2.5 ms^{-1}

B   5.0 ms^{-1}

C   7.5 ms^{-1}

D   15.0 ms^{-1}

8.   Diagram 5 shows a system consists of three identical springs. The original length of each spring is 10 cm. With a load of 50 g, each spring is stretched to 14 cm.

Rajah 5 menunjukkan satu sistem yang terdiri daripada tiga spring yang serupa. Panjang asal bagi setiap spring adalah 10 cm. Dengan beban 50 g, setiap spring itu akan meregang kepada 14 cm.
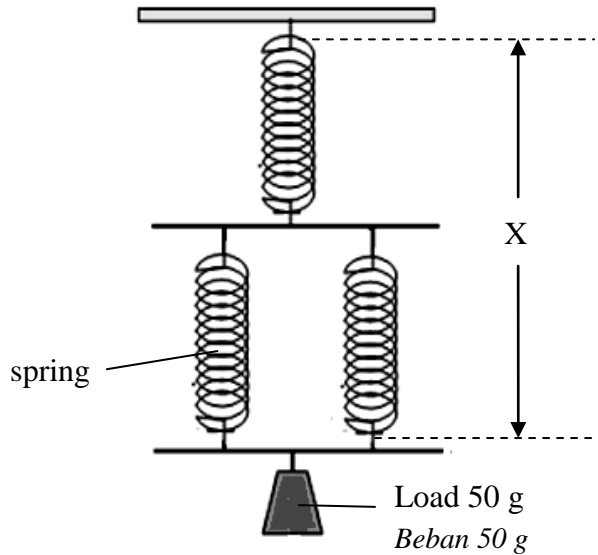

spring

Load 50 g
Beban 50 g

Diagram 5
Rajah 5

What is the total length, X of the springs in Diagram 5?

Berapakah jumlah panjang X bagi spring-spring dalam Rajah 5?

A   21 cm
B   24 cm
C   26 cm
D   28 cm

9.   Diagram 6 shows a weightlifter is lifting a load of 60 kg to a height, h. If the energy used to lift the load is 1020 J, what is h?

Rajah 6 menunjukkan seorang ahli angkat berat sedang mengangkat beban 60 kg pada suatu ketinggian h. Jika tenaga yang digunakan untuk mengangkat beban itu adalah 1020 J, berapakah h?

Diagram 6
Rajah 6
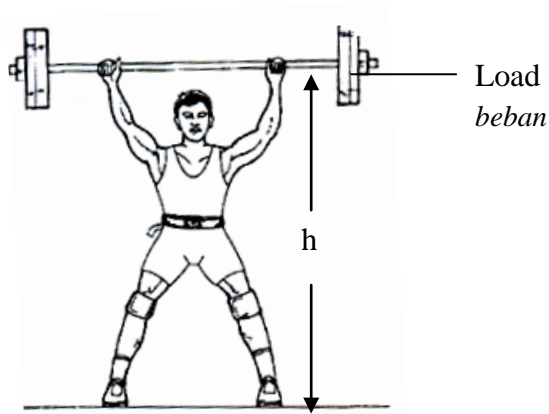
A   1.7 m

B   1.8 m

C   2.0 m

D   2.3 m

10.   Diagram 7 shows a method to determine the resultant force of the two forces, P and Q.

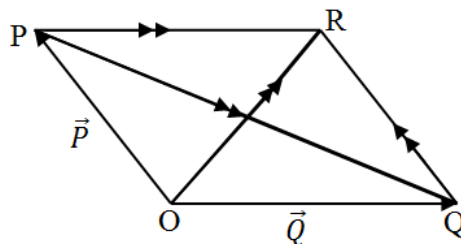*Rajah 7 menunjukkan kaedah untuk menentukan paduan daya bagi dua daya, P dan Q.*

Diagram 7
Rajah 7

Which of the followings represents the magnitude of the resultant force?

Yang manakah antara yang berikut mewakili magnitud daya paduan tersebut?

A   PR

B   RQ

C   PQ

D   OR

11.   Diagram 8 shows two identical bricks X and Y placed in two different ways on a sandy ground were pressed by an identical force, F.

Rajah 8 menunjukkan dua bongkah bata X dan Y yang serupa diletakkan dalam dua keadaan berbeza di atas tanah berpasir sedang ditekan dengan daya yang serupa, F.

Force, F
Daya, F

Force, F
Daya, F

Block X
Blok X
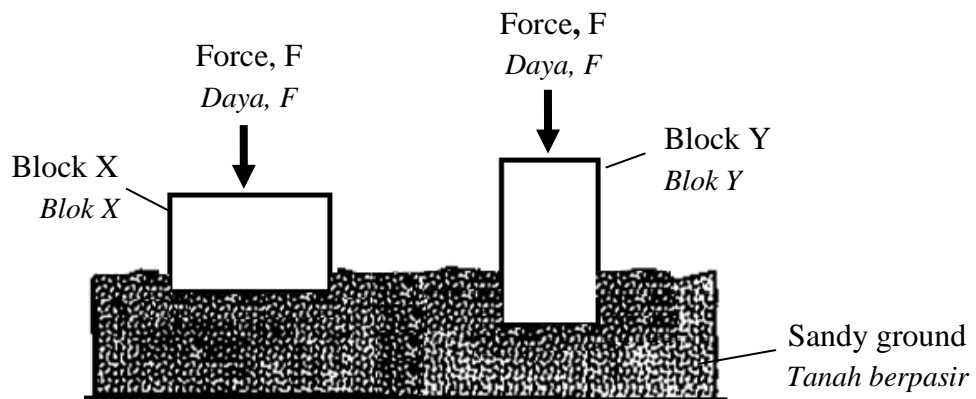
Block Y
Blok Y

Sandy ground
Tanah berpasir

Diagram 8
Rajah 8

What is the factor that causes brick Y to sink more into the sand?

Apakah faktor yang menyebabkan bata Y lebih tenggelam ke dalam pasir?

A   Force, F
        Daya, F

B   Weight of the block
        Berat blok

C   Pressure, P
        Tekanan,P

D   Density of the block
        Ketumpatan blok

12. Diagram 9 shows a hydraulic system which is in equilibrium. When the piston A is pushed in, the piston B will be lifted up

Rajah 9 menunjukkan satu sistem hidraulik dalam keseimbangan. Apabila omboh kecil ditekan ke dalam, omboh besar akan terangkat ke atas
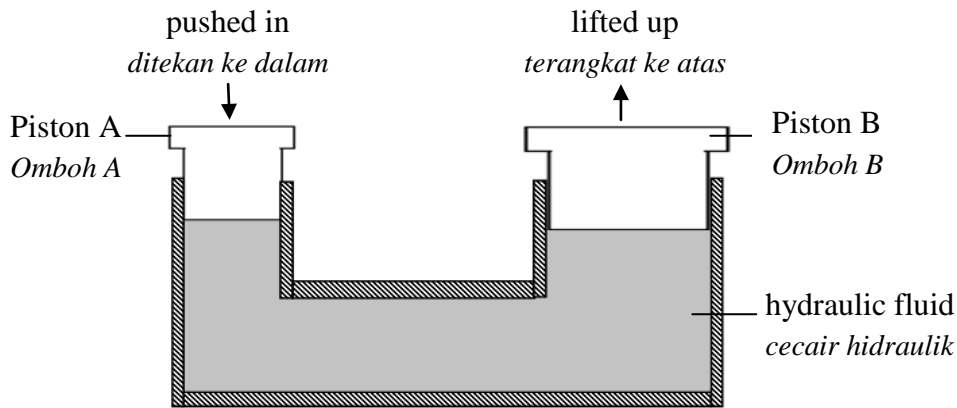
Diagram 9
Rajah 9

Which of the following statements is true?

Yang manakah antara kenyataan-kenyataan berikut adalah benar?

A   The pressure on the piston A is smaller than the pressure on the piston B.

Tekanan pada omboh A lebih kecil daripada tekanan pada omboh B.

B   The pressure on the piston A is bigger than the pressure on the piston B.
Tekanan pada omboh A lebih besar daripada tekanan pada omboh B.

C   The pressure on the piston A is equal to the pressure on the piston B.

Tekanan pada omboh A sama dengan tekanan pada omboh B.

13. Diagram 10 shows the arrangement of an apparatus for an experiment.

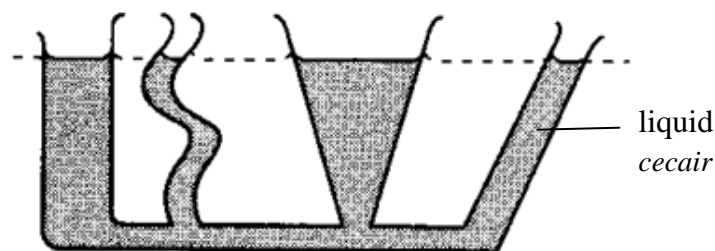*Rajah 10 menunjukkan susunan radas bagi satu eksperimen.*

Diagram 10
Rajah 10

Which of the following conclusions is correct ?

Yang manakah antara kesimpulan-kesimpulan berikut adalah betul ?

A   Liquid pressure acts perpendicularly to its surface.

Tekanan cecair bertindak tegak pada permukaannya.

B   Liquid pressure increases with depth.

Tekanan cecair bertambah dengan kedalaman.

C   Liquid pressure does not depend on the shape of the container.

Tekanan cecair tidak bergantung pada bentuk bekas isiannya.

D   Liquid pressure is caused by its weight acting on a surface.

Tekanan cecair disebabkan oleh beratnya yang bertindak ke atas permukaan.

14.   Diagram 11 shows a simple mercury barometer. Which of the height **A, B, C** or **D** shows the measurement of the atmospheric pressure?

Rajah 11 menunjukkan satu barometer merkuri ringkas. Yang manakah antara ketinggian A, B, C atau D yang menunjukkan ukuran bagi tekanan atmosfera?
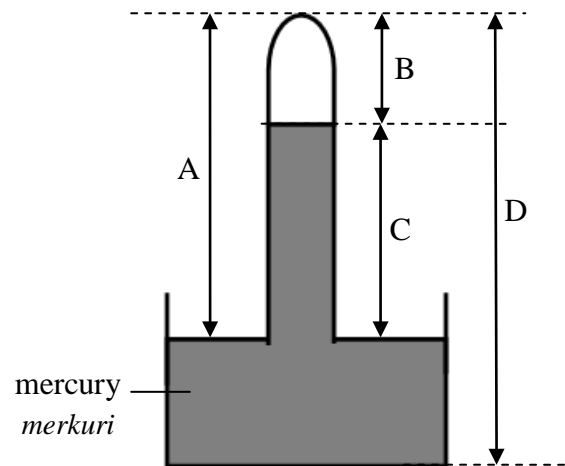
Diagram 11
Rajah 11

15.   Diagram 12 shows a suction pump is pressed on a smooth surface. P and Q are the pressure acted towards the outer surface and the inner surface of the suction pump respectively.

Rajah 12 menunjukkan satu pam penyedup yang sedang ditekan pada satu permukaan yang licin. P dan Q adalah tekanan yang bertindak di permukaan luar dan di permukaan dalam pam penyedup masing-masing.
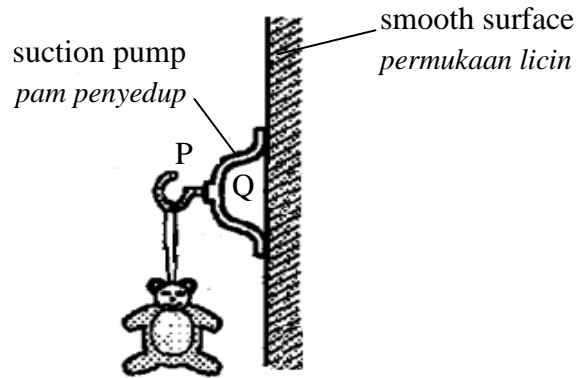
Diagram 12
Rajah 12

The pump is stuck to the smooth surface due to

Pam itu melekat ke permukaan licin disebabkan oleh

A   P < Q

B   P > Q

C   P = Q

D   Q = 0

16.   Diagram 13 shows a baseball which is thrown forward with a spinning, is moving in a curve.

Rajah 13 menunjukkan satu bola lisut yang dilontar ke hadapan dengan suatu putaran, sedang bergerak dalam satu lengkungan.
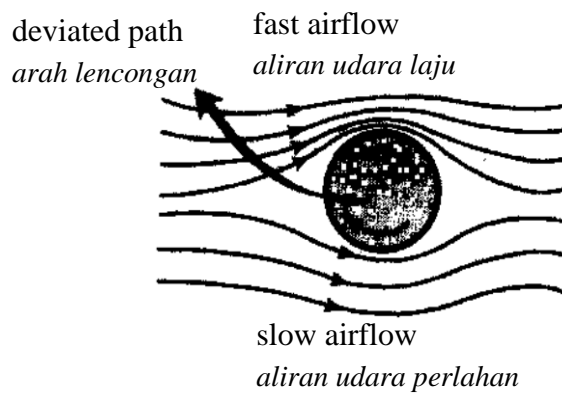
Diagram 13
Rajah 13

This situation can be explained by using

Keadaan ini boleh diterangkan dengan menggunakan

A   Archimedes' principle
       Prinsip Archimedes

B   Bernoulli's principle
       Prinsip Bernoulli

C   Pascal's principle
       Prinsip Pascal

17.   Which of the following pressure,P in liquid against depth,h, graphs is correct?
      Manakah antara graf tekanan di dalam cecai,r P melawan kedalaman, h, berikut adalah

      betul?

A

B

C

D
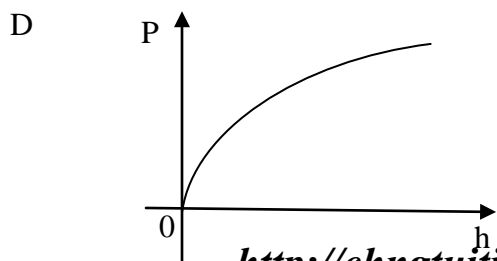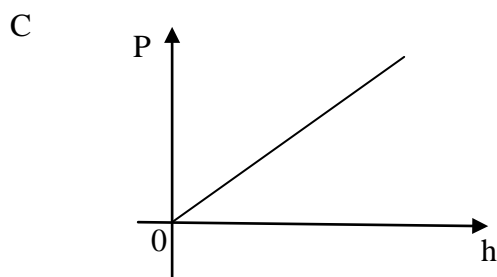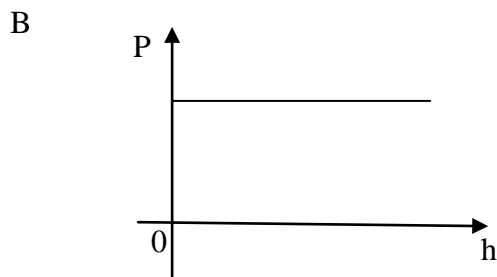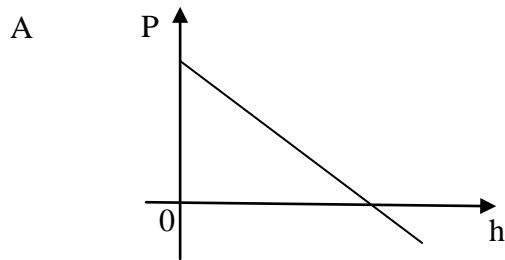
18. Diagram 14 shows a spring balance supporting a metal block is immersed slowly into a beaker, A which filled with water. The compression balance shows the reading of the weight, W of a beaker, B filled with water.

Rajah 14 menunjukkan sebuah neraca spring menyokong satu blok logam yang direndamkan secara beransur-ansur ke dalam satu bikar, A yang berisi air . Neraca mampatan menunjukkan bacaan berat, W bagi sebuah bikar, B yang berisi air.
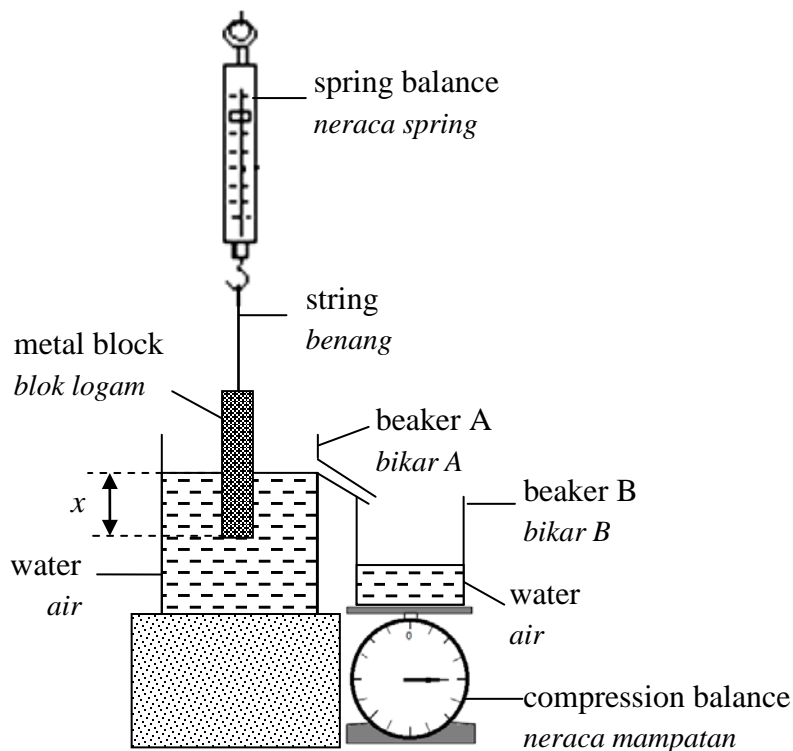
Diagram 14
Rajah 14

Which of the following W against x graphs is correct?

Yang manakah antara graf-graf W melawan x adalah betul?

A

B

C

D
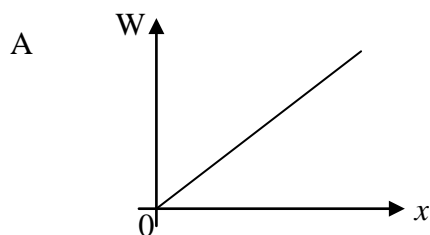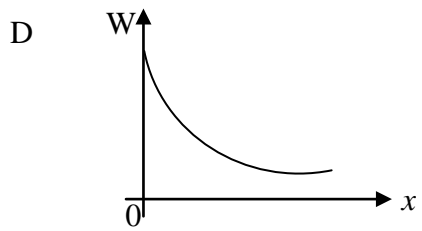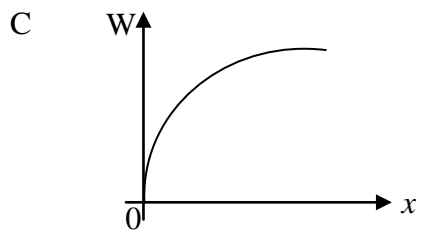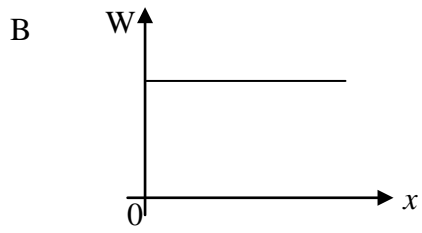
19. Diagram 15 shows the heating curve of water.

Rajah 15 menunjukkan lengkung pemanasan bagi air.
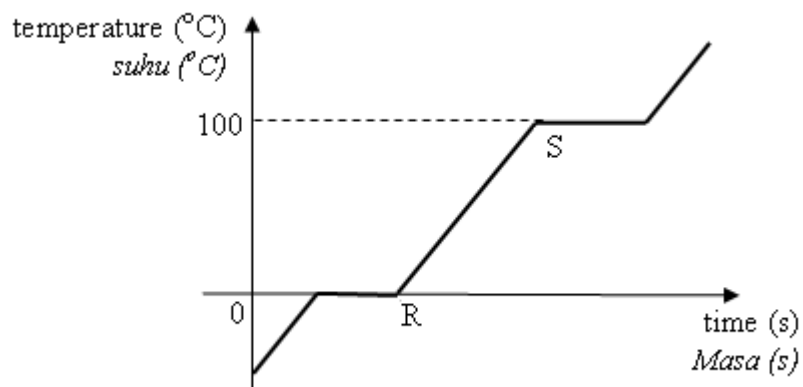
Diagram 15
Rajah 15

Which of the following statements is correct to explain the effect of the heat absorbed by the water between point R and S?

Yang manakah antara penyataan-pernyataan berikut adalah betul untuk menerangkan kesan haba yang diserap oleh air antara titik R dan S?

A   Weakens the forces between the water molecules

  Melemahkan daya-daya antara molekul-molekul air

B   Breaks the bonds between the water molecules

  Memutuskan ikatan-ikatan antara molekul-molekul air

C   Increases the kinetic energy of the water molecules

  Menambah tenaga kinetik molekul-molekul air

D   Strengthens the bonds between the water molecules

  Menguatkan ikatan-ikatan antara molekul-molekul air

20.   Diagram 16 shows two blocks M and N of equal masses and initial temperature are being heated with the same amount of heat energy.

  Rajah 16 menunjukkan dua blok M dan N yang sama jisim dan suhu awal sedang dipanaskan dengan jumlah tenaga haba yang sama.
.
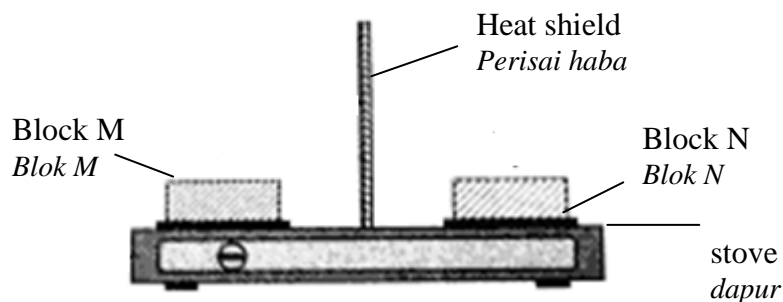
Diagram 16
Rajah 16

It is observed that M is hot faster than N. This observation is due to

Diperhatikan bahawa M lebih cepat panas berbanding dengan N. Pemerhatian ini adalah disebabkan oleh

A   density M < density N
    ketumpatan M < ketumpatan N

B   density M > density N
    ketumpatan M > ketumpatan N

C   specific heat capacity M < specific heat capacity N
    muatan haba tentu M < muatan haba tentu N

D   specific heat capacity M > specific heat capacity N
    muatan haba tentu M > muatan haba tentu N

21.   Table 1 shows the specific heat capacity for materials R, S and T.

      Jadual 1 menunjukkan muatan haba tentu bagi bahan-bahan R, S dan T.

Material	Specific heat capacity/$Jkg^{-1}°C^{-1}$
R	428
S	850
T	3500

Table 1
Jadual 1

Which of the following pairs is most suitable for making the base and the handle of the frying pan?

Yang manakah antara pasangan-pasangan berikut adalah paling sesuai untuk dijadikan dasar dan pemegang bagi kuali memanas?

	Base of the frying pan *Dasar kuali memanas*	Handle of the frying pan *Pemegang kuali memanas*
A	R	T
B	T	R
C	S	T
D	T	S

22. Diagram 17 shows a balloon filled with cool air is placed in a hot room.

Rajah 17 menunjukkan sebiji belon berisi dengan udara sejuk diletakkan dalam sebuah bilik yang panas.
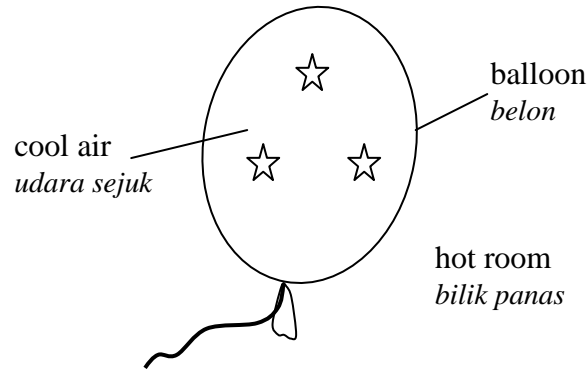
Diagram 17
Rajah 17

After a while, what happens to the balloon?

