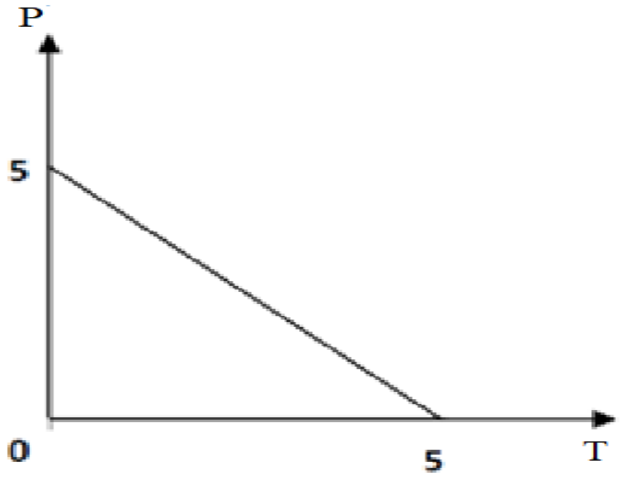
1. Graf menunjukkan hubungan antara **P** dan **T**.
Graph shows the relationship between **P** *and* **T**.



Hubungan **P** dan **T** boleh diwakili oleh persamaan
Relationship between **P** *and* **T** *can be represented by equation*

A P = T + 5

B P = T+ 1

C P = − T + 5

D P = − T + 1

2. Tempoh ayunan untuk suatu neraca inersia diberi oleh $\mathbf{T^2 = km}$ di mana **T** ialah tempoh ayunan dan unit ialah **s**, **m** ialah jisim dan unitnya **kg** dan **k** ialah suatu pemalar. Apakah unit bagi **k**?
Period of oscillation for an inertia balance is given by $\boldsymbol{T^2 = km}$ *where* ***T*** *is period of oscillation and its unit is* ***s***, ***m*** *is mass and its unit is* ***kg***. ***k*** *is a constant. What is the unit of* ***k****?*

A kg s^2

B kg s

C. kg^{-1} s^2

D kg^{-2} s^{-1}

3. Pilih kuantiti fizik yang betul bagi kuantiti terbitan dan kuantiti vektor.
Choose the right physical quantity for derived quantity and vector quantity.

A Luas
Area

B Laju
Speed

C Ketumpatan
Density

D Pecutan
Accerelation

4. Suatu kuantiti terbitan diperolehi daripada pembahagian jarak dengan masa. Apakah unit S.I. kuantiti ini?
A derivative quantity is obtained from the division of distance by time. What is the S.I. unit for this quantity?

A m s

B $m\ s^{-1}$

C $cm\ s^{-1}$

D $km\ s^{-1}$

5. Pilih kuantiti fizik yang betul bagi kuantiti terbitan dan kuantiti vektor.
Choose the right physical quantity for derived quantity and vector quantity.

A Luas
Area

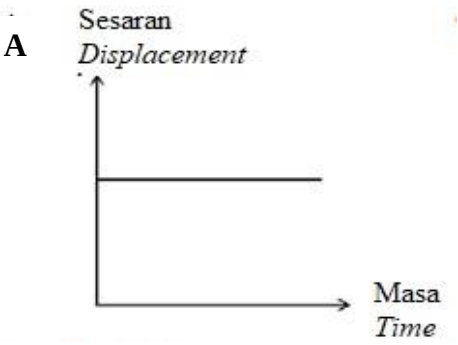
B Pecutan
Accerelation

C Ketumpatan
Density

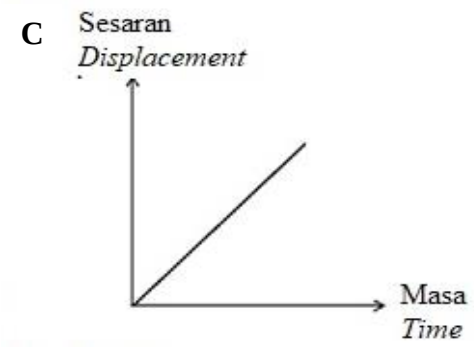
D Ketumpatan
Density

6. Antara berikut, pilih graf sesaran-masa yang mewakili nyahpecutan seragam suatu objek.
From the following displacement-time graph choose a graph that represents uniform deceleration of an object.

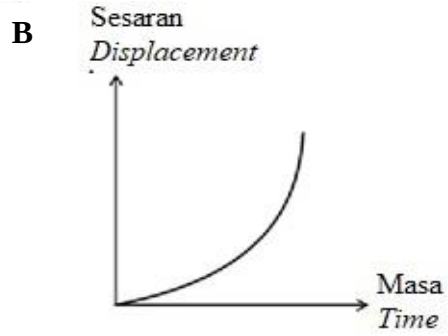
A



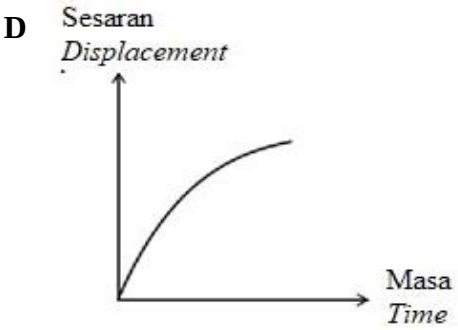
C



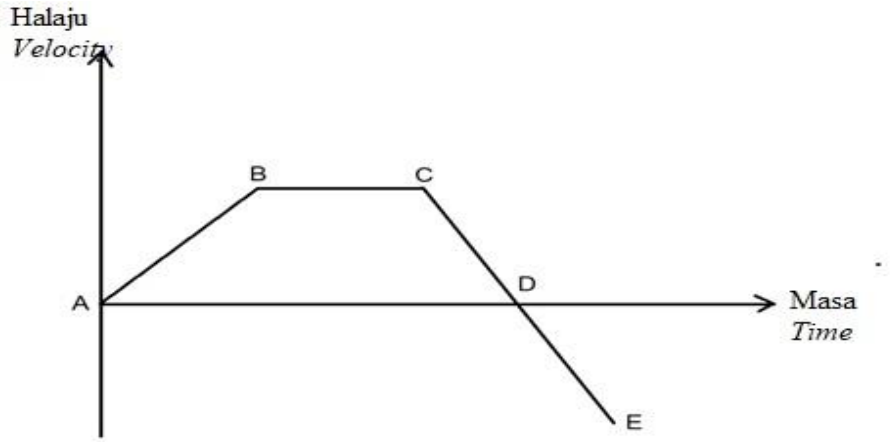
B



D



7. Rajah 1 menunjukkan graf halaju melawan masa bagi gerakan sebuah kereta mainan.
Diagram 1 shows a velocity against time for motion of a toy car.



