

Nama : Kelas :



فَرْسَيْنِكَ عَنْ فَعْنُوا ذَا مِنْ جَلِيلٍ فَعْنُوا
مُجْمَلًا كَرَامًا سَيَكُونُ لَكُمْ مَنَعًا وَكَامِلًا عَرَبِيًّا
يَا سَنَ إِسْلَامَ كَلْتَنَ



4531/1

Fizik

Kertas 1

Oktober 2024

1 jam 15 min

**PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA
TAHUN 2024 M / 1446 H**

**FIZIK
KERTAS 1**

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

1. Kertas soalan ini mengandungi **40** soalan objektif.
2. Jawab **semua** soalan.
3. Bagi setiap soalan, pilih **satu** jawapan sahaja. **Hitamkan** jawapan anda pada kertas jawapan objektif yang disediakan.
4. Kertas peperiksaan ini adalah dalam dwibahasa.

Kertas peperiksaan ini mengandungi 28 halaman bercetak

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SULIT

PERCUBAAN SPM YIK 2024 FIZIK K1

[LIHAT HALAMAN SEBELAH

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

DAYA DAN GERAKAN I
FORCE AND MOTION I

1. $v = u + at$
2. $s = \frac{1}{2} (u + v)t$
3. $s = ut + \frac{1}{2} at^2$
4. $v^2 = u^2 + 2as$
5. momentum = mv
6. $F = ma$

KEGRAVITIAN
GRAVITATION

1. $F = \frac{Gm_1m_2}{r^2}$
2. $g = \frac{GM}{r^2}$
3. $F = \frac{mv^2}{r}$
4. $a = \frac{v^2}{r}$
5. $v = \frac{2\pi r}{T}$
6. $\frac{T_1^2}{r_1^3} = \frac{T_2^2}{r_2^3}$
7. $v = \sqrt{\frac{GM}{r}}$
8. $u = -\frac{GMm}{r}$
9. $v = \sqrt{\frac{2GM}{R}}$

HABA
HEAT

1. $Q = mc\theta$
2. $Q = ml$
3. $Q = Pt$
4. $P_1 V_1 = P_2 V_2$
5. $\frac{V_1}{T_1} = \frac{V_2}{T_2}$
6. $\frac{P_1}{T_1} = \frac{P_2}{T_2}$

GELOMBANG
WAVES

1. $v = f\lambda$
2. $\lambda = \frac{ax}{D}$

CAHAYA DAN OPTIK
LIGHT AND OPTICS

1. $n = \frac{c}{v}$
2. $n = \frac{\sin i}{\sin r}$
3. $n = \frac{1}{\sin c}$
4. $n = \frac{H}{h}$
5. $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$
6. $n_1 \sin \theta_1 = n_2 \sin \theta_2$
7. Pembesaran linear, $m = \frac{v}{u}$

DAYA DAN GERAKAN II FORCE AND MOTION II

1. $F = kx$
2. $E = \frac{1}{2} Fx$
3. $E = \frac{1}{2} kx^2$

TEKANAN PRESSURE

1. $P = \frac{F}{A}$
2. $P = h\rho g$
3. $\rho = \frac{m}{V}$

ELEKTRIK ELECTRICITY

1. $E = \frac{F}{Q}$
2. $I = \frac{Q}{t}$
3. $V = \frac{E}{Q}$
4. $V = IR$
5. $R = \frac{\rho l}{A}$
6. $\varepsilon = V + Ir$
7. $P = VI$
8. $P = \frac{E}{t}$
9. $E = \frac{V}{d}$

KEELEKTROMAGNETAN ELECTROMAGNETISM

1. $\frac{V_s}{V_p} = \frac{N_s}{N_p}$
2. $\eta = \frac{\text{Kuasa output}}{\text{Kuasa input}} \times 100\%$

 $\eta = \frac{\text{Output power}}{\text{Input power}} \times 100\%$

ELEKTRONIK ELECTRONICS

1. Tenaga keupayaan elektrik, $E = eV$
Electrical potential energy, $E = eV$
2. Tenaga kinetik maksimum, $E = \frac{1}{2} mv^2$
Maximum kinetic energy, $E = \frac{1}{2} mv^2$
3. $\beta = \frac{I_C}{I_B}$

FIZIK NUKLEAR NUCLEAR PHYSICS

1. $N = \left(\frac{1}{2}\right)^n N_0$
2. $E = mc^2$
3. $c = 3.00 \times 10^8 \text{ ms}^{-1}$
4. $1 \text{ u.j.a} = 1.66 \times 10^{-27} \text{ kg}$
 $1 \text{ a.m.u} = 1.66 \times 10^{-27} \text{ kg}$

FIZIK KUANTUM QUANTUM PHYSICS

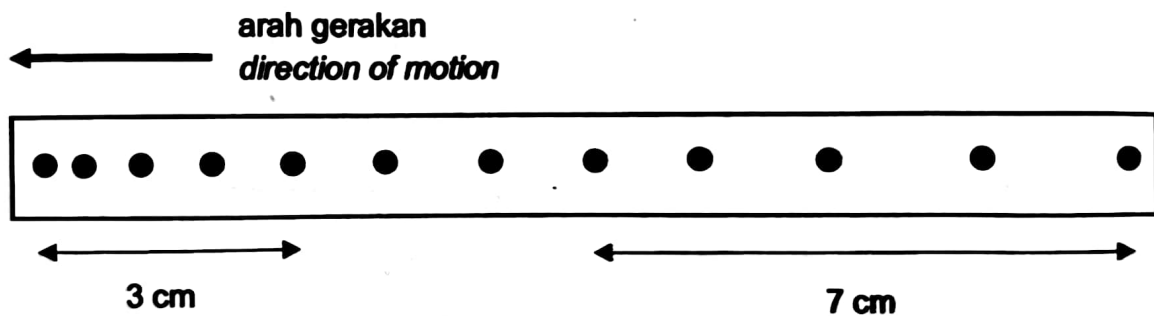
1. $E = hf$
2. $f = \frac{c}{\lambda}$
3. $\lambda = \frac{h}{p}$
4. $\lambda = \frac{h}{mv}$
5. $E = \frac{hc}{\lambda}$
6. $p = nhf$
7. $hf = W + \frac{1}{2} mv_{maks}^2$
8. $w = hf_0$
9. $g = 9.81 \text{ ms}^{-1} @ 9.81 \text{ Nkg}^{-1}$
10. $G = 6.67 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2}$
11. $h = 6.63 \times 10^{-34} \text{ Js}$

Jawab semua soalan
Answer all the questions

1. Antara unit S.I berikut, yang manakah merupakan unit asas S.I?
Which of the following S.I units is the basic unit of S.I?

- | | | | |
|---|-------|---|---------|
| A | Joule | B | Candela |
| | Joule | | Candela |
| C | Volt | D | Newton |
| | Volt | | Newton |

2. Rajah 1 menunjukkan keratan pita detik yang diperoleh daripada gerakan suatu objek.
Diagram 1 shows a section of ticker tape obtained from the motion of an object.



