

1 Antara yang berikut, yang manakah kuantiti vektor?

Which of the following is a vector quantity?

A Tenaga

Energy

B Jisim

Mass

C Daya

Force

D Laju

Speed

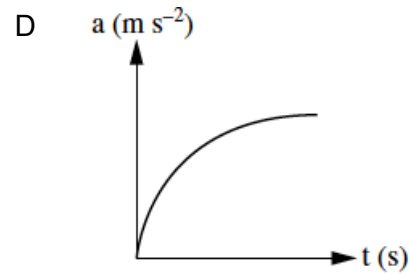
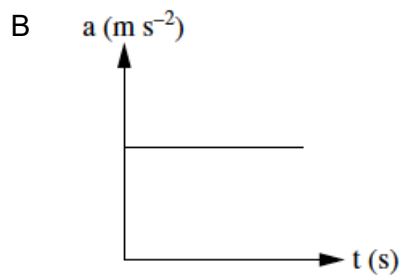
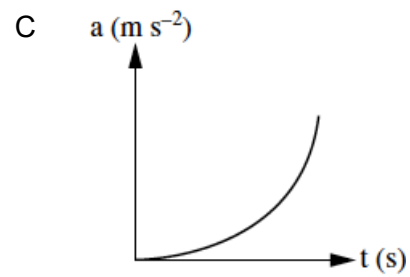
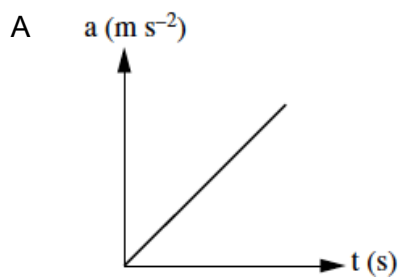
2 Rajah 1 menunjukkan sebiji mangga jatuh dari sebatang pokok.

Diagram 1 shows a mango falling from a tree.



Rajah 1

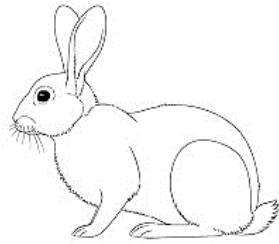
Diagram 1



3 Manakah antara berikut mempunyai inersia yang paling kecil?

Which of the following have a very small inertia?

A.



1.8 kg Arnab

1.8 kg *Rabbit*

C.



1350 g Kualiti

1350 g *Pan*

B.



850 g Spanar

850 g *Spanar*

D.



1.25 kg Mikroskop

1.25 kg *Microscope*

4 Rajah 2 menunjukkan dua orang budak melancarkan sebuah roket air.

Diagram 2 shows two boys launching a water rocket.



Rajah 2

Diagram 2

Prinsip fizik yang diaplikasikan adalah ...

The physics principle applied is ...

- | | | | |
|---|---|---|--|
| A | konsep inersia <i>concept of inertia</i> | C | prinsip keabadian tenaga <i>principle of conservation of energy</i> |
| B | keseimbangan daya <i>equilibrium of forces</i> | D | prinsip keabadian momentum <i>principle of conservation of momentum</i> |

- 5 Rajah 3 menunjukkan seorang atlet membengkokkan kakinya ketika mendarat dalam acara lompat jauh.

Diagram 3 shows an athlete bending his legs when landing in a long jump event.



Rajah 3

Diagram 3

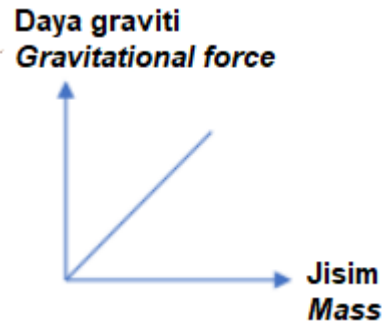
Mengapa atlet tersebut harus membengkokkan kakinya?

Why does the athlete need to bend his legs?

- | | | | |
|-----|---|---|------------|
| I | Untuk mengurangkan impuls <i>To reduce the impulse</i> | C | II dan III |
| II | Untuk mengurangkan daya impuls <i>To reduce impulsive force</i> | D | III dan IV |
| III | Untuk menambah masa ketika di udara <i>To increase the time in the air</i> | | |
| IV | Untuk mendapat jarak paling maksimum <i>To get maximum distance</i> | | |
| A | I dan II | | |
| B | I dan IV | | |

- 6 Graf 1 menunjukkan hubungan antara daya graviti dan jisim untuk objek berhampiran dengan permukaan bumi.

Graph 1 shows the relationship between gravitational force and mass for objects near to earth surface.



