

SULIT

4531/1

Nama:

Kelas:

SEKOLAH MENENGAH KEBANGSAAN

PEPERIKSAAN PERCUBAAN SPM 2026

FIZIK

4531/1

TINGKATAN 5

Kertas 1

Ogos 2026

1 ¼ jam



Satu jam lima belas minit

JANGAN BUKA KERTAS PEPERIKSAAAN INI SEHINGGAN DIBERITAHU

1. Kertas peperiksaan ini adalah dalam dwibahasa.
2. Soalan dalam Bahasa Melayu mendahului soalan yang sepadan dalam Bahasa Inggeris.
3. Kalkulator saintifik yang tidak boleh diprogramkan adalah dibenarkan.
4. Sila hitamkan jawapan anda dengan jelas pada Kertas Objektif. Sila padam dengan kemas jika ingin menukar jawapan.

Kertas peperiksaan ini mengandungi 37 halaman bercetak.

4531/1

SULIT

Rumus-rumus berikut boleh membantu anda menjawab soalan. Simbol-simbol yang Diberi adalah yang biasa digunakan.

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 GRAVITATIONAL	
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	$v = \sqrt{\frac{2GM}{r}}$
10	$g = 9.81ms^{-2} @ 9.81Nkg^{-1}$
11	$G = 6.67 \times 10^{-11} Nm^2kg^{-2}$
12	Jisim Bumi, $M = 5.97 \times 10^{24} kg$ Mass of Earth
13	Jejari Bumi, $R = 6.37 \times 10^6 m$ Radius of Earth

HABA HEAT	
1	$Q = mc\theta$
2	$Q = ml$
3	$Q = Pt$
4	$P_1V_1 = P_2V_2$
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	Pembesar linear, $m = \frac{v}{u}$ Linear Magnification, $m = \frac{v}{u}$

DAYA DAN GERAKAN II
FORCE AND MOTION II

$$\begin{aligned} 1 \quad & F = kx \\ 2 \quad & E = \frac{1}{2}Fx \\ 3 \quad & E = \frac{1}{2}kx^2 \end{aligned}$$

TEKANAN
PRESSURE

$$\begin{aligned} 1 \quad & P = \frac{F}{A} \\ 2 \quad & P = h\rho g \\ 3 \quad & \rho = \frac{m}{V} \end{aligned}$$

ELEKTRIK
ELECTRICITY

$$\begin{aligned} 1 \quad & E = \frac{F}{Q} & 6 \quad & \varepsilon = V + Ir \\ 2 \quad & I = \frac{Q}{t} & 7 \quad & P = IV \\ 3 \quad & V = \frac{E}{Q} & 8 \quad & P = \frac{E}{t} \\ 4 \quad & V = IR & 9 \quad & E = \frac{V}{d} \\ 5 \quad & R = \frac{\rho l}{A} \end{aligned}$$

KEELEKTROMAGNETAN
ELECTROMAGNETISM

$$\begin{aligned} 1 \quad & \frac{V_s}{V_p} = \frac{N_s}{N_p} \\ 2 \quad & \eta = \frac{\text{Kuasa output}}{\text{Kuasa input}} \times 100\% \\ & \eta = \frac{\text{Output power}}{\text{Input power}} \times 100\% \end{aligned}$$

ELEKTRONIK
ELECTRONIC

$$\begin{aligned} 1 \quad & \text{Tenaga keupayaan elektrik, } E = eV \\ & \text{Electrical potential energy, } E = eV \\ 2 \quad & \text{Tenaga kinetik maksimum, } E = \frac{1}{2}mv^2 \\ & \text{Maximum kinetic energy, } E = \frac{1}{2}mv^2 \\ 3 \quad & \beta = \frac{I_c}{I_B} \\ 4 \quad & V_{out} = \frac{R_2}{R_1 + R_2} V_{in} \end{aligned}$$

FIZIK NUKLEAR
NUCLEAR PHYSICS

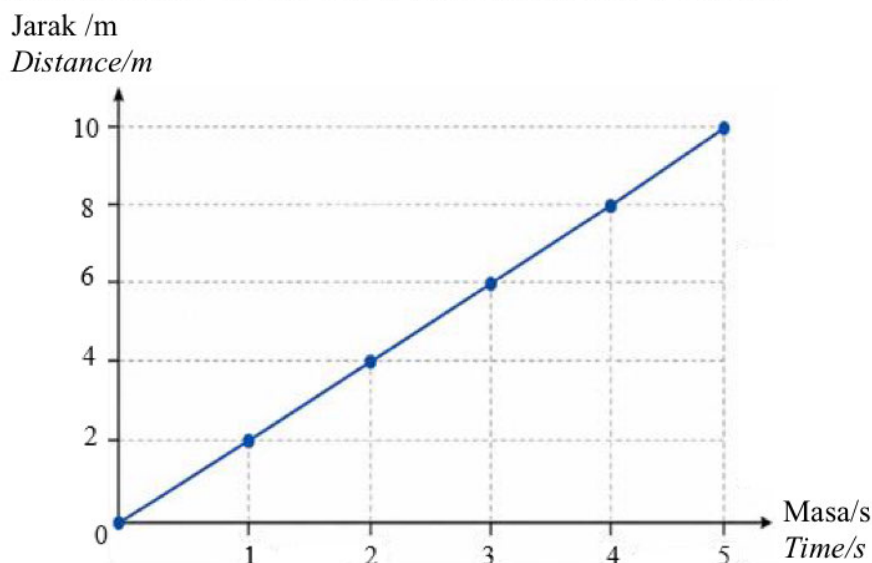
$$\begin{aligned} 1 \quad & N = \left(\frac{1}{2}\right)^n N_o \\ 2 \quad & E = mc^2 \\ 3 \quad & c = 3.00 \times 10^8 \text{ ms}^{-1} \\ 4 \quad & 1 \text{ u.j.a} = 1.66 \times 10^{-27} \text{ kg} \\ & 1 \text{ a.m.u} = 1.66 \times 10^{-27} \text{ kg} \end{aligned}$$

FIZIK KUANTUM
QUANTUM PHYSICS

$$\begin{aligned} 1 \quad & E = hf \\ 2 \quad & f = \frac{c}{\lambda} \\ 3 \quad & \lambda = \frac{h}{p} \\ 4 \quad & \lambda = \frac{h}{mv} \\ 5 \quad & E = \frac{hc}{\lambda} \\ 6 \quad & p = nhf \\ 7 \quad & hf = W + \frac{1}{2}mv_{maks}^2 \\ 8 \quad & W = hf_o \\ 9 \quad & h = 6.63 \times 10^{-34} \text{ Js} \end{aligned}$$

Jawab **semua** soalan
Answer **all** the questions

1. Antara kuantiti fizik berikut, yang manakah ialah kuantiti terbitan?
Which of the following physical quantities is a derived quantity?
- A Panjang
Length
- B Jisim
Mass
- C Masa
Time
- D Halaju
Velocity
2. Rajah 1 menunjukkan graf jarak melawan masa bagi pergerakan sebuah troli.
Diagram 1 shows a distance against time graph for the motion of a trolley.



Rajah 1
Diagram 1

Berdasarkan graf dalam Rajah 2, apakah hubungan antara jarak dengan masa?
Based on the graph in Diagram 2, what is the relationship between distance and time?

- A Jarak bertambah apabila masa bertambah.
Distance increases when time increases.
- B Jarak bertambah secara linear dengan masa.
Distance increase linearly with time.
- C Jarak berkadar terus dengan masa.
Distance is directly proportional with time.
- D Jarak kekal malar apabila masa bertambah.
Distance remains constant when time increases.

3. Rajah 2 menunjukkan seorang lelaki sedang menunggang sebuah motosikal bergerak dengan halaju awal, $u = 10 \text{ m s}^{-1}$ dan pecutan seragam, $a = 2 \text{ ms}^{-2}$ dalam masa, $t = 2$ saat.
Diagram 2 shows a man riding a motorcycle with an initial velocity, $u = 10 \text{ ms}^{-1}$, and uniform acceleration, $a = 2 \text{ ms}^{-2}$ for a time, $t = 2$ seconds.



Rajah 2
Diagram 2

Berapakah halaju akhir v , motosikal itu?
What is the final velocity v , of the motorcycle?

