SULIT
4531/1
Physics
Kertas 1
Ogos
2012
1½ jam

Nama : .....

Tingkatan : .....

MAJLIS PENGETUA SEKOLAH-SEKOLAH MALAYSIA (MPSM)
CAWANGAN KELANTAN

PEPERIKSAAN PERCUBAAN SPM
TINGKATAN LIMA
2012

PHYSICS
KERTAS 1
Masa : 1 jam 15 minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

Arahan
1. Kertas soalan ini adalah dalam dwibahasa.
2. Soalan dalam Bahasa Inggeris mendahului soalan yang 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 ini.

Kertas soalan ini mengandungi 37 halaman bercetak

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

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

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

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

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

4. momentum = mv

5. F = ma

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

7. Potential energy = mgh
Tenaga keupayaan

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

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

10. Pressure, P = hρg
Tekanan

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

12. Quantity of heat, Q = mcθ
Kuantiti haba

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

14. $E = mc^2$

15. $v = f\lambda$

16. V = IR

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

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

18. Power, P = IV
Kuasa

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

20. Efficiency $= \frac{I_s V_s}{I_p V_p} \times 100\,\%$
Kecekapan

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

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

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

24. $n = \frac{\text{real depth}}{\text{apparent depth}}$

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

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

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 is a base unit?
Yang manakah antara berikut adalah merupakan unit bagi kuantiti asas?

A Joule
Joule

B Watt
Watt

C Pascal
Pascal

D Second
Saat

2 144 km h^{-1} is equivalent to
144 km h^{-1} adalah bersamaan dengan

A 20 m s^{-1}

B 30 m s^{-1}

C 40 m s^{-1}

D 50 m s^{-1}

3. Diagram 1 shows a micrometer screw gauge used to measure the thickness of a sheet of Aluminium.
Rajah 1 menunjukkan tolok skru mikrometer yang digunakan untuk mengukur ketebalan sekeping Aluminium.

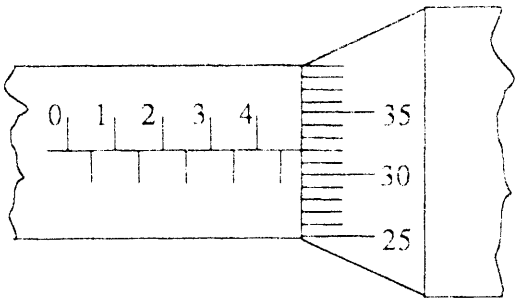


Diagram 1
Rajah 1

What is the thickness of the Aluminium sheet?
Berapakah ketebalan kepingan Aluminium itu?

A 4.32 mm
B 4.38 mm
C 4.82 mm
D 4.88 mm

4 Diagram 2 shows a part of a ticker tape produce by a motion of a trolley.
Rajah 2 menunjukkan sebahagian dari pita detik yang dihasilkan oleh gerakan sebuah troli.

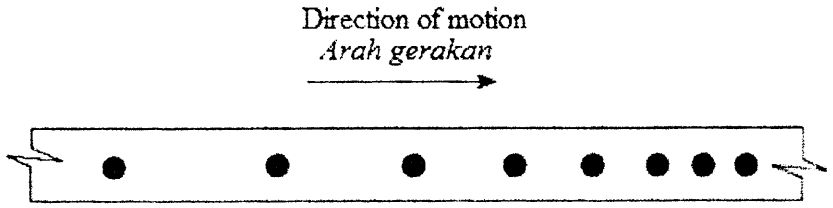


Diagram 2
Rajah 2

What is the type of motion produce by the trolley?
Apakah jenis gerakan yang dihasilkan oleh troli tersebut?

A Constant velocity
Halaju seragam
B Increasing velocity
Halaju bertambah
C Decreasing velocity
Halaju berkurang

5 Diagram 3 shows a velocity – time graph.
Rajah 3 menunjukkan satu graf halaju - masa.

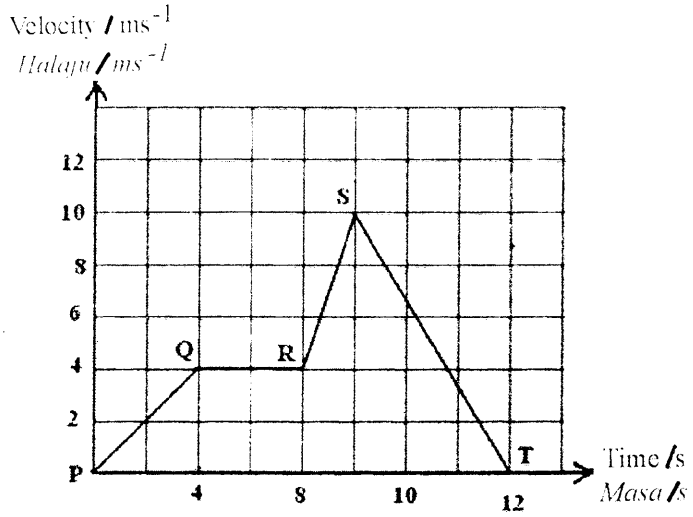


Diagram 3
Rajah 3

At which part of the graph shows the highest acceleration?
Pada bahagian manakah dari graf itu menunjukkan pecutan paling tinggi?

A PQ
B QR
C RS
D ST

6 Diagram 4 shows an air bag functioned when the emergency brake is applied by the driver.
Rajah 4 menunjukkan sebuah beg udara berfungsi apabila pemandu menekan brek kecemasan.

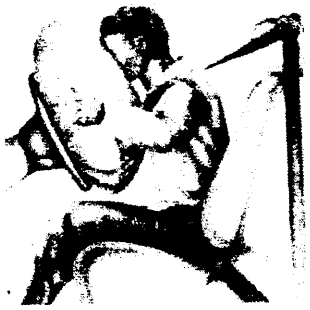


Diagram 4
Rajah 4

The air bag used in the car is to reduce
Beg udara yang digunakan di dalam kereta itu adalah untuk mengurangkan

A inertia
inersia

B friction
geseran

C change of momentum
perubahan momentum

D rate of change of momentum
kadar perubahan momentrum

7 Which of the following statement is true about an object that experiences free fall?
Antara pernyataan berikut, yang manakah benar mengenai suatu objek yang mengalami jatuh bebas?

A The kinetic energy of the object decreases.
Tenaga kinetik objek itu berkurang.

B The velocity of the object is constant.
Halaju objek itu adalah tetap.

C The momentum of the object decreases.
Momentum objek itu adalah berkurang.

D The acceleration of the object is constant.
Pecutan objek itu adalah tetap.

8 Diagram 5 shows a weightlifter successfully lifting a load of 50 kg. The work done is 750 J.
Rajah 5 menunjukkan seorang ahli angkat berat berjaya mengangkat beban 50 kg. Kerja yang telah dilakukan ialah 750 J.

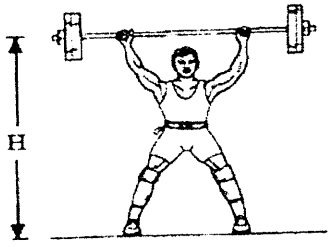


Diagram 5
Rajah 5

Calculate the value of H.
Hitung nilai H.

A 5.0 m
B 1.5 m
C 1.0 m
D 0.5 m

9 Diagram 6 shows a tanker with three small tanks.
Rajah 6 menunjukkan sebuah lori tangki dengan tiga tangki kecil.

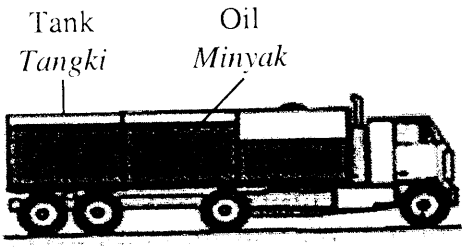


Diagram 6
Rajah 6

The three small tanks are used to reduce the
Tiga tangki kecil digunakan untuk mengurangkan

A kinetic energy
tenaga kinetik

B inertia
inersia

C momentum
momentum

D pressure
tekanan

10 Diagram 7 shows a car of mass 1000 kg. The forward thrust acting on the car is 9000 N and the frictional force between the car and the ground is 7000 N.
Rajah 7 menunjukkan sebuah kereta berjisim 1000 kg. Daya tujah yang bertindak ke atas kereta itu ialah 9000 N dan daya geseran di antara kereta dan permukaan tanah ialah 7000N.

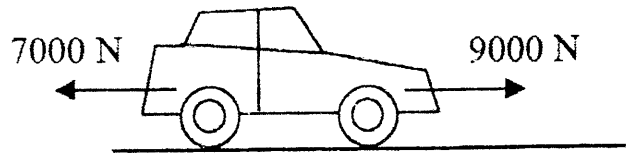


Diagram 7
Rajah 7

What is the acceleration of the car?
Berapakah pecutan kereta itu?

A $9\ ms^{-2}$

B $7\ ms^{-2}$

C $5\ ms^{-2}$

D $2\ ms^{-2}$

11 Which of the following statement is correct about the use of thick mattress in high jump event?
Antara pernyataan berikut yang manakah benar mengenai penggunaan tilam yang tebal dalam acara lompat tinggi?

A The time of collision during landing can be reduced.
Masa perlanggaran semasa pendaratan boleh dikurangkan.

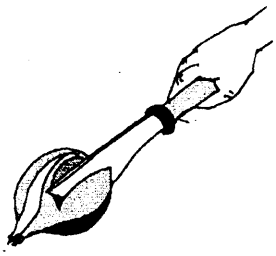
B The pressure acting on the mattress can be reduced.
Tekanan yang bertindak ke atas tilam boleh dikurangkan.

C The impulsive force during landing can be reduced.
Daya impuls semasa pendaratan boleh dikurangkan.

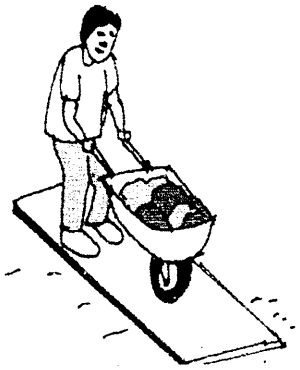
D The kinetic energy produced can be reduced.
Tenaga kinetik yang terhasil boleh dikurangkan.

12 In which situation is the concept of low pressure is applied ?
Dalam situasi manakah konsep tekanan rendah digunakan ?

A

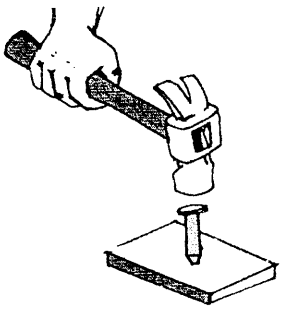


B



C

D



13 Diagram 8 shows mercury level in a mercury manometer when it is connected to a gas tank.
Rajah 8 menunjukkan paras merkuri dalam manometer merkuri apabila disambungkan kepada satu tangki gas.

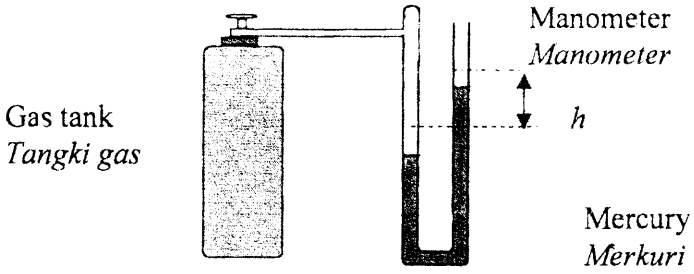


Diagram 8
Rajah 8

Which of the following statement is correct?
Antara pernyataan berikut manakah betul?

A Gas pressure = h cm Hg
Tekanan gas = h cm Hg

B Gas pressure = Atmospheric pressure
Tekanan gas = Tekanan atmosfera

C Gas pressure = Atmospheric pressure + h
Tekanan gas = Tekanan atmosfera + h

D Gas pressure = Atmospheric pressure - h
Tekanan gas = Tekanan atmosfera - h

14 Diagram 9 shows a student blowing air between two pieces of paper.
Rajah 9 menunjukkan seorang pelajar meniup udara antara dua helai kertas.

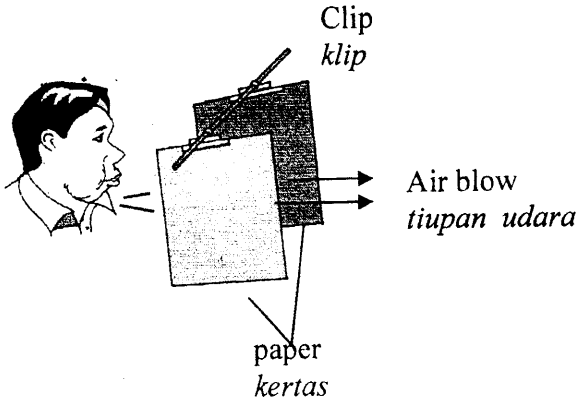


Diagram 9
Rajah 9

Which of following is correct ?
Antara berikut yang manakah benar ?

