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4531/1
Fizik
Kertas 1
Julai 2026
1 jam 15 minit

**PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA
TAHUN 2026 M / 1447 H**

**FIZIK
KERTAS 1**

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

1. Kertas soalan ini mengandungi 40 soalan objektif.
2. Jawab semua soalan.
3. Pilih satu jawapan terbaik dan hitamkan ruangan yang betul pada kertas jawapan objektif.
4. Hitamkan satu ruangan sahaja bagi setiap soalan.
5. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
6. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.



Kertas soalan ini mengandungi 30 halaman bercetak dan 2 halaman tidak 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. $F = ma$

KEGRAVITIAN GRAVITATION

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

HABA HEAT

1. $Q = mc\theta$
2. $Q = ml$
3. $Q = Pt$
4. $P_1V_1 = P_2V_2$
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. Pembesaran linear, $m = \frac{v}{u}$

DAYA DAN GERAKAN II FORCE AND MOTION II

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

TEKANAN PRESSURE

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

ELEKTRIK ELECTRICITY

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

KEELEKTROMAGNETAN ELECTROMAGNETISM

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

ELEKTRONIK ELECTRONIC

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

FIZIK NUKLEAR NUCLEAR PHYSICS

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

FIZIK KUANTUM QUANTUM PHYSICS

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



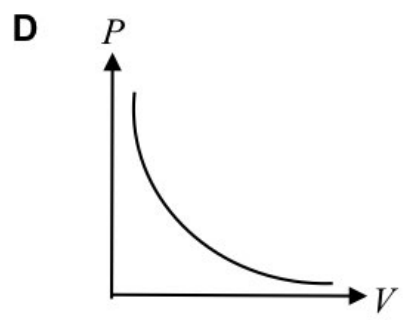
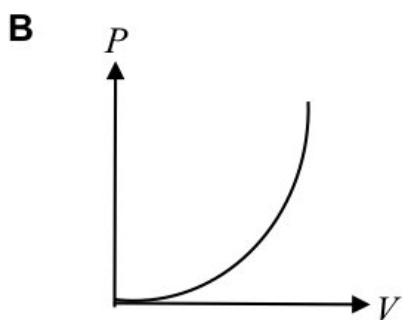
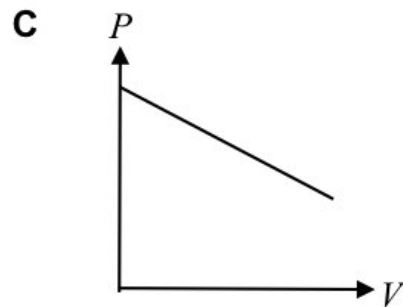
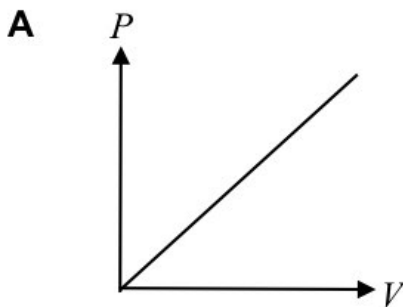
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Jawab **semua** soalan

1. Antara kuantiti berikut, yang manakah ialah kuantiti asas?
Which quantity is a based quantity?

- A** Jisim, masa, laju, suhu
Mass, time, speed, temperature
- B** Panjang, jisim, masa, arus
Length, mass, time, current
- C** Halaju, masa, kuantiti bahan, beza keupayaan
Velocity, time, quantity of material, potential difference
- D** Momentum, halaju, jisim, panjang
Momentum, velocity, mass, length

2. Antara graf berikut, yang manakah menunjukkan kuantiti fizik P bertambah secara tidak linear dengan V?
Which of the following graphs shows that the physical quantity P increasing non-linearly with V?



3. Sebuah kereta yang bergerak dengan halaju seragam mempunyai pecutan
A car moving at a uniform velocity has an acceleration

A bertambah
increase

C sifar
zero

B seragam
uniform

D berkurang
decrease

4. Rajah 1 menunjukkan seorang penunggang motosikal yang terpelanting ke hadapan apabila beliau membrek secara mengejut.

Diagram 1 shows a motorcyclist who was thrown forward when he braked suddenly.



Rajah 1 / Diagram 1

Hukum fizik manakah yang terlibat?

Which laws of physics are involved?

A Hukum Kegravitian Semesta Newton
Newton's Universal Law of Gravitation

B Hukum Gerakan Newton Pertama
Newton's First Law of Motion

C Hukum Gerakan Newton Kedua
Newton's Second Law of Motion

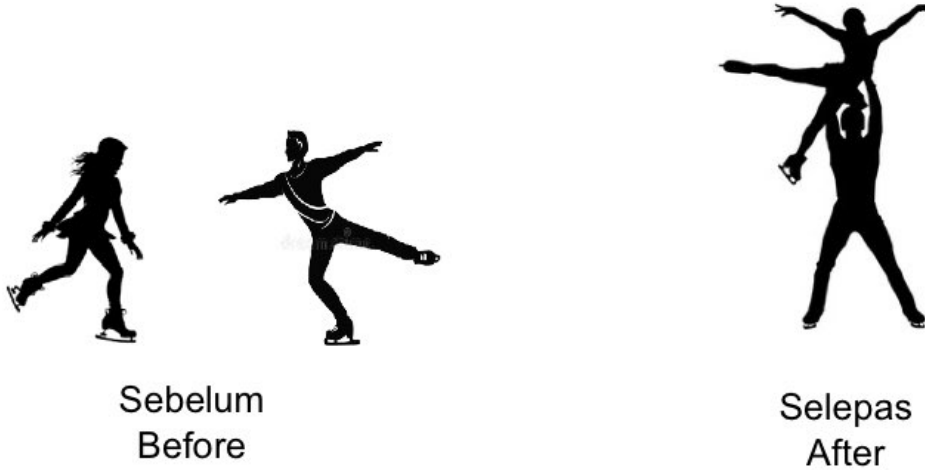
D Hukum Gerakan Newton Ketiga
Newton's Third Law of Motion



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5. Rajah 2 menunjukkan dua orang penari ais sedang menari. Pada awalnya kedua-dua penari menari berasingan dan selepas itu mereka bergerak bersama-sama.

Diagram 2 shows two ice dancers dancing. At first, both dancers dance separately and then they move together.



Rajah 2 / Diagram 2

Pernyataan manakah benar?

Which statements are correct?

