

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

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 $F = ma$

HABA
HEAT

- 1 $Q = mc\Delta\theta$
- 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 $\frac{P_1}{T_1} = \frac{P_2}{T_2}$

KEGRAVITIAN
GRAVITATION

- 1 $F = \frac{Gm_1 m_2}{r^2}$
- 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 $g = 9.81 \text{ m s}^{-2}$ @ 9.81 N kg^{-1}
- 11 $G = 6.67 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$
- 12 Jisim Bumi, $M = 5.97 \times 10^{24} \text{ kg}$
Mass of Earth
- 13 Jejari Bumi, $R = 6.37 \times 10^6 \text{ m}$
Radius of Earth

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, $m = \frac{v}{u}$
Linear magnification, $m = \frac{v}{u}$

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 $E = \frac{V}{d}$

ELEKTROMAGNET
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
ELECTRONIC

- 1 Tenaga keupayaan elektrik, $E = eV$
 Electrical potential energy, $E = eV$
- 2 Tenaga kinetic maksimum, $E = \frac{1}{2}mv^2$
 Maximum kinetik energy, $E = \frac{1}{2}mv^2$
- 3 $\beta = \frac{I_C}{I_B}$
- 4 $V_{out} = \frac{R_2}{R_1 + R_2} V_{in}$

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 u.j.a. = $1.66 \times 10^{-27} \text{ kg}$
 1 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 $h = 6.63 \times 10^{-34} \text{ Js}$

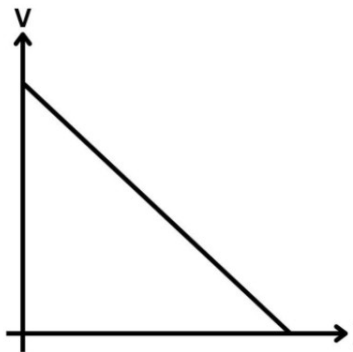
- 1 Kuantiti manakah adalah kuantiti terbitan?

Which quantity is a derived quantity?

- | | |
|---|--|
| A Panjang
<i>Length</i> | B Tempoh
<i>Period</i> |
| C Arus elektrik
<i>Electric current</i> | D Keamatan berluminesiti
<i>Luminous intensity</i> |

- 2 Rajah 1 menunjukkan graf V melawan I.

Diagram 1 shows graph V against I.



Rajah 1
Diagram 1

Antara yang berikut, hubungan manakah yang betul?

Which of the following is correct relationship?

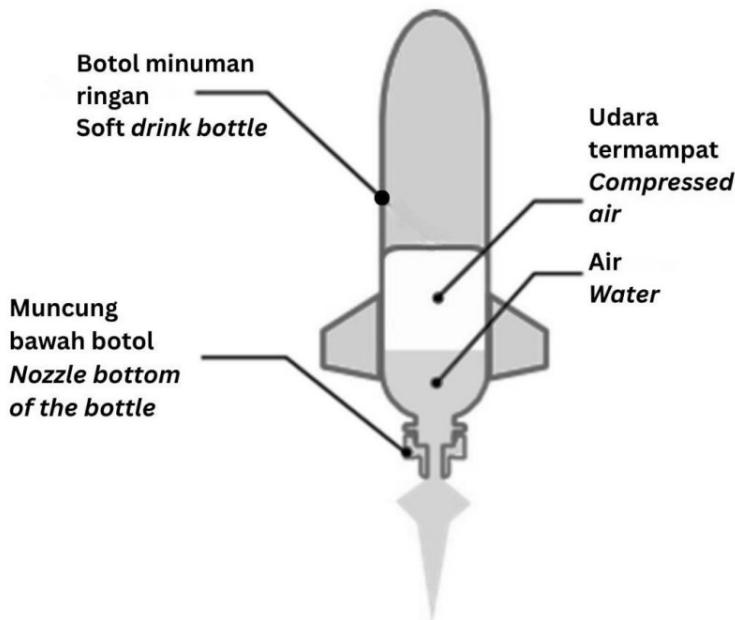
- A** V berkadar langsung dengan I
V is directly proportional to I
- B** V berkadar songsang dengan I
V is inversely proportional to I
- C** V bertambah secara linear dengan I
V increases linearly with I
- D** V berkurang secara linear dengan I
V decreases linearly with I

- 3 Kuantiti fizik yang manakah adalah sama dengan $\frac{\text{sesaran}}{\text{masa}}$?

Which physical quantity is equal to $\frac{\text{displacement}}{\text{time}}$?

- | | |
|------------------------------------|---|
| A Laju
<i>Speed</i> | B Jarak
<i>Distance</i> |
| C Halaju
<i>Velocity</i> | D Pecutan
<i>Acceleration</i> |

- 4 Rajah 2 menunjukkan sebuah roket air yang dilancarkan ke atas.
Diagram 2 shows a water rocket that is launched upwards.



Rajah 2
Diagram 2

Semasa roket air dilepaskan, air memancut keluar dengan laju melalui muncung di bahagian bawah.

As the water rocket is released, water spurts out at high speed through the nozzle at the bottom.

Antara pernyataan berikut, yang manakah benar tentang pergerakan roket air tersebut?

Which of the following statements is true about the motion of the water rocket?

- A Pancutan air ke bawah menghasilkan daya tujah yang menolak roket ke atas
The downward jet of water creates a thrust that pushes the rocket upwards
- B Roket bergerak ke atas kerana jisim botol roket lebih kecil daripada jisim air
The rocket moves upwards because the mass of the rocket bottle is smaller than the mass of the water
- C Pengurangan jisim air menyebabkan roket air bergerak ke atas dengan lebih perlahan
The reduction in water mass causes the water rocket to move upwards more slower
- D Jumlah daya yang dikenakan oleh air ke atas roket menyebabkan roket tertarik ke bawah
The amount of force applied by the water on the rocket causes the rocket to be pulled downwards

- 5 Rajah 3 menunjukkan seorang pekerja menolak sebuah troli yang berisi barangan berjisim 60 kg di sepanjang satu permukaan mengufuk dengan daya 120 N.
Diagram 3 shows a worker pushes a trolley containing goods with a mass of 60 kg along a horizontal surface with a force of 120 N.