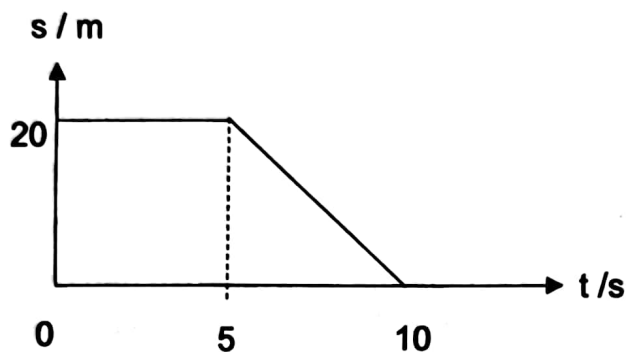
Rajah 1 / Diagram 1

Jangka masa detik dihidupkan dengan bekalan kuasa arus ulang alik dengan frekuensi 50 Hz. Kirakan pecutan objek tersebut.

The timer is powered by an alternating current power supply with a frequency of 50 Hz. Calculate the acceleration of the object.

- | | | | |
|---|---------------------------|---|--------------------------|
| A | 10.0 cm s ⁻² | B | 45.45 cm s ⁻² |
| C | 227.27 cm s ⁻² | D | 250.0 cm s ⁻² |

- Diagram 2 shows a graph of displacement against time for the movement of an object.**

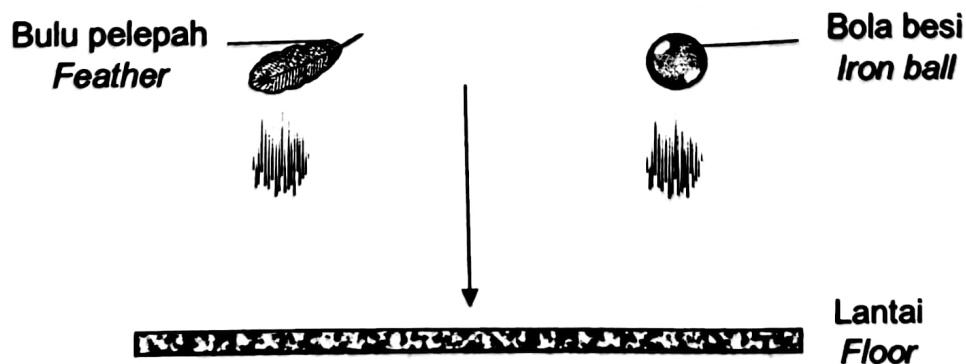


Rajah 2 / Diagram 2

What is the velocity of the object in the last 5 s?

- | | | | |
|----------|---------------------------|----------|----------------------------|
| A | 2 m s⁻¹ | B | -2 m s⁻¹ |
| C | 4 m s⁻¹ | D | -4 m s⁻¹ |

- Diagram 3 shows a feather and an iron ball that are released in a vacuum at the same height.**



Rajah 3 / Diagram 3

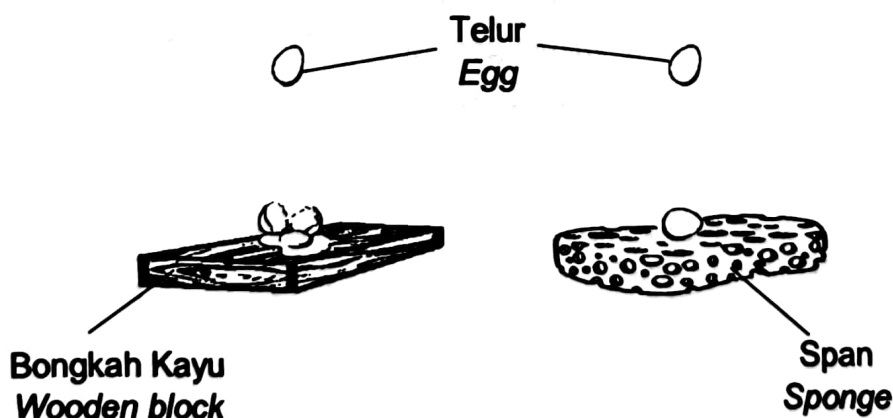
Mengapakah bulu pelepah dan bola besi sampai ke lantai pada masa yang sama?

Why do the feathers and the iron ball reach the floor at the same time?

- A Rintangan udara yang bertindak ke atas bola besi lebih besar daripada rintangan udara yang bertindak ke atas bulu pelepah.
The air resistance acting on the iron ball is greater than the air resistance acting on the feathers.
- B Pecutan kedua-dua bulu pelepah dan bola besi adalah sama.
The acceleration of both the feather and the iron ball is the same.
- C Luas permukaan kedua-dua bulu pelepah dan bola besi adalah sama.
The surface area of both the feather and the iron ball is the same.
- D Daya graviti yang bertindak ke atas bola besi lebih kecil daripada daya graviti yang bertindak ke atas bulu pelepah.
The force of gravity acting on the iron ball is smaller than the force of gravity acting on the feather.

5. Rajah 4 menunjukkan dua biji telur yang sama dilepaskan dari ketinggian yang sama ke atas dua permukaan yang berbeza.

Diagram 4 shows two identical eggs released from the same height onto two different surfaces.



Rajah 4 / Diagram 4

Pernyataan yang manakah benar tentang situasi di atas.

Which statement is true about the situation above.

- I Telur yang jatuh di atas bongkah kayu mempunyai daya impuls yang tinggi
An egg that falls on a wooden block has a high impulsive force
- II Telur yang jatuh di atas bongkah kayu melibatkan masa hentaman yang panjang
Eggs falling on a wooden block involve a long impact time
- III Permukaan span yang lembut menyebabkan masa hentaman bertambah
The soft surface of the sponge causes the impact time to increase
- IV Kadar perubahan momentum telur yang jatuh di atas span adalah rendah.
The rate of change of momentum of an egg falling on a sponge is low.

A I dan II
I and II

B I, II dan IV
I, II and IV

C I, III dan IV
I, III and IV

D I, II, III dan IV
I, II, III and IV

6. Rajah 5 menunjukkan sebuah motosikal melanggar sebuah kereta.
Diagram 5 shows a motorcycle hits a car.



Rajah 5 / Diagram 5

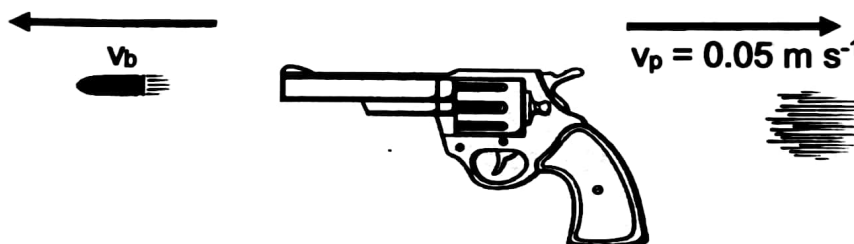
Penunggang motosikal tersebut telah tercampak ke hadapan disebabkan oleh

The motorcyclist was thrown forward because of

- | | | | |
|---|---------------------------------|---|--|
| A | inersia
<i>inertia</i> | B | momentum
<i>momentum</i> |
| C | jatuh bebas
<i>free fall</i> | D | keseimbangan daya
<i>equilibrium of force</i> |

7. Rajah 6 menunjukkan sebutir peluru dengan halaju, v_b ditembak keluar dari sebuah pistol. Jika jisim pistol ialah 0.1 kg, jisim peluru ialah 10 g dan halaju sentakan pistol, v_p ialah 0.05 m s^{-1} , hitungkan nilai v_b .

