

4531/1  
Physics  
Paper 1  
August/September  
2018  
1 ¼ hours



## MAKTAB RENDAH SAINS MARA

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### PEPERIKSAAN SIJIL PENDIDIKAN MRSMA 2018

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### PHYSICS

#### Paper 1

One hour and fifteen minutes

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**DO NOT OPEN THIS QUESTION BOOKLET UNTIL TOLD TO DO SO**

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

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This question booklet consists of **50** printed pages.

The following information may be useful. The symbols have their usual meaning.

*Maklumat berikut mungkin berfaedah. Simbol-simbol mempunyai makna yang biasa.*

1.  $a = \frac{v - u}{t}$
2.  $v^2 = u^2 + 2as$
3.  $s = ut + \frac{1}{2}at^2$
4. Momentum =  $mv$
5.  $F = ma$
6. Kinetic energy / Tenaga kinetik =  $\frac{1}{2}mv^2$
7. Gravitational potential energy / Tenaga keupayaan graviti =  $mgh$
8. Elastic potential energy / Tenaga keupayaan kenyal =  $\frac{1}{2}Fx$
9.  $\rho = \frac{m}{V}$
10. Pressure / Tekanan,  $P = h\rho g$
11. Pressure / Tekanan,  $P = \frac{F}{A}$
12. Heat / Haba,  $Q = mc\theta$
13. Heat / Heat,  $Q = ml$
14.  $\frac{PV}{T} = \text{constant} / \text{pemalar}$
15.  $E = mc^2$
16.  $v = f\lambda$
17. Power,  $P = \frac{\text{energy}}{\text{time}}$   
*Kuasa,  $P = \frac{\text{tenaga}}{\text{masa}}$*
18.  $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$

$$19. \lambda = \frac{ax}{D}$$

$$20. n = \frac{\sin i}{\sin r}$$

$$21. n = \frac{\text{real depth}}{\text{apparent depth}}$$

$$n = \frac{\text{dalam nyata}}{\text{dalam ketara}}$$

$$22. Q = It$$

$$23. V = \frac{E}{Q}$$

$$24. V = IR$$

$$25. \text{Power / Kuasa, } P = IV$$

$$26. \frac{N_s}{N_p} = \frac{V_s}{V_p}$$

$$27. \text{Efficiency / Kecekapan} = \frac{I_s V_s}{I_p V_p} \times 100\%$$

$$28. g = 10 \text{ m s}^{-2}$$

$$29. c = 3.0 \times 10^8 \text{ m s}^{-1}$$

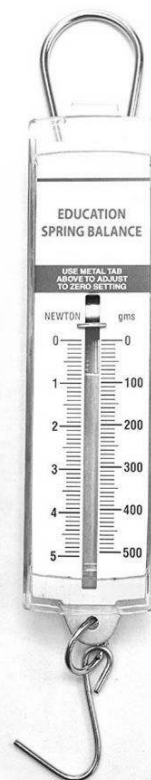
1 Which instrument used to measure potential difference?

*Instrumen manakah yang digunakan untuk mengukur beza keupayaan?*

A



B



C



D



- 2 The following are three readings X, Y and Z obtained from three different measuring instruments.

*Berikut adalah tiga bacaan X, Y dan Z yang diperolehi daripada tiga alat pengukuran yang berbeza.*

X = 75.8 m	Y = 3.56 mm	Z = 8.44 cm
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Which are the correct measuring instruments to obtain reading X, Y and Z?

*Alat pengukur manakah yang betul untuk mendapatkan bacaan X, Y dan Z?*

	X	Y	Z
<b>A</b>	Vernier calipers <i>Angkup vernier</i>	Micrometer screw gauge <i>Tolok skru mikrometer</i>	Measuring tape <i>Pita pengukur</i>
<b>B</b>	Micrometer screw gauge <i>Tolok skru mikrometer</i>	Measuring tape <i>Pita pengukur</i>	Vernier calipers <i>Angkup vernier</i>
<b>C</b>	Micrometer screw gauge <i>Tolok skru mikrometer</i>	Vernier calipers <i>Angkup vernier</i>	Measuring tape <i>Pita pengukur</i>
<b>D</b>	Measuring tape <i>Pita pengukur</i>	Micrometer screw gauge <i>Tolok skru mikrometer</i>	Vernier calipers <i>Angkup vernier</i>

- 3 Diagram 1 shows a boy and his uncle sitting on two identical beach balls.

*Rajah 1 menunjukkan seorang budak lelaki dan pakciknyang, masing-masing duduk di atas dua bola pantai yang serupa.*

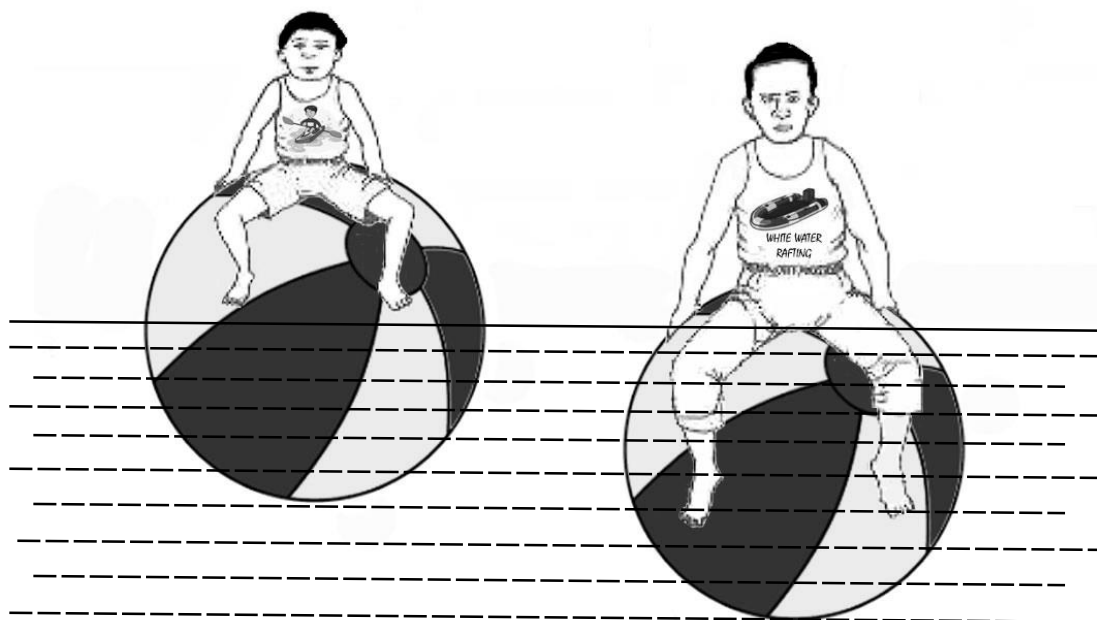


Diagram 1  
*Rajah 1*

Which hypothesis can be made from the situation?

*Hipotesis manakah yang boleh dibuat daripada situasi tersebut?*

- A** The depth of ball immersed depends on the total mass  
*Kedalaman bola tenggelam bergantung kepada jumlah jisim*
- B** The smaller the total mass, the deeper the ball immersed  
*Semakin kecil jumlah jisim, semakin dalam bola tenggelam*
- C** The volume of water displaced is affected by the total mass  
*Isipadu air tersesar dipengaruhi oleh jumlah jisim*
- D** The depth of ball immersed increases when the total mass increases  
*Kedalaman bola yang tenggelam bertambah apabila jumlah jisim bertambah*

- 4 Diagram 2 shows a track of Kuala Lumpur Fun Run 2018. All runners start at M and end at P.

*Rajah 2 menunjukkan laluan bagi Kuala Lumpur Fun Run 2018. Kesemua pelari bermula dari M dan berakhir pada P.*

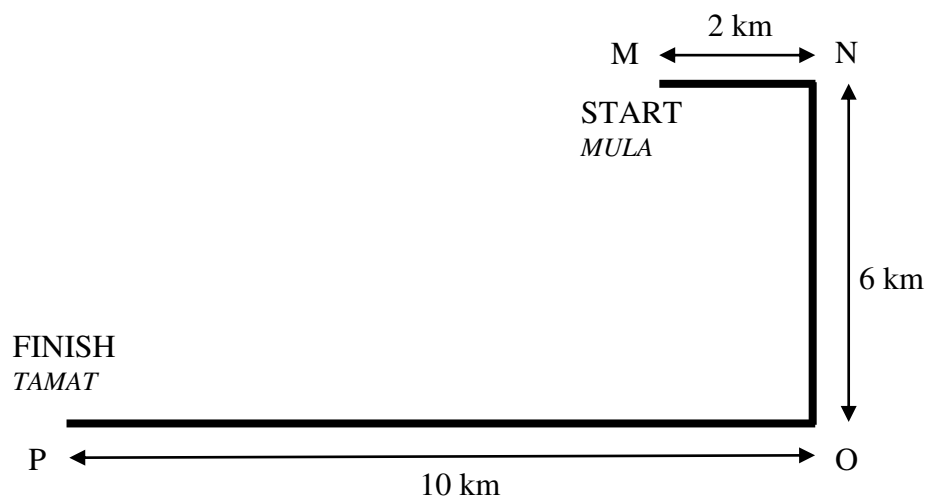


Diagram 2  
*Rajah 2*

What is the displacement of the runners?

*Berapakah sesaran pelari tersebut?*

- A 8.0 km
- B 10.0 km
- C 14.0 km
- D 18.0 km

5 Diagram 3 shows a graph of displacement against time.

Rajah 3 menunjukkan graf sesaran melawan masa.

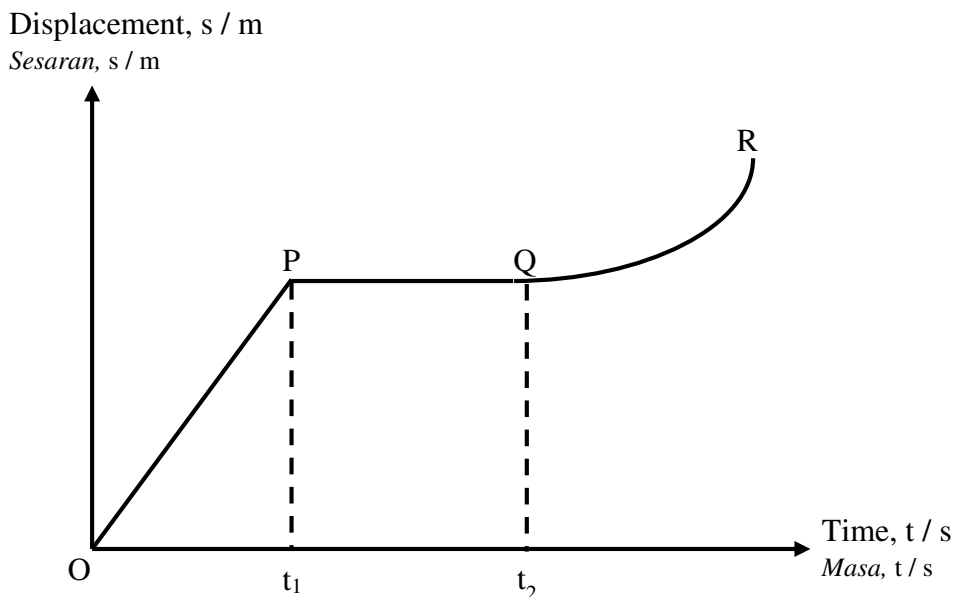


Diagram 3  
Rajah 3

Which of the velocities from the graph section is correct?

Halaju dari bahagian graf manakah yang betul?

	<b>Velocity at OP</b> <i>Halaju pada OP</i>	<b>Velocity at PQ</b> <i>Halaju pada PQ</i>	<b>Velocity at QR</b> <i>Halaju pada QR</i>
<b>A</b>	Increase <i>Bertambah</i>	Constant <i>Tetap</i>	Increase <i>Bertambah</i>
<b>B</b>	Constant <i>Tetap</i>	Zero <i>Sifar</i>	Increase <i>Bertambah</i>
<b>C</b>	Increase <i>Bertambah</i>	Constant <i>Tetap</i>	Decrease <i>Berkurang</i>
<b>D</b>	Constant <i>Tetap</i>	Zero <i>Sifar</i>	Decrease <i>Berkurang</i>



- 6 Diagram 4.1 shows a coin on the top of a loop.  
Diagram 4.2 shows the same loop is knocked by a pencil and the coin drops into a jar.