Rajah 1
Diagram 1

Kereta mainan itu mengalami pecutan sifar pada kedudukan
The toy car experiences zero acceleration at

A A B

B B C

C C D

D D E

8. Seorang pemain bola tampar melontarkan sebiji bola ke atas secara menegak dengan halaju awal 10 m s^{-1}, hitung masa diambil untuk mencapai tinggi maksimum.
(g = 9.81 m s^{-2} dan rintangan udara diabaikan)
A volleyball player throwing a ball vertically with initial velocity 10 m s^{-1}, calculate time taken to achieve maximum height (g = 9.81 m s^{-2} and air resistance is ignored)

A 1.02 s

B 0.98 s

C 1.98 s

D 4.96 s

9. Tentukan objek yang mempunyai inersia yang paling besar.
Determine the object that has the greatest inertia.

A

Jisim /*Mass* = 100 kg
Laju / *Speed* = 20 m s^{-1}

B

Jisim /*Mass* = 350 kg
Laju / *Speed* = 40 m s^{-1}

C

Jisim /*Mass* = 1 200 kg
Laju / *Speed* = 35 m s^{-1}

D

Jisim /*Mass* = 10 000 kg
Laju / *Speed* = 25 m s^{-1}

10. Rajah 2 menunjukkan sebutir peluru ditembak daripada sepucuk senapang.
Diagram 2 *shows a bullet is fired from a riffle.*

Rajah 2
Diagram 2

A true statement about momentum according to the diagram is
Satu keterangan yang benar mengenai momentum berdasarkan rajah adalah

A Momentum peluru adalah lebih dari momentum senapang.
The momentum of the bullet is more than the momentum of the rifle.

B Jumlah momentum peluru dan senapang adalah sifar
The total momentum of the bullet and the rifle is zero.

C Kelajuan senapang adalah lebih dari kelajuan peluru
The speed of the rifle is more than the speed of bullet.

D Tenaga kinetik peluru adalah sama dengan tenaga kinetik senapang.
The kinetic energy of the bullet is equal to the kinetic energy of the rifle.

11. Berdasarkan pernyataan berikut pilih pernyataan yang benar mengenai daya graviti bumi.
Based on the following statements, choose the correct statement on Earth's gravitational force.

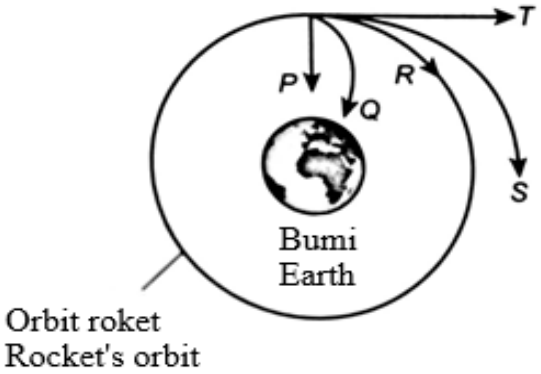
A Daya graviti Bumi bertindak ke atas pusat Bumi adalah seragam
The Earth's gravitational force acting towards the centre of the Earh is uniform.

B Daya graviti Bumi menjadi lebih kuat apabila objek berada jauh dari pusat Bumi
The Earth's gravitational force of an object becomes stronger when an object is further away from the Earth's centre

C Daya graviti Bumi mengakibatkan objek jatuh dengan pecutan yang berkadar songsang dengan kuasa dua jarak objek tersebut dari pusat Bumi
The Earth's gravitational force causes objects to fall with an acceleration that is inversely proportional to the square of their distances from the centre of the Earth

D Daya graviti Bumi hanya boleh memberi kesan ke atas beberapa objek di permukaan Bumi
The Earth's gravitational force can only affect some objects on the Earth's surface

12. Rajah 3 menunjukkan orbit sebuah roket sepanjang lengkung **R** apabila ia bergerak dengan laju linear, **v**.
Diagram 3 *shows the orbit of a rocket along curve* **R** *when it moves with linear speed,* **v**.



Rajah 3
Diagram 3

Jika tiba – tiba kelajuannya dikurangkan ke $\frac{1}{2}$ v, mana satu antara **P**, **Q**, **S** dan **T** akan menjadi orbit baru bagi roket tersebut?
If the speed suddenly decreases to $\frac{1}{2}v$ *, which one of* **P**, **Q**, **S** *and* **T** *will become the new orbit for the rocket?*

A P
B Q
C S
D T

13. Rajah 4 menunjukkan satu sudu logam diletakkan dalam secawan kopi panas.
Diagram 4 *shows a cold metal spoon is placed in a cup of hot coffee.*

Rajah 4
Diagram 4

Tentukan pernyataan yang benar mengenai sudu dan kopi dalam keadaan keseimbangan terma.
Determine the correct statement about the spoon and coffee in a thermal equilibrium state.

