KEMENTERIAN PENDIDIKAN

PENTAKSIRAN DIAGNOSTIK AKADEMIK SEKOLAH BERASRAMA PENUH 2025

PEPERIKSAAN PERCUBAAN SIJIL PELAJARAN MALAYSIA

FIZIK **4531/1**

Kertas 1

Ogos 2025

1 ¼ jam **Satu jam lima belas minit**

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

Arahan:

1. Kertas peperiksaan 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 objektif.
   Each question is followed by ***three*** *or* ***four*** *options. Choose the best option for each question and blacken the correct space on the objective answer sheet.*

4. Hitamkan **satu** ruangan sahaja bagi setiap soalan.
   Blacken only ***one*** *space for each question.*

5. Sekiranya anda hendak menukar jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baharu.
   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.
   You may use a scientific calculator.

8. Satu senarai formula disediakan di halaman 2 dan 3.
   A list of formulae is provided on page 2 *and* 3.

Kertas peperiksaan ini mengandungi **31** halaman bercetak.

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 $p = mv$

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 $\frac{T_1^2}{r_1^3} = \frac{T_2^2}{r_2^3}$

7 $v = \sqrt{\frac{GM}{r}}$

8 $U = -\frac{GMm}{r}$

9 $v = \sqrt{\frac{2GM}{r}}$

10 $g = 9.81 \text{ m s}^{-2}$

11 $G = 6.67 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$

HABA
HEAT

1 $Q = mc\Delta\theta$

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 $m = \frac{h_i}{h_o} = \frac{v}{u}$

DAYA DAN GERAKAN II

FORCE AND MOTION II

1 $F = kx$

2 $E_P = \frac{1}{2}Fx = \frac{1}{2}kx^2$

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 $\eta = \frac{P_O}{P_I} \times 100\ \%$

ELEKTRONIK

ELECTRONIC

1 $E = eV$

2 $E_K = \frac{1}{2}mv^2$

3 $\beta = \frac{I_C}{I_B}$

FIZIK NUKLEAR

NUCLEAR PHYSICS

1 $n = \left(\frac{1}{2}\right)^n N_O$

2 $E = mc^2$

3 $c = 3.0 \times 10^8\ ms^{-1}$

4 1 u.j.a. $= 1.66 \times 10^{-27}$ 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 $W = hf_O$

9 $h = 6.63 \times 10^{-34}$ Js

1 Apakah kuantiti vektor?
What is vector quantity?

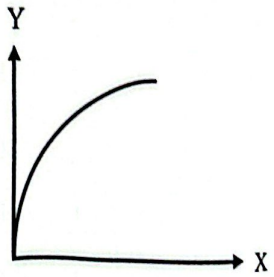
A Kuantiti fizik yang mempunyai magnitud sahaja.
Physical quantity that has magnitude only.

B Kuantiti fizik yang mempunyai magnitud dan arah.
Physical quantity that have both magnitude and direction.

C Kuantiti fizik yang tidak boleh diterbitkan daripada kuantiti fizik yang lain.
Physical quantity which cannot be derived from another physical quantities.

D Kuantiti fizik yang diterbitkan daripada pendaraban atau pembahagian kuantiti asas atau kedua-dua operasi itu.
Physical quantity which is derived from multiplication or division of base quantity or both operations.

2 Rajah 1 menunjukkan graf Y melawan X.
Diagram 1 shows Y against X graph.



Rajah 1
Diagram 1

Pernyataan yang manakah mewakili graf tersebut?
Which of the following statement presents the graph?

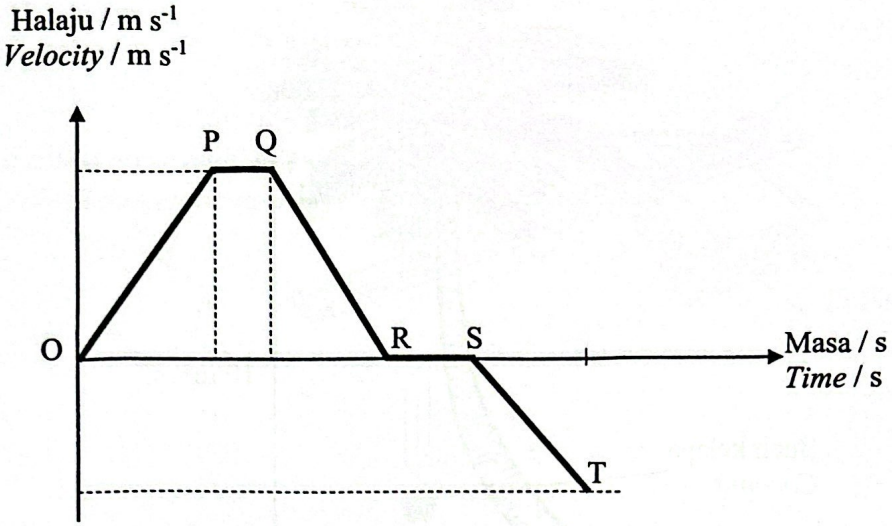
A Y bertambah dengan X
Y *increase with* X

B Y berkadar terus dengan X
Y *is directly proportional to* X

C Y berkadar songsang dengan X
Y *inversely proportional with* X

D Y bertambah secara linear dengan X
Y *increase linearly with* X

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



Rajah 2
Diagram 2

Pernyataan manakah yang betul tentang gerakan tersebut?
Which statement is correct regarding the motion?

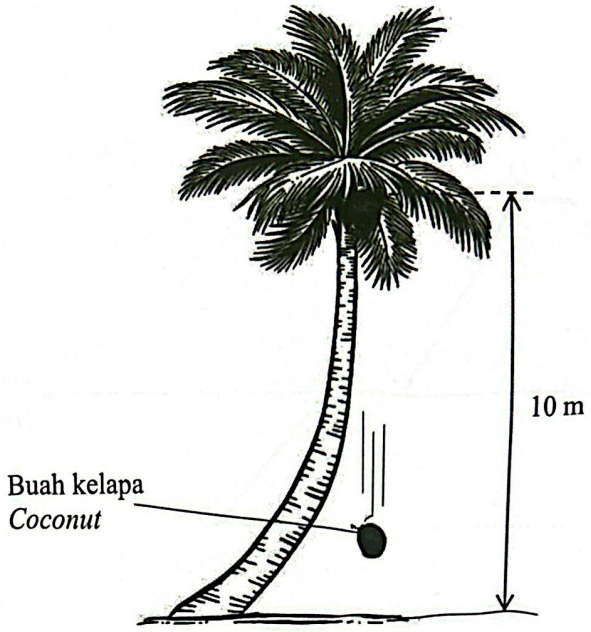
A Kereta tersebut dalam keadaan pegun di PQ
The car is in stationary at PQ

B Kereta tersebut mengalami halaju seragam di RS
The car is experienced uniform velocity at RS

C Kereta bergerak ke arah yang bertentangan di QR
The car moving in opposite direction at QR