Selepas seketika, apakah yang berlaku kepada belon itu ?

A.   It rises to the ceiling

Ia naik ke siling

B.   It falls to the floor

Ia jatuh ke lantai

C.   It expands

Ia mengembang

D.   It contracts

Ia mengecut

23. Diagram 18 shows a metal cylinder of mass 5.0 kg and specific heat capacity 400 J kg^{-1} $^{\circ}$C^{-1} is heated with a heater of power 1 KW.

Rajah 18 menunjukkan satu silinder logam yang berjisim 5.0 kg dan muatan haba tentu 400 kg^{-1} $^{\circ}$C^{-1} dipanaskan dengan pemanas yang berkuasa 1 KW.
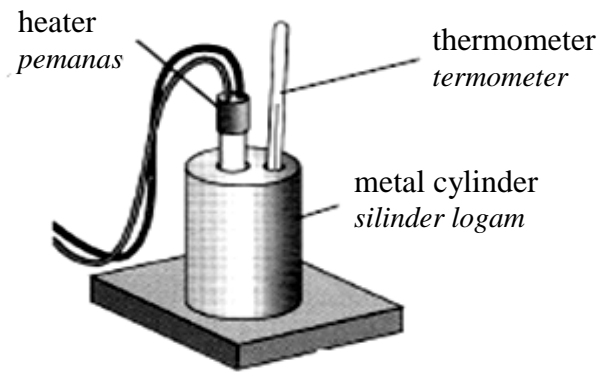
Diagram 18
Rajah 18

What is the rise in temperature of the cylinder if the heater is switched on for 10 seconds?

Berapakah kenaikan suhu silinder itu jika pemanas dihidupkan selama 10 saat ?

A   0.20 ^{o}C

B   0.80 ^{o}C

C   1.25 ^{o}C

D   5.00 ^{o}C

24.   Diagram 19 shows the path of light travelling from a glass block to air

      Rajah 19 menunjukkan satu lintasan cahaya yang merambat melalui satu blok kaca ke udara

.
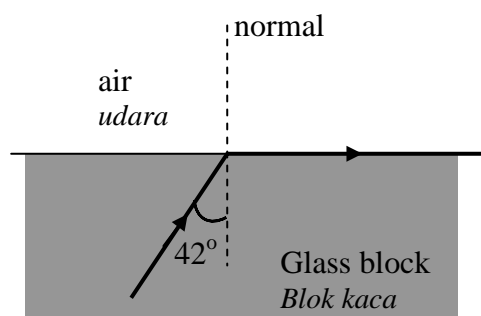
Diagram 19
Rajah 19

The refractive index of the glass block is

Indeks biasan bagi blok kaca ialah

A $\dfrac{1}{\sin 42}$

B $\dfrac{\sin 42}{\sin 90}$

C $\dfrac{1}{\sin 48}$

D $\dfrac{\sin 48}{\sin 90}$

25. Diagram 20 shows an object placed at a distance, x from a convex lens with a focal length, f.

Rajah 20 menunjukkan satu objek diletakkan pada jarak x dari kanta cembung dengan panjang fokus,f.
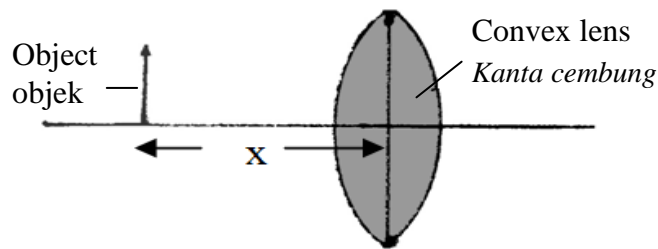
Diagram 20
Rajah 20

The image formed is **virtual** and **enlarged**. The object is at

*Imej yang terbentuk adalah **maya** dan **diperbesarkan**. Objek itu berada di*

A   x > 2f

B   x = 2f

C   x < f

D   f < x < 2f

26. Which of the following ray diagrams shows the correct reflection of light from a curved mirror?

Antara rajah-rajah sinar berikut, yang manakah yang menunjukkan pantulan cahaya yang betul daripada sebuah cermin melengkung?

A

B

C

D
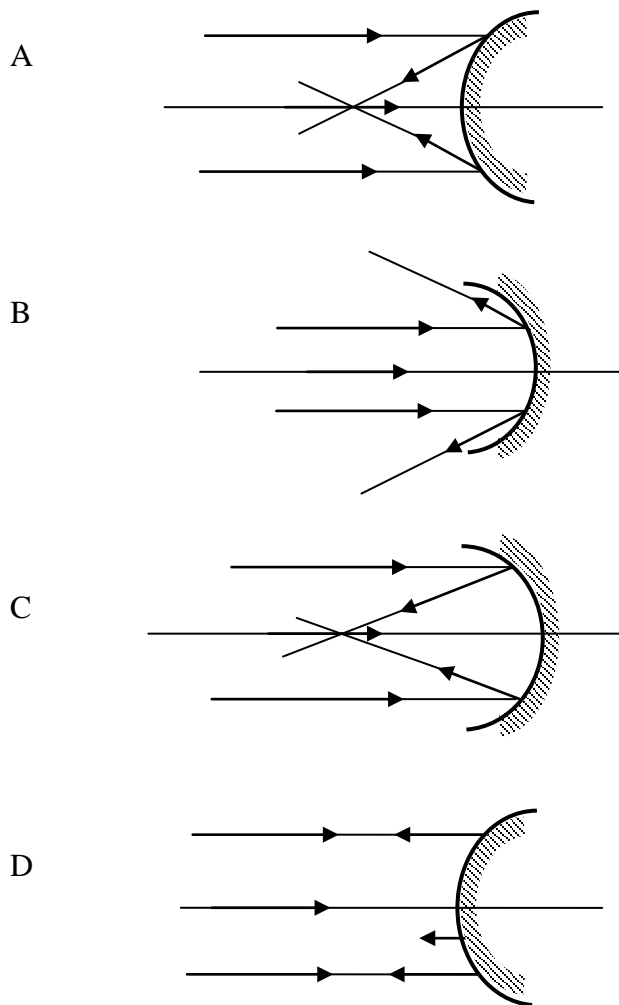
27. The focal length of the objective lens of an astronomical telescope is 100 cm. The magnification of the telescope is 20 times. What is the focal length of the eyepiece?

Panjang fokus bagi kanta objektif bagi satu teleskop astronomi ialah 100 cm. Pembesaran teleskop astronomi ialah 20 kali. Berapakah panjang fokus bagi kanta mata?

A   5 cm

B   20 cm

C   80 cm

D   120 cm

28. Diagram 21 shows a slinky spring being moved left and right continuously.

Rajah 21 menunjukkan sebuah spring slinki digerakkan secara berterusan ke kiri dan ke kanan.

hand
tangan

Direction of wave propagation
Arah perambatan gelombang

slinky spring
spring slinki

Direction of hand movement
Arah gerakan tangan
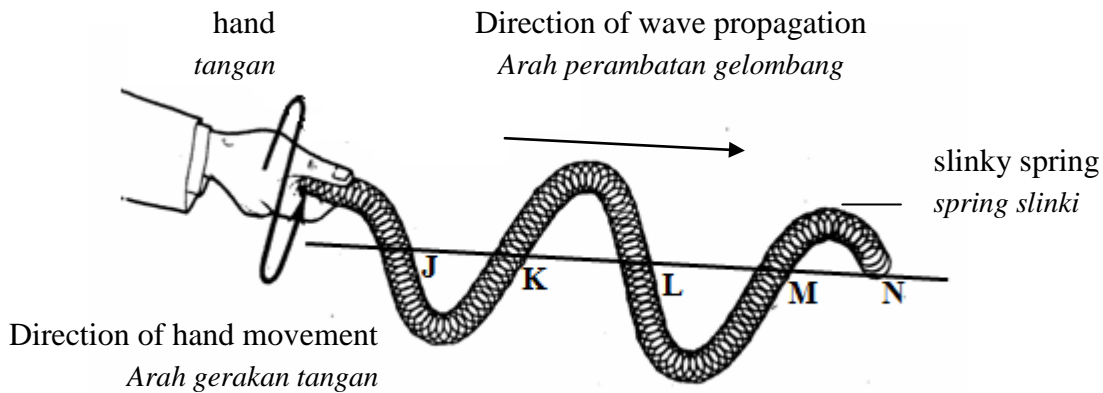
Diagram 21
Rajah 21

Wavelength is the distance between the points

Panjang gelombang ialah jarak antara titik-titik

A   JM

B   KM

C   KN

D   JK

29. Diagram 22 shows the bright and dark bands of the waves pattern formed on the screen in two different experiments to study the waves phenomenon .
Rajah 22 menunjukkan jalur cerah dan gelap bagi corak gelombang yang terbentuk pada tabir dalam dua eksperimen yang berlainan untuk mengkaji fenomena gelombang.

dark band
jalur gelap

bright band
jalur cerah

dark band
jalur gelap

bright band
jalur cerah

phenomenon P
fenomena P

phenomenon Q
fenomena Q
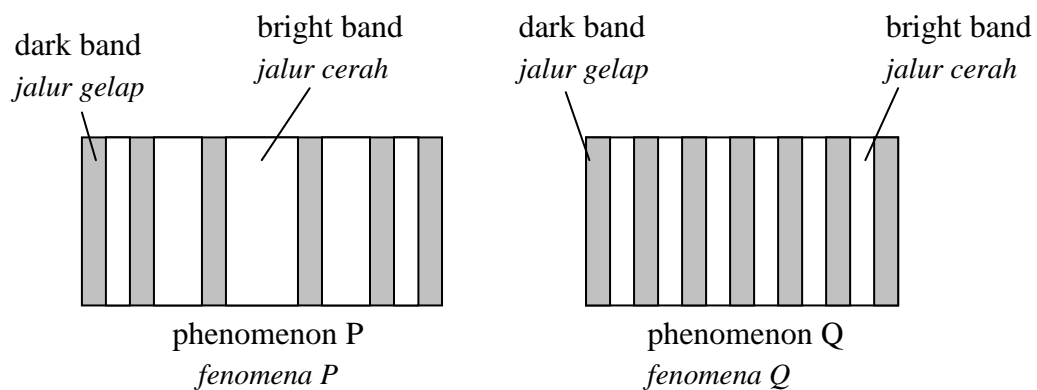
Diagram 22
Rajah 22

The wave's phenomenon P and Q are

Fenomena gelombang P dan Q adalah

	P	Q
A	Interference	Refraction
	Interferens	*Pembiasan*
B	Diffraction	Interference
	P*embelauan*	*Interferens*
C	Diffraction	Reflection
	pembelauan	*Pantulan*
D	Refraction	Interference
	Pembiasan	*Interferens*

30. Which of the following statements is correct about the loudness and the pitch of the sound when the amplitude and frequency of the sound waves are increased?

Yang manakah antara pernyataan-pernyataan berikut adalah betul mengenai kenyaringan dan kelansingan bunyi apabila amplitud dan frekuensi gelombang bunyi ditambah ?

	Loudness	Pitch
	Kenyaringan	*Kelansingan*
A.	decrease	increase
	berkurang	*bertambah*
B.	increase	decrease
	bertambah	*berkurang*
C.	increase	increase
	bertambah	*bertambah*
D	no change	decrease
	tidak berubah	*berkurang*

31. Diagram 23 shows water waves moving towards a harbour.

Rajah 23 menunjukkan ombak sedang menuju ke sebuah pelabuhan.
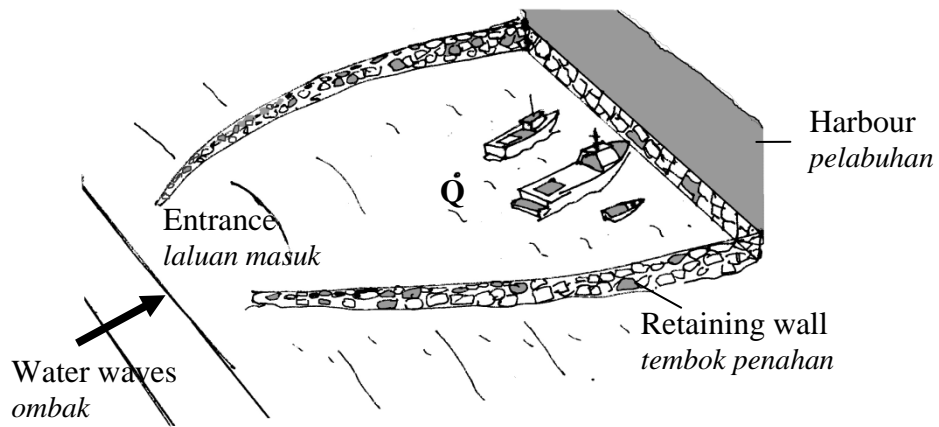
Diagram 23
Rajah 23

Which of the following statements is correct about the waves at Q?

Antara pernyataan-pernyataan berikut, yang manakah betul mengenai ombak di Q ?

A   The frequency is decrease

  Frekuensi berkurang

B   The velocity is increase

  Halaju bertambah

C   The wave length is increase

  Panjang gelombang bertambah

D   The energy is decrease

  Tenaga gelombang berkurang

32.   Which of the following methods is to reduce the echo inside a closed hall?

Antara kaedah-kaedah berikut , yang manakah adalah untuk mengurangkan gema di dalam sebuah dewan yang tertutup?

A   Wall is designed using a hard and smooth material

         Dinding direkabentuk menggunakan bahan yang keras dan licin

B   The inner wall is covered with sponge

         Dinding di bahagian dalam dilitupi dengan span

C.   The floor is designed using a smooth material

         Lantai direkabentuk menggunakan bahan yang licin

D   All curtains at the doors and windows are removed

         Kesemua langsir-langsir di pintu-pintu dan di tingkap-tingkap ditanggalkan

33.   Diagram 24 shows the spectrum of the electromagnetic waves.

Rajah 24 menunjukkan spektrum gelombang elektromagnet

Gamma ray *Sinar gama*	R	Ultra violet *Lampau ungu*	Visible light *Cahaya nampak*	S	Micro wave *Gelombang mikro*	T

Diagram 24
Rajah 24

The parts labeled R,S and T are

Bahagian berlabel R, S dan T adalah

A   X-ray, Infra red, Radio wave

         X-ray, Infra merah, Gelombang radio

B   Infra red, X-ray. Radio wave

         Infra merah, Sinar-X, Gelombang radio

C   Radio wave, Infra red, X-ray

         Gelombang radio, Infra merah, Sinar-X

D   X-ray , Radio wave, Infra red

Sinar-X, Gelombang radio, Infra merah

34.   Diagram 25 shows the electric field lines of a pair of charged particles, Q_1 and Q_2.

Rajah 25 menunjukkan garis-garis medan elektrik bagi sepasang zarah bercas, Q_1 dan Q_2.
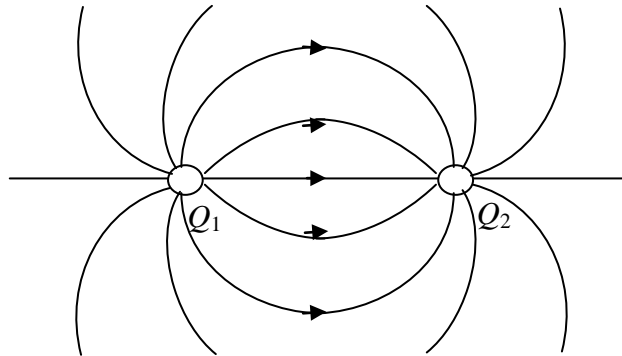
Diagram 25
Rajah 25

What are the type of charges of Q_1 and Q_2?

Apakah jenis cas bagi Q_1 dan Q_2?

	Q_1	Q_2
A	Positive	Negative
	Positif	*Negatif*
B	Positive	Positive
	Positif	*Positif*
C	Negative	Positive
	Negatif	*Positif*
D	Negative	Negative
	Negatif	*Negatif*

35. Diagram 26 shows a circuit with three identical resistors , R and two measuring instruments X and Y.

Rajah 26 menunjukkan satu litar elektrik yang mengandungi tiga perintang yang serupa, R dan dua alat pengukur X dan Y.
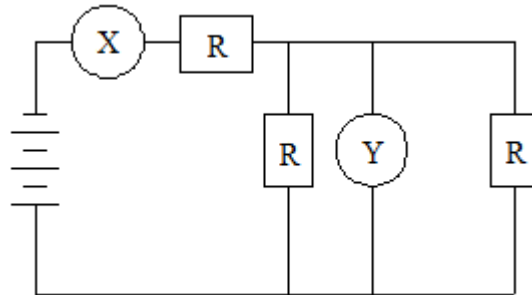
Diagram 26
Rajah 26

Which of the following is correct?

Antara berikut yang manakah adalah betul?

	X	Y
A	Ammeter	Ammeter
B	Voltmeter	Voltmeter
C	Ammeter	Voltmeter
D	Voltmeter	Ammeter

36. Which of the following arrangements of three identical resistors will has the least effective resistance between point X and point Y?

Yang manakah antara susunan-susunan bagi tiga perintang yang serupa berikut, mempunyai rintangan berkesan antara titik X dan titik Y yang paling kecil?

C $\quad$ X $\bullet$——▭——▭——▭——$\bullet$ Y

D $\quad$ X $\bullet$——[▭ ▭ / ▭]——$\bullet$ Y
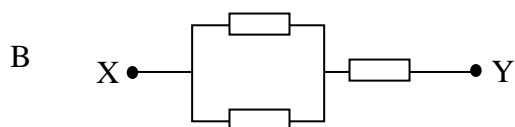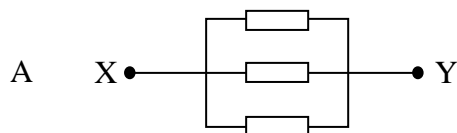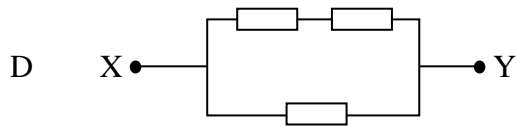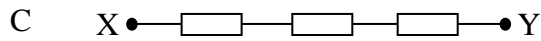
37. Diagram 27 shows a potential difference, V against current, I graph.

Rajah 27 menunjukkan graf beza keupayaan,V, melawan arus, I,.
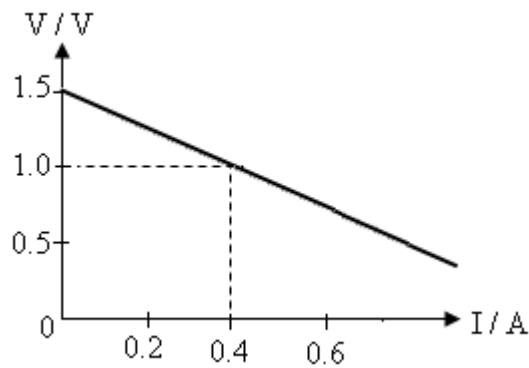
Diagram 27
Rajah 27

What is the internal resistance of the cell?

Berapakah rintangan dalam bagi sel itu?

A $\quad$ 2.40 Ω

B $\quad$ 1.50 Ω

C $\quad$ 1.25 Ω

D $\quad$ 0.40 Ω

38. Diagram 28 shows a straight wire passes through a horizontal cardboard.
Rajah 28 menunjukkan satu wayar lurus melalui suatu kadbod yang mengufuk.

Switch
Suis

Cardboard
Kadbod

Straight wire
Wayar lurus
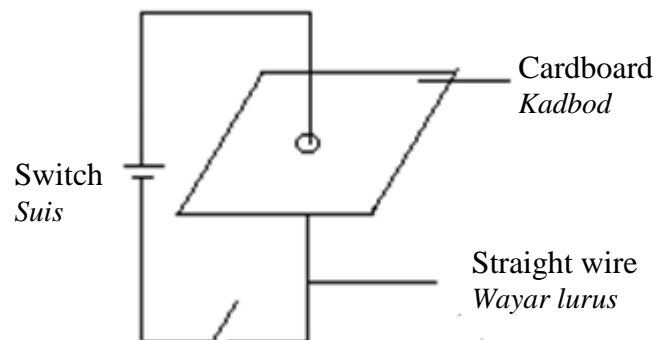
Diagram 28
Rajah 28

When the switch is closed, which of the following patterns of the magnetic field is correct?

Bila suis ditutup, yang manakah antara corak-corak medan magnet berikut adalah betul?

A

B

C

D
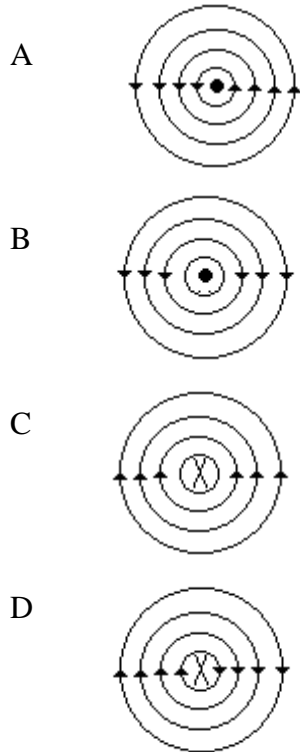
39.   Diagram 29 shows the arrangement of the apparatus of an experiment to study the effect of an electromagnet.

Rajah 29 mennjukkan susunan radas yang digunakan bagi satu eksperimen untuk mengkaji kesan keelektromagnetan.

Iron rod
Rod besi

Wire coil
Gegelung dawai

Paper clips
Klip kertas
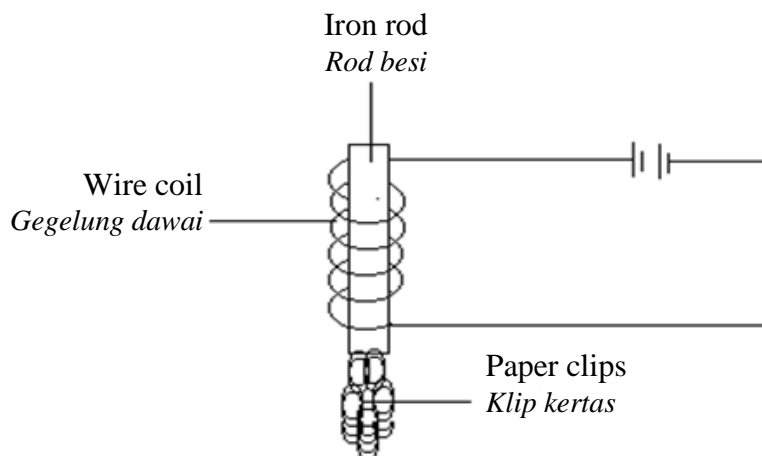
Diagram 29
Rajah 29

Which of the following methods will increase the number of paper clips attached to the iron rod?

Yang manakah antara kaedah-kaedah berikut akan menambahkan bilangan klip kertas yang melekat pada rod besi itu?

A   Reduce the number of coils

      Kurangkan bilangan lilitan gegelung

B   Use a thinner wire to form the coil

      Gunakan dawai yang lebih halus untuk membentuk gegelung

C   Increase the magnitude of current flow through the coils

      Tambahkan magnitud arus yang mengalir melalui gegelung

D   Replace the iron rod with aluminum rod

      Gantikan rod besi dengan rod aluminium

40.   Which of the following instruments uses the concept of electromagnet?

      Antara alat-alat berikut , yang manakah menggunakan konsep keelektromagnetan?