	Speed of air blown between two papers *Halaju udara ditiup diantara dua kertas*	Pressure of air between two papers *Tekanan udara antara dua kertas*	Condition of two papers *Keadaan dua kertas*
A	High *Tinggi*	Low *Rendah*	Closed together *Saling mendekati*
B	High *Tinggi*	High *Tinggi*	Far away *Saling menjauhi*
C	Low *Rendah*	Low *Rendah*	Far away *Saling menjauhi*
D	Low *Rendah*	High *Tinggi*	Closed together *Saling mendekati*

15 Diagram 10 shows a hydraulic brake system of a car.
Rajah 10 menunjukkan satu sistem brek hidraulik sebuah kereta.

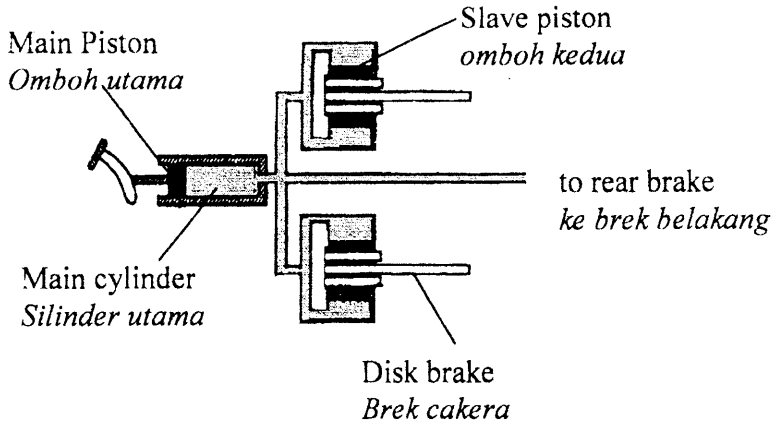


Diagram 10
Rajah 10

The main piston cylinder of the brake is smaller than slave piston cylinder. This is because of
Silinder piston utama lebih kecil daripada silinder piston kedua . Ini disebabkan oleh

A the small pressure applied at the main piston producing a high pressure at slave piston
tekanan yang kecil dikenakan ke atas omboh utama menghasilkan tekanan besar ke atas omboh kedua

B the high pressure applied at the main piston producing a small pressure at slave piston
tekanan yang besar dikenakan ke atas omboh utama menghasilkan tekanan kecil ke atas omboh kedua

C a large force applied at main piston producing a small force at the slave piston
daya yang besar bertindak ke atas omboh utama menghasilkan daya yang kecil ke atas omboh kedua.

D a small force applied at main piston producing a large force at the slave piston
daya yang kecil bertindak ke atas omboh utama menghasilkan daya yang besar ke atas omboh kedua.

16 Diagram 11 shows a metal block is immersed in a eureka tin filled with water. The water displaced is collected in a beaker.
Rajah 11 menunjukkan satu bongkah logam di tenggelamkan ke dalam tin eureka berisi air. Air tersesar dikumpulkan di dalam sebuah bikar .

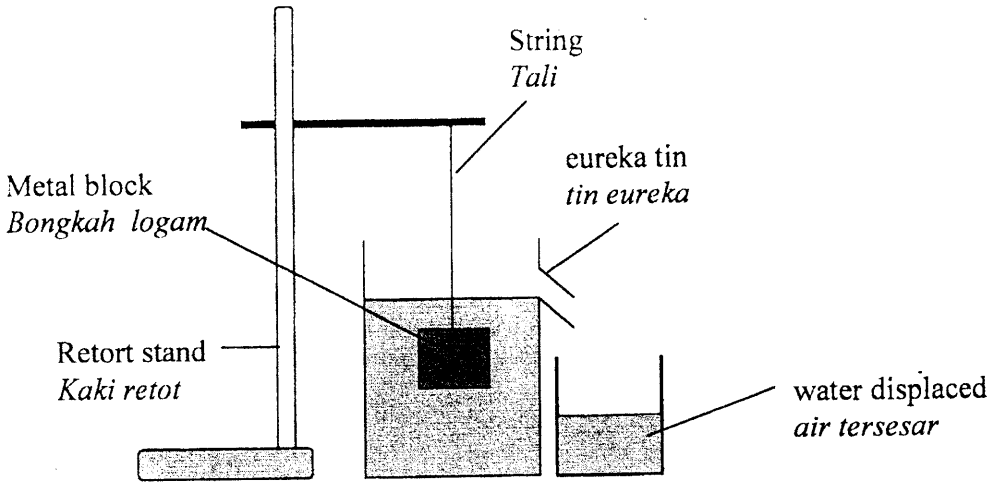


Diagram 11
Rajah 11

Which of the following statement is correct?
Antara pernyataan berikut manakah betul?

A Weight of metal block = weight of water displaced
Berat bongkah logam = berat air tersesar

B Bouyant force = volume of water displaced
Daya julangan = isipadu air yang disesarkan

C Volume of water displaced = volume of metal block
Isipadu air disesar = isipadu bongkah logam

D Bouyant force = Weight of metal block
Daya julangan = Berat bongkah logam

17 Diagram 12 shows water being spurt out from the water tank through a small hole.
Rajah 12 menunjukkan air terpancut keluar daripada tangki air melalui satu lubang kecil.

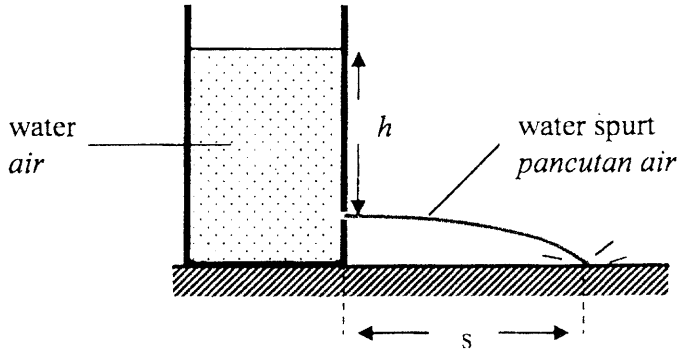
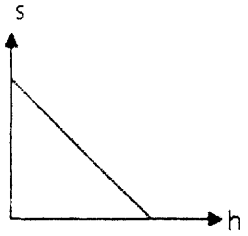
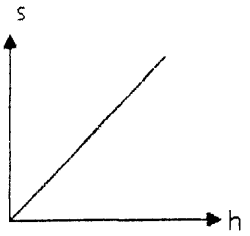
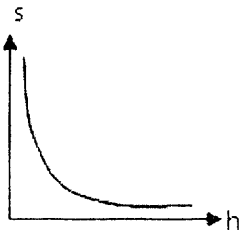


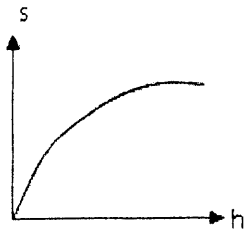
Diagram 12
Rajah 12

Which of the graph, s against h is correct?
Manakah antara graf, s melawan h berikut adalah betul ?

A


B


C


D


18 Diagram 13 shows the cross section of a water tank.
Rajah 13 menunjukkan keratan rentas sebuah tangki air.

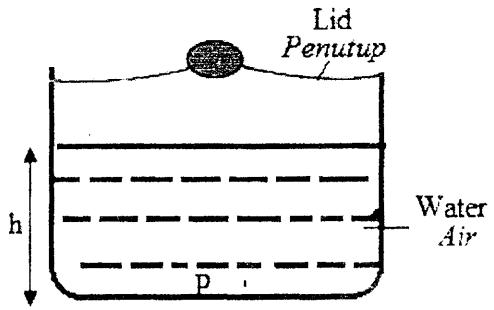


Diagram 8
Rajah 8

The water pressure at P is 5×10^4 Pa.
Calculate the depth, h
Tekanan air pada P ialah 5×10^4 *Pa.*
Hitungkan kedalaman , h
[g = 10Nkg^{-1} : Density of water/ *Ketumpatan air* = 1000 kg m^{-3}]

A 0.5 m

B 5.0 m

C 50.0 m

D 500.0 m

19 Diagram 14 shows the cooling curve of a substance.
Rajah 14 menunjukkan lengkung penyejukan suatu bahan.

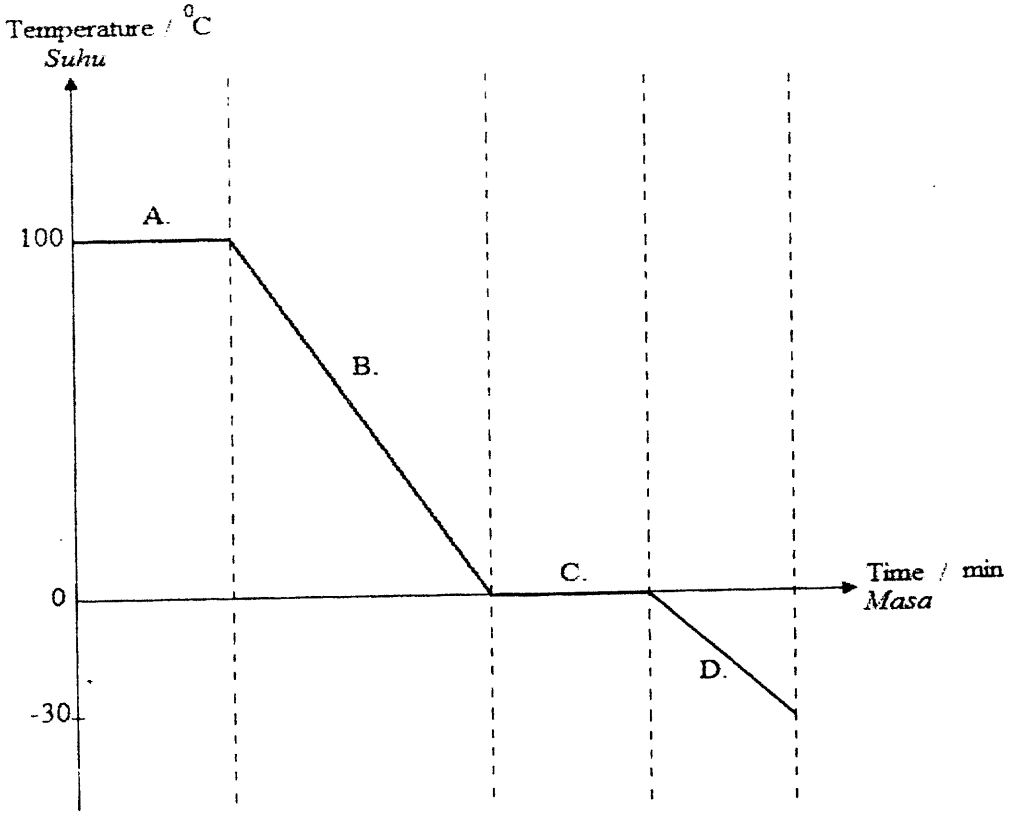


Diagram 14
Rajah 14

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

20 Diagram 15 shows a process in which water is changed to steam.
Rajah 15 menunjukkan satu proses air bertukar kepada stim.

Diagram 15
Rajah 15

The heat absorbed during the process is called
Haba yang diserap dalam proses itu dinamakan

A specific heat capacity of vapour
muatan haba tentu wap

B specific heat capacity of water
muatan haba tentu cecair

C specific latent heat of fusion
haba pendam tentu pelakuran

D specific latent heat of vaporization
haba pendam tentu pengewapan

21 Diagram 16 shows temperature-time graph of a liquid. The liquid is heated by using a 400 W heater. The mass of the liquid is 200 g.
Rajah 16 menunjukkan graf suhu-masa suatu cecair. Cecair itu dipanaskan dengan menggunakan pemanas 400 W. Jisim cecair itu ialah 200 g.

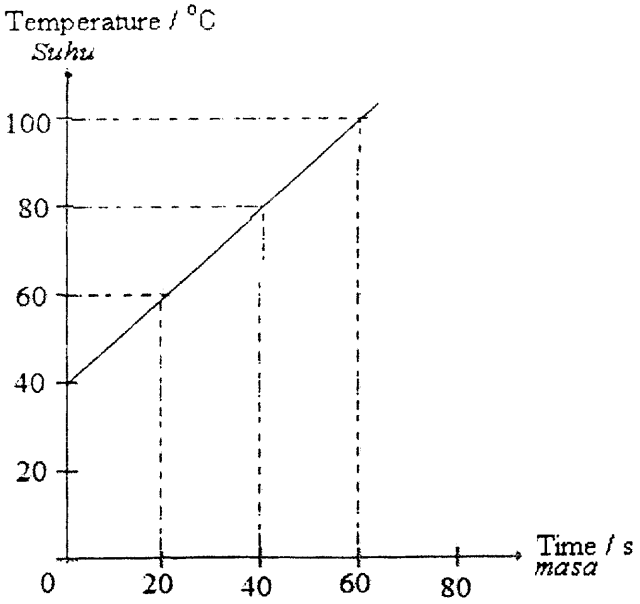


Diagram 16
Rajah 16

What is the specific heat capacity of the liquid?
Berapakah muatan haba tentu cecair itu?

A $2\ J\ kg^{-1}\ °C^{-1}$

B $20\ J\ kg^{-1}\ °C^{-1}$

C $200\ J\ kg^{-1}\ °C^{-1}$

D $2000\ J\ kg^{-1}\ °C^{-1}$

22 50 g of water at 10 °C is mixed with 100 g of water at 30 °C.
The temperature of the mixture is
50 g air pada 10 °C dicampurkan dengan 100 g air pada 30 °C.
Suhu campuran itu ialah

A between 10 °C and 20 °C
antara 10 °C dan 20 °C

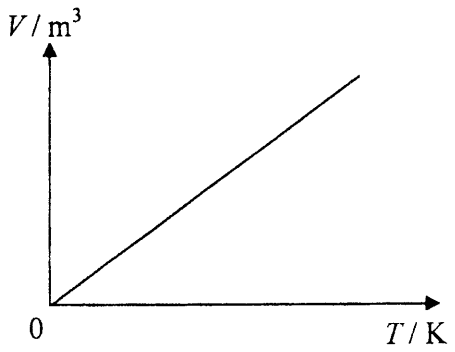
B equal to 20 °C
sama dengan 20 °C

C between 20 °C and 30 °C
antara 20 °C dan 30°C

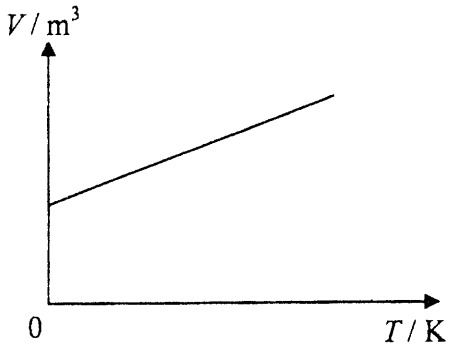
23 Which graph shows the relationship between the volume and absolute temperature of a fixed mass of the gas at constant pressure?

