

**MAKTAB RENDAH SAINS MARA****PEPERIKSAAN AKHIR SIJIL PENDIDIKAN MRSMA 2026****FIZIK****Kertas 1**

Satu jam lima belas minit

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

1. Kertas peperiksaan ini adalah dalam dwibahasa.
This paper is written in English and bahasa Melayu.
2. Soalan di atas adalah dalam bahasa Melayu dan soalan dalam bahasa Inggeris terdapat di bawahnya.
The question in bahasa Melayu is written on top while the English version is below.
3. Calon dikehendaki membaca maklumat di halaman belakang kertas peperiksaan ini.
Candidates are required to read the information at the back of the booklet.

Kertas peperiksaan ini mengandungi 34 halaman bercetak.

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 $F = ma$

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 $\frac{P_1}{T_1} = \frac{P_2}{T_2}$

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 $g = 9.81 \text{ m s}^{-2} @ 9.81 \text{ N kg}^{-1}$
- 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

DAYA DAN GERAKAN II
FORCE AND MOTION II

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

TEKANAN
PRESSURE

$$\begin{array}{ll} 1 & P = \frac{F}{A} \\ 2 & P = h\rho g \\ 3 & \rho = \frac{m}{v} \end{array}$$

ELEKTRIK
ELECTRICITY

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

KEELEKTROMAGNETAN
ELECTROMAGNETISM

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

ELEKTRONIK
ELECTRONICS

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

FIZIK NUKLEAR
NUCLEAR PHYSICS

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

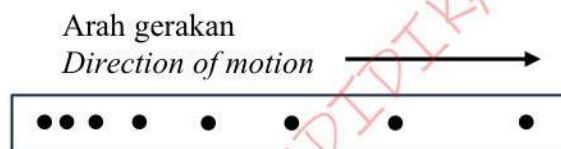
FIZIK KUANTUM
QUANTUM PHYSICS

$$\begin{array}{ll} 1 & E = hf \\ 2 & f = \frac{c}{\lambda} \\ 3 & \lambda = \frac{h}{p} \\ 4 & \lambda = \frac{h}{mv} \\ 5 & E = \frac{hc}{\lambda} \\ 6 & p = nhf \\ 7 & hf = W + \frac{1}{2} mv_{\text{maks}}^2 \\ 8 & W = hf_0 \\ 9 & h = 6.63 \times 10^{-34} \text{ J s} \end{array}$$

- 1 Antara berikut, kaedah manakah yang betul untuk membuat ramalan melalui graf?
Which of the following is the correct method for making predictions from a graph?

- A Interpolasi graf.
Interpolation of the graph.
- B Ekstrapolasi graf.
Extrapolation of the graph.
- C Menghitung kecerunan graf.
Calculate the gradient of the graph.
- D Menghitung luas di bawah graf.
Calculate the area under the graph.

- 2 Rajah 1 menunjukkan keratan pita detik sebuah troli.
Diagram 1 shows a strip of ticker tape of a trolley.

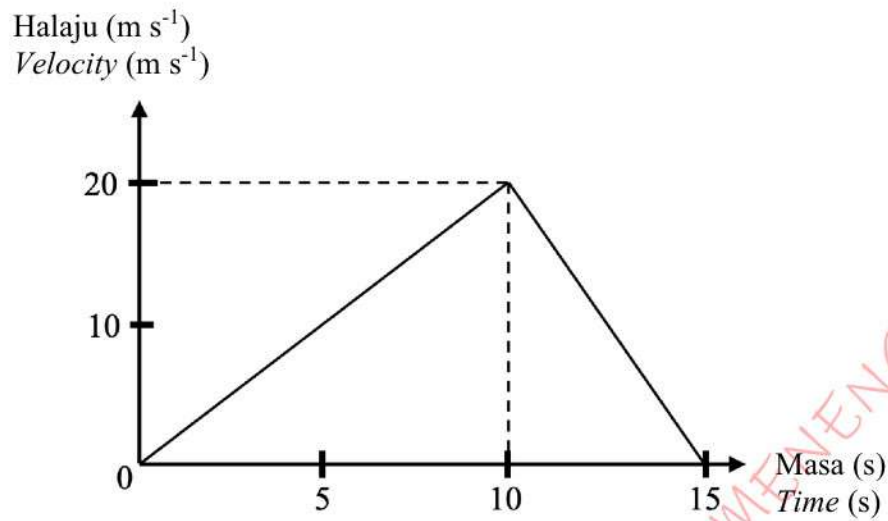


Rajah 1
Diagram 1

- Pernyataan manakah yang betul untuk menerangkan pergerakan troli tersebut?
Which of the following statements is correct to describe the movement of the trolley?

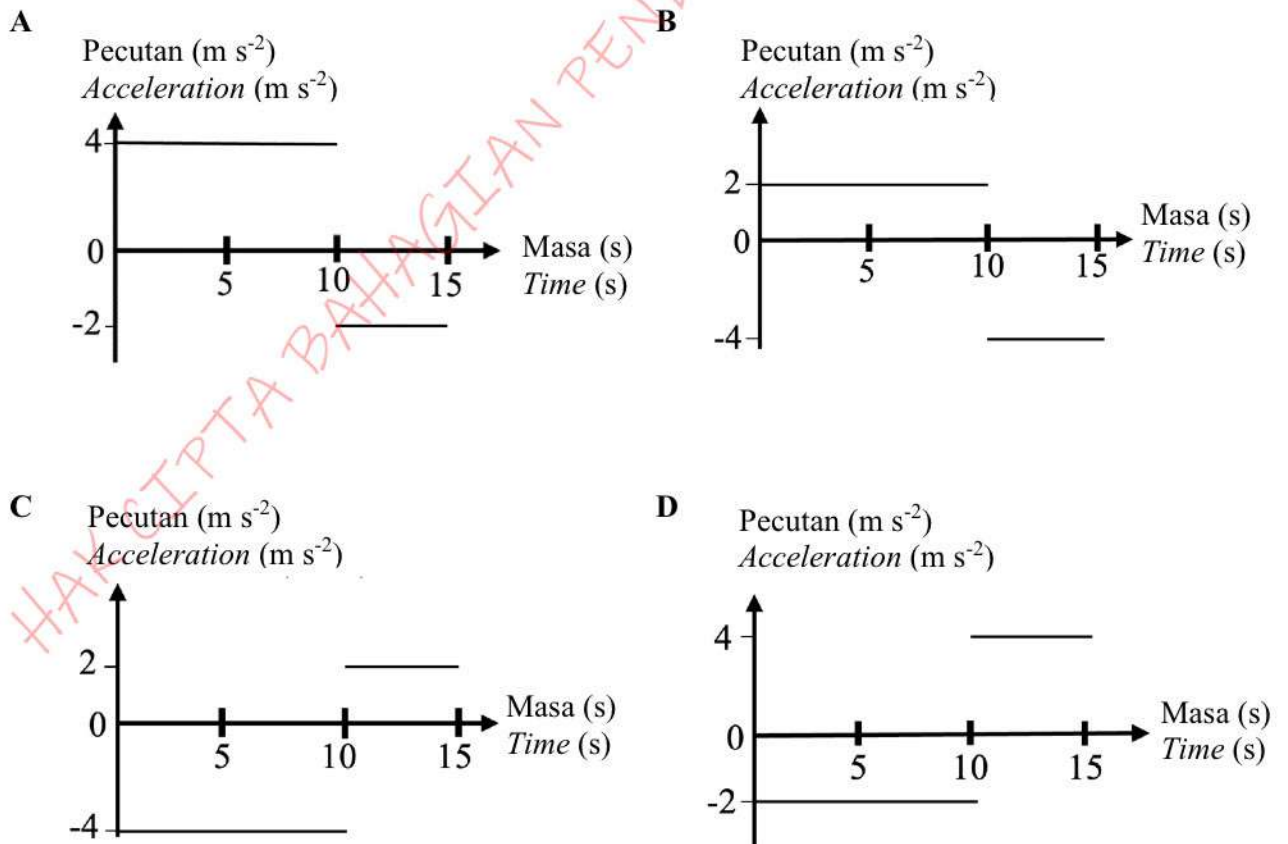
- A Nyahpecutan seragam.
Uniform deceleration.
- B Nyahpecutan sifar.
Zero deceleration.
- C Pecutan seragam.
Uniform acceleration.
- D Pecutan sifar.
Zero acceleration.