Diagram 6 shows a bullet with velocity, v_b is fired from a gun. If the mass of the gun is 0.1 kg, the mass of the bullet is 10 g and the recoil velocity of the gun, v_p is 0.05 m s^{-1} , calculate the value of v_b .



Rajah 6 / Diagram 6

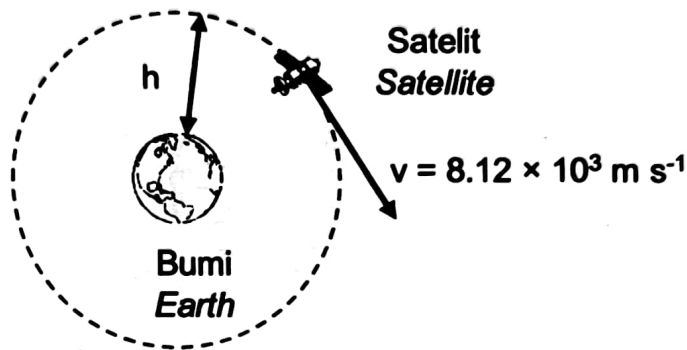
- | | | | |
|---|--------------------------|---|---------------------------------------|
| A | $- 0.5 \text{ m s}^{-1}$ | B | $- 5 \times 10^{-4} \text{ m s}^{-1}$ |
| C | 50 m s^{-1} | D | $5 \times 10^{-3} \text{ m s}^{-1}$ |

8. Rajah 7 menunjukkan sebuah satelit yang sedang mengorbit mengelilingi Bumi dengan pecutan memusat satelit ialah 7.35 m s^{-2} .

[Jejari Bumi, $R = 6.37 \times 10^6 \text{ m}$]

Diagram 7 shows a satellite that is orbiting around the Earth with a centripetal acceleration of the satellite is 7.35 m s^{-2} .

[*Earth radius, $R = 6.37 \times 10^6 \text{ m}$*]



Rajah 7 / Diagram 7

Hitung ketinggian satelit itu dari permukaan Bumi, h .

Calculate the height of the satellite from the Earth's surface, h .

- | | | | |
|---|------------------------------|---|------------------------------|
| A | $2.60 \times 10^6 \text{ m}$ | B | $6.36 \times 10^6 \text{ m}$ |
| C | $8.97 \times 10^6 \text{ m}$ | D | $1.10 \times 10^3 \text{ m}$ |

9. Antara yang berikut, yang manakah ciri-ciri satelit geopegun?
Which of the following are characteristics of geostationary satellites?

- A Tempoh orbit satelit lebih lama daripada tempoh putaran Bumi kerana jejari orbit satelit lebih besar dari jejari Bumi.
The orbital period of the satellite is longer than the period of rotation of the Earth because the radius of the satellite's orbit is greater than the radius of the Earth.
- B Kedudukan orbit satelit bergantung kepada saiz satelit.
The orbital position of a satellite depends on the size of the satellite.
- C Kedudukan satelit pegun sepanjang garisan khatulistiwa.
The position of satellite is stationary along the equator.
- D Tempoh orbit satelit sama dengan tempoh putaran Bumi.
The period of the satellite's orbit is the same as the period of the Earth's rotation.

10. Rajah 8 menunjukkan seorang pesakit yang demam sedang menggunakan pad penyejukan untuk mengurangkan suhu badannya. Apabila kulit dan pad penyejukan berada dalam keseimbangan terma, pernyataan manakah benar?

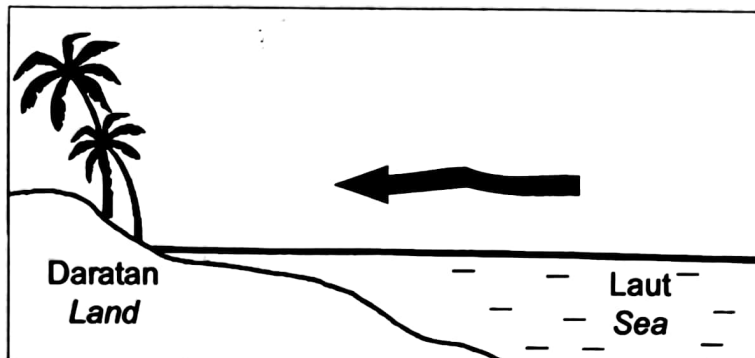
Diagram 8 shows a patient with a fever is using a cooling pad to reduce his body temperature. When the skin and the cooling pad are in thermal equilibrium, which statement is true?



Rajah 8 / Diagram 8

- A Pengaliran haba dari badan pesakit lebih tinggi.
The heat flow from the patient's body is higher.
- B Suhu pad penyejukan tidak berubah.
The temperature of the cooling pad does not change.
- C Pengaliran bersih haba antara badan pesakit dan pad penyejukan adalah sifar.
The net flow of heat between the patient's body and the cooling pad is zero.
- D Suhu akhir badan pesakit lebih tinggi daripada suhu akhir pad penyejukan.
The final temperature of the patient's body is higher than the final temperature of the cooling pad.

11. Rajah 9 menunjukkan pembentukan bayu laut.
Diagram 9 shows the formation of the sea breeze.



Rajah 9 / Diagram 9

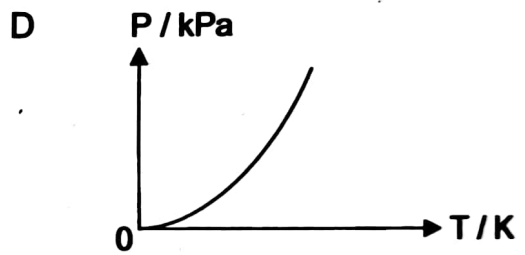
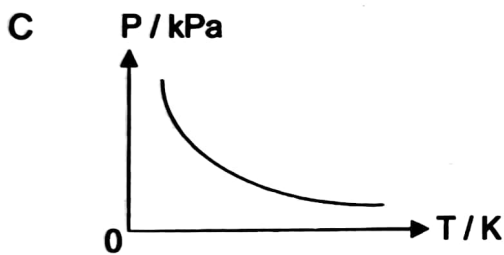
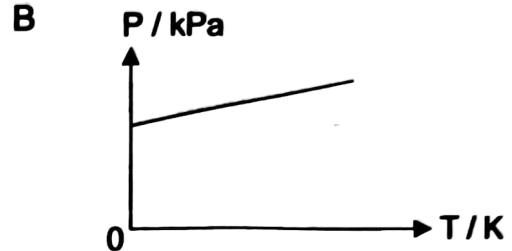
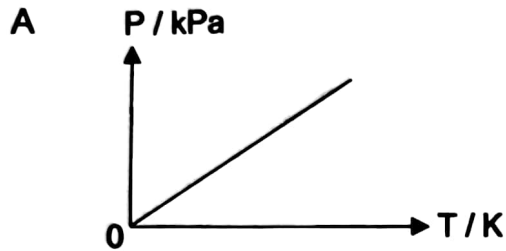
Pernyataan manakah yang betul?