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

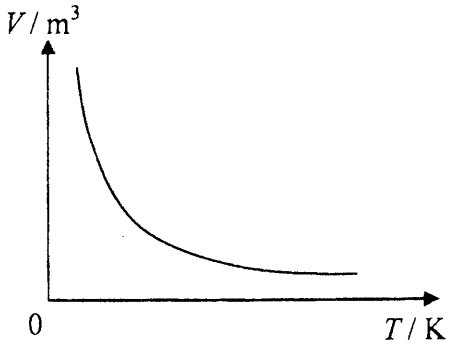
A



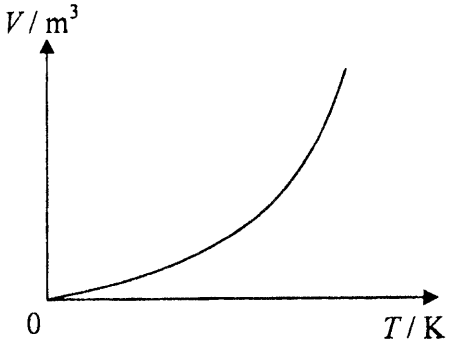
B



C



D



24 Two convex lens of focal length 50 cm and 5 cm respectively is used in a telescope. What is the linear magnification of the telescope?
Dua kanta cembung yang panjang fokus 50 cm dan 5cm masing-masing digunakan pada teleskop. Apakah pembesaran linear pada teleskop tersebut?

A 10
B 45
C 55
D 250

25 Diagram 17 shows two rays of light passing through a glass block with refractive index, n.
Rajah 17 menunjukkan dua lintasan cahaya melalui satu blok kaca dengan indeks biasan, n.

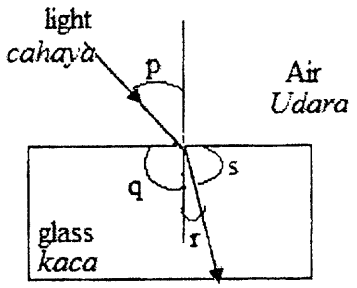


Diagram 17
Rajah 17

Which equation is correct?
Persamaan manakah yang benar?

A $n = \frac{p}{r}$

B $n = \frac{z}{q}$

C $n = \frac{\sin p}{\sin r}$

D $n = \frac{\sin z}{\sin q}$

26 The refractive index of glass is 1.5. What is the critical angle of the glass?
Indeks pembiasan kaca 1.5. Berapakah sudut genting bagi kaca?

A 46.5^o
B 46.8^o
C 48.8^o
D 48.2^o

27 Diagram 18 shows a ray diagram of formation of image in an optical device.
Rajah 18 menunjukkan rajah sinar bagi imej yang dibentuk dalam sebuah alat optik.

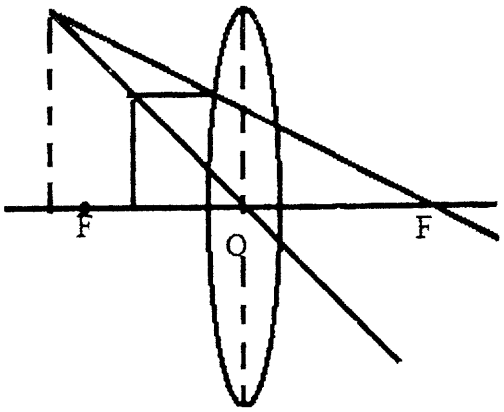


Diagram 18
Rajah 18

Which of the following optical device is represented by Diagram 18?
Antara alat optik berikut, yang manakah diwakili oleh Rajah 18?

A Slide projector
Projektor slaid

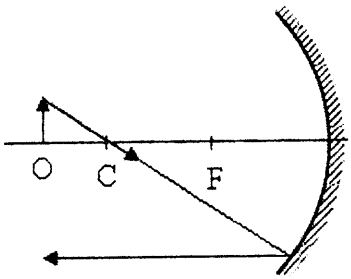
B Magnifying glass
Kanta pembesar

C Compound microscope
Mikroskop majmuk

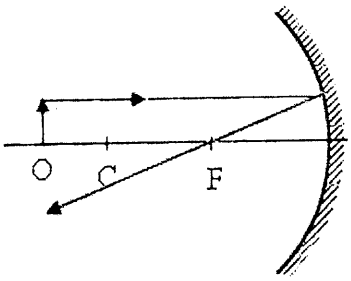
D Astronomical telescope
Teleskop astronomi

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

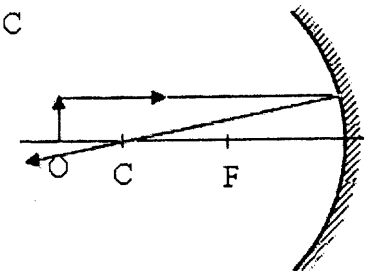
A



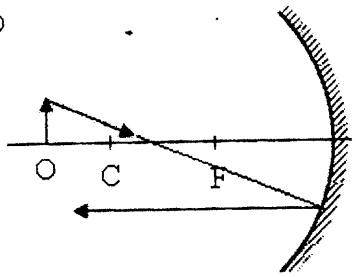
B



C



D



29 Diagram 19 shows a stone dropped into a lake with the depth of water increasing towards the centre of the lake.
Rajah 19 menunjukkan sebiji batu dijatuhkan ke dalam tasik yang kedalaman semakin bertambah ke arah tengah tasik.

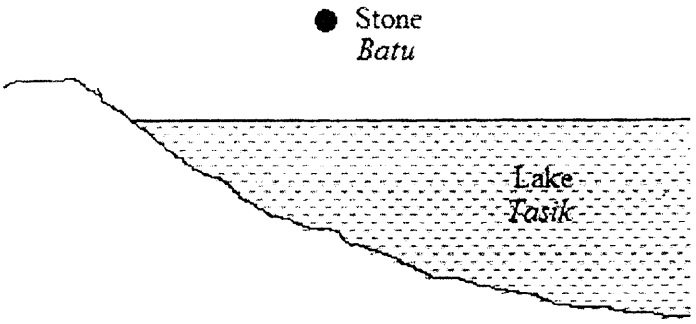
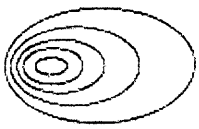
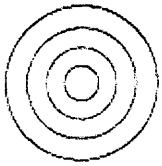
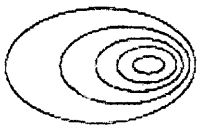


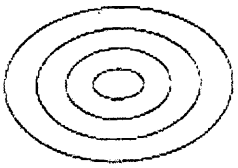
Diagram 19
Rajah 19

Which of the following is the wave pattern formed?
Antara yang berikut,yang manakah adalah corak gelombang yang dihasilkan?

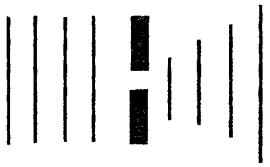
A 

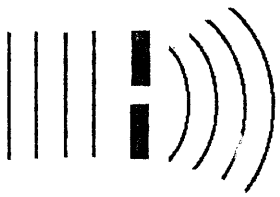
B 

C 

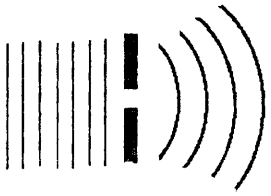
D 

30 Which diagram shows the correct wave pattern when plane water wave pass through a gap?
Rajah manakah menunjukkan corak gelombang yang betul apabila gelombang air berbentuk satah melalui suatu celah?

A 

B 

C 

D 

31 Diagram 20 shows the wavefronts as the waves approach the bay and the cape.
Rajah 20 menunjukkan muka gelombang apabila gelombang merambat menuju teluk dan tanjung.

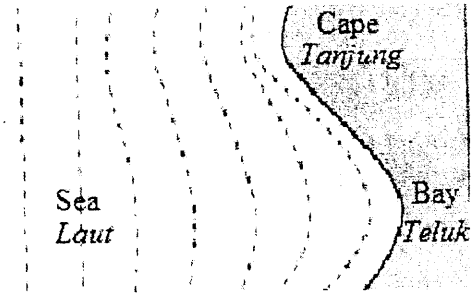


Diagram 20
Rajah 20

The wavefronts take the shape of the beach. This is cause by the phenomenon of
Muka gelombang menuruti bentuk pantai. Ini adalah disebabkan oleh fenomena

A interference
interferens

B reflection
pantulan

C diffraction
pembelauan

D refraction
pembiasan

32 Diagram 21 shows plane water waves passing through a glass sheet.
Rajah 21 menunjukkan gelombang satah melalui sekeping kaca.

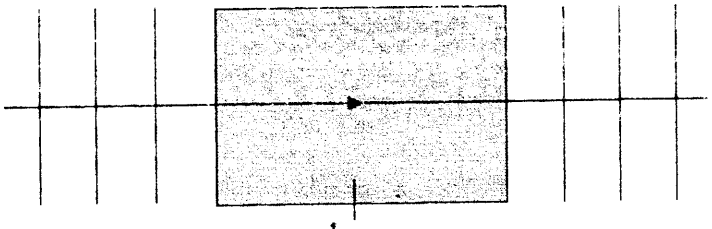
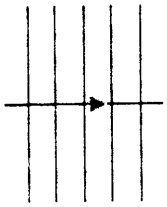


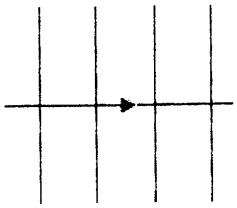
Diagram 21
Rajah 21

Which diagram shows the wave pattern of the waves that passed through the glass?
Rajah manakah menunjukkan corak gelombang bagi gelombang yang melalui kaca?

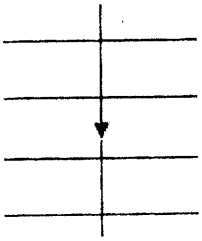
A



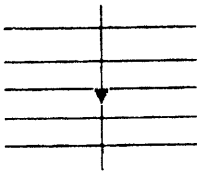
B



C



D



33 A high energy wave and low energy wave can only be differentiated by
Gelombang bertenaga tinggi dan rendah hanya dapat di bezakan dengan

A amplitude
amplitud

B frequency
frekuensi

C wavelength
panjang gelombang

D direction of vibration
arah perambatan gelobang

34 Diagram 22 shows a graph of amplitude against time for a wave.
Rajah 22 menunjukkan satu graf amplitud melawan masa bagi satu gelombang.

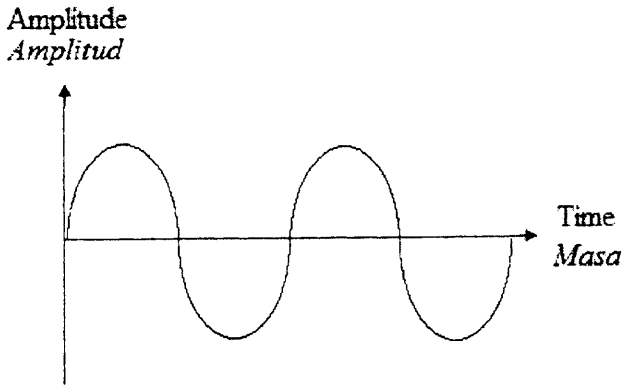


Diagram 22
Rajah 22

Which of the following is represented by the graph?
Antara berikut, yang manakah boleh diwakili oleh graf itu ?

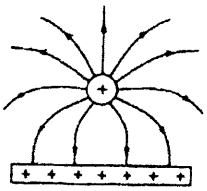
A Diffracted waves
Gelombang belauan

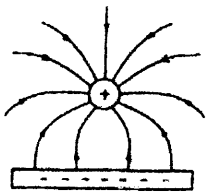
B Refracted waves
Gelombang terbias

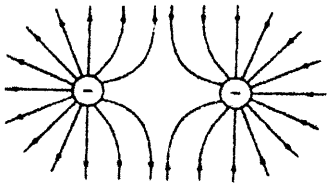
C Vibration of a tuning fork
Getaran tala bunyi

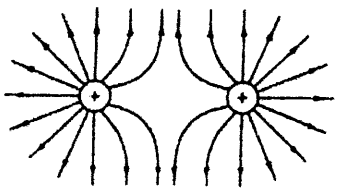
D The oscillations of a simple pendulum
Ayunan bandul ringkas

35 Which diagram shows the correct electric field?
Rajah manakah yang menunjukkan medan elektrik yang betul?

A 

B 

C 

D 

36 Diagram 23 shows I_1 is the current supplied by a source. I_2 and I_3 are the current in each branch of the parallel arrangement shown.
Rajah 23 menunjukkan I_1 *adalah arus yang dibekalkan oleh suatu sumber.* I_2 *dan* I_3 *adalah arus bagi setiap cabang ditunjukkan dalam susunan selari.*

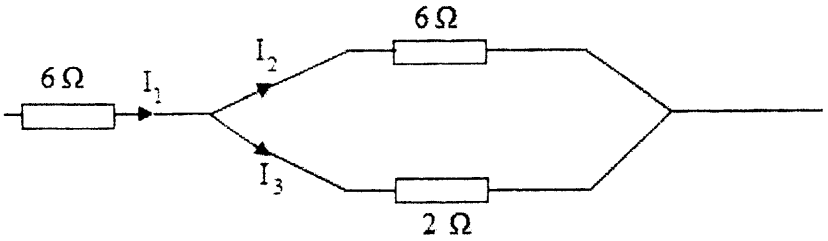


Diagram 23
Rajah 23

Which of the following statements concerning I_1, I_2 and I_3 is correct?
Manakah di antara penyataan berikut berkenaan I_1, I_2 *dan* I_3 *benar?*

A I_1 is equal to I_2, but smaller than I_3.
I_1 *sama dengan* I_2, *tetapi lebih kecil daripada* I_3.