Graf 1

Graph 1

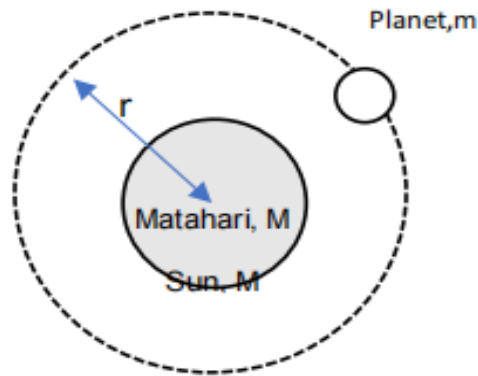
Kecerunan graf mewakili

Gradient of graph represent

- | | | | |
|---|---|---|--|
| A | Pecutan disebabkan daya graviti <i>Acceleration due to gravitational force</i> | C | Berat objek <i>Object weight</i> |
| B | Pemalar Kegravitian Semesta <i>Universal Gravitational Constant</i> | D | Momentum objek <i>Object momentum</i> |

- 7 Rajah 4 menunjukkan sebuah planet berjisim m , bergerak dalam satu orbit membulat berjejari, r mengelilingi matahari berjisim, M . Planet itu mengambil tempoh Orbit, T untuk membuat satu putaran lengkap.

Diagram 4 shows a planet of mass m , moves in a circular orbit of radius r around the sun of mass, M . The planet takes Orbital Period, T to complete one revolution.



Rajah 4

Diagram 4

Antara yang berikut, yang manakah menunjukkan hubungan yang betul antara T dengan m , M , r ?

Which of the following shows the correct relationship between T and m , M , r ?

A $T \propto m^2$

C $T \propto r^3$

B $T \propto Mm$

D $T^2 \propto r^3$

8 Rajah 5 menunjukkan pelancaran sebuah roket ke angkasa lepas.

Diagram 5 shows the launch of a rocket into space.



Rajah 5

Diagram 5

Berapakah halaju minimum yang diperlukan oleh roket itu supaya dapat dilancarkan ke angkasa lepas?

[Diberikan bahawa $M = 5.97 \times 10^{24}$ kg, $G = 6.67 \times 10^{-11}$ N m² kg⁻² dan $R = 6.37 \times 10^6$ m]

What is the minimum velocity required by the rocket to be launched into outer space?

[Given that $M = 5.97 \times 10^{24}$ kg, $G = 6.67 \times 10^{-11}$ N m² kg⁻² and $R = 6.37 \times 10^6$ m]

A 2.03×10^3 m s⁻¹

C 2.44×10^4 m s⁻¹

B 1.12×10^4 m s⁻¹

D 1.12×10^5 m s⁻¹

9 Apakah konsep yang digunakan dalam pengukuran suhu kopi menggunakan termometer?

What is the concept used in measuring the temperature of coffee using a thermometer?

A Perolakan terma

C Haba pendam tentu

Thermal convection

Specific latent heat

B Muatan haba tentu

D Keseimbangan terma

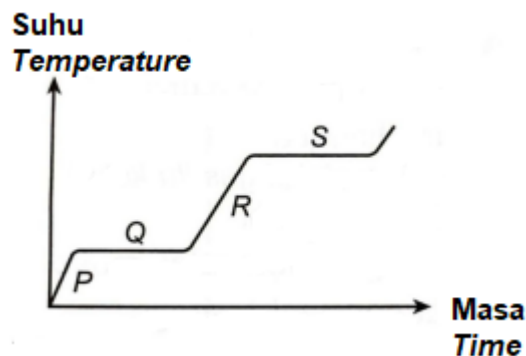
Specific heat capacity

Thermal equilibrium

10 Sejenis bahan dipanaskan pada kadar yang tetap. Bahan tersebut berubah daripada pepejal menjadi cecair, dan kemudian gas. Graf 2 menunjukkan bagaimana suhunya berubah terhadap masa.

A substance is heated at a steady rate. It changes from solid to a liquid, and then to a gas.

Graph 2 shows how its temperature changes with time.



Graf 2

Graph 2

Bahagian proses yang manakah melibatkan haba pendam tentu pengewapan?

Which section of the process involves the specific latent heat of vaporisation?

- | | | | |
|---|--------------------------------|---|--------------------------------|
| A | Bahagian P <i>Section P</i> | C | Bahagian R <i>Section R</i> |
| B | Bahagian Q <i>Section Q</i> | D | Bahagian S <i>Section S</i> |

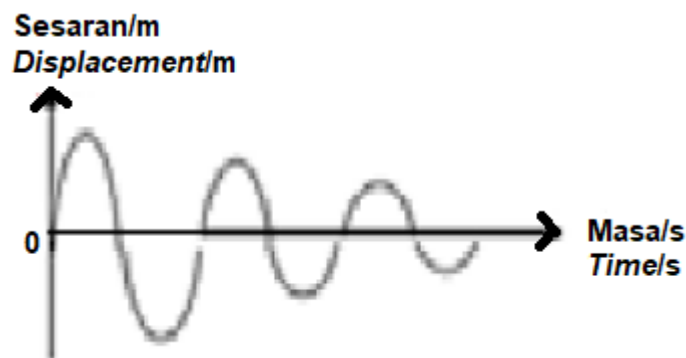
- 11 Antara hukum yang berikut, manakah menyatakan hubungan antara tekanan dan suhu pada isi padu gas malar?