D Kereta tersebut mengalami pecutan seragam di ST
The car is experienced uniform acceleration at ST

4 Rajah 3 menunjukkan sebiji buah kelapa jatuh dari ketinggian 10 m dari sebatang pokok.
Diagram 3 *shows a coconut falls* 10 m *high from a tree*

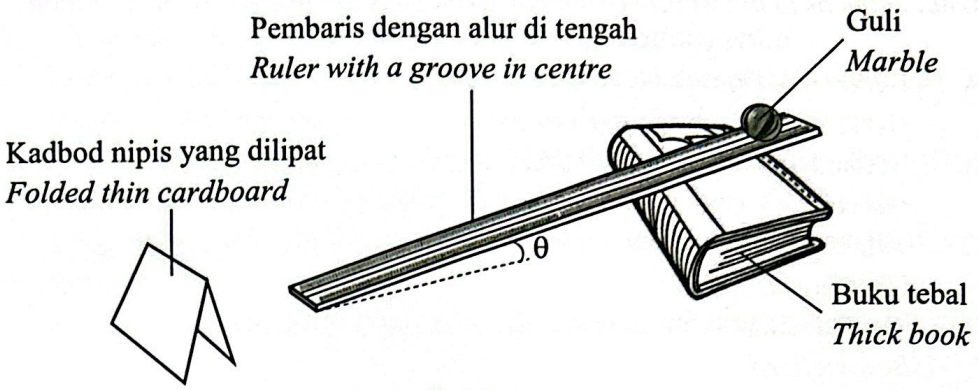


Rajah 3
Diagram 3

Tentukan masa untuk buah kelapa itu sampai ke tanah.
[Abaikan rintangan udara]
Determine the time for the coconut to reach the ground.
[*Ignore the air resistance*]

A 1.02 s
B 1.43 s
C 1.96 s
D 2.04 s

5 Rajah 4 menunjukkan susunan radas eksperimen ringkas untuk memahami konsep momentum.
Diagram 4 shows an arrangement of a simple experimental apparatus to understand the concept of momentum.



Rajah 4
Diagram 4

Apabila guli dilepaskan, pernyataan manakah **benar**?
When the marble is released, which statement is **true**?

A Sudut kecondongan θ bertambah, jarak kadbod nipis tertolak berkurang.
The angle of inclination θ increases, the distance of the thin cardboard is pushed decreases.

B Jisim guli bertambah, jarak kadbod nipis tertolak berkurang.
The mass of the marble increases, the distance of the thin cardboard is pushed decreases.

C Ketinggian guli dilepaskan bertambah, jarak kadbod nipis tertolak bertambah.
The height of the marble released increases, the distance of the thin cardboard is pushed increases.

D Kelajuan guli berkurang, jarak kadbod nipis tertolak bertambah.
The speed of the marble decreases, the distance of the thin cardboard is pushed increases

6 Satu objek berjisim 0.5 kg ditarik dengan satu daya 100 N selama 15 s .
Berapakah impuls yang bertindak kepada objek tersebut?
An object of mass 0.5 kg *is pulled with a force of* 100 N *for* 15 s.
What is the impulse acting on the object?

A 133 Ns
B 750 Ns
C 1500 Ns
D 3000 Ns

7 Berat seorang budak di Bumi ialah 700 N.
Apakah yang terjadi kepada berat budak tersebut apabila berada di permukaan Bulan?
The weight of a boy on the Earth is 700 N.
What happens to the weight of the boy when he is on the surface of the Moon?

A Berkurang
Decrease
B Bertambah
Increase
C Tidak berubah
Unchanged
D Menjadi sifar
Become zero

8 Jadual 1 menunjukkan jejari orbit, r dan tempoh orbit, T bagi Bumi, Marikh dan Zuhal.
Table 1 *shows the orbital radius,* r *and orbital period,* T *for the Earth, Mars and Saturn.*

Planet *Planet*	Jejari orbit, r (m) *Orbital radius,* r (m)	Tempoh orbit, T (hari) *Orbital period,* T (*days*)	$\frac{T^2}{r^3}$
Bumi *Earth*	r_1	T_1	X
Marikh *Mars*	r_2	T_2	Y
Zuhal *Saturn*	r_3	T_3	Z

Jadual 1
Table 1

Perbandingan manakah yang **betul**?
Which comparison is **correct**?

A $X < Y < Z$
B $Y < X < Z$
C $X < Y = Z$
D $X = Y = Z$

9 Pernyataan manakah benar menerangkan satelit bukan geopegun.
Which statement correctly describes a non-geostationary satellite?

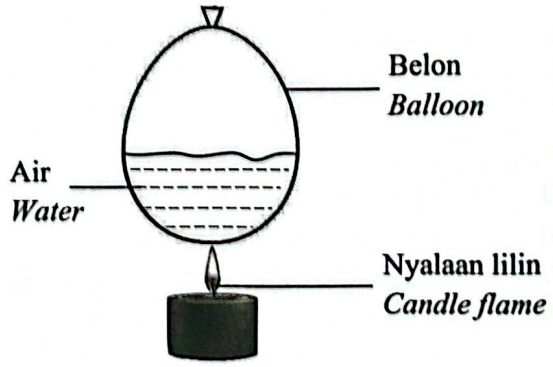
A Tempoh orbit sama dengan tempoh putaran Bumi.
The orbital period is the same as the Earth's rotation period.

B Sentiasa berada di kedudukan geografi yang sama dari permukaan Bumi.
Always at the same geographical location from the Earth's surface.

C Berada dalam orbit lebih rendah atau lebih tinggi daripada Orbit Bumi Geopegun.
Being in an orbit lower or higher than the Geostationary Earth Orbit.

D Bergerak mengelilingi Bumi dalam arah yang sama dengan arah putaran Bumi pada paksinya.
Moves around the Earth in the same direction as the Earth rotation on its axis.

10 Rajah 5 menunjukkan belon berisi air diletakkan di atas sebatang lilin yang sedang menyala. Didapati belon mengambil masa yang lama untuk pecah.
Diagram 5 shows a balloon filled with water placed on top of a lit candle. It was found that the balloon took a long time to burst.



Rajah 5
Diagram 5

Pernyataan manakah **benar**?
Which statement is **correct**?