Rajah 3
Diagram 3

Jika daya geseran yang bertindak ke atas permukaan mengufuk ialah 15 N, berapakah pecutan troli itu?

If the frictional force acting on the horizontal surface is 15 N, what is the acceleration of the trolley?

- A 1.75 m s⁻²
B 2.00 m s⁻²
C 2.25 m s⁻²
D 3.00 m s⁻²
- 6 Antara situasi berikut, yang manakah menghasilkan daya impuls yang kecil?
Which of the following situations produces a small impulsive force?

A



Penukul dan paku
Hammer and nail

B



Acara lompat jauh
Long jump event

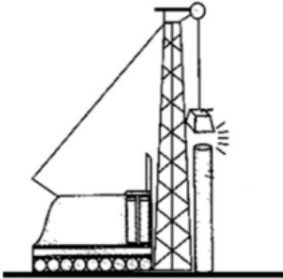


C



Lesung dan alu
Mortar and pestle

D



Cerucuk dan tukul cerucuk
di tapak pembinaan
*Pile and pile hammer
at a construction site*

- 7 Sebuah satelit berada pada ketinggian, h m dari permukaan bumi mengalami pecutan graviti, g , 8.95 m s^{-2} . Apakah tinggi h ?
[Pemalar kegravitian, $G = 6.67 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$]
[Jisim bumi, $M = 5.97 \times 10^{24} \text{ kg}$]
[Jejari bumi, $R = 6.37 \times 10^6 \text{ m}$]

A satellite is at a height, h m above the earth's surface experience gravitational acceleration, g , 8.95 m s^{-2} . What is height, h ?

[Gravitational constant, $G = 6.67 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$]

[Mass of the Earth, $M = 5.97 \times 10^{24} \text{ kg}$]

[Radius of the Earth, $R = 6.37 \times 10^6 \text{ m}$]

A 300 km

B 480 km

C 1200 km

D 6671 km

8

'Kuasa dua tempoh orbit planet adalah berkadar terus dengan kuasa tiga jejari orbitnya'

'The square of orbital period of any planet is directly proportional to the cube of the radius of its orbit'

Pernyataan diatas menerangkan tentang

The above statement explains about

A Hukum Kepler Pertama

Kepler's First Law

B Hukum Kepler Kedua

Kepler's Second Law

C Hukum Kepler Ketiga

Kepler's Third Law

D Hukum Kegravitian Semesta Newton

Newton's Universal Law of Gravitation

9 Satelit geopegun berada dalam orbit khas yang dikenali sebagai Orbit Bumi Geopegun.

Antara berikut, pernyataan manakah yang menerangkan tentang satelit geopegun?

Geostationary satellites are in a special orbit known as Geostationary Earth Orbit.

Which of the following statements describes about geostationary satellites?

A Jejari orbit satelit bergantung kepada saiz satelit

The orbital radius of the satellite depends on the size of the satellite

B Kedudukan satelit pegun sepanjang garisan khatulistiwa

The position of satellite is stationary along the equator

C Tempoh orbit satelit sama dengan tempoh putaran Bumi

The orbital period of the satellite is the same as the period of rotation of the Earth

D Tempoh orbit satelit lebih lama daripada tempoh putaran Bumi

The orbital period of the satellite is longer than the period of rotation of the Earth

- 10 Suhu badan pesakit dapat ditentukan oleh seorang doktor apabila berlaku keseimbangan terma antara badan pesakit dan termometer klinik.

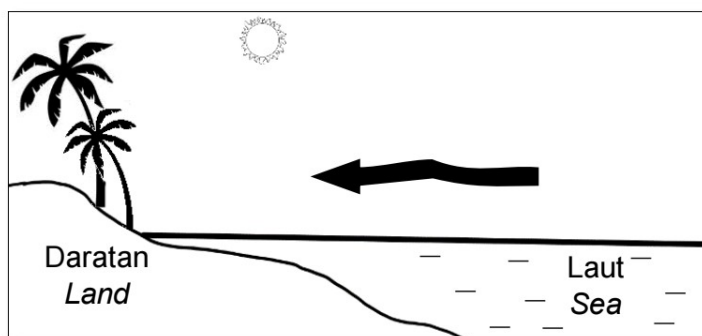
The patient's body temperature can be determined by a doctor when thermal equilibrium occur between patient's body and clinical thermometer.

Apakah yang dimaksudkan dengan keseimbangan terma?

What is the meaning of thermal equilibrium?

- A Pemindahan haba dari badan pesakit lebih tinggi
The heat transfer from the patient's body is higher
- B Pemindahan haba bersih antara badan pesakit dan termometer klinik adalah sifar
The net heat transfer between patient's body and clinical thermometer becomes zero
- C Keadaan apabila suhu satu objek lebih tinggi daripada objek lain dan haba mengalir secara seimbang
The condition when the temperature of one object is higher than another and heat flows in equilibrium
- D Keadaan apabila kedua-dua objek mempunyai suhu yang sama dan tiada pemindahan haba bersih berlaku
The condition when both objects have the same temperature and no net heat transfer occurs

- 11 Rajah 4 menunjukkan pembentukan bayu laut.
Diagram 4 shows the formation of the sea breeze.



Rajah 4
 Diagram 4

Pernyataan manakah yang betul?
Which statement is correct?