Which of the following laws states the relationship between pressure and temperature at constant volume of gas?

- | | | | |
|---|--------------------------------------|---|---|
| A | Hukum Boyle <i>Boyle's law</i> | C | Hukum Gay-Lussac <i>Gay-Lussac's law</i> |
| B | Hukum Charles <i>Charles' law</i> | D | Hukum Avogadro <i>Avogadro law</i> |

- 12 Rajah 6 menunjukkan suatu sistem berayun mengalami pengurangan amplitud dengan masa.

Diagram 6 shows a swinging system experiences a decrease in amplitude with time.



Rajah 6
Diagram 6

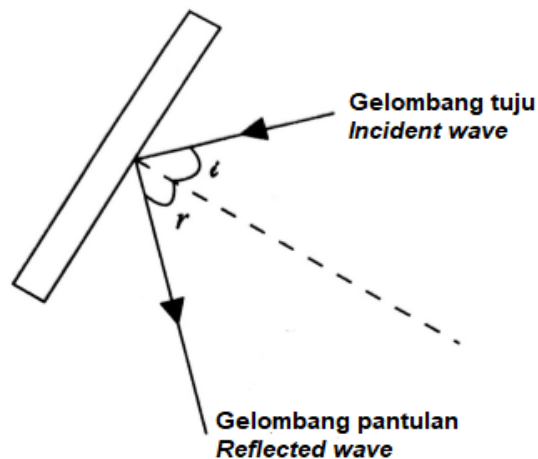
Apakah proses tersebut dan kesannya ke atas sistem tersebut?

What is the process and its impression on the system?

| | Proses <i>Process</i> | Tenaga <i>Energy</i> |
|---|---------------------------------|--------------------------------|
| A | Pelembapan <i>Damping</i> | Bertambah <i>Increase</i> |
| B | Resonans <i>Resonance</i> | Bertambah <i>Increase</i> |
| C | Resonans <i>Resonance</i> | Malar <i>Constant</i> |
| D | Pelembapan <i>Damping</i> | Berkurang <i>Decrease</i> |

13 Rajah 7 menunjukkan pemantulan gelombang satah oleh pemantul satah.

Diagram 7 shows the reflection of a plane wave by a plane reflector.



Rajah7
Diagram 7

Antara pernyataan yang berikut, manakah **tidak** benar?

*Which of the following statements is **not** true?*

- A Sudut tuju, i adalah sama dengan sudut pantulan, r .
Angle of incidence, i is equal to angle of reflection, r .
- B Arah perambatan gelombang pantulan berubah.
The direction of propagation of reflected waves is changed.
- C Kelajuan gelombang pantulan sama dengan gelombang tuju.
The speed of the reflected wave is same as the incident wave.
- D Frekuensi gelombang pantulan adalah separuh daripada gelombang tuju.
The frequency of the reflected wave is half of the incident wave.

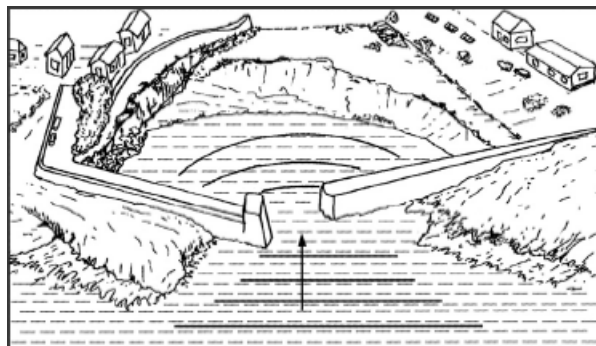
- 14** Antara berikut, yang manakah merupakan ciri gelombang biasan dari kawasan air cetek ke kawasan air dalam?

Which of the following is the characteristics of refractive waves from a shallow water region to a deep water region?

- A Sudut tuju lebih daripada sudut pembiasan.
The angle of incident is more than the angle of refraction.
- B Panjang gelombang meningkat.
The wavelength increases.
- C Frekuensi berkurang.
The frequency decreases.
- D Frekuensi meningkat.
The frequency increases.

- 15** Rajah 8 menunjukkan gelombang air yang melalui jurang yang sempit.

Diagram 8 shows a water wave passing through a narrow gap.



Rajah 8
Diagram 8

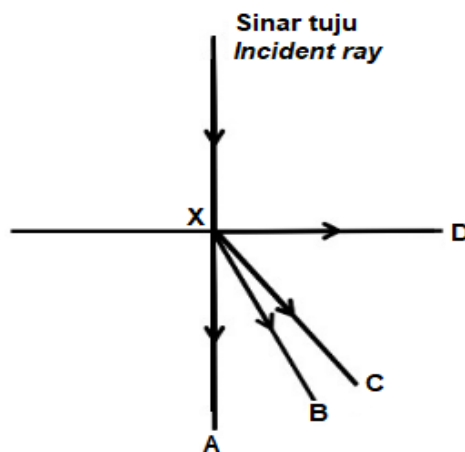
Manakah antara berikut adalah benar mengenai fenomena tersebut?