- I Jumlah momentum diabadikan
Total of momentum conserved
- II Jumlah tenaga kinetik diabadikan
Total of kinetic energy conserved
- III Kedua-dua penari mengalami pelanggaran kenyal
Both dancers experience elastic collision
- IV Kedua-dua penari mengalami pelanggaran tak kenyal
Both dancers experience inelastic collision

A I dan II
I and II

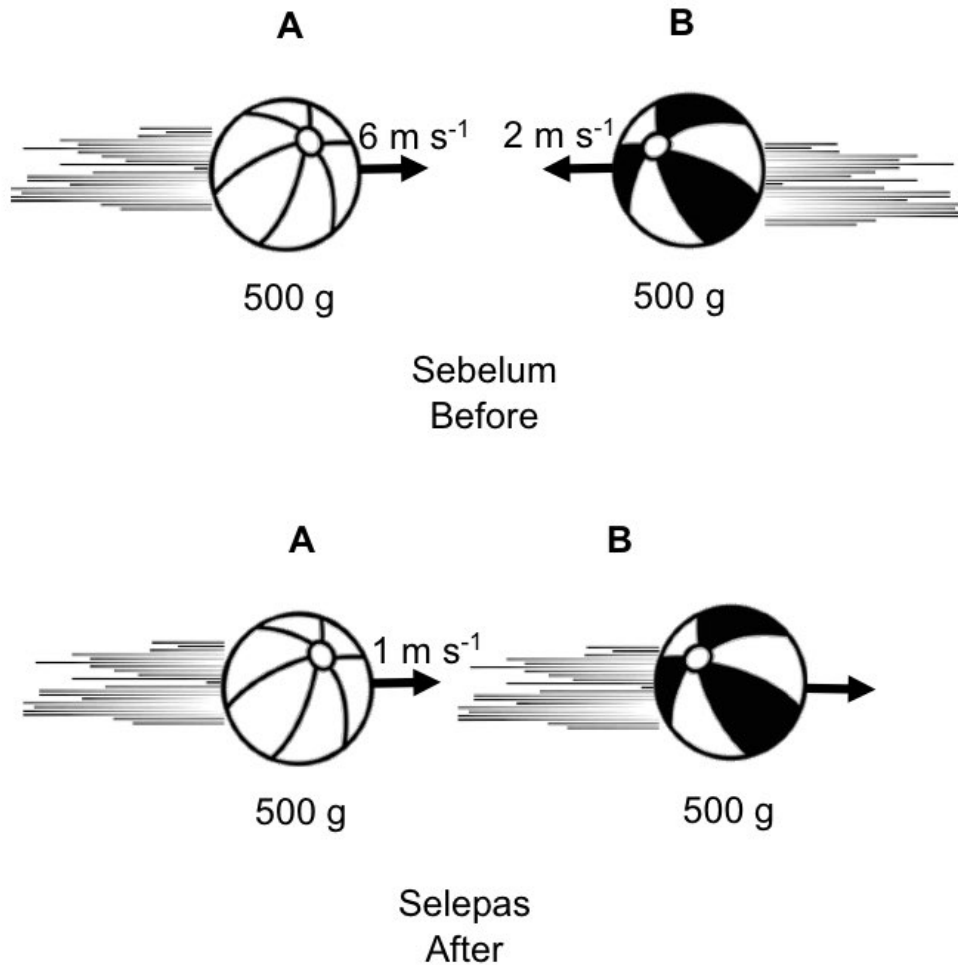
B I dan IV
I and IV

C II dan III
II and III

D III dan IV
III and IV

6. Rajah 3 menunjukkan dua biji bola A dan B mula bergerak ke arah satu sama lain dengan halaju 6 m s^{-1} dan 2 m s^{-1} masing-masing. Selepas pelanggaran berlaku bola A bergerak dengan halaju 1 m s^{-1} .

Diagram 3 shows two balls A and B starting to move towards each other with velocities of 6 m s^{-1} and 2 m s^{-1} respectively. After the collision, ball A moves with a velocity of 1 m s^{-1} .



Rajah 3 / Diagram 3

Berapakah halaju bola B selepas pelanggaran?
What is the velocity of ball B after the collision?

A 2 m s^{-1}

C 4 m s^{-1}

B 3 m s^{-1}

D 5 m s^{-1}

7.

“Daya graviti antara dua jasad adalah berkadar terus dengan hasil darab jisim kedua-dua jasad dan berkadar songsang dengan kuasa dua jarak di antara pusat dua jasad tersebut”

"The gravitational force between two bodies is directly proportional to the product of the masses of the two bodies and inversely proportional to the square of the distance between the centers of the two bodies"

Pernyataan di atas adalah berkaitan dengan

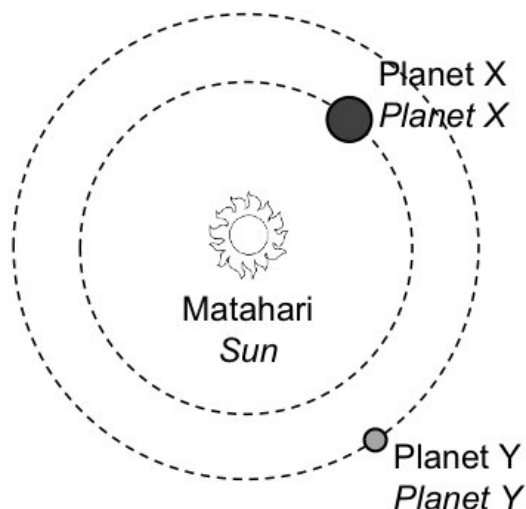
The above statement is related to

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



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8. Rajah 4 menunjukkan planet X dan planet Y yang mengorbit Matahari.
Diagram 4 shows planet X and planet Y orbiting the Sun.



Rajah 4 / Diagram 4

Diberi jejari orbit planet X dan Y masing-masing ialah 1.08×10^{11} m dan 1.50×10^{11} m. Tempoh mengorbit planet X ialah 687 hari.

Given that the orbital radius of planets X and Y are 1.08×10^{11} m and 1.50×10^{11} m respectively. The orbital period of planet X is 687 days.

Hitung tempoh orbit bagi planet Y.

Calculate the orbital period of planet Y.

A 954 hari
954 days

B 1124 hari
1124 days

C 1264 hari
1264 days

D 1375 hari
1375 days

9. Antara berikut, yang manakah benar tentang satelit bukan geopegun?

Which of the following is true about non-geostationary satellites?