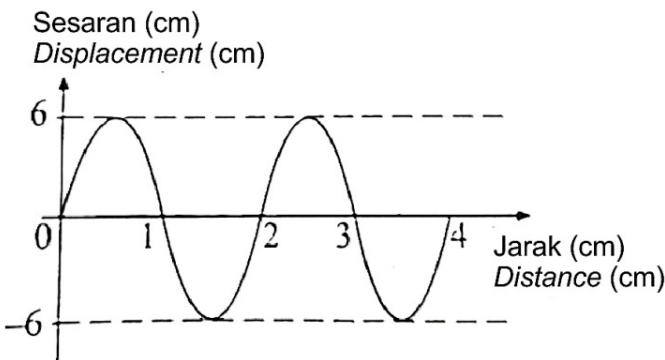
- A Suhu daratan menjadi lebih rendah daripada suhu air laut
The land temperature becomes lower than the sea water temperature
- B Kelajuan udara sejuk lebih tinggi berbanding kelajuan udara panas
The speed of cold air is higher than the speed of hot air
- C Muatan haba tentu air laut lebih tinggi daripada muatan haba tentu daratan
The specific heat capacity of sea water is higher than the specific heat capacity of land
- D 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
- 12 Tenaga haba sebanyak 2448000 J digunakan untuk mengubah keadaan 900 g cecair pada suhu 100 °C kepada gas pada suhu 100 °C. Berapakah haba pendam tentu pengewapan cecair itu?
A heat energy of 2448000 J is used to change the state of 900 g of liquid at a temperature of 100°C to gas at a temperature of 100°C. What is the latent heat of vaporization of that liquid?
- A $2.72 \times 10^3 \text{ J kg}^{-1}$
- B $2.72 \times 10^4 \text{ J kg}^{-1}$
- C $2.72 \times 10^5 \text{ J kg}^{-1}$
- D $2.72 \times 10^6 \text{ J kg}^{-1}$

13 Resonans berlaku apabila suatu sistem ayunan dikenakan daya luar yang mempunyai frekuensi yang sama dengan frekuensi asli sistem ayunan tersebut.
Resonance occurs when an oscillating system is subjected to an external force that has the same frequency as the natural frequency of the oscillating system.

Pernyataan manakah yang betul menerangkan fenomena resonans?
Which statement correctly describes the phenomenon of resonance?

- A Sistem berayun dengan frekuensi asli dan daya maksimum
The system oscillates with natural frequency and maximum force
- B Sistem berayun dengan frekuensi sifar dan daya maksimum
The system oscillates with zero frequency and maximum force
- C Sistem berayun dengan frekuensi sifar dan amplitud maksimum
The system oscillates with zero frequency and maximum amplitude
- D Sistem berayun dengan frekuensi asli dan amplitud maksimum
The system oscillates with a natural frequency and maximum amplitude

14 Rajah 5 menunjukkan graf sesaran-jarak bagi suatu gelombang melintang.
Diagram 5 shows a displacement-distance graph of a transverse wave.



Rajah 5
Diagram 5

Berapakah amplitud dan panjang gelombang dalam cm?
What is the amplitude and wavelength of the wave in cm?

	Amplitud (cm) <i>Amplitude (cm)</i>	Wavelength (cm) <i>Panjang gelombang (cm)</i>
A	6	1
B	6	2
C	12	1
D	12	2

Apakah sela masa antara bunyi tembakan dengan gemanya yang didengari oleh penembak?

[Laju bunyi di udara ialah 330 m s^{-1}]

What is the time interval between the shooting sound and its echo heard by the shooter?

[*The speed of the sound in air is 330 m s^{-1}*]

A 0.014 s

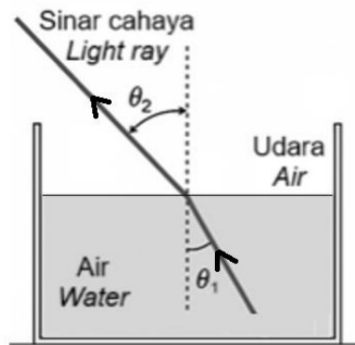
B 0.027 s

C 1.364 s

D 2.727 s

- 17 Rajah 8 menunjukkan sinar cahaya merambat dari air ke udara.

Diagram 8 shows a light ray propagating from water to air.



Rajah 8
Diagram 8

Jika sudut tuju, θ_1 ialah 40° , hitung sudut biasan, θ_2 dalam udara.

If the angle of incidence, θ_1 is 40° , calculate the angle of refraction, θ_2 in air.

[Indeks biasan udara, $n = 1.00$, indeks biasan air, $n = 1.33$]

[*Refractive index of air, $n = 1.00$, refractive index of water, $n = 1.33$*]

A 28.90°

B 40.00°

C 58.75°

D 62.05°

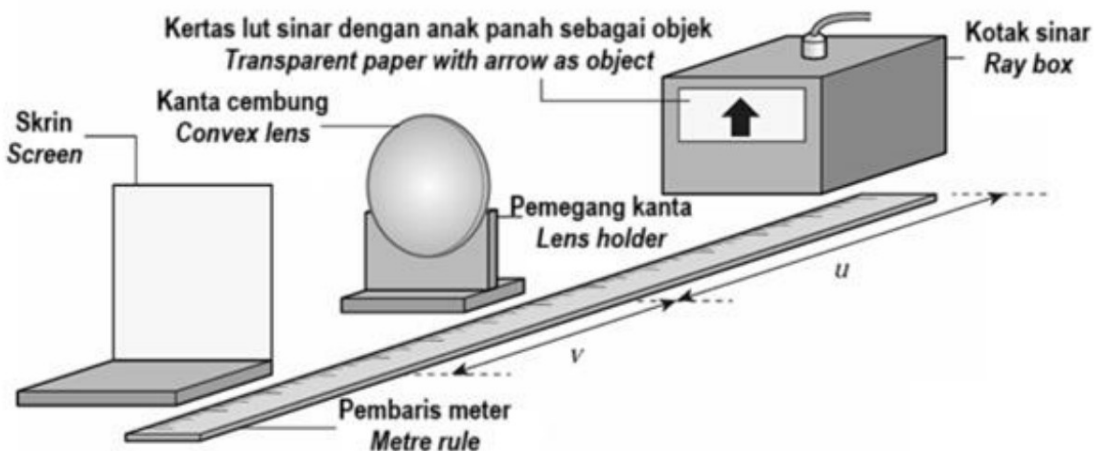
- 18 Antara berikut, yang manakah benar tentang syarat untuk berlakunya pantulan dalam penuh?