A Suhu kopi tidak berubah
Temperature of the coffee is unchanged

B Suhu sudu logam tidak berubah
Temperature of the metal spoon is unchanged

C Sudu logam dan kopi mempunyai suhu yang sama
Both metal spoon and coffee have same temperature

D Tiada pengaliran haba antara kopi dan sudu logam
No heat flow between the metal spoon and coffee

14. 400 g air yang bersuhu 30 ˚C dimasukkan ke dalam ***X*** g air yang bersuhu 100 ˚C. Dalam keadaan keseimbangan terma, suhu air tersebut adalah 60 ˚C. Hitung nilai ***X***
400 g *of water at temperature* 30 ˚C *is added to* **X** g *of water at temperature of* 100 ˚C. *In a thermal equilibrium state, the temperature of the water is* 60 ˚C. *Find the value of* **X**

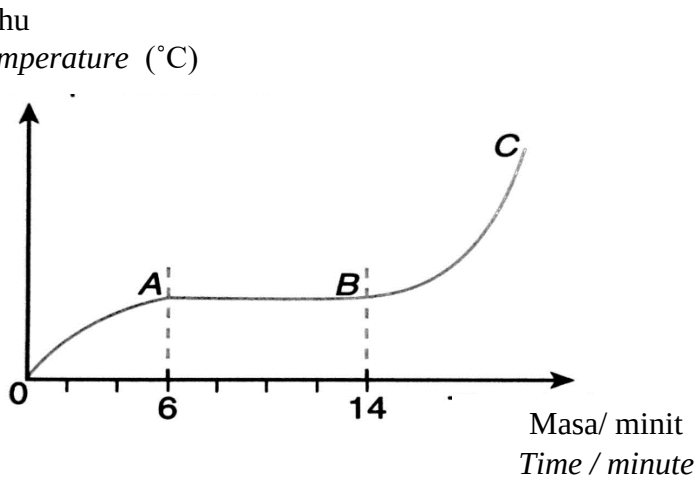
A 300

B 400

C 800

D 933

15. Suatu pepejal berjisim 1.2 kg dipanaskan menggunakan pemanas elektrik yang membekalkan 600 J tenaga haba dalam masa satu saat. Graf suhu melawan masa bagi pepejal tersebut ditunjukkan dalam Rajah 5 berikut
A solid of a mass 1.2 kg *is heated by an electric heater which supplies* 600 J *of heat energy per second. The temperature – time graph of the solid is shown by Diagram* 5 *as follows*



Rajah 5
Diagram 5

Cari nilai haba pendam tentu pelakuran bagi pepejal tersebut.
Find the specific latent heat of fusion for the solid.

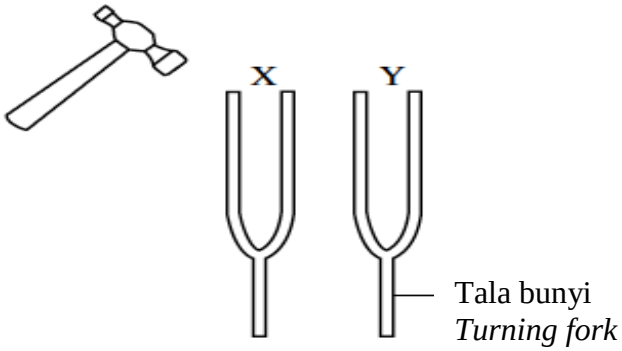
A 3 kJ kg^{-1}

B 4 kJ kg^{-1}

C 180 kJ kg^{-1}

D 240 kJ kg^{-1}

16. Rajah 6 menunjukkan dua tala bunyi yang serupa, **X** dan **Y**, diletakkan bersebelahan. Tala bunyi **X** diketuk supaya bergetar. Tala bunyi **Y** kemudian turut bergetar.
Diagram 6 *below shows two identical tuning forks,* **X** *and* **Y**, *which are placed side by side. Tuning fork* **X** *is struck to vibrate. Tuning fork* **Y** *then vibrates too.*



Rajah 6
Diagram 6

Kesan ini dikenali sebagai
This effect is known as

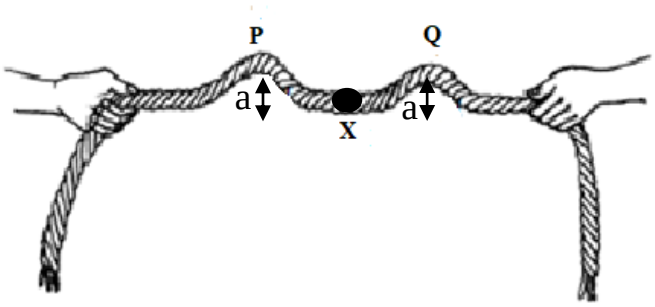
A Kelangsingan
Pitch

B Pelembapan
Damping

C Resonans
Resonance

D Ayunan
Oscillation

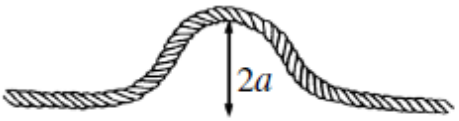
17. Rajah 7 menunjukkan dua denyutan gelombang dihasilkan pada **P** dan **Q**. **P** dan **Q** adalah sama jarak dari **X**.
*D*iagram 7 *shows two wave pulses produced at* **P** *and* **Q**. **P** *and* **Q** *are at the same distance from* **X**.



Rajah 7
Diagram 7

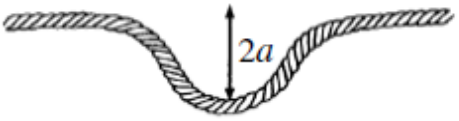
Pilih bentuk gelombang yang boleh diperhatikan di **X** ?
Choose the suitable waveform observed at **X** *?*