Which statement is correct?

- A Ketumpatan udara di atas permukaan daratan lebih tinggi daripada ketumpatan udara di atas permukaan air laut.
The air density above the land surface is higher than the air density above the sea surface.
- B Muatan haba tentu air laut lebih tinggi daripada muatan haba tentu daratan
The specific heat capacity of sea water is higher than the specific heat capacity of land.
- C Kelajuan udara sejuk lebih tinggi berbanding kelajuan udara panas.
The speed of cold air is higher than the speed of hot air.
- D Suhu daratan menjadi lebih rendah daripada suhu air laut.
The land temperature becomes lower than the sea water temperature.

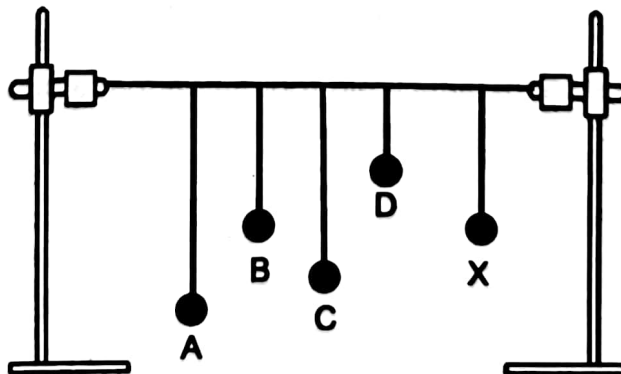
12. Antara graf berikut, yang manakah menunjukkan hubungan antara tekanan dan suhu mutlak suatu gas kering berjisim dan isipadu tetap?

Which of the following graphs shows the relationship between pressure and temperature of a dry gas with constant mass and volume?



13. Apabila bandul X dalam Rajah 10 disesar, bandul manakah yang akan berayun dengan amplitud maksimum?

When pendulum X in Diagram 10 is displaced, which pendulum will oscillate with maximum amplitude?



Rajah 10 / Diagram 10

14. Suatu gelombang satah dengan panjang gelombang 8.0 cm dan halaju 2.0 cm s⁻¹ bergerak di permukaan air cetek. Apabila gelombang tersebut bergerak ke kawasan yang lebih dalam, halajunya menjadi 12.0 cm s⁻¹. Hitungkan panjang gelombang air di kawasan dalam.

A plane wave with a wavelength of 8.0 cm and a velocity of 2.0 cm s⁻¹ travels on the surface of shallow water. When the wave moves to a deeper region, its velocity becomes 12.0 cm s⁻¹. Calculate the wavelength of the water in the depth water.

- | | | | |
|---|--------|---|--------|
| A | 3.0 cm | B | 3.5 cm |
| C | 4.0 cm | D | 4.5 cm |

15. Dua sumber gelombang yang koheren bermaksud kedua-dua sumber gelombang mempunyai

Two coherent wave sources means that both wave sources have

- A frekuensi dan amplitud yang sama
same frequency and amplitude
- B frekuensi sama tetapi berbeza amplitud
same frequency but different amplitude
- C frekuensi dan beza fasa yang sama
same frequency and phase difference
- D frekuensi sama tetapi beza fasa berlainan
same frequency but different phase difference

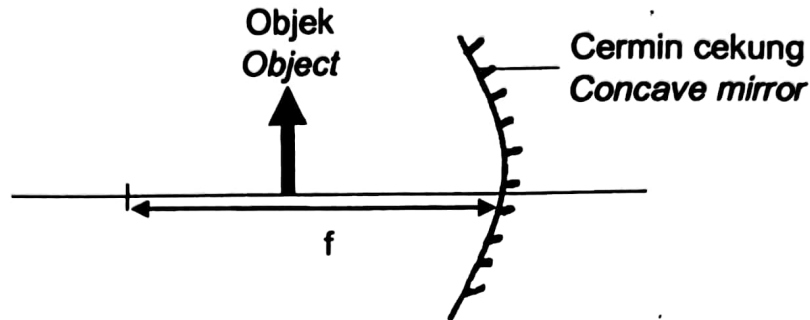
16. Halaju Cahaya di dalam vakum ialah 3×10^8 m s⁻¹. Indeks biasan bagi air ialah 1.30. Berapakah halaju cahaya di dalam air?

The velocity of light in a vacuum is 3×10^8 m s⁻¹. The refractive index of water is 1.30. What is the velocity of light in water?

- | | | | |
|---|--------------------------------------|---|--------------------------------------|
| A | 4.26×10^8 m s ⁻¹ | B | 3.11×10^8 m s ⁻¹ |
| C | 2.31×10^8 m s ⁻¹ | D | 2.11×10^8 m s ⁻¹ |

17. Rajah 11 menunjukkan satu objek diletakkan di hadapan satu cermin cekung. Jarak objek itu adalah kurang daripada panjang fokus, f cermin itu.

Diagram 11 shows an object placed in front of a concave mirror. The distance of the object is less than the focal length, f of the mirror.



Rajah 11 / Diagram 11

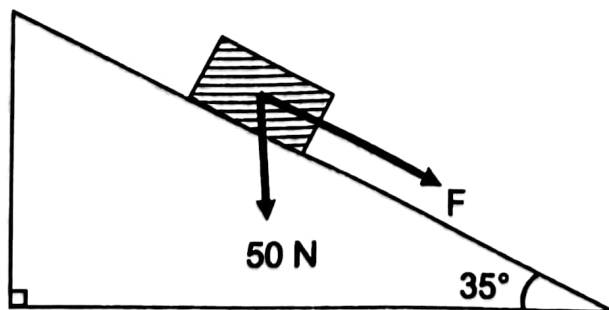
Apakah ciri-ciri imej yang terbentuk?

What are the characteristics of the image formed?

- | | | | |
|---|---|---|--|
| A | Lebih kecil, maya, tegak
<i>Diminished, virtual, upright</i> | B | Lebih kecil, nyata, songsang
<i>Diminished, real, inverted</i> |
| C | Lebih besar, maya, tegak
<i>Magnified, virtual, upright</i> | D | Lebih besar, maya, songsang
<i>Magnified, virtual, inverted</i> |

18. Rajah 12 menunjukkan sebuah bongkah kayu menggelongsor menuruni satah condong.

Diagram shows a block of wood sliding down an inclined plane.