- 3 Rajah 2 menunjukkan graf halaju-masa bagi sebuah kereta.
Diagram 2 shows velocity-time graph for a car.



Rajah 2
Diagram 2

Graf pecutan-masa manakah yang menerangkan pergerakan kereta tersebut?
Which acceleration-time graph describes the motion of the car?



[Lihat halaman sebelah
SULIT

- 4 Rajah 3 menunjukkan seorang tukang besi menghentakkan pemegang tukul ke permukaan keras dan menghentikannya secara tiba-tiba untuk mengetatkan kepala tukul tersebut.
Diagram 3 shows a black smith striking a hammer handle against a hard surface and suddenly stopping it to tighten the hammer head.



Rajah 3
Diagram 3

Berdasarkan situasi tersebut, apakah konsep fizik yang terlibat?
Based on the situation above, what is the physics concept involved?

- A Inersia.
Inertia.
- B Impuls.
Impulse.
- C Momentum.
Momentum.
- D Daya paduan.
Resultant force.
- 5 Rajah 4 menunjukkan pergerakan sebiji belon berisi udara apabila dilepaskan oleh seorang pelajar.
Diagram 4 shows movement of an air-filled balloon when it is released by a student.



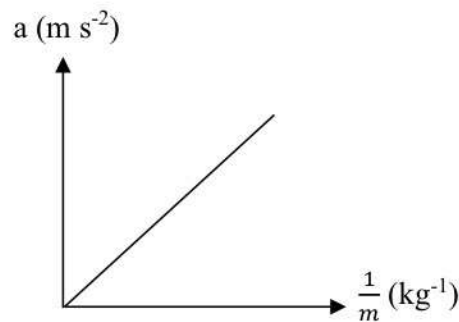
Rajah 4
Diagram 4

Apa yang akan berlaku kepada jumlah momentum jika belon yang lebih besar dilepaskan oleh pelajar?
What will happen to the total momentum if a larger balloon is released by the student?

- A Meningkat.
Increases.
- B Berkurang.
Decreases.
- C Sifar.
Zero.

- 6 Rajah 5 menunjukkan graf yang diperolehi daripada eksperimen untuk mengkaji hubungan antara pecutan, a dan jisim, m bagi satu objek.

Diagram 5 shows the graph obtained from an experiment to study the relationship between acceleration, a , and mass, m , for an object.

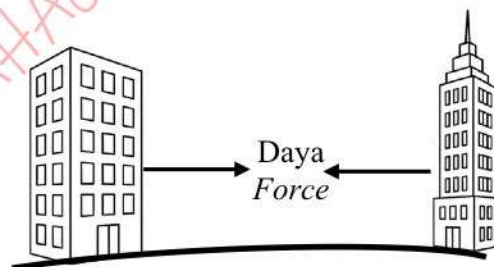


Rajah 5
Diagram 5

Apakah hubungan graf tersebut?

What is the relationship of the graph?

- A a bertambah dengan m .
 a increases with m .
- B a berkadar terus dengan m .
 a directly proportional with m .
- C a berkadar songsang dengan m .
 a inversely proportional with m .
- D a bertambah secara linear dengan m .
 a increases linearly with m .
- 7 Rajah 6 menunjukkan dua jasad pegun di Bumi dan masing-masing mengalami daya dengan magnitud yang sama.
- Diagram 6 shows two bodies at rest on the Earth and each experiences a force with the same magnitude.*



Rajah 6
Diagram 6

Apakah hukum fizik yang terlibat?

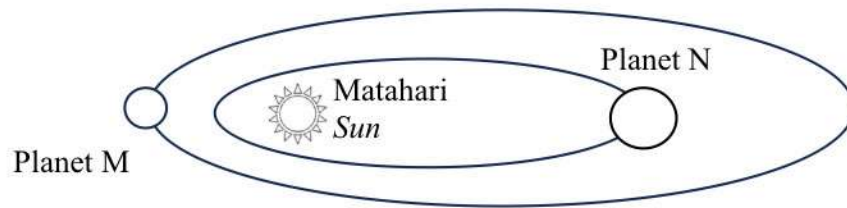
What is the physics law involved?

- A Hukum Gerakan Newton Pertama.
Newton's First Law of Motion.
- B Hukum Gerakan Newton Kedua.
Newton's Second Law of Motion.
- C Hukum Gerakan Newton Ketiga.
Newton's Third Law of Motion.
- D Hukum Kegravitian Semesta Newton.
Newton's Universal Law of Gravitation.

[Lihat halaman sebelah

SULIT

- 8 Rajah 7 menunjukkan planet M dan planet N yang mengorbit Matahari.
Diagram 7 shows planet M and planet N orbiting the Sun.



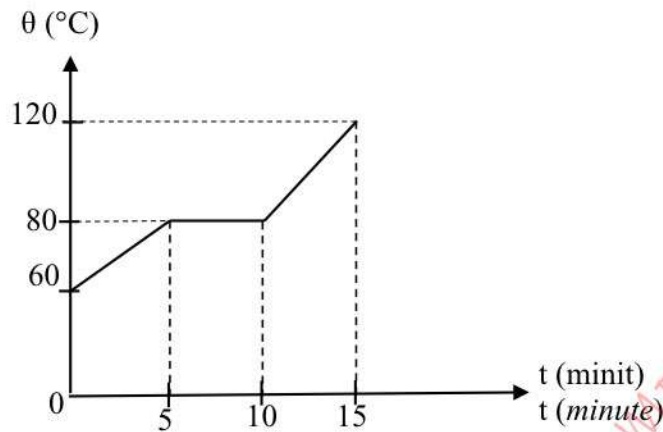
Rajah 7
Diagram 7

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

- A** Daya graviti antara Matahari dan planet M lebih tinggi dari planet N.
The gravitational force between the Sun and planet M is higher than planet N.
- B** Jejari orbit planet M lebih rendah berbanding planet N.
The orbital radius of planet M is lower than planet N.
- C** Halaju lepas planet M lebih tinggi berbanding planet N.
The escape velocity of planet M is higher than planet N.
- D** Tempoh orbit planet M lebih tinggi dari planet N.
The orbital period of planet M is higher than planet N.

- 9 Rajah 8 menunjukkan lengkung pemanasan suatu pepejal berjisim 0.5 kg dengan menggunakan plat pemanas berkuasa 48 W.

Diagram 8 shows a heating curve of a solid with a mass of 0.5 kg using a heating plate with a power of 48 W.



Rajah 8
Diagram 8

Tentukan muatan haba tentu, c pepejal itu.

Determine the specific heat capacity, c of the solid.

- A $12 \text{ J kg}^{-1}\text{ }^{\circ}\text{C}^{-1}$
B $24 \text{ J kg}^{-1}\text{ }^{\circ}\text{C}^{-1}$
C $720 \text{ J kg}^{-1}\text{ }^{\circ}\text{C}^{-1}$
D $1440 \text{ J kg}^{-1}\text{ }^{\circ}\text{C}^{-1}$

- 10 Rajah 9 menunjukkan sebuah periuk tekanan yang digunakan untuk mengurangkan masa memasak.
Diagram 9 shows a pressure cooker used to reduce cooking time.



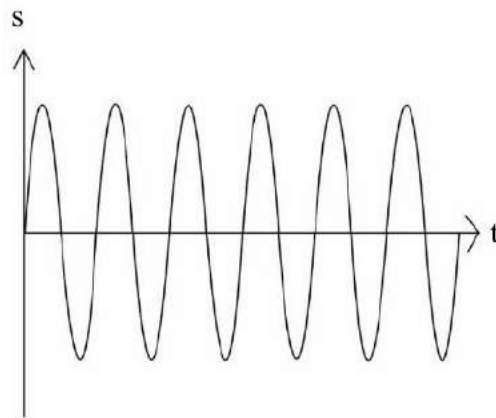
Rajah 9
Diagram 9

Hukum gas yang manakah terlibat dalam situasi tersebut?
Which gas law is involved in the situation?