*Rajah 4.1 menunjukkan duit syiling pada bahagian atas sebuah lingkaran.*

*Rajah 4.2 menunjukkan lingkaran yang sama diketuk dengan sebatang pensil dan duit syiling jatuh ke dalam balang.*

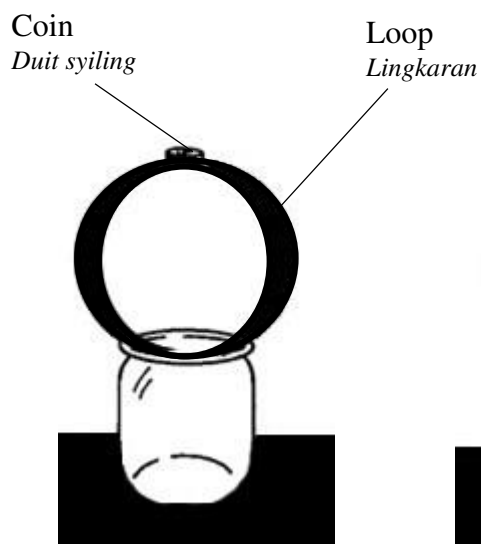


Diagram 4.1  
*Rajah 4.1*

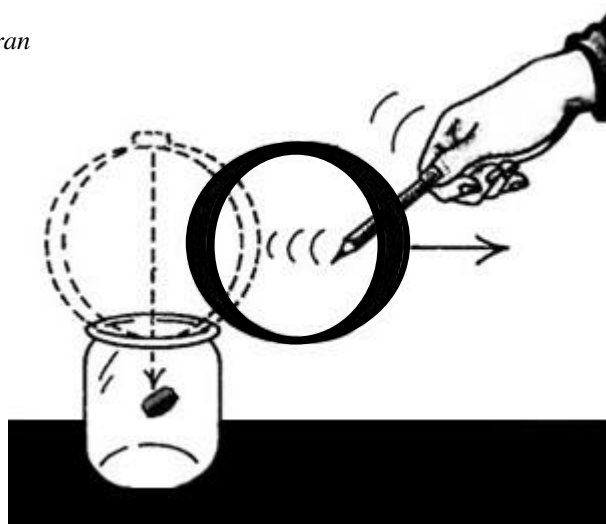


Diagram 4.2  
*Rajah 4.2*

Which physics concept is involved in the situation?

*Konsep fizik manakah yang terlibat dalam situasi tersebut?*

- A** Inertia  
*Inersia*
- B** Energy  
*Tenaga*
- C** Momentum  
*Momentum*
- D** Forces in equilibrium  
*Keseimbangan daya*

- 7 Diagram 5.1 shows a trolley with luggage being pushed with force,  $F$ .  
Diagram 5.2 shows the trolley with more luggage being pushed with the same force.

*Rajah 5.1 menunjukkan sebuah troli dengan bagasi sedang ditolak dengan daya,  $F$ .*

*Rajah 5.2 menunjukkan troli tersebut dengan bagasi yang lebih banyak sedang ditolak dengan daya yang sama.*

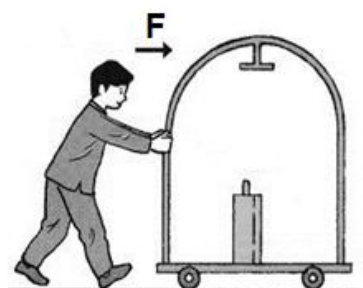


Diagram 5.1  
*Rajah 5.1*

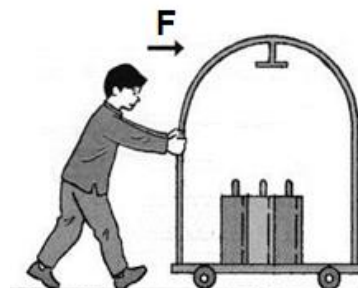


Diagram 5.2  
*Rajah 5.2*

What happen to the acceleration of the trolley in diagram 5.2?

*Apakah yang terjadi kepada pecutan troli itu dalam rajah 5.2?*

- A Decrease  
*Berkurang*
- B Increase  
*Bertambah*
- C Unchanged  
*Tidak berubah*

- 8 Diagram 6.1 shows Fazli driving a car.  
Diagram 6.2 shows an airbag inflate rapidly during a collision.

*Rajah 6.1 menunjukkan Fazli sedang memandu sebuah kereta.*

*Rajah 6.2 menunjukkan beg udara mengembang dengan cepat ketika perlanggaran.*

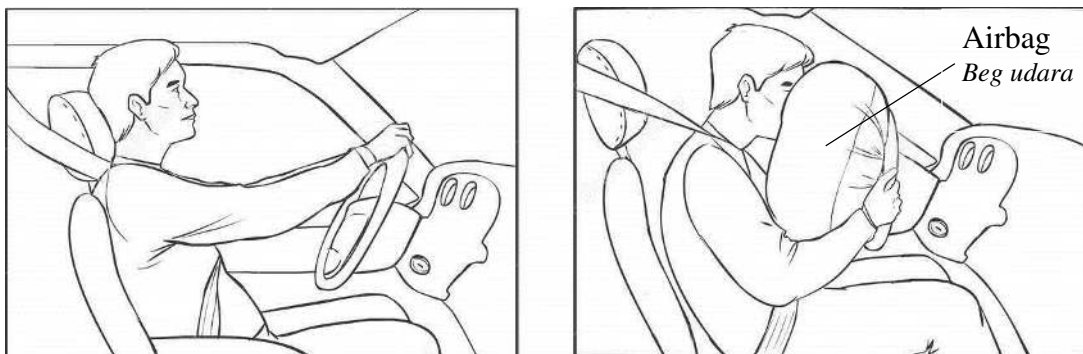


Diagram 6.1

*Rajah 6.1*

Diagram 6.2

*Rajah 6.2*

The airbag is designed to

*Beg udara direka untuk*

- A** reduce momentum  
*mengurangkan momentum*
- B** increase impulsive force  
*menambahkan daya impuls*
- C** lengthen the collision time  
*memanjangkan masa perlanggaran*
- D** prevent the driver being lurched forward  
*mengelakkan pemandu dari terhumban ke hadapan*

9 Diagram 7 shows a load of 250 kg is hung by two cables.

*Rajah 7 menunjukkan satu beban berjisim 250 kg digantung dengan dua kabel.*

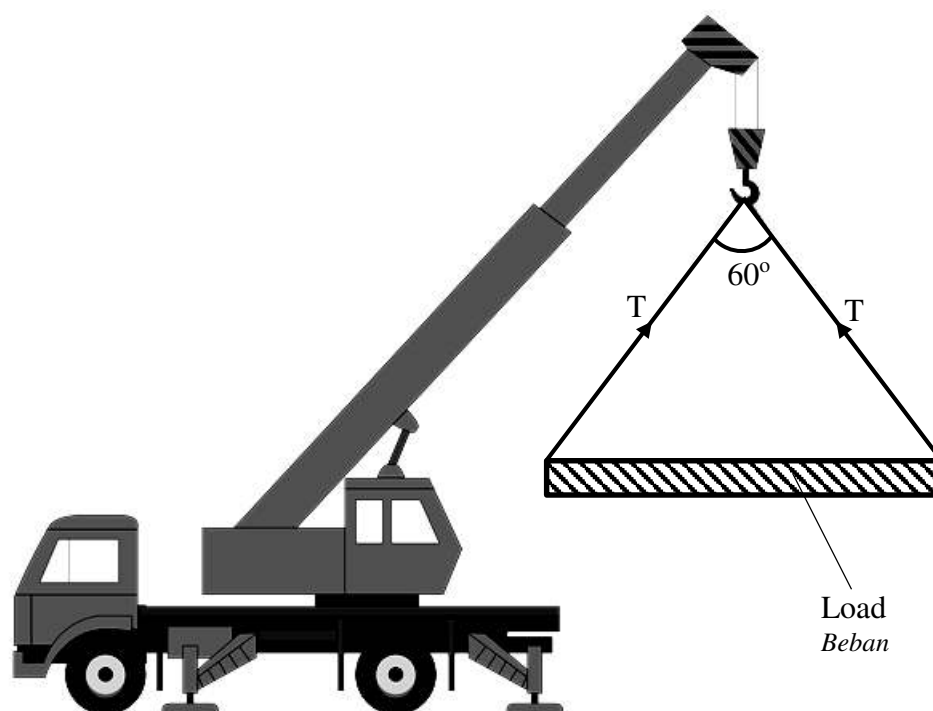


Diagram 7  
*Rajah 7*

What is the tension of each cable, T?

*Berapakah tegangan setiap kabel, T?*

- A 1250.00 N
- B 1443.38 N
- C 2500.00 N
- D 4330.13 N

10 Which situation experience forces in equilibrium?

*Situasi manakah yang mengalami keseimbangan daya?*

- A** A car moving down a hill with increasing velocity  
*Sebuah kereta menuruni bukit dengan halaju bertambah*
- B** A durian falls from a tree  
*Sebuah buah durian jatuh dari pokok*
- C** A rocket accelerates upward  
*Sebuah roket memecut ke atas*
- D** A ship floating at sea  
*Sebuah kapal terapung di laut*

11 Which situation shows no work being done?

*Situasi manakah yang menunjukkan tiada kerja dilakukan?*

**A**



Motion: Velocity decreases  
*Gerakan: Halaju berkurang*

**B**



Motion: Velocity increases  
*Gerakan: Halaju bertambah*

**C**



Motion: Constant velocity  
*Gerakan: Halaju seragam*

**D**



Motion: Constant acceleration  
*Gerakan: Pecutan seragam*

- 12 Diagram 8 shows a 2 kg load suspended on two different springs, P and Q. Both springs have the same initial length.

Rajah 8 menunjukkan 2 kg beban yang digantung pada dua spring yang berbeza, P dan Q. Kedua-dua spring mempunyai panjang asal yang sama.

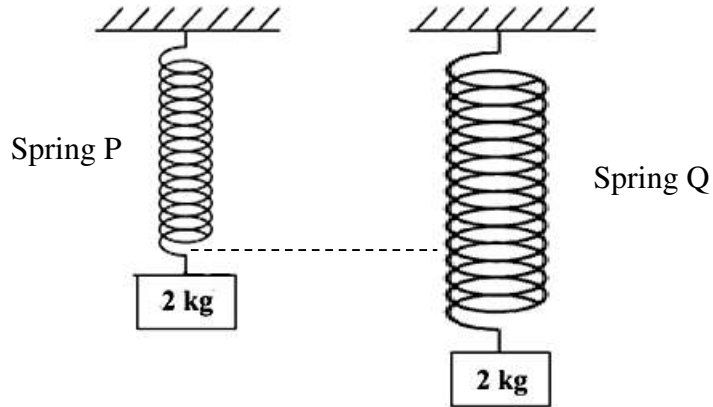
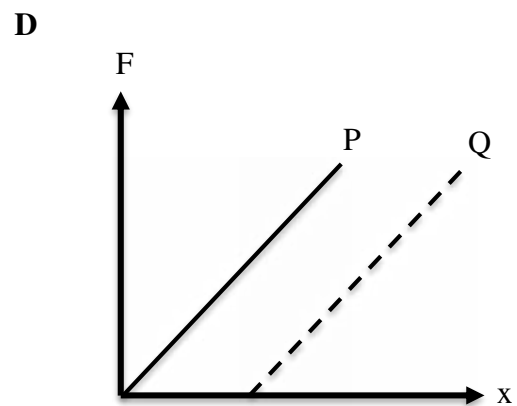
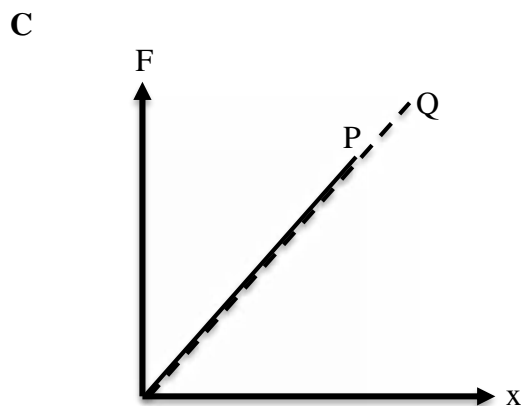
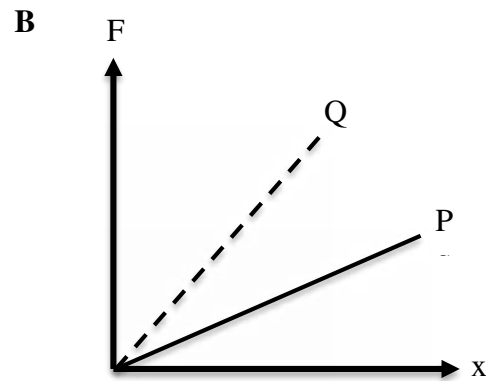
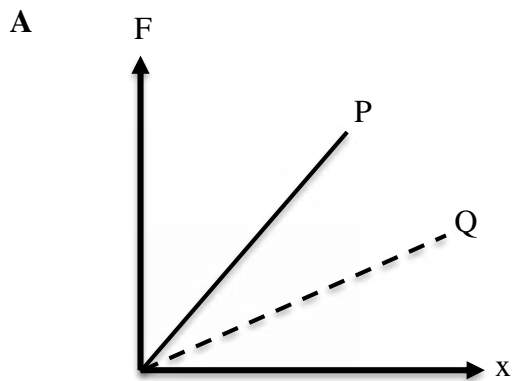


Diagram 8  
Rajah 8

Which graph shows the correct relationship between force,  $F$  and extension,  $x$ ?