- I Bergerak dalam arah yang sama dengan putaran bumi
Move in the same direction as the Earth's rotation
- II Tempoh putarannya adalah 24 jam
Its rotation period is 24 hours
- III Orbitnya sentiasa berada di atas kedudukan geografi yang sama di permukaan Bumi
Its orbit is always over the same geographical position on the Earth's surface
- IV Arah gerakan tidak perlu sama dengan arah putaran Bumi
The direction of motion does not have to be the same as the direction of Earth's rotation

A I dan II
I and II

C II sahaja
II only

B III dan IV
III and IV

D IV sahaja
IV only

10. Apakah yang dimaksudkan dengan keseimbangan terma?

What is meant by thermal equilibrium?

- A** Kadar pengaliran haba bersih antara dua objek menjadi sifar
The rate of net heat transfer between two objects becomes zero
- B** Proses penentukuran menggunakan sifat termometri cecair
The calibration process using the thermometric properties of liquids
- C** Kuantiti haba yang diperlukan untuk menaikkan suhu objek sebanyak 1°C
The quantity of heat required to raise the temperature of an object by 1°C
- D** Kuantiti haba yang diperlukan untuk menaikkan suhu 1 kg objek sebanyak 1°C
The quantity of heat required to raise the temperature of 1 kg of an object by 1°C



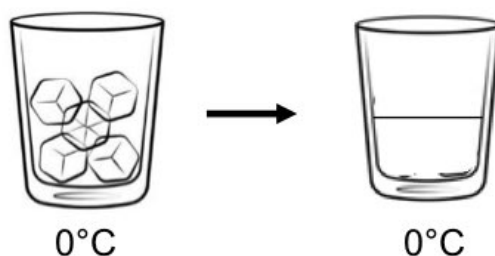
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11. Tenaga haba sebanyak 21 600 J digunakan untuk meningkatkan suhu sebuah blok logam 0.8 kg daripada 30°C kepada 60°C.
 21 600 J of heat energy is used to increase the temperature of a 0.8 kg metal block from 30°C to 60°C.

Berapakah muatan haba tentu blok logam itu?
 What is the specific heat capacity of the metal block?

- | | | | |
|----------|---|----------|---|
| A | 450 J kg ⁻¹ °C ⁻¹ | C | 900 J kg ⁻¹ °C ⁻¹ |
| B | 576 J kg ⁻¹ °C ⁻¹ | D | 1 200 J kg ⁻¹ °C ⁻¹ |

12. Rajah 5 menunjukkan suatu proses perubahan fasa jirim.
 Diagram 5 shows a process of phase change of matter.



Rajah 5 / Diagram 5

Apakah haba yang diserap semasa proses ini?
 What is the heat absorbed during this process?

- A** Muatan haba tentu air
Specific heat capacity of water
- B** Muatan haba tentu ais
Specific heat capacity of ice
- C** Haba pendam tentu pelakuran
Specific latent heat of fusion
- D** Haba pendam tentu pengewapan
Specific latent heat of vaporization

13. Tekanan udara dalam tayar kereta ialah 210 kPa pada suhu 25°C. Berapakah tekanan dalam tayar tersebut pada suhu 38°C?

The air pressure in a car tire is 210 kPa at a temperature of 25°C. What is the pressure in the tire at a temperature of 38°C?

- A 138.16 kPa
- B 158.16 kPa
- C 209.15 kPa
- D 219.16 kPa

14. Antara pernyataan berikut, yang manakah benar?

Which of the following statements is true?

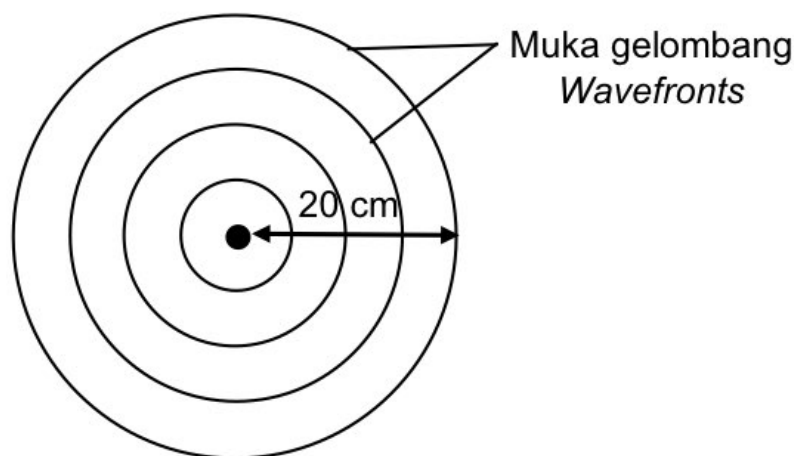
- A Fekkuensi ialah bilangan ayunan lengkap
Frequency is the number of complete oscillations
- B Frekuensi berkadar terus dengan tempoh ayunan
Frequency is directly proportional to the period of oscillation
- C Tempoh ialah masa yang diambil bagi satu ayunan lengkap
Period is the time taken for one complete oscillation
- D Amplitud ialah sesaran minimum suatu zarah dari kedudukan asalnya
Amplitude is the minimum displacement of a particle from its original position



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15. Rajah 6 menunjukkan corak muka gelombang yang terhasil daripada satu penggetar sfera yang bergetar dengan frekuensi 20 Hz di dalam sebuah tangka riak.

Diagram 6 shows the wavefront pattern produced by a spherical vibrator vibrating at a frequency of 20 Hz in a ripple tank.



Rajah 6 / Diagram 6

Hitung halaju gelombang.

Calculate the velocity of waves.

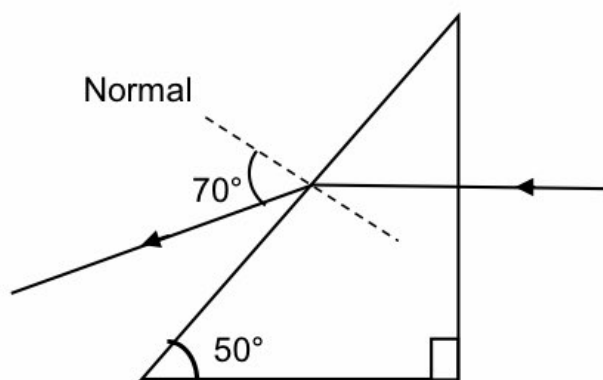
- | | |
|--|---|
| <p>A 40 cm s⁻¹</p> <p>B 100 cm s⁻¹</p> | <p>C 120 cm s⁻¹</p> <p>D 150 cm s⁻¹</p> |
|--|---|
16. Antara ciri gelombang berikut, yang manakah berubah apabila gelombang dipantulkan?
- Which of the following wave characteristics changes when the wave is reflected?*
- | | |
|----------|--|
| A | Arah perambatan
<i>Direction of propagation</i> |
| B | Panjang gelombang
<i>Wavelength</i> |
| C | Frekuensi
<i>Frequency</i> |
| D | Laju
<i>Speed</i> |

17. Berikut ialah pernyataan berkaitan kegunaan suatu sinaran elektromagnet.
The following is a statement regarding the uses of electromagnetic radiation.