A Muatan haba tentu air lebih tinggi
Specific heat capacity of water is higher

B Muatan haba tentu belon lebih tinggi
Specific heat capacity of balloon is higher

C Haba pendam tentu pengewapan air lebih tinggi
Specific latent heat of vaporization of water is higher

D Haba pendam tentu pengewapan belon lebih tinggi
Specific latent heat of vaporization of balloon is higher

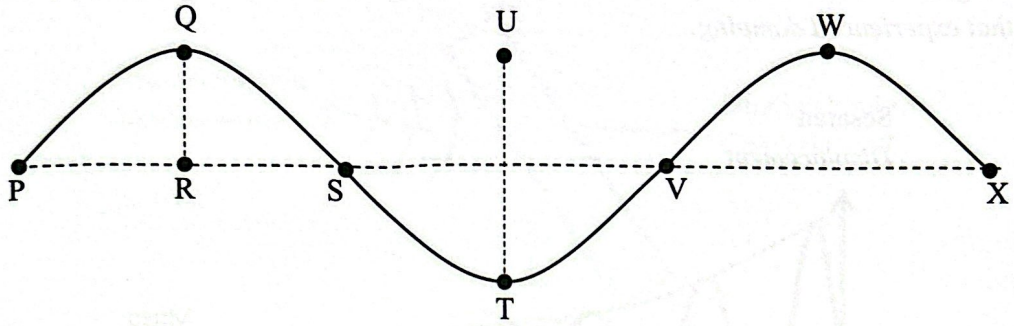
11 Apabila suhu 500 ml udara meningkat daripada 23°C kepada 43°C di bawah tekanan malar.
Antara pernyataan berikut yang manakah berkaitan dengan pernyataan masalah adalah **benar**?

When the temperature of 500 ml *of air rises from* 23°C *to* 43°C *under constant pressure.*
Which of the following statement related to the problem statement is ***true****?*

I Tenaga kinetik molekul adalah tidak berubah.
The kinetic energy of the molecules does not change.
II Bilangan molekul udara tidak berubah.
Number of air molecules does not change.
III Peningkatan isipadu ialah 33.78 ml
The increase in volume is 33.78 ml
IV Isipadu akhir ialah 934.78 ml
The final volume is 934.78 ml

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

12 Rajah 6 menunjukkan satu gelombang melintang.
Diagram 6 shows a transverse wave.

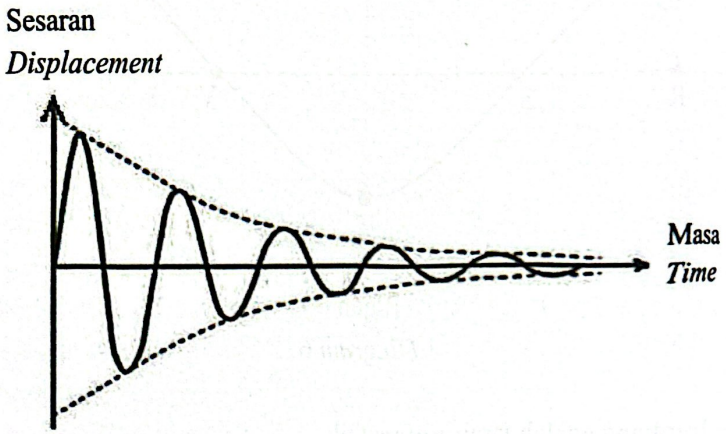


Rajah 6
Diagram 6

Panjang gelombang adalah jarak antara titik
A wavelength is the distance between points

A P dan S
P *and* S
B Q dan R
Q *and* R
C U dan T
U *and* T
D Q dan W
Q *and* W

13 Rajah 7 menunjukkan graf sesaran melawan masa bagi satu ayunan bandul yang mengalami pelembapan.
Diagram 7 shows the displacement against time graph for an oscillation of pendulum that experienced damping.

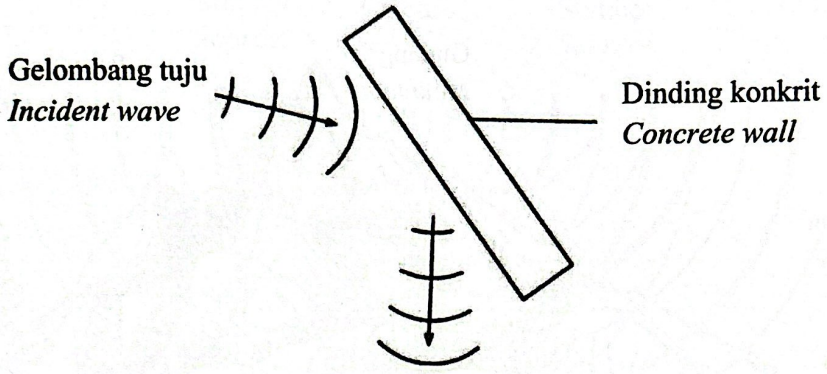


Rajah 7
Diagram 7

Pernyataan manakah **betul**?
Which statement is **correct**?

A Tenaga ayunan berkurang
The energy of oscillation decreases
B Tempoh ayunan berkurang
The period of oscillation decreases
C Frekuensi ayunan bertambah
The frequency of oscillation increases
D Amplitud ayunan bertambah
The amplitude of oscillation increases

14 Rajah 8 menunjukkan pantulan gelombang bunyi oleh dinding konkrit.
Diagram 8 shows the reflection of sound waves by a concrete wall.



Rajah 8
Diagram 8

Pernyataan manakah **betul**?
***Which statement is* correct?**

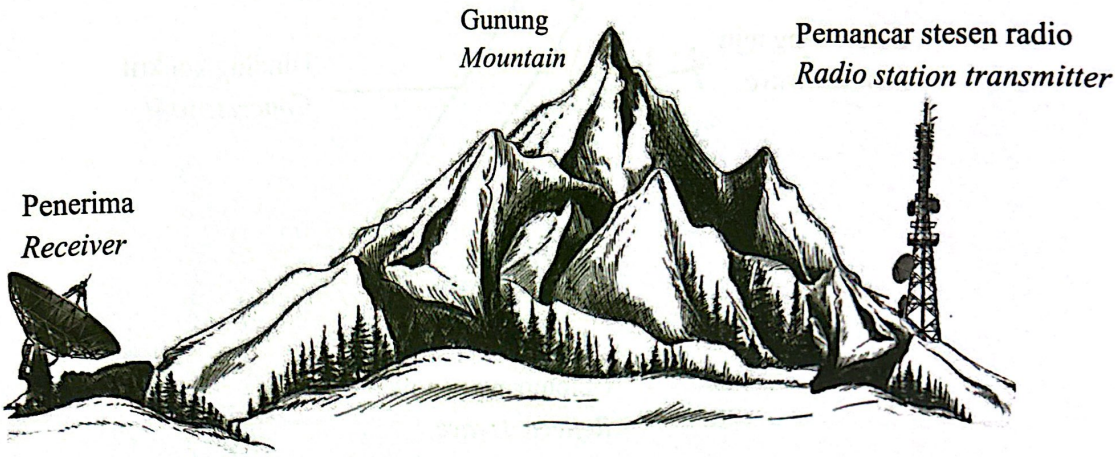
A Halaju gelombang tuju sama dengan halaju gelombang pantulan
The velocity of the incident wave is the same as the velocity of the reflected wave

B Panjang gelombang tuju lebih besar daripada panjang gelombang pantulan
The incident wavelength is greater than the reflected wavelength

C Frekuensi gelombang tuju lebih besar daripada frekuensi gelombang pantulan
The frequency of the incident wave is greater than the frequency of the reflected wave

D Sudut tuju bagi gelombang tuju adalah sama dengan sudut pantulan bagi gelombang pantulan
The angle of incidence of the incident wave is the same as the angle of reflection of the reflected wave

15 Rajah 9 menunjukkan kedudukan sebuah pemancar stesen radio dan sebuah penerima.
Diagram 9 shows the position of a radio station transmitter and a receiver.