- A Hukum Boyle.
Boyle's Law.
- B Hukum Charles.
Charles' Law.
- C Hukum Gay-Lussac.
Gay-Lussac's Law.

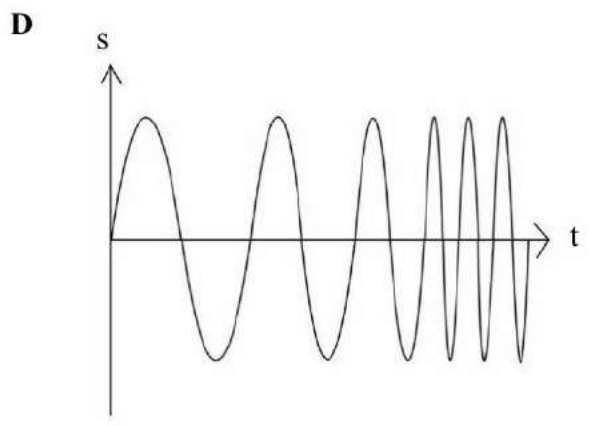
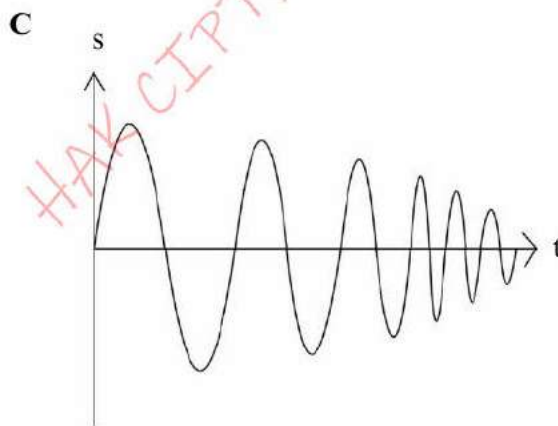
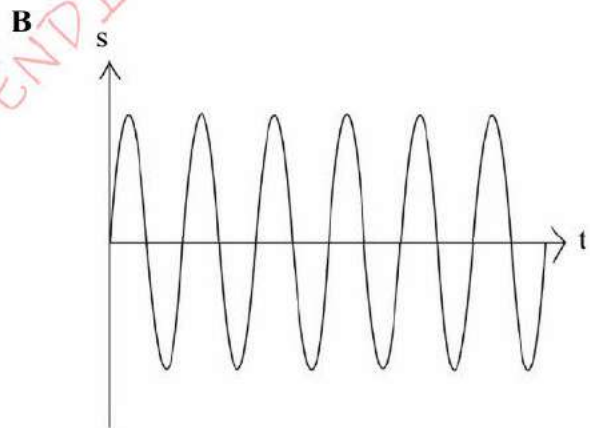
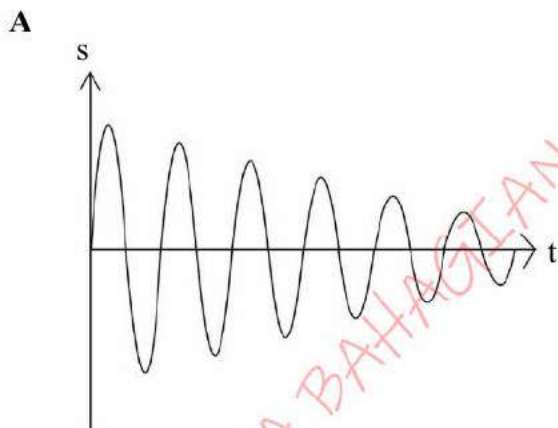
- 11 Rajah 10 menunjukkan graf sesaran, s melawan masa, t bagi satu sistem ayunan spring di dalam vakum.

Diagram 10 shows a displacement, s against time, t graph of an oscillation system of a spring in a vacuum.

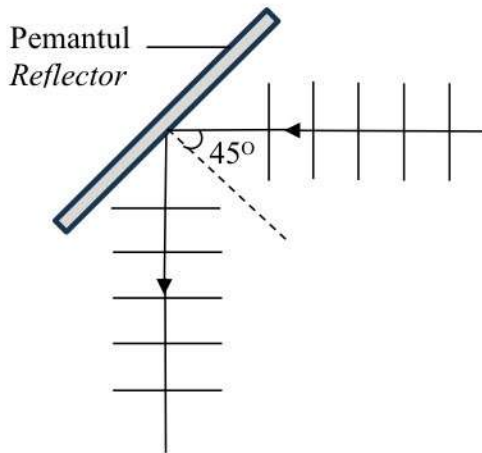


Rajah 10
Diagram 10

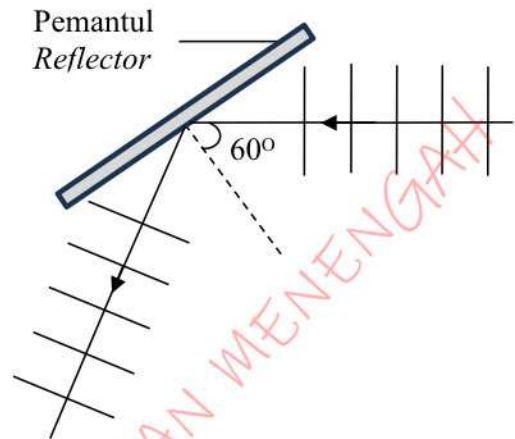
Antara berikut, rajah manakah yang betul jika sistem ayunan spring berayun di udara?
Which of the following diagrams is correct for a spring system oscillating in air?



- 12 Rajah 11.1 menunjukkan corak gelombang air yang terhasil dalam tangki riak. Rajah 11.2 menunjukkan corak gelombang air yang terhasil apabila kedudukan pemantul diubah. *Diagram 11.1 shows the pattern of water waves produces in a ripple tank. Diagram 11.2 shows the pattern of water waves produces when the position of the reflector is changed.*



Rajah 11.1
Diagram 11.1

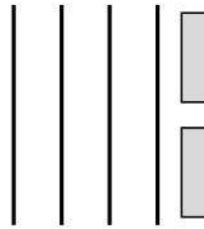


Rajah 11.2
Diagram 11.2

Antara pernyataan berikut yang manakah betul mengenai situasi di atas?
Which of the following statement is correct about the situation above?

- A Semakin tinggi sudut tuju semakin tinggi frekuensi.
The higher the angle of incident the higher the frequency.
- B Semakin tinggi sudut tuju panjang gelombang tidak berubah.
The higher the angle of incident the wavelength is unchanged.
- C Semakin tinggi sudut tuju semakin tinggi laju gelombang pantulan.
The higher the angle of incident the higher the speed of the reflected wave.
- D Semakin tinggi sudut tuju arah perambatan gelombang pantulan tidak berubah.
The higher the angle of incident the direction of propagation of reflected wave unchanged.

- 13 Rajah 12 menunjukkan gelombang air sebelum melalui satu celah.
Diagram 12 shows the water waves before passing through a gap.

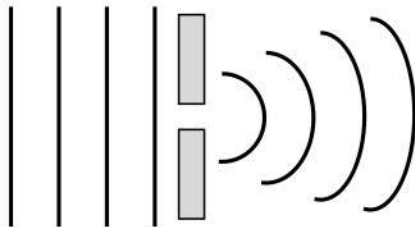


Rajah 12
Diagram 12

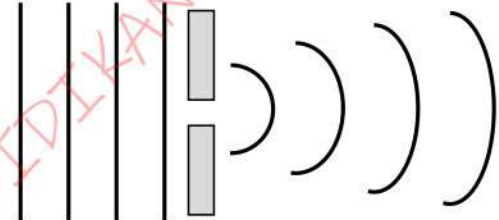
Antara berikut yang manakah menunjukkan corak bagi gelombang di atas selepas melalui celah tersebut?