Which of the following is true about the conditions for total internal reflection to occur?

- A Sudut tuju kurang dari sudut genting
The angle of incidence is less than the critical angle
- B Sudut tuju sama dengan sudut genting
The angle of incidence is equal to the critical angle
- C Cahaya bergerak dari medium berketumpatan optik rendah ke medium berketumpatan optik tinggi
Light travels from a medium of low optical density to a medium of high optical density
- D Cahaya bergerak dari medium berketumpatan optik tinggi ke medium berketumpatan optik rendah
Light travels from a medium of high optical density to a medium of low optical density

- 19 Rajah 9 menunjukkan satu susunan eksperimen untuk mengesan kedudukan imej dan ciri-ciri imej yang dibentuk oleh satu kanta cembung.

Diagram 9 shows an experimental setup to detect the position and characteristics of images formed by a convex lens.



Rajah 9
Diagram 9

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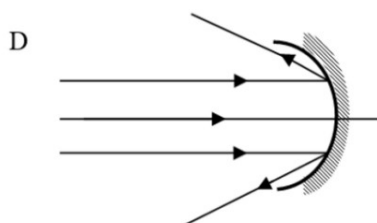
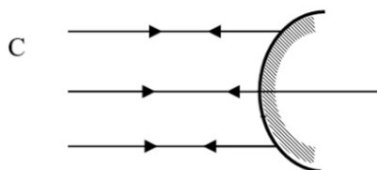
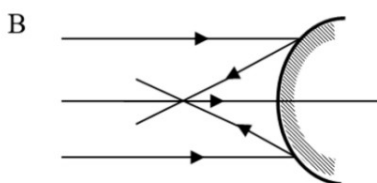
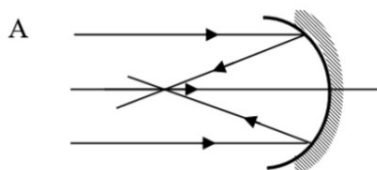
Apabila skrin digerakkan ke hadapan dan ke belakang, tiada imej yang terbentuk pada skrin. Apakah kesimpulan yang paling sesuai?

*When the screen is moved forward and backward, no image is formed on the screen.
What is the most suitable conclusion?*

- A Imej terbentuk adalah maya dan songsang
The image formed is virtual and inverted
- B Imej terbentuk adalah nyata dan diperbesarkan
The image formed is real and magnified
- C Objek berada di antara kanta dan titik fokusnya
The object is between the lens and its focal point
- D Objek berada pada jarak dua kali panjang fokus dari kanta
The object is at twice the focal length from the lens

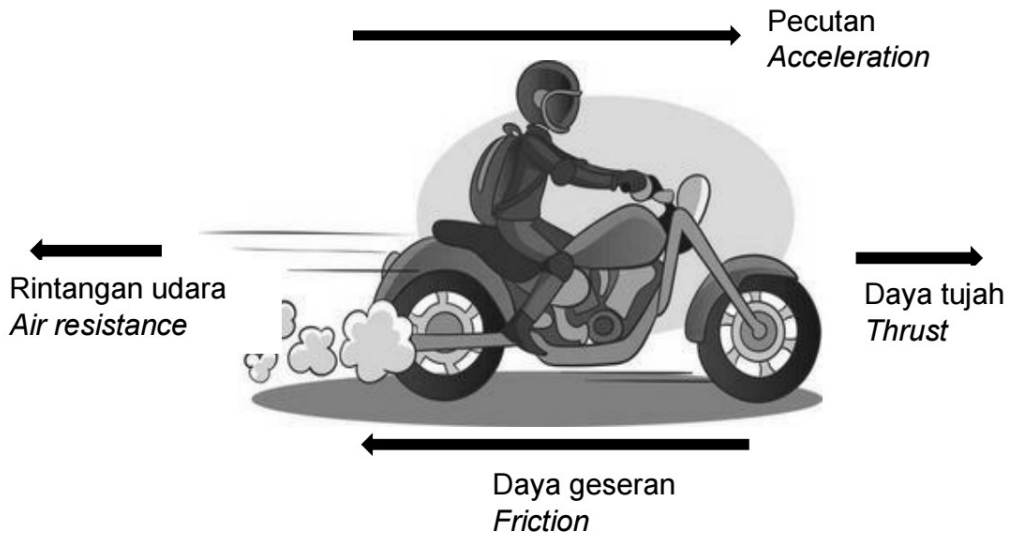
- 20 Antara rajah-rajah sinar berikut, yang manakah yang menunjukkan pantulan cahaya yang betul daripada sebuah cermin melengkung?

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



- 21 Rajah 10 menunjukkan daya-daya mengufuk yang bertindak ke atas motosikal yang sedang memecut.

Diagram 10 shows the horizontal forces acting on an accelerating motorcycle.



Rajah 10
Diagram 10

Antara pernyataan berikut, yang manakah benar?
Which of the following statements is true?