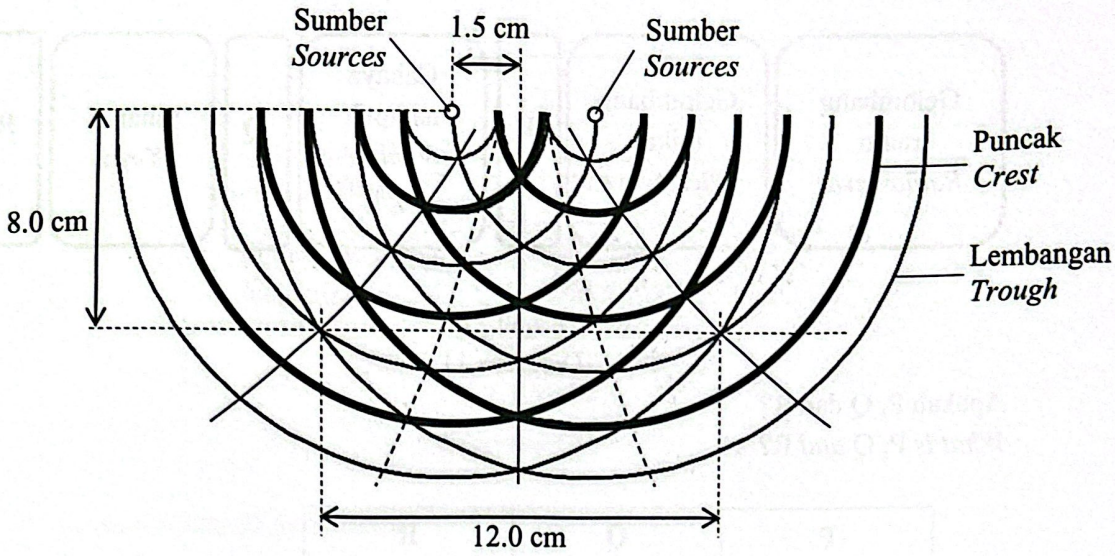


Rajah 9
Diagram 9

Penerima boleh menerima gelombang dari pemancar stesen radio kerana
The receiver can receive wave from the radio station transmitter because

A gelombang dibiaskan
waves were refracted
B gelombang dibelaukan
waves were diffracted
C gelombang dipantulkan
waves were reflected
D gelombang mengalami interferens
waves experiences interference.

16 Rajah 10 menunjukkan satu corak interferens
Diagram 10 *shows an interference pattern.*

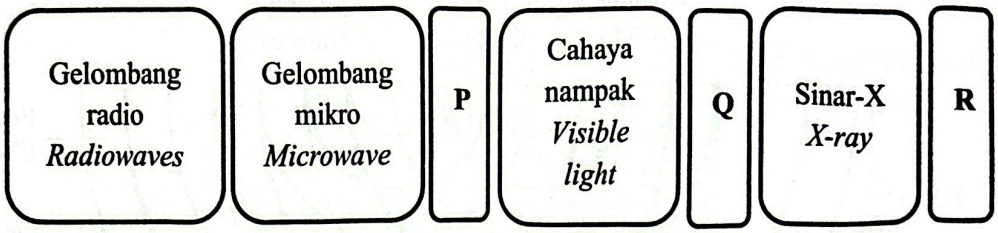


Rajah 10
Diagram 10

Hitungkan panjang gelombang.
Calculate the wavelength.

A 1.00 cm
B 1.13 cm
C 2.25 cm
D 4.50 cm

17 Rajah 11 menunjukkan suatu spektrum electromagnet.
Diagram 11 *shows an electromagnetic spectrum.*

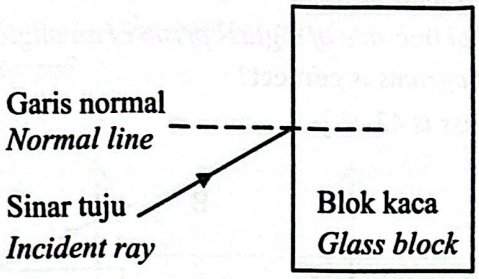


Rajah 11
Diagram 11

Apakah P, Q dan R?
What is P, Q *and* R?

	P	Q	R
A	Inframerah *Infrared*	Ultraungu *Ultraviolet*	Sinar gama *Gamma ray*
B	Ultraungu *Ultraviolet*	Sinar gama *Gamma ray*	Inframerah *Infrared*
C	Ultraungu *Ultraviolet*	Inframerah *Infrared*	Sinar gama *Gamma ray*
D	Inframerah *Infrared*	Sinar gama *Gamma ray*	Ultraungu *Ultraviolet*

18 Rajah 12 menunjukkan sinar cahaya ditujukan ke sebuah blok kaca.
Diagram 12 *shows a light ray is directed to a glass block.*



Rajah 12
Diagram 12

Pernyataan manakah yang **betul**?
Which statement is **correct**?

A Sudut tuju lebih kecil berbanding sudut biasan
The incident angle is smaller than the refracted angle

B Halaju cahaya berkurang apabila memasuki blok kaca
The velocity of light decrease as it enters the glass block

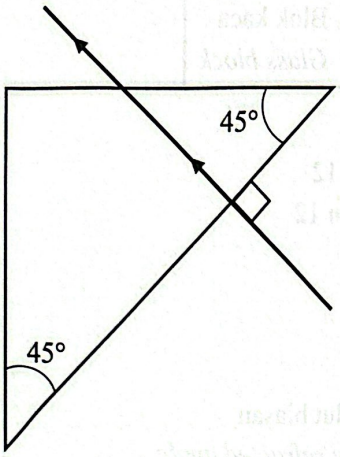
C Kecerahan cahaya bertambah apabila ia merambat di dalam blok kaca
The brightness of light increases as it travels in the glass block

D Cahaya terbengkok menjauhi garis normal apabila memasuki blok kaca
The light bend away from the normal line as it enters the glass block

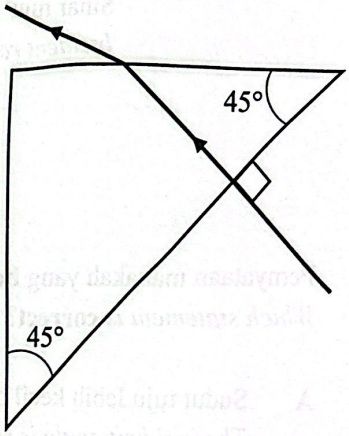
19 Satu sinar cahaya ditujukan pada satu sisi prisma kaca bersudut 45°– 90°– 45°.
Rajah manakah antara berikut adalah **benar**?
[Sudut genting kaca ialah 42°]