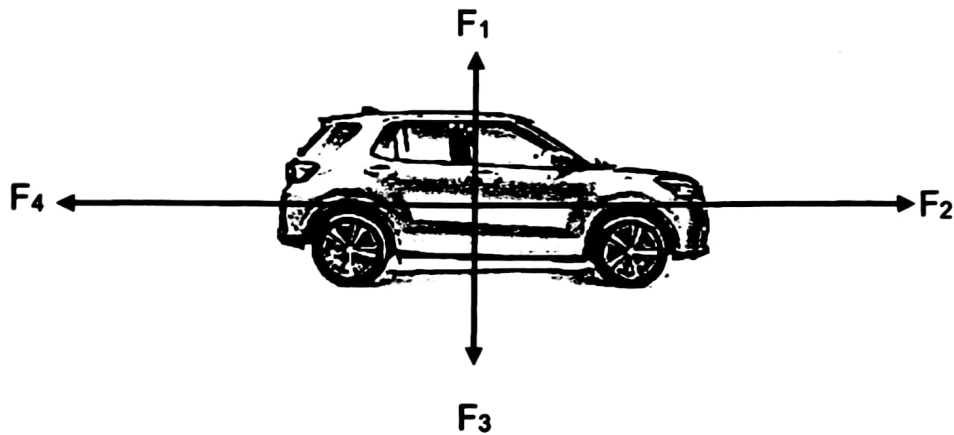
Rajah 12 / Diagram 12

Hitungkan nilai F .

Calculate the value of F .

- | | | | |
|---|--------|---|--------|
| A | 25.4 N | B | 28.7 N |
| C | 31.5 N | D | 41.0 N |

19. Rajah 13 menunjukkan sebuah kereta sedang bergerak dengan pecutan.
Diagram 13 shows a car moving with acceleration.



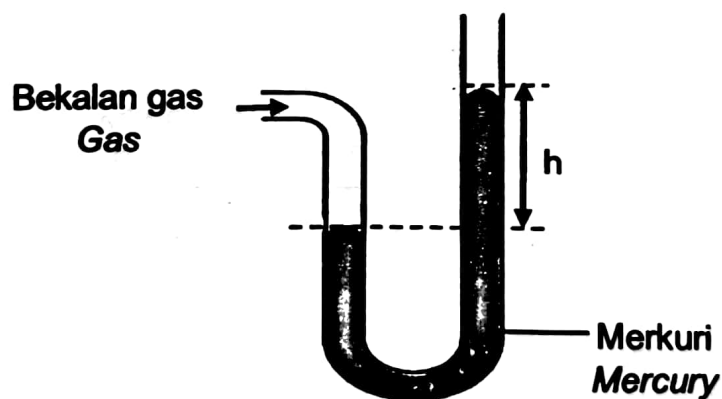
Rajah 13 / Diagram 13

Perbandingan manakah yang betul bagi daya-daya yang bertindak ke atas kereta itu?

Which comparison is correct for the forces acting on the car?

	F_1 dan F_3 F_1 and F_3	F_2 dan F_4 F_2 and F_4
A	$F_1 < F_3$	$F_2 > F_4$
B	$F_1 = F_3$	$F_2 > F_4$
C	$F_1 = F_3$	$F_2 < F_4$
D	$F_1 < F_3$	$F_2 < F_4$

20. Empangan dibina dengan keadaan bahagian bawah yang lebih tebal daripada bahagian atas. Kenapakah ianya direkabentuk sedemikian?
Dams are built with the condition that the lower part is thicker than the upper part. Why is it designed that way?
- A Tekanan air bertambah dengan kedalaman air
Water pressure increases with water depth
 - B Suhu air semakin rendah dengan kedalaman air
Water temperature decreases with water depth
 - C Ketumpatan air bertambah apabila kedalaman air bertambah
The density of water increases as the depth of water increases
 - D Saiz molekul air bertambah mengikut kedalaman air
The size of water molecules increases with water depth
21. Rajah 14 menunjukkan satu bekalan gas di sambung kepada sebuah manometer. Tekanan yang diberikan oleh bekalan gas itu ialah 86 cm Hg.
Diagram 14 shows a gas supply connected to a manometer. The pressure exerted by the gas supply is 86 cm Hg.



Rajah 14 / Diagram 14

Berapakah nilai h ?

[Tekanan atmosfera = 76 cm Hg]

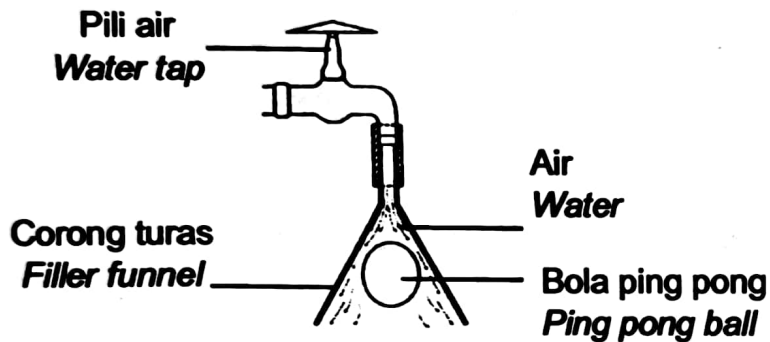
What is the value of h ?

[Atmospheric pressure = 76 cm Hg]

- | | | | |
|---|-------|---|--------|
| A | 10 cm | B | 76 cm |
| C | 86 cm | D | 162 cm |

22. Rajah 15 menunjukkan sebiji bola ping pong terangkat ke atas apabila pili air dibuka.

Diagram 15 shows a ping pong ball lifted upwards when the water tap is opened.



Rajah 15 / Diagram 15

Prinsip fizik manakah dapat menjelaskan situasi di atas?
Which principle of physics can explain the above situation?

- | | | | |
|---|--|---|--|
| A | Prinsip Pascal
<i>Pascal's principle</i> | B | Prinsip Bernoulli
<i>Bernoulli's principle</i> |
| C | Prinsip Archimedes
<i>Archimedes' principle</i> | D | Prinsip keabadian tenaga
<i>Principle of conservation of energy</i> |

23. Rajah manakah menunjukkan aplikasi prinsip Archimedes?
Which diagram shows the application of Archimedes' principle?

A



B



C



D



24. Hitungkan kuantiti cas elektrik, Q yang mengalir melalui sebiji mentol dalam masa 8 jam jika arus yang melaluinya ialah 0.85 A.
Calculate the amount of electric charge, Q that flows through a bulb in 8 hours if the current through it is 0.85 A.

A 6.8 C

B 48 C

C 2.45×10^4 CD 3.39×10^4 C

25. Rajah 16 menunjukkan sebuah mentol yang menggunakan gegelung dawai tungsten sebagai filamen.
Diagram 16 shows a bulb that uses a coil of tungsten wire as a filament.