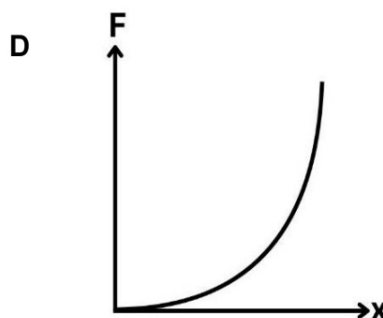
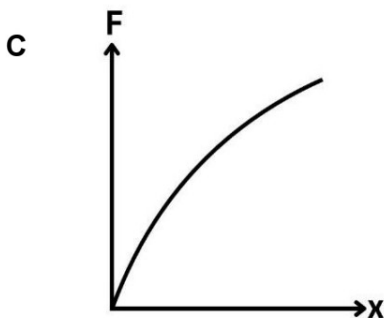
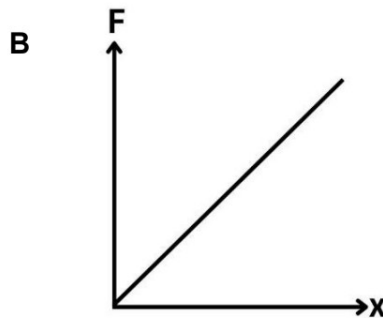
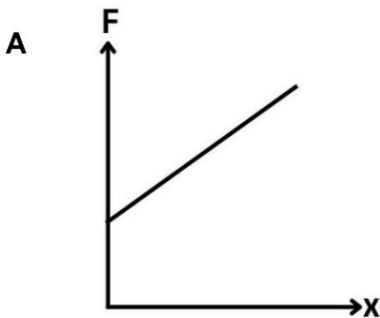
- I Daya paduan adalah **bukan** sifar
*The resultant force is **not** zero*
- II Daya tujah sama dengan rintangan udara
Thrust equal to air resistance
- III Motosikal tersebut **tidak** berada dalam keseimbangan daya
*The motorcycle is **not** in equilibrium of force*
- IV Rintangan udara + daya geseran > daya tujah
Air resistance + frictional force > thrust force

- | | |
|---------------------------------|-----------------------------------|
| A I dan II
I and II | B I dan III
I and III |
| C II dan IV
II and IV | D III dan IV
III and IV |

22 Apakah leraian daya?
What is resolution of forces?

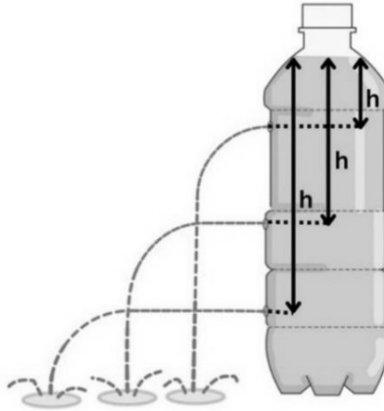
- A Proses meleraikan satu daya tunggal kepada komponen-komponen daya
The process of resolving a single force into its components
- B Proses meleraikan beberapa daya kepada satu daya tunggal
The process of resolving multiple forces into a single force
- C Proses menggabungkan satu daya tunggal kepada komponen-komponen daya
The process of combining a single force into component of forces
- D Proses menggabungkan beberapa daya kepada satu daya tunggal
The process of combining several forces into a single force

23 Graf manakah yang menunjukkan hubungan yang betul antara daya, F dengan pemanjangan, x bagi suatu spring?
Which graph shows the correct relationship between the force, F and the extension, x of a spring?



- 24** Rajah 11 menunjukkan pancutan air dari lubang yang berbeza kedudukan pada sebuah botol berisi air untuk mengkaji faktor yang mempengaruhi tekanan cecair.

Diagram 11 shows water spurts from holes in different positions on a bottle filled with water to study the factors that affect liquid pressure.



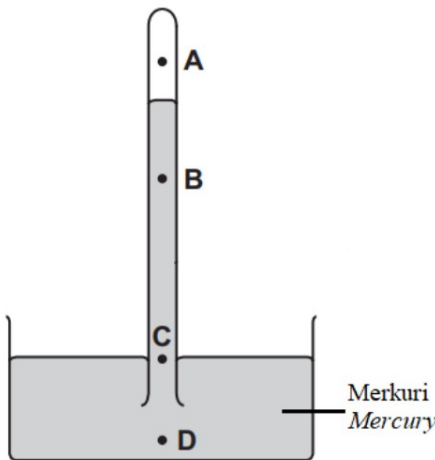
Rajah 11
Diagram 11

Rajah 11 menunjukkan tekanan cecair bergantung kepada...

Diagram 11 shows the pressure of liquid depends on...

- | | |
|---|---|
| A isipadu cecair
<i>volume of liquid</i> | B ketumpatan cecair
<i>density of liquid</i> |
| C kedalaman cecair
<i>depth of liquid</i> | D pecutan graviti
<i>gravitational acceleration</i> |

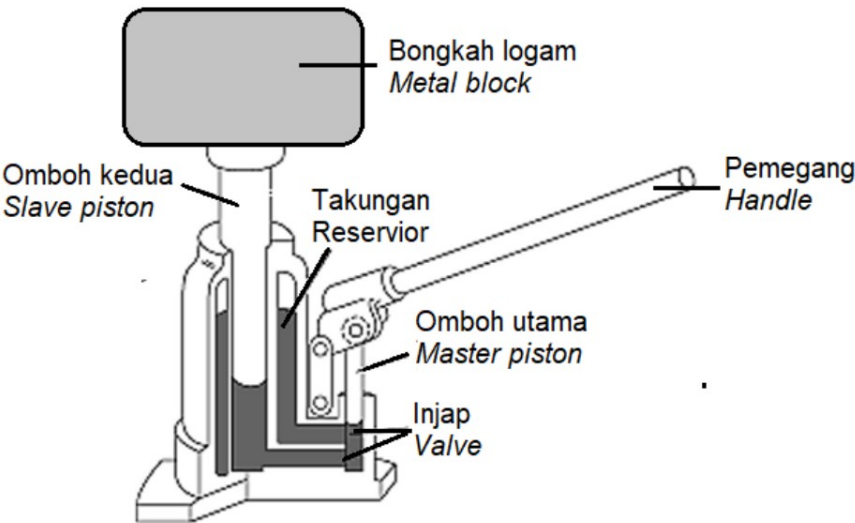
- 25 Rajah 12 menunjukkan sebuah barometer merkuri ringkas yang menunjukkan tekanan atmosfera pada aras laut.
Diagram 12 shows a simple mercury barometer that shows atmospheric pressure at sea level.



Rajah 12
Diagram 12

Pada titik manakah, tekanan adalah melebihi tekanan atmosfera pada aras laut?
At what point does the pressure exceed the atmospheric pressure at sea level?

- 26 Rajah 13 menunjukkan sebuah jek hidraulik digunakan untuk menaikkan bongkah logam yang beratnya 4000 N.
Diagram 13 shows a hydraulic jack used to lift a metal block of weight 4000 N.