Which of the following is correct about the phenomenon?

- A Laju gelombang berkurang.
The speed of the waves is decreasing.
- B Frekuensi gelombang berkurang.
The frequency of the waves is decreasing.
- C Panjang gelombang berkurang.
The wavelength of the waves is decreasing.
- D Amplitud gelombang berkurang.
The amplitude of the waves is decreasing.

- 16 Rajah 9 menunjukkan sinar tuju ditujukan ke atas satu permukaan kaca. Arah manakah sinar itu merambat selepas melalui X?

Diagram 9 shows a incident ray, is directed into glass block. Which direction does the light travels after through X?



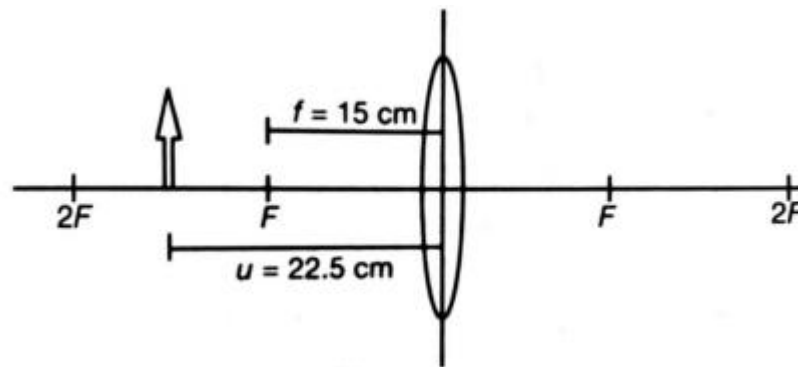
Rajah 9

Diagram 9

- 17 Di manakah satu objek harus diletak di depan satu kanta cembung supaya imej sama besar dengan objek? Jarak fokus kanta cembung itu ialah f .
Where should the object be placed in front of a convex lens for its image is same as the object? The focal length of the convex lens is f .

- | | |
|---|--|
| A Sama dengan $2f$ <i>Equal to $2f$</i> | C Kurang daripada $2f$ <i>Less than $2f$</i> |
| B Lebih daripada $2f$ <i>More than $2f$</i> | D Antara f dan $2f$ <i>Between f and $2f$</i> |

- 18 Rajah 10 menunjukkan satu objek di hadapan sebuah kanta cembung.
Diagram 10 shows an object in front of a convex lens.

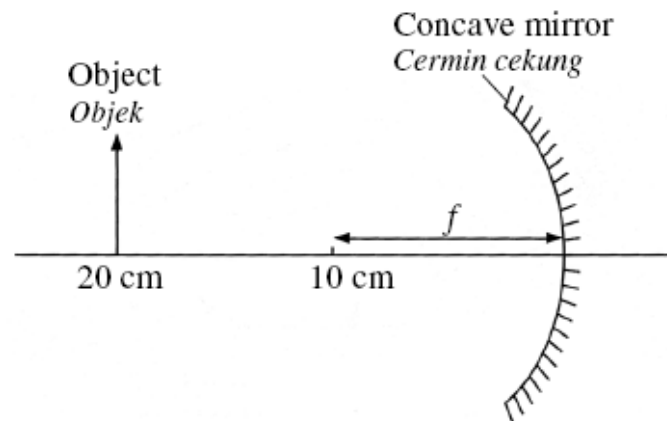


Rajah 10
 Diagram 10

Hitung jarak imej.

Calculate the image distance.

- | | |
|---------|---------|
| A 25 cm | C 45 cm |
| B 30 cm | D 50 cm |
- 19 Rajah 11 menunjukkan suatu objek diletakkan 20 cm di hadapan suatu cermin cekung yang mempunyai panjang fokus, f , 10 cm.
 Diagram 11 shows an object placed 20 cm in front of a concave mirror of focal length, f , 10 cm.



Rajah 11

Diagram 11

Apakah ciri-ciri imej yang terbentuk?

What are the characteristics of the image formed?

- A Nyata, sama saiz, songsang
Real, same size, inverted
- B Nyata, dikecilkan, songsang
Real, diminished, inverted
- C Maya, sama saiz, tegak
Virtual, same size, upright
- D Maya, dikecilkan, tegak
Virtual, diminished, upright

20 Rajah 12 menunjukkan seorang pekerja sedang mengemop lantai.

Diagram 12 shows a worker mopping the floor.