B I_2 is bigger than I_3 but smaller than I_1.
I_2 *lebih besar daripada* I_3 *tetapi lebih kecil daripada* I_1.

C I_3 is bigger than I_2, but smaller than I_1.
I_3 *lebih besar daripada* I_2 , *lebih kecil daripada tetapi* I_1.

D I_3 is equal to I_2, but smaller than I_1.
I_3 *sama dengan* I_2, *tetapi lebih kecil daripada* I_1.

37 Diagram 24 shows a complete electric circuit.
Rajah 24 menunjukkan suatu litar elektrik yang lengkap.

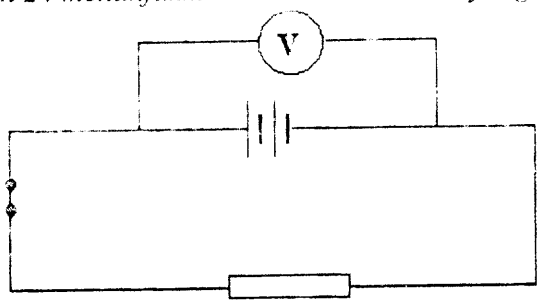


Diagram 24
Rajah 24

The voltmeter shows the reading of the
Voltmeter menunjukkan bacaan

A internal resistance of the battery
rintangan dalam bateri

B electromotive force of the battery
dayagerak elektrik bateri

C current flow in the circuit
arus elektrik dalam litar

D potential difference across the resistor
bezaupaya merentasi perintang

38 Diagram 25 shows an electric circuit.
Rajah 25 menunjukkan satu litar elektrik.

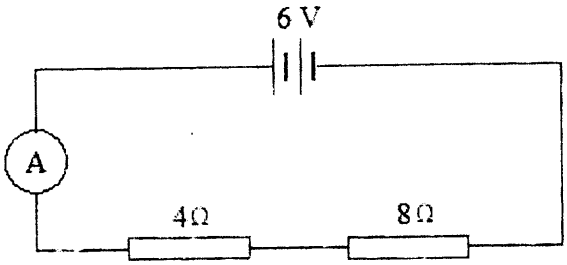


Diagram 25
Rajah 25

What is the reading of the ammeter in the circuit?
Berapakah bacaan ammeter dalam litar?

A 0.5 A
B 2.0 A
C 3.0 A
D 6.0 A

39 Diagram 26 shows an electromagnet.
Rajah 26 menunjukkan sebuah elektromagnet.

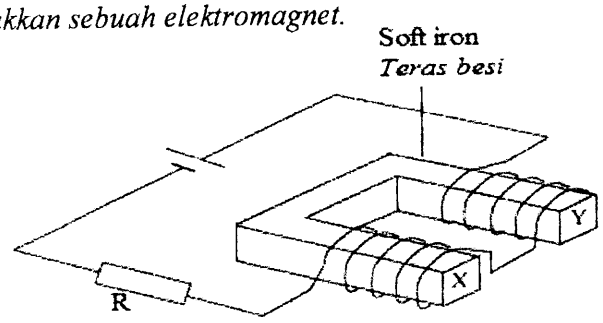


Diagram 26
Rajah 26

What is the polarity at X and Y when the current flows?
Apakah kekutuban pada X dan Y apabila arus mengalir?

	X	Y
A	North *Utara*	North *Utara*
B	North *Utara*	South *Selatan*
C	South *Selatan*	South *Selatan*
D	South *Selatan*	North *Utara*

40 Diagram 27 shows a current carrying conductor in a magnetic field.
Rajah 27 menunjukkan konduktor pembawa arus dalam medan magnet.

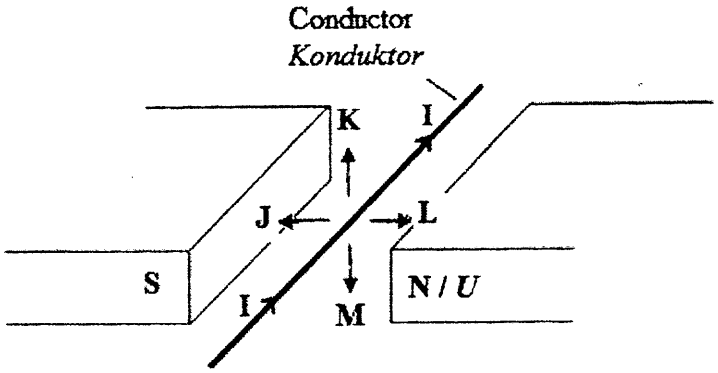


Diagram 27
Rajah 27

What is the direction of the force that acts on the conductor?
Pada arah manakah daya yang bertindak ke atas konduktor itu?

A J
B K
C L
D M

41 Diagram 28 shows a transformer used to light up a bulb labeled 6V, 12W at normal brightness.
Rajah 28 menunjukkan sebuah transformer digunakan untuk menyalakan sebiji mentol berlabel 6 V, 12 W pada kecerahan normal.

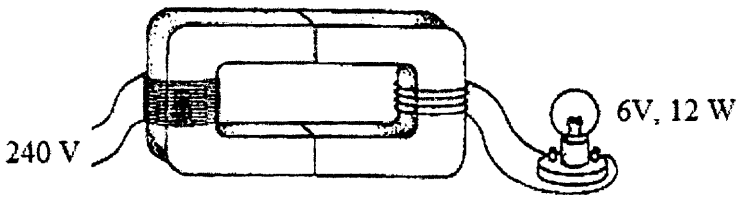


Diagram 28
Rajah 28

If the number of turns at the primary coil is 1000 turns, what is the number of turns at the secondary coil?
Jika bilangan lilitan pada gegelung primer adalah 1000 lilitan, berapakah bilangan lilitan pada gegelung sekunder?

A 5
B 17
C 25
D 50

42. Diagram 29 shows four compasses placed near a solenoid.
Rajah 29 menunjukkar. empat buah kompas diletakkan berhampiran dengan suatu solenoid.

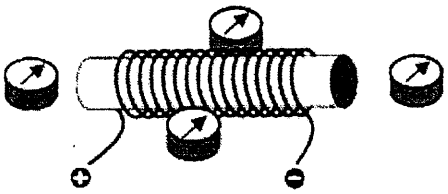
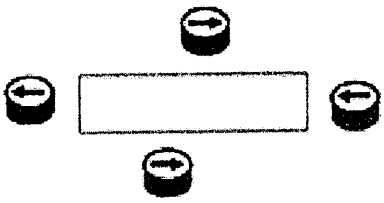


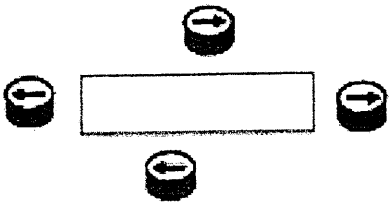
Diagram 29
Rajah 29

Which of the following shows the correct direction of the plotting compasses when the current flows through the solenoid?
Yang manakah antara berikut menunjukkan arah pesongan kompas yang betul apabila arus mengalir melalui solenoid?

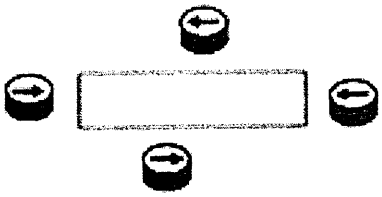
A



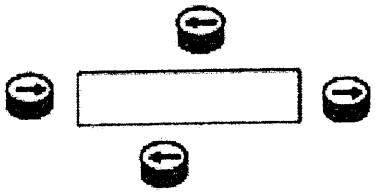
B



C



D



43 Diagram 30 shows a student holding a copper rod in a magnetic field.
Rajah 30 menunjukkan seorang pelajar memegang sebatang rod kuprum dalam suatu medan magnet.

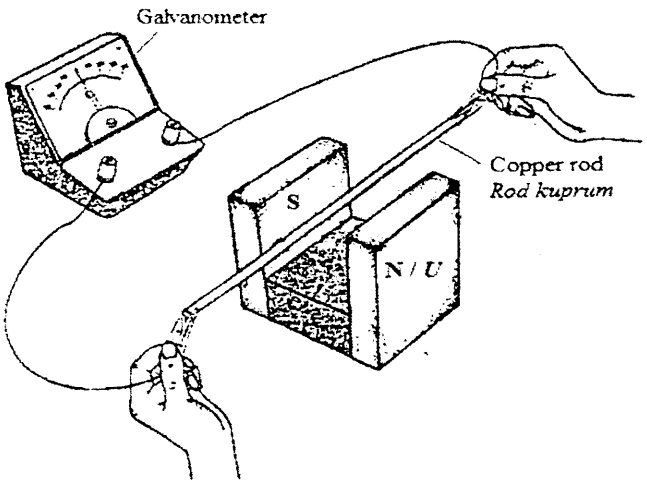


Diagram 30
Rajah 30

What happens to the galvanolmeter's pointer if the copper rod is moved upwards?
Apakah yang berlaku kepada jarum galvanometer jika rod kuprum itu digerakkan ke atas?

A No change
Tiada perubahan

B Deflect to the right
Terpesong ke kanan

C Deflect to the left
Terpesong ke kiri

D Deflect to the right and to the left
Terpesong ke kanan dan ke kiri

44 The rate of the thermionic emission increased when
Kadar pancaran termion bertambah apabila

A the melting point of the metal is lower
takat lebur logam lebih rendah

B the metal is connected to a low voltage power supply
logam itu disambungkan ke suatu bekalan kuasa bervoltan rendah

C the temperature of the metal increases
suhu logam bertambah

D the surface area of the metal decreases
luas permukaan logam berkurang

45 Diagram 31 shows a cathode ray is deflected due to the potential difference between electrode P and Q.
Rajah 31 menunjukkan suatu sinar katod terpesong disebabkan oleh beza keupayaan di antara elektrod P dan Q.

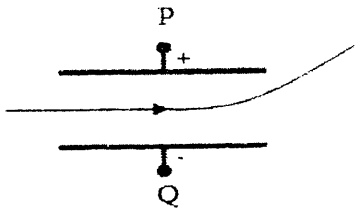
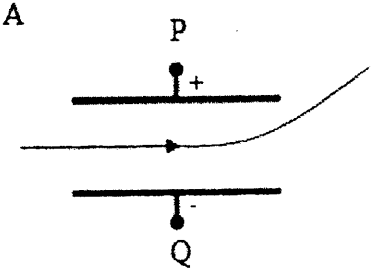


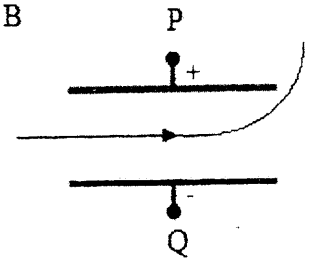
Diagram 31
Rajah 31

Which of the following is the correct path of the cathode ray when the potential difference between P and Q is increased?
Antara berikut yang manakah benar mengenai lintasan sinar katod itu bila beza keupayaan di antara P dan Q bertambah?

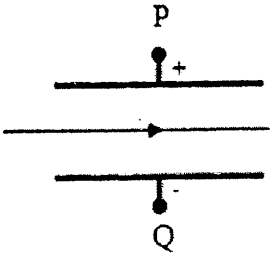
A



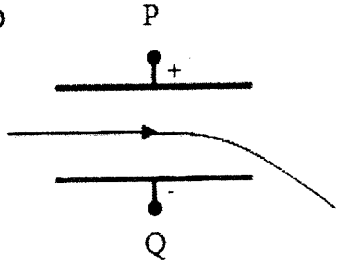
B



C



D



46 Diagram 32 shows a circuit that has four identical bulbs P, Q, R and S.
Rajah 32 menunjukkan suatu litar yang mempunyai empat mentol serupa P, Q, R dan S.

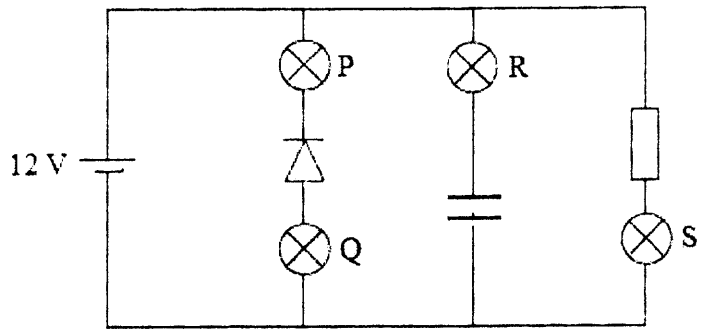


Diagram 32
Rajah 32

Which of the bulbs will light up?
Antara mentol berikut yang manakah akan menyala?

A P and Q
P dan Q

B R and S
R dan S

C R only
R sahaja

D S only
S sahaja

47 Diagram 33 shows a combination of logic gates. The logic inputs of A, B and C are 1, 0 and 0 respectively.
Rajah 33 menunjukkan gabungan get logik, Input logik P, Q dan R adalah 1, 0 dan 0 masing - masing

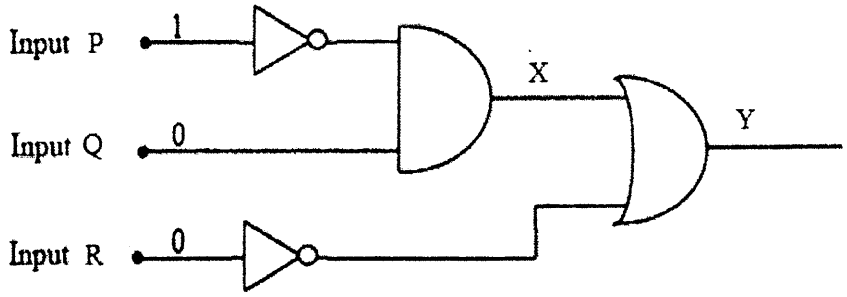


Diagram 33
Rajah 33

Which of the following are the correct logic output at X and Y?
Antara berikut yang manakah betul bagi logik output pada X dan Y?