Graf manakah yang menunjukkan hubungkait yang betul di antara daya,  $F$  dan pemanjangan,  $x$ ?



13 Diagram 9 shows a tractor on muddy ground.

*Rajah 9 menunjukkan sebuah traktor di atas tanah berlumpur.*

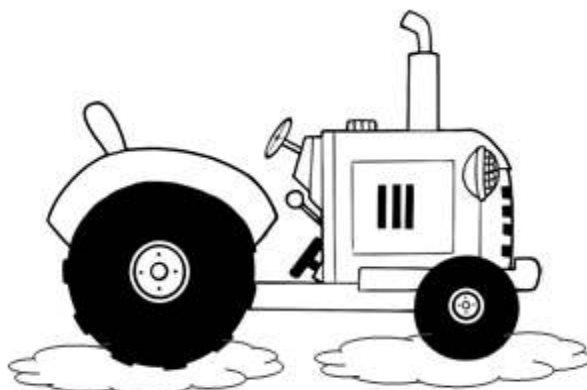


Diagram 9

*Rajah 9*

Why does the tractor has wide tyres?

*Mengapakah traktor tersebut mempunyai tayar yang lebar?*

**A** To do work faster

*Untuk melakukan kerja dengan pantas*

**B** To decrease the density of tyres

*Untuk mengurangkan ketumpatan tayar*

**C** To reduce pressure on the ground

*Untuk mengurangkan tekanan pada tanah*

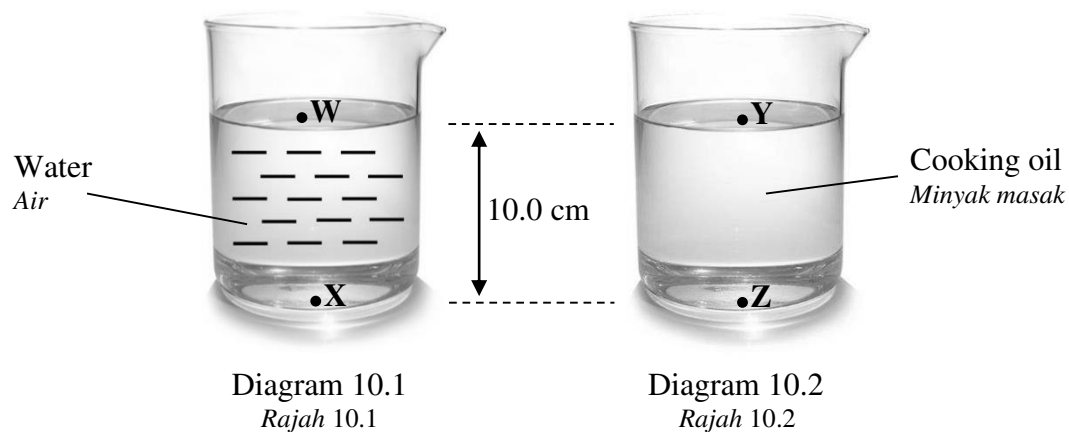
**D** To produce a strong grip on the ground

*Untuk menghasilkan cengkaman yang kuat pada tanah*

- 14 Diagram 10.1 shows two points W and X in water.  
Diagram 10.2 shows two points Y and Z in cooking oil.

*Rajah 10.1 menunjukkan dua titik W dan X dalam air.*

*Rajah 10.2 menunjukkan dua titik Y dan Z dalam minyak masak.*



Which comparison is correct about the liquid pressure, P?

*Perbandingan manakah yang betul tentang tekanan cecair, P?*

- A  $P_X > P_W > P_Z > P_Y$
- B  $P_X > P_Z > P_W > P_Y$
- C  $P_X > P_Z$  ;  $P_W = P_Y$
- D  $P_X = P_Z$  ;  $P_W = P_Y$



15 Diagram 11 shows a manometer being connected to a gas supply.

*Rajah 11 menunjukkan sebuah manometer yang disambungkan kepada bekalan gas.*

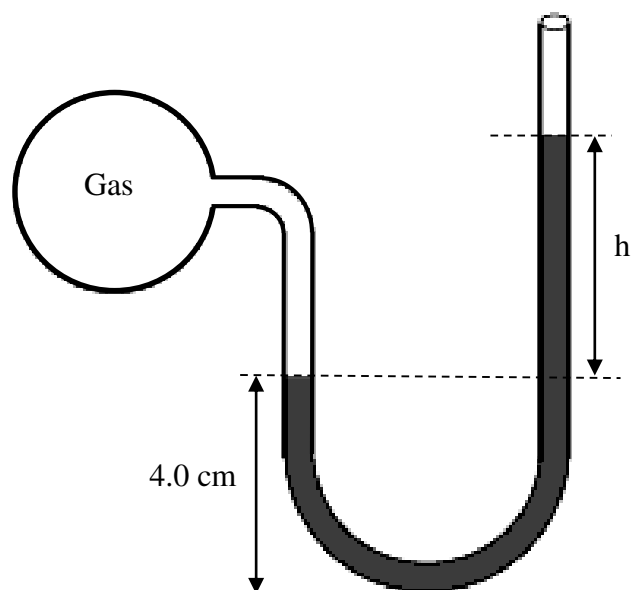


Diagram 11  
*Rajah 11*

What is the value of **h** if the pressure of the gas is 82.0 cm Hg?

*Berapakah nilai **h** jika tekanan gas adalah 82.0 cm Hg?*

Atmospheric pressure = 76.0 cm Hg

*Tekanan atmosfera = 76.0 cm Hg*

- A 4.0 cm
- B 6.0 cm
- C 8.0 cm
- D 10.0 cm

16 Diagram 12 shows a fork-lift truck.

*Rajah 12 menunjukkan sebuah trak angkat susun.*



Diagram 12

*Rajah 12*

Which principle is related to the fork-lift truck?

*Prinsip manakah yang berkaitan dengan trak angkat susun tersebut?*

**A** Pascal's Principle

*Prinsip Pascal*

**B** Bernoulli's Principle

*Prinsip Bernoulli*

**C** Archimedes' Principle

*Prinsip Archimedes*

**D** Principle of Conservation of Momentum

*Prinsip Keabadian Momentum*

17 Diagram 13 shows a hydraulic brake system used to stop a moving car.

*Rajah 13 menunjukkan sebuah sistem brek hidraulik digunakan untuk menghentikan pergerakan sebuah kereta.*

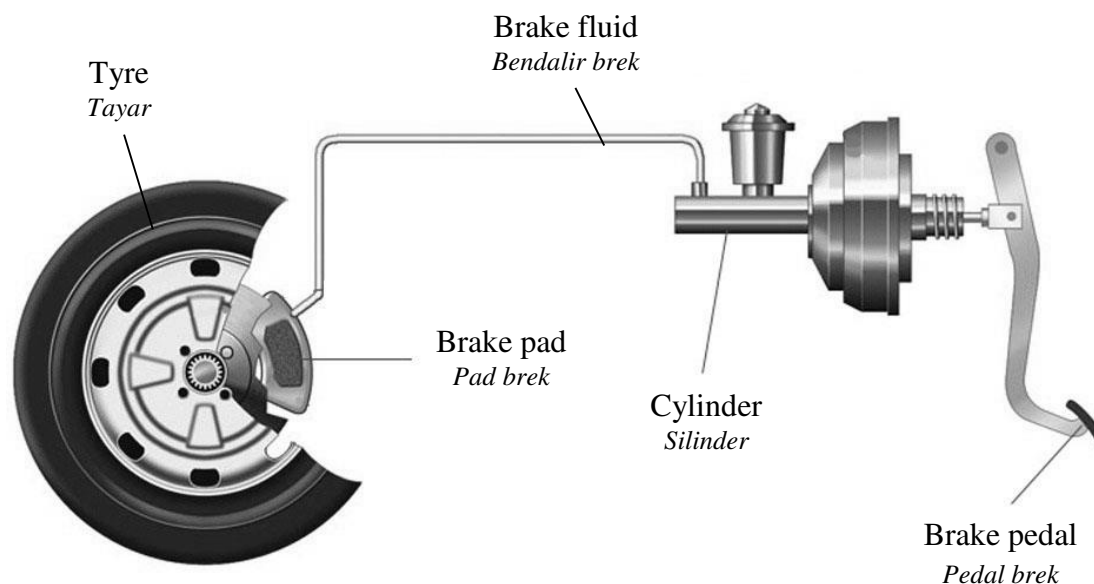


Diagram 13  
*Rajah 13*

Which statement is correct about the hydraulic brake system?

*Pernyataan manakah yang betul bagi sistem brek hidraulik tersebut?*

- A** Pressure changes with depth  
*Tekanan berubah dengan kedalaman*
- B** Pressure changes with fluid velocity  
*Tekanan berubah dengan halaju bendalir*
- C** Pressure is transmitted equally in the fluid  
*Tekanan dipindahkan secara seragam dalam bendalir*
- D** Force is transmitted equally through the cylinder  
*Daya dipindahkan secara seragam melalui silinder*

18 Diagram 14 shows a wooden block with height of 4.0 cm is pushed into water.

Rajah 14 menunjukkan sebuah bongkah kayu dengan ketinggian 4.0 cm ditekan ke dalam air.

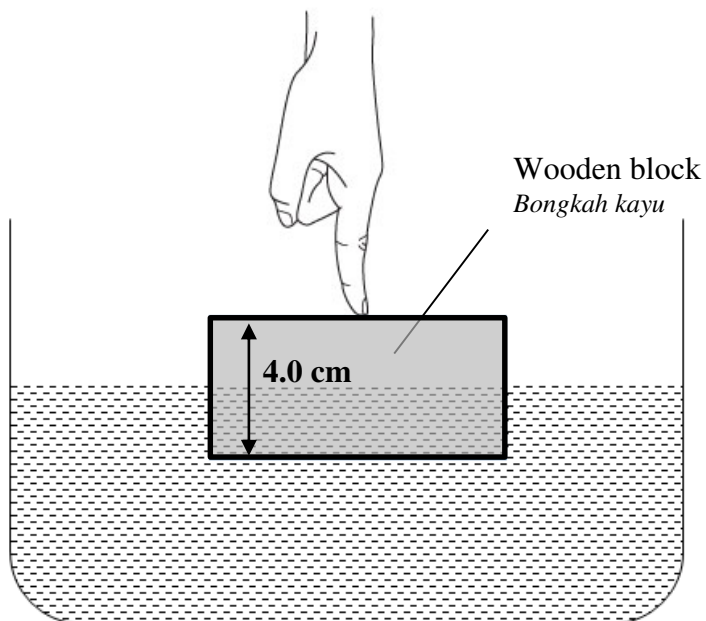
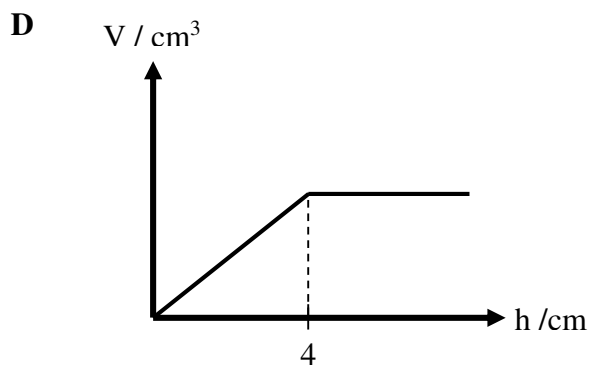
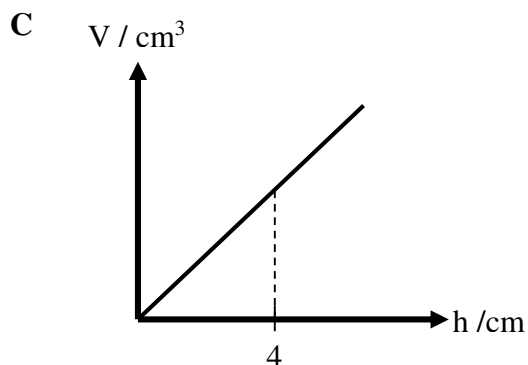
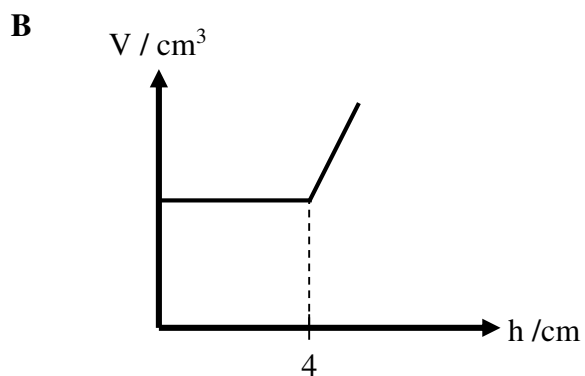
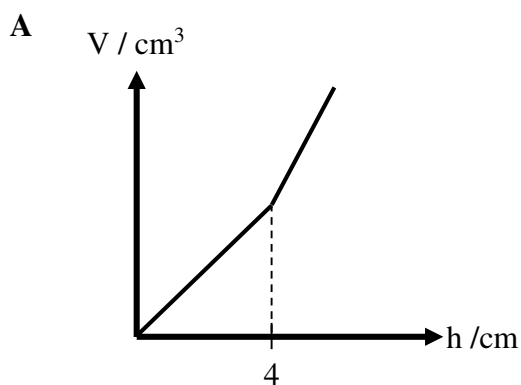


Diagram 14  
Rajah 14

Which of the graph shows the relationship between volume of water displaced,  $V$  and depth of sinking,  $h$ ?