- A 10 m s^{-1}
- B 14 m s^{-1}
- C 25 m s^{-1}
- D 30 m s^{-1}

4. Rajah 3 menunjukkan dua ciri keselamatan kenderaan.
Diagram 3 shows two characteristics of safety vehicles.

P

Van melanggar penghadang besi
tanpa zon remuk
*A van crashes into a barrier
without a crumple zone*



Q

Kereta melanggar penghadang
besi dengan zon remuk
*A car crashes into a barrier with
a crumple zone*



Rajah 3
Diagram 3

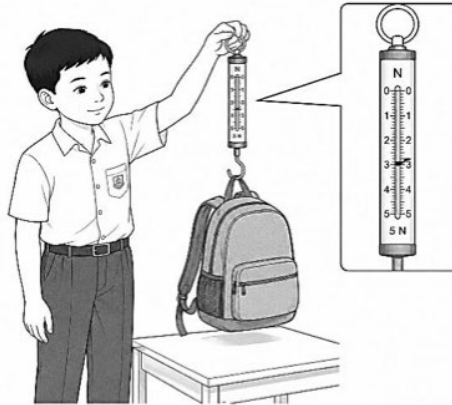
Mengapakah zon remuk digunakan pada bahagian hadapan kenderaan?
Why is a crumple zone used at the front part of a vehicle?

- A** Untuk meningkatkan momentum kereta semasa pelanggaran.
To increase the momentum of the car during collision.
- B** Untuk memendekkan masa pelanggaran supaya daya bertambah.
To shorten the collision time so that force increases.
- C** Untuk memanjangkan masa pelanggaran supaya daya yang bertindak berkurang.
To lengthen the collision time so that the acting force decreases.
- D** Untuk mengurangkan jisim kereta supaya halaju bertambah.
To reduce the mass of the car so that velocity increases.



5. Rajah 4 menunjukkan seorang murid menimbang beg sekolahnya menggunakan neraca spring.

Diagram 4 shows a student measuring the weight of a school bag using a spring balance.



Rajah 4
Diagram 4

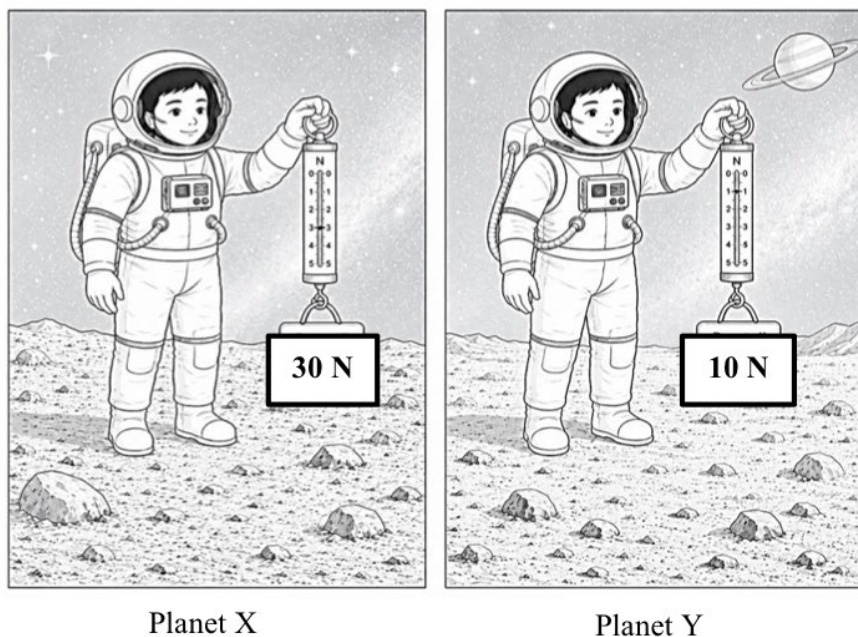
Apakah kesimpulan yang betul tentang berat beg sekolah tersebut?

What is the correct conclusion about the weight of the school bag?

- A Berat bergantung pada daya graviti.
Weight depends on gravitational force.
- B Berat ialah isi padu objek.
Weight is the volume of an object.
- C Berat sentiasa malar di semua tempat.
Weight is always constant everywhere.
- D Berat dan jisim ialah kuantiti yang sama.
Weight and mass are the same quantity.

6. Rajah 5 menunjukkan seorang angkasawan berdiri di dua planet yang berbeza, Planet X dan Planet Y.

Diagram 5 shows an astronaut standing on two different planets, Planet X and Planet Y.



Rajah 5

Diagram 65 berbeza di kedua-dua planet tersebut.

Antara berikut, yang manakah kepentingan utama mengetahui nilai pecutan graviti setiap planet dalam Sistem Suria?

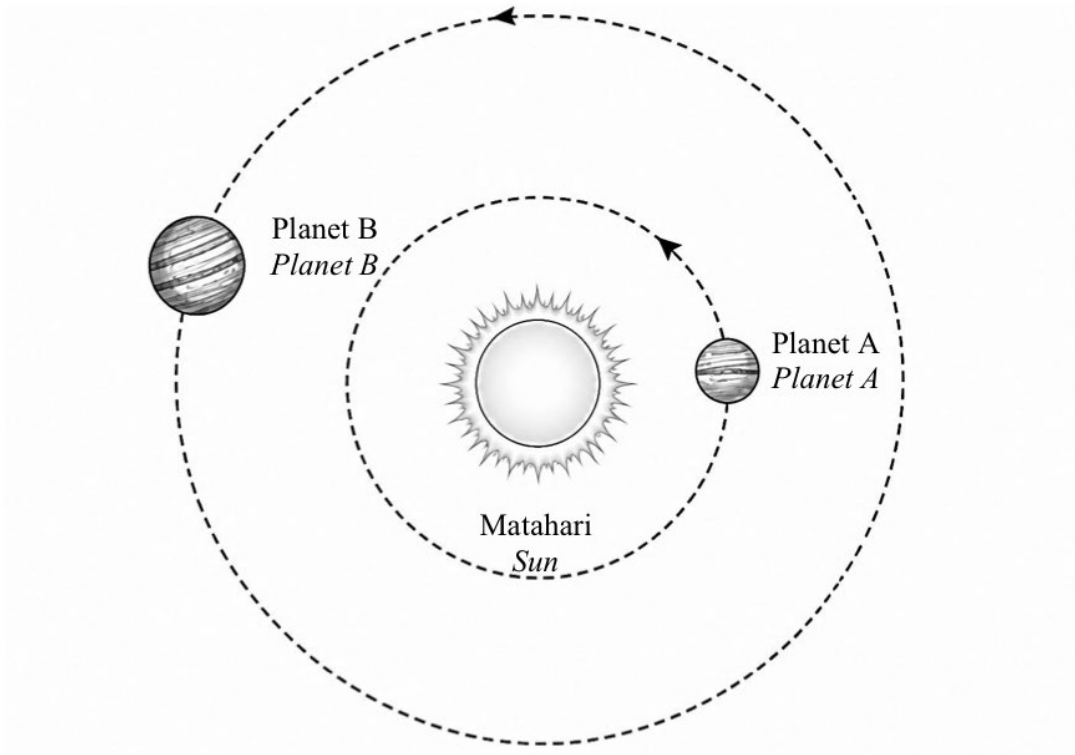
The astronaut finds that the weight of the load his carried is different on both planets.

Which of the following is the most importance of knowing the value of gravitational acceleration on each planet in the Solar System?

- A** Menentukan warna atmosfera planet.
To determine the colour of the planet's atmosphere.
- B** Mengira berat objek di permukaan planet dengan tepat.
To calculate the accurate weight of objects on the planet's surface.
- C** Menentukan jarak planet dari Matahari.
To determine the distance of the planet from the Sun.
- D** Menentukan suhu permukaan planet .
To determine the surface temperature of the planet.

7. Rajah 6 menunjukkan dua buah planet, Planet A dan Planet B, yang mengorbit Matahari pada jejari orbit yang berbeza.

Diagram 6 shows two planets, Planet A and Planet B, orbiting the Sun at different orbital radius.



Rajah 6
Diagram 6

Diberi bahawa tempoh orbit Planet B lebih panjang berbanding Planet A.