Rajah 12

Diagram 12

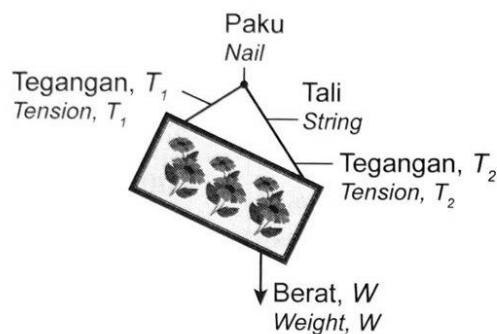
Berapakah magnitud komponen mengufuk, F_x , jika daya tolakan pekerja pada mop itu ialah 40 N?

What is the magnitude of horizontal component, F_x , if the pushing force of the worker on the mop is 40 N?

- | | | | |
|---|--------|---|--------|
| A | 22.3 N | C | 30.6 N |
| B | 25.7 N | D | 40.0 N |

21. Rajah 13 menunjukkan sebuah gambar yang tergantung pada dinding.

Diagram 13 shows a picture hanging on a wall.



Rajah 13

Diagram 13

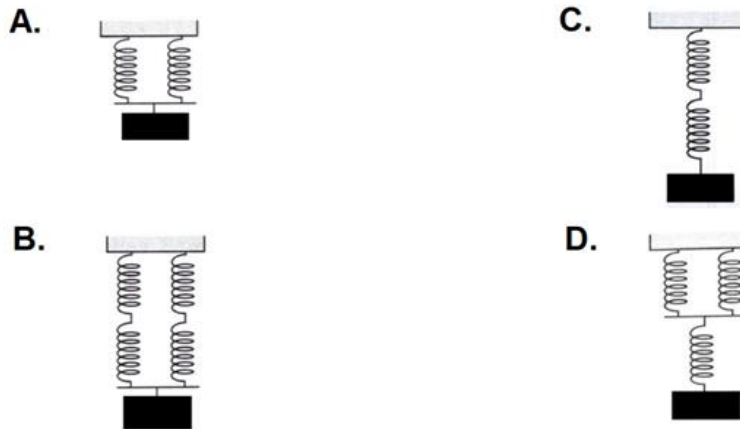
Antara hubungan berikut, yang manakah adalah benar mengenai daya-daya itu?

Which of the following relationship is true about the forces?

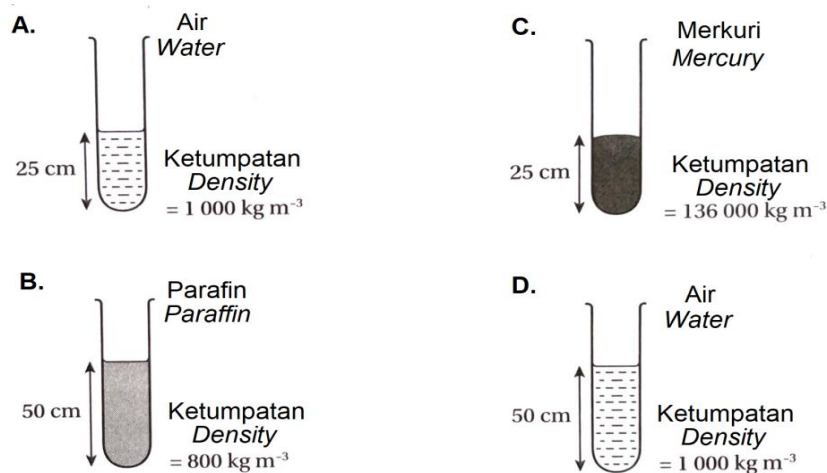
- | | | | |
|---|---------------------|---|-----------------|
| A | $T_1 + T_2 + W = 0$ | C | $T_1 + T_2 = W$ |
| B | $T_1 = T_2 = W$ | D | $T_1 > T_2 > W$ |

22. Susunan spring yang manakah menunjukkan pemanjangan yang paling besar apabila dibebankan dengan jisim yang sama?

Which arrangement of spring shows the largest extension when they are loaded with the same mass?



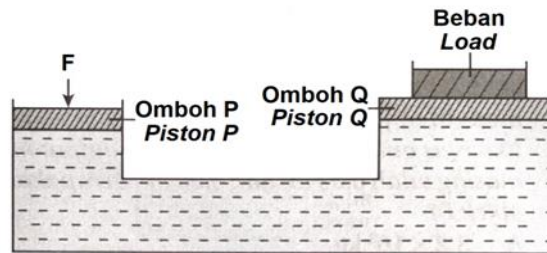
23. Turus cecair manakah yang memberikan tekanan paling besar di dasar bekasnya?
Which column of liquid exerts the greatest pressure on the base of its container?



24. Ketinggian turus merkuri dalam sebuah barometer akan berkurang jika.....
The height of a mercury column in a barometer will decreased if.....
- A. tiub kaca diturunkan ke dalam bekas. B. tiub kaca dinaikkan ke atas
the glass tube is lowered into the the glass tube is lifted up
container
- C. tiub kaca dicondongkan D. tekanan atmosfera berkurang
the glass tube is tilted the atmospheric pressure decreases

25. Rajah 14 menunjukkan satu sistem hidraulik.

Diagram 14 shows a hydraulic system.