A

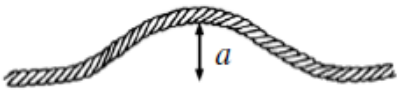


C

B



D



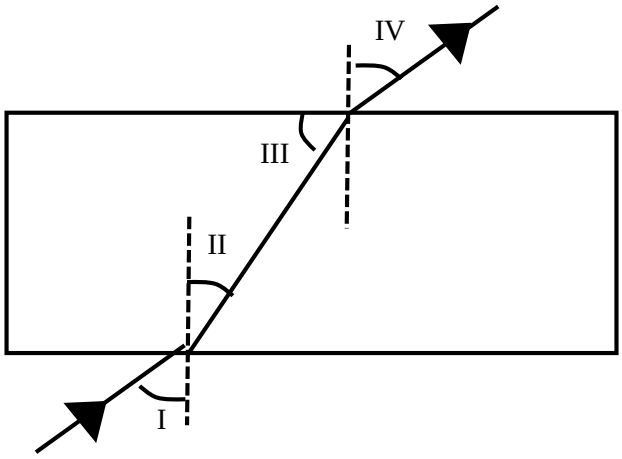
18. Rajah 8 menunjukkan suatu spektrum elektromagnet.
Diagram 8 *below shows an electromagnetic spectrum.*

Rajah 8
Diagram 8

Apakah yang mewakili **P**, **Q** dan **R** ?
What represents **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*

19. Rajah 9 menunjukkan satu sinar cahaya ditujukan kepada satu bongkah kaca.
Diagram 9 *shows a light ray directed into a glass block.*



Rajah 9
Diagram 9

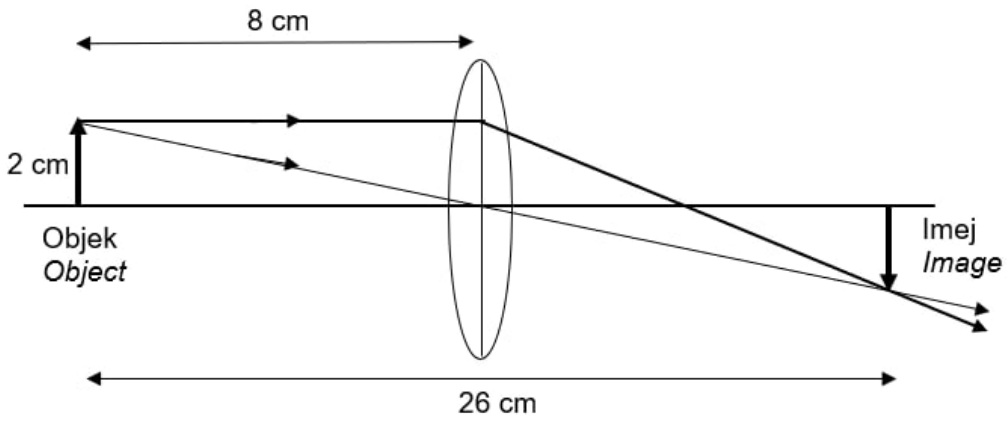
Pilih pasangan sudut yang mempunyai nilai yang sama
Choose pair of angles that have the same value

A I dan II sahaja
I and II only

B I dan III sahaja
I and III only

C I dan IV sahaja
I and IV only

20. Rajah 10 menunjukkan pembentukan imej suatu objek oleh sebuah kanta cembung.
Diagram 10 *shows the image formation of an object by a convex lens.*



Rajah 10
Diagram 10

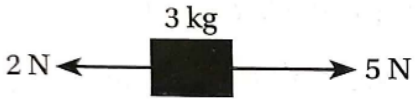
Jika tinggi objek ialah 2 cm, berapakah tinggi imej?
If the height of the object is 2 *cm, what is the height of the image?*

A 3.25 cm **C** 4.50 cm

B 4.00 cm **D** 6.50 cm

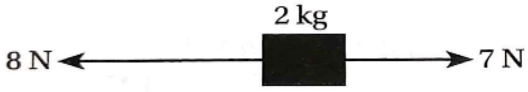
21. Situasi manakah yang akan menghasilkan pecutan minimum ?
Which situation will produce minimum acceleration ?

A

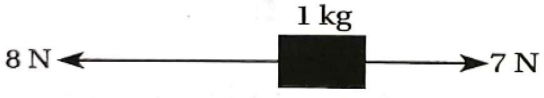


B

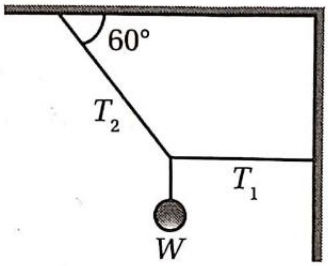
C



D



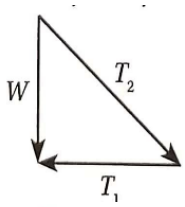
22. Rajah 11 menunjukkan sebuah pemberat digantung pada dua utas tali.
Diagram 11 *shows a weight hanging on two strings.*



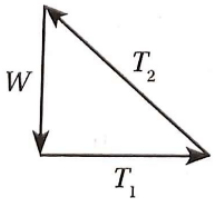
Rajah 11
Diagram 11

Tentukan segi tiga daya yang betul menunjukkan keseimbangan kesemua daya bertindak ke atas pemberat tersebut.
Determine the triangle of forces which is correct in showing the equilibrium of all forces acting on the weight.

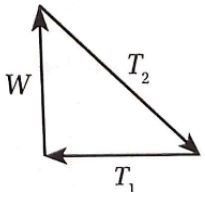
A



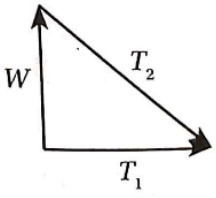
B



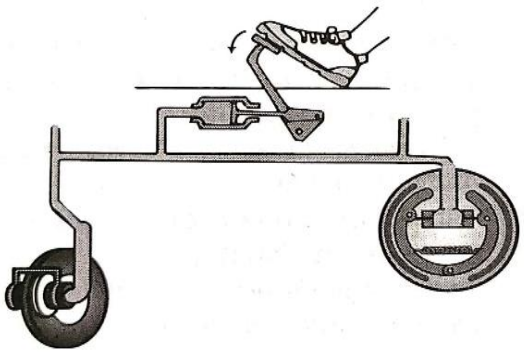
C



D



23. Rajah 12 menunjukkan suatu sistem brek yang digunakan dalam sebuah kenderaan. Nyatakan prinsip yang digunakan dalam prinsip kerja sistem brek tersebut.
Diagram 12 *shows a braking system which is used in a vehicle. State the principle used in the working principle of the braking system.*



Rajah 12
Diagram 12

A Prinsip Pascal
Pascal's principle

B Prinsip Bernoulli
Bernoulli's principle

C Prinsip Archimedes
Archimedes' principle

D Prinsip Keabadian Momentum
Principle of Conservation of Momentum

24. Rajah 13 menunjukkan seorang budak lelaki di atas sebuah pelampung.
Diagram 13 *shows a boy on a float.*

Rajah 13
Diagram 13

Hubungan antara kuantiti – kuantiti fizik manakah yang betul berdasarkan situasi itu?
Which relationship between the physical quantities is correct based on the situation?