A ray of light is directed at one side of a glass prism at an angle of 45°– 90°– 45°.
Which of the following diagrams is **correct**?
[*The critical angle of glass is* 42.2°]

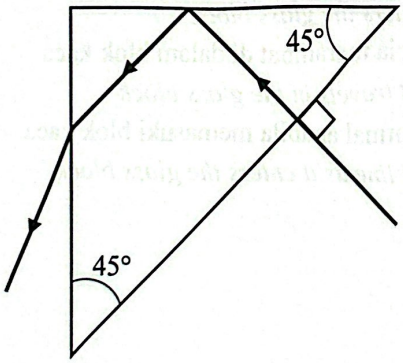
A



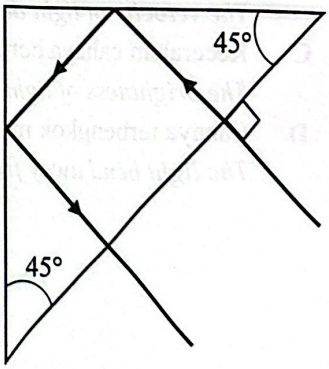
B



C



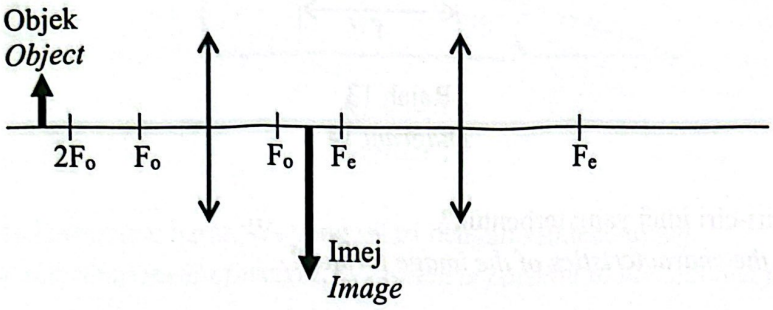
D



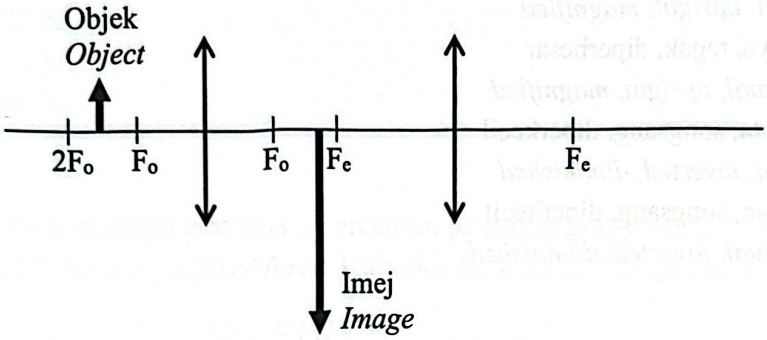
20 Diberi bahawa titik fokus kanta objektif dan kanta mata masing-masing adalah F_o dan F_e. Antara berikut, yang manakah kedudukan objek dan imej akhir yang **betul** dalam sebuah mikroskop majmuk?

Given that the focal points of the objective lens and eyepiece are F_o *and* F_e *respectively. Which of the following is the* **correct** *position of the object and the final image in a compound microscope?*

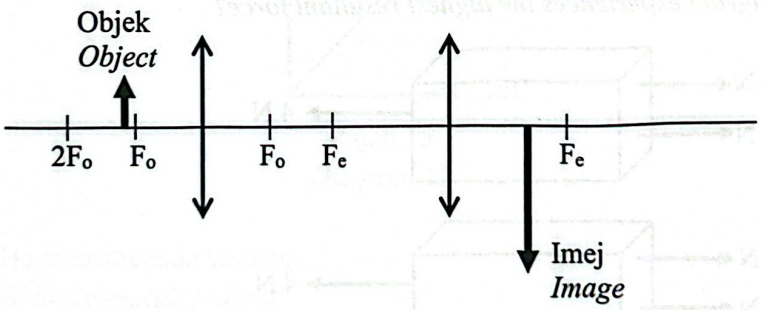
A



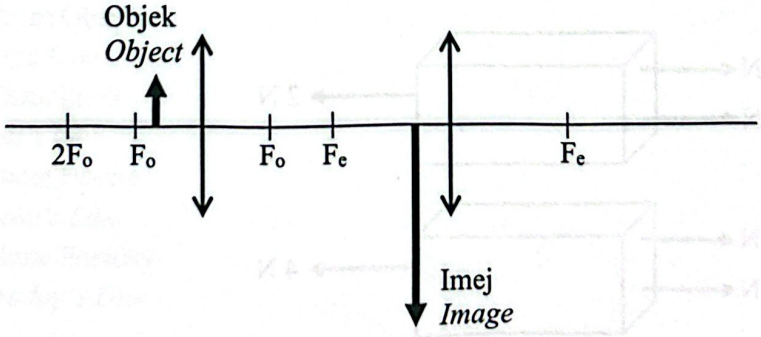
B



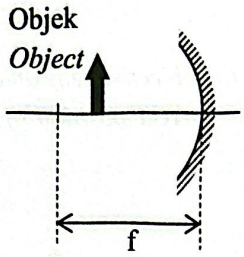
C



D



21 Rajah 13 menunjukkan objek diletakkan di hadapan sebuah cermin cekung.
Diagram 13 *shows an object placed in front of a concave mirror.*



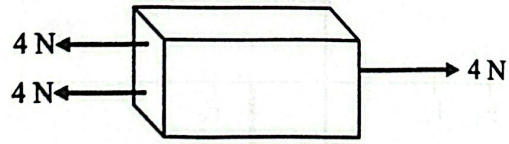
Rajah 13
Diagram 13

Apakah ciri-ciri imej yang terbentuk?
What are the characteristics of the image formed?

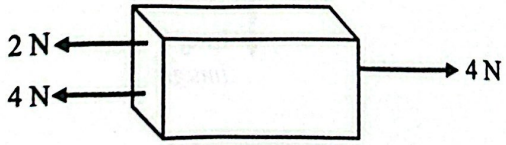
A Nyata, tegak, diperbesar
Real, upright, magnified
B Maya, tegak, diperbesar
Virtual, upright, magnified
C Nyata, songsang, diperkecil
Real, inverted, diminished
D Maya, songsang, diperkecil
Virtual, inverted, diminished