Rajah 13
Diagram 13

Jika nisbah antara luas permukaan omboh utama ke omboh kedua adalah 1 : 10, hitung daya, F yang dikenakan ke atas omboh utama.

If the ratio between the surface area of the master piston and the slave piston is 1 : 10, calculate the force, F , exerted on the master piston.

- A** 200 N
C 2000 N

- B** 400 N
D 8000 N

- 27** Rajah 14 menunjukkan sebuah kapal yang berat dapat terapung di atas permukaan air laut.
Diagram 14 shows a heavy ship that can float on the surface of sea water.



Rajah 14
Diagram 14

Antara yang berikut, prinsip manakah benar menerangkan tentang situasi dalam Rajah 14?

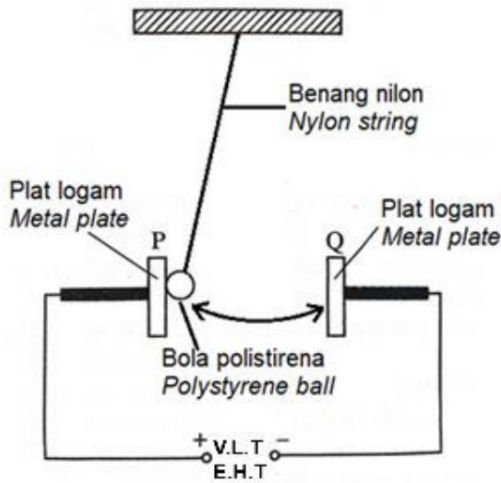
Which of the following principles correctly explains the situation in Diagram 14?

- A** Prinsip Pascal
Pascal's principle
C Prinsip Archimedes
Archimedes' principle

- B** Prinsip Bernoulli
Bernoulli's principle
D Prinsip Keabadian Momentum
Principle of Conservation of Momentum

- 28 Rajah 15 menunjukkan satu bola polistirena bersalut logam berayun dalam medan elektrik yang kuat.

Diagram 15 shows a metal coated polystyrene ball oscillating in a strong electric field.



Rajah 15
Diagram 15

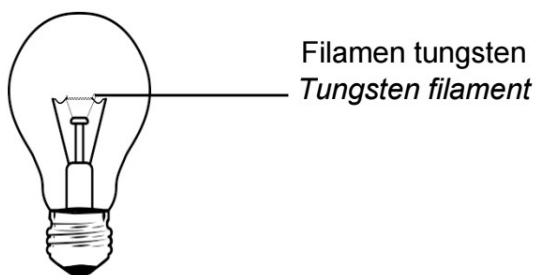
Antara berikut, pernyataan manakah yang akan meningkatkan frekuensi ayunan bola polistirena?

Which of the following statements will increase the oscillation frequency of the polystyrene ball?

- A Menambah panjang tali nilon
Increase the length of nylon string
- B Meningkatkan jisim bola polistirena
Increase the mass of the polystyrene ball
- C Manambah jarak antara plat P dan Q
Increase the distance between plates P and Q
- D Meningkatkan nilai voltan lampau tinggi, V.L.T.
Increase the value of extra high tension, E.H.T.

- 29 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.

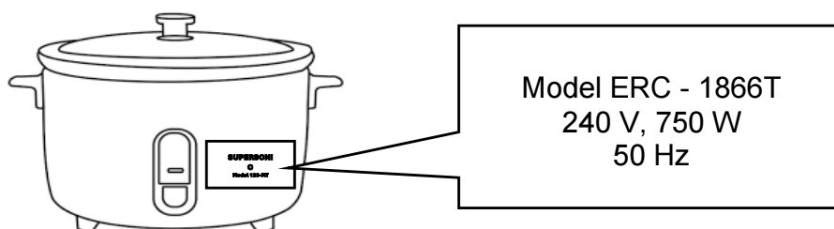


Rajah 16
Diagram 16

Apakah fungsi gegelung dawai tungsten?

What is the function of tungsten wire coil?

- | | |
|---|--|
| A meningkatkan arus
<i>increase the current</i> | B meningkatkan kuasa
<i>increase the power</i> |
| C meningkatkan rintangan
<i>increase the resistance</i> | D meningkatkan beza keupayaan
<i>increase the potential difference</i> |
- 30 Rajah 17 menunjukkan sebuah periuk nasi elektrik berlabel 240 V, 750 W.
Diagram 17 shows a rice cooker labelled 240 V, 750 W.



Rajah 17
Diagram 17

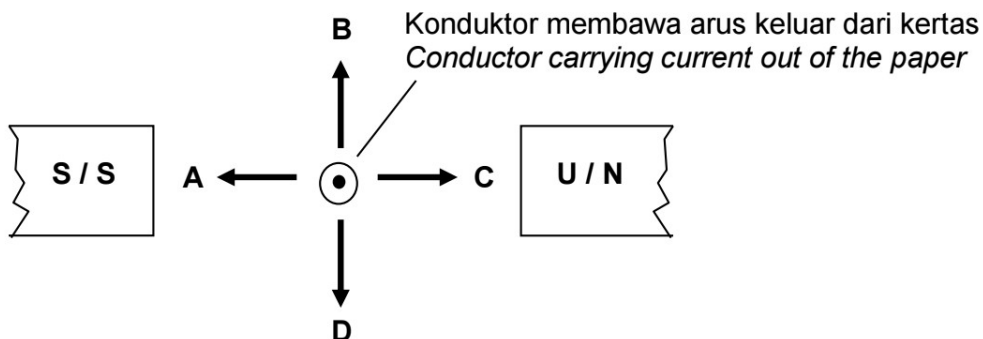
Label 240 V, 750 W bermaksud periuk nasi itu menggunakan ...

The labelled of 240 V, 750 W means that the rice cooker uses ...