Filamen tungsten
Tungsten filament

Rajah 16 / Diagram 16

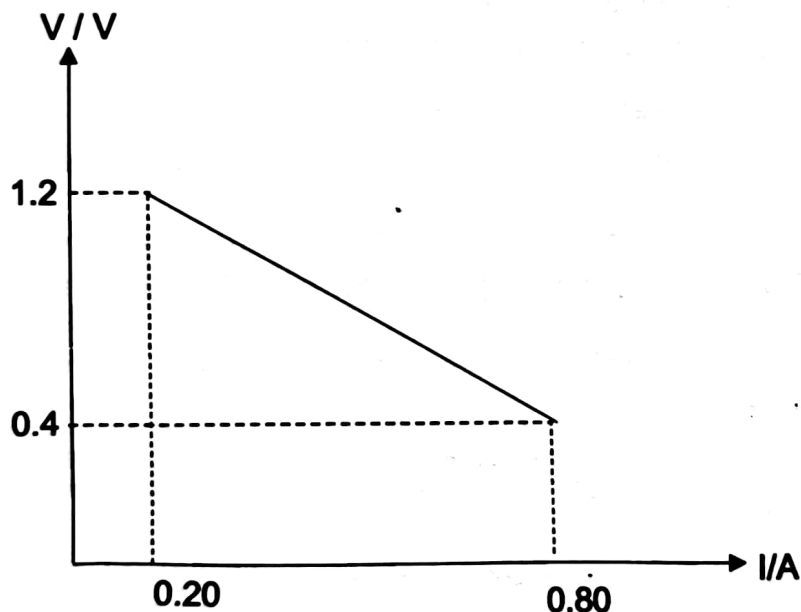
Apakah fungsi gegelung dawai tungsten?

What is the function of tungsten wire coil?

- | | | | |
|---|--|---|---|
| A | meningkatkan arus
<i>increase the current</i> | B | meningkatkan beza keupayaan
<i>increase the potential difference</i> |
| C | meningkatkan rintangan
<i>increase the resistance</i> | D | meningkatkan kuasa
<i>increase the power</i> |

26. Rajah 17 menunjukkan graf beza keupayaan, V melawan arus, I melalui suatu sel.

Diagram 17 shows a graph of potential difference, V against current, I through a cell.



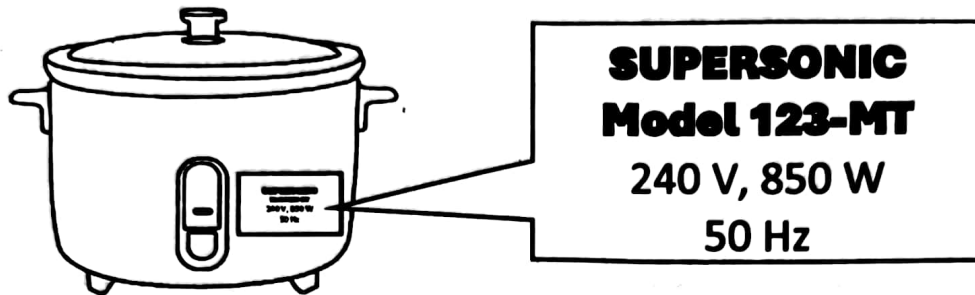
Rajah 17 / Diagram 17

Berapakah rintangan dalam sel itu?

What is the internal resistance of the cell?

- | | | | |
|---|---------------|---|---------------|
| A | 1.33 Ω | B | 1.50 Ω |
| C | 3.00 Ω | D | 6.00 Ω |

27. Rajah 18 menunjukkan sebuah periuk nasi elektrik berlabel 240 V, 850 W.
Diagram 18 shows a rice cooker labelled 240 V, 850 W.



Rajah 18 / Diagram 18

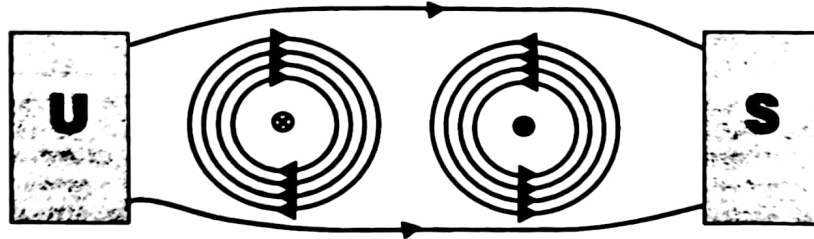
Label bermaksud periuk nasi itu akan menggunakan

The label means the rice cooker will use

- A 240 J tenaga elektrik jika disambung kepada 850 V beza keupayaan.
240 J of electrical energy if connected to 850 V potential difference.
- B 850 J tenaga elektrik jika disambung kepada 240 V beza keupayaan.
240 J of electrical energy if connected to 850 V potential difference.
- C 240 J tenaga elektrik setiap saat jika disambung kepada 850 V beza keupayaan.
240 J of electrical energy every second if connected to 850 V potential difference.
- D 850 J tenaga elektrik setiap saat jika disambung kepada 240 V beza keupayaan.
850 J of electrical energy every second if connected to 240 V potential difference.

28. Rajah 19 menunjukkan interaksi antara medan magnet daripada magnet bar dan gegelung pembawa arus.

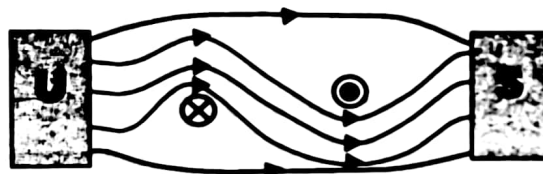
Diagram 19 shows interaction between the magnetic field from the bar magnet and the current carrying coil.



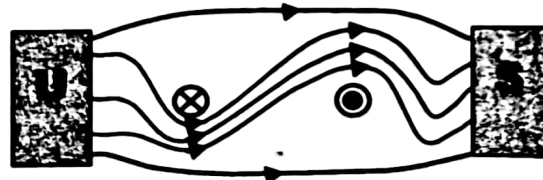
Rajah 19 / Diagram 19

Corak manakah yang benar menunjukkan corak medan lastik yang terhasil?
Which pattern correctly shows the resulting catapult field pattern?