Which of the following shows the pattern of the wave above after passing through the gap?

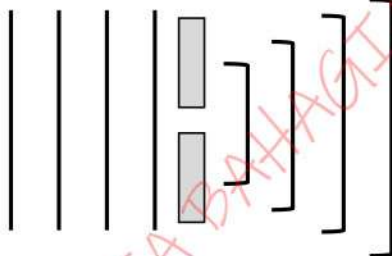
A



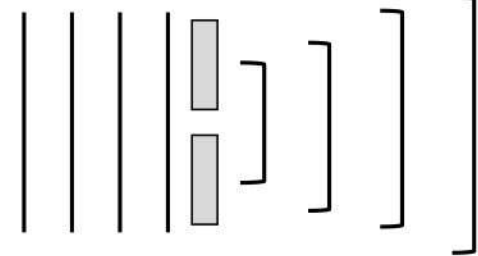
B



C



D



- 14 Antara berikut yang manakah menerangkan tentang interferens gelombang?
Which of the following explain about interference of the waves?

- A Superposisi dua atau lebih gelombang dari sumber yang sama.
Superposition of two or more waves from a same source of waves.
- B Superposisi dua atau lebih gelombang dari sumber gelombang yang koheren.
Superposition of two or more waves from a coherent source of waves.
- C Superposisi dua atau lebih gelombang dari sumber gelombang monokromatik.
Superposition of two or more waves from a monochromatic source of waves.
- D Superposisi dua atau lebih gelombang dengan panjang gelombang yang sama.
Superposition of two or more waves with the same wavelength.

[Lihat halaman sebelah
SULIT

- 15 Antara berikut yang manakah ciri-ciri bagi gelombang elektromagnet?
Which of the following are the characteristics of the electromagnetic wave?

- I Gelombang membujur.
Longitudinal wave.
- II Tidak boleh merambat melalui vakum.
Can not propagate through vacuum.
- III Laju gelombang dalam vakum ialah $3 \times 10^8 \text{ m s}^{-1}$.
Speed of wave in vacuum is $3 \times 10^8 \text{ m s}^{-1}$.
- IV Menunjukkan fenomena pantulan, pembiasan, pembelauan dan interferens.
Show phenomena of reflection, refraction, diffraction and interference.

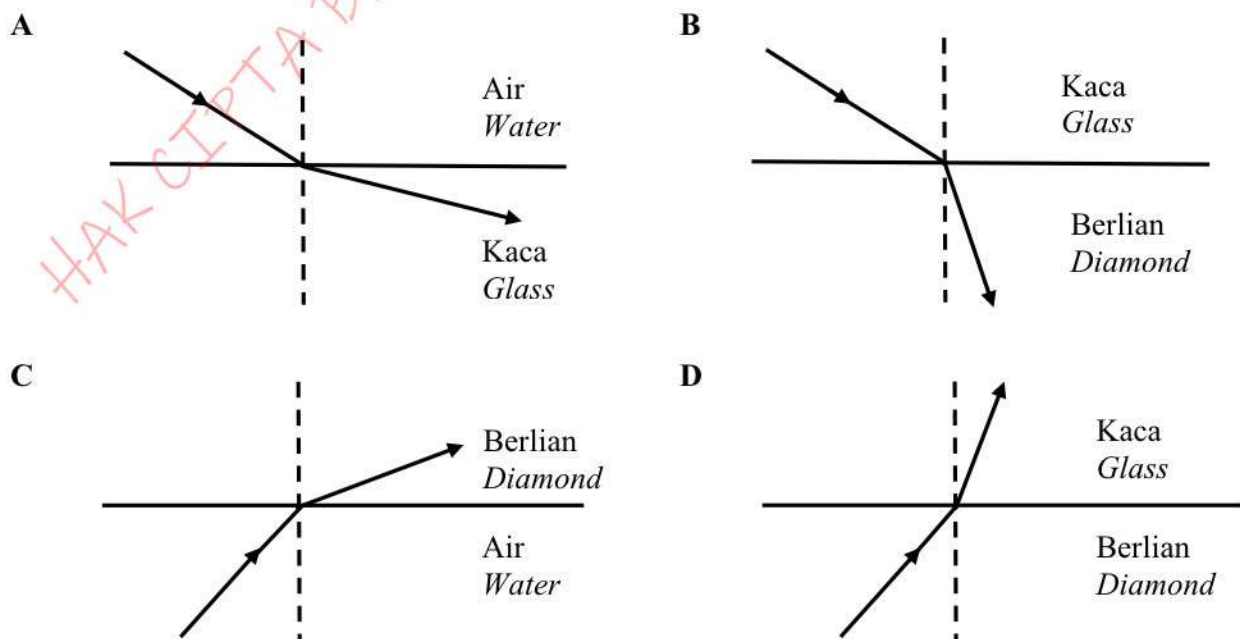
- A I dan II
I and II
- B I dan III
I and III
- C II dan IV
II and IV
- D III dan IV
III and IV

- 16 Jadual 1 menunjukkan indeks biasan tiga medium yang berlainan.
Table 1 shows refractive index of three different medium.

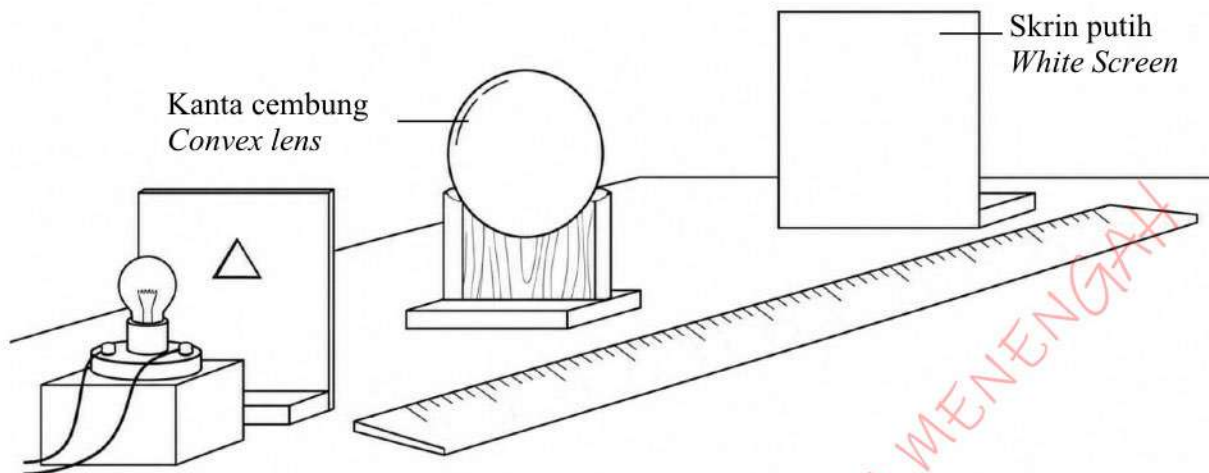
Medium <i>Medium</i>	Indeks biasan, n <i>Refractive index, n</i>
Berlian <i>Diamond</i>	2.42
Kaca <i>Glass</i>	1.52
Air <i>Water</i>	1.33

Jadual 1
Table 1

- Rajah sinar yang manakah adalah betul?
Which ray diagram is correct?



- 17 Rajah 13 menunjukkan susunan radas bagi eksperimen pembentukan imej oleh kanta cembung. *Diagram 13 shows the arrangement of the apparatus for the experiment of image formation by a convex lens.*



Rajah 13
Diagram 13

Penyataan yang manakah betul?
Which statement is correct?