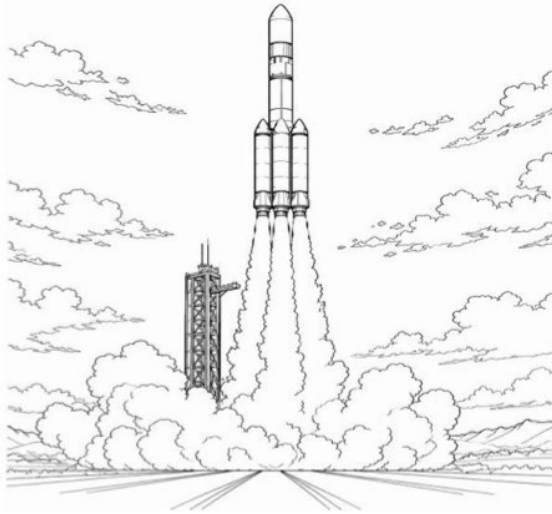
Antara berikut, yang manakah mewakili Hukum Kepler III?

It is given that Planet B has a longer orbital period than Planet A.

Which of the following represents Kepler's Third Law?

- A $T^2 \propto r$
- B $T \propto r^2$
- C $T^2 \propto r^3$
- D $T \propto r^3$

8. Rajah 7 menunjukkan sebuah roket dilancarkan dari permukaan Bumi.
Diagram 7 shows a rocket launched from the Earth's surface.



Rajah 7
Diagram 7

Berapakah halaju lepas roket dari permukaan Bumi?

What is the escape velocity of the rocket from the Earth's surface?

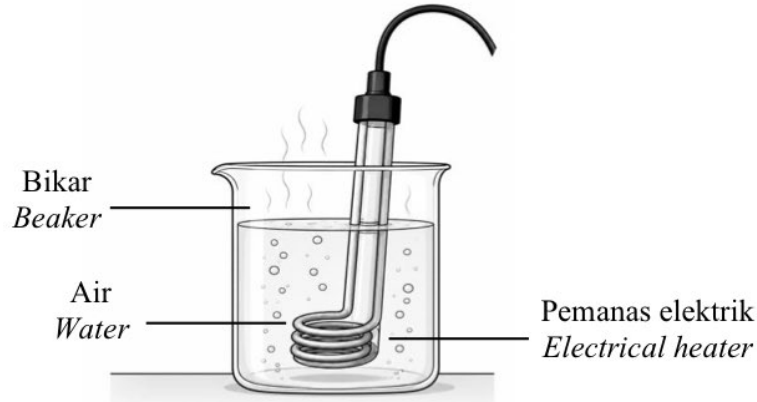
[Diberi nilai jisim Bumi = 5.56×10^{24} kg dan jejari Bumi, $R = 6.37 \times 10^6$ m]

[Given the mass of the Earth = 5.56×10^{24} kg and the radius of the Earth, $R = 6.37 \times 10^6$ m]

- A $7.92 \times 10^4 \text{ m s}^{-1}$
- B $1.12 \times 10^4 \text{ m s}^{-1}$
- C $1.93 \times 10^4 \text{ m s}^{-1}$
- D $3.12 \times 10^4 \text{ m s}^{-1}$

9. Rajah 8 menunjukkan air dipanaskan menggunakan pemanas elektrik di dalam bikar. Air menyerap tenaga haba dan mengalami peningkatan suhu.

Diagram 8 shows water being heated using an electric heater in a beaker. The water absorbs heat energy and its temperature increases.



Rajah 8
Diagram 8

Antara berikut, yang manakah definisi yang betul bagi muatan haba tentu, c ?

Which of the following is the correct definition of specific heat capacity, c ?

- A** Tenaga haba yang diperlukan untuk menaikkan suhu 1 kg bahan sebanyak 1°C .
The heat energy required to raise the temperature of 1 kg of a substance by 1°C .
- B** Tenaga haba yang diperlukan untuk menaikkan suhu 1 g bahan sebanyak 1°C .
The heat energy required to raise the temperature of 1 g of a substance by 1°C .
- C** Tenaga haba yang diperlukan untuk menukarkan keadaan jirim bahan.
The heat energy required to change the state of matter of a substance.
- D** Tenaga haba yang hilang oleh bahan apabila disejukkan.
The heat energy lost by a substance when it cools down.

10. Rajah 9 menunjukkan air dipanaskan menggunakan cerek elektrik sehingga menjadi wap air.

Diagram 9 shows water being heated by using electrical kettle until it changes into steam.



Rajah 9
Diagram 9

Sebanyak 0.50 kg air pada suhu 100°C berubah menjadi wap pada 100°C .

Berapakah tenaga haba, Q , yang diperlukan?

A mass of 0.50 kg of water at 100°C is converted into steam at 100°C .

How much heat energy, Q , required?

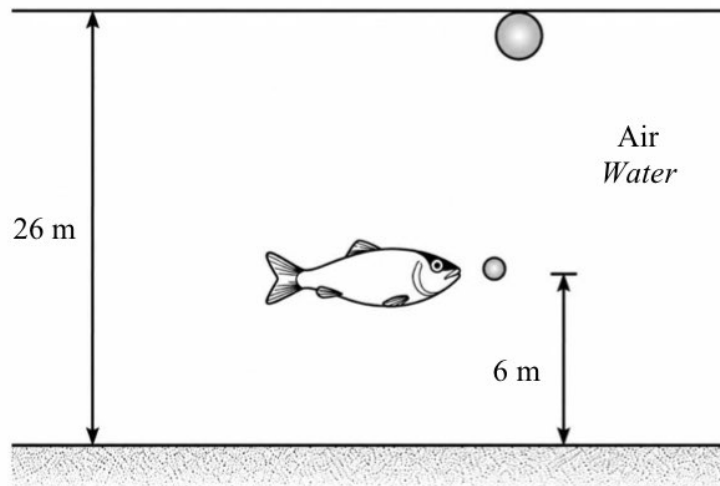
[Diberi haba pendam tentu pengewapan air, $l_v = 2.26 \times 10^6 \text{ J kg}^{-1}$]

[Given specific latent heat of vaporisation of water, $l_v = 2.26 \times 10^6 \text{ J kg}^{-1}$]

- A** $1.13 \times 10^6 \text{ J}$
- B** $2.26 \times 10^6 \text{ J}$
- C** $4.52 \times 10^6 \text{ J}$
- D** $9.04 \times 10^5 \text{ J}$

11. Rajah 10 menunjukkan seekor ikan yang berada pada kedalaman 6 m dari dasar laut, membebaskan gelembung udara yang berisi padu 10 cm^3 .

Diagram 10 shows a fish at a depth of 6 m from the seabed, releasing an air bubble of volume 10 cm^3 .



Rajah 10
Diagram 10

Berapakah isi padu gelembung udara pada permukaan air?

What is the volume of the air bubble at the surface of the water?

[Diberi nilai tekanan atmosfera : 10 m air]

[Given the atmospheric pressure : 10 m water]