- A** 240 J tenaga elektrik setiap saat jika disambung kepada 750 V beza keupayaan
240 J of electrical energy every second if connected to 750 V potential difference
- B** 750 J tenaga elektrik setiap saat jika disambung kepada 240 V beza keupayaan
750 J of electrical energy every second if connected to 240 V potential difference
- C** 240 J tenaga elektrik setiap minit jika disambung kepada 750 V beza keupayaan
240 J of electrical energy every minute if connected to 750 V potential difference
- D** 750 J tenaga elektrik setiap minit jika disambung kepada 240 V beza keupayaan
750 J of electrical energy every minute if connected to 240 V potential difference

- 31 Rajah 18 menunjukkan satu konduktor membawa arus berada dalam medan magnet. Ke arah manakah konduktor itu akan bergerak?

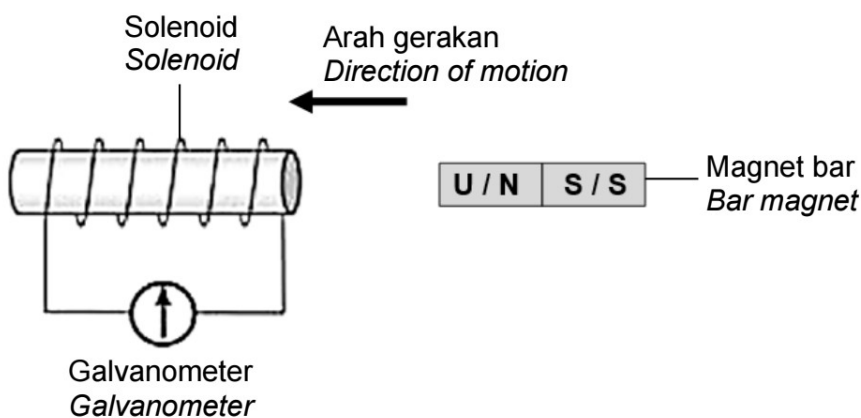
Diagram 18 shows a conductor carrying current in a magnetic field. In which direction will the conductor move?



Rajah 18
Diagram 18

- 32 Rajah 19 menunjukkan magnet bar yang sedang bergerak mendekati solenoid. Didapati jarum penunjuk galvanometer akan terpesong.

Diagram 19 shows a moving bar magnet approaching a solenoid. It was found that the galvanometer indicator pointer will be deflected.



Rajah 19
Diagram 19

Arah pesongan jarum galvanometer boleh ditentukan oleh ...
The direction of deflection of the galvanometer pointer can be determined by ...

- A

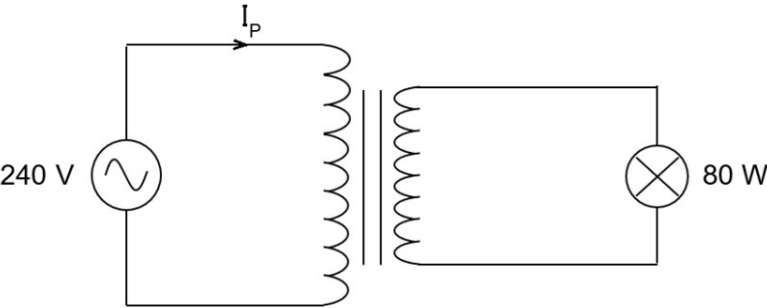
Hukum Lenz
Lenz's law
- B

Hukum Faraday
Faraday's law
- C

Petua Tangan Kiri Fleming
Fleming's Left Hand Rule
- D

Petua Tangan Kanan Fleming
Fleming's Right Hand Rule

- 33 Rajah 20 menunjukkan sebuah transformer unggul yang digunakan untuk menyalakan sebiji mentol pada kecerahan normal.
Diagram 20 shows an ideal transformer used to light up a bulb at normal brightness.



Rajah 20
Diagram 20

Berapakah nilai arus primer, I_p ?
What is the value of the primary current, I_p ?

- A

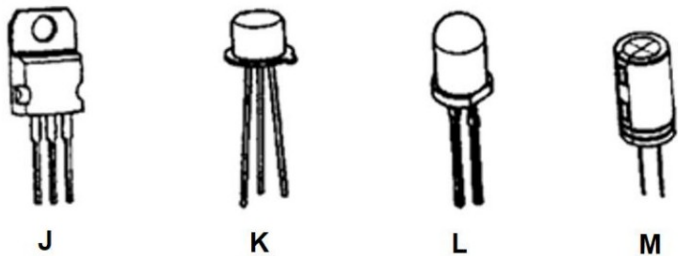
0.03 A
- B

0.33 A
- C

3.00 A
- D

33.33 A

- 34 Rajah 21 menunjukkan empat jenis komponen elektronik.
Diagram 21 shows four types of electronic components.



Rajah 20
Diagram 20

Antara pernyataan berikut, yang manakah benar menerangkan tentang komponen **J**, **K**, **L** dan **M**?

*Which of the following statements correctly describes the components **J**, **K**, **L** and **M**?*

- I Komponen **J** dan **K** digunakan sebagai penguat arus
*Components **J** and **K** are used as current amplifiers*
- II Komponen **L** dan **M** digunakan sebagai penguat arus
*Components **L** and **M** are used as current amplifiers*
- III Komponen **J** dan **K** digunakan sebagai suis automatik
*Components **J** and **K** are used as automatic switches*
- IV Komponen **L** dan **M** digunakan sebagai suis automatik
*Components **L** and **M** are used as automatic switches*

- | | |
|--|--|
| A I dan II
<i>I and II</i> | B I dan III
<i>I and III</i> |
| C II dan IV
<i>II and IV</i> | D III dan IV
<i>III and IV</i> |

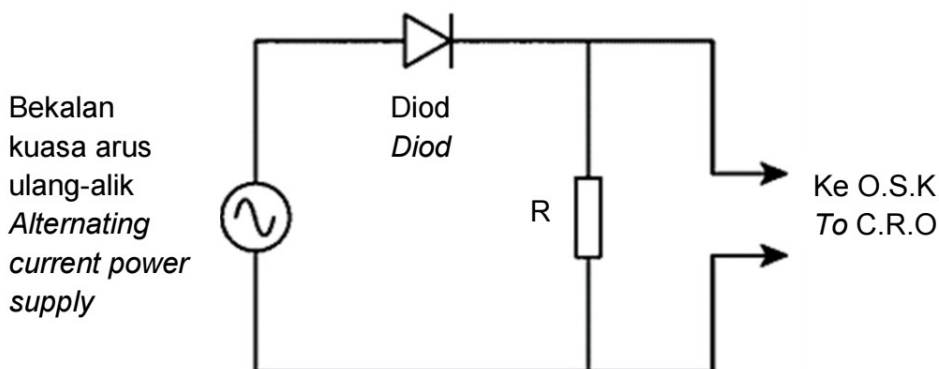
35 Antara berikut, yang manakah merupakan sinar katod?