	Pemboleh ubah dimanipulasikan <i>Manipulated variable</i>	Pemboleh ubah bergerak balas <i>Responding variable</i>	Pemboleh ubah dimalarkan <i>Constant variable</i>
A	Jarak imej <i>Image distance</i>	Jarak objek <i>Object distance</i>	Panjang fokus <i>Focal length</i>
B	Jarak objek <i>Object distance</i>	Jarak imej <i>Image distance</i>	Panjang fokus <i>Focal length</i>
C	Panjang fokus <i>Focal length</i>	Jarak objek <i>Object distance</i>	Jarak imej <i>Image distance</i>
D	Panjang fokus <i>Focal length</i>	Jarak imej <i>Image distance</i>	Jarak objek <i>Object distance</i>

- 20 Rajah 16 menunjukkan imej yang terbentuk pada permukaan sudu yang dipegang oleh seorang pelajar.

Diagram 16 shows the image formed on the surface of a spoon held by a student.



Rajah 16
Diagram 16

Apakah fenomena yang terlibat dalam situasi di atas?

What is phenomenon related to the above situation?

- A Pembelauan cahaya.
Diffraction of light.
- B Pembiasan cahaya.
Refraction of light.
- C Interferens cahaya.
Interference of light.
- D Pantulan cahaya.
Reflection of light.

- 21 Rajah 17 menunjukkan sebuah motorsikal sedang bergerak dengan halaju seragam di atas jalan raya.

Diagram 17 shows a motorcycle moving with uniform velocity on the road.



Rajah 17
Diagram 17

Apakah daya paduan yang bertindak ke atas motosikal tersebut?
What is the resultant force acting on the motorcycle?

- | | |
|--------------------------|---------------------------------|
| A Sifar
Zero | B Bertambah
Increases |
| C Berkurang
Decreases | D Tiada perubahan
No changes |
- 22 Rajah 18 menunjukkan seorang budak lelaki menuruni cerun.
Diagram 18 shows a boy sliding down a slope.

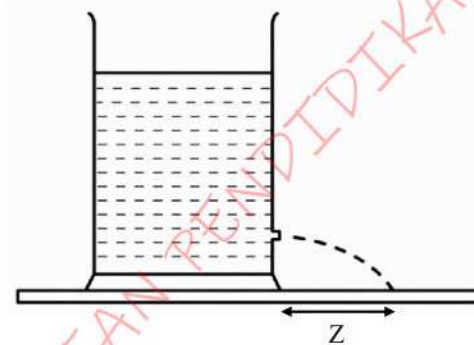


Rajah 18
Diagram 18

Apakah yang mewakili X?
What is represented by X?

- | | |
|-------------------|-------------------|
| A $R \sin \theta$ | B $R \cos \theta$ |
| C $W \sin \theta$ | D $W \cos \theta$ |

- 23 Antara berikut yang manakah menyebabkan pemalar spring lebih tinggi?
Which of the following causes the spring constant to be higher?
- A Ketebalan dawai spring lebih rendah.
Thickness of spring is lower.
 - B Diameter spring lebih tinggi.
Diameter of spring is higher.
 - C Panjang spring lebih rendah.
Length of spring is shorter.
 - D Susunan spring sesiri.
Arrangement of spring in series.
- 24 Rajah 19 menunjukkan sebuah tangki air yang bocor dan menghasilkan pancutan air dengan jarak Z.
Diagram 19 shows a leaked water tank producing a water spurt at distance Z.



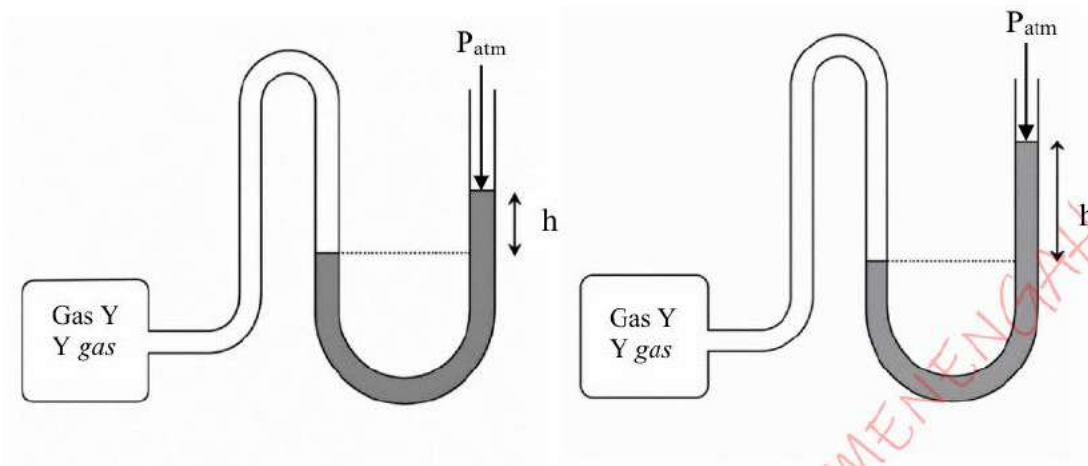
Rajah 19
Diagram 19

Ramalkan apa yang akan berlaku kepada jarak Z sekiranya air digantikan dengan minyak?
Predict what will happen to the distance Z if water is replaced with oil?

- A Bertambah
Increases
- B Berkurang
Decreases
- C Tiada perubahan
No change

- 25 Rajah 20 menunjukkan dua manometer yang menggunakan cecair yang berbeza untuk mengukur tekanan gas Y.

Diagram 20 shows two manometer using two different liquids to measure the pressure of gas Y.



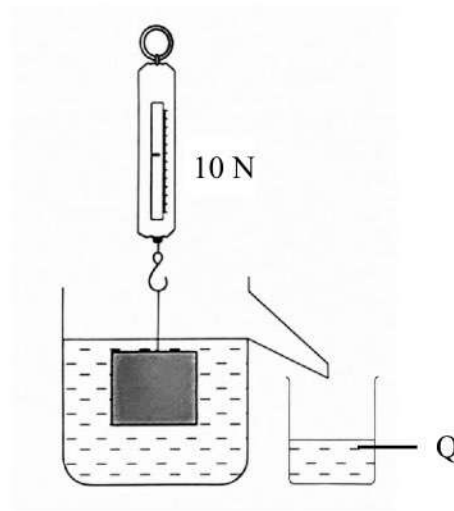
Rajah 20
Diagram 20

Antara berikut, pernyataan yang manakah betul?

Which of the following statements is correct?

- A Semakin tinggi ketumpatan cecair semakin tinggi tekanan gas Y.
The higher the density of the liquid the higher the Y gas pressure.
- B Semakin rendah ketumpatan cecair semakin tinggi tekanan gas Y.
The lower the density of the liquid the higher the Y gas pressure.
- C Semakin tinggi ketumpatan cecair, semakin rendah ketinggian, h .
The higher the density of the liquid, the lower the height, h .
- D Semakin tinggi ketumpatan cecair, semakin tinggi ketinggian, h .
The higher the density of the liquid, the higher the height, h .

- 26 Rajah 21 menunjukkan satu eksperimen untuk mengkaji Prinsip Archimedes.
Diagram 21 shows an experiment to investigate Archimedes' Principle.

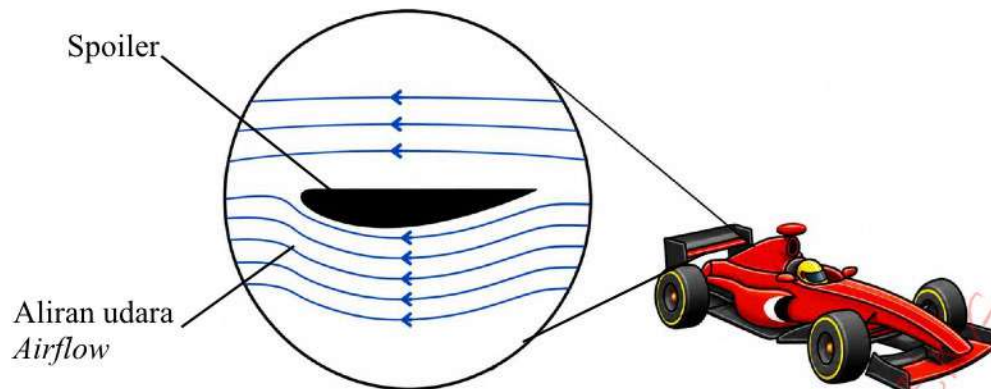


Rajah 21
Diagram 21

Apakah yang mewakili Q dalam eksperimen di atas?
What does Q represent in the experiment above?