- A 20 cm^3
- B 30 cm^3
- C 40 cm^3
- D 50 cm^3

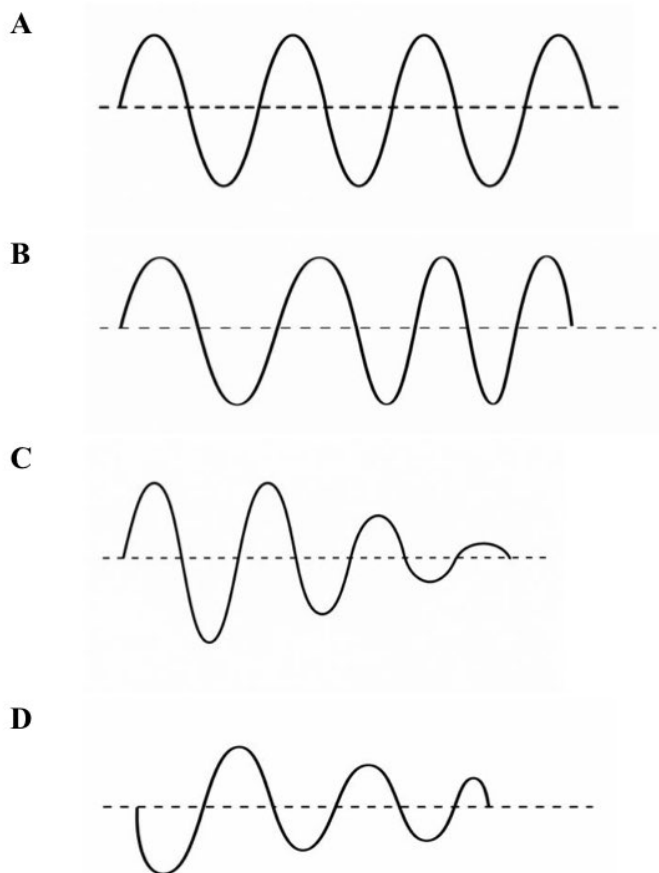


12. Rajah 11 menunjukkan seorang budak lelaki bermain buaian.
Diagram 11 shows a boy playing a swing.

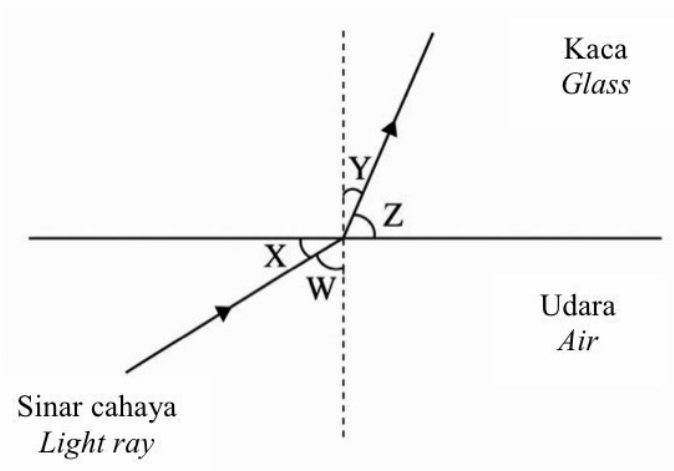


Rajah 11
 Diagram 11

Antara gelombang berikut, yang manakah mewakili situasi di atas?
Which of the following waves represents the situation above?



13. Rajah 12 menunjukkan satu sinar cahaya merambat dari udara ke kaca.
Diagram 12 shows a light ray propagates from air to glass.



Rajah 12
 Diagram 12

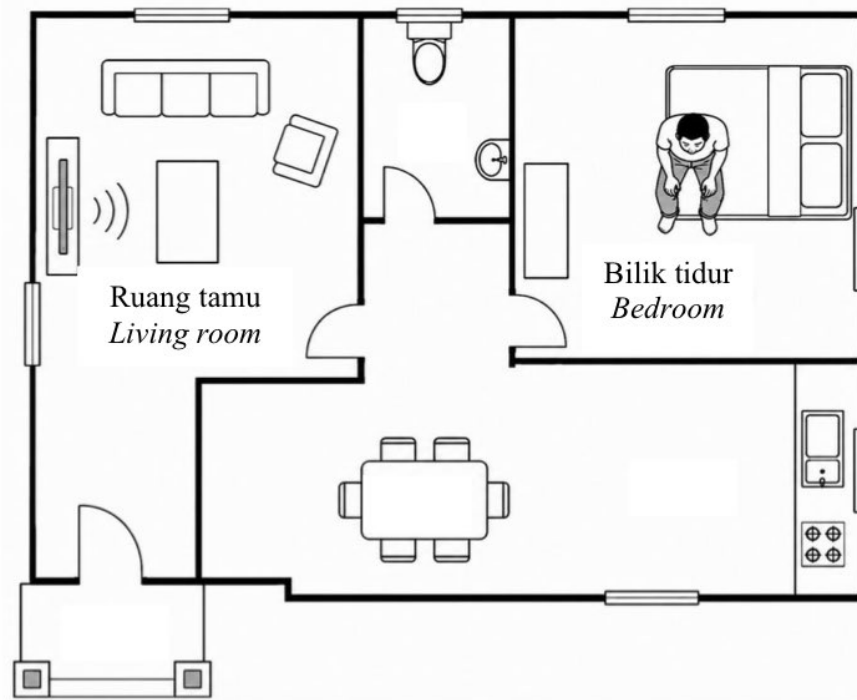
Apakah indeks biasan kaca itu?

What is the refractive index of the glass?

- A** $\frac{\sin Y}{\sin W}$
- B** $\frac{\sin W}{\sin Y}$
- C** $\frac{\sin Z}{\sin X}$
- D** $\frac{\sin x}{\sin z}$

14. Rajah 13 menunjukkan pelan pandangan atas sebuah rumah. Bunyi televisyen di ruang tamu boleh didengari oleh seseorang yang berada di dalam bilik tidur.

Diagram 13 shows a top view plan of a house. The sound of television in the living room can be heard by a person in the bedroom.



Rajah 13
Diagram 13

Apakah fenomena yang menyebabkan bunyi merambat dari televisyen ke seseorang itu?
What is the phenomenon that causes sound to propagate from the television to the person?

- A Pembelauan
 Diffraction
- B Pembiasan
 Refraction
- C Pantulan
 Reflection
- D Interferens
 Interference

15. Rajah 14 menunjukkan corak interferens yang dihasilkan pada skrin dalam eksperimen dwicelah Young.

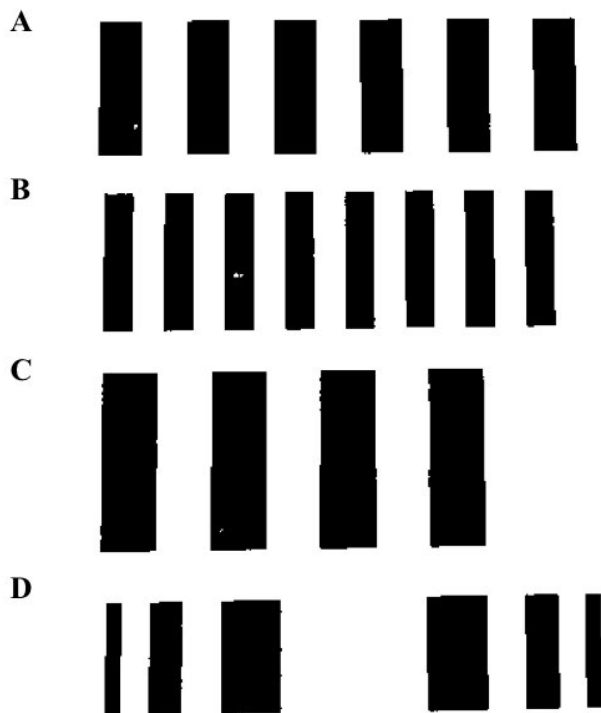
Diagram 14 shows the interference pattern produced on a screen in Young's double slit experiment.



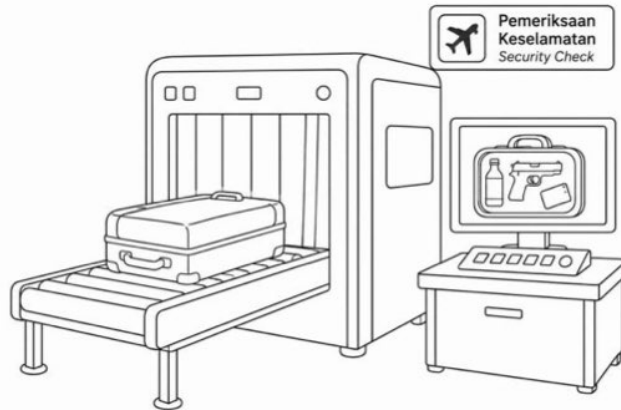
Rajah 14
Diagram 14

Jika jarak pemisahan antara dwicelah dikurangkan, corak pinggir yang manakah akan terbentuk di atas skrin?

If the separation of the double slits is decreased, which of the fringe patterns is formed on the screen?



16. Rajah 15 menunjukkan sebuah beg diperiksa di lapangan terbang.
Diagram 15 shows a bag being checked at the airport.



Rajah 15
Diagram 15

Apakah jenis gelombang elektromagnet yang digunakan di lapangan terbang untuk pemeriksaan beg penumpang?

What type of electromagnetic waves is used in the airport to check the luggage of the passenger?

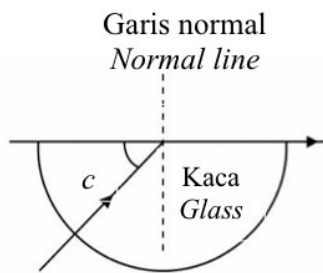
- A** Sinaran gama
Gamma ray
- B** Sinar-X
X-ray
- C** Sinaran inframerah
Infrared ray
- D** Gelombang radio
Radio wave

SULIT

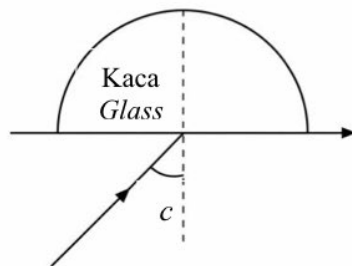
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17. Antara gambar rajah sinar berikut, yang manakah menunjukkan sudut genting dengan betul?
Which of the following ray diagrams shows the critical angle correctly?