Graf manakah yang menunjukkan hubungan antara isipadu air tersesar,  $V$  dan kedalaman bahagian yang tenggelam,  $h$ ?



19 Diagram 15 shows a thermometer is used to measure the temperature of patient.

*Rajah 15 menunjukkan sebuah termometer digunakan untuk mengukur suhu pesakit.*



Diagram 15  
*Rajah 15*

Which concept explains the working principle of the thermometer?

*Konsep manakah yang menerangkan prinsip kerja termometer?*

**A** Specific heat capacity

*Muatan haba tentu*

**B** Thermal equilibrium

*Keseimbangan terma*

**C** Thermal contact

*Sentuhan terma*

**D** Heat transfer

*Pemindahan haba*

- 20 Diagram 16.1 shows a cube of ice melting.  
Diagram 16.2 shows water boiling in a glass container.

*Rajah 16.1 menunjukkan ketulan ais sedang melebur.*

*Rajah 16.2 menunjukkan air sedang mendidih di dalam sebuah bekas kaca.*



Diagram 16.1  
*Rajah 16.1*



Diagram 16.2  
*Rajah 16.2*

Which pair is correct for both situation?

*Pasangan manakah yang betul bagi kedua-dua situasi?*

	Temperature of the melting ice <i>Suhu ais melebur</i>	Temperature of boiling water <i>Suhu air mendidih</i>
<b>A</b>	Constant <i>Seragam</i>	Constant <i>Seragam</i>
<b>B</b>	Constant <i>Seragam</i>	Increasing <i>Bertambah</i>
<b>C</b>	Increasing <i>Bertambah</i>	Constant <i>Seragam</i>
<b>D</b>	Increasing <i>Bertambah</i>	Increasing <i>Bertambah</i>

21 Diagram 17 shows an apparatus to investigate gas law.

*Rajah 17 menunjukkan radas yang digunakan untuk mengkaji hukum gas.*

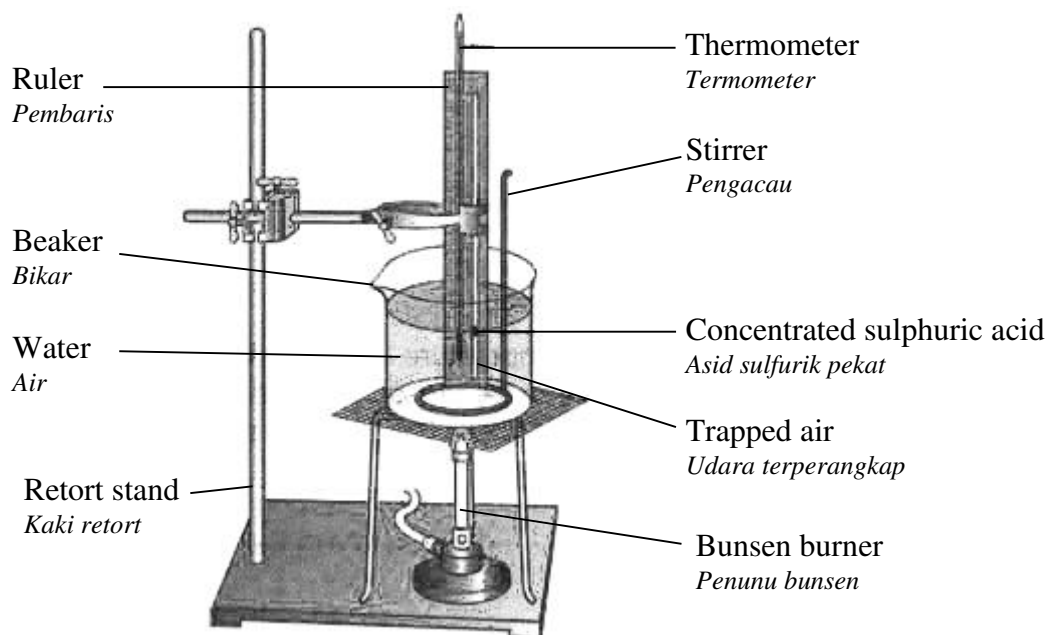


Diagram 17  
*Rajah 17*

Which gas law uses the apparatus as above?

*Hukum gas manakah yang menggunakan set radas seperti di atas?*

- A Boyle's law  
*Hukum Boyle*
- B Charles' law  
*Hukum Charles*
- C Pressure law  
*Hukum Tekanan*

- 22 Diagram 18 shows light ray propagates through a glass block. The refractive index of the glass is 1.50.

*Rajah 18 menunjukkan sinar cahaya merambat melalui satu bongkah kaca. Indeks biasan kaca ialah 1.50.*

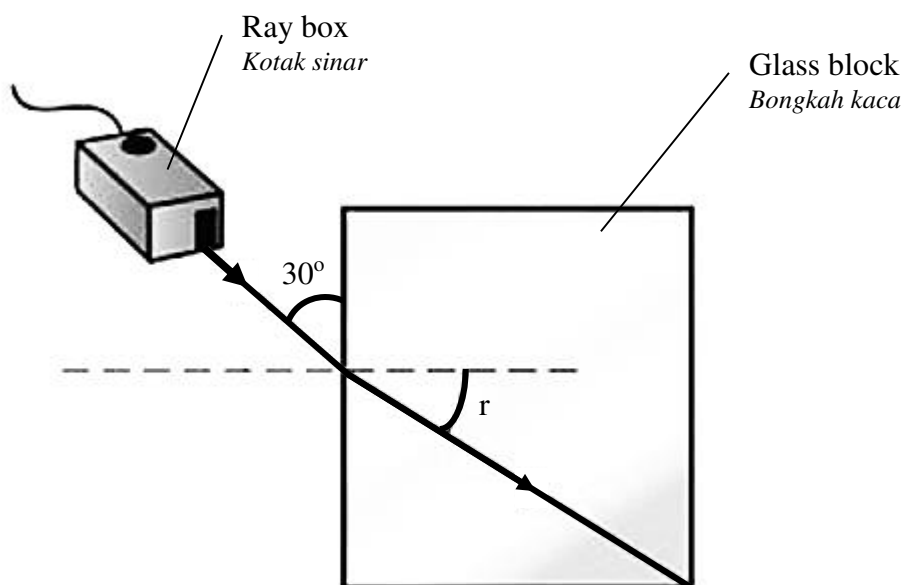


Diagram 18  
*Rajah 18*

What is the angle of refraction,  $r$  of the light ray?

*Berapakah sudut biasan,  $r$  sinar cahaya tersebut?*

- A  $19^\circ$
- B  $25^\circ$
- C  $35^\circ$
- D  $49^\circ$



23 Diagram 19 shows a prism binoculars.

Rajah 19 menunjukkan sebuah binokular prisma.

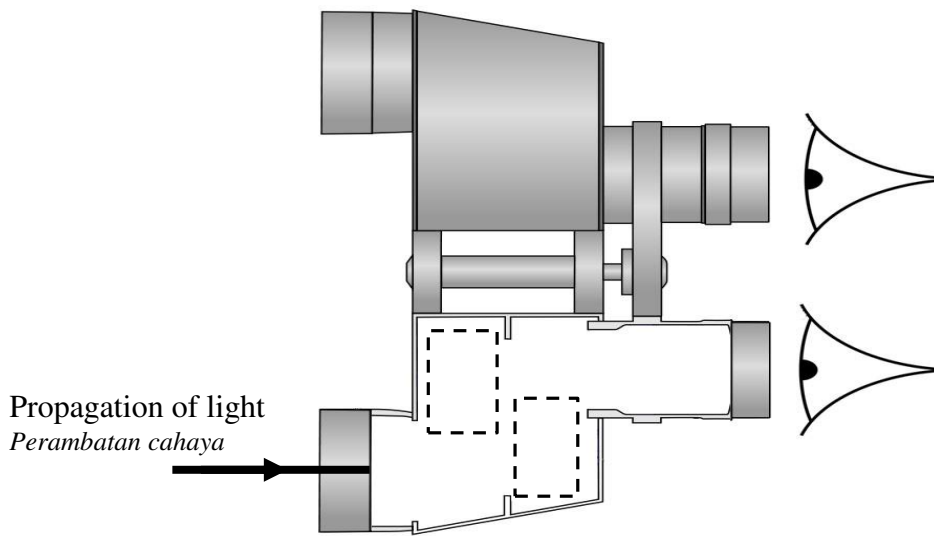
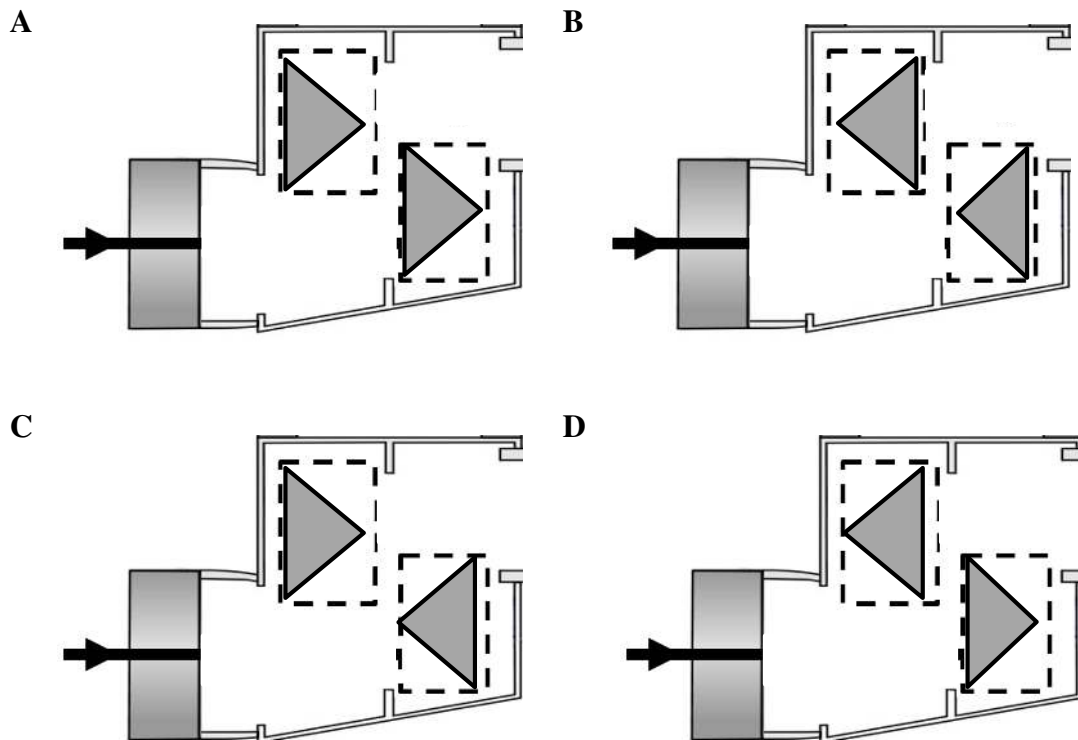


Diagram 19  
Rajah 19

Which diagram shows the correct arrangement of prisms?