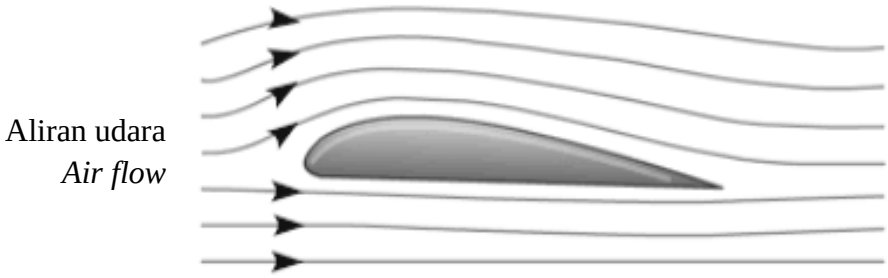
A Berat air disesarkan = berat budak lelaki + berat pelampung
Weight of water displaced = weight of the boy + weight of the float

B Berat air yang disesarkan > berat budak lelaki + berat pelampung
Weight of water displaced > weight of the boy + weight of the float

C Isipadu air yang disesarkan = isipadu budak lelaki + isipadu pelampung
Volume of water displaced = volume of the boy + volume of the float

D Isipadu air yang disesarkan > isipadu budak lelaki + isipadu pelampung
Volume of water displaced > volume of the boy + volume of the float

25. Gambar di bawah menunjukkan keratan rentas sayap kapal terbang yang berbentuk aerofoil. Antara berikut, manakah benar menerangkan aerofoil.
Picture below shows a cross-section of an aeroplane wing in the form of aerofoil. Which of the following is true describing aerofoil.



I Halaju udara di bahagian atas lebih besar dari bahagian bawah
Air velocity on the upper side is bigger than the bottom

II Halaju udara tinggi menghasilkan tekanan udara tinggi
The higher the air velocity, the higher the air pressure

III Mematuhi Hukum Boyle
Abide the Boyle's Law

IV Tekanan udara di bahagian atas rendah berbanding di bahagian bawah
Air pressure on the upperside is lower than the bottom

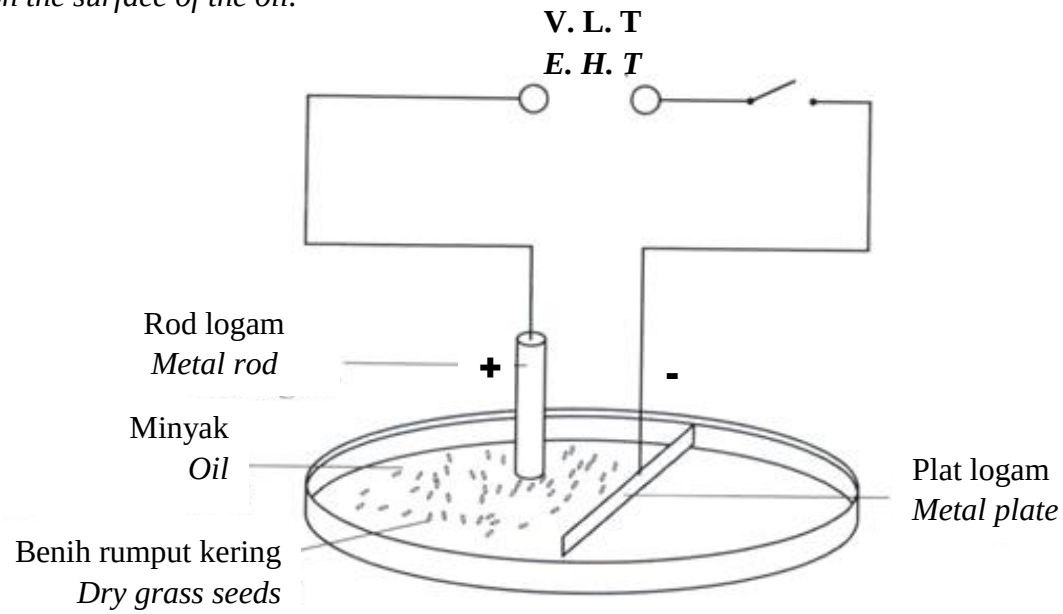
A I dan II sahaja
I and II only

B I dan III sahaja
I and III only

C I dan IV sahaja
I and IV only

D II dan III sahaja
II and III only

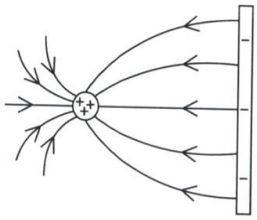
26. Rajah 14 di bawah menunjukkan satu rod logam dan satu plat logam berada di dalam piring petri berisi minyak. Kedua-dua rod dan plat logam itu disambungkan ke bekalan Voltan Lampau Tinggi (V.L.T). Benih rumput kering kemudiannya ditabur di atas permukaan minyak tersebut.
Diagram 14 *below shows a metal rod and a metal plate in an oil filled petri dish. Both rods are connected to the Extra High Tension (E. H. T) supply. Dry grass seeds are then sprinkled on the surface of the oil.*



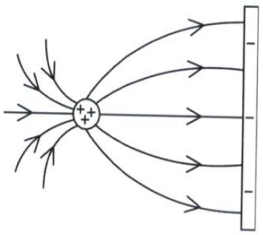
Rajah 14
Diagram 14

Pilih corak taburan benih rumput kering yang betul apabila suis dihidupkan.
Choose the correct pattern formation of the dry grass seeds when the switch is turned on.