	X	Y
A	0	0
B	0	1
C	1	0
D	1	1

48 Diagram 34 shows a radioactive source emits radiation that can pass through a sheet of paper and a piece of aluminium but cannot pass through a piece of lead.
Rajah 34 menunjukkan satu sumber radioaktif memancarkan radiasi yang boleh menembusi sekeping kertas dan sekeping aluminum tetapi tidak dapat menembusi sekeping plumbum.

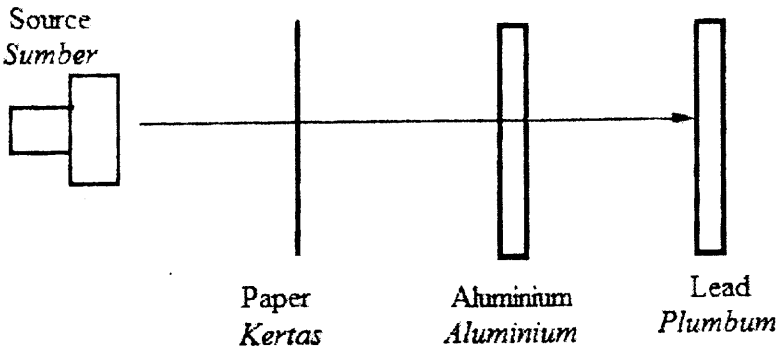


Diagram 34
Rajah 34

What type of radiation is emitted?
Apakah jenis radiasi yang dipancarkan?

A α particle
Zarah α

B β particle
Zarah β

C γ rays
Sinar γ

D X rays
Sinar X

49 Which of the following statement is a characteristic of beta radiation?
Antara pernyataan-pernyataan berikut yang manakah merupakan ciri sinar beta?

A It has a positive charge
Zarah bercas positif

B It is an electromagnetic wave
Ianya adalah satu gelombang elektromagnet

C It has a higher ionizing power than alpha
Mempunyai kuasa pengionan lebih tinggi daripada alfa

D It has a lower penetrating power than gamma
Mempunyai kuasa penembusan lebih rendah daripada gama.

50 The following equation represents a decay process of element X.
Persamaan berikut mewakili proses pereputan bagi unsur X.

$$^{226}_{88}X \longrightarrow {}^{P}_{Q}Y + \alpha + \text{energy / } \textit{tenaga}$$

What are the values of P and Q?
Berapakah nilai P dan Q?

	P	Q
A	230	90
B	230	86
C	222	90
D	222	86

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

SULIT
4531/2
Physics
Kertas 2
Ogos
2012
$2\frac{1}{2}$ jam

Nama : .....

Tingkatan : .....

MAJLIS PENGETUA SEKOLAH-SEKOLAH MALAYSIA (MPSM)
CAWANGAN KELANTAN

PEPERIKSAAN PERCUBAAN SPM
TINGKATAN LIMA
2012

PHYSICS
KERTAS 2
Masa : 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 yang 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			
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	

Kertas soalan ini mengandungi 35 halaman bercetak

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

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

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

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

4. Momentum = mv

5. F = ma

6. Kinctic energy = $\frac{1}{2}mv^2$
Tenaga kinetik

7. Gravitational potential energy = mgh
Tenaga keupayaan graviti

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

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

10. Pressure, P = hρg
Tekanan

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

12. Heat, Q = mcθ
Haba

13. $\frac{PV}{T}$ = Constant (*pemalar*)

14. $E = mc^2$

15. $v = f\lambda$

16. Power, $P = \frac{\text{energy}}{\text{time}}$
Kuasa, $P = \frac{tenaga}{masa}$

17. V = IR

18. Power, P = IV
Kuasa

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

20. Efficiency = $\frac{I_s V_s}{I_p V_p} \times 100$
Kecekapan

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

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

23. $n = \frac{\text{real depth}}{\text{apparent depth}}$
$n = \frac{dalam\ nyata}{dalam\ ketara}$

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

25. Q = It

26. E = I (R + r)

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

28. $\frac{V}{V_T} = \frac{R}{R_T}$

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

SECTION A
BAHAGIAN A

[60 *marks*]
[*60 markah*]

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

1. Diagram 1.1 shows a measuring instrument that normally used in our daily life.
Rajah 1.1 menunjukkan alat pemgukur yang biasa digunakan dalam kehidupan harian.

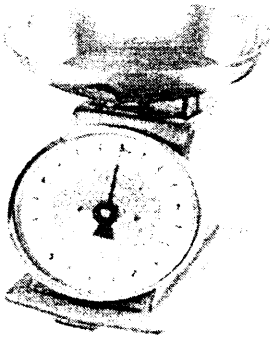


Diagram 1.1
Rajah 1.1

(a) Name the physical quantity can be measured by the instrument?
Namakan kuantiti fizik yang boleh diukur oleh alat itu ?

.....

[1 mark]
[*1 markah*]

(b) Diagram 1.2 and Diagram 1.3 show two scales of compression balances .
Rajah 1.2 dan Rajah 1.3 menunjukkan dua skala bagi neraca mampatan.

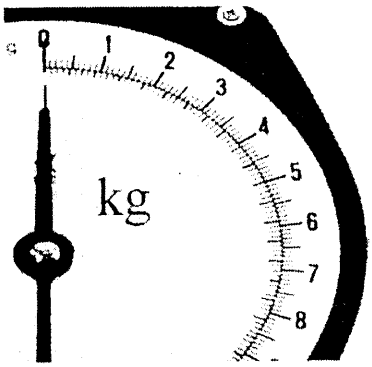
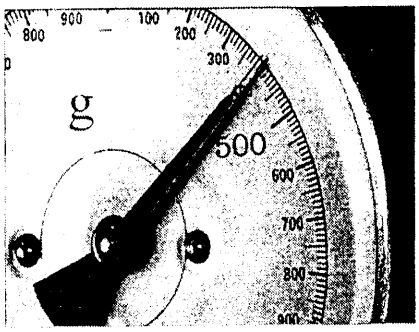


Diagram 1.2
Rajah 1.2



Diagran 1.3
Rajah 1.3

(i) Which compression balance is more sensitive ?
Neraca mampatan yang manakah lebih peka?

.....

[1 mark]
[*1 markah*]

(ii) Give **one** reason for answer in 1b(i).
*Beri **satu** sebab bagi jawapan di 1b(i)*

.....

[1 mark]
[*1 markah*]

(c) Give **one** method to increase the accuracy of readings.
*Beri **satu** kaedah untuk meningkatkan kejituan bagi bacaan.*

.....

[1 mark]
[*1 markah*]

2. Diagram 2.1 shows a water waves travelling from deep area to shallow area.
Rajah 2.1 menunjukkan gelombang air bergerak daripada kawasan dalam ke kawasan cetek.

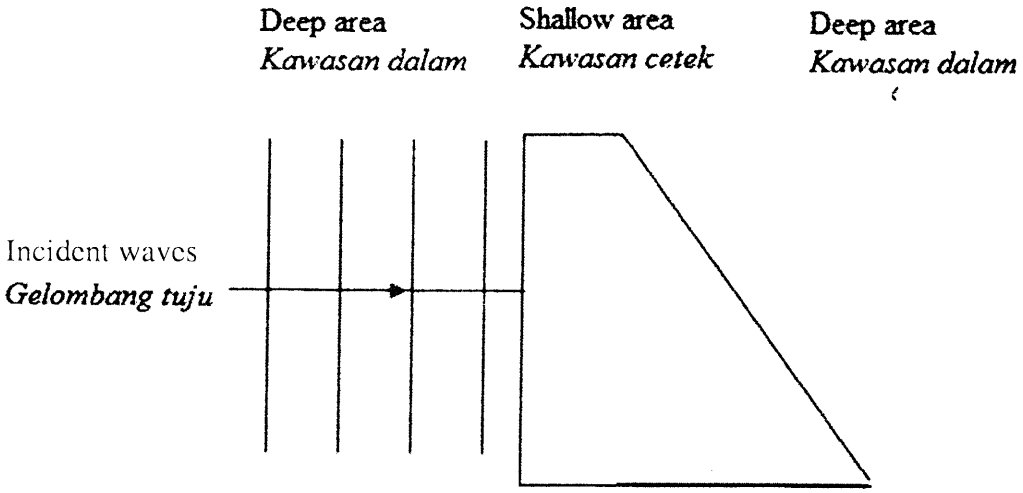


Diagram 2.1
Rajah 2.1

(a) What type of wave is the water waves?
Apakah jenis gelombang bagi gelombang air?

.....

[1 mark]
[*1 markah*]

(b) Complete Diagram 2.1 to show the direction of propagation of the water waves in deep area and shallow area.
Draw the waves' patterns in both areas.
Lengkapkan Rajah 2.1 untuk menunjukkan arah perambatan bagi gelombang air itu di kawasan dalam dan kawasan cetek.
Lukis corak gelombang dalam kedua-dua kawasan.

[2 marks]
[*2 markah*]

(c) Calculate the wavelength at deep area if the speed of water waves at shallow area and deep area are 4.0 ms^{-1} and 9.0 ms^{-1} respectively.
The wavelength at shallow area is 2 m.
Hitung jarak gelombang pada kawasan dalam jika laju gelombang air pada kawasan cetek dan kawasan dalam adalah 4.0 ms^{-1} dan 9.0 ms^{-1} masing-masing.
Jarak gelombang pada kawasan cetek adalah 2m.

[2 marks]
[*2 markah*]

3. Diagram 3 shows a system used in a factory to ensure the thickness of cardboard sheet is uniform. The system used radioactive source that emits radioactive radiation.
Rajah 3 menunjukkan suatu sistem yang digunakan dalam sebuah kilang untuk memastikan ketebalan kepingan kadbod adalah seragam. Sistem itu menggunakan sumber radioaktif.

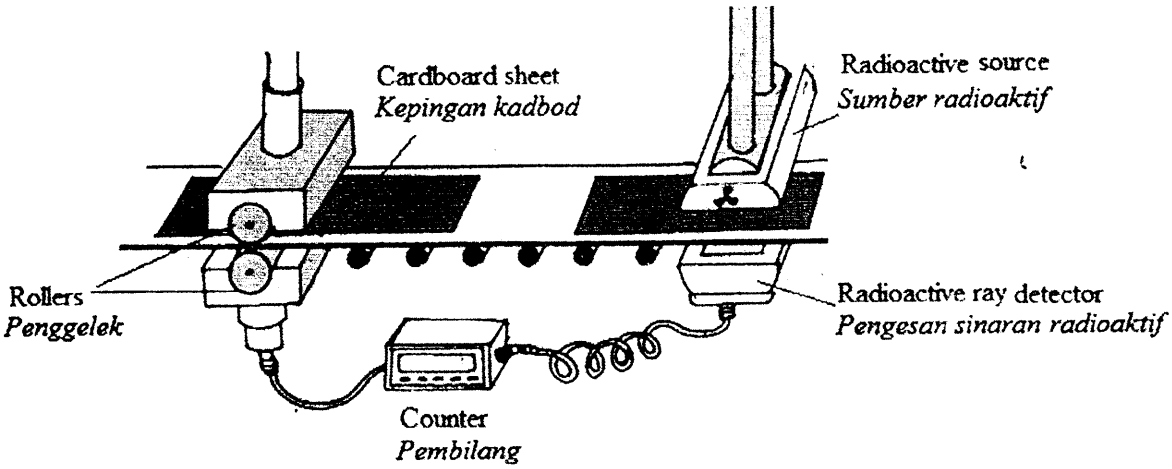


Diagram 3
Rajah 3

(a) What is the meaning of radioactive?
Apakah maksud radioaktif?

.....

[1 mark]
[*1 markah*]

(b) Name the suitable type of radioactive radiation should be emitted by the source.
Namakan jenis sinaran yang sesuai perlu dipancarkan oleh sumber itu.

.....

[1 mark]
[*1 markah*]

(c) The thickness of cardboard sheets are accepted if the reading of the counter is 230 counts per minute.
Ketebalan kepingan kadbod akan diterima jika bacaan pembilang adalah 230 bilangan per minit.

(i) If one of the readings shown by the counter is less than 230 counts per minute, what can you say about the thickness of the cardboard sheet compared to the accepted thickness?
Jika satu dari bacaan yang ditunjukkan oleh pembilang itu kurang dari 230 bilangan per minit, apakah yang boleh anda katakan mengenai ketebalan kepingan kadbod itu berbanding dengan nilai ketebalan yang diterima?

Tick (√) the correct answer in the box provided.
Tanda (√) jawapan betul dalam kotak yang disediakan.

☐ The cardboard sheet is thicker.
Kepingan kadbod itu lebih tebal.

☐ The cardboard sheet is thinner.
Kepingan kadbod itu lebih nipis.

[1 mark]
[*1 markah*]

(ii) Give **one** reason for the answer in 3(c) (i).
*Beri **satu** sebab bagi jawapan bagi 3(c) (i).*

.....

[1 mark]
[*1 markah*]

(d) The initial mass of the radioactive source used is 100.0 g. The mass of the source becomes 12.5 g after it is being used for 9 years.
Jisim awal bahan radioaktif yang digunakan ialah 100.0 g. Jisim bahan itu menjadi 12.5 g selepas ia digunakan selama 9 tahun.

Calculate the half life of the radioactive source?
Hitung separuh hayat bahan radioaktif itu?