- Digunakan untuk membunuh sel kanser di hospital
Used to kill cancer cells in hospitals
- Digunakan untuk pensterilan peralatan pembedahan
Used to sterilize surgical equipment

Apakah jenis gelombang yang digunakan?
What type of wave is used?

- A** Sinar-X
X-ray
- B** Sinar gama
Gamma ray
- C** Sinar ultraungu
Ultraviolet ray
- D** Sinar inframerah
Infrared ray
18. Berapakah indeks biasan bahan prisma yang ditunjukkan dalam Rajah 7?
What is the refractive index of the prism material shown in Diagram 7?

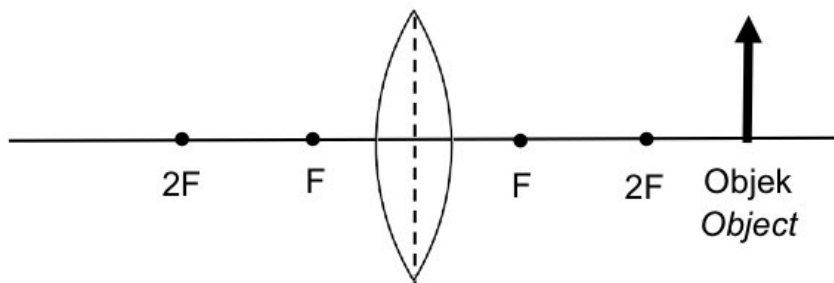


Rajah 7 / Diagram 7

- | | | | |
|----------|------|----------|------|
| A | 0.68 | C | 1.23 |
| B | 0.82 | D | 1.46 |

19. Rajah 8 menunjukkan suatu objek diletakkan di hadapan sebuah kanta cembung.

Diagram 8 shows an object placed in front of a convex lens.



Rajah 8 / Diagram 8

Apakah ciri-ciri imej yang terbentuk?

What are the characteristics of the image formed?

- A** Nyata, songsang, sama saiz
Real, inverted, same size
 - B** Nyata, songsang, diperbesar
Real, inverted, magnified
 - C** Maya, tegak, diperbesar
Virtual, upright, magnified
 - D** Nyata, songsang, diperkecil
Real, inverted, reduced
20. Suatu objek dengan ketinggian 5.0 cm diletakkan 12.0 cm dari sebuah cermin cekung. Satu imej terbentuk pada jarak 48.0 cm dari cermin. Berapakah ketinggian imej?
- An object with a height of 5.0 cm is placed 12.0 cm from a concave mirror. One image is formed at a distance of 48.0 cm from the mirror. What is the height of the image?*

- | | |
|-----------------|------------------|
| A 2.5 cm | C 15.0 cm |
| B 3.0 cm | D 20.0 cm |

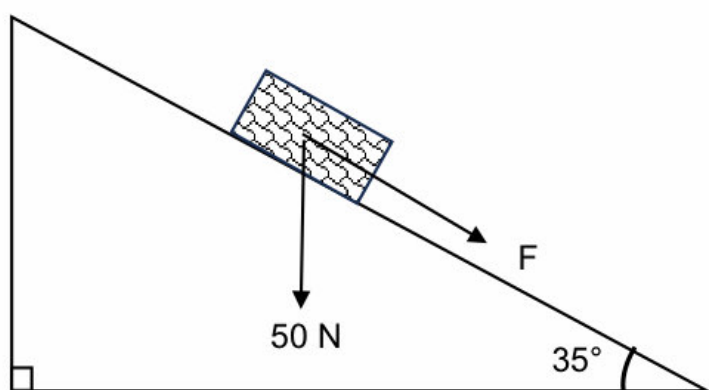
21. Fenomena manakah menunjukkan keseimbangan daya?

Which phenomenon shows the balance of forces?

- A** Kereta sedang bergerak dengan halaju seragam
A car is moving at uniform velocity
- B** Pelari menghampiri garis penamat
A runner is approaching the finishing line
- C** Objek sedang menuruni landasan condong
The object is going down an inclined plane.
- D** Sebuah kapal terbang sedang mendarat
An airplane is landing

22. Rajah 9 menunjukkan sebuah bongkah kayu menggelongsor menuruni satah condong.

Diagram 9 shows a block of wood sliding down an inclined plane.



Rajah 9 / Diagram 9

Hitung nilai F .

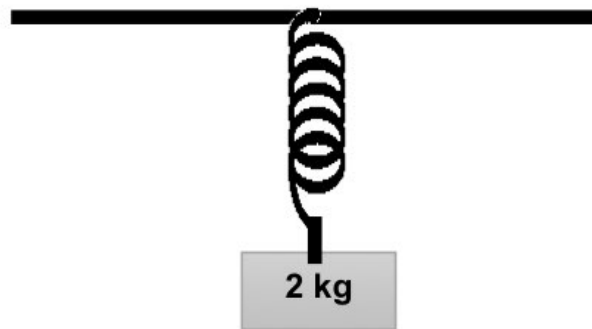
Calculate the value of F .

- | | | | |
|----------|--------|----------|--------|
| A | 24.4 N | C | 31.5 N |
| B | 28.7 N | D | 41.0 N |



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23. Rajah 10 menunjukkan satu beban berjisim 2 kg digantung pada satu spring.
Diagram 10 shows a load of mass 2 kg is hang on a spring.

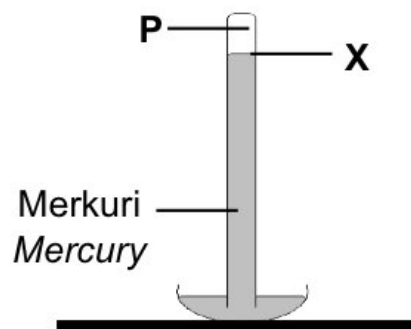


Rajah 10 / Diagram 10

Apakah pengubahsuaian yang boleh dibuat untuk menggantung beban yang lebih berat?