- A Jisim sebenar.
Actual mass.
- B Berat ketara.
Apparent weight.
- C Kehilangan jisim ketara.
Apparent loss in mass.
- D Kehilangan berat ketara.
Apparent loss in weight.

- 27 Rajah 22 menunjukkan sebuah kereta lumba sedang memecut dalam satu perlumbaan.
Diagram 22 shows a racing car accelerating in a race.



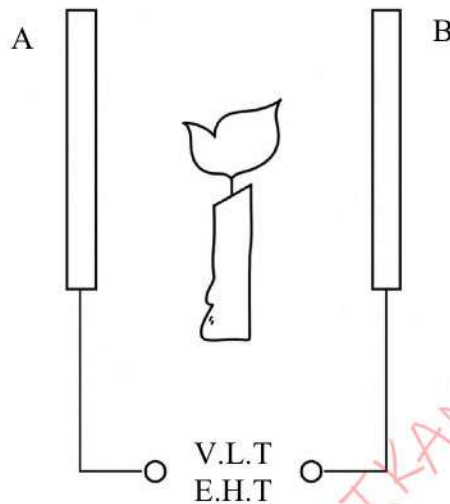
Rajah 22
Diagram 22

Apakah kegunaan spoiler pada kereta lumba?
What is the function of a spoiler on a racing car?

- A Spoiler menghasilkan daya ke bawah pada kereta lumba.
The spoiler produces a downward force on the racing car.
- B Perbezaan tekanan pada spoiler menghasilkan daya angkat ke atas kereta.
The difference in pressure at the spoiler produces an upward lift force on the car.
- C Perbezaan tekanan pada spoiler menyebabkan kereta lumba menjadi lebih laju.
The difference in pressure at the spoiler causes the racing car to move faster.
- D Spoiler mengurangkan daya graviti yang bertindak ke atas kereta.
The spoiler reduces the gravitational force acting on the car.

- 28 Rajah 23 menunjukkan sebatang lilin yang bernyala di antara dua plat logam A dan B yang disambung kepada bekalan kuasa V.L.T.

Diagram 23 shows a lighted candle flame between two metal plates A and B that is connected to E.H.T power supply.



Rajah 23
Diagram 23

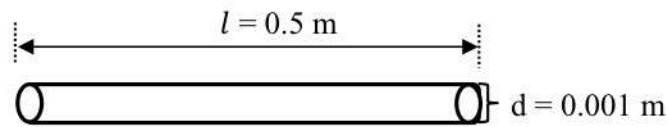
Apakah cas pada plat A dan plat B?

What are the charges on plate A and plate B?

	Plat logam A <i>Metal plate A</i>	Plat logam B <i>Metal plate B</i>
A	Bercas negatif <i>Negatively charged</i>	Bercas negatif <i>Negatively charged</i>
B	Bercas positif <i>Positively charged</i>	Bercas positif <i>Positively charged</i>
C	Bercas positif <i>Positively charged</i>	Bercas negatif <i>Negatively charged</i>
D	Bercas negatif <i>Negatively charged</i>	Bercas positif <i>Positively charged</i>

- 29 Rajah 24 menunjukkan satu dawai kuprum dengan panjang, l dan diameter, d mempunyai rintangan, R 0.3Ω .

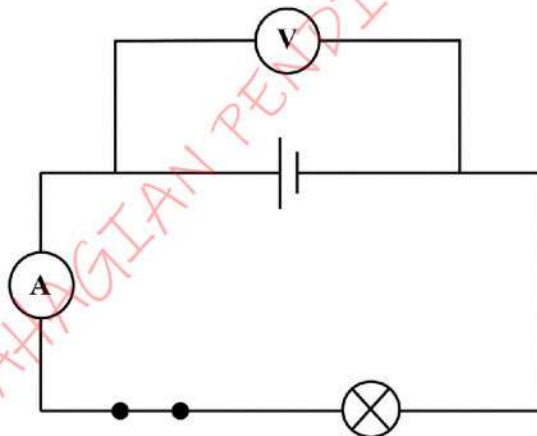
Diagram 24 shows a copper wire with length, l and diameter, d with resistance, R of 0.3Ω .



Rajah 24
Diagram 24

Berapakah kerintangan dawai kuprum?
What is the resistivity of copper wire?

- A $4.71 \times 10^{-7} \Omega \text{ m}$ B $6.00 \times 10^{-4} \Omega \text{ m}$
C $4.71 \times 10^{-3} \Omega \text{ m}$ D $6.00 \times 10^{-1} \Omega \text{ m}$
- 30 Rajah 25 menunjukkan satu litar elektrik dengan bacaan voltmeter 1.2 V .
Diagram 25 shows an electric circuit with voltmeter reading of 1.2 V .



Rajah 25
Diagram 25

Berapakah nilai daya gerak elektrik (d.g.e) sel kering dalam litar ?
What is the electromotive force (e.m.f) of the dry cell in the circuit?

- A 0.3 V B 1.2 V
C 1.5 V D 2.7 V

- 31 Jadual 2 menunjukkan dua jenis lampu yang menghasilkan kuasa output yang sama selepas 5 minit.

Table 2 shows two type of lamps that produce the same output power after 5 minutes.

Jenis lampu <i>Type of lamp</i>	Kuasa input / W <i>Input power / W</i>	Kuasa output / W <i>Output power / W</i>
LED	18	10
Filamen <i>Filament</i>	60	10

Jadual 2

Table 2

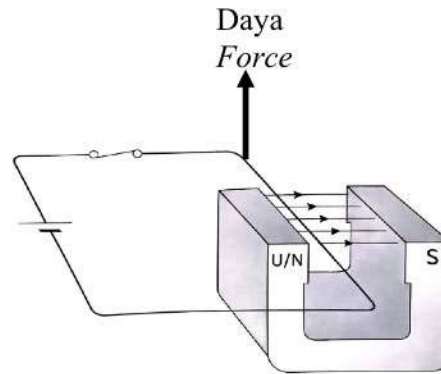
Berdasarkan Jadual 2, pernyataan yang manakah betul?

Based on Table 2, which statement is correct?

- A Kecekapan tenaga lampu LED lebih tinggi kerana kehilangan tenaga lebih rendah.
The energy efficiency of LED lamp is higher because the loss of energy is lower.
- B Kecekapan tenaga lampu LED lebih tinggi kerana kehilangan tenaga lebih tinggi.
The energy efficiency of LED lamp is higher because the loss of energy is higher.
- C Kecekapan tenaga lampu filamen lebih tinggi kerana kehilangan tenaga lebih rendah.
The energy efficiency of filament lamp is higher because the loss of energy is lower.
- D Kecekapan tenaga lampu filamen lebih tinggi kerana kehilangan tenaga lebih tinggi.
The energy efficiency of filament lamp is higher because the loss of energy is higher.

- 32 Rajah 26 menunjukkan susunan radas untuk mengkaji daya yang terhasil ke atas konduktor pembawa arus.

Diagram 26 shows an arrangement of apparatus to study the force produced on a current carrying conductor.



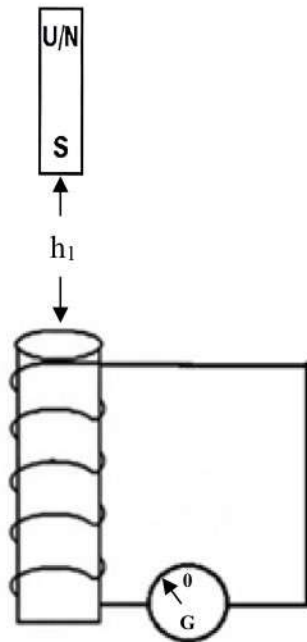
Rajah 26
Diagram 26

Apakah yang menyebabkan terhasilnya daya dalam Rajah 26?
What causes the force in Diagram 26?