A   Dynamo

      Dinamo

B   Circuit breaker

      Pemutus litar

C   Electric Motor

      Motor elektrik

D   Transformer

      Transformer

41.   Diagram 30 shows a current carrying conductor is placed in between two   permanent magnets. In which direction, **A, B, C** or **D** will the conductor move when the current flows out of the paper?

*Rajah 29 menunjukkan suatu konduktor yang mengalirkan arus elektrik diletakkan diantara dua magnet kekal . Dalam arah manakah **A, B, C,** atau **D** konduktor itu akan bergerak apabila arus mengalir keluar daripada kertas?*

Permanent magnet
Magnet kekal

Permanent magnet
Magnet kekal
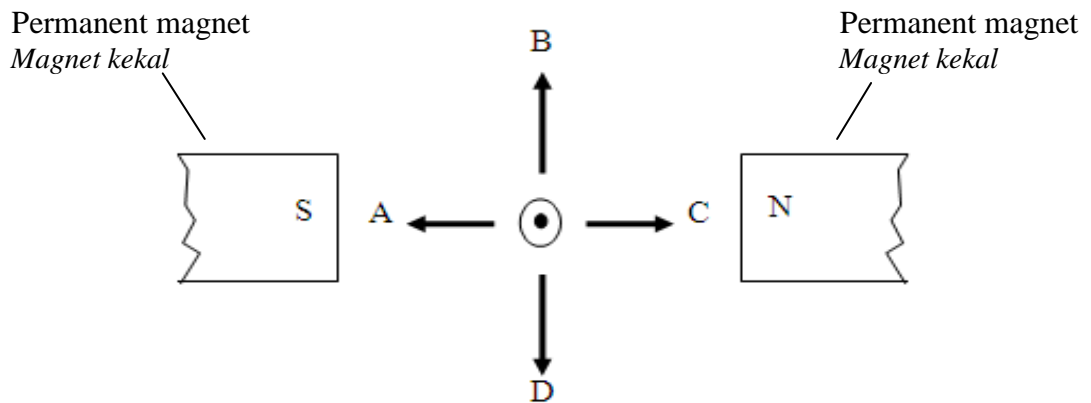
Diagram 30
Rajah 30

42.   The purpose of using soft iron core in a transformer is to

Tujuan menggunakan teras besi lembut dalam transformer adalah untuk

A   reduce the eddy current

       mengurangkan arus pusar

B   easily magnetised and demagnetised the iron core

       mudah memagnetkan dan menyahmagnetkan teras besi

C   prevent flux leakage

       mengelakkan kebocoran fluks

D   reduce the resistance

       mengurangkan rintangan

43. Diagram 31 shows the traces of a C.R.O. (Cathode Ray Oscilloscope) for an alternating current (a.c.).

Rajah 31 menunjukkan surihan O.S.K (Osiloskop Sinar Katod) bagi suatu arus ulang alik.(a.u).
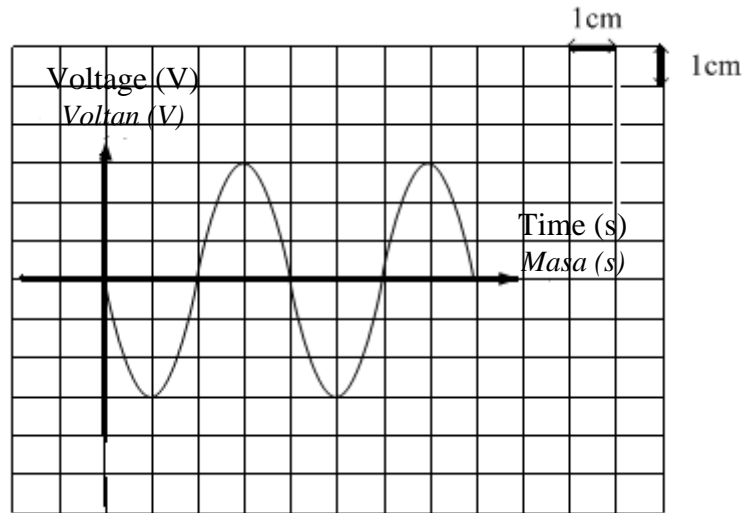
Diagram 31
Rajah 31

What is the peak voltage if the Y-gain is set at 5 V cm^{-1} ?

Berapakah voltan puncak jika pelaras–Y dilaraskan pada 5 V cm^{-1} ?

A   5 V

B   10 V

C   15 V

D   30 V

44. Which of the following circuits does **not** light up the bulb?

*Antara litar-litar berikut, yang manakah **tidak** menyalakan mentol?*

A

B

C

D
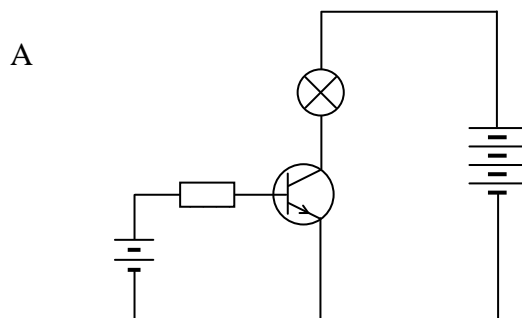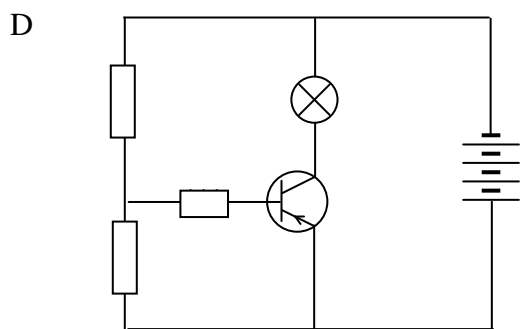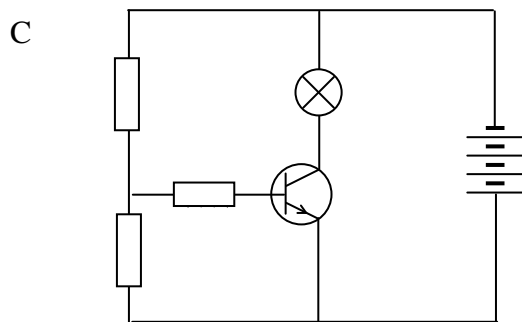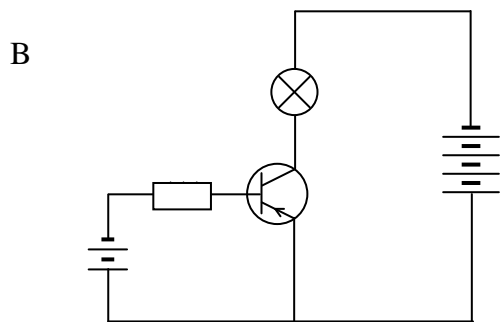
45.   Diagram 32 shows a logic gate circuit which has two inputs, *X* and *Y*.

Rajah 32 menunjukkan satu litar get logik yang menpunyai dua input, X dan Y.
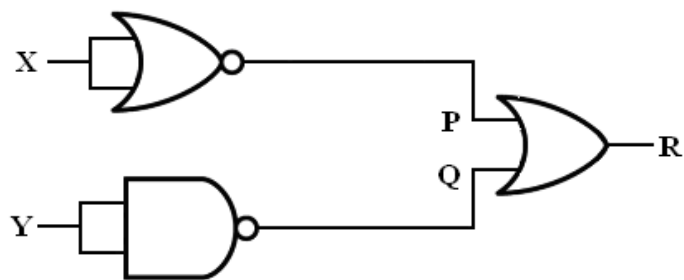
Diagram 32
Rajah 32

If the logic state of *X* is 0 and the logic state of *Y* is 1, what are the logic states at *P*, *Q* and *R*?

Jika keadaan logik X ialah 0 dan keadaan logik Y ialah 1, apakah keadaan logik bagi P, Q dan R ?

	P	*Q*	*R*
A	0	0	1
B	0	1	1
C	1	1	0
D	1	0	1

46.   Diagram 33 shows the path of particle P when it moves close to a nucleus.

Rajah 33 menunjukkan lintasan bagi zarah P apabila ia bergerak berhampiran dengan satu nukleus.

Particle P
Zarah P
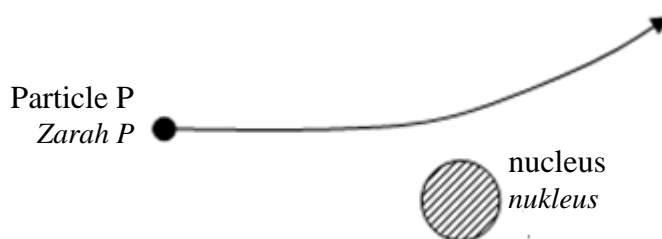
nucleus
nukleus

Diagram 33
Rajah 33

Identify the particle P.

Kenal pasti zarah P.

A   α-particle

       zarah-α

B   β-particle

       zarah-β

C　　γ-ray

　　　sinar-γ

D　　neutron

　　　neutron

47.　　Diagram 34 shows an equation of a nuclear reaction.

　　　Rajah 34 menunjukkan persamaan suatu tindakbalas nukleus.

$$^{2}_{1}H \; + \; ^{P}_{1}H \; \rightarrow \; ^{Q}_{0}n \; + \; ^{4}_{2}He \; + \; \text{energy}/\textit{tenaga}$$
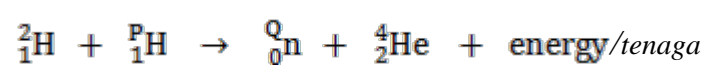
Diagram 34

Rajah 34

What are the values of P and Q?

Berapakah nilai P dan Q?

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

48.　　Diagram 35 shows the decay curve of a radioactive sample.

　　　Rajah 35 menunjukkan lengkung reputan bagi satu sampel radioaktif.
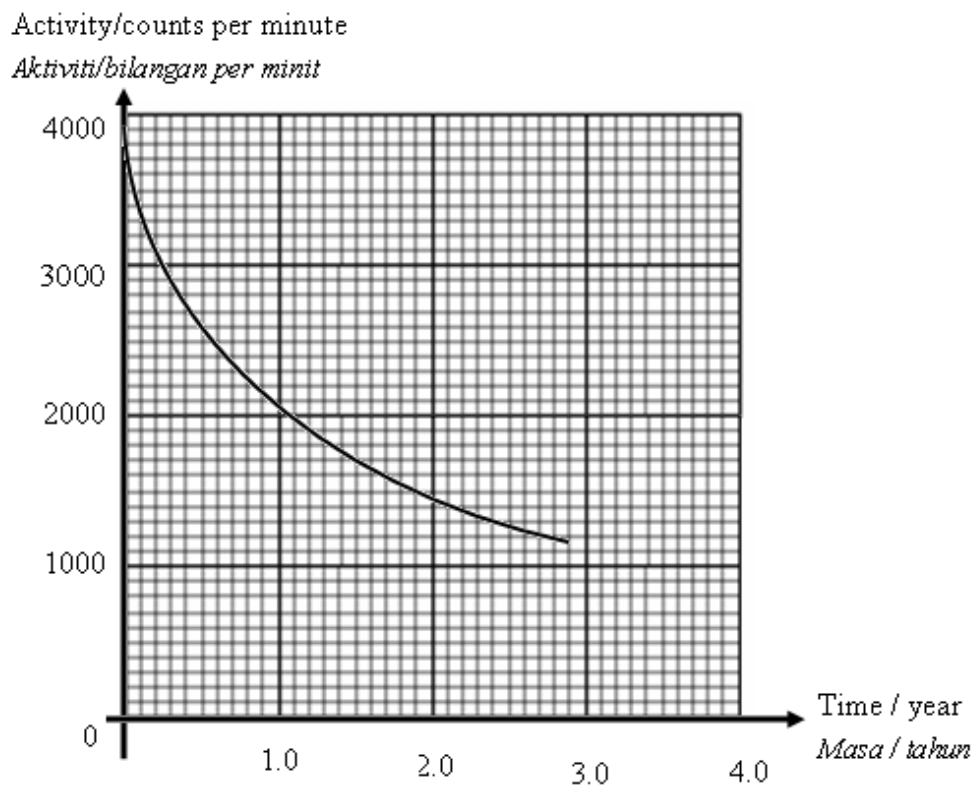
Diagram 35
Rajah 35

What is the half life of the radioactive sample?

Berapakah separuh hayat bagi sampel radioaktif tersebut?

A   0.2 years
     0.2 tahun

B   0.4 years
     0.4 tahun

C   1.0 years
     1.0 tahun

D   1.2 years
     1.2 tahun

49. Which of the following is correct about the penetrating power of α ,β and γ ?

Antara berikut yang manakah adalah benar mengenai kuasa penembusan α ,β dan γ?

A

B

C

D
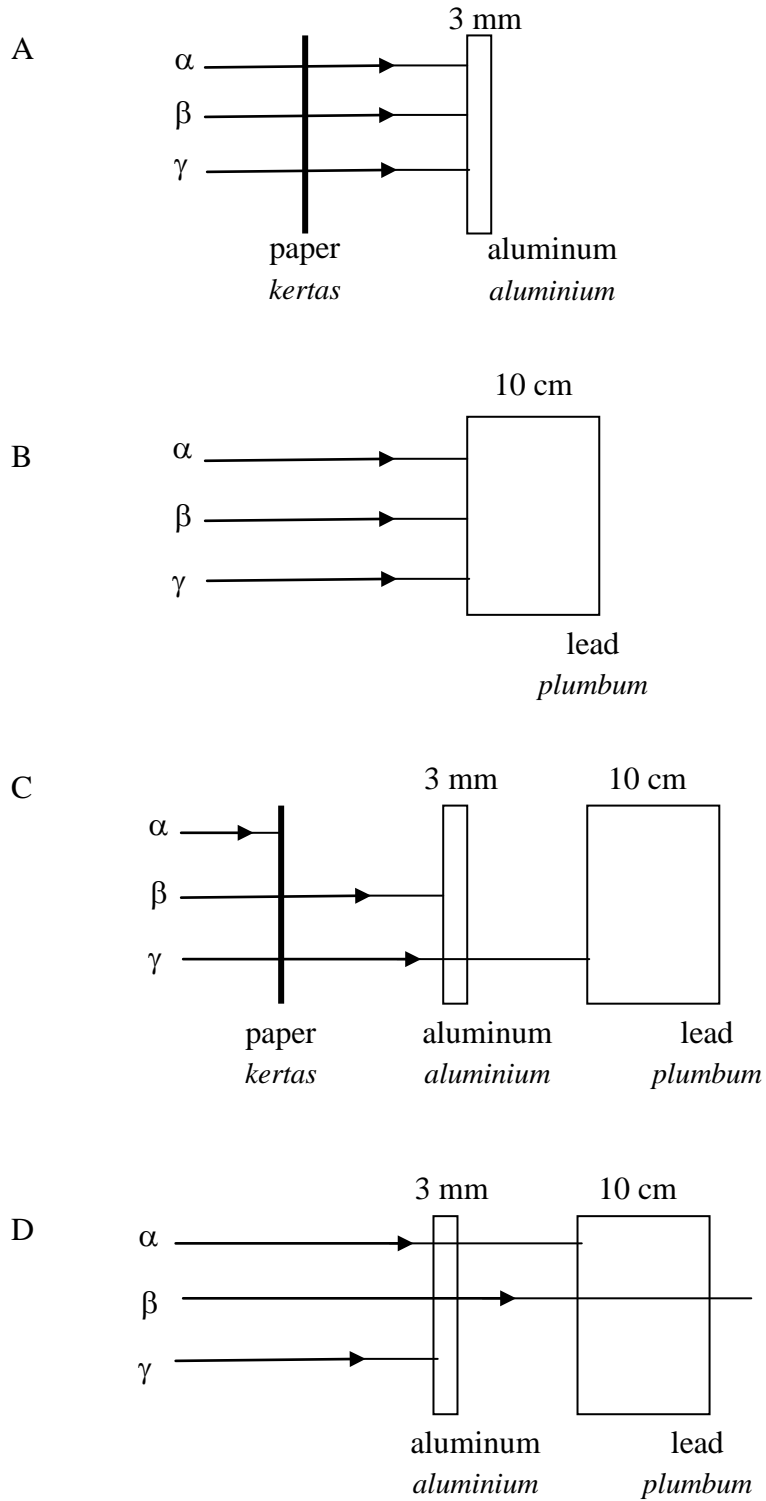
50. Diagram 36 shows the arrangement of a radioactive source and a detector to monitor the thickness of aluminum sheets in a factory.

Rajah 36 menunjukkan susunan satu sumber radioaktif dan satu alat pengesan untuk memantau ketebalan kepingan aluminium di dalam sebuah kilang.
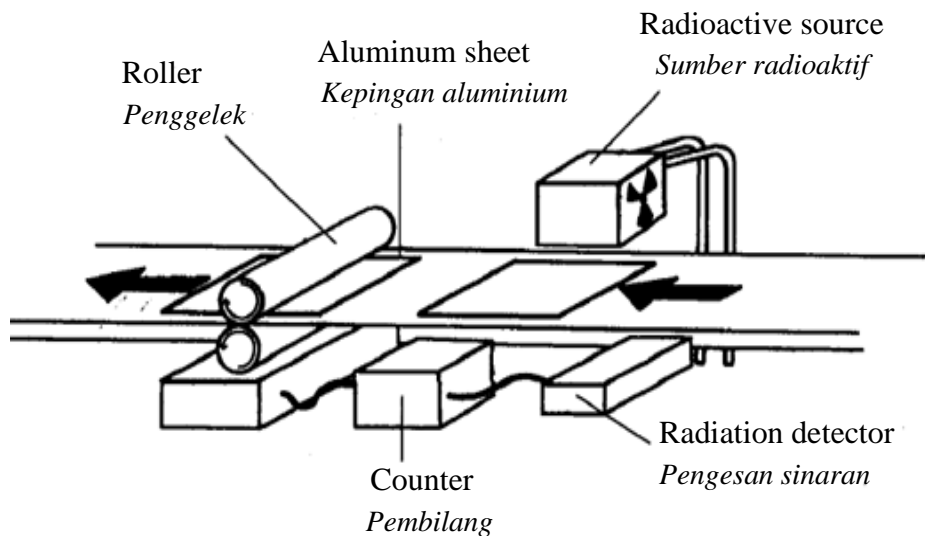
Diagram 36
Rajah 36

Which of the following would be most suitable to be used as the radioactive source?

Antara berikut, yang manakah adalah paling sesuai digunakan sebagai sumber radioaktif itu?

	Radiation emitted *Sinaran yang dipancar*	Half life *Setengah hayat*
A	alpha *alfa*	5 days *5 hari*
B	gamma *gama*	5 years *5 tahun*
C	beta *beta*	5 days *5 hari*
D	alpha *alfa*	5 years *5 tahun*

END OF QUESTION
SOALAN TAMAT

NAMA : ……………………………………….   TING : ……………

ANGKA GILIRAN : …………………………………

PERSIDANGAN KEBANGSAAN PENGETUA-PENGETUA SEKOLAH MENENGAH MALAYSIA CAWANGAN KELANTAN

SIJIL PELAJARAN MALAYSIA   4531/2
PEPERIKSAAN PERCUBAAN 2010

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. $a = \dfrac{v - u}{t}$

2. $v^2 = u^2 + 2\,as$

3. $s = ut + \dfrac{1}{2}at^2$

4. Momentum $= mv$

5. $F = ma$

6. Kinetic energy $= \dfrac{1}{2}mv^2$
    Tenaga kinetik

7. Gravitational potential energy $= mgh$
    Tenaga keupayaan graviti

8. Elastic potential energy $= \dfrac{1}{2}Fx$
    Tenaga keupayaan kenyal

9. $\rho = \dfrac{m}{V}$

10. Pressure, $P = h\rho g$.
    Tekanan

11. Pressure, $P = \dfrac{F}{A}$
    Tekanan

12. Heat, $Q = mc\theta$
    Haba

13. $PV = $ Constant (*pemalar*)

14. $E = mc^2$

15. $v = f\,\lambda$

16. Power, $P = \dfrac{\text{energy}}{\text{time}}$

17. $V = IR$

18. Power, $P = IV$
    Kuasa

19. $\dfrac{N_s}{N_p} = \dfrac{V_s}{V_p}$

20. Efficiency $= \dfrac{I_s\,V_s}{I_p\,V_p} \times 100\,\%$
    (*kecekapan*)

21. $\dfrac{1}{f} = \dfrac{1}{u} + \dfrac{1}{v}$

22. $n = \dfrac{\sin i}{\sin r}$

23. $n = \dfrac{\text{Real depth}}{\text{Apparent depth}}$

24. $\lambda = \dfrac{ax}{D}$

25. $Q = It$

26. $E = I(R + r)$

27. $eV = \frac{1}{2}mv^2$

28. $g = 10\ \text{ms}^{-2}$

[60 *marks*]
[*60 markah*]
Answer **all** questions in this section.
*Jawab **semua** soalan dalam bahagian ini.*

1. Diagram 1 shows a metal sphere with initial temperature of 30^oC is immersed in boiling water.

    Rajah 1 menunjukkan sebiji sfera logam yang mempunyai suhu awal 30^oC direndam dalam air mendidih.
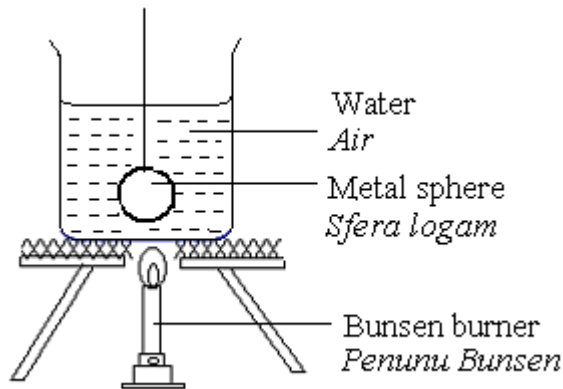
    Diagram 1
    Rajah 1

    a) i)   What happen to the temperature of the metal sphere?

         Apakah yang berlaku kepada suhu sfera logam ?

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

    ii)   Give a reason for the answer in 1(a)(i).

         Beri satu sebab bagi jawapan dalam 1(a)(i).

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

(b) After sometime, the metal sphere and the boiling water have the same temperature.
   Selepas beberapa ketika, sfera logam dan air mendidih itu mempunyai suhu yang sama.

   (i) Tick (√) in the box below for the correct statement about heat flows between
        the metal sphere and the boiling water.

        *Tandakan (√) dalam kotak di bawah bagi pernyataan yang betul tentang
        pengaliran haba di antara sfera logam dan air mendidih.*

   ☐ The rate of heat flows from boiling water < the rate of heat flows from metal sphere.
      Kadar pengaliran haba dari air mendidih < kadar pengaliran haba dari sfera logam.

   ☐ The rate of heat flows from boiling water = the rate of heat flows from metal sphere.
      Kadar pengaliran haba dari air mendidih = kadar pengaliran haba dari sfera logam.

   ☐ The rate of heat flows from boiling water > the rate of heat flows from metal sphere.
      Kadar pengaliran haba dari air mendidih > kadar pengaliran haba dari sfera logam.

   (ii) State the physics concept involve in 1(b) (i).

        Nyatakan konsep fizik yang terlibat dalam 1(b) (i).