What modifications can be made to hang heavier loads?

- A** Meningkatkan diameter spring
Increase the diameter of the spring
 - B** Mengurangkan pemalar spring
Decrease the spring constant
 - C** Menambahkan panjang spring
Increase the length of the spring
 - D** Meningkatkan ketebalan dawai spring
Increase the thickness of the spring wire
24. Rajah 11 menunjukkan sebuah barometer merkuri ringkas digunakan untuk mengukur tekanan atmosfera.
Diagram 11 shows a simple mercury barometer used to measure atmospheric pressure.



Rajah 11 / Diagram 11

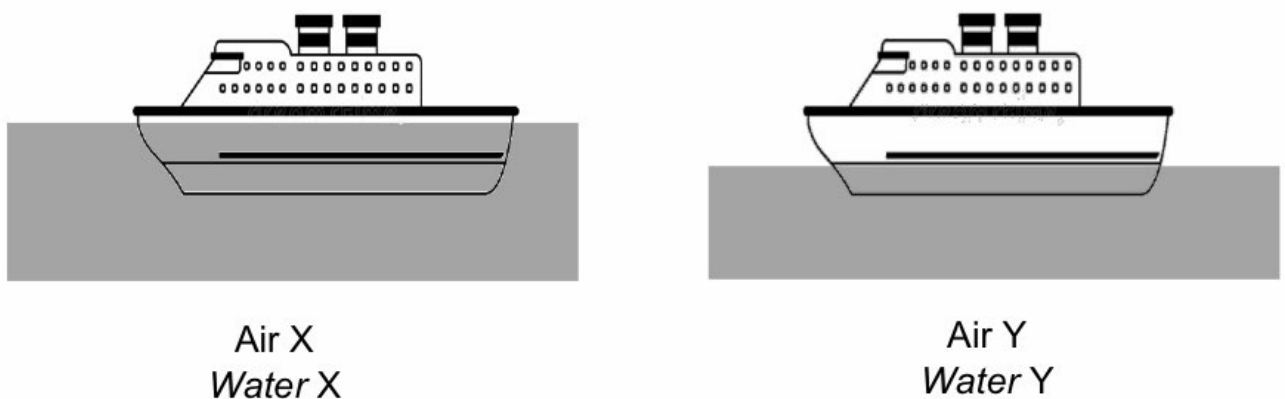
Apabila tekanan atmosfera berkurang, apakah yang berlaku kepada aras X dan tekanan dalam P?

When atmospheric pressure decreases, what happens to the level X and the pressure in P?

	Aras X Level X	Tekanan di P Pressure at P
A	Bertambah <i>Increase</i>	Bertambah <i>Increase</i>
B	Bertambah <i>Increase</i>	Tidak berubah <i>Remain unchanged</i>
C	Berkurang <i>Decrease</i>	Bertambah <i>Increase</i>
D	Berkurang <i>Decrease</i>	Tidak berubah <i>Remain unchanged</i>

25. Rajah 12 menunjukkan sebuah kapal terapung di atas permukaan air X dan Y yang berbeza.

Diagram 12 shows a ship floating on different water surfaces X and Y.



Rajah 12 / Diagram 12



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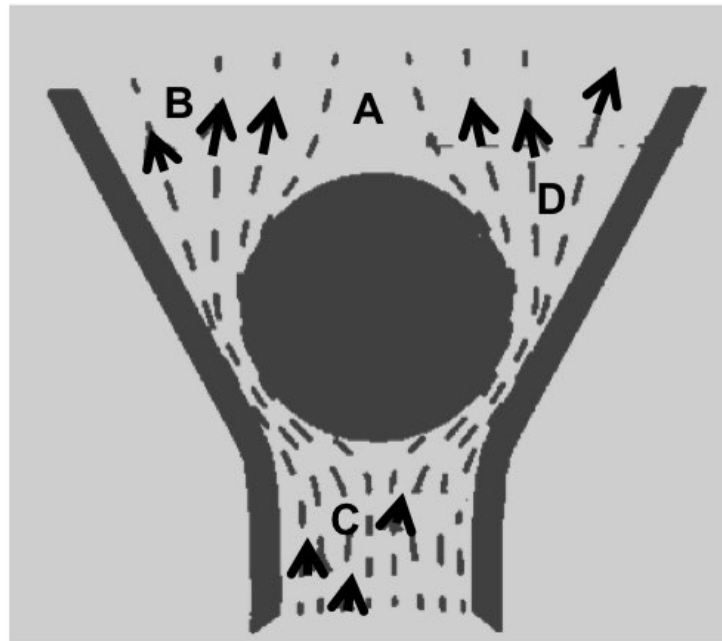
Pernyataan manakah adalah benar?

Which statement is correct?

- A** Ketumpatan air X = Ketumpatan air Y
Density of water X = Density of water Y
- B** Daya apungan yang bertindak dalam air X
= Daya apungan yang bertindak dalam air Y
Buoyant force acting in water X = Buoyant force acting in water Y
- C** Ketumpatan air X > Ketumpatan air Y
Density of water X > Density of water Y
- D** Daya apungan yang bertindak dalam air X
> Daya apungan yang bertindak dalam air Y
Buoyant force acting in water X > Buoyant force acting in water Y

26. Rajah 13 menunjukkan sebiji bola ping pong ditiup dengan menggunakan satu muncung.

Diagram 13 shows a ping pong ball being blown using a nozzle.



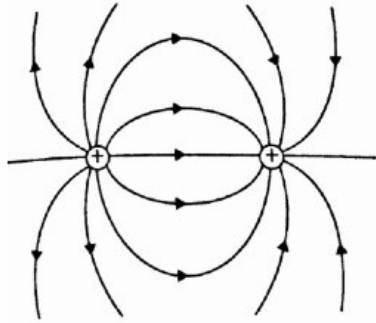
Rajah 13 / Diagram 13

Di antara kawasan **A**, **B**, **C** dan **D**, kawasan manakah yang mengalami tekanan paling rendah?