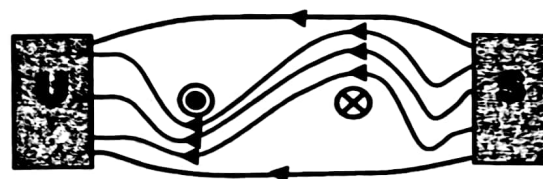
A



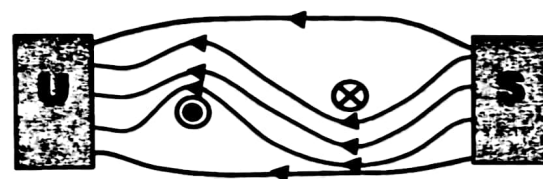
B



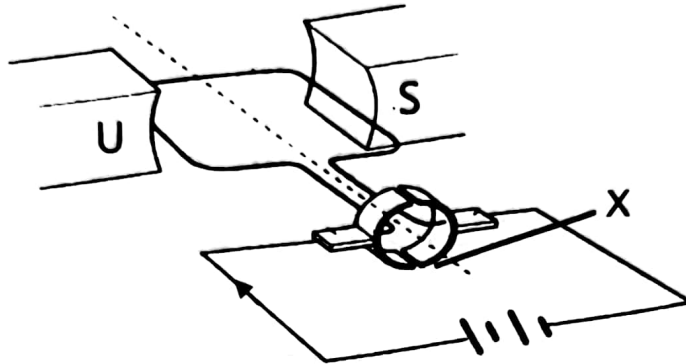
C



D



29. Rajah 20 menunjukkan motor arus terus.
Diagram 20 shows direct current motor.

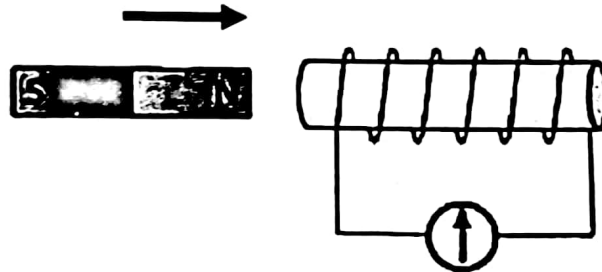


Rajah 20 / Diagram 20

Apakah fungsi komponen yang berlabel X?
What is the function of the component labeled X?

- A Memastikan arus mengalir dari sel kering ke gegelung
Ensures current flows from the dry cell to the coil
- B Mengawal jumlah arus yang merentasi gegelung
Controls the amount of current that passes through the coil
- C Songsangkan arah arus merentasi gegelung bagi setiap separuh pusingan
Reverse the direction of the current across the coil for each half turn
- D Songsangkan arah arus merentasi gegelung bagi setiap satu pusingan
Reverse the direction of the current across the coil for each turn

30. Rajah 21 menunjukkan magnet bar yang sedang bergerak mendekati gegelung. Didapati jarum penunjuk galvanometer terpesong.
Diagram 21 shows a moving bar magnet approaching a coil. It was found that the galvanometer indicator pointer was deflected.

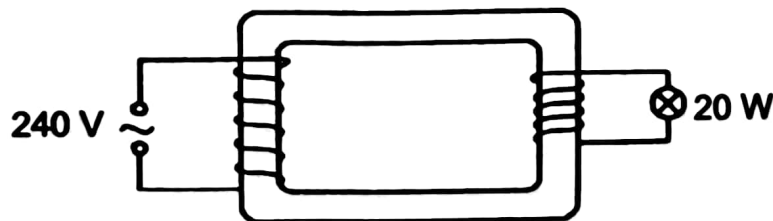


Rajah 21 / Diagram 21

Antara yang berikut, yang manakah boleh digunakan untuk menentukan arah pesongan jarum galvanometer itu?

Which of the following can be used to determine the direction of deflection of the galvanometer pointer?

- | | | | |
|---|--|---|---------------------------------------|
| A | Petua Tangan Kanan Fleming
<i>Fleming's Right Hand Rule</i> | B | Hukum Lenz
<i>Lenz's law</i> |
| C | Petua Tangan Kiri Fleming
<i>Fleming's Left Hand Rule</i> | D | Hukum Faraday
<i>Faraday's law</i> |
31. Rajah 22 menunjukkan sebuah transformer unggul yang digunakan untuk menyalakan sebiji mentol pada kecerahan normal.
Diagram 22 shows a superior transformer used to light a bulb at normal brightness.



Rajah 22 / Diagram 22

Berapakah nilai arus primer, I_p ?

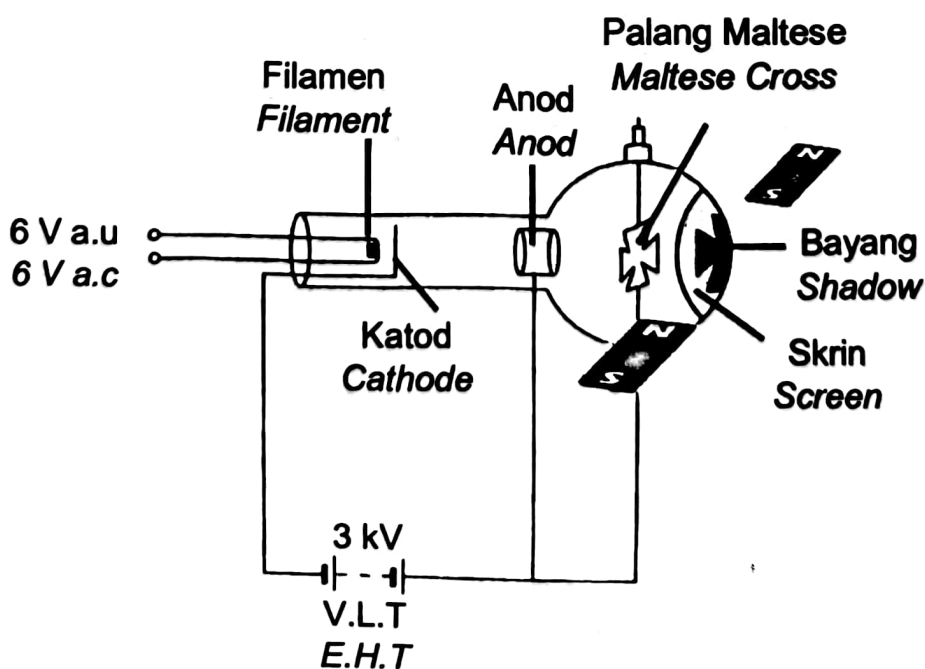
What is the value of the primary current, I_p ?

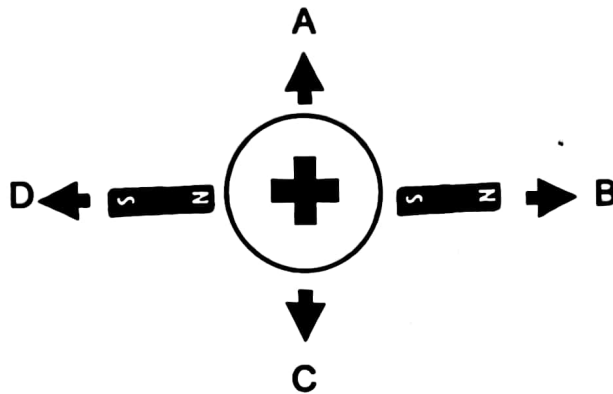
- | | | | |
|---|--------|---|---------|
| A | 0.08 A | B | 8.00 A |
| C | 1.20 A | D | 12.00 A |

32. Apakah pancaran termion?
What is thermionic emission?

- A Pancaran elektron daripada permukaan logam yang dipanaskan.
The emission of electrons from a heated metal surface.
- B Pancaran neutron daripada permukaan logam yang dipanaskan.
The emission of neutron from heated metal surface.
- C Pancaran elektron daripada permukaan logam yang dipanaskan di dalam medan magnet.
The emission of electrons from a heated metal surface in a magnetic field.
- D Pancaran atom daripada permukaan logam yang dipanaskan.
The emission of atoms from a heated metal surface.