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

2. Diagram 2.1 shows two different containers filled with water. The water pressure at point P and point Q are the same.
Rajah 2.1 menunjukkan dua bekas berlainan diisi dengan air. Tekanan air pada titik P dan titik Q adalah sama.
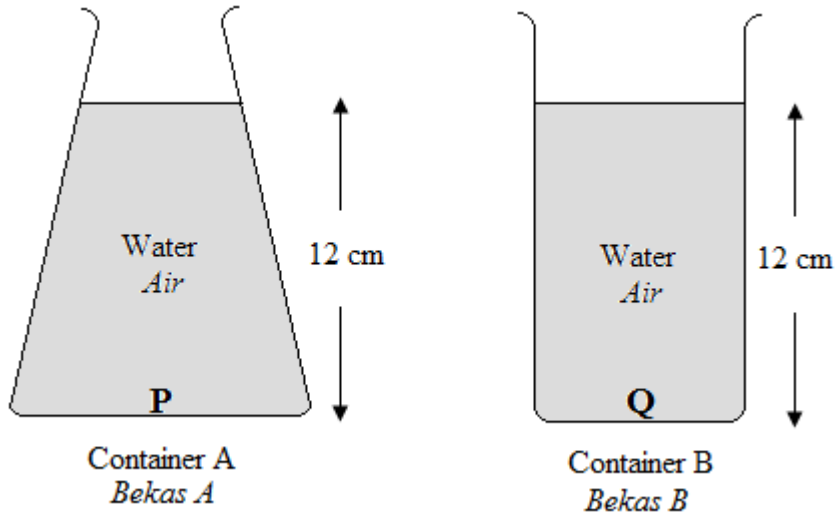
Diagram 2.1
Rajah 2.1

(a) What is the meaning of pressure?
Apakah maksud tekanan?

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

(b) State **one** factor that affect the water pressure at point P and Q.
*Nyatakan **satu** faktor yang mempengaruhi tekanan air di titik P dan titik Q.*

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

(c) Calculate the water pressure at point P.
[Density of water = 1000 kgm^{-3}]
Hitungkan tekanan air pada titik P.
[*Ketumpatan air = 1000 kgm^{-3}*]

[2 marks]

2 markah

(d)   Diagram 2.2 shows the water spurt when a hole is made near the base of
       container B.
       *Rajah 2.2 menunjukkan pancutan air apabila satu lubang dibuat berdekatan
       dengan dasar bekas B.*
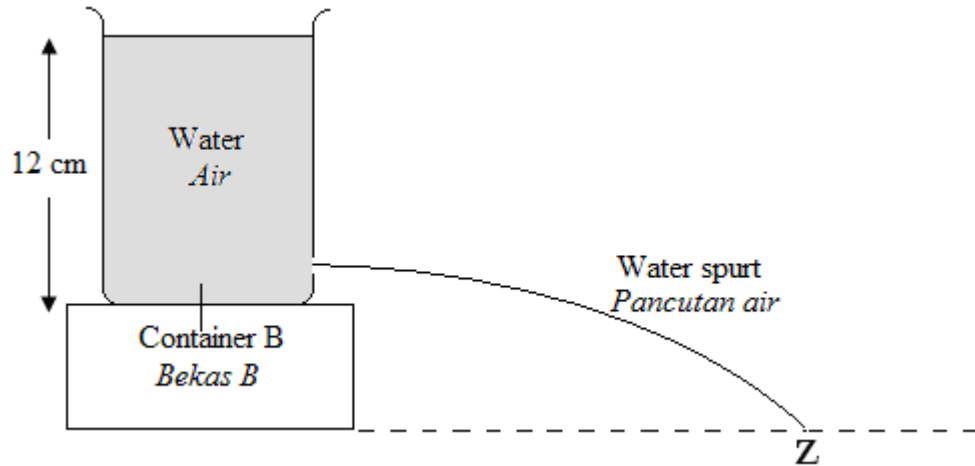
Diagram 2.2
Rajah 2.2

Diagram 2.3 shows the water in container B is replaced by liquid X which has
higher density than water.
*Rajah 2.3 menunjukkan air dalam bekas B digantikan dengan cecair X yang
mempunyai ketumpatan yang lebih tinggi daripada air.*
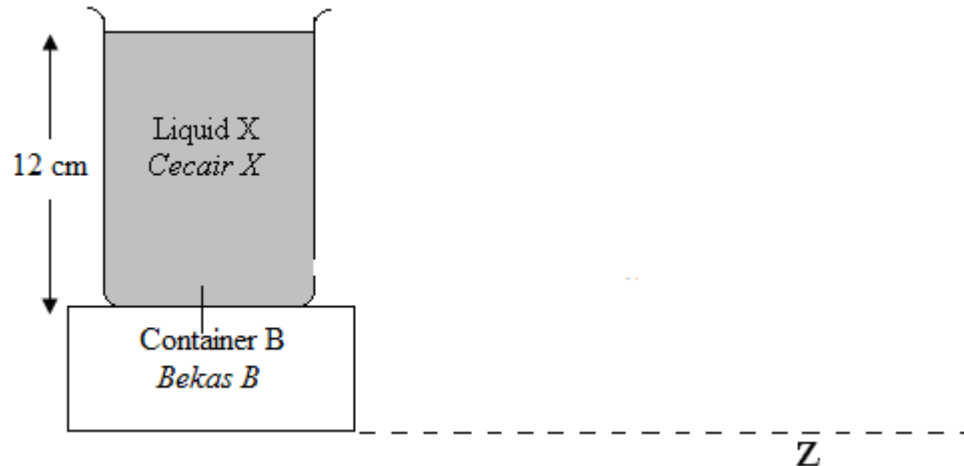
Diagram 2.3
Rajah 2.3

Sketch the spurt of liquid X in Diagram 2.3.
Lakarkan pancutan cecair X dalam Rajah 2.3.

[1 mark]
[*1 markah*]

3. Diagram 3.1 shows a cross section of a Maltese cross tube used to study the characteristics of cathode ray.

   Rajah 3.1 menunjukkan keratan rentas sebuah tiub palang Maltese yang digunakan untuk mengkaji sifat-sifat sinar katod.
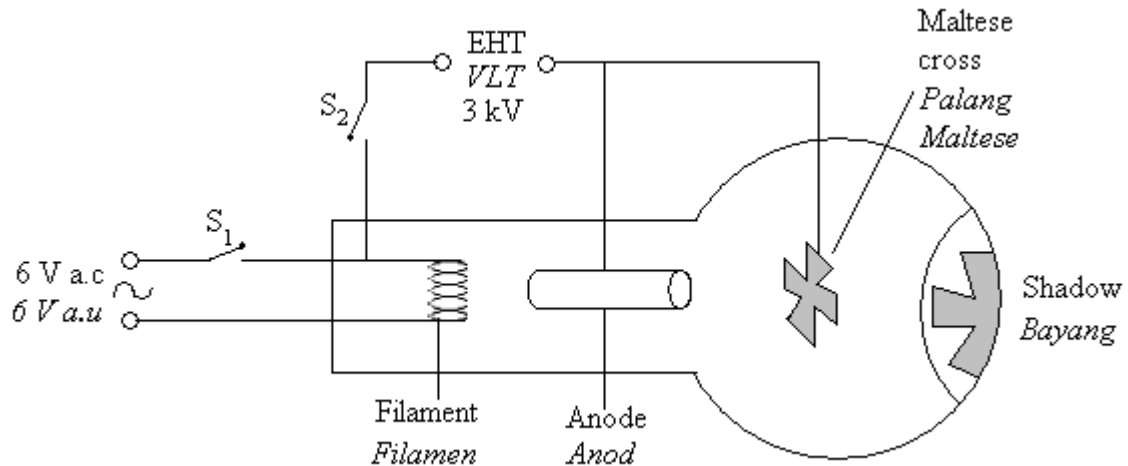
Diagram 3.1
Rajah 3.1

(a) What is the meaning of cathode ray?

   Apakah yang di maksudkan dengan sinar katod?

   ………………………………………………………………………………………...

   [1 mark]
   [*1 markah*]

(b) When switch S_1 and switch S_2 are turned on, two overlapping shadows are formed on the screen. Explain why the shadows are formed on the screen.

   Apabila suis S_1 dan suis S_2 dihidupkan, dua bayang-bayang yang bertindih terbentuk diatas skrin. Terangkan kenapa bayang-bayang ini terbentuk di atas skrin.

   ………………………………………………………………………………………..

   ………………………………………………………………………………………..

   [1 mark]
   [*1 markah*]

(c) Calculate the velocity of cathode ray in the Maltese cross tube .

[The charge of electron, e = 1.6 x 10^{-19} C and the mass of one electron,
   m$_e$ = 9 x 10^{-31} kg]

Hitungkan halaju sinar katod di dalam tiub palang maltese .

[*Cas bagi elektron, e = 1.6 x 10^{-19} C dan jisim bagi elektron,*
   m$_e$ = 9 x 10^{-31} kg]

[2 marks]
[2 *markah*]

(d) Diagram 3.2 shows a pair of magnet with opposite poles are placed at the sides of
the tube. One of the shadow deflects.

*Rajah menunjukkan sepasang magnet dengan kutub berbeza diletakkan pada sisi
tiub tersebut. Satu daripada bayang-bayang tersebut terpesong.*
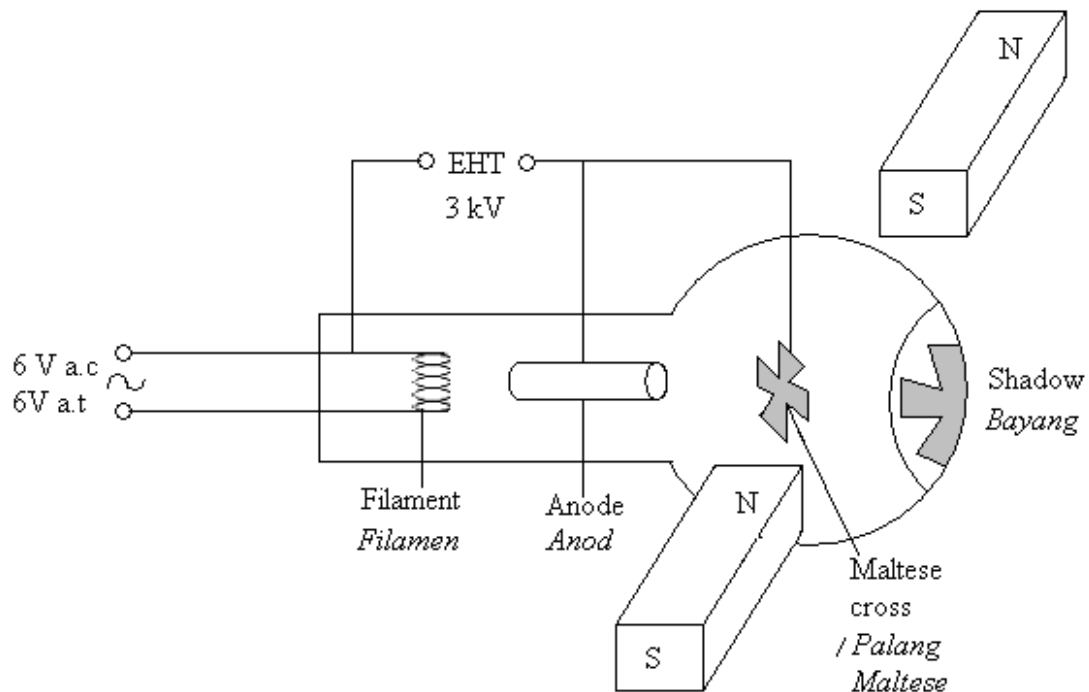
Diagram 3.2
Rajah 3.2

(i) By using an arrow, show the direction of the shadow which deflects in Diagram 3.2.

Dengan menggunakan anak panah, tunjukkan arah pesongan bayang pada skrin di Rajah 3.2.

[1 mark]
[*1 markah*]

(ii) State the physics rule used to determine the direction of the shadow.

Nyatakan peraturan fizik yang digunakan untuk menentukan arah bayang tersebut.

…………………………………………………………………….............................

[1 mark]
[*1 markah*]

4. Diagram 4.1 shows a polystyrene ball that coated with metallic paint is hung in an electric field between two metal plates.

Rajah 4.1 menunjukkan sebiji bola polisterin yang disalut dengan cat logam digantung dalam suatu medan elektrik di antara dua plat logam.

Polisterine ball coated with metallic paint
Bola polisterin bersalut logam

Nylon thread
Benang nilon

Insulator rod
Penebat

Metal plate
Plat logam

High voltage supply
Voltan lampau tinggi
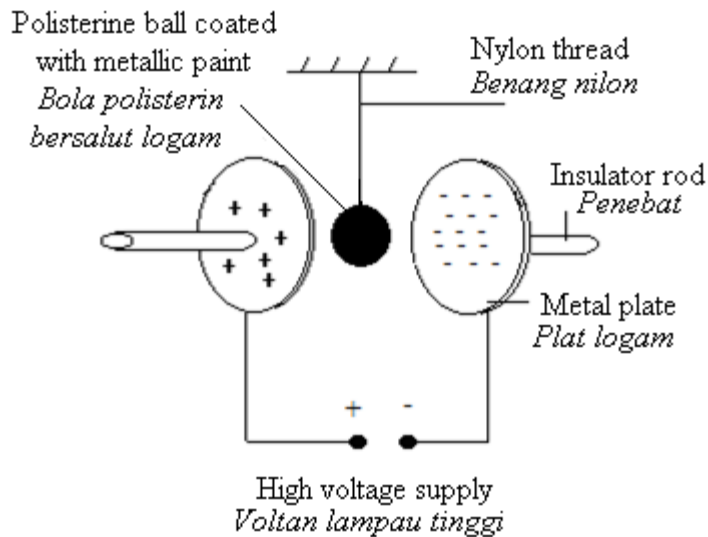
Diagram 4.1
Rajah 4.1

(a) (i) What is the meaning of electric field?

Apakah maksud medan elektrik?

……………………………………………………………………………………...

[1 mark]
[*1 markah*]

(ii) State the change on the strength of the magnetic field when the potential difference of the high voltage supply increases.
Nyatakan perubahan ke atas kekuatan medan magnet bila beza keupayaan bekalan voltan lampau tinggi bertambah.

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

(b) The polystyrene ball then is touched to the negative plate.
Bola polisterin itu kemudian dibawa menyentuh plat negatif.

(i) State the type of charge received by the polystyrene ball.
Nyatakan jenis cas yang diterima oleh bola polisterin itu.

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

(ii) What happen to the polystyrene ball when it is released from negative plate?
Apakah berlaku kepada bola polisterin itu bila ia lepaskan dari plat negatif?

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

(c) (i) The polystyrene ball in Diagram 4.1 is replaced by a burning candle. On Diagram 4.2, draw the shape of the candle flame observed in the electric field.
Bola polisterin dalam Rajah 4.1 itu digantikan dengan sebatang lilin yang menyala. Pada Rajah 4.2, lukiskan bentuk nyalaan lilin yang diperhatikan dalam medan elektrik itu.
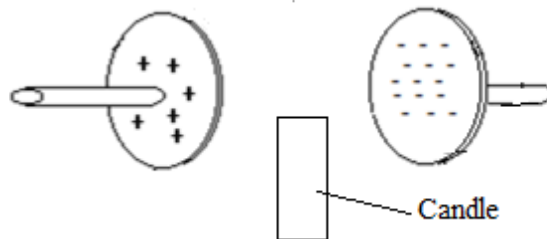
Diagram 4.2
Rajah 4.2

[1 mark]
[*1 markah*]

(ii) Explain why the shape of the candle flame observed as drawn in answer
4 (c) (i).
Terangkan mengapa bentuk nyalaan lilin yang diperhatikan adalah seperti yang dilukis dalam jawapan 4 (c) (i).

………………………………………………………………………………………...

………………………………………………………………………………………...

[2 marks]
[*2 markah*]

5. Diagram 5.1 and Diagram 5.2 show two pieces of plasticine are attached to two similar hacksaw blades of the same length.
The two plasticine then are set to oscillate. The frequency of oscillations for both plasticine is determine as shown in Diagram 5.1 and Diagram 5.2.

Rajah 5.1 dan Rajah 5.2 menunjukkan dua ketul plastisin yang dilekatkan pada dua bilah gergaji yang sama panjang.
Kedua-dua plastisin kemudiannya diayunkan. Frekuensi ayunan bagi kedua-dua platisin ditentukan sebagaimana ditunjukkan dalam Rajah 5.1 dan Rajah 5.2.

Hacksaw blade	Hacksaw blade
Bilah gergali	*Bilah gergali*
G-clamp	G-clamp
Pengapit-G	*Pengapit-G*
Plasticine	Plasticine
Plastisin	*Plastisin*

Frequency
Frekuensi
= 15 Hz

Frequency
Frekuensi
= 5 Hz
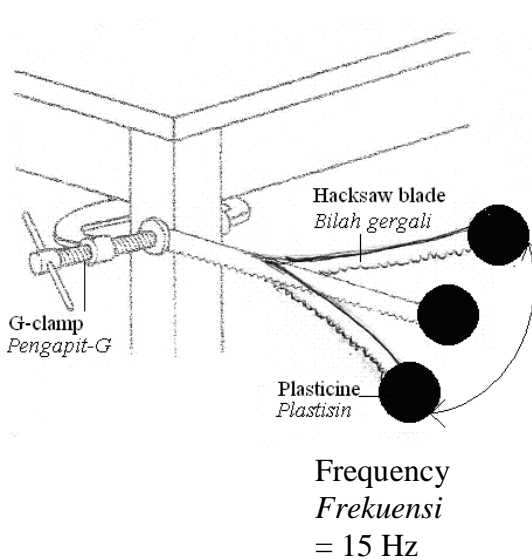
Diagram 5.1
Rajah 5.1

Diagram 5.2
Rajah 5.2

(a)   What is the meaning of frequency?
      Apakah maksud frekuensi?

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

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

      (i)   Compare the mass of the two plasticines.
             Bandingkan jisim kedua-dua plastisin.

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

      (ii)   Compare the frequency of oscillation of the two plasticines.
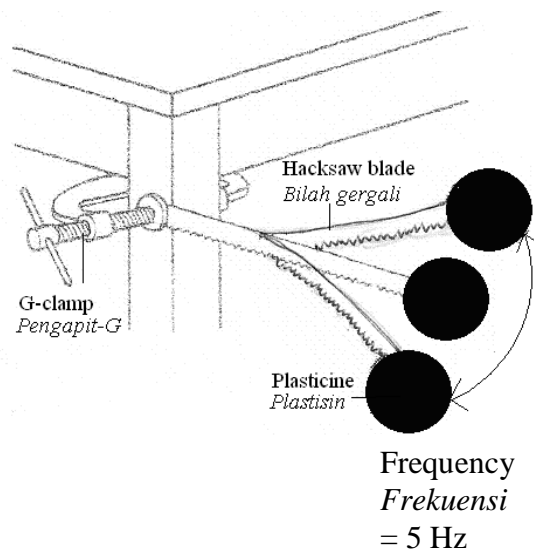   *Bandingkan frekuensi ayunan kedua-dua plastisin.*

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

      (iii) Relate the mass and the frequency of oscillation of the two plasticines
             Hubungkaitkan jisim dan frekuensi ayunan bagi kedua-dua plastisin.

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

(c)   Name a physics concept involved in these situations.
      Namakan satu konsep fizik yang terlibat dalam situasi ini.

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

(d)   What happen to the frequency of oscillations when the length of the hacksaw
      blade clamped is shorter?
      *Apakah yang berlaku kepada frekuensi ayunan apabila panjang bilah gergaji
      yang diapit dipendekkan?*

      ………………………………………………………………………………………

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

(e) The time taken for 20 complete oscillations of the plasticine is 10 seconds.
Calculate:
Masa yang diambil untuk 20 ayunan lengkap bagi plastisin ialah 10 saat.
Hitungkan:

   (i)   the period of oscillations.
         tempoh ayunan.

   (ii)   The frequency of oscillation.
         frekuensi ayunan.

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

6. Diagram 6.1 and Diagram 6.2 show the pattern of iron filing formed when the solenoids are connected to the battery.

   Rajah 6.1 dan Rajah 6.2 menunjukkan corak susunan serbuk besi yang terbentuk apabila solenoid disambungkan kepada bateri.
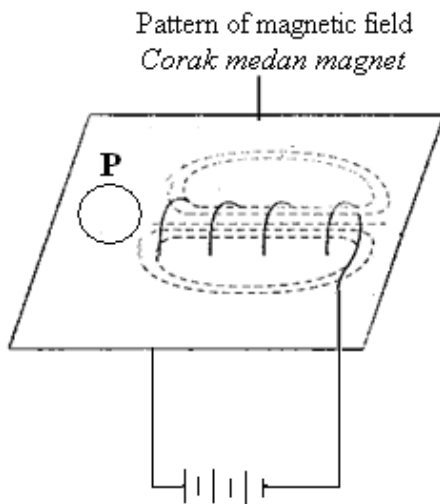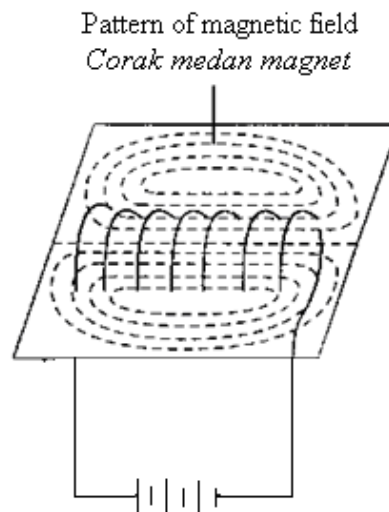

Diagram 6.1
Rajah 6.1

Diagram 6.2
Rajah 6.2

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

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

(b) A compass is located at P in Diagram 6.1.By using an arrow, mark the direction of the
   pointer of the compass.
   *Sebuah kompas diletakkan pada titik P dalam Rajah 6.2. Dengan menggunakan anak
   panah, tandakan arah penunjuk kompas.*

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

(c)   Based on Diagram 6.1 and Diagram 6.2, compare;
      Berdasarkan Rajah 6.1 dan Rajah 6.2, bandingkan;

   (i)   the number of turns of the coil.
          bilangan lilitan solenoid.

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

   (ii)   the number of magnetic field line of force.
          Bilangan garis daya medan magnet.

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

   (iii) the current passing through the solenoid.
          magnitud arus yang mengalir melalui soleniod.

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

(d) State the relationship between the number of turns of the coil and the strength of the
   magnetic field.
   Nyatakan hubungan antara bilangan lilitan gegelung dengan kekuatan medan magnet.

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

(e) (i)   What happen to the strength of the electromagnet if a soft iron core is inserted in the solenoid?
Apakah yang terjadi kepada kekuatan elektromagnet jika satu teras besi lembut dimasukkan ke dalam solenoid?

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

(i)   Explain your answer in 6 (e) (i).
Terangkan jawapan anda dalam 6 (e) (i).

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

7   Diagram 7 shows the deflection of three types of radioactive emission in an electric field.
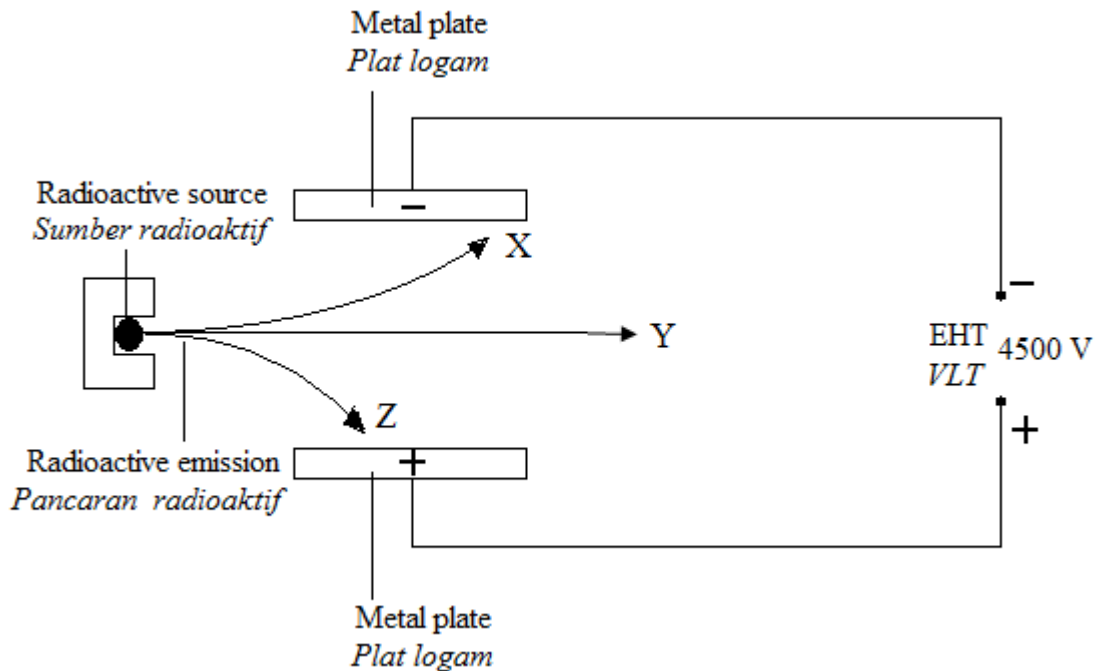*Rajah 7 menunjukkan pesongan tiga jenis pancaran radioaktif di dalam suatu medan elektrik.*

Diagram 7
Rajah 7

(a) What is the meaning of radioactivity?
Apakah maksud keradioaktifan?