Rajah 14

Diagram 14

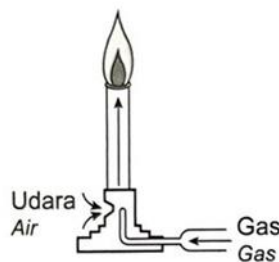
Perbandingan manakah yang benar?

Which comparison is true?

- | | |
|---|---|
| A. Daya F sama dengan berat beban <i>Force F is the same as the weight of the load</i> | B. Daya F lebih besar daripada berat beban <i>Force F is greater than the weight of the load</i> |
| C. Tekanan pada omboh P sama dengan tekanan pada omboh Q <i>The pressure on piston P is the same as the pressure on piston Q</i> | D. Tekanan pada omboh P lebih kecil daripada tekanan pada omboh Q <i>The pressure on piston P is smaller than the pressure on piston Q</i> |

26. Rajah 15 menunjukkan sebuah penunu Bunsen di dalam makmal sekolah. Udara ditolak ke dalam penunu Bunsen disebabkan oleh tekanan di dalam yang lebih rendah.

Diagram 15 shows a Bunsen burner in a school laboratory. Air is driven into the Bunsen burner due to the lower pressure inside.



Rajah 15

Diagram 15

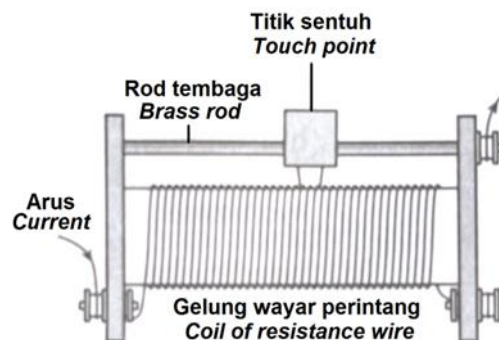
Prinsip yang manakah digunakan dalam alat tersebut?

Which principle is applied in this device?

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

27. Rajah 17 menunjukkan sebuah reostat gegelung dawai.

Diagram 17 shows a wire-wound rheostat.



Rajah 17

Diagram 17

Kuantiti fizik yang manakah berubah ketika titik sentuh digerakkan ke kiri dan ke kanan?

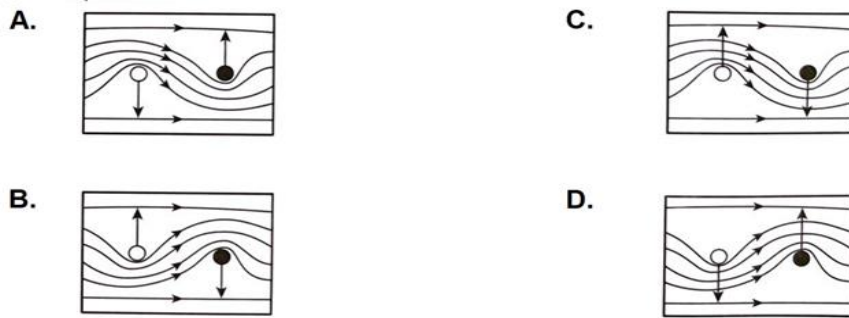
Which physical quantity varies when the touch point is moved left and right?

- | | |
|--|---|
| A. Rintangan <i>Resistance</i> | B. Kuasa <i>Power</i> |
| C. Daya gerak elektrik <i>Electromotive force</i> | D. Kerja yang dilakukan <i>Work done</i> |

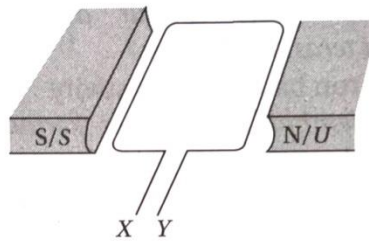
28. Mengapakah sel suria mesti disusun secara siri untuk membentuk satu panel solar?

Why must solar cells be arranged in series to form a solar panel?

- | | |
|---|---|
| A. Mengurangkan rintangan dalam <i>To reduce the internal resistance</i> | B. Menyerap lebih banyak tenaga haba <i>To absorb more heat energy</i> |
| C. Menghasilkan voltan yang tinggi <i>To produce high voltage</i> | D. Mengurangkan pengaliran arus <i>To reduce the current flow</i> |



31. Rajah 20 menunjukkan satu gegelung segi empat tepat dalam medan magnet.
 Diagram 20 shows a rectangular coil in a magnetic field.



Rajah 20

Diagram 20

Sekiranya anda ingin mereka satu penjana arus ulang-alik, apakah yang perlu disambungkan pada X dan Y?

If you want to create an alternating current generator, what should be connected to X and Y?