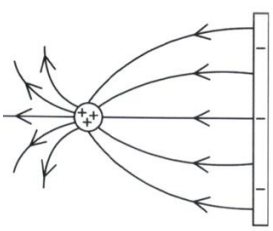
A



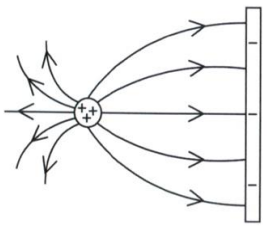
C



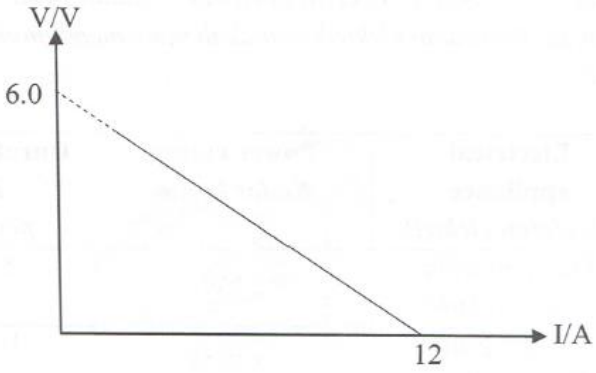
B



D



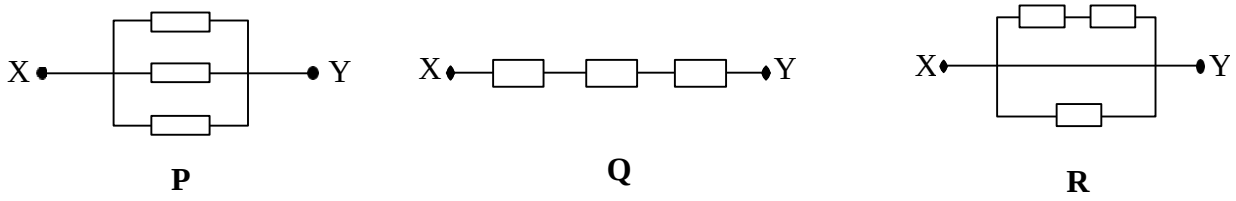
27. Graf di bawah menunjukkan beza keupayaan, V melawan arus, I bagi suatu sel kering.
The graph below shows potential difference, V *against current,* I *of a dry cell.*



Pilih pernyataan yang benar mengenai sel kering itu.
Choose the correct statement about the dry cell.

	Daya gerak elektrik/ V ***Electromotive force/* V**	**Rintangan dalam/ Ω** ***Internal resistance / Ω***
A	3.0	0.5
B	3.0	2.0
C	6.0	0.5
D	6.0	2.0

28. Rajah 15 menunjukkan tiga perintang yang serupa disambungkan seperti **P**, **Q** dan **R**.
Diagram 15 *shows three identical resistors are connected as* **P**, **Q** *and* **R**.



P **Q** **R**

Rajah 15
Diagram 15

Antara berikut pernyataan manakah yang betul mengenai rintangan berkesan antara XY dalam **P**, **Q** dan **R**?
Which of the following statement is true about the effective resistance across XY *in* **P**, **Q** *and* **R***?*

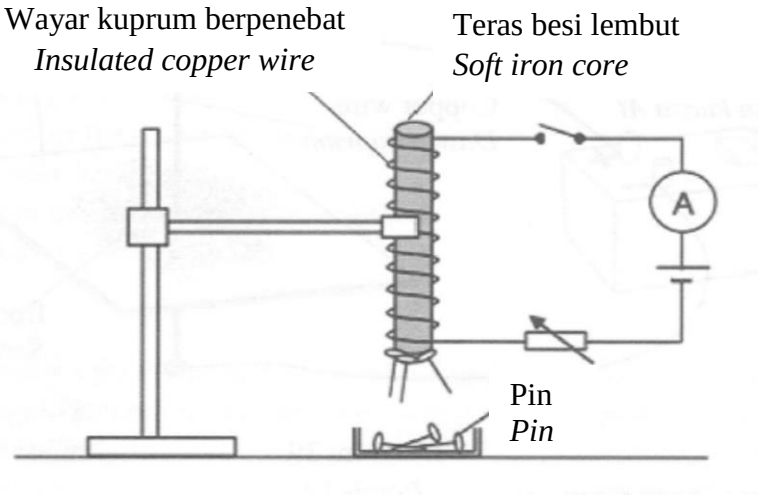
A Q > R > P

B P > R > Q

C Q > P > R

D R > Q > P

29. Rajah 16 menunjukkan susunan radas untuk mengkaji kekuatan suatu electromagnet.
Diagram 16 *shows the arrangement of apparatus to investigate the strength of an electromagnet.*



Rajah 16
Diagram 16

Bilangan pin yang tertarik kearah rod besi lembut boleh ditambah dengan
The number of pins attracted to the rod can be increased by

I menambahkan ketebalan wayar kuprum
Increasing the thickness of copper wire

. II menambahkan bilangan lilitan gegelung
Increasing the number of turns of the coil.

III mengurangkan rintangan rheostat.
Decrease the resistance of the rheostat.