………………………………………………………………………………………………

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

(b) (i) Name the type of radioactive emission.
Namakan jenis pancaran radioaktif.

X : …………………………………………………………….......................

Z:……………………………………………………………………….

[2 marks]
[*2 markah*]

(ii) Give **one** reason why the deflection of Z more than the deflection of X.
*Berikan **satu** sebab kenapa pesongan Z lebih daripada pesongan X.*

……………………………………………………...

[1 mark]
[*1 markah*]

(c) In a reactor nuclear, Uranium 235 is bombarded by a neutron produces Barium 141 and Kripton 92 by releasing three neutrons. This reaction experiences a mass defect.
Dalam suatu tindak balas nuklear, Uranium 235 ditembak dengan satu neutron menghasilkan Barium 141 dan Kripton 92 dengan membebaskan tiga neutron. Tindakbalas ini mengalami kecacatan jisim.

(i)   Name the type of nuclear reaction.
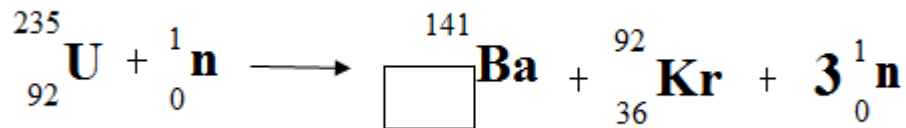*Namakan jenis tindak balas nuklear ini.*

……………………………………………………………………………………...

[1 mark]
[*1 markah*]

(ii)   Complete the equation of the reaction by writing the appropriate number in the boxes provided.
Lengkapkan persamaan tindak balas dengan menulis nombor yang sesuai dalam kotak yang disediakan.

$$^{235}_{92}U + {}^{1}_{0}n \longrightarrow \boxed{}^{141}Ba + {}^{92}_{36}Kr + 3\,{}^{1}_{0}n$$

[1 mark]
[*1 markah*]

(iii) The nuclear reaction of one nucleus of uranium - 235 experiences a mass defect of 2.988×10^{-28} kg. Calculate the energy released in the nuclear reaction. The velocity of light is 3×10^{8} ms^{-1}.

Tindak balas nuklear bagi satu nucleus uranium - 235 mengalami kecacatan jisim sebanyak 2.988×10^{-28} kg. Hitungkan tenaga yang dibebaskan dalam tindak balas itu. Halaju cahaya adalah 3×10^{8} ms^{-1}.

[2 marks]
[*2 markah*]

(d) Radioactive substances give out radiations which are harmful to our body.
Bahan-bahan radioaktif mengeluarkan sinaran yang berbahaya kepada badan kita.

(ii) Suggest **one** precaution that need to be taken when handling a radioactive source.
*Cadangkan **satu** langkah berjaga-jaga yang perlu diambil semasa mengendalikan sumber radioaktif.*

…………………………………………………………………......................................

[1 mark]
[*1 markah*]

(ii) give **one** reason for the answer in 7 (d) (i).
*berikan **satu** sebab bagi jawapan di 7 (d) (i).*

……………………………………………………………………………………...

[1 mark]
[*1 markah*]

8   Diagram 8 shows an electric bell produces sound waves.
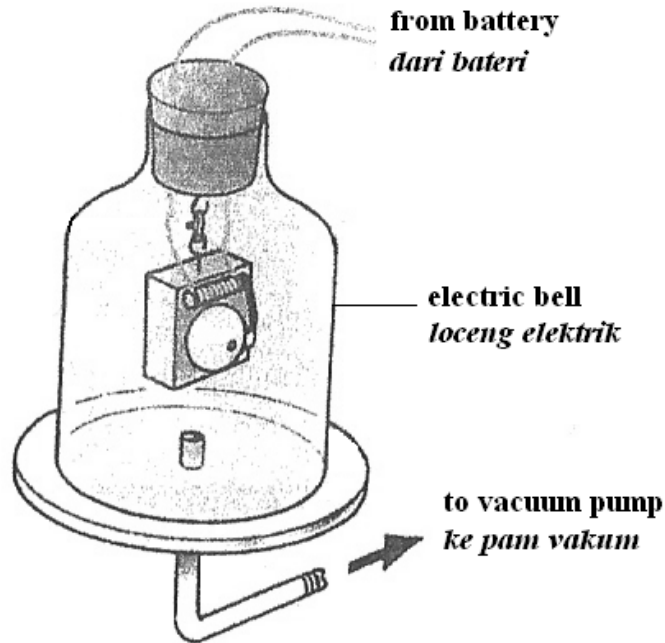   *Rajah 8 menunjukkan satu loceng elektrik menghasilkan gelombang bunyi.*

Diagram 8
Rajah 8

(a) (i) Name the type of wave produced by the electric bell.
        Namakan jenis gelombang yang dihasilkan oleh loceng elektrik.

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

    (ii) When the air in the electric bell is sucked out by using vacuum pump, what happen
         to the sound produced?
         *Apabila udara dalam loceng elektrik disedut keluar dengan menggunakan pam
         vakum, apakah yang berlaku kepada bunyi yang dihasilkan?*

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

    (iii) Give **one** reason for the answer in 8 (a) (ii).
          *Berikan **satu** sebab bagi jawapan di 8 (a) (ii).*

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

(b) Diagram 8.2 shows a sound wave form produced by a tuning fork displayed on the screen of cathode ray oscilloscope.
Rajah 8.2 menunjukkan suatu bentuk gelombang bunyi yang dihasilkan oleh suatu tala bunyi ditunjukkan pada skrin tiub sinar katod.
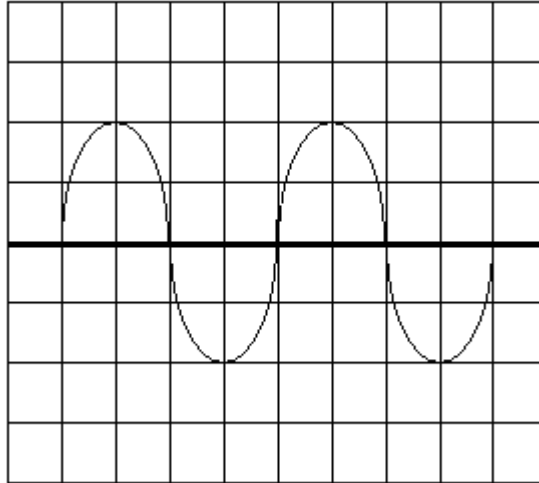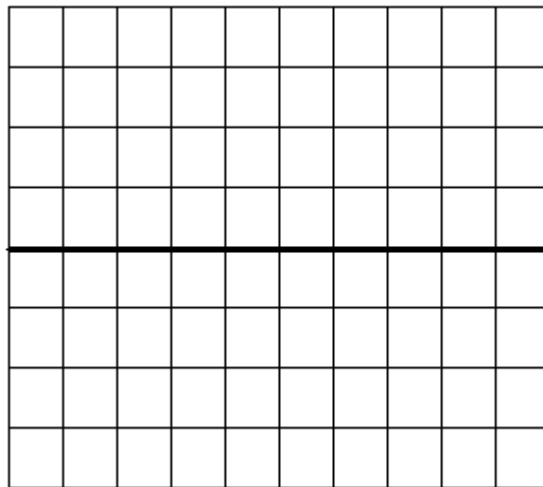

Diagram 8.2
Rajah 8.2

On Diagram 8.3, draw the sound wave form produced when the loudness is increased.
Pada Rajah 8.3, lukiskan bentuk gelombang bunyi yang dihasilkan bila kekuatan bunyi ditambah.

Diagram 8.3
Rajah 8.3

[1 mark]
[*1 markah*]

(c) Diagram 8.4 shows an electromagnetic wave spectrum.
   Rajah 8.4 menunjukkan satu spektrum gelombang elektromagnet.

Radio wave *Gelombang radio*	Microwave *Gelombang mikro*	P	Visible light *Cahaya nampak*	Q	X-ray *Sinar-x*	Gamma ray Sinar Gama

Diagram 8.4
Rajah 8.4

(i) Name the wave for;
   Namakan gelombang bagi;

   P : …………………………………………………………………

   Q : …………………………………………………………………
   [2 marks]
   [*2 markah*]

(ii) Choose **one** wave that harmful to human body.
   *Pilih **satu** gelombang yang merbahaya kepada badan manusia.*

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

(iii) Give **one** reason for the answer in 8 (c) (ii).
   *Beri **satu** sebab bagi jawapan di 8 (c)(ii).*

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

(iv) Choose **one** wave that used in telecommunications.
   *Pilih **satu** gelombang yang sesuai digunakan dalam telekomunikasi.*

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

(v)   Give **one** reason for the answer in 8 (c) (iv).
*Beri **satu** sebab bagi jawapan di 8 (c) (iv).*

………………………………………………………………………………………...

[1 mark]

[*1 markah*]

(vi)   Choose the suitable wave that can be used in cancer treatment.
Pilih gelombang yang sesuai digunakan untuk rawatan penyakit kanser.

....

[1 mark]

[*1 markah*]

(vii)   Give **one** reason for the answer in 8 (c) (vi).
*Beri **satu** sebab bagi jawapan di 8 (c) (vi).*

………………………………………………………………………………………...

[1 mark]

[*1 markah*]

Section 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 the heating curves obtained when 50 g and 80 g of the
      solid substance are heated respectively. The melting point of the substance is 78°C.

      *Rajah 9.1 dan Rajah 9.2 menunjukkan graf pemanasan yang diperolehi apabila 50 g dan
      80 g bahan itu dipanaskan masing-masing. Takat lebur bahan itu adalah 78°C.*
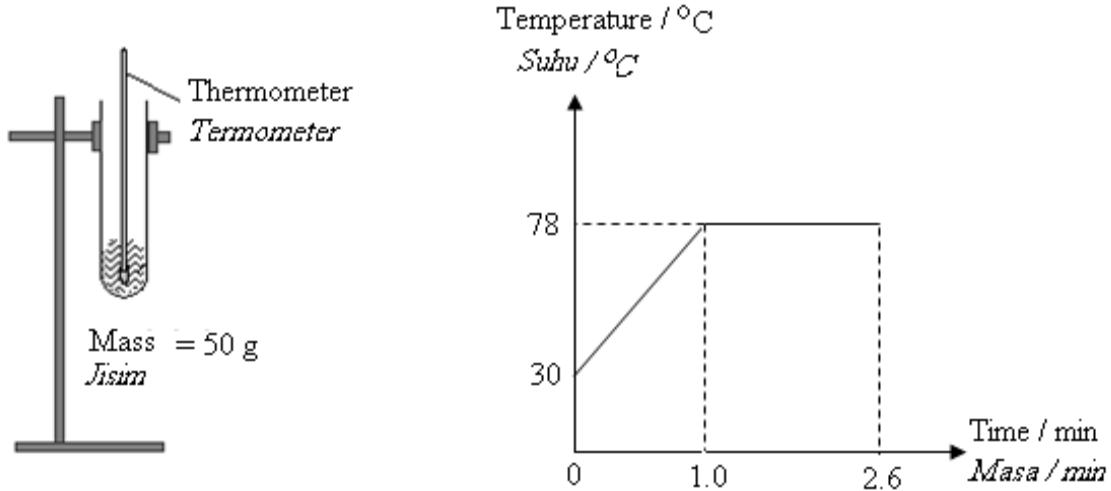
Diagram 9.1
Rajah 9.1
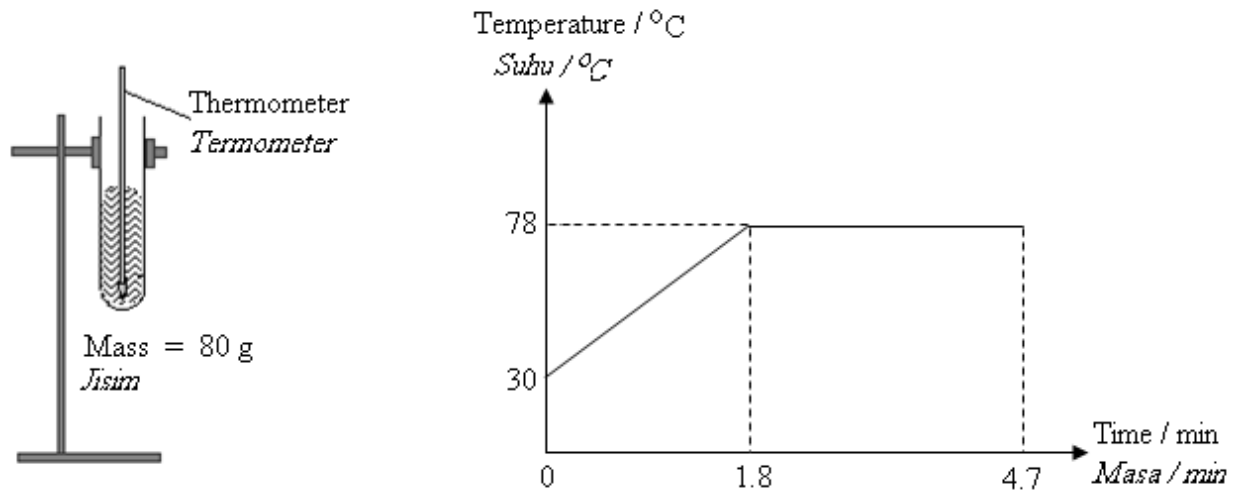
Diagram 9.2
Rajah 9.2

(a) (i) What is the meaning of melting point?
         Apakah maksud takat lebur?

[1 mark]
[*1 markah*]

   (ii) Based on the information and the observation on Diagram 9.1 and Diagram 9.2,
         compare the mass, the time taken to reach the melting point and the time taken by
         the substance to change into liquid completely.

         Relate the mass and the time taken by the substance to change into liquid
         completely to make a deduction on the relationship between the mass and the
         latent heat of fusion absorbed by the substance.

         *Berdasarkan maklumat dan pemerhatian pada Rajah 9.1 dan Rajah 9.2,
         bandingkan jisim,masa yang diambil untuk mencapai takat lebur dan masa yang
         diambil untuk bahan itu berubah kepada cecair sepenuhnya.*

         *Hubungkaitkan antara jisim dengan masa yang diambil untuk bahan berubah
         kepada cecair sepenuhnya untuk membuat kesimpulan tentang hubungan antara
         jisim dengan haba pendam peleburan yang diserap oleh bahan itu.*

[5 marks]
[*5 markah*]

(b)   Diagram 9.3 shows the phenomenon of sea breeze.
      Rajah 9.3 menunjukkan fenomena bayu laut.
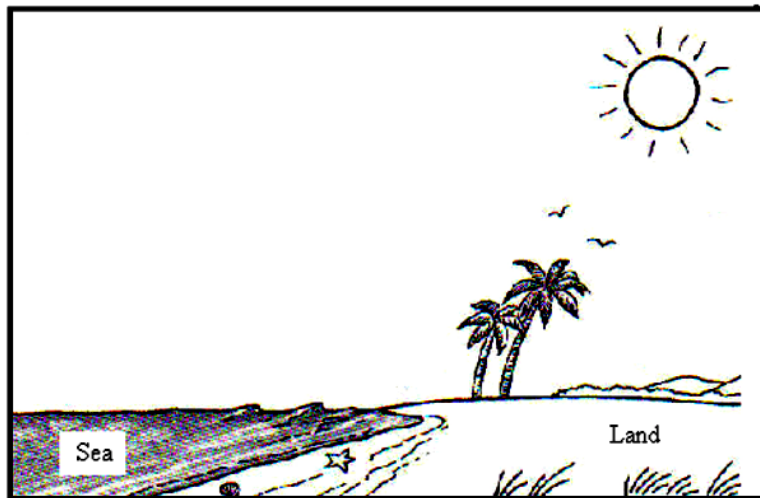
Diagram 9.3
Rajah 9.3

Using the concept of specific heat capacity, explain how the phenomenon of sea breeze occurs.
Menggunakan konsep muatan haba tentu, terangkan bagaimana fenomena bayu laut berlaku.

[4 marks]
[*4 markah*]

(c) Diagram 9.4 shows a design of central heating system used in cold country to heat and keep houses warm.

Rajah 9.4 menunjukkan suatu rekabentuk sistem pemanasan berpusat yang digunakan di negara yang berhawa sejuk untuk memanas dan mengekalkan haba di dalam rumah.
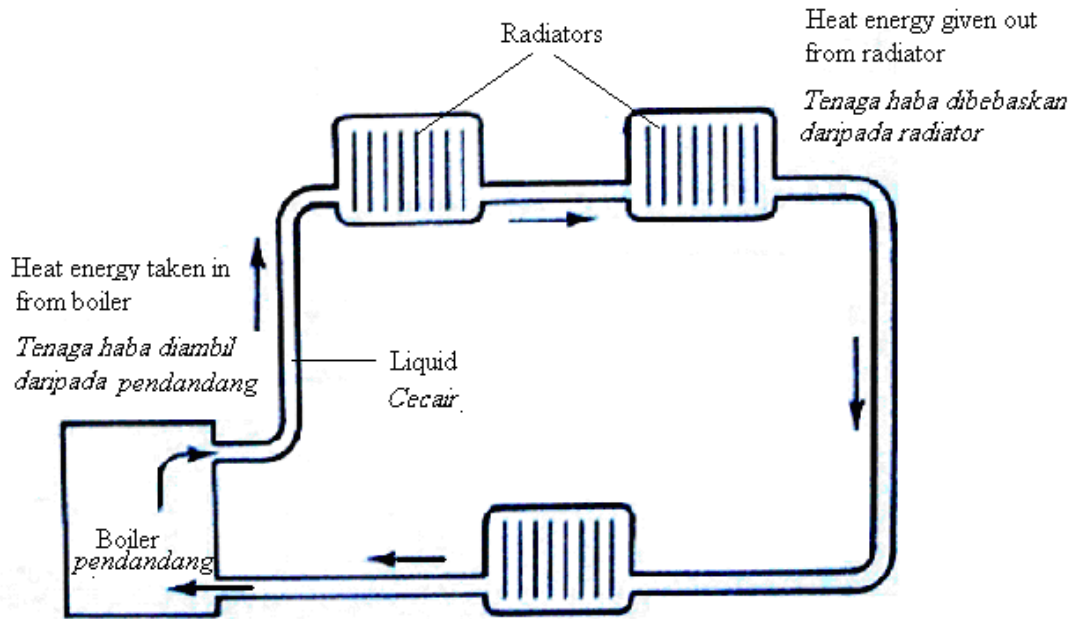
Diagram 9.4
Rajah 9.4

Suggest and explain how to build a house central heating system which can function effectively based on the following aspects:

Cadang dan terangkan bagaimana untuk membina suatu sistem pemanasan berpusat sebuah rumah yang boleh berfungsi dengan cekap berdasarkan aspek-aspek berikut:

i)   The specific heat capacity of the liquid
     Muatan haba tentu cecair

ii) The boiling point of the liquid
     Takat didih cecair

iii) The properties of material used for transmission pipe
     Sifat-sifat bahan yang digunakan untuk paip penghantaran cecair

iv) The size of the fan used to blow the heat from radiator
     Saiz kipas yang digunakan untuk meniup haba daripada radiator

[10 marks]
[*10 markah*]

10. Diagram 10.1 and Diagram 10.2 show two circuits. Each circuit contains an ammeter, 4 cells, rheostat and a filament lamp labeled 6V, 24 W. Diagram 10.3 and Diagram 10.4 show the thickness of coiled wire of the filament lamp M and N, respectively.

Rajah 10.1 dan Rajah 10.2 menunjukkan dua litar. Setiap litar itu mengandungi satu ammeter, empat sel, reostat dan satu lampu filamen berlabel 6V, 24 W. Rajah 10.3 dan Rajah 10.4 menunjukkan ketebalan gegelung dawai bagi lampu filamen M dan N, masing-masing
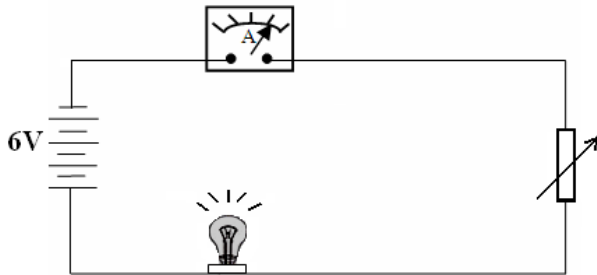
Filament lamp M
Lampu filamen M

Filament lamp N
Lampu filamen N
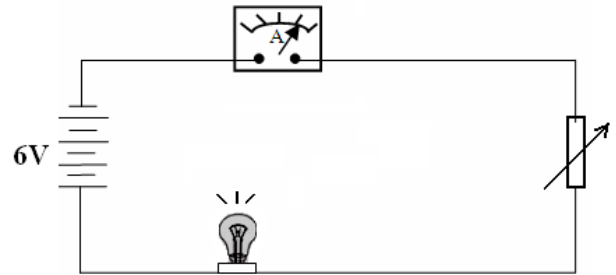
Diagram 10.1
Rajah 10.1

Diagram 10.2
Rajah 10.2
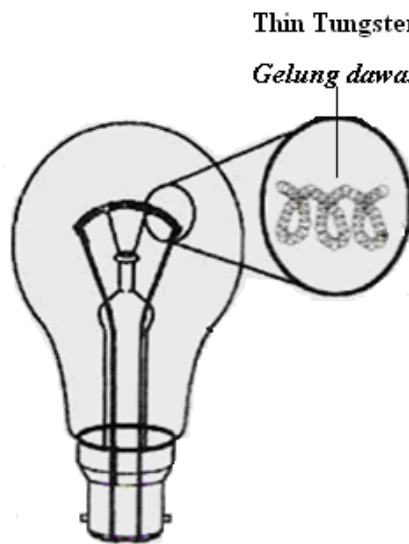
Thin Tungsten coil wire
Gelung dawai Tungsten nipis
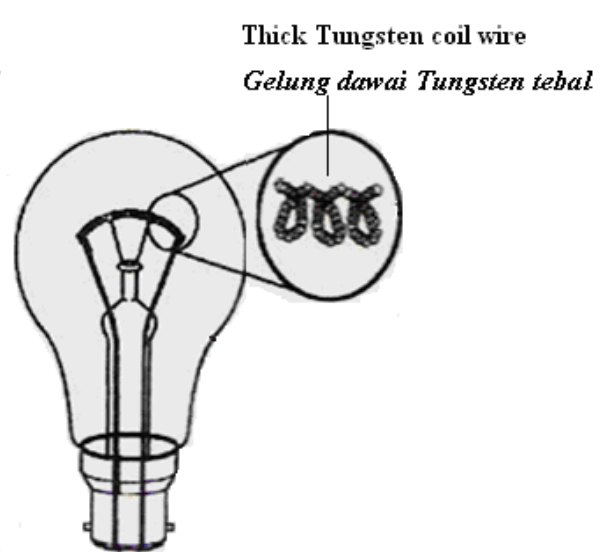
Thick Tungsten coil wire
Gelung dawai Tungsten tebal

Filament lamp M
Lampu filamen M

Filament lamp N
Lampu filamen N

Diagram 10.3
Rajah 10.3

Diagram 10.4
Rajah 10.4

(a)   What is the meaning of the labeled "6V, 24 W" on the filament lamp?
            Apakah yang dimaksudkan dengan label "6V, 24 W" pada lampu filamen?