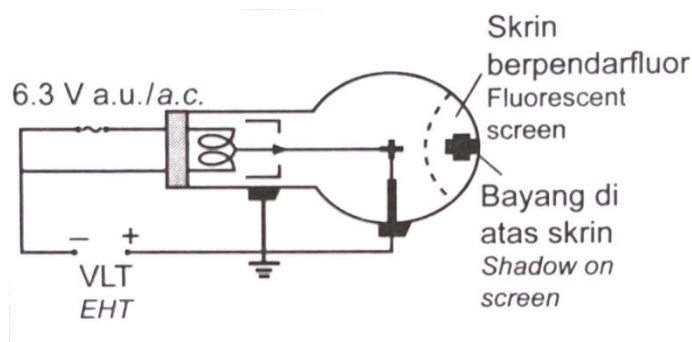
- | | |
|---|--|
| A. Gelang gelincir <i>Slips ring</i> | B. Teras besi lembut <i>Soft iron core</i> |
| C. Bekalan kuasa arus terus <i>Direct current power supply</i> | D. Komutator jenis gelang terbelah <i>Split ring commutator</i> |

32. Pernyataan manakah yang betul tentang transformer injak turun?

Which statement is true about a step-down transformer?

- | | |
|---|--|
| A. Arus output lebih besar daripada arus input <i>Output current is greater than input current</i> | B. Kuasa output lebih besar daripada kuasa input <i>Output power is greater than input power</i> |
| C. Voltan output lebih tinggi daripada voltan input <i>Output voltage is higher than input voltage</i> | D. Voltan output lebih rendah daripada voltan input <i>Output voltage is lower than input voltage</i> |

33. Rajah 21 menunjukkan bayang-bayang yang terbentuk di atas skrin tiub palang Maltese. Diagram 21 shows a shadow formed on the screen of a Maltese cross tube.



Rajah 21

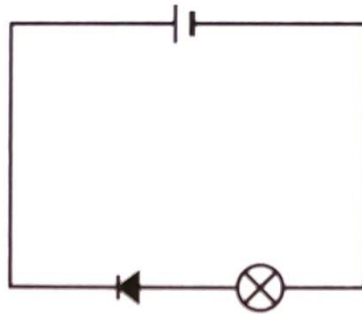
Diagram 21

Apakah fungsi skrin berpendarflour?

What is the function of the fluorescent screen?

- | | |
|---|--|
| A. Untuk menghasilkan alur elektron To produce the electron beam | B. Untuk menukarkan tenaga kinetik elektron kepada cahaya To turn the kinetic energy of electron into light |
| C. Untuk mengawal keamatan alur elektron To control the intensity of electron beam | D. Untuk memecutkan elektron To accelerate the electron |

34. Rajah 22 menunjukkan sebuah litar dengan mentol tidak menyala.
Diagram 22 shows a circuit where the bulb does not light up.



Rajah 22

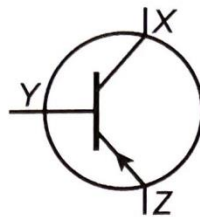
Diagram 22

Antara langkah yang berikut, yang manakah akan menyalakan mentol tersebut?

Which of the following step below will make the bulb light up?

- | | |
|--|---|
| A. Memasang fius di dalam litar <i>Inserting a fuse in the circuit</i> | B. Menyongsangkan sambungan bateri <i>Reversing the battery connection</i> |
| C. Menukarkan bekalan kuasa kepada bateri 3V <i>Changing the power supply to a 3V battery</i> | D. Menyongsangkan sambungan mentol <i>Reversing the bulb connection</i> |

35. Rajah 23 menunjukkan simbol bagi sebuah transistor.
Diagram 23 shows the symbol for a transistor.



Rajah 23

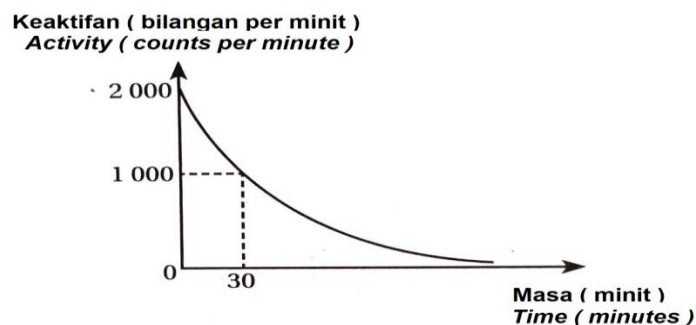
Diagram 23

Antara berikut, yang manakah betul mengenai nama elektrod X, Y dan Z?

Which of the following is the correct name of the electrodes X, Y and Z?

| | X | Y | Z |
|----|-------------------------------|----------------------------|-------------------------------|
| A. | Tapak <i>Base</i> | Pemancar <i>Emitter</i> | Pengumpul <i>Collector</i> |
| B. | Pemancar <i>Emitter</i> | Tapak <i>Base</i> | Pengumpul <i>Collector</i> |
| C. | Pengumpul <i>Collector</i> | Tapak <i>Base</i> | Pemancar <i>Emitter</i> |
| D. | Pengumpul <i>Collector</i> | Pemancar <i>Emitter</i> | Tapak <i>Base</i> |

36. Rajah 24 menunjukkan satu graf mewakili reputan suatu bahan radioaktif.
Diagram 24 shows a graph representing the decay of a radioactive material.