[2 marks]
[*2 markah*]

4. Diagram 4 shows the use of a transistor in a circuit.
Rajah 4 menunjukkan kegunaan transistor dalam suatu litar.

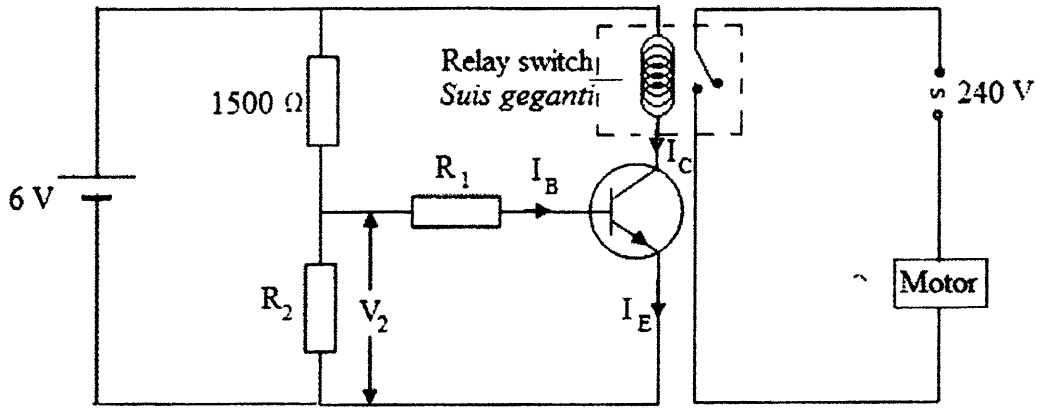


Diagram 4
Rajah 4

(a) Name the type of transistor used.
Namakan jenis transistor yang digunakan.

.....

[1 mark]
[1 *markah*]

(b) State the function of
Nyatakan fungsi

(i) relay switch.
suis geganti.

.....

[1 mark]
[1 *markah*]

(ii) resistor R_1
perintang R_1

.....

[1 mark]
[1 *markah*]

(c) The transistor is switched on when the base voltage $V_2 \geq 2$ V.
Calculate the minimum value of R_2 when the transistor is switched on.
Transistor itu dihidupkan apabila voltan tapak $V_2 \geq 2$ V
Hitungkan nilai minimum R_2 apabila transistor itu dihidupkan

[2 marks]
[*2 markah*]

(d) The resistor R_2 is then replaced with a light dependent resistor, LDR,which has high resistance when it is dark.
Perintang R_2 kemudian digantikan dengan perintang peka cahaya,PPC, yang mempunyai rintangan tinggi apabila gelap.

(i) State whether the bulb lighted up during the day.
Nyatakan sama ada mentol itu menyala pada waktu siang.

.....

[1 mark]
[*1 markah*]

(ii) Give **one** reason for the answer in 4 (d) (i).
*Beri **satu** sebab bagi jawapan di 4 (d) (i).*

.....

[1 mark]
[*1 markah*]

5. Diagram 5.1 and Diagram 5.2 show two identical springs supporting two babies, P and Q, of mass 5 kg and 8 kg respectively.
Rajah 5.1 dan Rajah 5.2 menunjukkan dua spring yang serupa menampung dua orang bayi, P dan Q berjisim 5 kg dan 8 kg masing-masing.

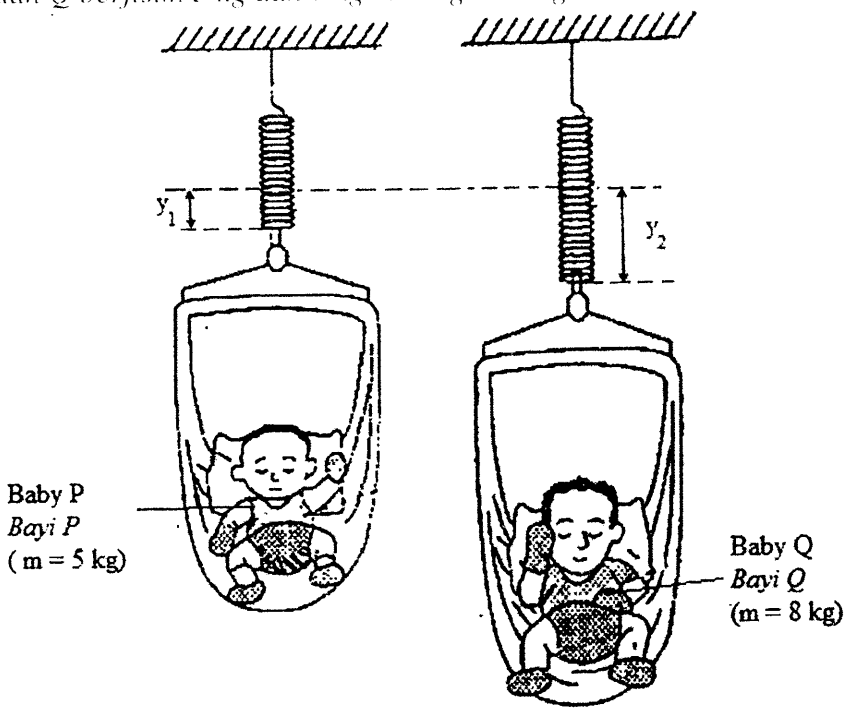


Diagram 5.1
Rajah 5.1

Diagram 5.2
Rajah 5.2

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

.....

[1 mark]
[*1 markah*]

(b) Observe Diagram 5.1 and Diagram 5.2,
Perhatikan Rajah 5.1 dan Rajah 5.2,

(i) compare the mass of the baby
bandingkan jisim bayi.

.....

[1 mark]
[*1 markah*]

(ii) compare the extension of the spring, y.
bandingkan pemanjangan spring, y.

.....

[1 mark]
[*1 markah*]

(iii) compare the spring constant.
bandingkan pemalar spring.

.....

[1 mark]
[*1 markah*]

(c) (i) Relate the mass of the baby with the extension of the spring.
Hubungkaitkan jisim bayi dengan pemanjangan spring.

.....

[1 mark]
[*1 markah*]

(ii) State the physics law involved.
Nyatakan hukum fizik yang terlibat.

.....

[1 mark]
[*1 markah*]

(d) Another identical spring is hung parallel with the spring in Diagram 5.1.
Satu spring yang serupa digantung selari dengan spring dalam Rajah 5.1.

(i) What happens to the extension of the spring?
Apakah yang berlaku kepada pemanjangan spring?

.....

[1 mark]
[*1 markah*]

(ii) Give **one** reason to the answer in 5(d)(i).
*Beri **satu** sebab bagi jawapan dalam 5(d)(i).*

.....

[1 mark]
[*1 markah*]

6. Diagram 6.1 and Diagram 6.2 show current is induced in the coils when similar magnets are dropped into the coils from the same height.
Rajah 6.1 dan Rajah 6.2 menunjukkan arus diaruhkan dalam gegelung-gegelung apabila dua batang magnet yang serupa dijatuhkan ke dalam gegelung-gegelung itu dari ketinggian yang sama.

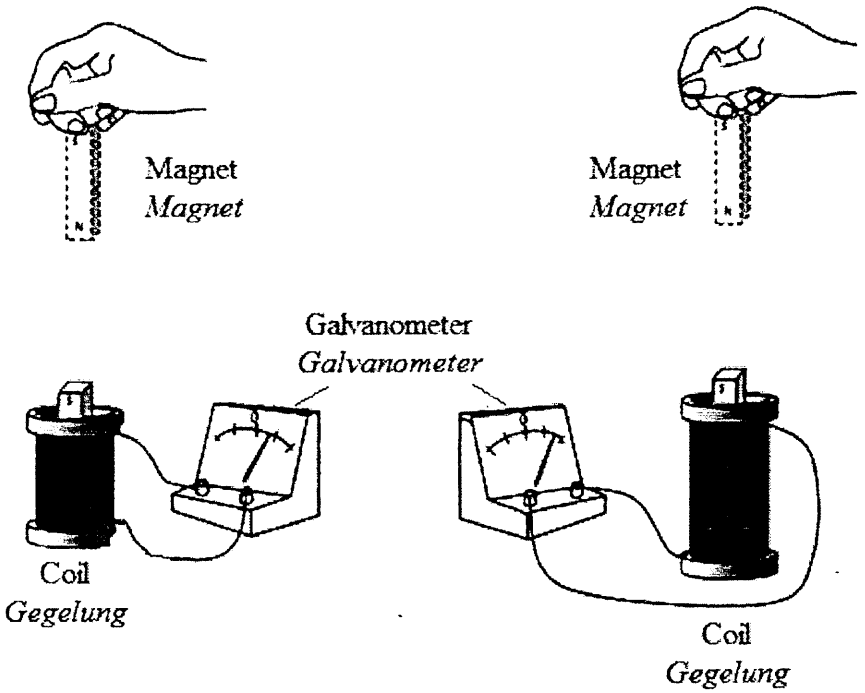


Diagram 6.1
Rajah 6.1

Diagram 6.2
Rajah 6.2

(a) What is meant by induced current?
Apakah yang dimaksudkan dengan arus aruhan?

.....

[1 mark]
[*1 markah*]

(b) (i) Give **one** reason why current is induced in the coil.
*Berikan **satu** sebab mengapa arus diaruhkan dalam gegelung.*

.....

[1 mark]
[*1 markah*]

(ii) Using an arrow, show the direction of the induced current in Diagram 6.1.
Menggunakan anak panah, tunjukkan arah arus aruhan di Rajah 6.1.

[1 mark]
[*1 markah*]

(iii) Name the law used to determine the direction of the induced current in 6(b) (ii).
Namakan hukum yang digunakan untuk menentukan arah arus aruhan dalam 6(b)(ii).

.....

[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) number of turns of the coils
bilangan lilitan gegelung

.....

[1 mark]
[*1 markah*]

(ii) deflection of the pointer of the galvanometer
pesongan jarum galvanometer

.....

[1 mark]
[*1 markah*]

(d) State the relationship between number of turns of the coil and,
Nyatakan hubungan antara bilangan lilitan gegelung dan,

(i) deflection of the pointer of the galvanometer.
pesongan jarum galvanometer

.....

[1 mark]
[*1 markah*]

(ii) magnitude of current flows in the coils.
magnitud arus yang mengalir dalam gegelung

.....

[1 mark]
[*1 markah*]

7. Diagram 7.1 shows the structure of mirror periscope.
Rajah 7.1 menunjukkan struktur bagi periskop cermin.

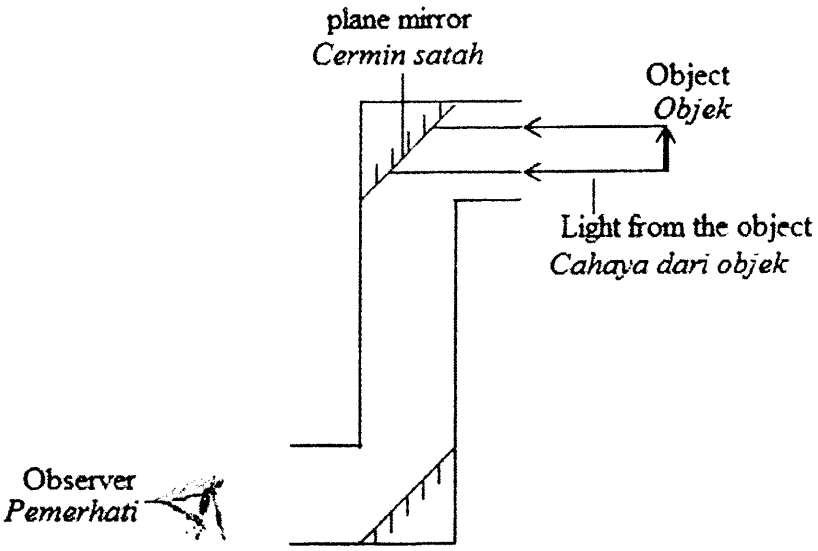


Diagram 7.1
Rajah 7.1

(a) Name the light wave phenomenon involved in Diagram 7.1.
Namakan fenomena gelombang cahaya yang terlibat dalam Rajah 7.1.

.....

[1 mark]
[*1 markah*]

(b) (i) On Diagram 7.1, complete the path of light ray from the object to the observer's eye.
Pada Rajah 7.1, lengkapkan lintasan sinar cahaya daripada objek ke mata pemerhati.

[2 marks]
[*2 markah*]

(ii) State **one** characteristic of the image observed.
*Nyatakan **satu** ciri imej yang diperhatikan.*

.....

[1 mark]
[*1 markah*]

(c) Diagram 7.2 shows a glass prism.
Rajah 7.2 menunjukkan satu prisma kaca.

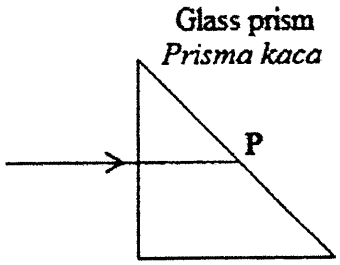


Diagram 7.2
Rajah 7.2

(i) The critical angle of the glass prism is 42^0.
Calculate the refractive index of the glass prism.
Sudut genting bagi prisma kaca adalah 42^0
Hitung indeks biasan bagi prisma kaca itu.

[2 marks]
[*2 markah*]

(ii) What happens to the light ray after passing point P?
Apakah yang berlaku kepada sinar cahaya itu selepas melalui titik P?

.....

[1 mark]
[*1 markah*]

(iii) On Diagram 7.2, complete the path of light ray from point P.
Pada Rajah 7.2 lengkapkan lintasan sinar cahaya daripada titik P.

[1 mark]
[*1 markah*]

(d) The mirror periscope in Diagram 7.1 cannot produced a clear image.
Periskop cermin dalam Rajah 7.1 tidak boleh menghasilkan imej yang jelas.

(i) In the space below, draw the arrangement of the glass prisms in Diagram 7.2 to enable clearer image produced.
Pada ruang di bawah, lukis susunan prisma kaca dalam Rajah 7.2 bagi membolehkan imej yang lebih jelas dihasilkan.

[1 mark]
[*1 markah*]

(ii) Give **one** reason for the answer in 7(d)(i).
*Beri **satu** sebab bagi jawapan dalam 7(d)(i).*

.....

[1 mark]
[*1 markah*]

8. (a) A solid substance of mass 0.05 kg is heated using an immersion heater of 240V, 1 kW for 1.0 minute until its temperature is 78°C
Suatu bahan pepejal berjisim 0.05 kg dipanaskan menggunakan pemanas rendam 240 V, 1 kW selama 1 minit sehingga suhunya adalah 78°C.