[1 mark]
[*1 markah*]

(b)   (i)   Observe Diagram 10.1and Diagram 10.2. Compare the reading of the
               ammeter and the brightness of the filament lamp M and N.
               Perhatikan Rajah 10.1 dan Rajah 10.2. Bandingkan bacaan pada ammeter
               dan kecerahan lampu filamen M dan N.

[2 marks]
[*2 markah*]

    (ii)   Observe Diagram 10.3 and Diagram 10.4. Compare the thickness of coiled
               wire of the filament lamps.
               Perhatikan Rajah 10.3 dan Rajah 10.4. Bandingkan ketebalan gegelung
               dawai bagi lampu-lampu filamen itu.

[1 mark]
[*1 markah*]

    (iii)   Relate the brightness of the filament lamp with the thickness of coiled wire
               to make a deduction on the relationship between thickness of coil wire and
               the heat produced by the filament lamp
               Hubungkaitkan kecerahan lampu filamen dengan ketebalan gegelung dawai
               untuk membuat kesimpulan tentang hubungan antara ketebalan gegelung
               dawai dengan haba yang dihasilkan oleh filamen lampu tersebut.

[2 marks]
[*2 markah*]

(c)   Diagram 10.5 shows two types of plug for the electric kettle that can be
       connected to the electric supply. Diagram 10.5(a) uses two pin plug, while
       Diagram 10.5(b) uses a three pin plug with an earth wire.

       Rajah 10.5 menunjukkan dua jenis plug untuk cerek elektrik yang boleh
       disambungkan pada bekalan kuasa. Rajah 10.5(a) menggunakan palam dua pin,
       manakala Rajah 10.5(b) menggunakan palam tiga pin dengan dawai bumi.

Electric kettle
Cerek elektrik
2 pin plug
Palam 2 pin

Electric kettle
Cerek elektrik
3 pin plug
Palam 3 pin

Diagram 10.5(a)
Rajah 10.5(a)

Diagram 10.5(b)
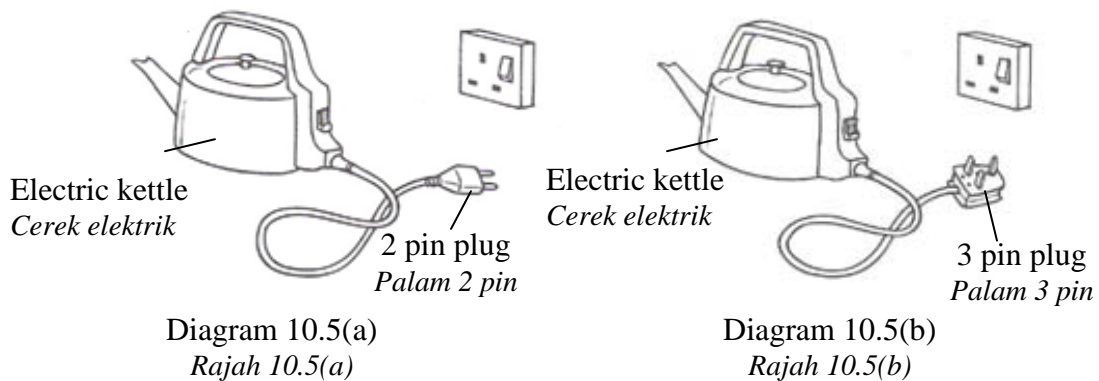*Rajah 10.5(b)*

Diagram 10.5
Rajah 10.5

(i)   Explain why a three pin plug is more suitable compared with a two pin
        plug.
        Terangkan mengapa palam tiga pin adalah lebih sesuai berbanding
        dengan palam dua pin.

[4 marks]
[*4 markah*]

(d)   Diagram 10.6 shows a water heater used to boil water.
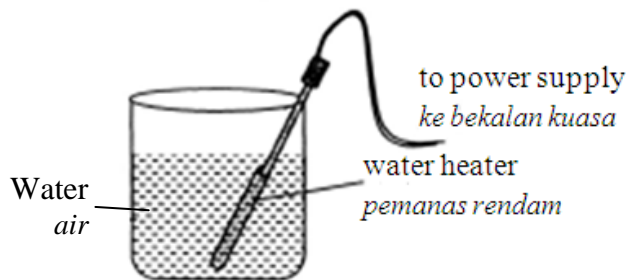   *Rajah 10.6 menunjukkan satu pemanas rendam digunakan untuk mendidihkan air.*

Diagram 10.6
Rajah 10.6

Using appropriate physics concepts, suggest and explain how to build a water heater
which can boil a larger quantity of water faster , more efficient, and more safety
based on the following aspects;
Dengan menggunakan konsep-konsep Fizik yang sesuai, cadang dan terangkan
bagaimana untuk membina satu pemanas rendam yang boleh mendidihkan kuantiti
air yang lebih besar dengan lebih cepat, lebih cekap dan lebih selamat ,
berdasarkan aspek-aspek berikut ;

(i)   type of material used for the heating element of the water heater
        Jenis *bahan yang digunakan untuk elemen pemanas bagi pemanas rendam*

(ii)   shape of the heating element of the water heater
        bentuk elemen pemanas bagi pemanas rendam

(iii)   melting point of the heating element of the water heater
        takat lebur elemen pemanas bagi pemanas rendam

(iv)   rate of rusting of the heating element of the water heater
        kadar pengaratan elemen pemanas bagi pemanas rendam

(v)   additional component used for safety when the water boil
        Komponen tambahan yang digunakan untuk keselamatan bila air mendidih

[10 marks]
[*10 markah*]

[20 marks]
[20 markah]

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

11. Diagram 11.1 shows two convex lenses, P and Q, used in an astronomical telescope. The focal length of P is 40 cm and for Q is 10 cm
Rajah 11.1 menunjukkan dua kanta penumpu , P dan Q, yang digunakan dalam sebuah teleskop astronomi. Panjang fokus bagi kanta penumpu P adalah 40 cm dan panjang focus bagi kanta Q adalah 10 cm.
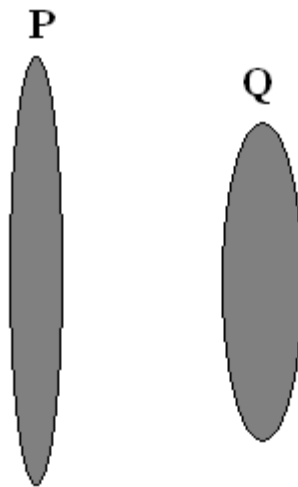
P

Q

Diagram 11.1
Rajah 11.1

(a) What is the meaning of focal length of lens ?
Apakah yang dimaksudkan dengan panjang fokus kanta?   [1mark]
[1 *markah*]

(b) By using suitable apparatus, explain how the focal length of both lenses can be estimated.

Dengan menggunakan peralatan yang sesuai terangkan bagaimana panjang fokus kedua-dua kanta dapat di anggarkan.
[4 marks]
[4 *markah*]

(c) Diagram 11.2 shows an arrangement of lenses to construct a simple astronomical telescope using lens P and lens Q.

Rajah 11.2 menunjukkan satu susunan kanta untuk membina sebuah teleskop astronomi ringkas menggunakan kanta P dan kanta Q.
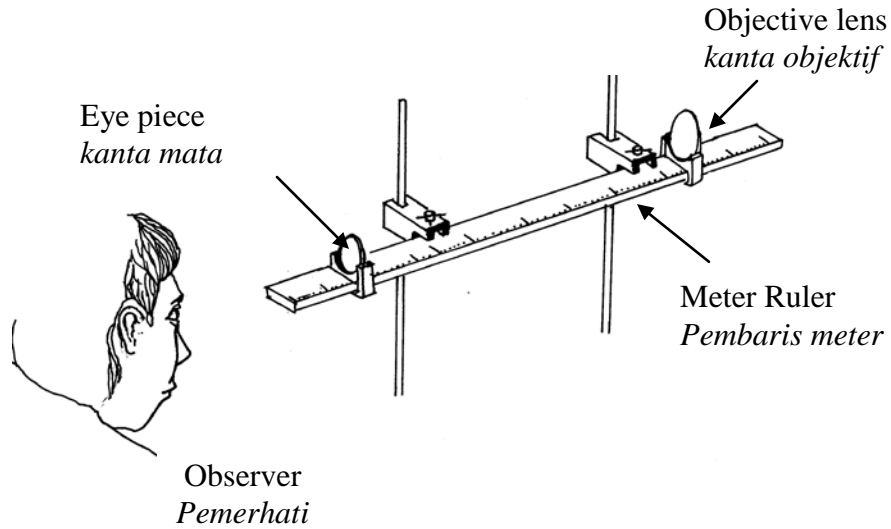
Diagram 11.2
Rajah 11.2

You are asked to investigate the arrangement and characteristics of the lenses used to construct the simple astronomical telescope as shown in Diagram 11.3.

Anda ditugaskan untuk menyiasat susunan kanta dan sifat-sifat kanta yang akan digunakan untuk membina sebuah teleskop astronomi ringkas seperti dalam Rajah 11.3.

Arrangement of lenses *Susunan kanta*	Focal length of objective lens, f₀ /cm *Panjang fokus kanta objek, f₀/cm*	Magnification of image *Pembesaran imej*	Distance between objective lens and eyepiece,D / cm *Jarak antara kanta objek dengan kanta mata, D / cm*	Diameter of objective lens, d /cm *Diameter kanta objek , d / cm*
J	40.0	4.00	50.0	Large
K	40.0	0.25	60.0	Small
L	10.0	4.00	50.0	Large
M	10.0	0.25	60.0	Small

Diagram 11.3
Rajah 11.3

Explain the suitability of the arrangement and each characteristics of the lenses and determine the arrangement which can produce the brightest and sharp image at normal adjustment.
Terangkan kesesuaian susunan dan sifat-sifat kanta dan tentukan susunan yang dapat menghasilkan imej yang paling terang dan paling tajam pada pelarasan normal.

(d) A camera has a convex lens of focal length 5 cm is used to capture an object of 1 m in height and 4 m from the camera.
Sebuah kamera yang mempunyai kanta cembung berjarak fokus 5 cm, digunakan untuk menangkap gambar suatu objek , 1m tinggi yang berjarak 4m dari kamera tersebut.

(i) determine the image distance from the camera
tentukan jarak imej yang terbentuk dari kamera

[2marks]
[2 *markah*]

(ii) Calculate the height of image produced in the camera
hitung tinggi imej yang terhasil dalam dalam kamera

[2marks]
[2 *markah*]

(iii) State the characteristics of image formed in the camera
Nyatakan ciri-ciri imej yang terbentuk dalam kamera

[1 marks]
[1 *markah*]

12. Diagram 12.1 shows a simple transformer.

Rajah 12.1 menunjukkan satu transformer mudah.
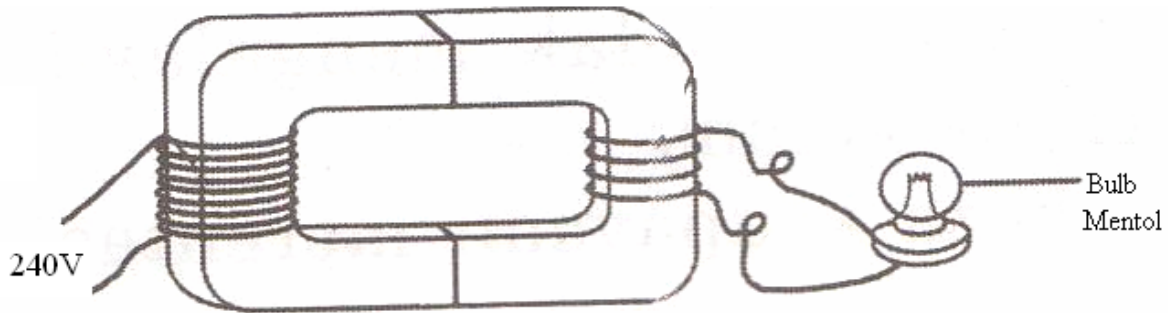
Diagram 12.1
Rajah 12.1

(a) State the transformations of energy involved in Diagram 12.1.

Nyatakan pemindahan bentuk tenaga yang terlibat dalam Rajah 12.1

[1mark]
[1 *markah*]

(b) Explain how the transformer works

Terangkan bagaimana transformer berfungsi.

[4 marks]
[4 *markah*]

(c) You are asked to investigate the design and the characteristic of four transformers
shown in Diagram 12.2.
Explain the suitability of each characteristics of the transformer and determine the
transformer which can be use as an ideal transformer.
Give reasons for your choice.

*Anda ditugaskan untuk mengkaji rekabentuk dan ciri-ciri bagi empat transformer
seperti yang ditunjukkan dalam rajah 12.2.
Terangkan kesesuaian setiap ciri transformer itu dan tentukan transformer yang
boleh digunakan sebagai transformer unggul.
Beri sebab untuk pilihan anda.*

[10 marks]
[10 *markah]*
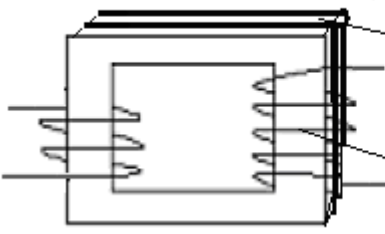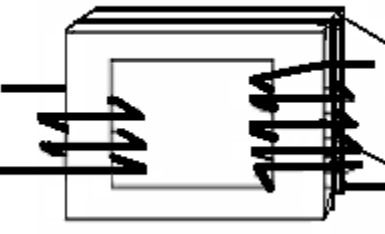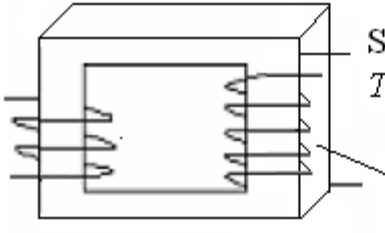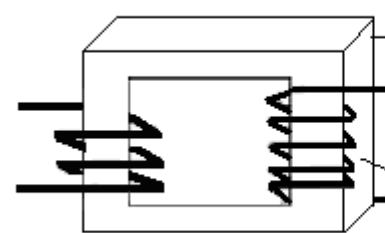
P	Laminated steel core *Teras keluli berlamina* Thin Constantan wire *Dawai konstanstan nipis*
Q	Laminated soft iron core *Teras besi lembut berlamina* Thick Copper wire *Dawai Kuprum tebal*
R	Solid soft iron core *Teras besi lembut padat* Thin Copper wire *Dawai Kuprum nipis*
S	Solid Steel Core *Teras besi keluli padat* Thick Constantan wire *Dawai konstantan tebal*

Diagram 12.2
Rajah   12.2

(d) Diagram 12.3 shows a 12V, 48W bulb lights up with normal brightness when it
      is   connected to a 240V main supply through a transformer.

      *Rajah 12.3 menunjukkan sebuah mentol 12V, 48W menyala dengan kecerahan
      normal bila ia disambungkan pada 240V bekalan utama melalui satu
      transformer.*
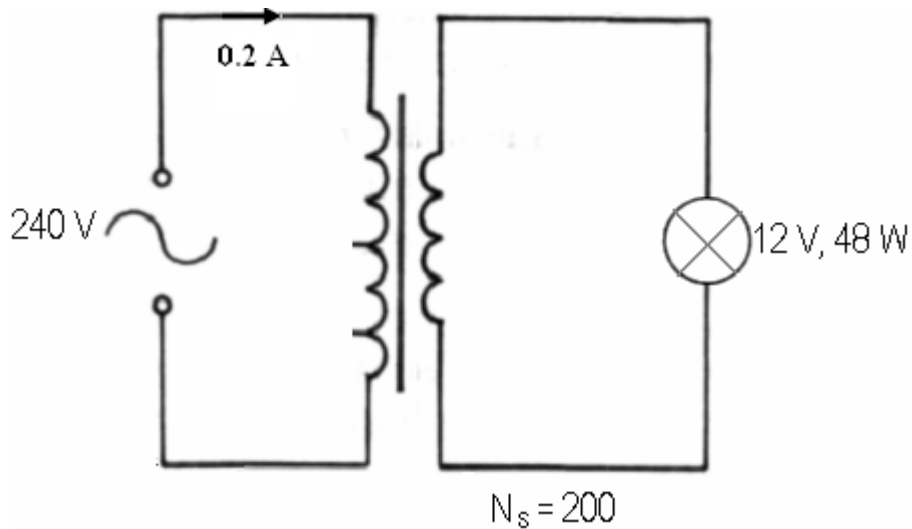
Diagram 12.3
Rajah 12.3

Calculate:
Hitung:

(i)   the output voltage of the transformer
         voltan output bagi transformer

(ii)   the number of turns of the primary coil
         bilangan lilitan pada gelung utama

(iii)   the efficiency of the transformer .
         kecekapan transformer itu .

[5 marks]
[5 *markah*]

PERSIDANGAN KEBANGSAAN PENGETUA-PENGETUA
SEKOLAH MENENGAH MALAYSIA
CAWANGAN KELANTAN

PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2010
PHYSICS
Kertas 3
Ogos / Sept
1 ½ jam

4531/3

Satu 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

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 15 halaman bercetak dan ___halaman tidak bercetak.

[28 marks]
[28 markah]

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

1. A student carries out an experiment to find out the relationship between number of turns, N and the current induce, I. A coil is wound with an insulated cooper wire with 40 turns. The coil is connected to a microammeter. The arrangement of the apparatus for the experiment is shown in Diagram 1.1.

    Seorang pelajar menjalankan satu eksperimen untuk mencari hubungan antara bilangan lilitan,N, dan arus teraruh, I . Satu gegelung dililitkan dengan dawai kuprum bertebat dengan 40 lilitan. Gegelung itu disambungkan kepada sebuah mikroammeter. Susunan radas bagi eksperimen itu ditunjukkan dalam Rajah 1.1.
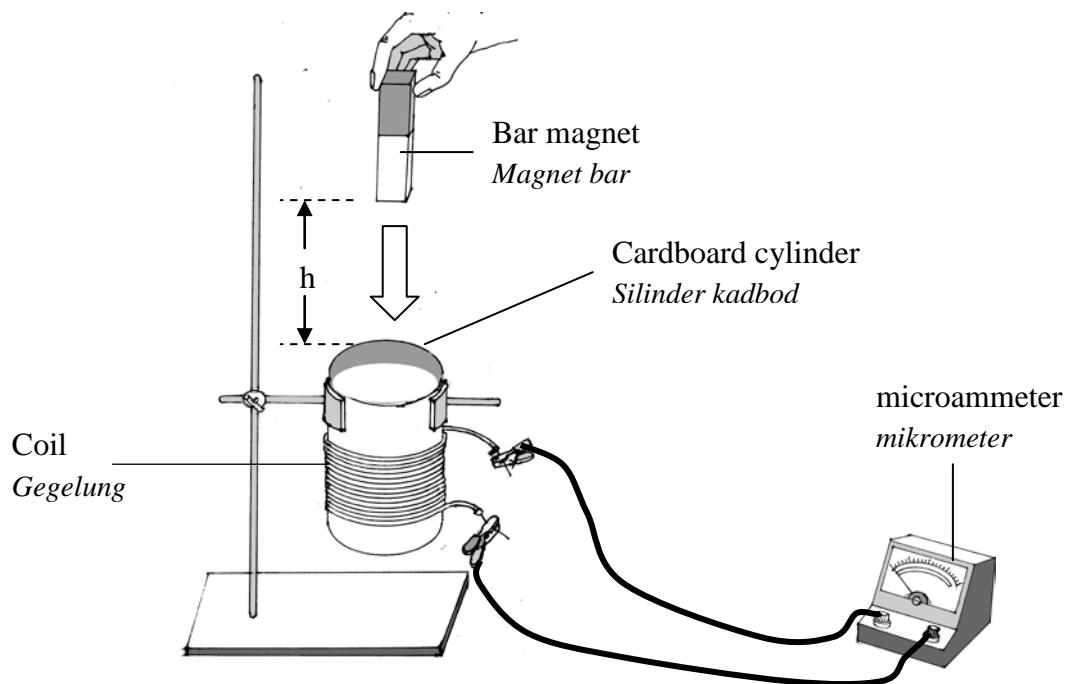
Diagram 1.1
Rajah 1.1

A bar magnet from a height, h of 50.0 cm is released so that it passes through the coil. The induce current, I is measured from the maximum reading of the microammeter . The actual maximum reading of the microammeter is shown in Diagram 1.2.

The experiment is repeated by using coils with number of turns 60, 80, 100 and 120. The maximum readings of the microammeter are shown in Diagram 1.3, 1.4, 1.5 and 1.6.

Satu magnet bar daripada ketinggian,h 50.0 cm dilepaskan supaya ia melalui gegelung. Arus teraruh, I diukur daripada bacaan maksimum mikroammeter. Bacaan maksimum sebenar mikroammeter adalah ditunjukkan dalam Rajah 1.2.