22 Rajah manakah mengalami daya paduan yang paling besar?
Which diagram experiences the highest resultant force?

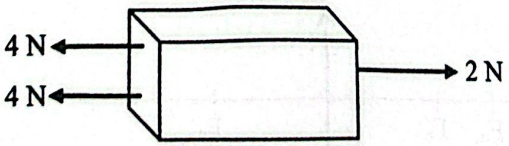
A



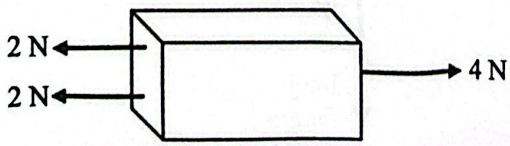
B



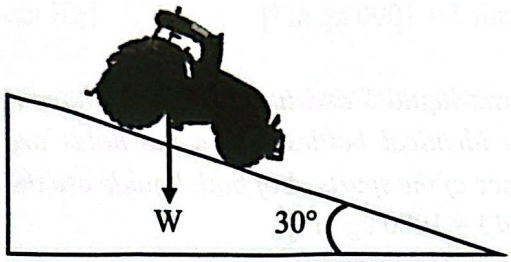
C



D



23 Rajah 14 menunjukkan sebuah trak mainan berjisim 2.0 kg berada di atas satu satah condong.
Diagram 14 *show a toy truck with a mass of* 2.0 kg *on an inclined plane.*

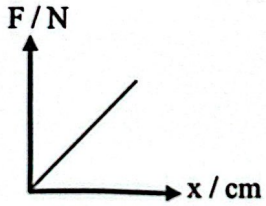


Rajah 14
Diagram 14

Hitungkan komponen berat, W_x yang selari dengan satah condong.
Calculate the component of weight, W_x *which is parallel to the inclined plane.*

A 9.81 N
B 16.99 N
C 19.62 N
D 20.00 N

24 Rajah 15 menunjukkan graf daya, F melawan pemanjangan spring, x.
Diagram 15 *shows a graph of force,* F *against the extension of spring,* x.



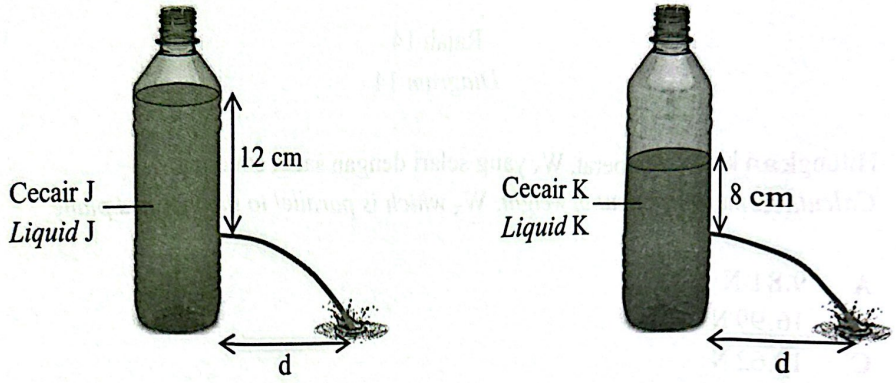
Rajah 15
Diagram 15

Graf di atas menerangkan tentang
The graph above explains about

A Hukum Ohm
Ohm's Law
B Hukum Snell
Snell's Law
C Hukum Hooke
Hooke's Law
D Hukum Faraday
Faraday's Law

25 Rajah 16 menunjukkan cecair J dan cecair K yang mempunyai ketumpatan dan isipadu berbeza dituang ke dalam dua botol yang serupa. Apabila lubang dibuka, didapati jarak ufuk pancutan, d kedua-dua cecair adalah sama.
[Ketumpatan cecair J = 1000 kg m^{-3}]

Diagram 16 *shows liquid* J *and liquid* K *which have different densities and volumes poured into two identical bottles. When the holes are opened, it is found that the horizontal distance of the spurts,* d *of both liquids are the same.*
[*Density of liquid* J = 1000 kg m^{-3}]



Rajah 16
Diagram 16

Berapakah ketumpatan cecair K?
What is the density of liquid K?

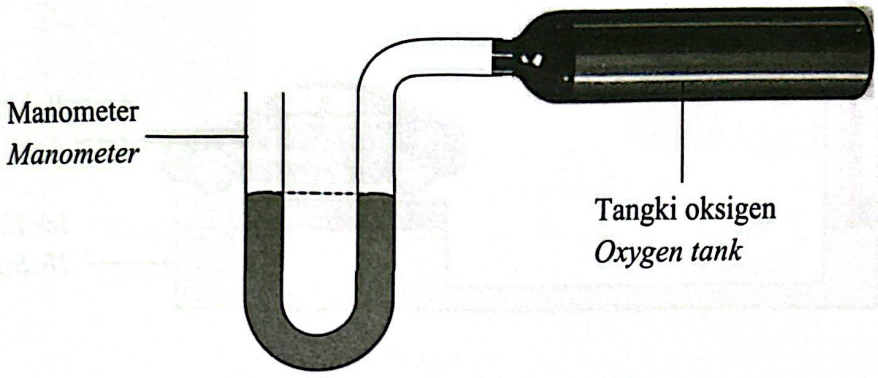
A 667 kg m^{-3}
B 900 kg m^{-3}
C 1000 kg m^{-3}
D 1500 kg m^{-3}

26 Apakah alat yang digunakan untuk mengukur tekanan atmosfera?
What is the instrument used to measure the atmospheric pressure?

A Barometer
Barometer
B Manometer
Manometer
C Hidrometer
Hydrometer
D Tolok Bourdon
Bourdon Gauge

27 Rajah 17 menunjukkan sebuah manometer yang digunakan untuk menentukan tekanan gas oksigen di dalam tangki oksigen.
[Tekanan atmosfera = 76 cm Hg]

Diagram 17 *shows a manometer is used to determine the pressure of the oxygen gas in a oxygen tank.*
[*Atmospheric pressure* = 76 cm Hg]

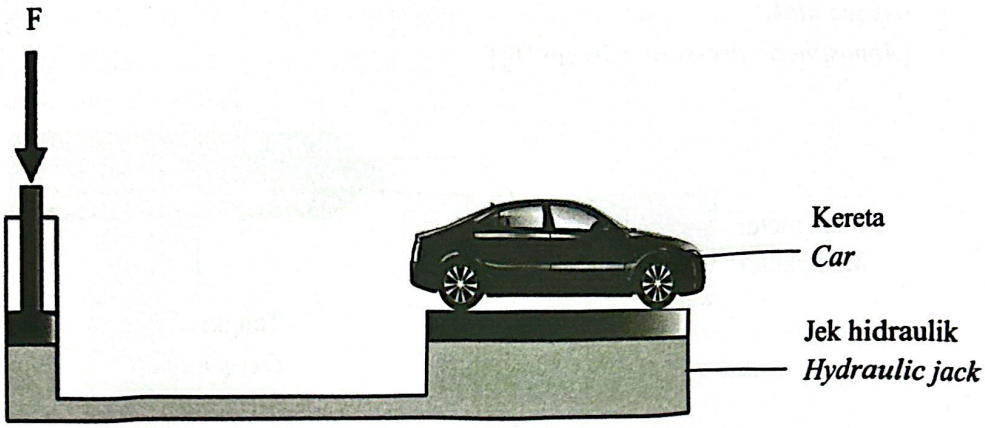


Rajah 17
Diagram 17

Tekanan gas oksigen ialah
The pressure of the oxygen gas is

A lebih dari 76 cm Hg
more than 76 cm Hg
B kurang dari 76 cm Hg
less than 76 cm Hg
C sama dengan 0 cm Hg
equal to 0 cm Hg
D sama dengan 76 cm Hg
equal to 76 cm Hg

28 Rajah 18 menunjukkan sebuah jek hidraulik dengan faktor penggandaan 100. Jisim kereta terebut adalah 2000 kg.
Diagram 18 *shows a hydraulic jack with multiplying factor* 100. *The mass of the car is* 2000 kg.