Rajah manakah yang menunjukkan susunan prisma yang betul?



24 Diagram 20 shows a ray diagram of convex lens.

*Rajah 20 menunjukkan rajah sinar sebuah kanta cembung.*

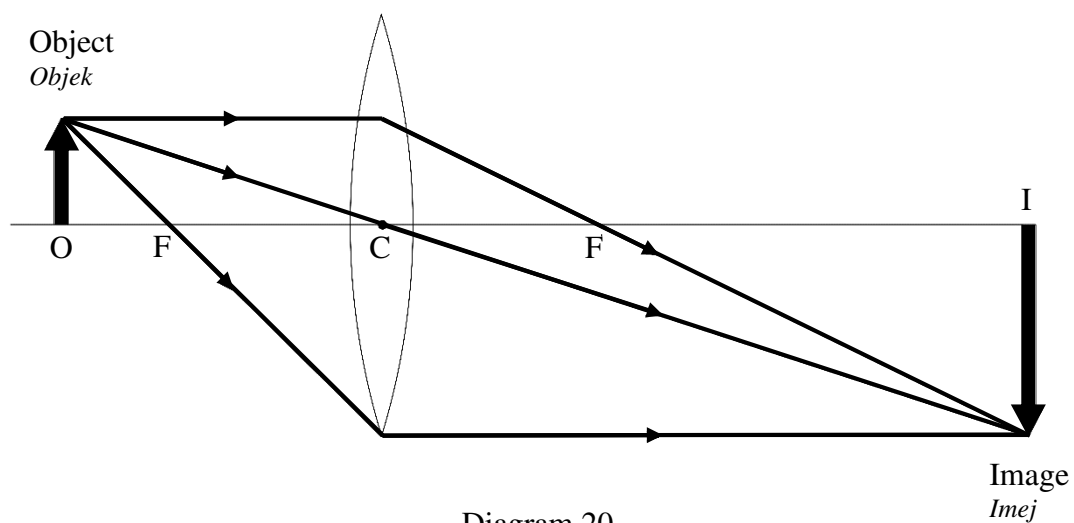


Diagram 20  
*Rajah 20*

What happen to the image if the object is placed at a distance less than focal length?

*Apakah yang berlaku kepada imej jika objek diletakkan pada jarak kurang dari jarak fokus?*

- A** Image is virtual  
*Imej adalah maya*
- B** Image is smaller  
*Imej adalah mengecil*
- C** Image is inverted  
*Imej adalah songsang*
- D** Image is laterally inverted  
*Imej adalah songsang sisi*

25 Diagram 21 shows light rays passing through a concave lens.

*Rajah 21 menunjukkan sinar cahaya melalui satu kanta cekung.*

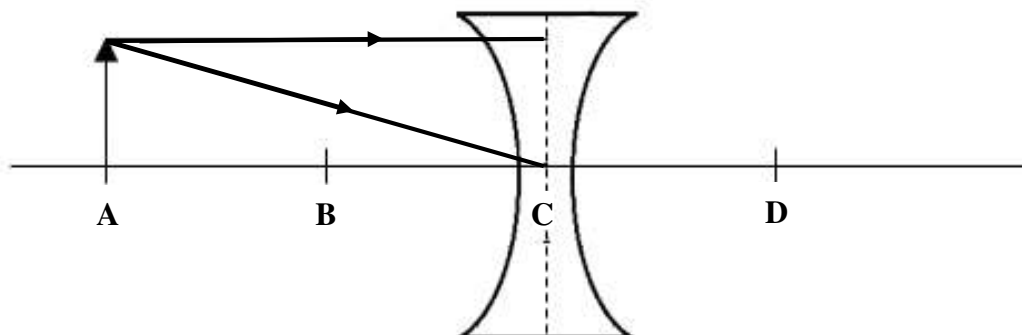


Diagram 21

*Rajah 21*

Which point **A**, **B**, **C** or **D** is the focal point?

*Titik manakah antara **A**, **B**, **C** atau **D** adalah titik fokus?*

26 Which statement is correct about longitudinal wave?

*Pernyataan manakah yang betul tentang gelombang membujur?*

**A** The speed of wave is  $3 \times 10^8 \text{ m s}^{-1}$

*Kelajuan gelombang adalah  $3 \times 10^8 \text{ m s}^{-1}$*

**B** The wave can propagate through vacuum

*Gelombang tersebut boleh merambat melalui vakum*

**C** Electromagnetic waves are longitudinal wave

*Gelombang elektromagnet adalah gelombang membujur*

**D** Vibration of medium particles is parallel to the direction of propagation of waves

*Getaran zarah medium adalah selari dengan arah perambatan gelombang*

27 Diagram 22 shows circular waves.

*Rajah 22 menunjukkan gelombang membulat.*

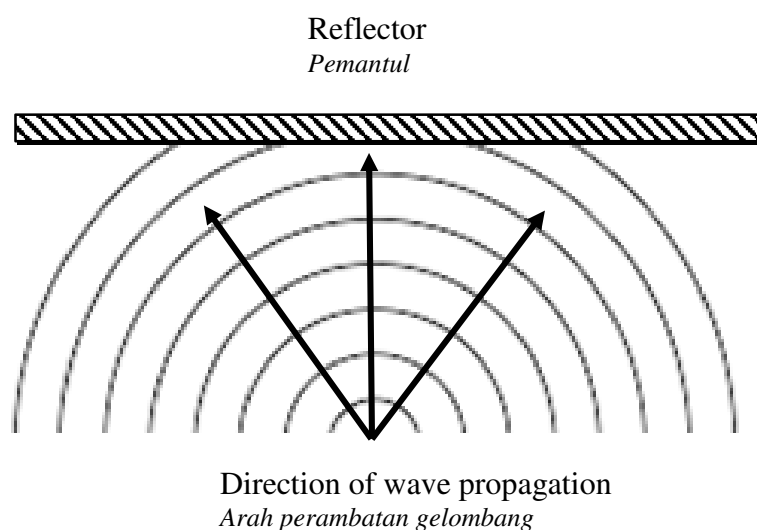


Diagram 22

*Rajah 22*

Which quantity changes after the wave is being reflected?

*Kuantiti manakah yang berubah setelah gelombang dipantulkan?*

**A** Speed

*Laju*

**B** Frequency

*Frekuensi*

**C** Wavelength

*Panjang gelombang*

**D** Direction of propagation of wave

*Arah perambatan gelombang*

28 Diagram 23 shows a tilted basin containing water. A spherical vibrator is used to produce waves.

Rajah 23 menunjukkan sebuah besen condong yang berisi air. Satu penggetar sfera digunakan untuk menghasilkan gelombang.

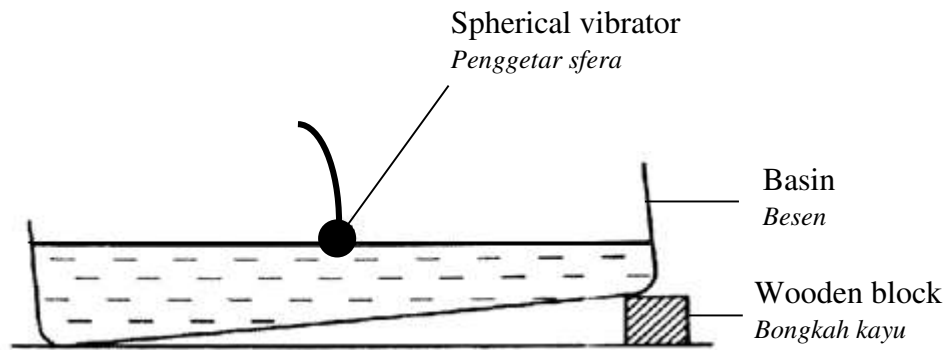


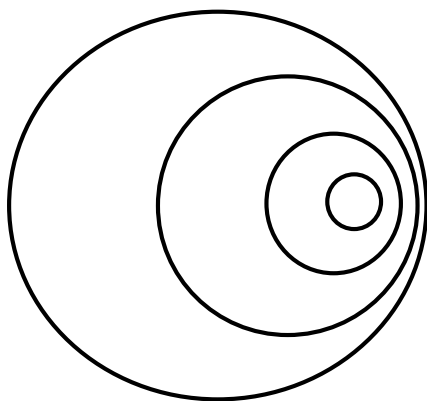
Diagram 23

Rajah 23

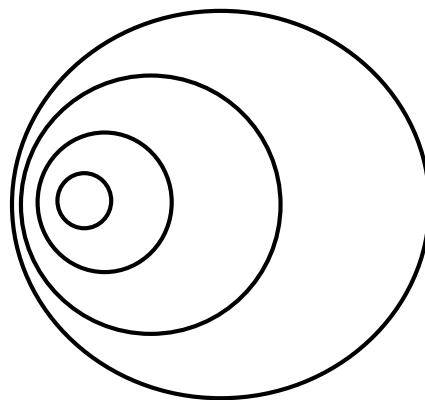
Which wave pattern will be observed in the basin?

Corak gelombang manakah yang akan diperhatikan di dalam besen?

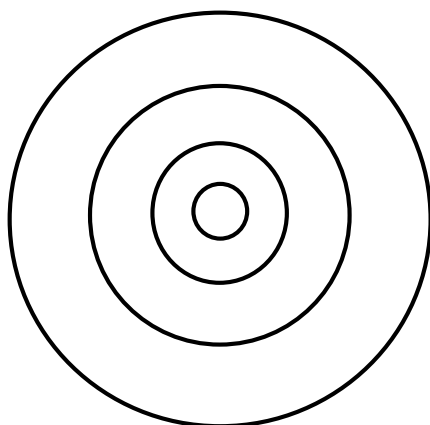
A



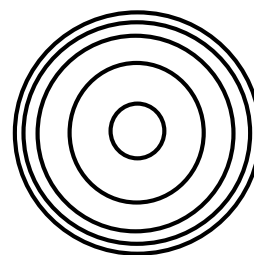
B



C



D



- 29 Diagram 24 shows water waves propagating through a gap. Depth of the water is the same.

*Rajah 24 menunjukkan gelombang air yang merambat melalui satu celah. Kedalaman air adalah sama.*

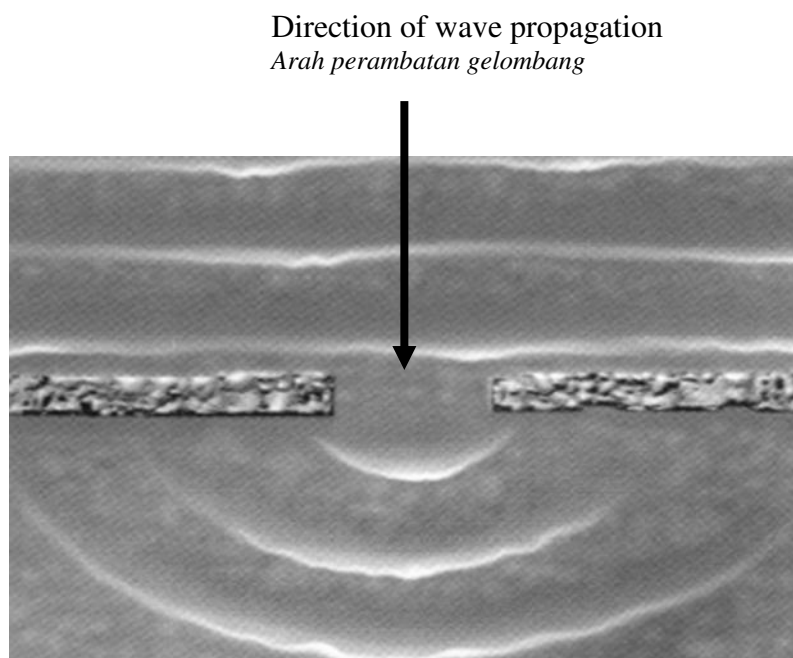


Diagram 24  
*Rajah 24*

Which quantity changes when the waves pass through the gap?