Eksperimen diulangi dengan menggunakan gegelung-gegelung dengan bilangan lilitan 60, 80, 100 dan 120. Bacaan-bacaan maksimum mikroammeter ditunjukkan dalam Rajah 1.3, 1.4, 1.5 dan 1.6.
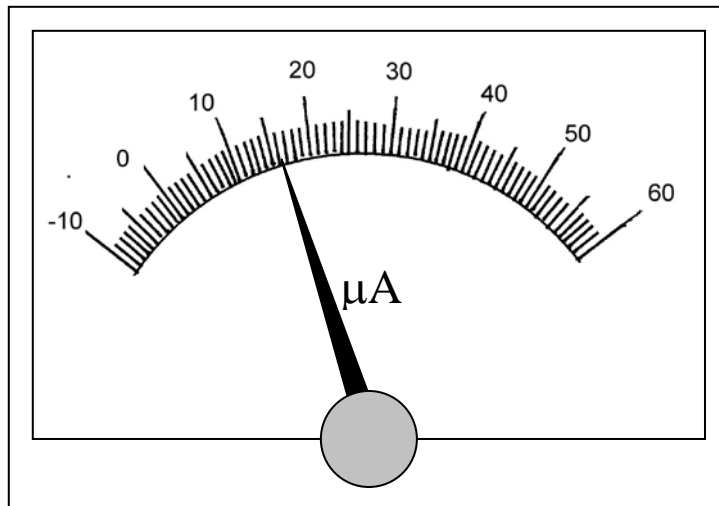
I = ……… μA

Number of turns = 40 turns
Bilangan lilitan = 40 lilitan

Diagram 1.2
Rajah 1.2
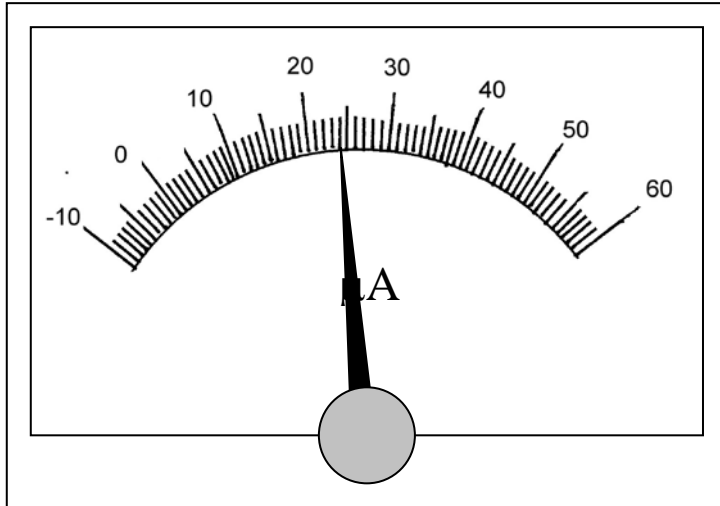
I = ……… μA

Number of turns = 60 turns
Bilangan lilitan = 60 lilitan

Diagram 1.3
Rajah 1.3
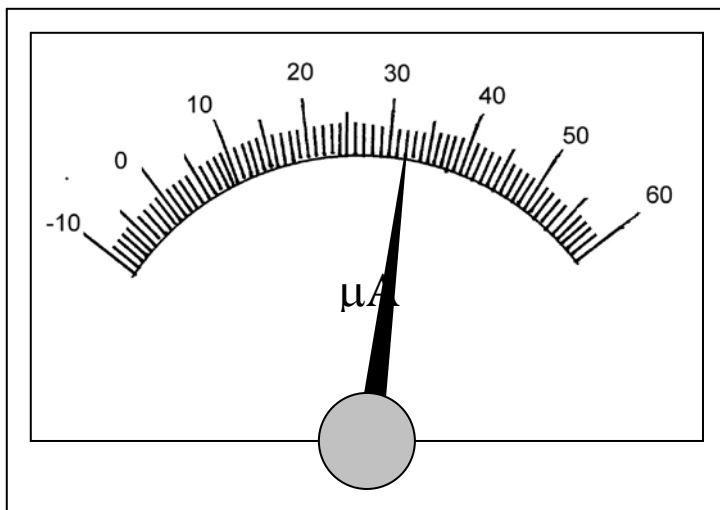
I = ……… μA

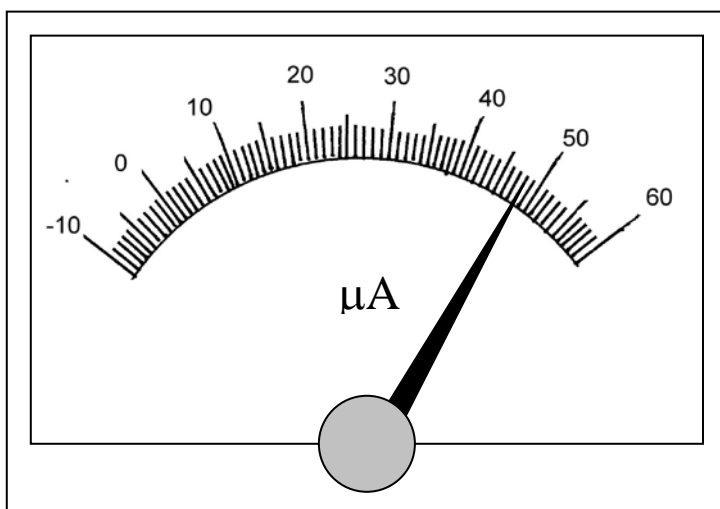Number of turns = 80 turns
Bilangan lilitan = 80 lilitan

Diagram 1.4
Rajah 1.4
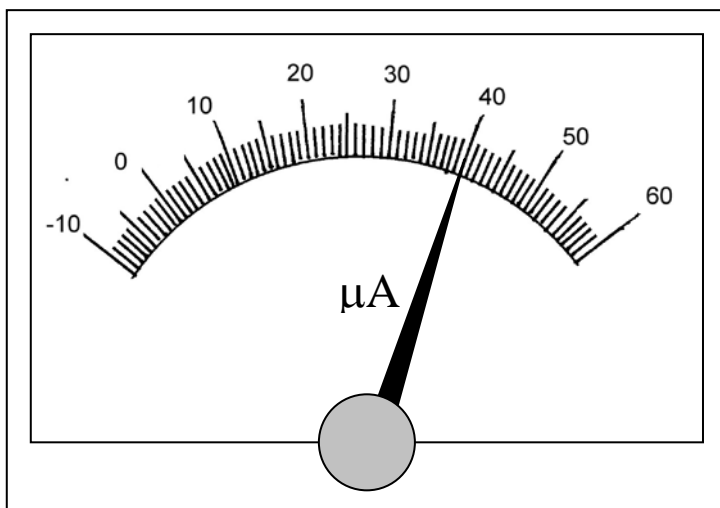
I = ………   μA

Number of turns = 100 turns
Bilangan lilitan = 100 lilitan

Diagram 1.5
Rajah 1.5

I = ………   μA

Number of turns = 120 turns
Bilangan lilitan = 120 lilitan

Diagram 1.6
Rajah 1.6

(a)   For the experiment described on pages 2, 3, 4 and 5, identify :

Bagi eksperimen yang diterangkan di halaman 2, 3, 4 dan 5, kenal pasti:

(i)   The manipulated variable.

Pemboleh ubah di manipulasikan.

……………………………………………………………………..

[1 mark]

[*1 markah*]

(ii)   The responding variable.

Pemboleh ubah bergerakbalas

……………………………………………………………………..

[1 mark]

[*1 markah*]

(iii)   The constant variable.

Pemboleh ubah dimalarkan

……………………………………………………………………..

[1 mark]

[*1 markah*]

(b)   For this part of the question, write your answers in the spaces provided in the corresponding diagrams.

Untuk bahagian soalan ini, tulis jawapan anda dalam ruang yang disediakan dalam rajah-rajah yang sepadan.

(i)   Based on Diagram 1.2, 1.3, 1.4, 1.5 and 1.6 on pages 3, 4 and 5, record the reading of I.

Berdasarkan Rajah 1.2, 1.3, 1.4, 1.5 dan 1.6 di halaman 3,4 dan 5,   catat bacaan I.

[3 marks]

[*3 markah*]

http://chngtuition.blogspot.com

(ii)   Tabulate your results for all the values of N and I in the space below.

Jadualkan keputusan anda bagi semua nilai N dan I dalam ruang di bawah.

[4 marks]
[*4 markah*]

(c)   On the graph paper on page 8, draw a graph of *I* against N.

Pada kertas graf di halaman 8, lukis graf I melawan N.
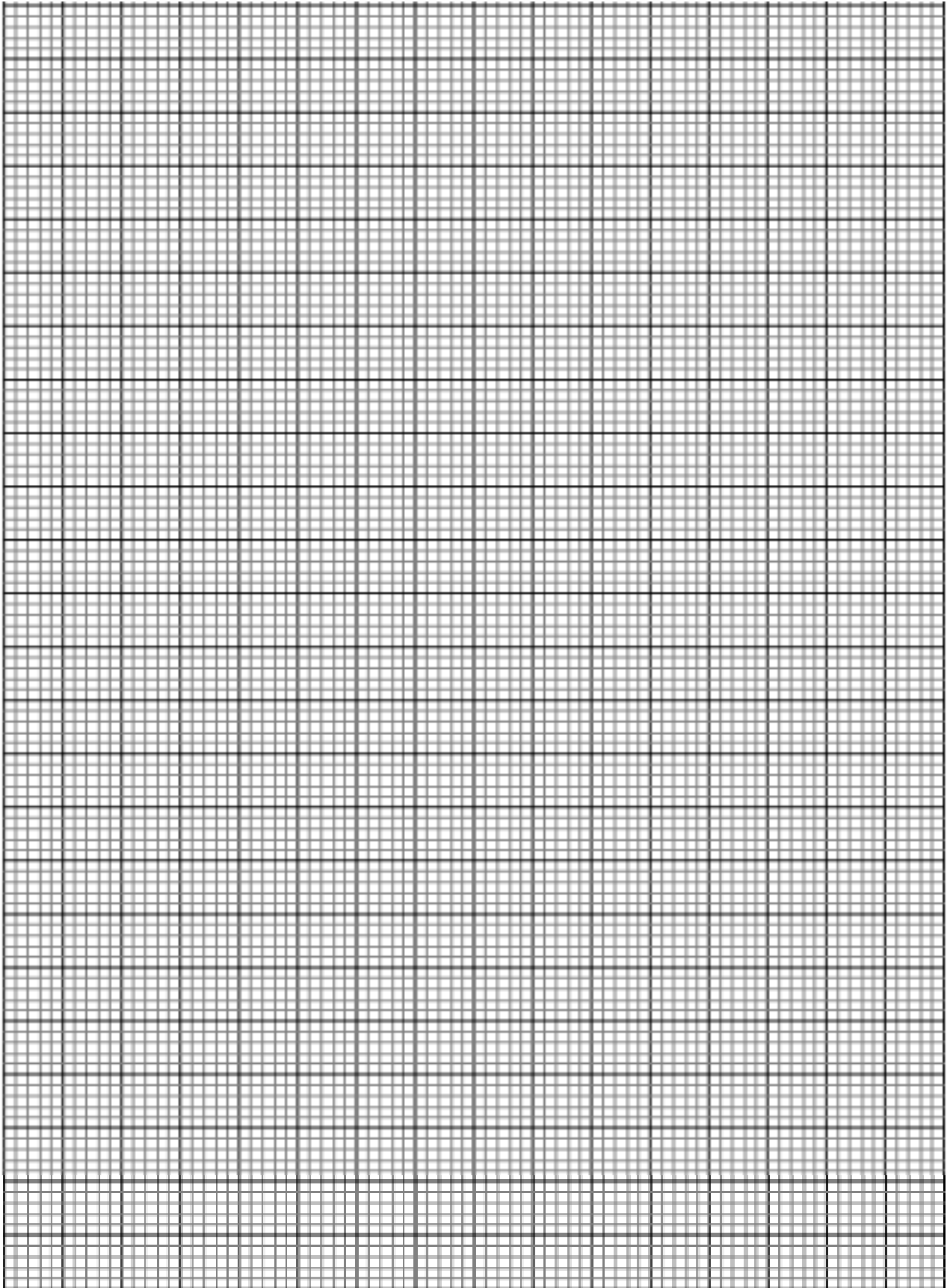
[5 marks]
[*5 markah*]

(e)   Based on your graph in 1(c), state the relationship between N and *I*.

Berdasarkan graf anda di 1(c), nyatakan hubungan antara I dan N.

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

Graph of I against N
Graf I melawan N

2. A student carried out an experiment to investigate the relationship between the depth, *h*, of a test tube which floats vertically in water and the number of steel ball bearings, *N*, in the test tube.

The results of this experiment are shown in the graph of *h* against *N* in Diagram 2.1 on page 10.

Seorang murid telah menjalankan satu eksperimen untuk menyiasat hubungan antara kedalaman, h satu tabung uji yang terapung tegak dalam air dan bilangan bebola logam, N dalam tabung uji itu.

Keputusan eksperimen ini ditunjukkan oleh graf h melawan N pada Rajah 2.1 di halaman 10.

(a)   Based on graph in Diagram 2.1 :

Berdasarkan graf pada Rajah 2.1 :

(i)   State the relationship between *h* and *N*.

Nyatakan hubungan antara h dan N.

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

(ii)   Determine the value of *h* when *N* = 0.
Show on the graph, how you determine the value of *h*.

Tentukan nilai h apabila N = 0.
Tunjukkan pada graf itu bagaimanaanda menentukan nilai h.

h = ……………………….. cm
[3 marks]
[3 *markah*]

(iii)   Determine the value of *N* when *h* = 12.6 cm
Show on the graph how you determine the value of *N*.

Tentukan nilai N apabila h = 12.6 cm.
Tunjukkan pada graf itu bagaimana anda menentukan nilai N.

N = ………………………..
[2 marks]
[2 *markah*]

Graph of *h* against *N*

Graf h lawan N
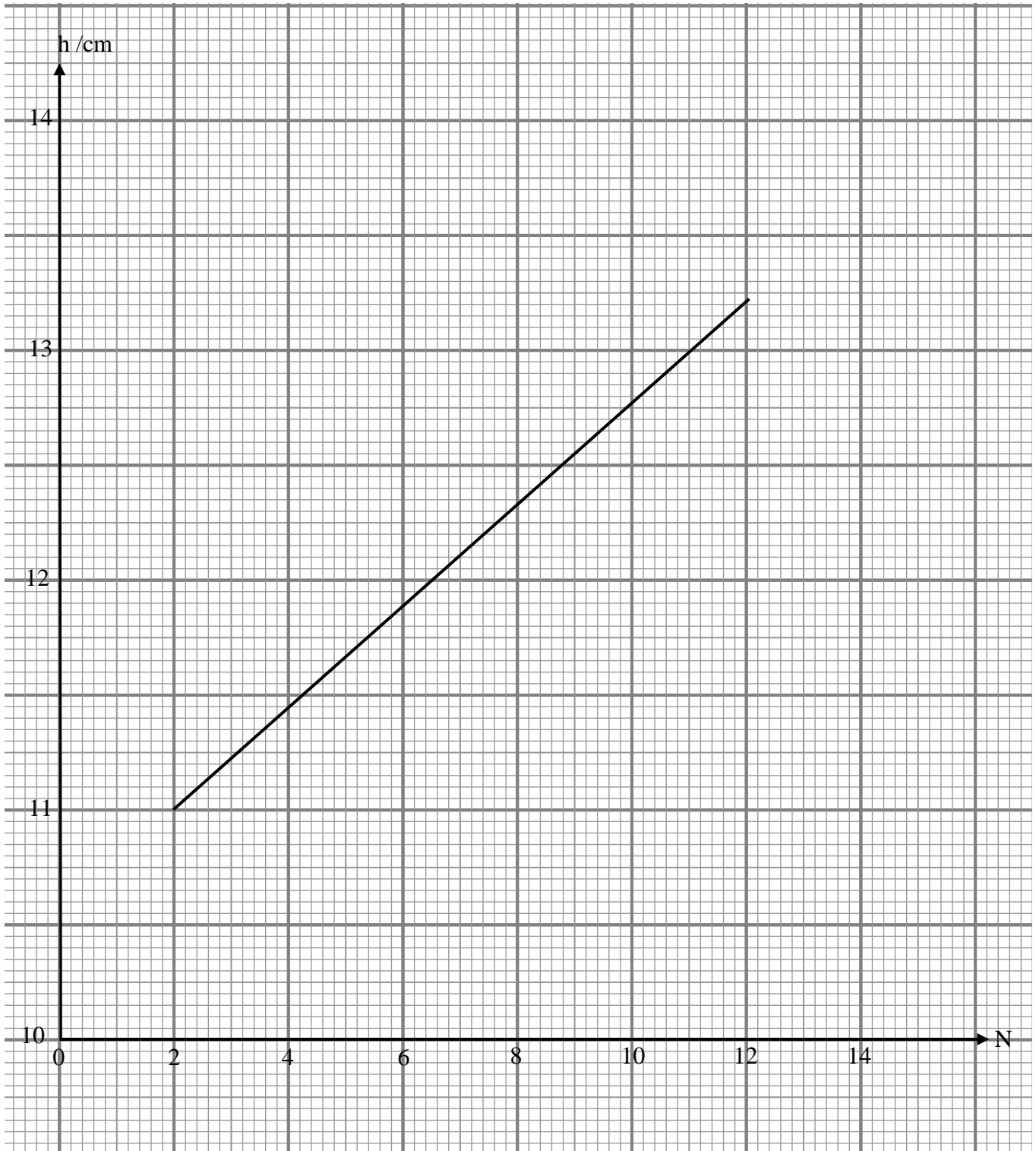
Diagram 2.1

Rajah 2.1

(b)   Calculate the gradient, *k*, of the graph.
Show on the graph how you calculate k.

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

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

(c)   The mass, *m*, of a steel ball bearing is given by the formula $m = 5.455\ d^2 k$,
where k is the gradient of the graph and *d* is the diameter of a steel ball bearing.
In this experiment, $d = 2.50$ cm.
Calculate the value of *m*.

Jisim, m, bagi bebola logam itu diberi oleh formula $m = 5.455\ d^2 k$,
dengan keadaan k ialah kecerunan graf dan d ialah diameter bebola logam.
Dalam eksperimen ini, $d = 2.50$ cm.
Hitung nilai m.

m = ……………………….

[2 marks]
[2 *markah*]

(d)   State **one** precaution that should be taken to improve the accuracy of the result
of this experiment.

*Nyatakan **satu** langkah berjaga-jaga yang perlu diambil untuk memperbaiki ketepatan*
bacaan dalam eksperimen ini.

……………………………………………………………………………..

[1 mark]
[1 *markah*]

Section B
Bahagian B

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3. Diagram 3.1 shows a line under a glass block. Diagram 3.2 shows an identical line under a Perspex block of the same size. An observer noticed that the image of the line formed in the glass block is nearer to the surface of the block.

    Rajah 3.1 menunjukkan satu garisan di bawah satu blok kaca. Rajah 3.2 menunjukkan garisan yang serupa di bawah blok perspek yang bersaiz sama. Seorang pemerhati mendapati imej garisan yang terbentuk dalam blok kaca adalah lebih dekat dengan permukaan blok itu.
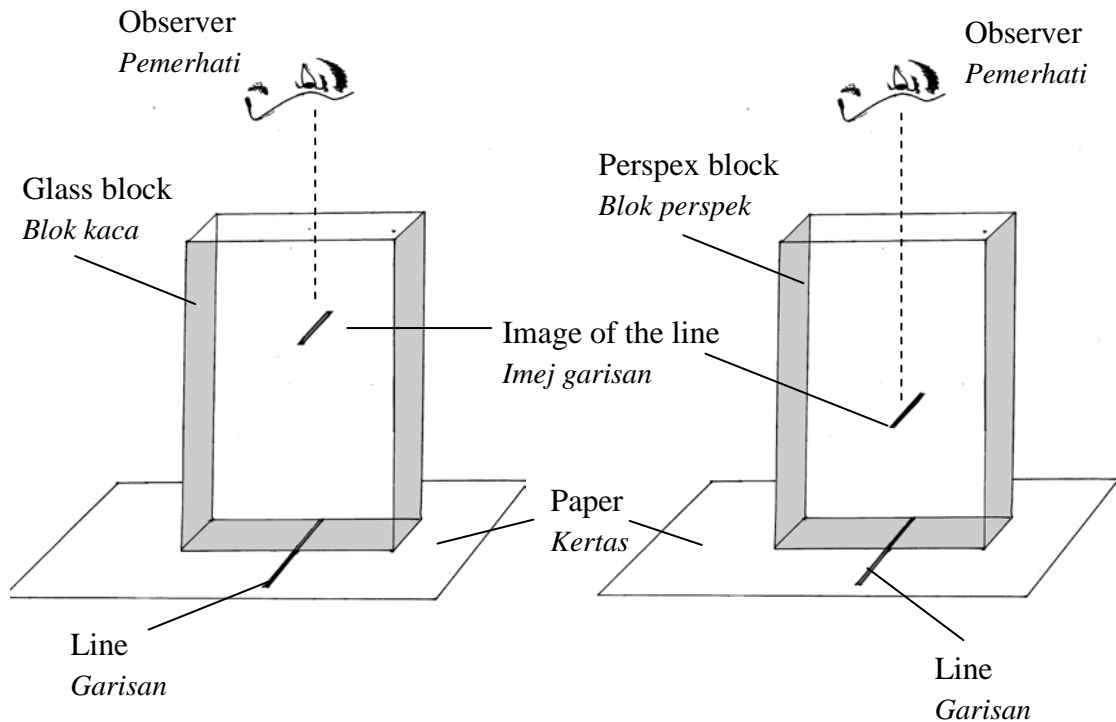

Observer
Pemerhati

Observer
Pemerhati

Glass block
Blok kaca

Perspex block
Blok perspek

Image of the line
Imej garisan

Paper
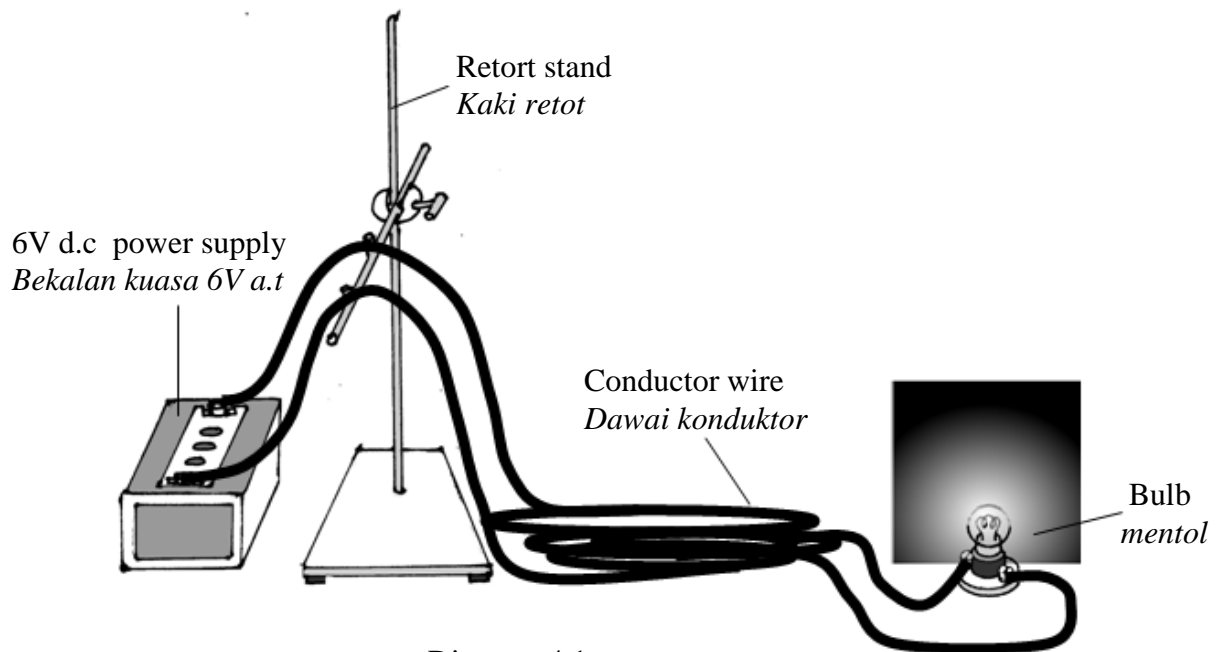*Kertas*

Line
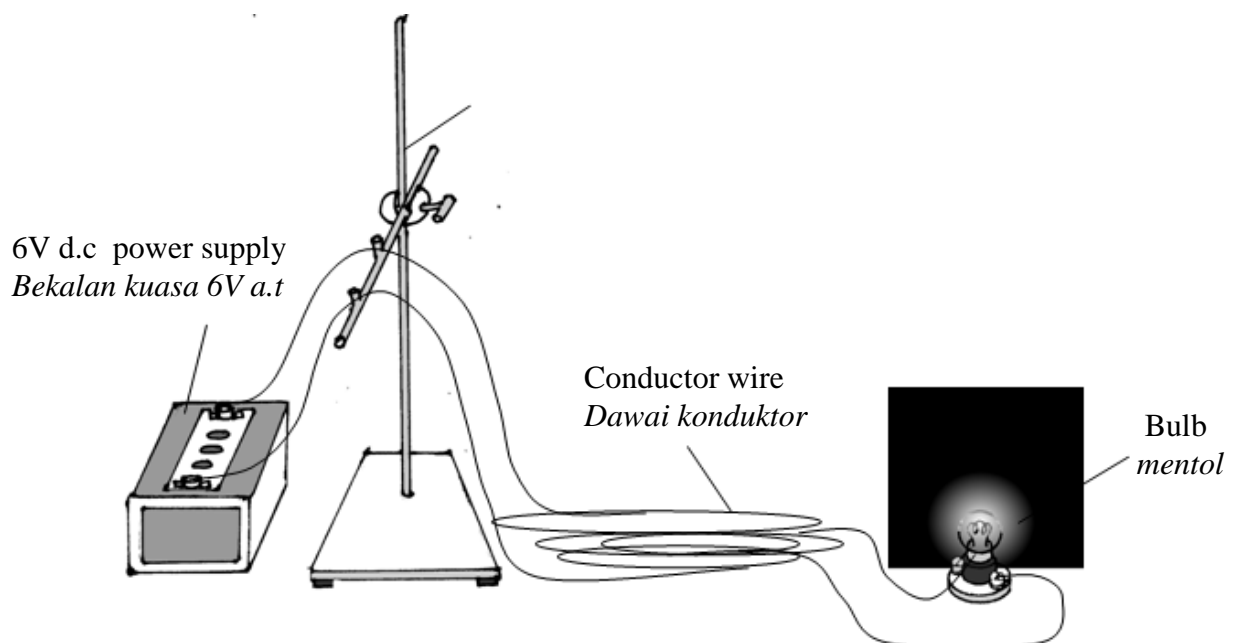*Garisan*

Line
Garisan

Diagram 3.1
Rajah 3.1

Diagram 3.2
Rajah 3.2

Based on the information and observation :

Berdasarkan maklumat dan pemerhatian tersebut :

(a)   State **one** suitable inference,

  *Nyatakan **satu** inferens yang sesuai.*

[1 mark]
[*1 markah*]

(b)   State **one** hypothesis that could be investigated.