33. Rajah 23 menunjukkan dua magnet dengan kutub berlawanan diletakkan di sisi tiub palang Maltese.
Diagram 23 shows two magnets with opposite poles placed on the side of a Maltese cross tube.





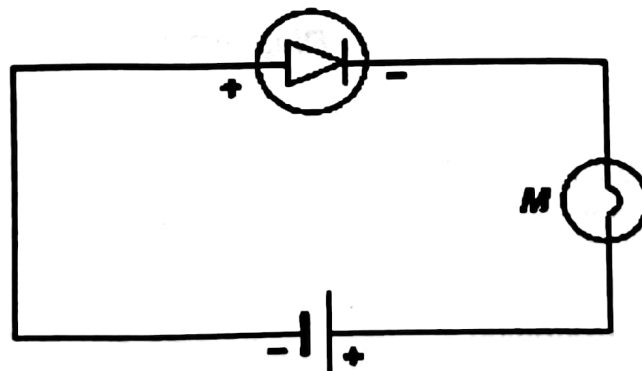
Rajah 23 / Diagram 23

Antara arah A, B, C dan D yang manakah arah pesongan bayang yang dapat diperhatikan pada skrin?

Which of the directions A, B, C and D is the direction of shadow deflection that can be observed on the screen?

34. Seorang murid memasang litar seperti Rajah 24. Didapati mentol tidak menyala.

A student sets up a circuit as shown in Diagram 24. It was found that the bulb does not light up.



Rajah 24 / Diagram 24

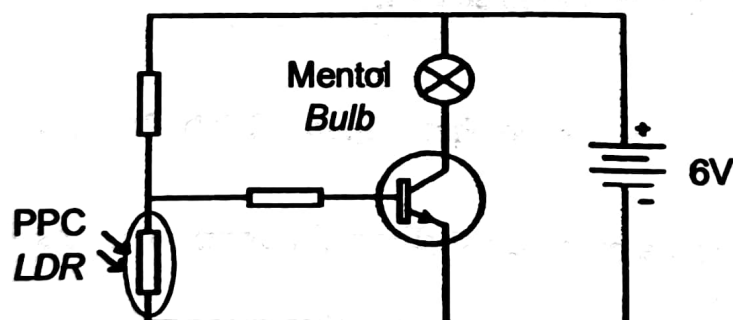
Apakah pengubahsuaian yang perlu dilakukan untuk memastikan mentol itu menyala?

What modifications need to be made to light up the bulb?

- A Sambungkan fuis di dalam litar
Connect the fuse in the circuit
- B Songsangkan sambungan sel kering
Reverse the dry cell connection
- C Songsangkan sambungan mentol
Reverse the bulb connection
- D Menambahkan bilangan sel kering
Increases the number of dry cells

35. Rajah 25 menunjukkan litar transistor dengan sebuah perintang peka cahaya (PPC).

Diagram 25 shows transistor circuit with a light dependent resistor (LDR).



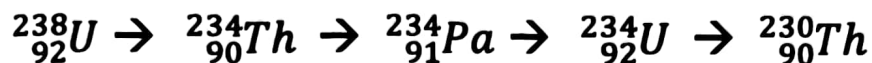
Rajah 25 / Diagram 25

Antara situasi berikut, yang manakah akan menyalakan mentol?

Which of the following situations will light up the bulb?

- | | |
|---|--|
| A Persekitaran yang terang
<i>Bright surrounding</i> | B Persekitaran yang gelap
<i>Dark surrounding</i> |
| C Persekitaran yang sejuk
<i>Cold surrounding</i> | D Persekitaran yang panas
<i>Hot surrounding</i> |

36. Persamaan di bawah menunjukkan satu siri reputan bagi isotop Uranium-238.
The equation below shows a decaying series of the Uranium-238 isotope.



Hitung bilangan zarah alfa dan zarah beta yang dipancarkan.
Calculate the number of alpha particles and beta particles emitted.

- A 1 zarah alfa, 3 zarah beta
1 alpha particle, 3 beta particles
- B 3 zarah alfa, 1 zarah beta
3 alpha particle, 1 beta particles
- C 2 zarah alfa, 2 zarah beta
2 alpha particle, 2 beta particles
- D 4 zarah beta sahaja
4 beta particles
37. Satu sampel radium-226 mereput dengan membebaskan tenaga 7.81×10^{-13} J.
 Hitungkan cacat jisim sampel.
A sample of radium-226 decays by releasing 7.81×10^{-13} J of energy.
Calculate the mass defect of the sample.
- A 2.60×10^{-21} kg B 3.35×10^{-27} kg
- C 8.68×10^{-30} kg D 4.77×10^{-32} kg
38. Di dalam sebuah reaktor nuklear, boron digunakan sebagai rod pengawal untuk
In a nuclear reactor, boron is used as a control rod to
- A menyerap neutron.
absorb neutrons.
- B memperlahankan neutron yang berhalaju tinggi.
slows down high velocity neutrons.
- C menyerap pancaran radioaktif daripada teras reaktor.
absorbs radioactive radiation from the reactor core.
- D meningkatkan halaju neutron.
increases the neutron velocity.

39. Antara berikut yang manakah benar tentang foton?

Which of the following is true about photons?

I Semakin pendek panjang gelombang cahaya, semakin sedikit tenaga foton.

The shorter the wavelength of light, the less photon energy.

II Semakin tinggi frekuensi gelombang cahaya, semakin tinggi kuantum tenaga.

The higher the frequency of the light wave, the higher the quantum energy.

III Tenaga foton adalah berkadar terus dengan frekuensi gelombang cahaya.

Photon energy is directly proportional to the frequency of light waves.

IV Foton ialah kuantum tenaga cahaya yang boleh dipindahkan.

A photon is a quantum of light energy that can be transferred.

A I dan II

B I, II dan III

C I dan III

D II, III dan IV

40. Bagaimanakah fotoelektron memperoleh tenaga kinetik?

How do photoelectrons acquire kinetic energy?

A apabila cahaya bergabung dengan elektron
when light combines with an electron

B apabila gelombang cahaya mempunyai banyak sifat
when light waves have many properties

C Apabila frekuensi cahaya melebihi frekuensi ambang
When the light frequency exceeds the threshold frequency

D Apabila menggunakan cahaya berhalaju tinggi.
When using high velocity light

KERTAS PEPERIKSAAN TAMAT