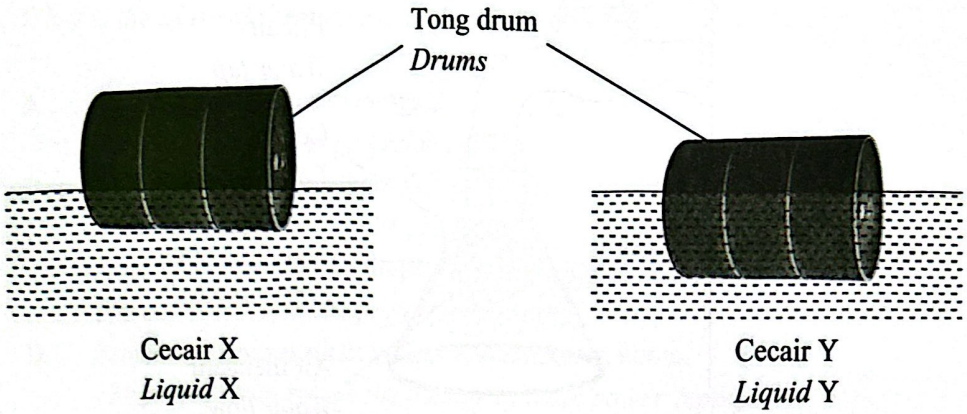


Rajah 18
Diagram 18

Berapakah daya F?
What is the force F?

A 19.6 N
B 20.0 N
C 196.2 N
D 200.0 N

29 Rajah 19 menunjukkan dua tong drum yang serupa terapung di atas permukaan cecair X dan cecair Y.
Diagram 19 *shows two identical drums floating on the surface of liquid* X *and liquid* Y.



Rajah 19
Diagram 19

Antara berikut, pernyataan manakah adalah **benar**?
Which of the following statement is **true***?*

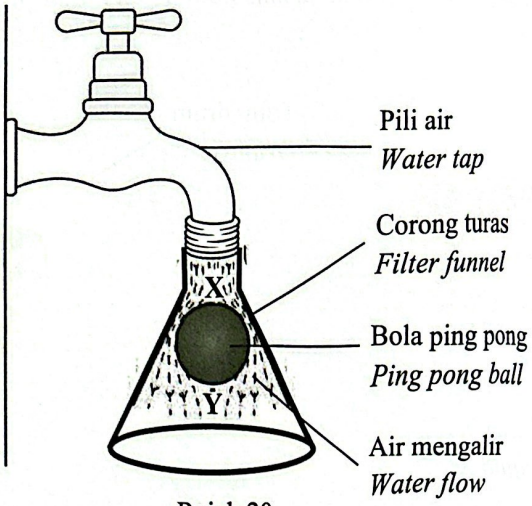
A Ketumpatan cecair X = ketumpatan cecair Y
Density of liquid X = *density of liquid* Y

B Isipadu cecair X yang disesarkan = isipadu cecair Y yang disesarkan
Volume of liquid X *displaced = volume of liquid* Y *displaced*

C Kedalaman tong drum terendam dalam cecair X = kedalaman tong drum terendam dalam cecair Y
The depth of the drum immersed in liquid X = *the depth of the drum immersed in liquid* Y

D Daya apungan yang bertindak ke atas tong drum dalam cecair X = daya apungan yang bertindak ke atas tong drum dalam cecair Y
The buoyant force acting on drum in liquid X = *the buoyant force acting on drum in liquid* Y

30 Rajah 20 menunjukkan sebiji bola ping pong yang tidak jatuh apabila air dialirkan dalam corong turas.
Diagram 20 shows a ping pong ball that does not fall when water is flow in a filter funnel.



Rajah 20
Diagram 20

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

A Tekanan air di kawasan X lebih tinggi
The pressure of water in region X is higher
B Tekanan air di kawasan Y lebih tinggi
The pressure of water in region Y is higher
C Halaju air di kawasan Y lebih tinggi
The velocity of water in region Y is higher
D Halaju air di kawasan X lebih rendah
The velocity of water in region X is lower

31 Kipas dan peti sejuk disambung selari kepada bekalan kuasa 240 V. Rintangan kipas dan peti sejuk masing-masing ialah 150 Ω dan 480 Ω.
Apakah fius yang sesuai digunakan?

A fan and a refrigerator are connected in parallel to a 240 V *power supply. The resistance of the fan and refrigerator are* 150 Ω *and* 480 Ω *respectively.*
What is the suitable fuse to use?

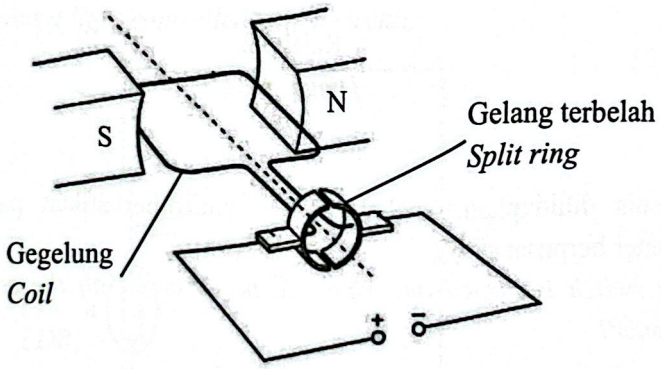
A 1 A
B 2 A
C 3 A
D 5 A

32 Seorang guru menggunakan projektor selama 6 jam secara berterusan. Guru itu menyedari bil elektrik sekolah telah meningkat.
Apakah punca yang menyebabkan bil elektrik tinggi?

A teacher uses a projector for 6 hours continuously. The teacher noticed that the school's electricity bill is high.
What is the cause of the increase in the electricity bill?

A Rintangan projektor meningkat
The resistance of the projector increases
B Banyak cahaya dihasilkan oleh projektor
More light produced by the projector
C Arus yang mengalir dalam projektor meningkat
The current flow in the projector increases
D Projektor meningkatkan voltan bekalan kuasa utama
The projector increases the voltage of main power supply

33 Rajah 21 menunjukkan gelang terbelah di dalam sebuah motor arus.
Diagram 21 shows a split ring in a direct current motor.