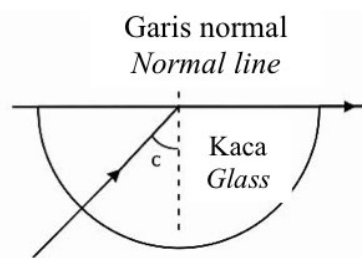
A



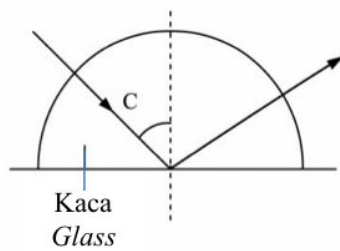
B



C



D

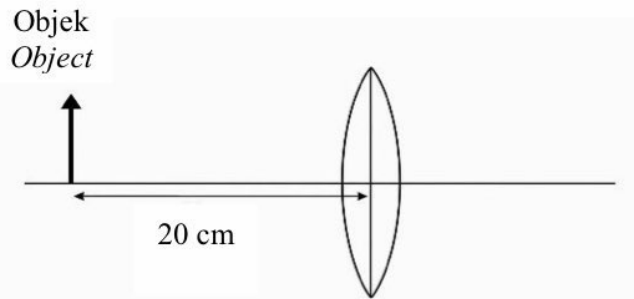


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18. Rajah 16 menunjukkan satu objek diletakkan di hadapan sekeping kanta cembung untuk mengkaji ciri-ciri pembentukan imej.

Diagram 16 shows an object is placed in front of a convex lens to study the characteristics of the formation of images.



Rajah 16
Diagram 16

Apakah ciri-ciri imej yang terbentuk jika panjang fokus kanta ialah 10 cm?

What are the characteristics of the image formed if the focal length of the lens is 10 cm?

- A** Nyata, songsang dan diperkecil
Real, inverted and diminished
 - B** Nyata, songsang dan sama saiz dengan objek
Real, inverted and same size as the object
 - C** Nyata, songsang dan diperbesar
Real, inverted and magnified
 - D** Maya, tegak dan diperbesar
Virtual, upright and magnified
19. Antara persamaan berikut, yang manakah menunjukkan hubungan antara jarak objek, u , jarak imej, v , dan panjang fokus satu kanta nipis, f dengan betul?
Which of the following equation shows the relationship between object distance, u , image distance, v and focal length of a thin lens f , correctly?

- A** $\frac{1}{f} = \frac{u+v}{uv}$
- B** $\frac{1}{f} = \frac{u+v}{u}$
- C** $\frac{1}{f} = \frac{uv}{u+v}$
- D** $\frac{1}{f} = \frac{u+v}{v}$

20. Rajah 17 menunjukkan satu cermin pergigian yang digunakan oleh doktor gigi.
Diagram 17 shows a dental mirror used by a dentist.



Rajah 17
Diagram 17

Mengapakah cermin yang digunakan bukan cermin cembung?
Why the mirror used does not a convex mirror?

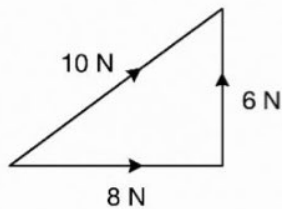
- A** Cermin cembung menghasilkan imej nyata, songsang dan diperkecil.
A convex mirror produces real, inverted and diminished image.
- B** Cermin cembung menghasilkan imej nyata, songsang dan diperbesar
A convex mirror produces real, inverted and magnified image.
- C** Cermin cembung menghasilkan imej maya, tegak dan diperkecil.
A convex mirror produces virtual, upright and diminished image.
- D** Cermin cembung menghasilkan imej maya, tegak dan diperbesar
A convex mirror produces virtual, upright and magnified image.

21. Daya paduan dapat ditakrifkan sebagai
The resultant force can be defined as

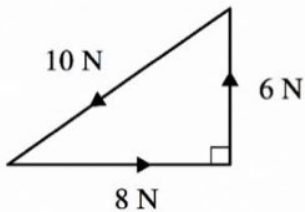
- A** Daya tunggal yang mewakili hasil tambah dua atau lebih daya - daya yang bertindak ke atas sesuatu objek.
A single force that represents the sum of two or more forces acting on an object.
- B** Daya tunggal yang mewakili hasil tolak dua atau lebih daya - daya yang bertindak ke atas sesuatu objek.
A single force that represents the difference of two or more forces acting on an object.
- C** Daya tunggal yang mewakili hasil tambah atau hasil tolak dua atau lebih daya - daya yang bertindak ke atas sesuatu objek.
A single force that represents the addition or subtraction of two or more forces acting on an object.
- D** Daya tunggal yang mewakili hasil tambah atau hasil tolak secara vektor dua atau lebih daya - daya yang bertindak ke atas sesuatu objek.
A single force that represents the vector addition or subtraction of two or more forces that act on an object.

22. Rajah yang manakah menunjukkan hasil tambah daya 6 N dengan daya 8 N?
Which diagram shows the sum of a force of 6 N with a force of 8 N?

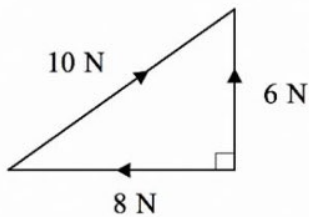
A



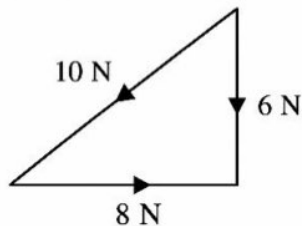
B



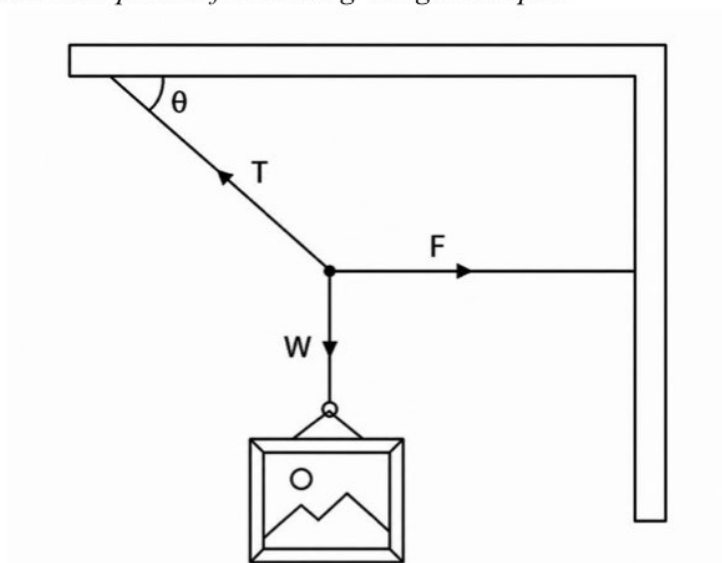
C



D



23. Rajah 18 menunjukkan sebuah bingkai gambar digantung menggunakan dua tali.
The diagram 18 shows a picture frame hung using two ropes.



Rajah 18
 Diagram 18

Pilih persamaan yang betul mewakili situasi di atas.

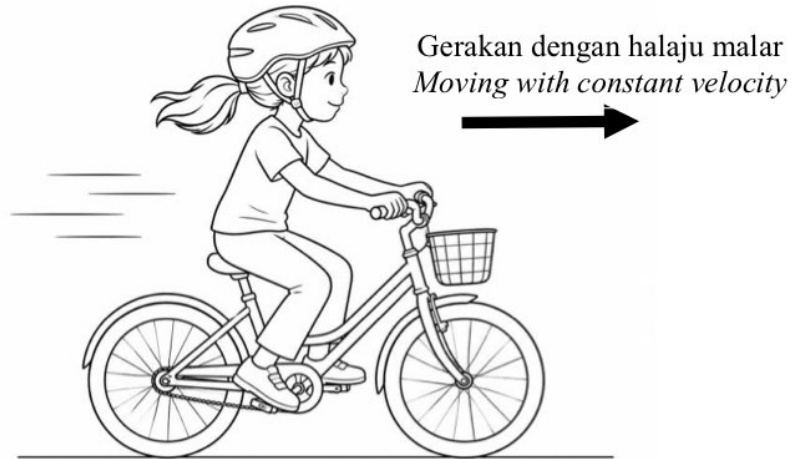
Choose the correct equations that represent the situation above

- I** $T + F + W = 0$
- II** $T = F = W$
- III** $T \cos \theta = F$
- IV** $T \cos \theta = W$

- A** I dan II sahaja
I and II only
- B** I dan III sahaja
I and III only
- C** II dan IV sahaja
II and IV only
- D** III dan IV sahaja
III and IV only

24. Rajah 19 menunjukkan seorang budak perempuan sedang menunggang basikal dengan halaju malar.

Diagram 19 shows a girl riding a bicycle with constant velocity.