Which of the following is a cathode ray?

- | | |
|---|--|
| A Neutron
<i>Neutron</i> | B Alur elektron
<i>Electron beam</i> |
| C Sinar gama
<i>Gamma ray</i> | D Zarah alfa
<i>Alpha particles</i> |

- 36** Rajah 22 menunjukkan litar rektifikasi gelombang separuh yang disambungkan kepada bekalan kuasa arus ulang-alik dan osiloskop sinar katod (O.S.K).

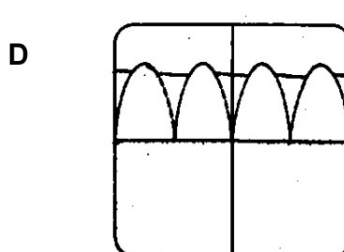
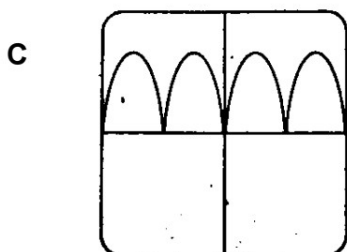
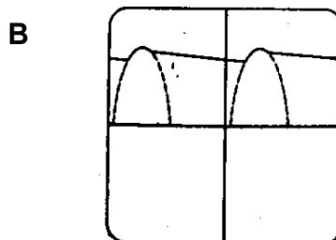
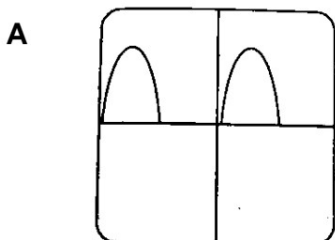
Diagram 22 shows a half wave rectification circuit connected to an alternating current power supply and a cathode ray oscilloscope (C.R.O).



Rajah 22
Diagram 22

Yang manakah lakaran perubahan paparan skrin osiloskop sinar katod jika satu kapasitor, **C** disambungkan secara selari dengan perintang, **R**.

*Which is a sketch of the change in the display of a cathode ray oscilloscope screen if a capacitor, **C** is connected in parallel with a resistor, **R**.*



- 37 Apakah maksud separuh hayat bagi satu nukleus radioaktif?
What is the meaning of the half-life of a radioactive nuclei?
- A Masa yang diambil untuk nukleus radioaktif mereput sepenuhnya
The time taken for a radioactive nuclei to decay completely
 - B Masa yang diambil untuk aktiviti nukleus radioaktif menjadi sifar
The time taken for the activity of a radioactive nuclei to become zero
 - C Masa yang diambil untuk nukleus radioaktif bertukar kepada unsur baharu
The time taken for a radioactive nuclei to change into a new element
 - D Masa yang diambil untuk separuh daripada bilangan asal nukleus radioaktif mereput
The time taken for half of the initial number of radioactive nuclei to decay
- 38 Mengapakah reaktor nuklear dilengkapi dengan rod kawalan?
Why is a nuclear reactor equipped with control rods?
- A Untuk mempercepatkan tindak balas pembelahan nukleus
To speed up the nuclear fission reaction
 - B Untuk menukarkan tenaga haba kepada tenaga mekanik
To convert heat energy into mechanical energy
 - C Untuk menyerap haba yang berlebihan dalam teras reaktor
To absorb excess heat in the reactor core
 - D Untuk mengawal bilangan reputan dan kadar tindak balas berantai
To control the number of decays and the rate of chain reaction
- 39 Antara berikut, yang manakah menerangkan kesan fotoelektrik?
Which of the following describes the photoelectric effect?
- A Kesan fotoelektrik boleh berlaku apabila frekuensi cahaya melebihi frekuensi ambang logam, f_0
Photoelectric effect can occur when the frequency of light exceeds the threshold frequency of the metal, f_0
 - B Frekuensi maksimum yang dapat mengeluarkan elektron dikenali sebagai frekuensi ambang, f_0 bagi suatu logam
Maximum frequency that can emit electrons is known as the threshold frequency of the metal, f_0
 - C Tenaga kinetik elektron bergantung kepada keamatan cahaya
Kinetic energy of electrons depends on the intensity of light
 - D Fotoelektron mengambil masa yang lama untuk dipancarkan apabila disinari dengan cahaya
Photoelectrons take a long time to be emitted when illuminated with light

- 40** Sebuah logam mempunyai fungsi kerja sebanyak 3.2 eV. Cahaya dengan frekuensi 8.5×10^{14} Hz disinarkan ke atas logam tersebut. Apakah tenaga kinetik maksimum elektron yang dipancarkan?
[$h = 6.63 \times 10^{-34}$ Js , $1\text{eV} = 1.6 \times 10^{-19}$ J]

A metal has a work function of 3.2 eV. Light of frequency 8.5×10^{14} Hz is shone on the metal. What is the maximum kinetic energy of the emitted electron?
[$h = 6.63 \times 10^{-34}$ Js, and $1\text{eV} = 1.6 \times 10^{-19}$ J]

- | | |
|-----------------|-----------------|
| A 0.3 eV | B 1.2 eV |
| C 2.1 eV | D 4.5 eV |

KERTAS SOALAN TAMAT
END OF QUESTION PAPER