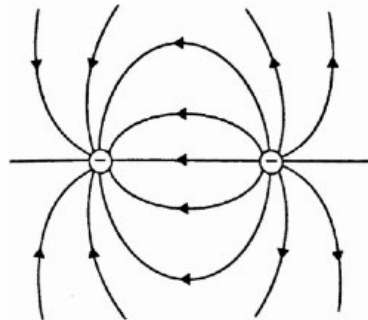
*Among areas **A**, **B**, **C** and **D**, which area experiences the lowest pressure?*

27. Corak medan elektrik manakah yang betul?
Which electric field pattern is correct?

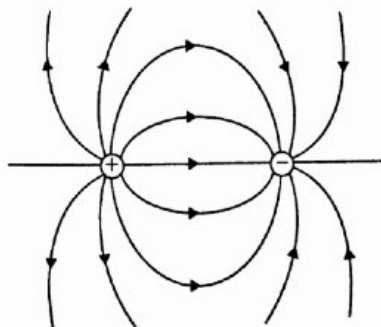
A



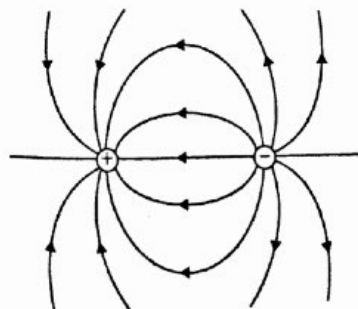
B



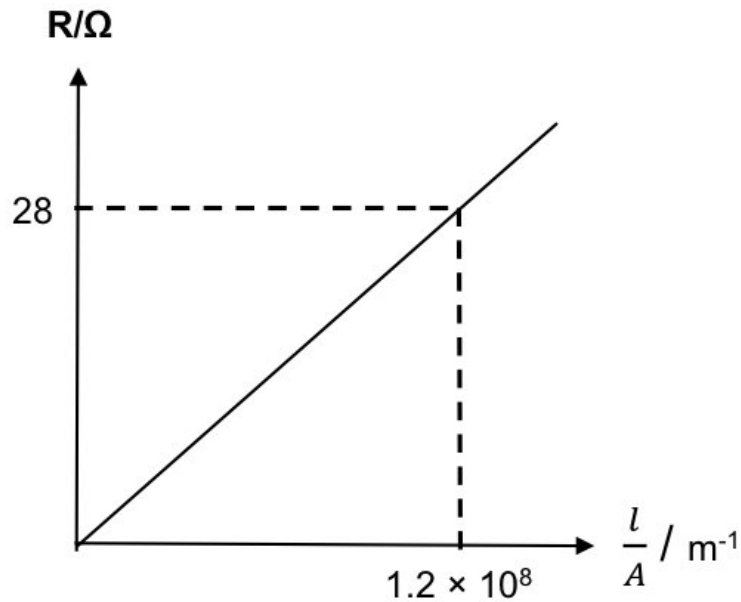
C



D



28. Rajah 14 menunjukkan graf rintangan, R melawan $\frac{l}{A}$.
 Diagram 14 shows a graph of resistance, R against $\frac{l}{A}$



Rajah 14 / Diagram 14

Hitung kerintangan, ρ konduktor tersebut?
 Calculate the resistance, ρ of the conductor?

- A** $2.3 \times 10^{-7} \Omega \text{ m}$
- B** $4.3 \times 10^6 \Omega \text{ m}$
- C** $2.3 \times 10^9 \Omega \text{ m}$
- D** $2.3 \times 10^{-6} \Omega \text{ m}$

29. Sebuah sel kering menghasilkan arus 0.45 A apabila disambungkan kepada perintang $4\ \Omega$. Apabila sel kering yang sama disambungkan kepada perintang $8\ \Omega$, arus 0.25 A terhasil.

Hitung daya gerak elektrik, $\mathcal{E}$ dan hitungkan nilai rintangan dalam sel kering, r .

A dry cell produces a current of 0.45 A when connected to a $4\ \Omega$ resistor. When the same dry cell is connected to an $8\ \Omega$ resistor, a current of 0.25 A is produced.

Calculate the electromotive force, $\mathcal{E}$ and calculate the value of the resistance in the dry cell, r .

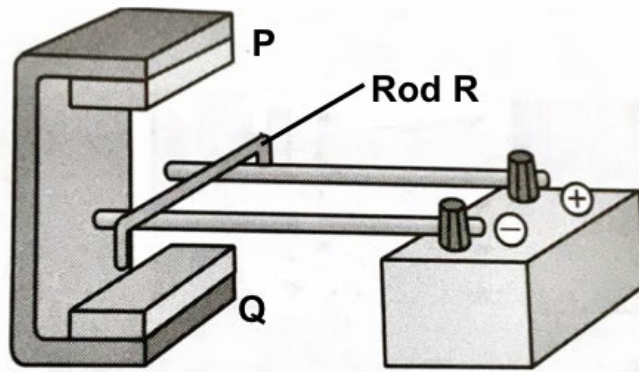
- A** $\mathcal{E} = 2.2\ \text{V}, r = 0.8\ \Omega$
- B** $\mathcal{E} = 2.2\ \text{V}, r = 1.8\ \Omega$
- C** $\mathcal{E} = 2.25\ \text{V}, r = 1.0\ \Omega$
- D** $\mathcal{E} = 2.25\ \text{V}, r = 0.6\ \Omega$



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30. Rajah 15 menunjukkan rod pembawa arus, R yang diletakkan dalam medan magnet.

Diagram 15 shows a current-carrying rod, R, placed in a magnetic field.



Rajah 15 / Diagram 15

Antara berikut, kombinasi yang manakah betul?

Which of the following combinations is correct?