Rajah 24

Diagram 24

Sekiranya keaktifan awal bahan radioaktif itu ialah 2 000 kiraan per minit, berapakah keaktifannya selepas sejam?

If the initial activity of the radioactive material is 2 000 counts per minute, what is its activity after an hour?

- A. 250
B. 500
C. 1 000
D. 2 000

37. Dalam suatu tindak balas pembelahan nukleus Uranium-235, tenaga yang dihasilkan ialah 3.15×10^{-8} J. Hitung jumlah kehilangan jisim dalam tindak balas itu.

[Kelajuan cahaya, $c = 3.0 \times 10^8$ ms⁻¹]

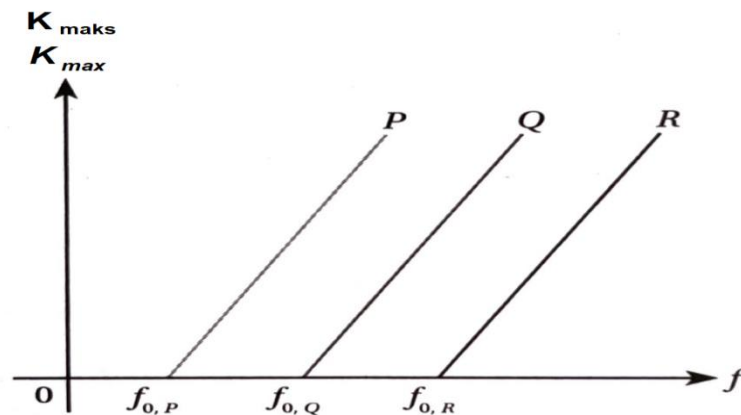
In a nuclear fission reaction of Uranium-235, the energy produced is 3.15×10^{-8} J. Calculate the total loss of mass in the reaction.

[Speed of light, $c = 3.0 \times 10^8$ ms⁻¹]

- | | |
|------------------------------|------------------------------|
| A. 1.05×10^{-16} kg | B. 1.05×10^{-20} kg |
| C. 3.50×10^{-25} kg | D. 3.50×10^{-28} kg |
38. Jasad hitam merupakan
- A black body is.....
- | | |
|--|---|
| A. suatu jasad yang tiada keupayaan untuk menyerap semua sinaran elektromagnet. <i>a body that is unable to absorb all electromagnetic radiation.</i> | B. suatu jasad yang berupaya menyerap semua sinaran elektromagnet. <i>a body that is able to absorb all electromagnetic radiation.</i> |
| C. suatu jasad yang tidak dapat memancarkan sinaran termal. <i>a body that cannot emits thermal radiation</i> | D. suatu jasad yang memancarkan gelombang dengan frekuensi yang rendah. <i>a body that emits wave with low frequency.</i> |
39. Apakah maksud fotoelektron?
- What is the meaning of photoelectron?*
- | | |
|---|--|
| A. Voltan output lebih tinggi daripada voltan input <i>Output voltage is higher than input voltage</i> | B. Voltan output lebih rendah daripada voltan input <i>Output voltage is lower than input voltage</i> |
| C. Kuasa output lebih besar daripada kuasa input <i>Output power is greater than input power</i> | D. Arus output lebih besar daripada arus input <i>Output current is greater than input current</i> |

40. Rajah 25 menunjukkan satu graf tenaga kinetic maksimum, K_{maks} fotoelektron melawan frekuensi, f cahaya bagi empat jenis logam yang berbeza.

Diagram 25 shows a graph of maximum kinetic energy of photoelectrons, K_{max} against light frequency, f for four different types of metals.



Rajah 25

Diagram 25

Apakah kesimpulan yang dapat anda buat daripada graf itu?

What conclusion can you draw from the graph?

- | | |
|---|--|
| <p>A. Logam yang berbeza mempunyai frekuensi ambang yang berbeza <i>Different metals have different threshold frequencies</i></p> | <p>B. Semakin tinggi frekuensi ambang suatu logam, semakin rendah fungsi kerja <i>The higher the threshold frequency of a metal, the lower the work function</i></p> |
| <p>C. Kecerunan graf P lebih rendah daripada kecerunan graf Q <i>The gradient of the graph of P is lower than that of Q</i></p> | <p>D. Fotoelektron akan memperoleh tenaga kinetic apabila frekuensi cahaya lebih rendah daripada frekuensi ambang <i>Photoelectrons will acquire kinetic energy when light frequency is lower than threshold frequency</i></p> |

END OF QUESTION PAPER
KERTAS SOALAN TAMAT