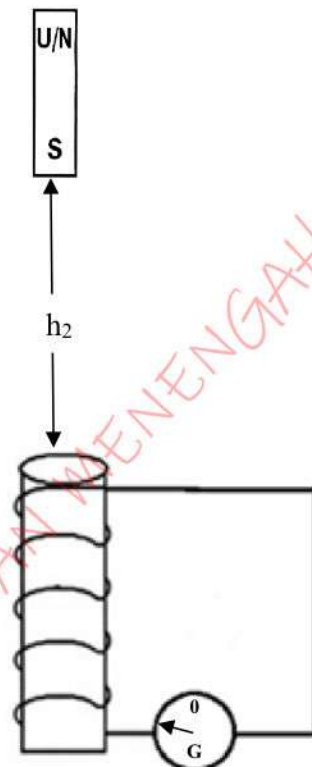
- A Medan elektromagnet
Electromagnetic field
- B Medan elektrik
Electric field
- C Medan magnet
Magnetic field
- D Medan lastik
Catapult field

- 33 Rajah 27.1 dan Rajah 27.2 menunjukkan satu magnet yang sama dijatuhkan dari ketinggian h_1 dan h_2 .

Diagram 27.1 and Diagram 27.2 show a same magnet is dropped from height h_1 and h_2 .



Rajah 27.1
Diagram 27.1

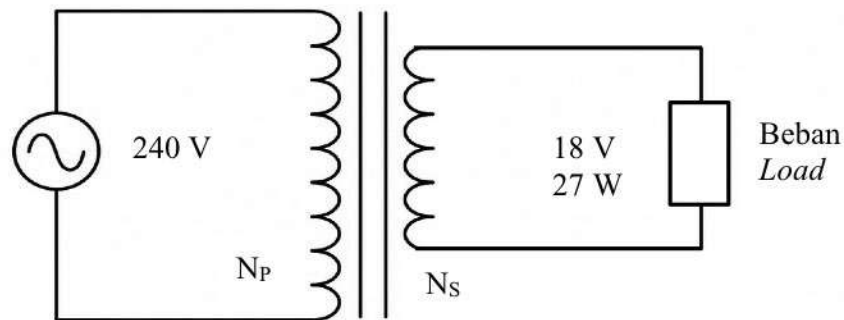


Rajah 27.2
Diagram 27.2

Antara berikut hubungkait manakah yang betul?
Which of the following is the correct relationship?

- A Semakin tinggi halaju magnet semakin rendah pemotongan fluks magnet.
The higher the velocity of the magnet the lower the cutting of magnetic flux.
- B Semakin rendah halaju magnet semakin rendah pemotongan fluks magnet.
The lower the velocity of the magnet the lower the cutting of magnetic flux.
- C Semakin tinggi halaju magnet semakin tinggi kadar pemotongan fluks magnet.
The higher the velocity of the magnet the higher the rate of cutting magnetic flux.
- D Semakin rendah halaju magnet semakin tinggi kadar pemotongan fluks magnet.
The lower the velocity of the magnet the higher the rate of cutting magnetic flux.

- 34 Rajah 28 menunjukkan sebuah transformer unggul.
Diagram 28 shows an ideal transformer.



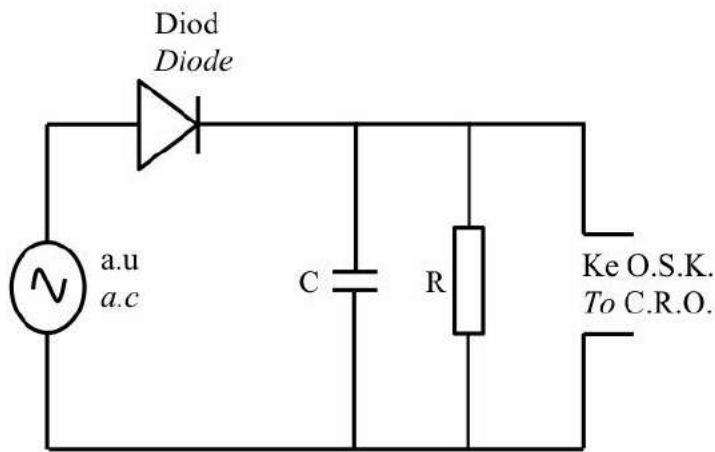
Rajah 28
Diagram 28

Apakah yang akan berlaku kepada kuasa output jika bilangan lilitan gegelung sekunder dikurangkan?

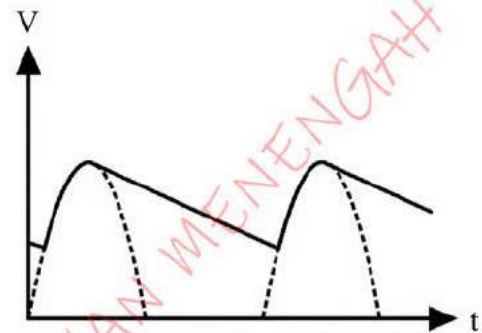
What happen to the output power if the number of turns of secondary coil is decreased?

- A Berkurang
Decreases
- B Bertambah
Increases
- C Menjadi sifar
Becomes zero
- D Tiada perubahan
No change

- 35 Rajah 29.1 menunjukkan satu litar rektifikasi.
 Rajah 29.2 menunjukkan Osiloskop Sinar Katod O.S.K. memaparkan surihan arus yang melalui perintang, R bagi litar rektifikasi tersebut.
Diagram 29.1 shows a rectification circuit.
Diagram 29.2 shows Cathode Ray Oscilloscope C.R.O. displays the tracing of current flow through resistor, R of the rectification circuit.

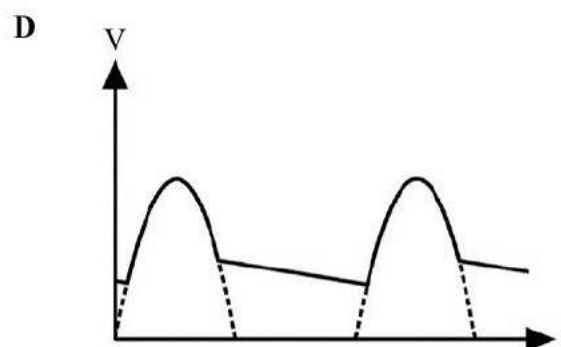
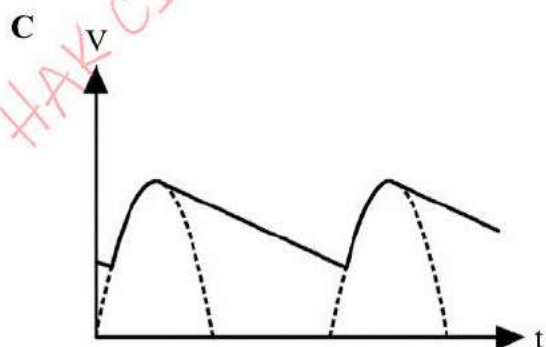
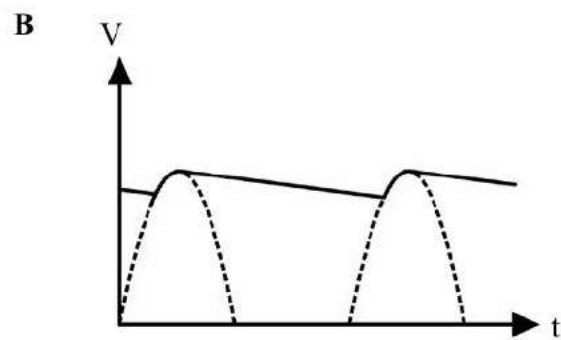
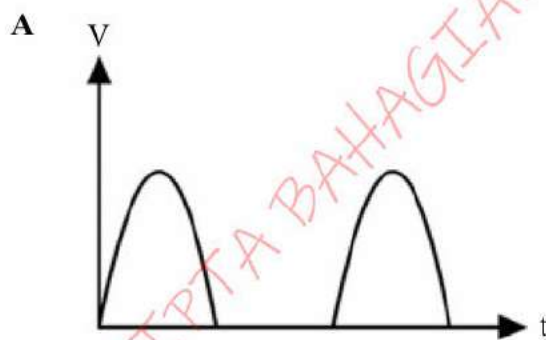