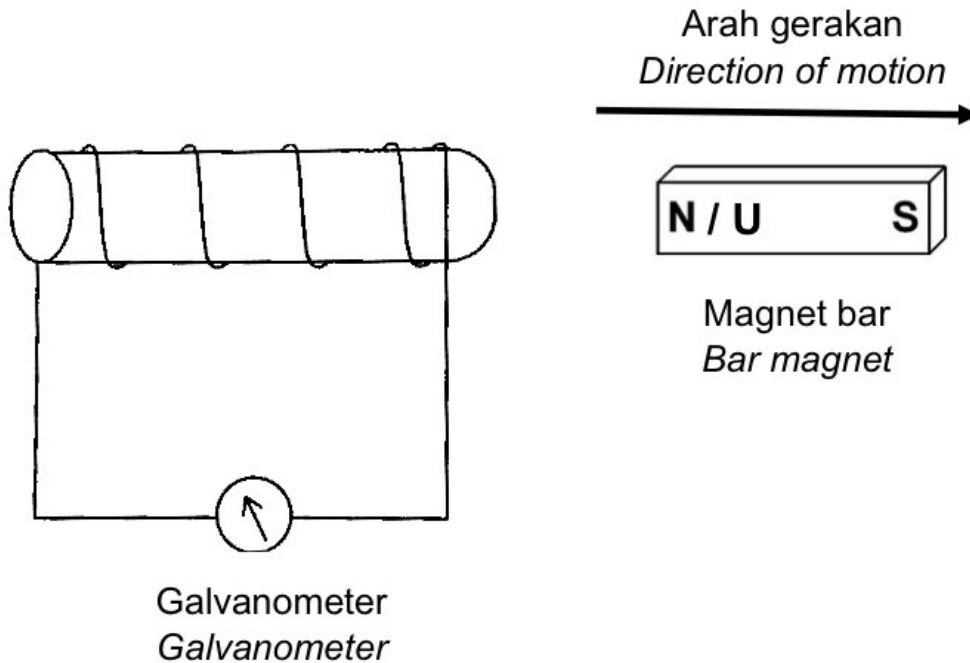
	Kutub P Pole P	Kutub Q Pole Q	Arah daya ke atas rod R Force direction of R rod
A	Utara North	Selatan South	Timur East
B	Selatan South	Utara North	Timur East
C	Selatan South	Utara North	Selatan South
D	Utara North	Selatan South	Utara North



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31. Rajah 16 menunjukkan pesongan jarum galvanometer apabila magnet bar digerakkan menjauhi solenoid.

Diagram 16 shows the deflection of the galvanometer needle when the bar magnet is moved away from the solenoid.



Rajah 16 / Diagram 16

Arah pesongan jarum galvanometer dapat ditentukan oleh

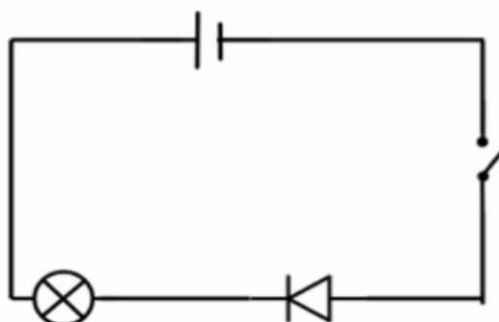
The direction of deflection of the galvanometer needle can be determined by

- 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

32. Apakah fungsi utama teras besi lembut dalam transformer unggul?
What is the main function of the soft iron core in a ideal transformer?
- A** Mengelakkan kebocoran fluks magnet
Prevents leakage of magnetic flux
 - B** Mengurangkan arus pusar
Reduces eddy currents
 - C** Membebaskan haba yang dihasilkan oleh gegelung primer dan gegelung sekunder
Dissipates heat generated by the primary and secondary coils
 - D** Meningkatkan fluks magnet di antara gegelung primer dan gegelung sekunder
Increases magnetic flux between the primary and secondary coils
33. Rajah 17 menunjukkan satu litar yang terdiri daripada mentol dan diod yang disambungkan kepada sel kering.
 Apabila suis ditutup, mentol tidak menyala.

Diagram 17 shows a circuit consisting of a bulb and a diode connected to a dry cell.

When the switch is closed, the bulb does not light up.



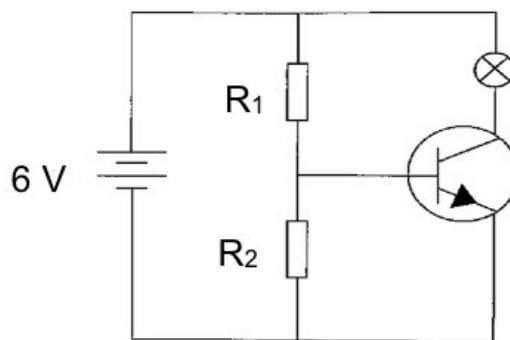
Rajah 17 / Diagram 17

Tindakan manakah yang dapat menyalakan mentol itu?
Which action will light up the bulb?

- | | | | |
|----------|---|----------|---|
| I | Diod digantikan dengan kapasitor
<i>Diode replaced with capacitor</i> | | |
| II | Menyongsangkan sambungan diod
<i>Inverting diode connection</i> | | |
| III | Menyongsangkan terminal sel kering
<i>Inverting dry cell terminals</i> | | |
| IV | Sel kering digantikan dengan bekalan kuasa arus ulang-alik
<i>Dry cell replaced with AC power supply</i> | | |
| A | I dan II sahaja
<i>I and II only</i> | C | I dan IV sahaja
<i>I and IV only</i> |
| B | II dan III Sahaja
<i>II and III only</i> | D | II, III dan IV sahaja
<i>II, III and IV only</i> |

34. Rajah 18 menunjukkan satu litar bertransistor. Beza keupayaan yang merentasi R_2 ialah 4 V, Diberi nilai R_1 ialah 10 k Ω .

Diagram 18 shows a transistor circuit. The potential difference across R_2 is 4 V, Given the value of R_1 is 10 k Ω .