*Nyatakan **satu** hipotesis yang boleh disiasat.*

[1 mark]
[*1 markah*]

(c) With the use of apparatus such as a tall beaker, water and other apparatus and material, describe **one** experiment to investigate the hypothesis stated in 3(b).

*Dengan menggunakan radas seperti sebuah bikar yang tinggi, air dan lain-lain radas, terangkan **satu** eksperimen untuk menyiasat hipotesis yang dinyatakan di 3(b).*

.

In your description, state clearly the following:

Dalam penerangan anda nyatakan dengan jelas perkara berikut

(i) The aim of an experiment.

Tujuan eksperimen.

(ii) The variables in the experiment

Pemboleh ubah dalam eksperimen

(iii) The list of apparatus and materials.

Senarai radas dan bahan

(iv) The arrangement of the apparatus

Susunan radas

(v) The procedure of the experiment.
Describe how to control the manipulated variable and how to measure the responding variable.
Prosedur yang digunakan dalam eksperimen.
Terangkan bagaimana mengawal pembolehubah dimanipuasikan dan bagaimana mengukur pembolehubah bergerak balas.

(vi) The way to tabulate the data

Cara anda menjadualkan data

(vii) The way to analyse the data

Cara untuk menganalisis data.

[10 marks]
[*10 markah*]

4. Diagram 4.1 and Diagram 4.2 show an identical bulbs connected to the conductor wires of identical length but of different thickness. When the power supply is switched on, the bulbs lighted with different brightness.

Rajah 4.1 dan Rajah 4.2 menunjukkan mentol yang serupa disambungkan pada dawai konduktor yang mempunyai panjang yang serupa tetapi berbeza ketebalan. Apabila bekalan kuasa dihidupkan, mentol itu menyala dengan kecerahan yang berbeza.

Retort stand
Kaki retot

6V d.c power supply
Bekalan kuasa 6V a.t

Conductor wire
Dawai konduktor

Bulb
mentol

Diagram 4.1
Rajah 4.1

6V d.c power supply
Bekalan kuasa 6V a.t

Conductor wire
Dawai konduktor

Bulb
mentol

Diagram 4.2
Rajah 4.2

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

(a)   State **one** suitable inference,

   *Nyatakan **satu** inferens yang sesuai.*

[1 mark]
[*1 markah*]

(b)   State **one** hypothesis that could investigated.

   *Nyatakan **satu** hipotesis yang boleh disiasat.*

[1 mark]
[*1 markah*]

(c)   With the use of apparatus such as a dry cells, constantan wire and other apparatus, describe **one** experiment to investigate the hypothesis stated in 4(b).

   *Dengan menggunakan rada seperti sel kering ,wayar konstantan dan lain-lain radas, terangkan **satu** eksperimen untuk menyiasat hipotesis yang dinyatakan di 4(b).*

   In your description, state clearly the following:
   Dalam penerangan anda nyatakan dengan jelas perkara berikut

   (i)   The aim of an experiment.

      T*ujuan eksperimen.*

   (ii)   The variables in the experiment.

      Pemboleh ubah dalam eksperimen.

   (iii)   The list of apparatus and materials.

      Senarai radas dan bahan.

   (iv)   The arrangement of the apparatus

      Susunan radas.

   (v)   The procedure of the experiment.
           Describe how to control the manipulated variable and how to measure the responding variable.
      Prosedur yang digunakan dalam eksperimen.
      Terangkan bagaimana mengawal pembolehubah dimanipuasikan dan bagaimana mengukur pembolehubah bergerak balas.

   (vi)   The way to tabulate the data

      Cara untuk menjadualkan data

   (vii)   The way to analyse the data

      Cara untuk menganalisis data

[10 marks]
[*10 markah*]

END OF QUESTION
KERTAS SOALAN TAMAT

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PEPERIKSAAN PERCUBAAN SPM KELANTAN 2010
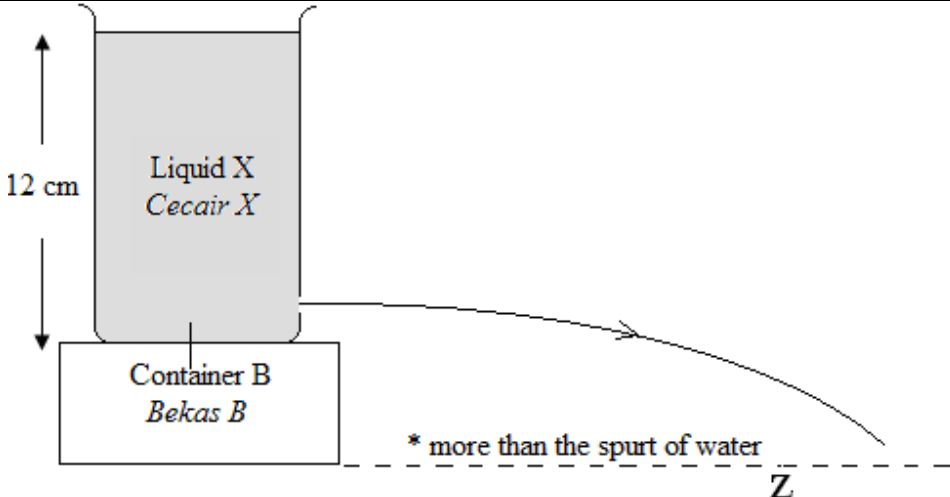
PERATURAN PEMARKAHAN PHYSICS

PAPER 1

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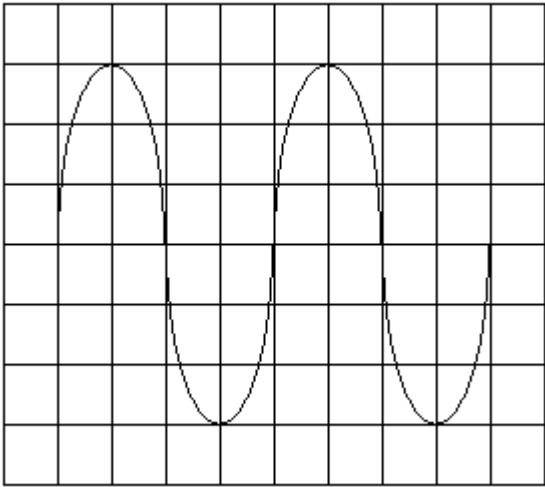
MARKING SCHEME (PAPER 2)

SECTION A

Question No.	Answer	Marks
1 (a) (i)	Increases	1
(ii)	Metal sphere absorbs heat from boiling water.	1
(b) (i)	<table><tr><td>√</td><td>The rate of heat flows from boiling water = the rate of heat flows from metal sphere. *Kadar pengaliran haba dari air mendidih = kadar pengaliran haba dari sfera logam.*</td></tr></table>	1
(ii)	Thermal equilibrium	1
	TOTAL	**4**
2 (a)	Pressure = $\frac{\text{Force}}{\text{Area}}$	1
(b)	Depth / Density / gravity	1

(c)	P = hρg
	    = 0.12 x 1000 x 10
	    = 1200 Pa.
		1
		1

(d)		1
	TOTAL	**5**
3 (a)	Beam of electron moving at high speed *Alur elektron berhalaju tinggi*	1

(b)	1. Light from the filament is blocked by the cross
	    Cahaya dari filament dihalang oleh palang
	// Cathode ray is blocked by the cross
	    Sinar katod dihalang oleh palang
		1

(c)	1. Correct substitution $\sqrt{\quad}$ $\dfrac{2\,(1.6 \times 10^{-19})\,(3000)}{9 \times 10^{-31}}$ 2. Correct answer with unit $3.27 \times 10^{7}\ ms^{-1}$	1 1
(d) (i)		1
(ii)	Fleming's left- hand rule // *Peraturan tangan kiri Fleming*	1
	TOTAL	**6**
4 (a) (i)	A region in which there is an electric force // a region around a charged object which gives electric force on another charged object.	1
(ii)	Increases	1
(b) (i)	Negative charged	**1**
(ii)	Attracted to positive plate // Repelled away from negative plate	**1**
(c) (i)	Note : The flame flatten and spread out more toward negative plate Candle	1
(ii)	1. The heat of burning candle produces positive and negative ions. 2. The positive ions which are heavier is pulled towards negative plate with a large proportion flame	1 1
	TOTAL	**7**
5 (a)	Number of oscillations in one second.	1
(b) (i)	Mass of plasticine in Diagram 5.1 < in Diagram 5.2	1
(ii)	Frequency in Diagram 5.1 > frequency in Diagram 5.2	1
(iii)	The greater the mass the lower the frequency	1
(c)	Inertia	1
(d)	Increase	1

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(e) (i)	$T = \dfrac{t}{n} = \dfrac{10}{20} = 0.5$ s		1
(ii)	$F = \dfrac{1}{T} = \dfrac{1}{0.5} = 2$ Hz		1
		TOTAL	**8**
6 (a)	An electromagnet is a solenoid which can produce magnetic field when current passes through it. When the current is switch off, the solenoid loses its magnetism.		1
(b)	Due to left		1
(c) (i)	In diagram 6.2 the number of turns of the coils more than 6.1		1
(ii)	In diagram 6.2 the number of magnetic field line is more than that in Diagram 6.1		1
(iii)	The current flow in Diagram 6.1 and Diagram 6.2 are the same		1
(d)	As the number of turns of solenoid increase the strength of an electromagnet increase		1
(e) (i)	The strength of electromagnet increase		1
(ii)	The magnetic field line are closer // magnetic field line will be concentrate		1
		TOTAL	**8**
7. (a)	Radioactivity is the spontaneous disintegration of unstable nucleus with the emission of energetic particles or photons.		1
(b) (i)	X - alpha particle Z – beta particle		1 1
(ii)	Z is lighter than X		1
(c) (i)	Nuclear Fission		1
(ii)	$$_{92}^{235}\text{U} + {}_{0}^{1}\text{n} \longrightarrow \boxed{{}_{56}}^{141}\text{Ba} + {}_{36}^{92}\text{Kr} + 3\,{}_{0}^{1}\text{n}$$		1
(iii)	$E = mc^2$ $= (2.988 \times 10^{-11})(3 \times 10^8)^2$ $= 2.67 \times 10^{-11}$ J		1 1
(d) (i)	-strong radioactive substances are handled using remote controlled mechanical arms from a safe distance // -weak radioactive substance can be handled by forceps		1

		-workers should wear a special badge // -wearing protective suits and gears such as gloves, eye glasses//	
	(ii)	-to avoid direct contact - detect the amount of radiation they are exposed to// * the reason should be related to the answer given in (d)(i)	1
		TOTAL	**10**
8. (a)(i)		Longitudinal wave / mechanical wave	1
	(ii)	No sound / sound cannot be heard	1
	(iii)	Sound wave cannot propagate // sound energy cannot be transferred	1
(b)		 1. Amplitude of the wave drawn is bigger Note: accept as long as the amplitude drawn is slightly bigger.	1
(c) (i)		P – Infrared Q - Ultraviolet	1 1
	(ii)	Gamma ray / ultraviolet / x-Ray	1
	(iii)	Can kills the life cell / skin burn or skin cancer / Note: the reason given must be related to the answer in (c) (ii)	1
	(iv)	Radio wave / microwave	1
	(v)	High frequency / high energy / high penetrating power / less diffracted	1
	(vi)	Gamma Ray	1
	(vii)	high energy / high penetrating power	1
		TOTAL	**12**

SECTION B

No			Suggested Answer	Mark	
9	(a)	i)	The temperature in which a solid substance change to liquid at atmospheric pressure	1	1
		ii)	1. The mass of substance in Diagram 9.1 < in Diagram 9.2	1	
			2. Time taken to reach the melting point in Diagram 9.1 < in Diagram 9.2	1	
			3. Time taken by the substance to change into liquid completely in Diagram 9.1 < in Diagram 9.2	1	
			4. The greater the mass the longer the time taken by the substance to change into liquid completely.	1	
			5. The greater the mass the greater the latent heat of fusion absorbed	1	5
	(b)		1. In daytime the sun warms the land to higher temperature than the sea.	1	
			2. The land has a lower specific heat capacity than sea-water.	1	
			3. The air above the land is heated and rises	1	
			4. The cooler air above the sea moving to land.	1	4
	(c)		*(see table below)*		

Aspect	Explanation		
High specific heat capacity of liquid	Becomes hot faster	2	
High boiling point of liquid	Not easily change into vapour	2	
Low rate of rusting material	Long lasting // not easily rust	2	
Strong material	Not easily breaks	2	
The size of the fan is big	To blow large amount of heat	2	10

			TOTAL		**20**

No			Suggested Answer	Mark	
10	(a)		24 J of energy is consumed in 1 s if connected to a 6V power supply // if the voltage is 6 V the power produced is 24 W	1	1
	(b)	(i)	Reading of ammeter is the same	1	
			The brightness of filament lamp in Diagram 10.1 is brighter than Diagram 10.2 // vice versa // Filament M is brighter	1	
		(ii)	The thickness of wire in Diagram 10.4 is bigger than in Diagram 10.3 // vice versa // Filament M is thinner	1	5
		(iii)	The thinner the wire the brighter the lamp // vice versa	1	
			The thinner the wire the more the heat produced by the lamp.	1	
	(c)		1 Two pin plug has no earth wire // three pin plug has earth wire	1	
			2 using 2 pin plug, if there is leakege of current it will also flow through the metal body // using 3 pin plug if there is leakege of current it will flow to the ground	1	
			3 The person who touches the metal body will experiences electric shock // using 3 pin plug, the current will be earthed	1	
			4 using 2 pin is not safe to the consumer // Using 3 pin plug is more safer to the consumer	1	4

(d)	
Aspect	Explanation
Use tungsten	High melting point
Coiled	longer wire, increase the resistance
high melting point	not easy to melt under high temperature
Low rate of rusting	Does not get rust easily
use termostat	When temperature reach $100^{o}C$, the water heater will automatically turned off

Marks: 2, 2, 2, 2, 2 — 10

| | | | TOTAL | | 20 |

No			Suggested Answer	Mark	
11	(a)		Distance between focal pint and the optical centre of a lens	1	1
	(b)		1. The convex lens is aimed/focused to a distant object (infinity) 2. The screen is adjusted until a sharp image is formed on the screen 3. The distance between the screen and the lens is measured 4. Focal length = distance between the screen and the lens	1 1 1 1	4
	(c)		<table><tr><td>Aspect</td><td>Explanation</td></tr><tr><td>Longer focal length</td><td>To produce real, inverted and smaller image</td></tr><tr><td>High magnification</td><td>Produce bigger image</td></tr><tr><td>Distance = fo + fe</td><td>Produce image at normal adjustment // image at infinity</td></tr><tr><td>Bigger diameter</td><td>More light can enter objective lens // more brighter</td></tr><tr><td>J is chosen</td><td>Longer focal length, higher magnification, Distance between two lenses = fo + fe and bigger diameter</td></tr></table>	2 2 2 2 2	10
	(d)	(i)	$\dfrac{1}{f} = \dfrac{1}{u} + \dfrac{1}{v}$ $\dfrac{1}{v} = \dfrac{1}{5} - \dfrac{1}{400}$ $v = 5.063$ cm	1 1	
		(ii)	$\dfrac{h_2}{h_1} = \dfrac{v_2}{v_1}$ $\dfrac{h_2}{100} = \dfrac{5.063}{400}$ $h_2 = 1.27$ cm	1 1	
		(iii)	Real , inverted and diminished.	1	5
			TOTAL		**20**

No			Suggested Answer	Mark	
12	(a)		Electrical energy ⟶ light energy	1	1
	(b)	(i)	1. When an a.c. voltage is supplied to the primary coil, the soft - iron core is magnetized	1	
			2. The magnet produced varies in magnitude and direction	1	
			3. This causes a changing magnetic flux to pass through the secondary coil	1	
			4. Induced e.m.f across the secondary coil is produced.	1	4
	(c)				

Aspect	Explanation	
Soft iron core	Easy to magnetized and demagnetised	2
Laminated	Less eddy current/ reduce energy lost	2
Thick wire	Reduce the resistance/more current	2
Copper wire	Low resistance/ reduce the lost of heat	2
Q	Soft iron core, Laminated , thick wire, Copper wire	2

(c) total: 10

No			Suggested Answer	Mark	
	(d)	(i)	12 V	1	
		(ii)	$\dfrac{Np}{Ns} = \dfrac{Vp}{Vs}$		
			$Np = \dfrac{240}{12} \times 200$	1	
			$= 4000$	1	
		(iii)	Efficiency $= \dfrac{Po}{Pi} \times 100$		
			$= \dfrac{240 \times 0.2}{48} \times 100$	1	
			$= 100 \%$	1	5
			TOTAL		**20**

PAPER 3
TRIAL KELANTAN 2010 FIZIK
PERATURAN PEMARKAHAN

No	SECTION A	
	Answer	Mark
1 (a)	(i) number of turn // N	1
	(ii) induced current//current // I	1
	(iii) height of magnet, h	1
(b)	16 µA 5 are correct - 3 m 24 µA 4 - 2 m 32 µA < 3 - 1 m 40 µA 48 µA	3
(c)		4

N/ turns	I / µA
40	16
60	24
80	32
100	40
120	48

Topic (N and I)   ✓
Unit (turns and µA)   ✓
Value-N (No d.p)   ✓
Value-I   (consistency)   ✓

| (d) | | 5 |

Correct axis --- ✓
Correct unit -   ✓
Even scale   ✓
All 5 point transfer correctly on graph   ✓✓
or 4 point transfer correctly on graph   ✓
Draw one best fit straight line with y-intercept ✓
Graph size used (> 50 percent)   ✓

Skor	Markah
7	5
6 or 5	4
4 or 3	3
2	2
1	1

(e)	I is directly proportional to N	1
	TOTAL MARK	**16**

2 (a)	(i) h increased linearly with N.	1
	(ii) -Extrapolate line intercept h axis.	1
	- show on graph the value of h (with unit)	1
	- state the value of h = 12.6 cm	1
	(iii) – show horizontal line from 13.4 cm touches the graph then vertical line until it touches the n axis.	1
	- N = 9 (from the graph = 9.2)	1
(b)	- show Δ with an acceptable size. (> 8 cm x 8 cm)	1
	- substitute correctly $$\frac{y_2 - y_1}{x_2 - x_1} = \frac{13.2 - 11.0}{12.0 - 2.0}$$	1
	- state the value of gradient and its value k = 0.22 cm	1
(c)	m = 5.455 d^2 k	
	= 5.455 (2.5)^2 (0.22) ………….. gantian betul	1
	= 7.5 (tanpa unit)	1
(d)	The position of eye should be in line with the scale reading to be taken	1
	TOTAL MARK	**12**

	SECTION B	
3 (a)	*Inference* : Apparent depth depends on the density/type of block/material	1
	Hypothesis : When the density (of material) increase , the apparent depth decrease/depth of image	1
	(i) Aim : To investigate the relationship between density and apparent depth/depth of the image	1
	(ii)*Variables* :	
	manipulated V : density// mass of salt	1
	responding V : apparent depth/depth of image	1
	fixed V : real depth , volume water(ignore the change of volume of water + salt)	No Mark
	(iii)*Apparatus and materials* : Tall Beaker/cylinder, pin, retort stand , water , salt , meter	

	rule, triple beam balance	1

(iv) Set up apparatus
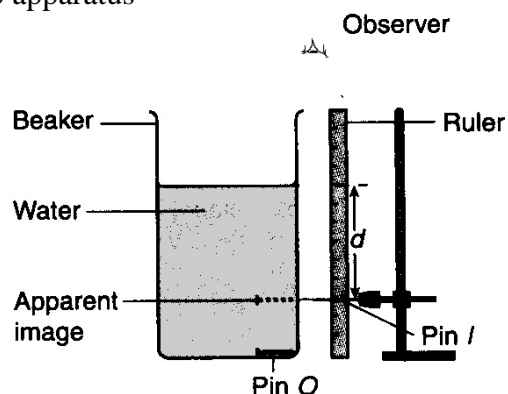
(v) *procedure*
Fill the beaker with (V = 1000 cm^3) water.
Put the 20 g of salt into the beaker and stir .

Place a pin O into the water.
Adjust the position of the pin I (at the retort stand) by observing above the beaker until it appears in line with the image
Measure the apparent depth of the straight line,d.

Repeat the experiment with(different four densities of liquids) by mixing the mass of salt , m = 30g , 40g, 50g, and 60g .

(vi)

Mass of salt,m/g	Apparent depth,d /cm
30	
40	
50	
60	
70	

Density of liquid,ρ / kgm^{-3}	Apparent depth,d /cm
ρ_1	
ρ_2	
ρ_3	
ρ_4	
ρ_5	
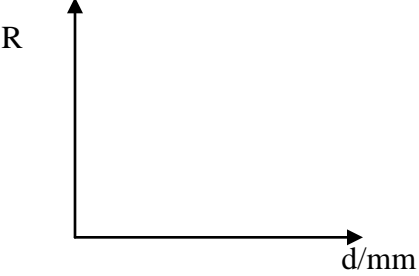
(vii) graph

Accept : Correct axis and unit only

		TOTAL MARK	12

4 (a)	Inference: Resistance// brightness of bulb depends on the diameter/thickness of the conductor wire	1
	Hypothesis When the diameter/thickness increase , the resistance decrease	1
	Aim : To investigate the relationship between the diameter /thickness of the conductor wire and resistance	1
	Variable : Manipulated : diameter / thickness Responding : resistance / voltage	1 1
	Fixed : length of conductor	No mark
	Apparatus and material Dry cells, insulated constantan wire, connector wire, ammeter, voltmeter, rheostat , switch, meter rule	1
	Set up apparatus 	1
	Procedure: A 20 cm length of constantan wire of diameter of 0.1 mm is connected to a circuit as shown in diagram above.	1
	Adjust the rheostat and until the ammeter reading is I = (0.2A). Measure the corresponding reading on the voltmeter, V Calculate the resistance of conductor using equation; $R = V/I$	1

	Repeat the experiment with the diameter of constantan wire , 0.2 mm , 0.3 mm, 0.4mm and 0.5mm.	1
	Tabulating data	1

Diameter,d/mm	Resistance,R/ Ω
0.1	
0.2	
0.3	
0.4	
0.5	

(Accept : swg as a scale of diameter)

Analyzing data:

R

d/mm

	1
TOTAL MARK	12