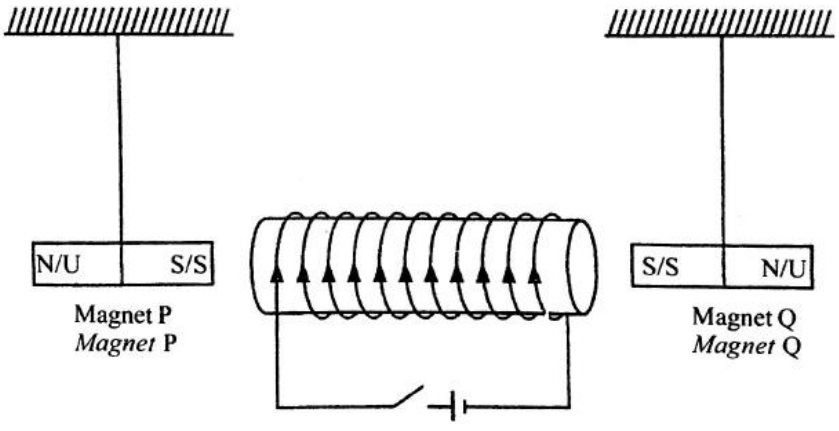
A I dan II sahaja
I and II only

B I dan III sahaja
I and III only

C II dan III sahaja
II and III only

D I, II dan III sahaja
I, II and III only

30. Rajah 17 menunjukkan dua magnet bar, **P** dan **Q** tergantung bebas di kedua-dua hujung solenoid.
Diagram 17 *shows two bar magnets,* **P** *and* **Q**, *hang freely at both ends of the solenoid.*

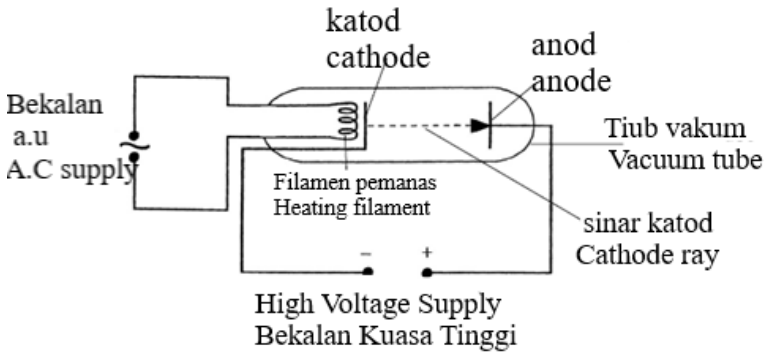


Rajah 17
Diagram 17

Nyatakan pemerhatian yang tepat apabila suis dihidupkan,
State the correct observation when the switch is turned on.

	Magnet P ***Magnet* P**	**Magnet Q** ***Magnet* Q**
A	Bergerak menjauhi solenoid *Moves away from the solenoid*	Bergerak mendekati solenoid *Moves towards the solenoid*
B	Bergerak menjauhi solenoid *Moves away from the solenoid*	Bergerak menjauhi solenoid *Moves away from the solenoid*
C	Bergerak mendekati solenoid *Moves towards the solenoid*	Bergerak mendekati solenoid *Moves towards the solenoid*
D	Bergerak mendekati solenoid *Moves towards the solenoid*	Bergerak menjauhi solenoid *Moves away from the solenoid*

31. Rajah 18 di bawah menunjukkan satu katod yang dipanaskan oleh satu filamen.
Diagram 18 *below shows a cathode being heated by a filament*.



Rajah 18
Diagram 18

Pilih zarah yang betul dipancarkan dari katod.
Choose the correct particle emitted from the cathode.

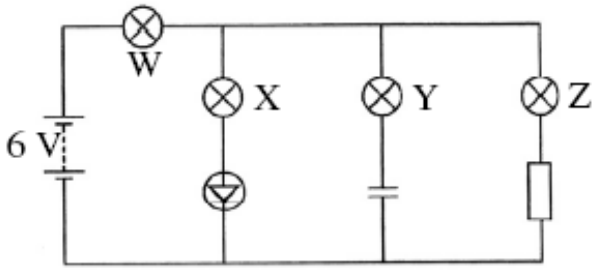
A Proton
Proton

B Neutron
Neutron

C Elektron
Electron

D Zarah Alfa
Alpha particle

32 Rajah 19 di bawah menunjukkan litar elektrik yang mengandungi 4 buah mentol, **W**, **X**, **Y** dan **Z** yang serupa. Tiga daripada mentol-mentol itu menyala berterusan.
Diagram 19 *below shows an electric circuit which contains* 4 *identical bulbs*, **W**, **X**, **Y** *and* **Z**. *Three of the bulbs light up continuously.*



Rajah 19
Diagram 19

Tentukan 3 mentol yang menyala berterusan berdasarkan rajah yang disediakan.
Determine the 3 *bulbs that light up continuously according to the given diagram.*

A W, Y, Z

B W, X, Z

C X, W, Y

D X, Y, Z

33. Pernyataan manakah yang betul mengenai suatu transistor?

Which statement about a transistor is correct?

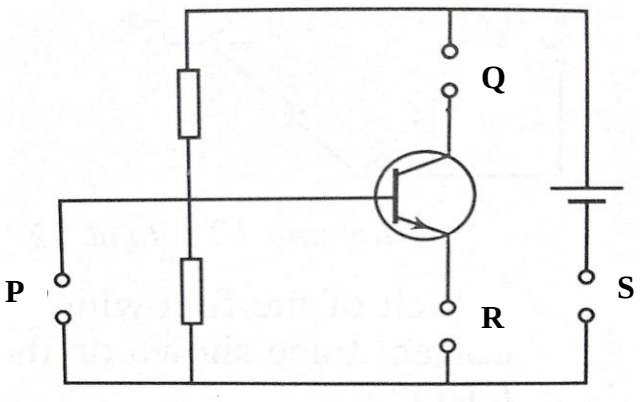
A Mempunyai dua elektrod
Has two electrodes

B Berfungsi sebagai rektifier gelombang penuh
Acts as a full wave rectifier

C Mempunyai bekalan tenaga dalam sendiri
Has its own internal energy supply

D Berfungsi sebagai amplifier
Functions as an amplifier

34. Rajah 20 menunjukkan sebuah litar transistor yang digunakan untuk meningkatkan isyarat audio daripada mikrofon. Kawasan bertanda **P**, **Q**, **R**, dan **S** perlu disambungkan dengan dawai atau komponen tertentu.
Diagram 20 *shows a transistor circuit used to amplify the audio signal from a microphone. The region labelled* **P**, **Q**, **R** *and* **S** *need to be connected with certain wire or components.*



Rajah 20
Diagram 20

Ramalkan kedudukan yang betul untuk menyambungkan mikrofon dalam litar transistor seperti di atas
Predict the correct position for a microphone to be connected in the transistor circuit as above.