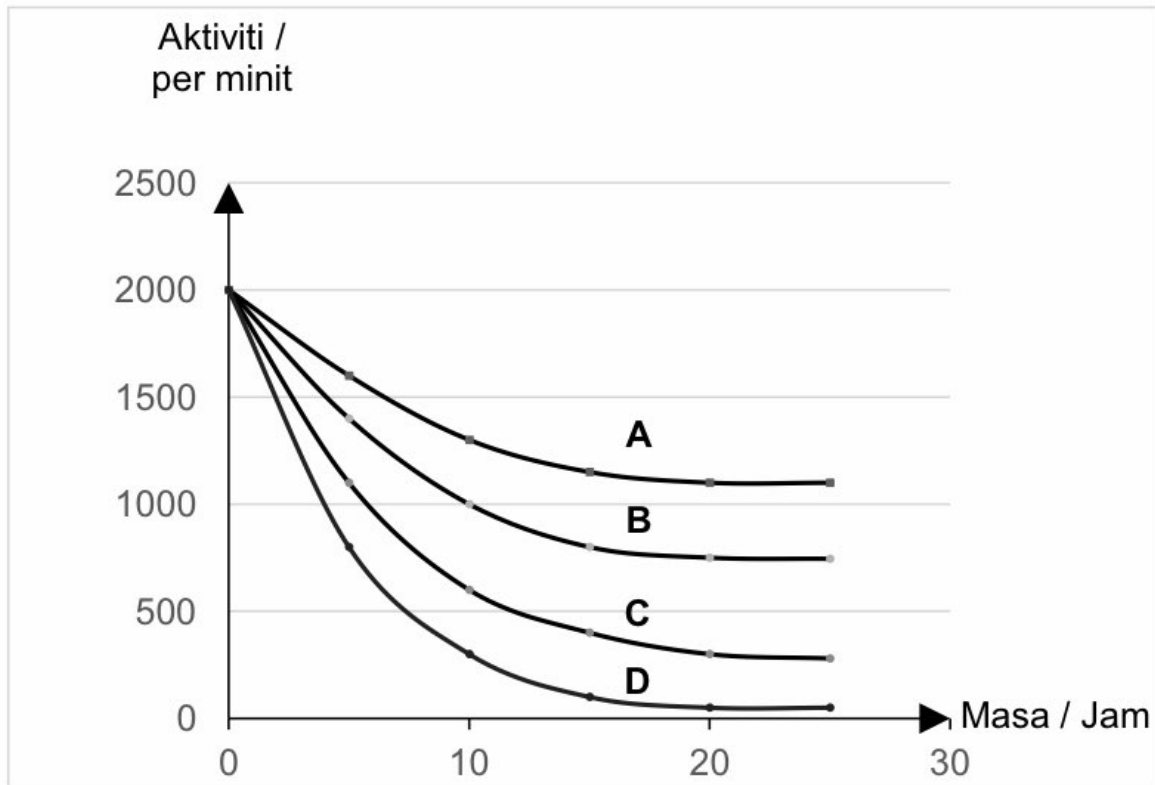
Rajah 18 / Diagram 18

Berapakah nilai R_2 ?
What is the value of R_2 ?

- | | | | |
|----------|---------------|----------|---------------|
| A | 10 k Ω | C | 30 k Ω |
| B | 20 k Ω | D | 40 k Ω |

35. Rajah 19 menunjukkan lengkung reputan bagi empat radioisotop yang berbeza.

Diagram 19 shows the decay curves of four different radioisotopes.



Rajah 19 / Diagram 19

Di antara radioisotop **A**, **B**, **C** dan **D**, radioisotop manakah yang mempunyai separuh hayat yang paling lama?

*Among the radioisotopes **A**, **B**, **C** and **D**, which radioisotope has the longest half-life?*



36. Semasa pembelahan nukleus, jumlah tenaga yang dibebaskan ialah 1.650×10^{-3} J. Berapakah cacat jisim dalam tindak balas nuklear itu?

During nuclear fission, the total energy released is 1.650×10^{-3} J. What is the mass defect in the nuclear reaction?

- | | | | |
|----------|----------------------------|----------|----------------------------|
| A | 5.500×10^{-12} kg | C | 1.833×10^{-20} kg |
| B | 9.075×10^{-15} kg | D | 3.025×10^{-23} kg |

37. Suatu tindak balas berantai boleh berlaku di dalam reaktor nuklear kerana semasa tindak balas pembelahan nukleus,

A chain reaction can occur in a nuclear reactor because during a nuclear fission reaction,

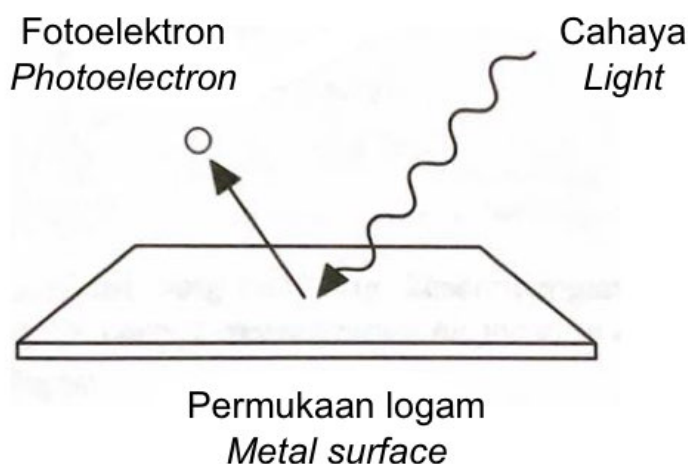
- A** neutron baharu dihasilkan.
new neutrons are produced.
- B** ia mencapai jisim kritikal atom.
it reaches the critical mass of the atom.
- C** dua serpihan belahan dihasilkan.
two fission fragments are produced.
- D** sejumlah tenaga dibebaskan.
a certain amount of energy is released.

38. Tenaga minimum yang diperlukan untuk fotoelektron terlepas dari suatu permukaan logam dikenali sebagai

The minimum energy required for a photoelectron to be released from a metal surface is known as

- A** tenaga kinetik maksimum.
maximum kinetic energy.
- B** frekuensi ambang.
threshold frequency.
- C** frekuensi minimum.
minimum frequency.
- D** fungsi kerja.
work function.

39. Rajah 20 menunjukkan pemancaran fotoelektron dari permukaan logam.
Diagram 20 shows the emission of photoelectrons from a metal surface.



Rajah 20 / Diagram 20

Pemancaran fotoelektron berlaku apabila
Photoelectron emission occurs when

- A** keamatan cahaya bertambah.
the intensity of light increases.
- B** permukaan logam menjadi panas.
the metal surface becomes hot.
- C** tenaga kinetik fotoelektron rendah.
the kinetic energy of the photoelectrons is low.
- D** frekuensi cahaya melebihi frekuensi ambang logam.
the frequency of the light exceeds the threshold frequency of the metal.

40. Apabila sejenis logam yang mempunyai fungsi kerja 4.16×10^{-20} J disinari oleh cahaya merah dengan Panjang gelombang, $\lambda = 7.1 \times 10^{-7}$ m, berapakah tenaga kinetik maksimum fotoelektron yang terpancar?

When a metal with a work function of 4.16×10^{-20} J is irradiated by red light with a wavelength of $\lambda = 7.1 \times 10^{-7}$ m, what is the maximum kinetic energy of the emitted photoelectrons?

[Laju Cahaya dalam vakum, $c = 3.00 \times 10^8$ m s⁻¹]

[Speed of light in vacuum, $c = 3.00 \times 10^8$ m s⁻¹]

- A 1.12×10^{-19} J
- B 1.76×10^{-19} J
- C 2.39×10^{-19} J
- D 4.88×10^{-19} J

KERTAS PEPERIKSAAN TAMAT



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