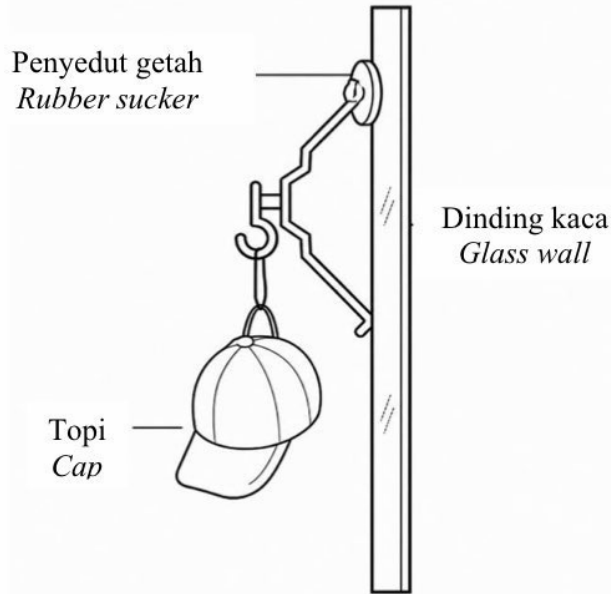
Rajah 19
Diagram 19

Situasi ini menunjukkan
The situation shows that

- A** ada daya bersih.
has net force.
- B** pecutan berkurang.
acceleration decreases.
- C** tindak balas normal sifar.
normal reaction is zero.
- D** daya – daya adalah dalam keseimbangan.
the forces are in equilibrium.

25. Rajah 20 menunjukkan sebuah penyedut getah yang dilekatkan pada dinding kaca untuk menggantung sebuah topi.

Diagram 20 shows a rubber sucker attached to a glass wall to hang a cap.



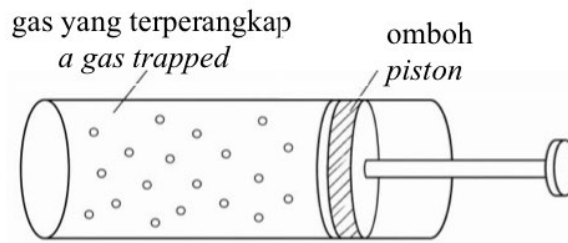
Rajah 20
Diagram 20

Penyedut getah itu melekat pada dinding kaca kerana

The rubber sucker sticks to the glass wall because

- A** tekanan atmosfera sama dengan tekanan di dalam penyedut getah.
the atmospheric pressure is equal to the pressure inside the rubber sucker.
- B** tekanan atmosfera lebih rendah daripada tekanan di dalam penyedut getah.
the atmospheric pressure is lower than the pressure inside the rubber sucker.
- C** tekanan atmosfera lebih tinggi daripada tekanan di dalam penyedut getah.
the atmospheric pressure is higher than the pressure inside the rubber sucker.
- D** tekanan atmosfera menekan penyedut getah dengan lebih kuat daripada tekanan udara di dalam penyedut getah.
the atmospheric pressure pushes the rubber sucker more strongly than the air pressure inside the rubber sucker.

26. Rajah 21 menunjukkan gas yang terperangkap di dalam suatu silinder dimampatkan.
Diagram 21 shows a gas trapped in a cylinder being compressed.



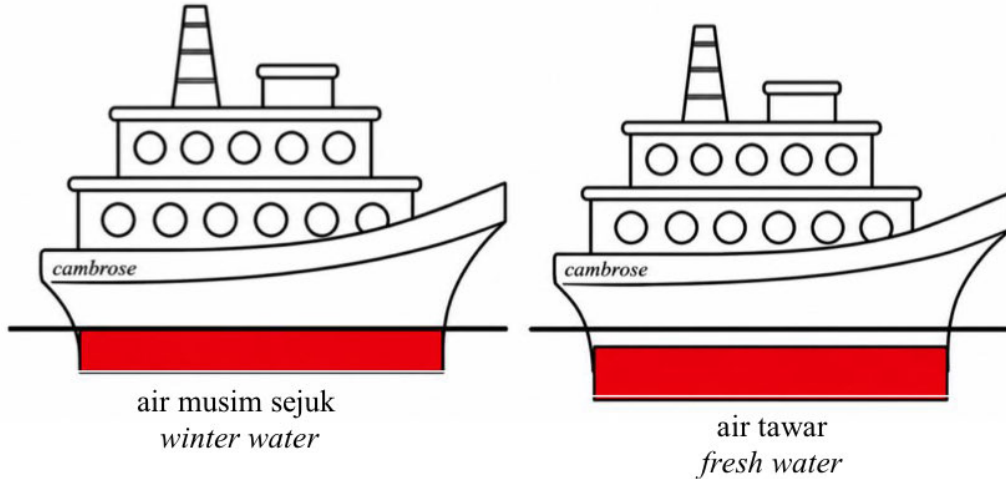
Rajah 21
Diagram 21

Kuantiti fizik manakah yang akan berubah?
Which physical quantities will change?

- I** Ketumpatan
Density
 - II** Jisim
Mass
 - III** Tekanan
Pressure
 - IV** Tenaga Kinetik
Kinetic energy
- A** I dan II sahaja
I and II only
 - B** I dan III sahaja
I and III only
 - C** II dan IV sahaja
II and IV only
 - D** III dan IV sahaja
III and IV only

27. Rajah 22.1 dan Rajah 22.2 menunjukkan kapal yang serupa masing – masing berada dalam air musim sejuk dan air tawar.

Diagram 22.1 and Diagram 22.2 shows identical ship in winter water and fresh water respectively.



Rajah 22.1
Diagram 22.1

Rajah 22.2
Diagram 22.2

Manakah pernyataan berikut adalah benar?

Which of the following statemen is correct?

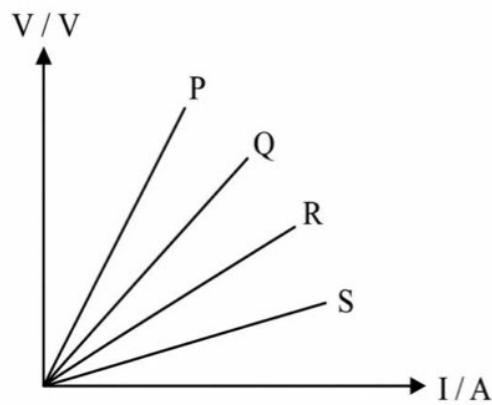
- A** Berat air musim sejuk yang tersesar lebih berat daripada air tawar yang tersesar.
The weight of winter water displaced is greater than the weight of fresh water displaced.
- B** Berat air musim sejuk yang tersesar adalah sama dengan berat air tawar yang tersesar.
The weight of winter water displaced is the same with the weight of fresh water displaced.
- C** Berat air musim sejuk yang tersesar lebih kecil daripada air tawar yang tersesar.
The weight of winter water displaced is smaller than the weight of fresh water displaced.
- D** Isipadu air musim sejuk yang tersesar adalah sama dengan isipadu air tawar yang tersesar.
The volume of winter water displaced is equal to the volume of fresh water displaced.

28. Kerja yang dilakukan untuk menggerakkan satu coulomb cas di antara dua titik ialah maksud bagi

The work done to move one coulomb of charge between two point is the meaning of

- A Daya gerak elektrik
Electromotive force
 - B Rintangan dalam
Internal resistance
 - C Arus elektrik
Electric current
 - D Beza keupayaan
Potential difference
29. Rajah 23 yang menunjukkan graf beza keupayaan, V melawan arus elektrik, I bagi dawai P, Q, R dan S. Dawai tersebut diperbuat daripada bahan yang sama dan mempunyai ketebalan yang sama.

Diagram 23 shows a graph of potential difference, V against electric current, I for wire P, Q, R and S. The wires are made of same material and same thickness.