(i) What is the meaning of temperature?
Apakah yang dimaksudkan dengan suhu?

.....

[1 mark]
[*1 markah*]

(ii) Calculate the specific heat cpacity of the substance if the initial temperature of the substance is 20°C?
Hitung muatan haba tentu bagi bahan itu jika suhu awal bahan itu adalah 20°C?

[2 marks]
[*2 markah*]

(b) The substance is then put into a beaker filled with water of mass 2.0 kg and temperature 28°C.
Bahan itu kemudiannya diletakkan ke dalam bikar berisi air berjisim 2.0 kg dan suhu 28°C.

Calculate the final temperature of the substance and water.
Hitung suhu akhir bagi bahan itu dan air.
(Specific heat capacity of water is 4 200 $Jkg^{-1}{}^{o}C^{-1}$)
(*Muatan haba tentu bagi air adalah 4 200* $Jkg^{-1}{}^{o}C^{-1}$)

[2 marks]
[*2 markah*]

(c) Diagram 8.1 shows parts of the ice box used to store ice.
Rajah 8.1 menunjukkan bahagian bagi kotak ais.

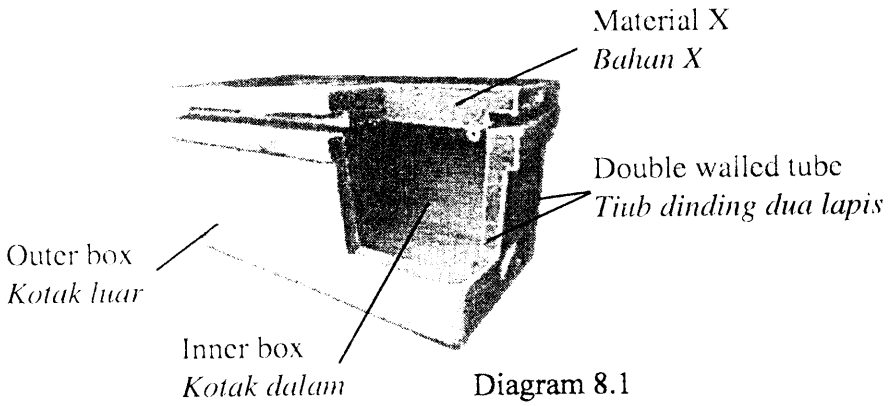


Diagram 8.1
Rajah 8.1

Table 8 shows the characteristics of two different ice boxes.
Jadual 8 menunjukkan ciri-ciri bagi dua kotak ais yang berbeza.

Ice box *Kotak ais*	Material X *Bahan X*	Specific heat capacity of inner box *Muatan haba tentu bagi kotak dalam*	Diameter of double walled tube *Diameter bagi tiub dinding dua lapis*
R	Air *Udara*	Small *Kecil*	Small *Kecil*
S	Polystyrene *Polisterin*	Big *Besar*	Big *Besar*
T	Polystyrene *Polisterin*	Small *Kecil*	Big *Besar*
U	Air *Udara*	Big *Besar*	Big *Besar*

Table 8
Jadual 8

Based on Table 8, state the suitable characteristics of the ice box to be used as an efficient ice storage .
Give **one** reason for suitable characteristics.
Berdasarkan Jadual 8, nyatakan ciri-ciri kesesuaian kotak ais untuk digunakan sebagai tempat simpanan ais yang cekap.
*Beri **satu** sebab untuk kesesuaian ciri itu.*

(i) Material X :
Bahan X :

.....

Reason :
Sebab :

.....

[2 marks]
[*2 markah*]

(ii) The specific heat capacity of inner box :
Muatan haba tentu bagi kotak dalam :

.....

Reason :
Sebab :

.....

[2 marks]
[*2 markah*]

(iii) Diameter of double walled tube :
Diameter bagi tiub dinding dua lapis :

.....

Reason :
Sebab :

.....

[2 marks]
[*2 markah*]

(d) Based on the answers in 8(c) (i), 8(c)(ii) and 8(c)(iii), determine the most suitable ice box to be used as an efficient ice storage .
Berdasarkan jawapan di 8(c) (i), 8(c)(ii) dan 8(c)(iii), tentukan kotak ais yang paling sesuai digunakan sebagai tempat simpanan ais yang berkesan.

.....

[1 mark]
[*1 markah*]

SECTION B
BAHAGIAN B

[20 marks]
[*20 markah*]

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

9. Diagram 9.1 and Diagram 9.2 show the distances between two streams of water, x_1 and x_2 when air are blown in the middle with two tubes which nozzles have different cross sectional areas. The air pressure supplied at both tubes is the same.
Rajah 9.1 dan Rajah 9.2 menunjukkan jarak di antara dua aliran air, x_1 dan x_2 apabila udara ditiup pada bahagian tengah dengan dua tiub yang mana muncungnya mempunyai luas keratan rentas yang berbeza. Tekanan udara yang dibekalkan pada kedua-dua tiub adalah sama.

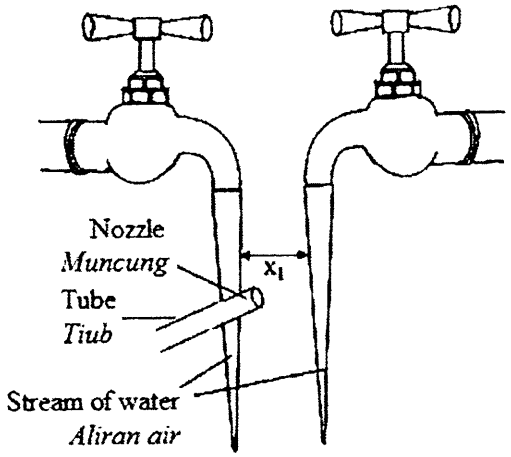


Diagram 9.1
Rajah 9.1

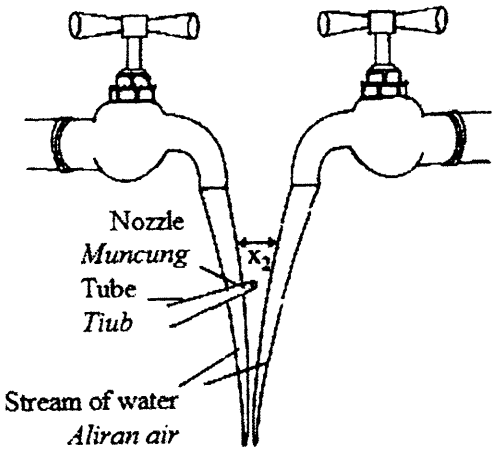


Diagram 9.2
Rajah 9.2

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

(b) Using Diagram 9.1 and Diagram 9.2,
Menggunakan Rajah 9.1 dan Rajah 9.2,

(i) compare the cross sectional area of the nozzles [1 mark]
bandingkan luas keratan rentas bagi muncung [*1 markah*]

(ii) compare the distance between the two streams of water, x_1 and x_2 [1 mark]

bandingkan jarak di antara dua aliran air, x_1 dan x_2 [*1 markah*]

(iii) relate the cross sectional area of the nozzle with the speed of the air at the nozzle. [1 mark]

hubungkait luas keratan rentas muncung dengan laju udara pada muncung. [*1 markah*]

(iv) relate the air pressure with the distance, x in at position between two streams of water. [1 mark]

hubungkait tekanan udara dengan jarak, x pada kedudukan antara dua aliran air itu. [*1 markah*]

(v) deduce the relationship between the speed of air with the air pressure [1 mark]

deduksikan hubungan antara laju udara dengan tekanan udara [*1 markah*]

(c) Diagram 9.3 shows a Bunsen burner.
Rajah 9.3 menunjukkan satu penunu Bunsen.

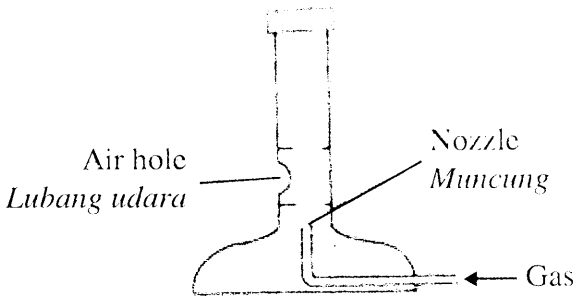


Diagram 9.3
Rajah 9.3

Explain how the Bunsen burner can produce a blue flame. [4 marks]
Terangkan bagaimana penunu Bunsen boleh menghasilkan nyalaan biru. [*4 markah*]

(d) Diagram 9.4 shows a submarine.
Rajah 9.4 menunjukkan sebuah kapal selam.

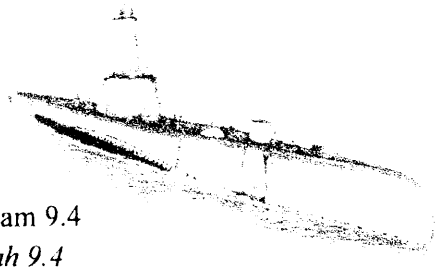


Diagram 9.4
Rajah 9.4

Using appropriate physics concepts, explain the suitable characteristics of the submarine that can work efficiently and safe.
Menggunakan konsep-konsep fizik yang sesuai, terangkan ciri-ciri kapal selam yang sesuai yang boleh bekerja dengan cekap dan selamat.

Your answer should include the following aspects:
Jawapan anda hendaklah merangkumi aspek-aspek berikut:

(i) Shape of the submarine [2 marks]
Bentuk kapal selam. [*2 markah*]

(ii) Strength of material used for the body of the submarine [2 marks]
Kekuatan bahan yang digunakan untuk badan kapal selam [*2 markah*]

(iii) Rate of rusting for the material used. [2 marks]
Kadar pengaratan untuk bahan yang digunakan. [*2 markah*]

(iv) Component which enable the submarine to submerge and float. [2 marks]
Komponen yang membolehkan kapal selam menyelam dan terapung. [*2 markah*]

(v) Type of power source used. [2 marks]
Jenis sumber tenaga yang digunakan. [*2 markah*]

10. Diagram 10.1 and Diagram 10.2 show traces on the screen of a Cathode Ray Oscilloscope (C.R.O) when connected to the output a.c. generators of different frequency.
Rajah 10.1 dan Rajah 10.2 menunjukkan surihan pada skrin sebuah Osiloskop Sinar Katod (O.S.K) apabila disambung kepada output sebuah penjana a.u. yang berbeza frekuensi.

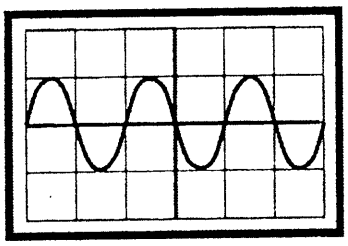


Diagram 10.1
Rajah 10.1

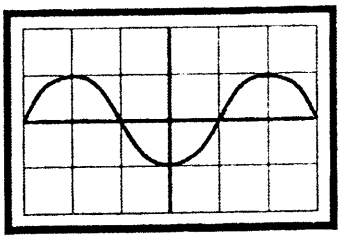


Diagram 10.2
Rajah 10.2

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

(b) Using Diagram 10.1 and Diagram 10.2, compare the amplitude, number of complete oscillations and period of the traces.
Relate the number of complete oscillations with the period of oscillation to make a deduction regarding the relationship between period and frequency.
[5 marks]
Menggunakan Rajah 10.1 dan Rajah 10.2, bandingkan amplitud, bilangan ayunan lengkap dan tempoh bagi surihan itu.
Hubungkait bilangan ayunan lengkap dengan tempoh ayunan untuk membuat satu deduksi berkaitan dengan hubungan antara tempoh dengan frekuensi.
[*5 markah*]

(c) Diagram 10.3 shows a loud speaker produces sound waves in air.
Rajah 10.3 menunjukkan satu pembesar suara menghasilkan gelombang bunyi di udara.

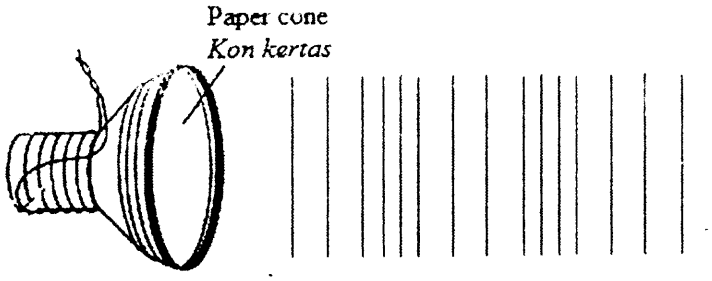


Diagram 10.3
Rajah 10.3

Explain how the sound waves is produced . [4 marks]
Terangkan bagaimana gelombang bunyi dihasilkan. [*4 markah*]

(d) Diagram 10.4 shows a radar system at an airport.
Rajah 10.4 menunjukkan satu sistem radar di sebuah lapangan terbang.

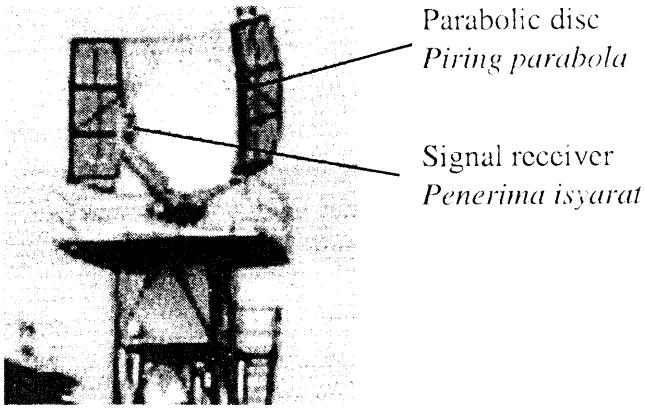


Diagram 10.4
Rajah 10.4

Using appropriate physics concepts, explain the modifications should be done on the system so that it can be used to determined the position of an aeroplane more efficiently.
Menggunakan konsep-konsep fizik yang sesuai, terangkan pengubahsuaian yang perlu dilakukan ke atas sistem itu supaya ia boleh digunakan untuk menentukan kedudukan kapal terbang dengan lebih cekap.