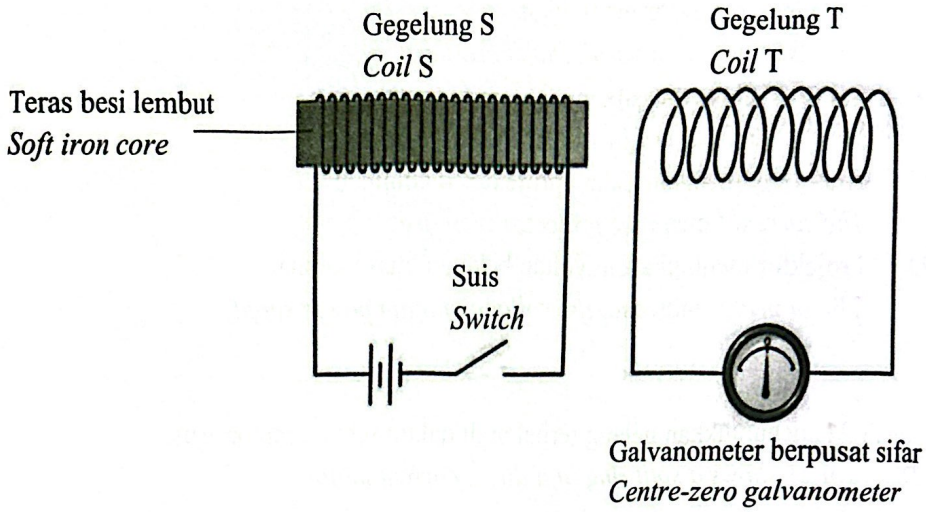
Rajah 21
Diagram 21

Apakah fungsi gelang terbelah?
What is the function of split ring?

A Menjadikan daya magnetik berubah-ubah setiap saat
To make the magnetic force change every second
B Mengelakkan gegelung daripada berputar terlalu laju
To prevent the coils from spinning too fast
C Mengurangkan tenaga elektrik yang digunakan oleh motor
To reduce the electric power used by the motor
D Menukar arah arus dalam gegelung setiap setengah pusingan
To reverse the direction of current in the coils every half rotation

34 Rajah 22 menunjukkan dua gegelung S dan T. Gegelung S dililit pada teras besi lembut yang disambungkan kepada dua bateri manakala gegelung T disambungkan pada galvanometer berpusat sifar.

Diagram 22 shows two coils S *and* T. *Coil* S *is wound to the soft iron core connected to two batteries while coil* T *is connected to centre-zero galvanometer.*



Rajah 22
Diagram 22

Apabila suis dihidupkan, apakah yang dapat diperhatikan pada penunjuk jarum galvanometer berpusat sifar?
When the switch is turned on, what can be observed on the pointer of centre-zero galvanometer?

A Tidak terpesong
Not deflected

B Terpesong ke satu arah sahaja
Deflected in one direction only

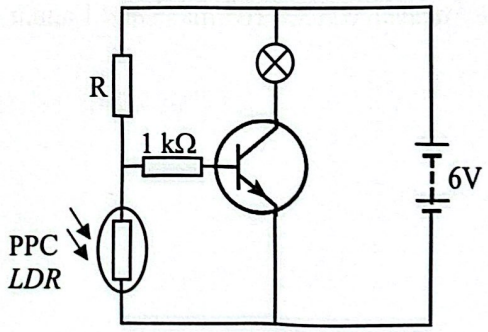
C Terpesong ke satu arah dan kembali kepada sifar
Deflected in one direction and returned to zero

D Terpesong ke kiri dan ke kanan secara berterusan
Continuously deflects to the left and right

35 Pasangan manakah yang **betul** mengenai fungsi anod dan katod dalam tiub sinar katod?
Which pair is **correct** *about the function of the anode and the cathode in a cathode ray tube*?

	Anod *Anode*	**Katod** *Cathode*
A	Memancarkan elektron *Emits electrons*	Menarik elektron supaya elektron memecut *Attract electrons so that electrons accelerate*
B	Menarik elektron supaya elektron memecut *Attract electrons so that electrons accelerate*	Memancarkan elektron *Emits electrons*
C	Memanaskan katod *Heats the cathode*	Memesongkan elektron *Deflects electrons*
D	Memesongkan elektron *Deflects electrons*	Memanaskan katod *Heats the cathode*

36 Rajah 23 menunjukkan suatu litar suis kawalan cahaya.
Diagram 23 *shows a light-controlled switch circuit.*



Rajah 23
Diagram 23

Pernyataan manakah yang **betul** mengenai litar di atas dalam keadaan gelap?
Which statement is **correct** *about the circuit above in the dark situation*?

A Rintangan perintang R berkurang.
Resistance of resistor R *decreases.*

B Rintangan perintang R bertambah.
Resistance of resistor R *increases.*

C Rintangan perintang peka cahaya, PPC berkurang.
Resistance of light dependent resistor, LDR decreases.

D Rintangan perintang peka cahaya, PPC bertambah.
Resistance of light dependent resistor, LDR increases.

37 Dalam sebuah reaktor nuklear, bahan yang digunakan untuk menyerap neutron berlebihan adalah
In a nuclear reactor, the material used to absorb excess neutrons is

A rod boron
boron rods
B teras grafit
graphite core
C rod uranium
uranium rods
D konkrit tebal
Thick konkrit

38 Tenaga sebanyak 2.068×10^{-11} J telah dihasilkan dari tindak balas nuklear bagi satu radioisotop.
Hitung cacat jisim yang terlibat dalam unit u.j.a.
[Laju cahaya dalam udara/vakum, $c = 3 \times 10^8$ ms^{-1} dan 1 u.j.a.= 1.66×10^{-27} kg]

An energy of 2.068×10^{-11} J *was produced from the nuclear reaction of a radioisotope.*
Calculate the mass defect involved in the unit of a.m.u.
[*The speed of light in air/vacuum,* $c = 3 \times 10^8$ ms^{-1} *and* 1 a.m.u = 1.66×10^{-27} kg]

A 0.13842
B 0.15380
C 0.16744
D 0.18605

39 Antara yang berikut, manakah yang akan meningkatkan halaju gerakan fotoelektron.
Which of the following will increase the velocity of photoelectrons?

A Frekuensi cahaya
Light frequency
B Frekuensi ambang
Threshold frequency
C Keamatan cahaya
Light intensity
D Fungsi kerja logam
Work function of the metal

40 Satu sinar cahaya yang mempunyai panjang gelombang 550 nm ditujukan ke permukaan logam yang mempunyai fungsi kerja 6.83×10^{-20} J.
Hitung tenaga kinetik maksimum fotoelektron yang terpancar dari permukaan logam tersebut.
[Pemalar plank, $h = 6.63 \times 10^{-34}$ J s]

A beam of light with a wavelength of 550 nm *is directed to a metal surface that has a work function of* 6.83×10^{-20} J.
Calculate the maximum kinetic energy of the photoelectron emitted from the metal surface.
[*Planck's constant*, $h = 6.63 \times 10^{-34}$ J s]

A 3.62×10^{-28} J
B 6.83×10^{-20} J
C 2.93×10^{-19} J
D 3.62×10^{-19} J

KERTAS SOALAN TAMAT
END OF QUESTION PAPER