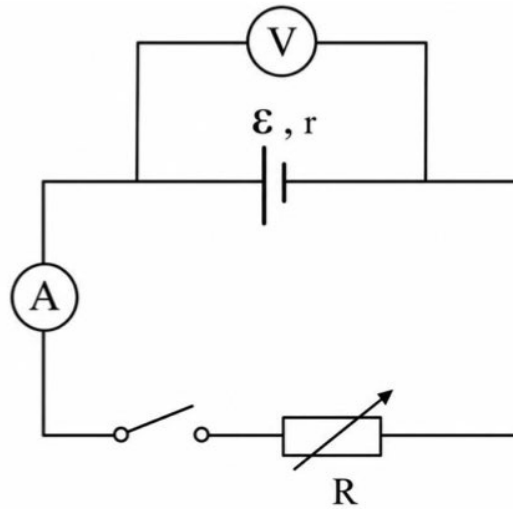
Rajah 23
Diagram 23

Dawai yang manakah paling panjang?

Which wire is the longest?

- A P
- B Q
- C R
- D S

30. Rajah 24 menunjukkan suatu litar terbuka. Daya gerak elektrik, d.g.e bateri ialah $\mathcal{E}$.
Diagram 24 shows an opened circuit. The electromotive force, e.m.f of the battery is $\mathcal{E}$.

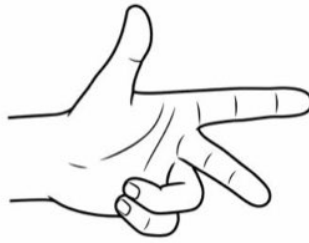


Rajah 24
 Diagram 24

Apakah yang berlaku kepada bacaan voltmeter apabila suis di tutup?
What happens to the reading of the voltmeter when the switch is closed?

- A** Sama dengan sifar.
Equal to zero.
- B** Sama dengan daya gerak elektrik, $\mathcal{E}$.
Same as the electromotive force, $\mathcal{E}$.
- C** Kurang daripada daya gerak elektrik, $\mathcal{E}$.
Less than the electromotive force, $\mathcal{E}$.
- D** Lebih besar daripada daya gerak elektrik, $\mathcal{E}$.
Greater than the electromotive force, $\mathcal{E}$.

31. Rajah 25 menunjukkan petua tangan kiri Fleming.
Diagram 25 shows the Fleming's left-hand rule.

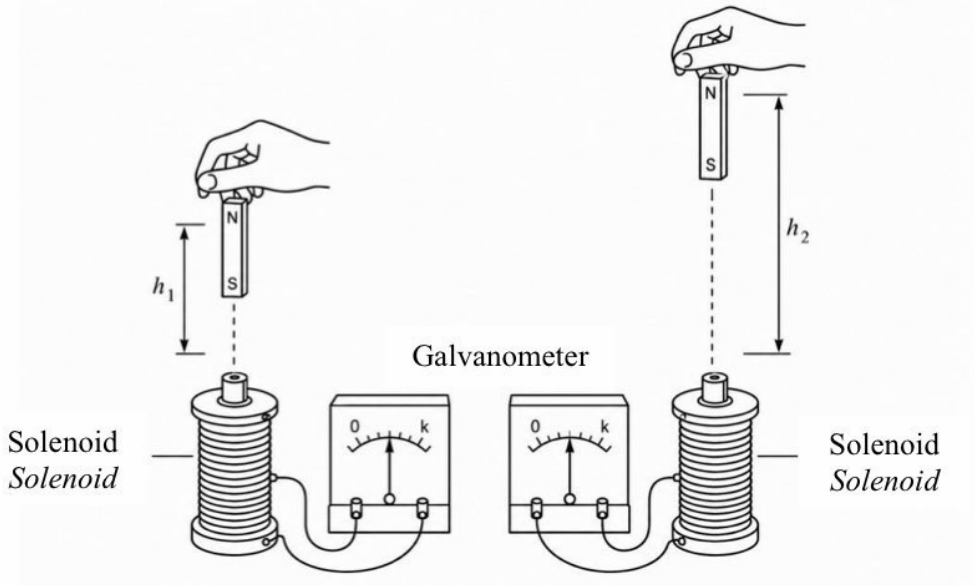


Rajah 25
Diagram 25

Ibu jari mewakili
The thumb represents

- A** Medan elektromagnet
Electromagnetic field
- B** Medan magnet
Magnetic field
- C** Arus aruhan
Induced Current
- D** Daya
Force

32. Rajah 26 menunjukkan sebuah magnet bar dilepaskan ke dalam satu solenoid pada ketinggian berbeza.
Diagram 26 shows a bar magnet released into a solenoid at different heights.

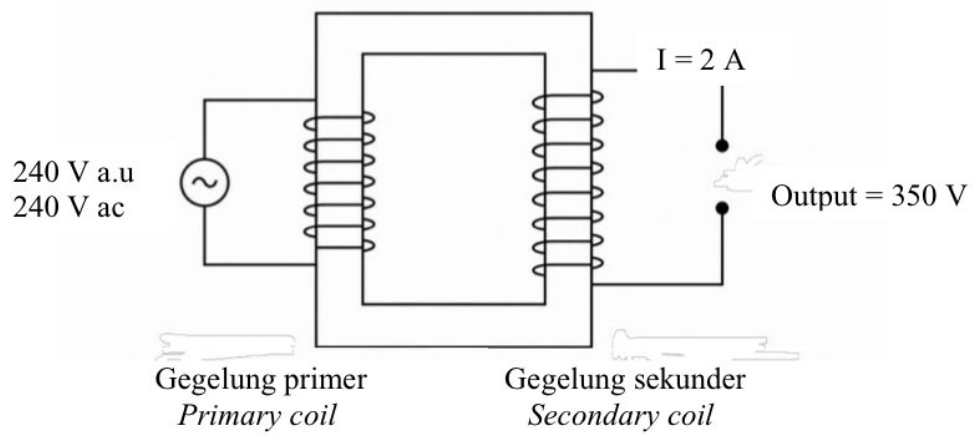


Rajah 26
Diagram 26

Pernyataan manakah yang betul apabila magnet yang lebih tinggi dilepaskan?
Which statements is correct when the magnet is released from higher position?

	Ketinggian <i>Height</i>	Pesongan galvanometer <i>Deflection of galvanometer's pointer</i>	Kadar pemotongan fluks magnet <i>Rate of cutting of magnetic flux</i>
A	Bertambah <i>Increase</i>	Bertambah <i>Increase</i>	Bertambah <i>Increase</i>
B	Bertambah <i>Increase</i>	Bertambah <i>Increase</i>	Berkurang <i>Decrease</i>
C	Bertambah <i>Increase</i>	Berkurang <i>Decrease</i>	Berkurang <i>Decrease</i>
D	Berkurang <i>Decrease</i>	Berkurang <i>Decrease</i>	Bertambah <i>Increase</i>

33. Rajah 27 menunjukkan sebuah transformer dengan kecekapan 85%.
Diagram 27 shows a transformer with 85% efficiency.



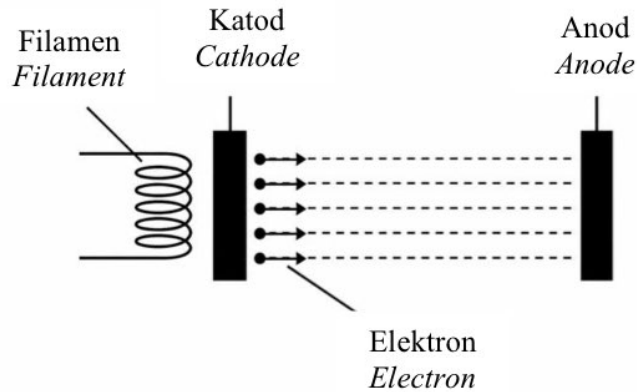
Rajah 27
Diagram 27

Hitung arus input dalam gegelung primer.
Calculate the input current in primary coil.

- A 2.25 A
- B 2.45 A
- C 3.43 A
- D 4.25 A

34. Rajah 28 menunjukkan proses pancaran elektron daripada permukaan katod yang panas ke anod dalam sebuah tiub sinar katod.

Diagram 28 shows the emmissions process of the electrons from a hot cathode surface to the anode in a cathode ray tube.