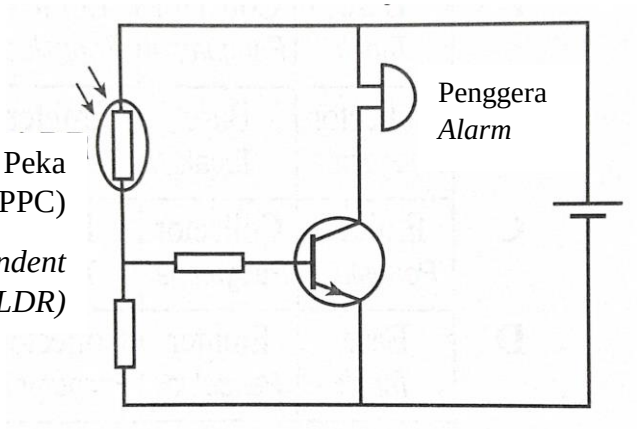
A P

B Q

C R

D S

35. Rajah 21 menunjukkan sebuah suis kawalan cahaya.
Diagram 21 *shows a light-controlled switch.*



Rajah 21
Diagram 21

Penggera itu akan dihidupkan jika
The alarm will be activated when

A persekitaran adalah gelap
the surrounding is dark

B persekitaran adalah cerah
the surrounding is bright

C suhu persekitaran adalah tinggi
the surrounding's temperature is high

D suhu persekitaran adalah rendah
the surrounding's temperature is low

36. Antara berikut yang manakah tidak dapat dijelaskan melalui teori gelombang klasik?
Which of the following cannot be explained by classical wave theory?

A Pembiasan
Refraction

B Pembelauan
Diffraction

C Interferens
Interference

D Fotoelektrik
Photoelectric

37. Pilih padanan yang betul mengenai ahli fizik berikut dengan teori masing-masing
Choose the correct match about the following physicists and their theories

	Ahli fizik ***Physicist***	**Teori** ***Theory***
A	Isaac Newton	Penemuan elektron *Discovery of electron*
B	J. J. Thomson	Cahaya terdiri daripada zarah *Light consists of particles*
C	Thomas Young	Idea tenaga kuanta *Idea of quantum of energy*
D	Louis de Broglie	Sifat kedualan gelombang-zarah *Wave-particle duality properties*

38. Frekuensi ambang bagi logam litium ialah 5.6×10^{14} Hz. Hitungkan fungsi kerja litium.
[Pemalar Planck, $h = 6.63 \times 10^{-34}$ J s]
The threshold frequency for lithium metal is 5.6×10^{14} Hz. *Calculate the work function of lithium.* [*Planck's constant, h* = 6.63×10^{-34} J s]

A 3.70×10^{-19} J

B 3.71×10^{-19} J

C 3.72×10^{-19} J

D 3.73×10^{-19} J

39. Contoh aplikasi kesan fotoelektrik adalah
An example of photoelectric effect application is

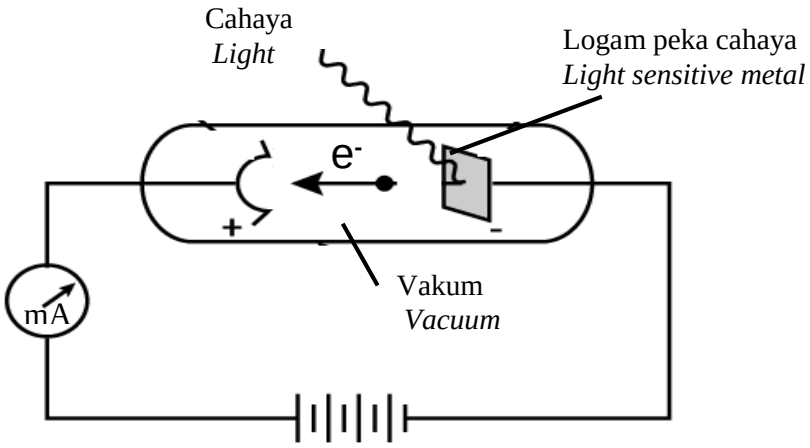
A Pengesan cahaya pada pintu automatic
Light detector at the automatic gate

B Pengesan asap pada sistem amaran kebakaran
Smoke detector on fire alarming system

C Penghasilan sinar X dalam mesin X-ray.
X-ray production in X-ray machines

D Proses mengecas bateri telefon mudah alih
The process of charging a mobile phone battery

40. Rajah 22 menunjukkan kesan fotoelektrik yang menghasilkan fotoelektron.
Diagram 22 *shows the photoelectric effect which produces photoelectron.*



Rajah 22
Diagram 22

Berdasarkan rajah tersebut tentukan pemerhatian yang benar mengenai teori kuantum cahaya
Based on the given diagram, choose the correct observations that best explained the quantum theory of light?

I Terdapat fotoelektron yang dipancarkan di bawah frekuensi ambang.
There are photoelectrons emitted below the threshold frequency.

II Fotoelektron dipancar secara serta-merta apabila permukaan logam disinar dengan cahaya.
Photoelectrons are emitted instantaneously when a metal surface is illuminated by light.

III Keamatan cahaya yang bertambah tidak menghasilkan fotoelektron yang lebih bertenaga kinetik.
An increase in the light intensity does not produce photoelectrons with a higher kinetic energy

A I dan II sahaja
I and II only

B II dan III sahaja
II and III only

C I dan III sahaja
I and III only

KERTAS SOALAN TAMAT

END OF QUESTION