*Kuantiti manakah yang berubah apabila gelombang melepasi celah tersebut?*

- A** Speed decreases  
*Laju berkurang*
- B** Energy decreases  
*Tenaga berkurang*
- C** Frequency decreases  
*Frekuensi berkurang*
- D** Wavelength decreases  
*Panjang gelombang berkurang*

30 Diagram 25 shows an interference pattern.

*Rajah 25 menunjukkan satu corak interferens.*

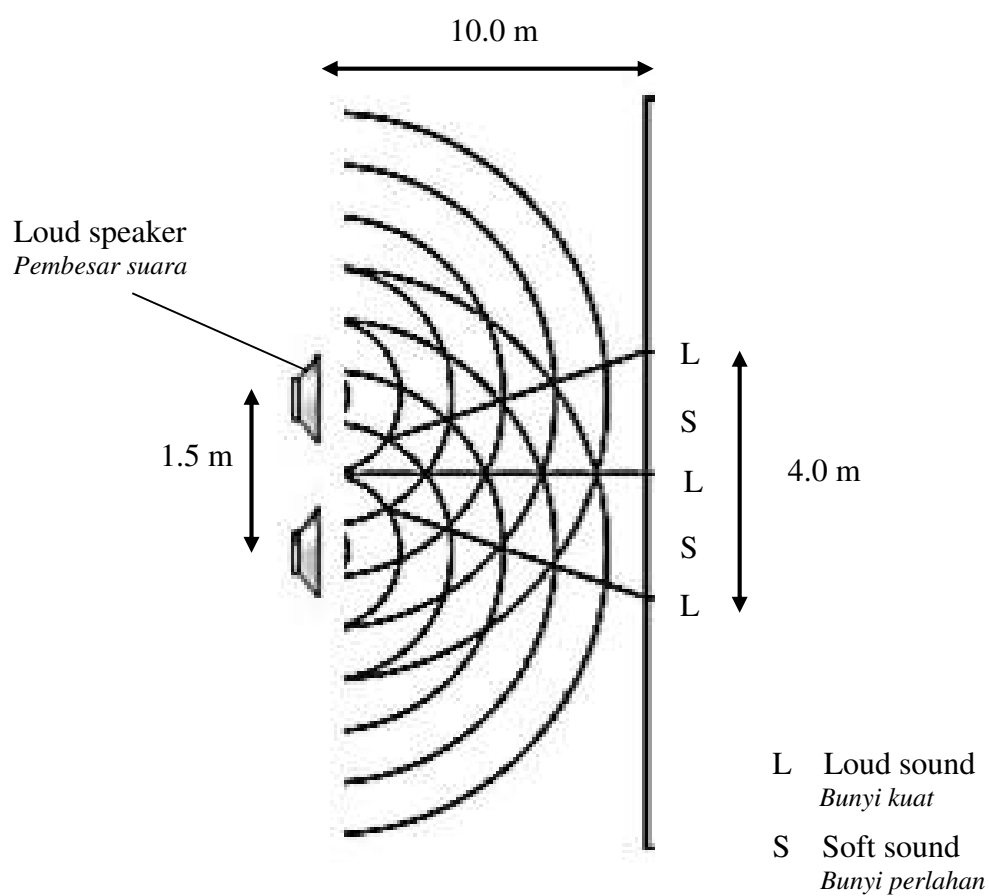


Diagram 25  
*Rajah 25*

What is the value of wavelength?

*Berapakah nilai panjang gelombang?*

- A 0.15 m
- B 0.30 m
- C 0.60 m
- D 7.50 m

31 Diagram 26 shows a singer plucking his guitar.

*Rajah 26 menunjukkan seorang penyanyi memetik gitar.*



Diagram 26

*Rajah 26*

High pitch produced by the guitar is due to

*Kelangsingan yang tinggi dihasilkan oleh gitar disebabkan oleh*

- A** high amplitude  
*amplitud tinggi*
- B** lower amplitude  
*amplitud rendah*
- C** high frequency  
*frekuensi tinggi*
- D** lower frequency  
*frekuensi rendah*



32 Diagram 27 shows spectrum of electromagnetic waves.

*Rajah 27 menunjukkan spektrum gelombang elektromagnet.*

<b>P</b>	X-ray <i>Sinar X</i>	Ultra violet <i>Ultra ungu</i>	<b>Q</b>	Infrared <i>Infra merah</i>	<b>R</b>	Radiowave <i>Gelombang radio</i>
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Diagram 27

*Rajah 27*

What are represented by P, Q and R?

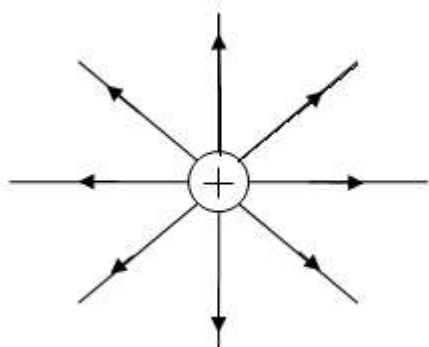
*Apakah yang diwakili oleh P, Q dan R?*

	<b>P</b>	<b>Q</b>	<b>R</b>
<b>A</b>	Microwave <i>Gelombang mikro</i>	Visible light <i>Cahaya nampak</i>	Gamma ray <i>Sinar gama</i>
<b>B</b>	Gamma ray <i>Sinar gama</i>	Microwave <i>Gelombang mikro</i>	Visible light <i>Cahaya nampak</i>
<b>C</b>	Gamma ray <i>Sinar gama</i>	Visible light <i>Cahaya nampak</i>	Microwave <i>Gelombang mikro</i>
<b>D</b>	Microwave <i>Gelombang mikro</i>	Gamma ray <i>Sinar gama</i>	Visible light <i>Cahaya nampak</i>

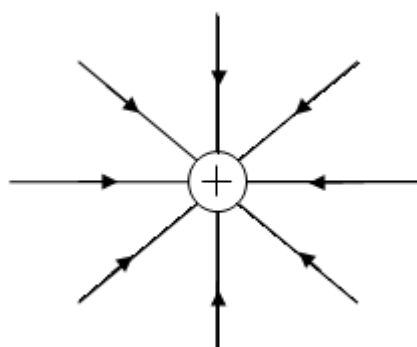
33 Which electric field pattern of a positive charge is correct?

*Corak medan elektrik bagi satu cas positif manakah yang betul?*

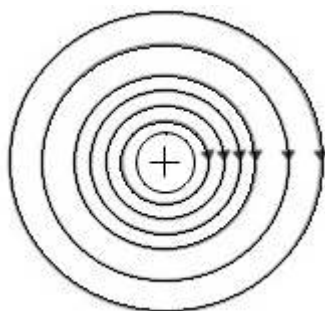
A



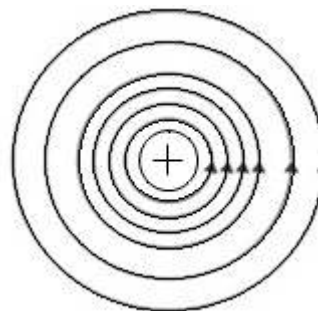
B



C



D



34 Diagram 28 shows a voltage-current graph for a conductor.

*Rajah 28 menunjukkan graf voltan-arus bagi satu konduktor.*

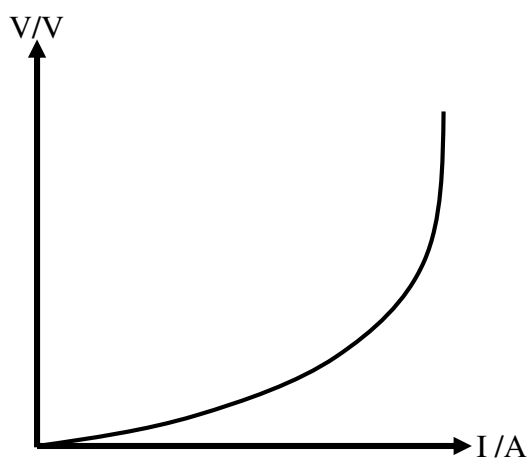


Diagram 28

*Rajah 28*

Which statement is correct about the graph?

*Pernyataan manakah yang betul mengenai graf tersebut?*

- A** The conductor obey Ohm's Law  
*Konduktor tersebut mematuhi Hukum Ohm*
- B** The conductor is a copper wire  
*Konduktor tersebut adalah wayar kuprum*
- C** Resistance increases as the current increases  
*Rintangan bertambah apabila arus bertambah*
- D** Resistance decreases as the voltage increases  
*Rintangan berkurang apabila voltan bertambah*

35 Diagram 29.1 and diagram 29.2 show three identical bulbs in two different arrangement circuit.

*Rajah 29.1 dan rajah 29.2 menunjukkan tiga mentol serupa disambung dalam dua susunan litar yang berbeza.*

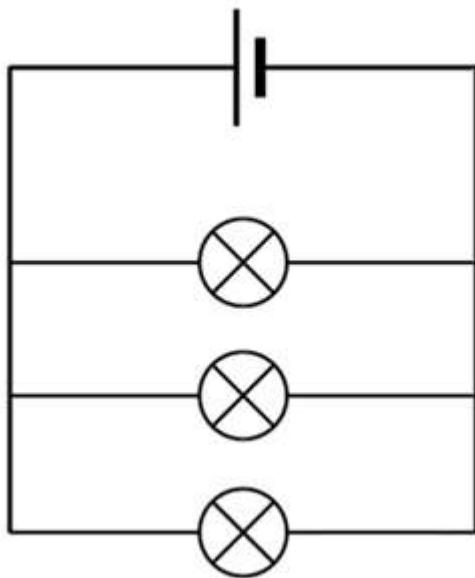


Diagram 29.1

*Rajah 29.1*

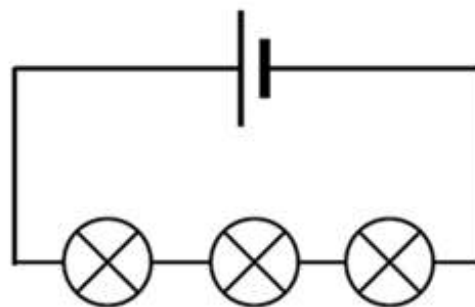


Diagram 29.2

*Rajah 29.2*

Which pair is correct if one of the bulbs is faulty?

*Pasangan manakah yang betul jika salah satu mentol terbakar?*

	<b>Diagram 29.1</b> <i>Rajah 29.1</i>	<b>Diagram 29.2</b> <i>Rajah 29.2</i>
<b>A</b>	The other bulbs do not light up <i>Mentol yang lain tidak menyala</i>	The other bulbs do not light up <i>Mentol yang lain tidak menyala</i>
<b>B</b>	The other bulbs do not light up <i>Mentol yang lain tidak menyala</i>	The other bulbs light up <i>Mentol yang lain menyala</i>
<b>C</b>	The other bulbs light up <i>Mentol yang lain menyala</i>	The other bulbs light up <i>Mentol yang lain menyala</i>
<b>D</b>	The other bulbs light up <i>Mentol yang lain menyala</i>	The other bulbs do not light up <i>Mentol yang lain tidak menyala</i>

36 Diagram 30 shows a clothes iron labelled 240 V, 1200 W.

*Rajah 30 menunjukkan sebuah seterika pakaian yang berlabel 240 V, 1200 W.*



Diagram 30

*Rajah 30*

What is the amount of electrical energy consumed in one minute?

*Berapakah jumlah tenaga elektrik yang digunakan dalam masa satu minit?*

- A 240 J
- B 1200 J
- C 14400 J
- D 72000 J

- 37 Diagram 31 shows a pattern of magnetic field produced by a current-carrying conductor.

*Rajah 31 menunjukkan corak medan magnet yang dihasilkan oleh satu konduktor membawa arus.*

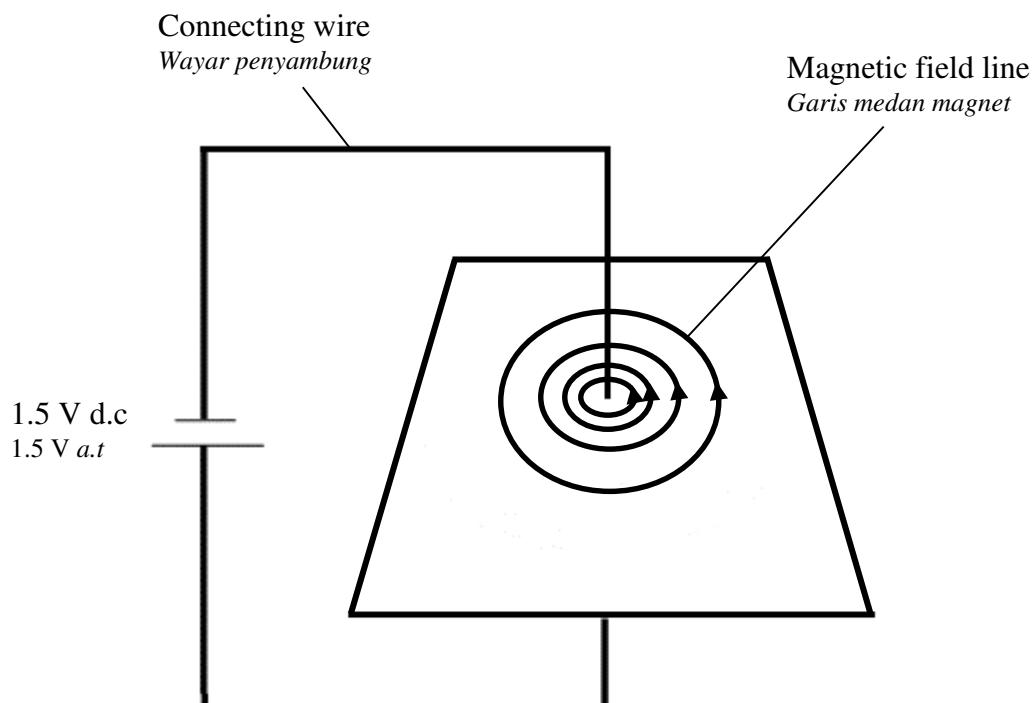


Diagram 31  
*Rajah 31*

Which of the following will decrease the distance between the magnetic field lines?