Your answer should include the following aspects :
Jawapan anda hendaklah merangkumi aspek-aspek berikut:

(i) Diameter of the parabolic disc. [2 marks]
Diameter piring parabola. [*2 markah*]

(ii) Distance of the signal receiver from the centre of the parabolic disc. [2 marks]
Jarak penerima isyarat dari pusat piring parabola. [*2 markah*]

(iii) Type of wave transmitted 2 marks]
Jenis gelombang yang dipancar [*2 markah*]

(iv) Height of the parabolic disc from the ground. [2 marks]
Ketinggian piring parabola dari bumi. [*2 markah*]

(v) Characterictics of the surface of the parabolic disc. [2 marks]
Ciri-ciri bagi permukaan piring parabola [*2 markah*]

SECTION C
BAHAGIAN C

[20 marks]
[*20 markah*]

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

11. Diagram 11.1 shows a vibrating pile driver used to drive a steel pile to the ground. The force involved in driving the steel pile is impulsive force.
Rajah 11.1 menunjukkan satu pelantak cerucuk yang digunakan untuk menanam cerucuk besi ke dalam tanah. Daya yang terlibat dalam menanam cerucuk besi ini adalah daya impuls.

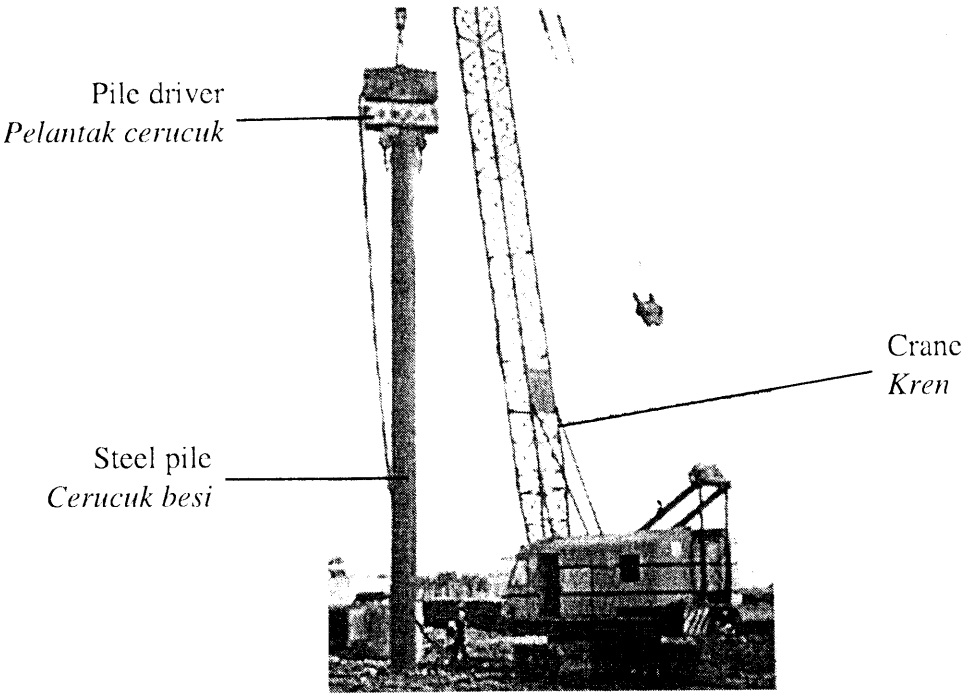


Diagram 11.1
Rajah 11.1

(a) (i) What is the meaning of impulsive force? [1 mark]
Apakah yang dimaksudkan dengan daya impuls? [1 *markah*]

(ii). Explain how the steel pile is driven to the ground. [4 marks]
Terangkan bagaimana cerucuk besi ditanam ke dalam tanah.
[4 *markah*]

(b) Diagram 11.2 .shows a tennis player is hitting a tennis ball with his racket.
Rajah 11.2 menunjukkan seorang pemain tenis memukul bola tenis dengan menggunakan raketnya.

Diagram 11.2
Rajah 11.2

You are required to investigate the techniques done by the player and the characteristics of the racket's string as shown in Table 11.
Anda dikehendaki menyiasat teknik-teknik yang dibuat oleh pemain itu dan ciri-ciri tali raket seperti ditunjukkan dalam Jadual 11.

Techniques and characteristics of string *Teknik dan ciri-ciri tali*	Action after hitting the ball *Tindakan selepas memukul bola*	Time of contact between the ball and racket *Masa tindakan antara bola dengan raket*	String tension *Tegangan tali*	Material of the string *Bahan tali raket*
P	Continue to swing the racket after hitting the ball *Meneruskan ayunan raket selepas memukul bola*	Long *Panjang*	High *Tinggi*	Steel *Besi*

Q	Continue to swing the racket after hitting the ball *Meneruskan ayunan raket selepas memukul bola*	Short *Singkat*	High *Tinggi*	Nylon *Nilon*
R	Stops the racket immediately after hitting the ball *Menghentikan raket sebaik sahaja memukul bola*	Short *Singkat*	Low *Rendah*	Steel *Besi*
S	Stops the racket immediately after hitting the ball *Menghentikan raket sebaik sahaja memukul bola*	Long *Panjang*	Low *Rendah*	Nylon *Nilon*

Table 11
Jadual 11

Explain the suitability of the techniques done by the tennis player and characteristics of the racket's string.
Determine the most effective technique done by the tennis player and the most suitable characteristics of the racket's string to produce high speed motion of the tennis ball after being hit.
Give reasons for the choice. [10 marks]
Terangkan kesesuaian teknik yang dibuat oleh pemain tenis itu dan ciri-ciri bagi tali raket.
Tentukan teknik yang paling efektif yang dibuat oleh pemain tenis itu dan ciri-ciri yang paling sesuai bagi tali raket untuk menghasilkan gerakan bola tenis yang berhalaju tinggi selepas dipukul.
Beri sebab bagi pilihan itu. [*10 markah*]

(c) A tennis ball of mass 100 g is moving at a velocity of 40 m s^{-1}. A player hits the ball and moves in the opposite direction with a velocity of 50 m s^{-1}. The time of collision is 20 ms.
Sebiji bola tenis berjisim 100 g sedang bergerak pada halaju 40 m s^{-1}. Seorang pemain memukul bola itu dan bergerak dalam arah berlawanan dengan halaju 50 m s^{-1}. Masa perlanggaran adalah 20 ms.

Calculate:
Hitungkan:

(i) The mass of ball in unit kg. [1 mark]
Jisim bola dalam unit kg. [1 *markah*]

(ii) The time of collision in unit second. [1 mark]
Masa hentaman dalam unit saat. [1 *markah*]

(iii) Impulsive force acted on the tennis ball. [3 marks]
Daya impuls yang bertindak ke atas bola tenis itu. [3 *markah*]

12. Diagram 12.1 shows two identical bulbs that are connected to a dry cell and an ammeter. The current flows through the bulbs is measured by the ammeter.
Rajah 12.1 menunjukkan dua biji mentol yang serupa disambungkan kepada suatu sel kering dan sebuah ammeter. Arus yang mengalir melalui mentol itu diukur oleh ammeter itu.

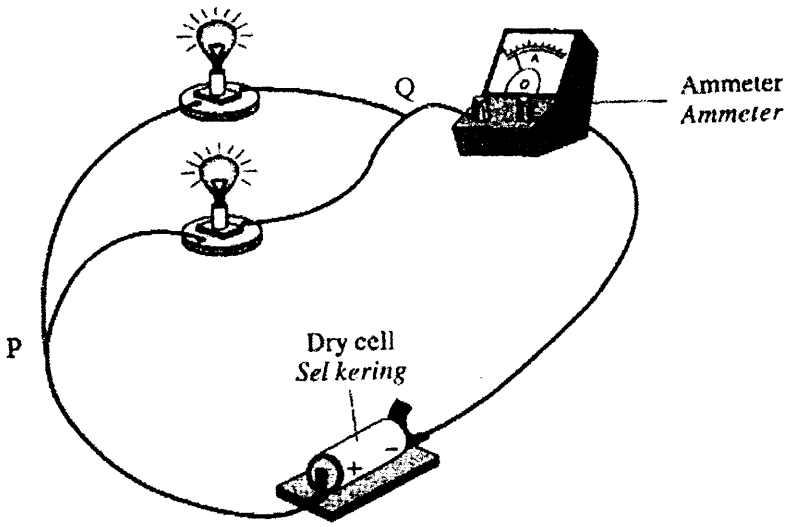


Diagram 12.1
Rajah 12.1

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

(b) (i) Name the type of connection of the bulbs. [1 mark]
Namakan jenis sambungan mentol. [*1 markah*]

(ii) Draw the circuit diagram for Diagram 12.1. [1 mark]
Lukis rajah litar untuk Rajah 12.1. [*1 markah*]

(iii) Explain what happens to the reading of ammeter when an identical bulb is connected parallel to points P and Q? [2 marks]
Terangkan apa berlaku kepada bacaan ammeter itu apabila sebiji mentol yang serupa disambungkan secara selari pada titik P dan Q.
[2 *markah*]

(c) Diagram 12.2 shows a three pin plug connected to an electric iron labeled 240 V, 1000W. A fuse is installed in the three pin plug.
Rajah 12.2 menunjukkan sebuah palam tiga pin disambungkan kepada sebuah seterika elektrik berlabel 240 V, 1000W. Satu fius dipasangkan dalam palam tiga pin itu.

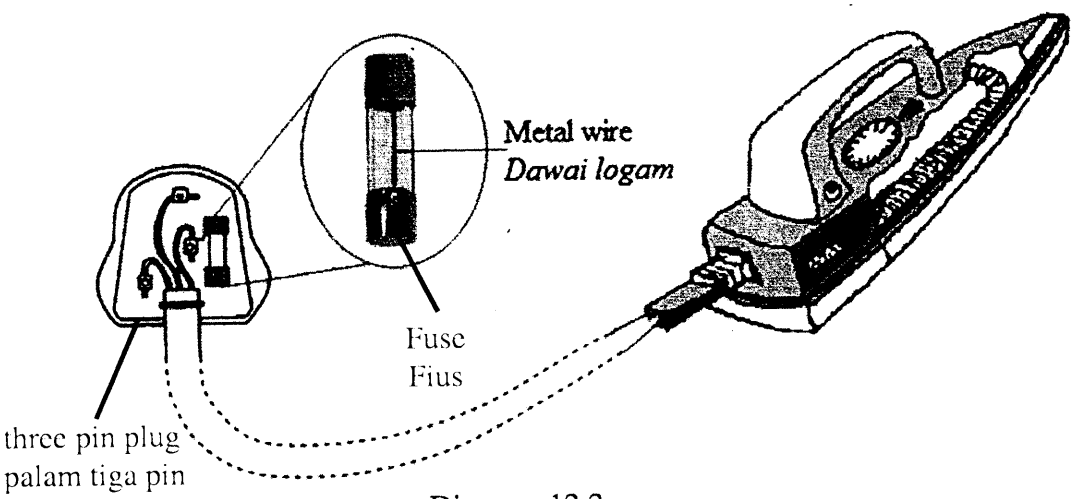


Diagram 12.2
Rajah 12.2

Table 12 shows the characteristics of metals that could be used as fuse wire.
Jadual 12 menunjukkan ciri-ciri logam yang boleh digunakan sebagai dawai fius.

Metal *Logam*	Melting point (°C) *Takat lebur(°C)*	Ampere value (A) *Nilai ampere(A)*	Diameter of wire *Diameter wayar*	Resistivity *Kerintangan*
P	High *Tinggi*	4.2	Big *Besar*	Low *Rendah*
Q	Low *Rendah*	4.0	Small *Kecil*	High *Tinggi*
R	Low *Rendah*	4.2	Small *Kecil*	High *Tinggi*
S	High *Tinggi*	5.0	Big *Besar*	Low *Rendah*

Table 12
Jadual 12

You are required to determined the most suitable metal that can be used as a fuse wire as shown in Diagram 12.2.
Anda dikehendaki menentukan logam yang paling sesuai untuk digunakan sebagai dawai fius seperti yang ditunjukkan dalam Rajah 12.2.

Study the specifications of the four metals based on the following aspects:
Kaji spesifikasi keempat-empat logam itu berdasarkan aspek-aspek berikut:

(i) Melting point of wire
Takat lebur dawai
[2 marks]
[*2 markah*]

(ii) Ampere value of the fuse
Nilai ampere pada fius
[2 marks]
[*2 markah*]

(iii) Diameter of wire
Diameter dawai
[2 marks]
[*2 markah*]

(iv) Resistivity of wire
Kerintangan dawai
[2 marks]
[*2 markah*]

(d) Diagram 12.3 shows an energy saver light bulb labeled 240 V 12 W and it is connected to the 240 V power supply. The power released by the bulb is 10 W.
Rajah 12.3 menunjukkan sebuah mentol jimar tenaga berlabel 240 V 12W dan disambungkan kepada bekalan kuasa 240 V. Kuasa yang dibebaskan oleh mentol itu ialah 10 W.

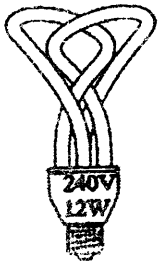


Diagram 12.3
Rajah 12.3

Calculate
Hitung

(i) the current flows through the bulb.
arus yang mengalir melalui mentol.

(ii) the power lost from the bulb.
kuasa yang hilang daripada mentol itu.

(iii) the efficiency of the bulb.
kecekapan mentol itu.

[5 marks]
[*5 markah*]

END OF QUESTION
SOALAN TAMAT