Rajah 29.1
 Diagram 29.1



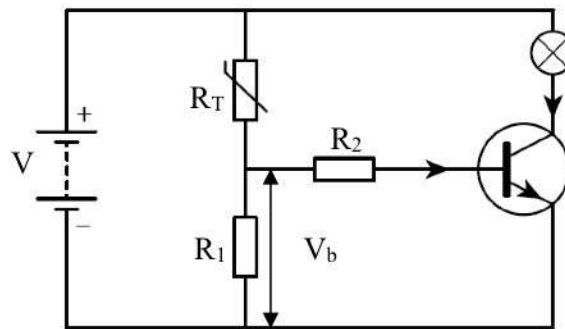
Rajah 29.2
 Diagram 29.2

Apakah perubahan yang akan berlaku pada arus output jika kapasitor tersebut digantikan dengan sebuah kapasitor yang mempunyai nilai kapasitans yang lebih tinggi?
What is the change that will happen to the output current if the capacitor is replaced with a higher value of capacitance capacitor?



[Lihat halaman sebelah
 SULIT

- 36 Rajah 30 menunjukkan sebuah litar suis automatik.
Diagram 30 shows an automatic switch circuit.

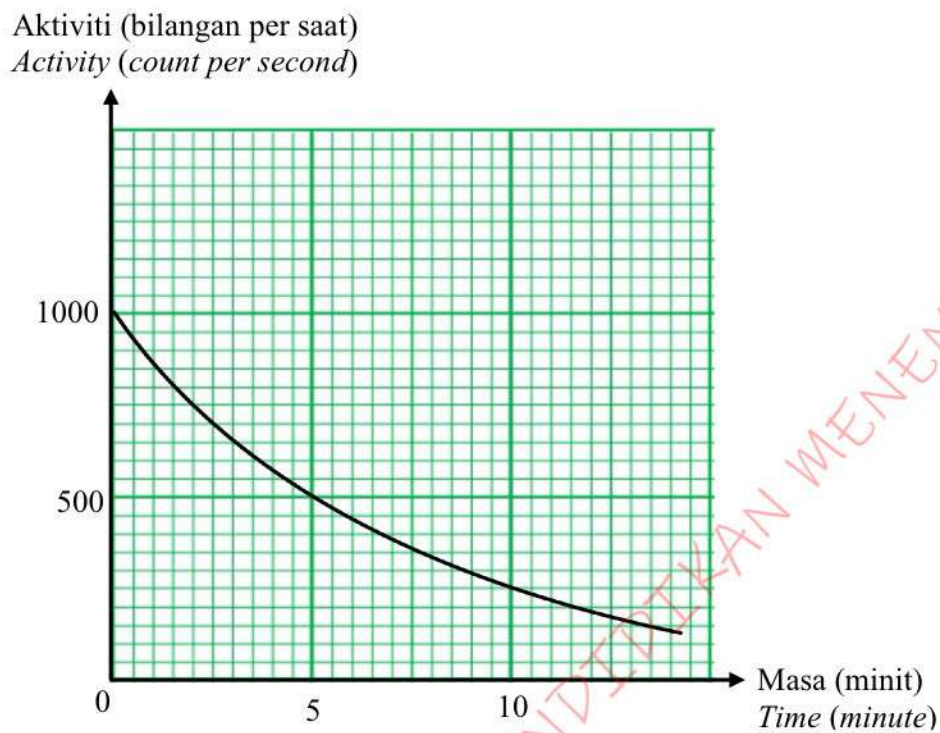


Rajah 30
Diagram 30

Apakah yang berlaku pada voltan tapak, V_b apabila mentol menyala?
What will happen to base voltage, V_b when the bulb is light up?

- A Berkurang
Decreases
- B Bertambah
Increases
- C Tidak berubah
No change

- 37 Rajah 31 menunjukkan graf reputan radioaktif suatu bahan.
Diagram 31 shows a decay graph of a radioactive substance.

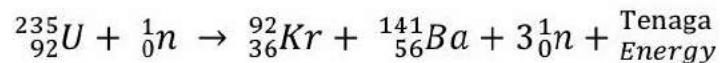


Rajah 31
Diagram 31

Berapakah bilangan separuh hayat yang diperlukan untuk aktiviti menyusut kepada 250 bilangan per saat?
How many half-life are required for the activity to decrease to 250 counts per second?

- A 2
B 3
C 6
D 10

- 38 Persamaan berikut menunjukkan satu tindakbalas nuklear.
The equation shows a nuclear reaction.



Jumlah jisim sebelum tindak balas = 236.052590 u.j.a
Total mass before reaction = 236.052590 a.m.u

Jumlah jisim selepas tindak balas = 235.86653 u.j.a
Total mass after reaction = 235.86653 a.m.u

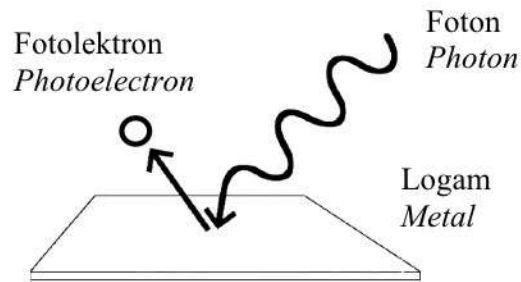
Apakah kuantiti fizik yang ditukarkan menjadi tenaga dalam tindakbalas di atas?
What is the physical quantity that converted into energy in the reaction above?

- A Kehilangan jisim
Loss of mass
- B Jisim uranium
Mass of uranium
- C Jisim neutron
Mass of neutron
- D Jisim genting
Critical mass

- 39 Apakah sifat tenaga kuantum menurut Max Planck?
What is the nature of quantum energy according to Max Planck?

- A Tenaga selanjar
Continuos energy
- B Gelombang
Wave
- C Diskrit
Discrete
- D Zarah
Particle

- 40 Rajah 32 menunjukkan sekeping logam disinari dengan foton.
Diagram 32 shows a metal is illuminated by photon.



Rajah 32
Diagram 32

Antara pernyataan berikut, yang manakah akan meningkatkan tenaga kinetik fotoelektron tersebut ?

Which of the following will increase the kinetic energy of the photoelectron?

- A Meningkatkan frekuensi ambang bagi logam, f_0 .
Increase the threshold frequency of metal, f_0 .
- B Meningkatkan fungsi kerja bagi logam, W_0 .
Increase the work function of metal, W_0 .
- C Meningkatkan keamatan cahaya.
Increase the intensity of light.
- D Meningkatkan frekuensi foton, f .
Increase the frequency of photon, f .

KERTAS PEPERIKSAAN TAMAT
END OF QUESTION PAPER

MAKLUMAT UNTUK CALON
INFORMATION FOR CANDIDATES

1. Kertas soalan ini mengandungi **40** soalan.
*This question paper consists of **40** questions.*
2. Jawab **semua** soalan.
*Answer **all** questions.*
3. Tiap-tiap soalan diikuti oleh **tiga** atau **empat** pilihan jawapan. Pilih satu jawapan yang terbaik bagi setiap soalan dan hitamkan ruangan yang betul pada kertas jawapan anda.
*Each question is followed by **three** or **four** options. Choose the best option for each question and blacken the correct space on the answer sheet.*
4. Hitamkan **satu** ruangan sahaja bagi setiap soalan.
*Blacken only **one** space for each question.*
5. Sekiranya anda hendak menukarkan jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.
If you wish to change your answer, erase the blackened mark that you have made. Then blacken the space for the new answer.
6. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
The diagrams in the questions provided are not drawn to scale unless stated.
7. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.
You may use a non-programmable scientific calculator.
8. Satu senarai formula disediakan di halaman 2 dan 3.
A list of formulae is provided on page 2 and 3.