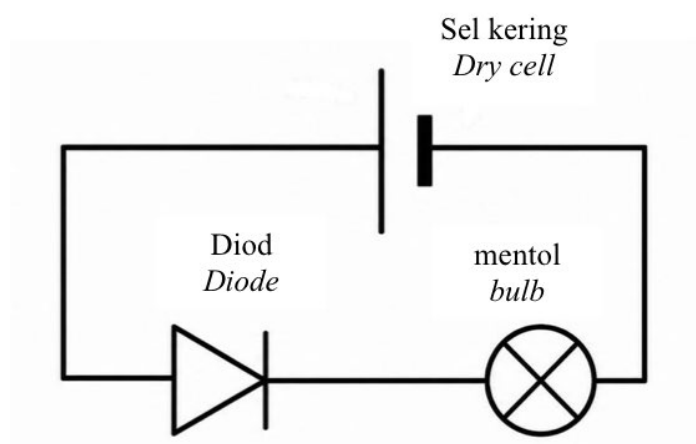
Rajah 28
Diagram 28

Apakah proses yang menyebabkan pemancaran elektron bebas daripada permukaan logam yang dipanaskan?

What process causes the emission of free electrons from a heated metal surface?

- A Pancaran elektron.
Electrons emission.
- B Pancaran termion.
Thermionic emission.
- C Sinar katod.
Cathode ray.
- D Fotoelektrik.
Photoelectric.

35. Rajah 29 menunjukkan sebuah litar elektronik yang mengandungi satu diod.
Diagram 29 shows an electronic circuit which consists of a diode.



Rajah 29
 Diagram 29

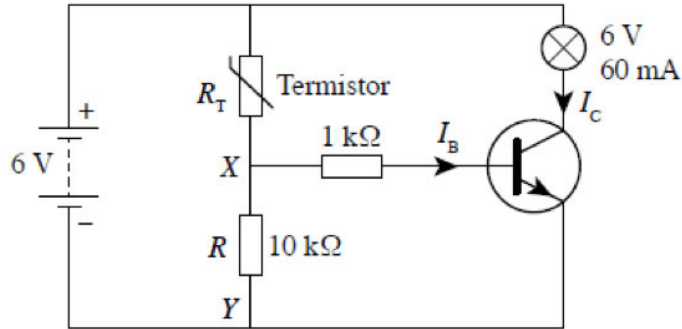
Pernyataan manakah yang benar?

Which statement is correct?

- I** Mentol menyala
The bulb lights up
 - II** Mentol tidak menyala
The bulb not lights up
 - III** Diod adalah dalam pincang hadapan
Diode is in forward biased
 - IV** Diod adalah dalam pincang songsang
Diode is in reverse biased
- A** I dan III sahaja
I and III only
 - B** I dan II sahaja
I and II only
 - C** II dan III sahaja
II and III only
 - D** II dan IV sahaja
II and IV only

36. Rajah 30 menunjukkan litar penggera kawalan suhu. Perintang, R mempunyai rintangan $10\text{ k}\Omega$. Beza keupayaan merentasi XY mestilah sekurang-kurangnya 5.5 V untuk menyalakan mentol 6 V , 60 mA .

Diagram 30 shows a temperature control alarm circuit. The resistor, R has a resistance of $10\text{ k}\Omega$. The potential difference across XY must be at least 5.5 V to light a 6 V , 60 mA bulb.



Rajah 30

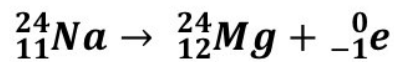
Diagram 30

Berapakah rintangan termistor, R_T apabila mentol itu menyala?

What is the resistance of the thermistor, R_T , when the bulb is light up?

- A 5.00 V
 - B 1.00 V
 - C 0.91 V
 - D 0.09 V
37. Persamaan berikut merupakan satu reputan radioaktif.

The following equation represents a radioactive decay.

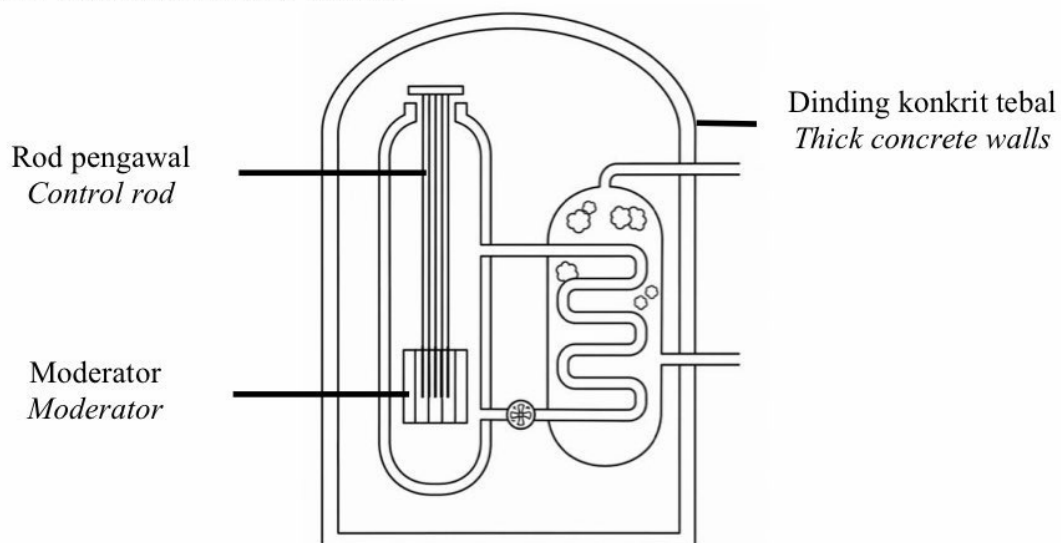


Antara berikut, yang manakah mewakili reputan radioaktif bagi persamaan ini?

Which of the following represents radioactive decay by this equation?

- A Proton
Proton
- B Neutron
Neutron
- C Reputan alfa
Alpha decay
- D Reputan beta
Beta decay

38. Rajah 31 menunjukkan sebuah reaktor nuklear.
Diagrams 31 shows a nuclear reactor.

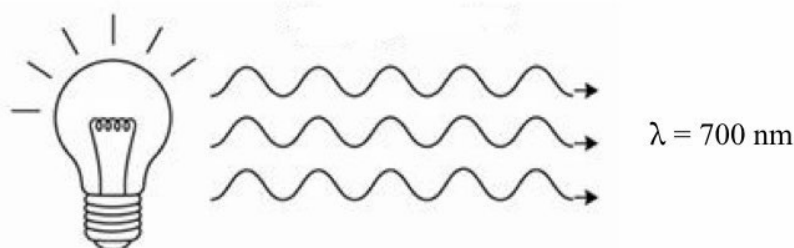


Rajah 31
Diagram 31

Apakah fungsi moderator?
What is the function of moderator?

- A** Mengawal kadar tindak balas.
Control the reaction rate.
- B** Memperlahankan pergerakan neutron.
Slow down the fast moving neutron.
- C** Sebagai bahan api untuk hasilkan tenaga.
As fuel to produce nuclear energy.
- D** Menyerap tenaga haba daripada tindak balas berantai.
Absorb heat energy from the chain reaction.

39. Apakah idea yang telah diperkenalkan oleh Max Planck?
What ideas was introduced by Max Planck?
- A** Memperkenalkan idea kuantum iaitu tenaga yang diskrit.
Introducing the idea of quantum which is discrete energy.
- B** Menerangkan penghasilan spektrum garis oleh atom hidrogen.
Explain the production of line spectrum by hydrogen atoms.
- C** Memperkenalkan konsep foton dan menjelaskan ciri – ciri kesan fotoelektrik.
Introducing the concept of photons and explain the characteristics of the photoelectric effect.
- D** Memperkenalkan zarah bersifat gelombang dan idea sifat kedualan gelombang zarah.
Introducing the wave nature of particle and the idea of wave – particle duality.
40. Rajah 32 menunjukkan sebuah lampu berkuasa 80 W yang memancarkan cahaya merah dengan panjang gelombang 700 nm.
Diagram 32 shows a 80 W lamp that emits red light with a wavelength of 700 nm.



Rajah 32
 Diagram 32

Berapakah bilangan foton cahaya merah yang dipancarkan sesaat?
What is the number of photon emitted per second?

- A** $3.82 \times 10^{20} \text{ s}^{-1}$
- B** $2.83 \times 10^{20} \text{ s}^{-1}$
- C** $1.80 \times 10^{20} \text{ s}^{-1}$
- D** $1.31 \times 10^{25} \text{ s}^{-1}$

KERTAS PEPERIKSAAN TAMAT
END OF QUESTION PAPER