*Manakah antara berikut akan mengurangkan jarak antara garis medan magnet?*

- A** Inverse the terminal of dry cell  
*Songsangkan terminal sel kering*
- B** Increase the number of dry cell  
*Menambahkan bilangan sel kering*
- C** Decrease the thickness of connecting wire  
*Mengurangkan ketebalan wayar penyambung*
- D** Replace 1.5 V d.c dry cell with 1.5 V a.c power supply  
*Gantikan sel kering 1.5 V a.t kepada bekalan kuasa 1.5 V a.u*

38 The speed of direct current motor can be reduced by

*Kelajuan motor arus terus boleh dikurangkan dengan*

- A increasing the amount of current  
*menambah nilai arus*
- B increasing the strength of magnet  
*menambah kekuatan magnet*
- C increasing number of turns of coil  
*menambah bilangan lilitan gegelung*
- D increasing the resistance of coil wire  
*menambah nilai rintangan bagi gegelung wayar*

39 Diagram 32 shows two magnets X and Y are hung near solenoid. An electric current flows when the switch is closed.

Rajah 32 menunjukkan dua magnet X dan Y digantung berdekatan solenoid. Arus elektrik mengalir apabila suis ditutup.

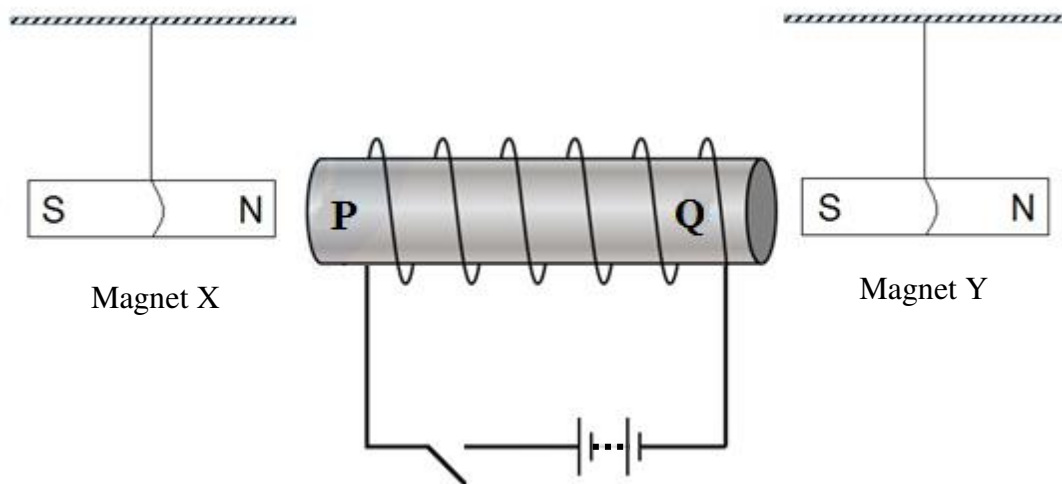


Diagram 32

Rajah 32

What are the poles of P and Q and the direction of movement of the two magnets.

Apakah kutub P dan Q serta arah gerakan kedua-dua magnet tersebut.

	<b>P</b>	<b>Q</b>	<b>Direction of movement of the two magnets</b> <i>Arah gerakan kedua-dua magnet</i>
<b>A</b>	North <i>Utara</i>	South <i>Selatan</i>	X and Y moves toward the solenoid <i>X dan Y bergerak mendekati solenoid</i>
<b>B</b>	South <i>Selatan</i>	North <i>Utara</i>	X and Y moves toward the solenoid <i>X dan Y bergerak mendekati solenoid</i>
<b>C</b>	North <i>Utara</i>	South <i>Selatan</i>	X and Y moves away from solenoid <i>X dan Y bergerak menjauhi solenoid</i>
<b>D</b>	South <i>Selatan</i>	North <i>Utara</i>	X and Y moves away from solenoid <i>X dan Y bergerak menjauhi solenoid</i>



40 Diagram 33 shows an electric car using a charging module.

*Rajah 33 menunjukkan sebuah kereta elektrik menggunakan modul pengecas.*

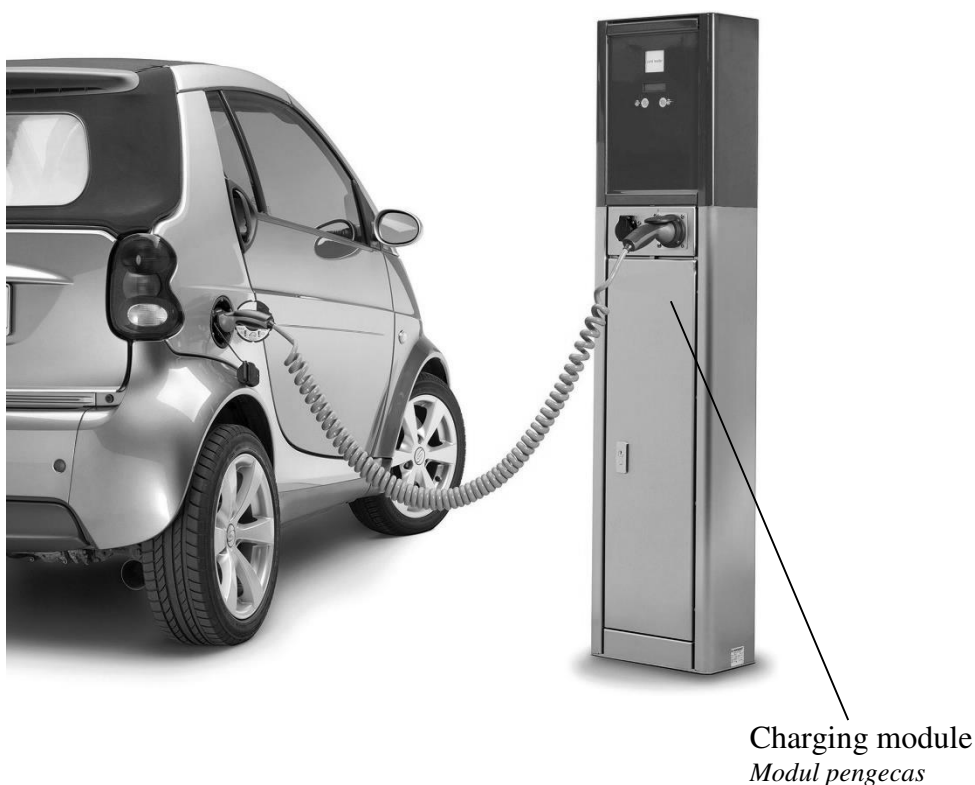


Diagram 33

*Rajah 33*

Which of the following will increase the efficiency of the transformer used in the charging module?

*Manakah antara berikut akan meningkatkan kecekapan transformer yang digunakan di dalam modul pengecasan?*

- A** Soft iron is used as a core  
*Besi lembut digunakan sebagai teras*
- B** Aluminium is used as a core  
*Aluminium digunakan sebagai teras*
- C** Decrease the thickness of coil of the transformer  
*Mengurangkan ketebalan gegelung wayar transformer*
- D** Decrease the number of turns in secondary coil of the transformer  
*Mengurangkan bilangan lilitan pada gegelung sekunder transformer*

41 Diagram 34 shows a simple transformer. The bulb does not light up.

*Rajah 34 menunjukkan sebuah transformer ringkas. Mentol tersebut tidak menyala.*

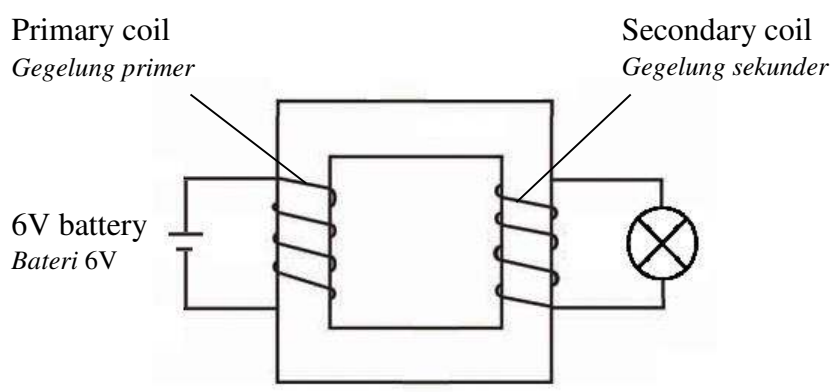


Diagram 34

*Rajah 34*

Which modification will cause the bulb to light up?

*Pengubahsuaian manakah yang akan menyebabkan mentol menyala?*

- A** Replace the 6 V battery with a 9 V battery  
*Menggantikan bateri 6 V dengan bateri 9 V*
- B** Increase the number of turns of the primary coil  
*Menambahkan bilangan lilitan gegelung primer*
- C** Decrease the number of turns of the primary coil  
*Mengurangkan bilangan lilitan gegelung primer*
- D** Replace the 6 V battery with a 6 V a.c power supply  
*Menggantikan 6 V bateri dengan bekalan kuasa 6 V a.u*

42 Diagram 35 shows part of the National Grid Network.

Rajah 35 menunjukkan sebahagian daripada Rangkaian Grid Nasional.

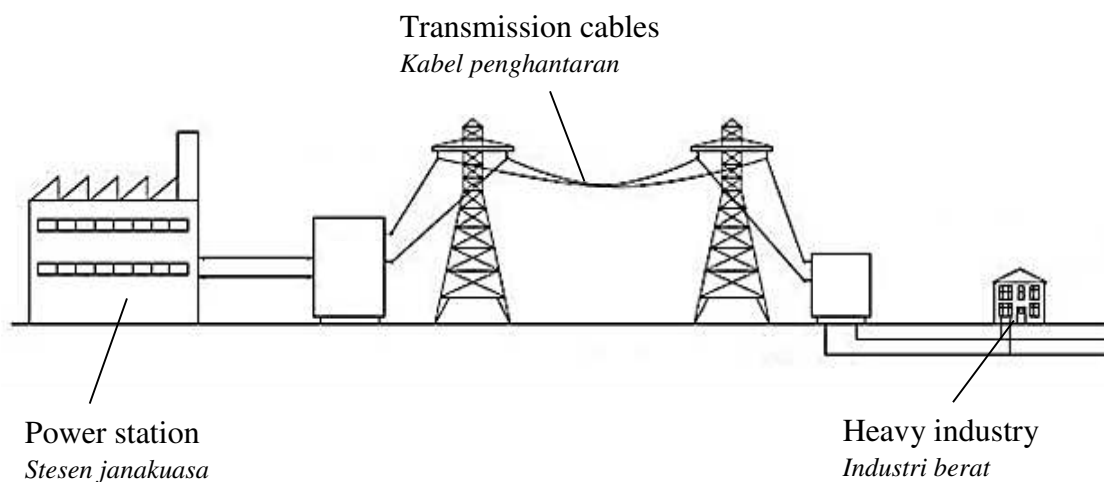


Diagram 35

Rajah 35

What is the magnitude of voltage and type of current in the transmission cables?

Apakah magnitud voltan dan jenis arus dalam kabel penghantaran?

	<b>Magnitude of voltage</b> <i>Magnitud voltan</i>	<b>Type of current</b> <i>Jenis arus</i>
<b>A</b>	Low <i>Rendah</i>	Direct current <i>Arus terus</i>
<b>B</b>	Low <i>Rendah</i>	Alternating current <i>Arus ulangalik</i>
<b>C</b>	High <i>Tinggi</i>	Alternating current <i>Arus ulangalik</i>
<b>D</b>	High <i>Tinggi</i>	Direct current <i>Arus terus</i>

43 Diagram 36 shows a n-type semiconductor.

*Rajah 36 menunjukkan sebuah semikonduktor jenis-n.*

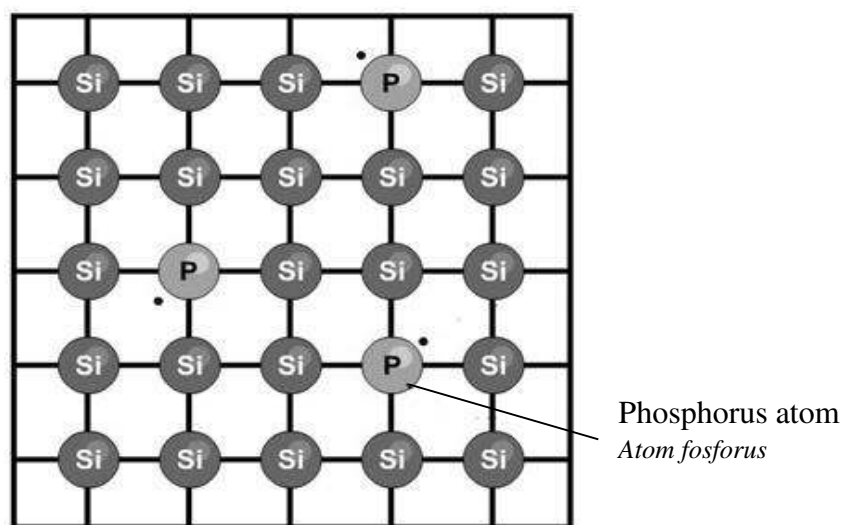


Diagram 36

*Rajah 36*

The process of adding phosphorus atoms into crystal lattice of pure semiconductor is known as

*Proses penambahan atom fosforus ke dalam kekisi hablur semikonduktor tulen dikenali sebagai*

- A** doping  
*pendopan*
- B** smoothen  
*perataan*
- C** rectification  
*rektifikasi*
- D** amplification  
*amplifikasi*

44 Diagram 37 shows a circuit that contains a transistor, a resistor R and a bulb.

*Rajah 37 menunjukkan satu litar yang mengandungi sebuah transistor, perintang R dan sebiji mentol.*

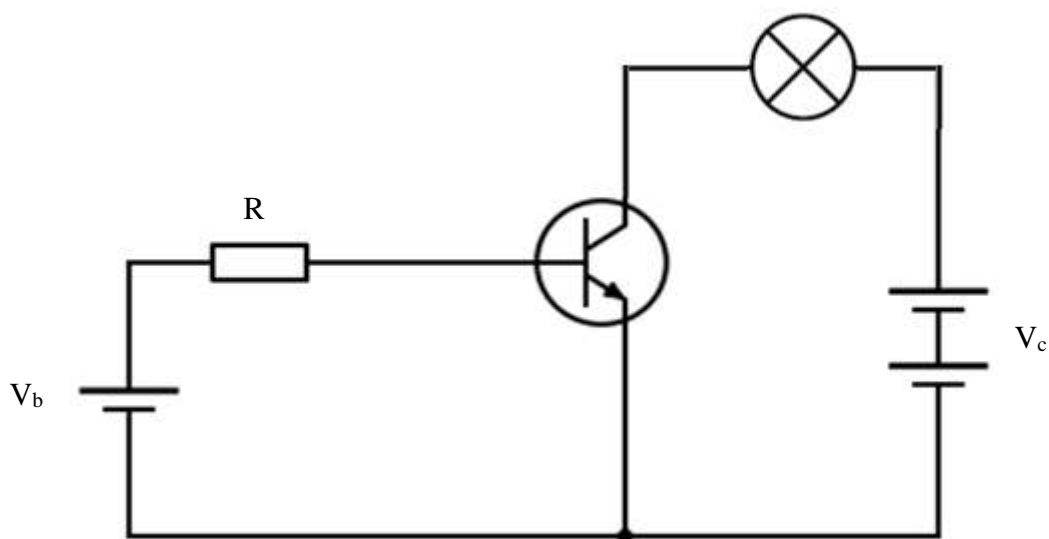


Diagram 37

*Rajah 37*

What should be done to increase the brightness of the bulb?

*Apakah yang perlu dilakukan untuk meningkatkan kecerahan mentol?*

- A Increase  $V_b$   
*Meningkatkan  $V_b$*
- B Decrease  $V_c$   
*Mengurangkan  $V_c$*
- C Invert the terminal of  $V_b$   
*Menyongsangkan terminal pada  $V_b$*
- D Invert the terminal of  $V_c$   
*Menyongsangkan terminal pada  $V_c$*

45 Diagram 38 shows a logic gate circuit with inputs M and N to produce output P.

Rajah 38 menunjukkan litar get logik dengan input M dan N untuk menghasilkan output P.

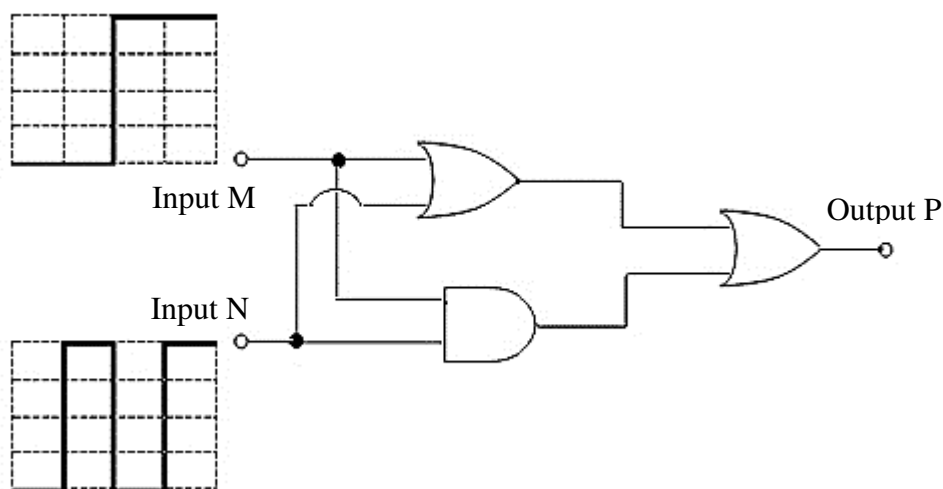


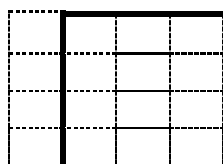
Diagram 38

Rajah 38

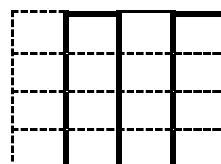
Which output signal is correct?

Signal output manakah yang betul?

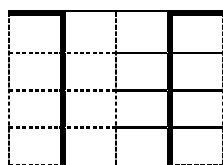
A



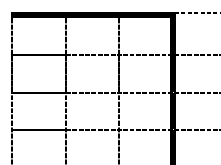
B



C

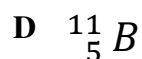
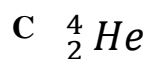
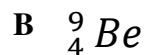
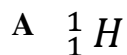


D



46 Which of the nuclide has same numbers of neutron and proton?

*Nuklid manakah yang mempunyai bilangan neutron dan proton yang sama?*



47 Diagram 39 shows a graph of decay curve of radioactive material.

*Rajah 39 menunjukkan graf lengkung pereputan bahan radioaktif.*

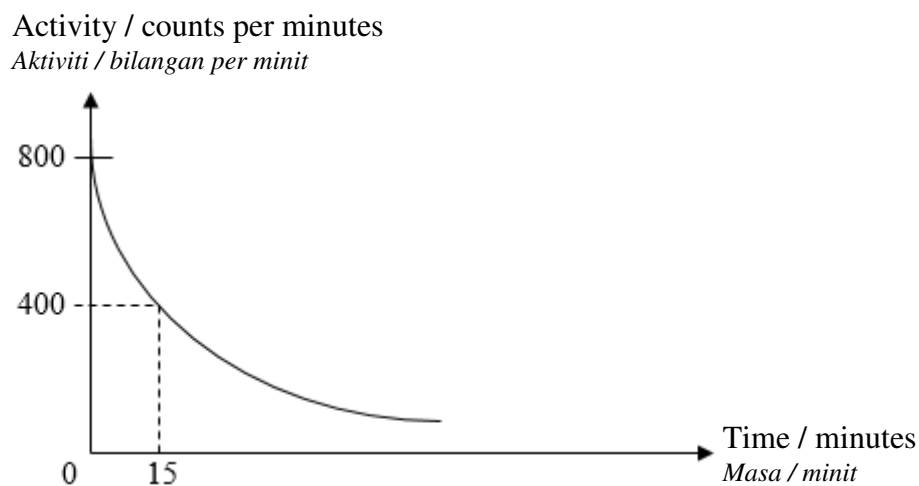


Diagram 39

*Rajah 39*

If the initial activity of radioactive material is 800 counts per minute, what is the activity after 1 hour?

*Jika aktiviti awal bahan radioaktif adalah 800 bilangan per minit, apakah aktiviti selepas 1 jam?*

A 50

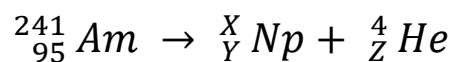
B 100

C 200

D 400

- 48 When Americium-241 decays to Neptunium-X, the process emits alpha particle.

*Apabila Americium-241 mereput kepada Neptunium-X, proses ini memancarkan zarah alfa.*



What is X, Y and Z?

*Apakah X, Y dan Z?*

	<b>X</b>	<b>Y</b>	<b>Z</b>
<b>A</b>	241	93	0
<b>B</b>	237	93	2
<b>C</b>	237	90	1
<b>D</b>	240	93	2

- 49 Which radioisotope is most suitable to be used as a tracer to study absorption and movement of fertiliser in plants?

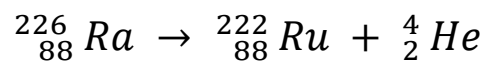
*Radioisotop manakah yang paling sesuai digunakan sebagai penyurih untuk mengkaji penyerapan dan pergerakan baja pada tumbuhan?*

	<b>Radioisotope</b> <i>Radioisotop</i>	<b>Half life</b> <i>Separuh hayat</i>
<b>A</b>	Bismuth-213 <i>Bismuth-213</i>	45 minutes 45 minit
<b>B</b>	Iodine-131 <i>Iodin-131</i>	8 days 8 hari
<b>C</b>	Phosphorus-32 <i>Fosforus-32</i>	14 days 14 hari
<b>D</b>	Cobalt-60 <i>Kobalt-60</i>	5 years 5 tahun



- 50 The following equation shows a decay process of Radium-226.  
The mass defect is  $8.68 \times 10^{-30}$  kg.

*Persamaan berikut menunjukkan proses pereputan bagi Radium-226.  
Cacat jisim adalah  $8.68 \times 10^{-30}$  kg.*



What is the energy released?

*Berapakah tenaga yang dibebaskan?*

[ $c = 3.00 \times 10^8 \text{ ms}^{-1}$ ]

A  $1.07 \times 10^{-47} \text{ J}$

B  $2.89 \times 10^{-38} \text{ J}$

C  $2.60 \times 10^{-21} \text{ J}$

D  $7.81 \times 10^{-13} \text{ J}$

**END OF QUESTION PAPER**  
**KERTAS SOALAN TAMAT**

**INFORMATION FOR CANDIDATES**  
**MAKLUMAT UNTUK CALON**

1. This question paper consists of **50** questions.  
*Kertas soalan ini mengandungi **50** soalan.*
2. Answer **all** questions.  
*Jawab **semua** soalan.*
3. Each question is followed by either **three** or **four** options. Choose the best option for each question and blacken the correct space on the answer sheet.  
*Tiap-tiap soalan diikuti oleh sama ada **tiga** atau **empat** pilihan jawapan. Pilih satu jawapan yang terbaik bagi setiap soalan dan hitamkan ruangan yang betul pada kertas jawapan anda.*
4. Blacken only **one** space for each question.  
*Hitamkan **satu** ruangan sahaja bagi setiap soalan.*
5. If you wish to change your answer, erase the blackened mark that you have made. Then blacken the space for the new answer.  
*Sekiranya anda hendak menukarkan jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.*
6. The diagrams in the questions provided are not drawn to scale unless stated.  
*Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.*
7. You may use a non-programmable scientific calculator.  
*Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.*
8. A list of formulae is provided on page 2 and 3.  
*Satu senarai formula disediakan di halaman 2 dan 3.*