

4531/1
Physics
Paper 1
September
2010
1 ¼ hours



MAKTAB RENDAH SAINS MARA

**SIJIL PELAJARAN MALAYSIA
TRIAL EXAMINATION 2010**

PHYSICS

Paper 1

One hour and fifteen minutes

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.

This question booklet consists of 46 printed pages

The following information maybe 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. $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$

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

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

$$21. n = \frac{\text{realdepth}}{\text{apparentdepth}}$$

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

$$22. Q = It$$

$$23. V = IR$$

$$24. \text{Power / Kuasa, } P = IV$$

$$25. \frac{N_s}{N_p} = \frac{V_s}{V_p}$$

$$26. \text{Efficiency / Kecekapan} = \frac{I_s V_s}{I_p V_p} \times 100\%$$

$$27. g = 10 \text{ m s}^{-2}$$

$$28. \text{Atmospheric pressure at sea level / tekanan atmosfera pada aras laut} = 1 \times 10^5 \text{ Pa}$$

$$29. \text{Speed of light / Halaju cahaya, } c = 3.0 \times 10^8 \text{ m s}^{-1}$$

1 Which of the following is a scalar quantity?

Yang manakah di antara berikut adalah kuantiti skalar?

A Displacement
Sesaran

B Momentum
Momentum

C Force
Daya

D Work
Kerja

2 Which of the following measuring instruments measures a derived quantity?

Yang manakah antara alat pengukur berikut mengukur satu kuantiti terbitan?

A



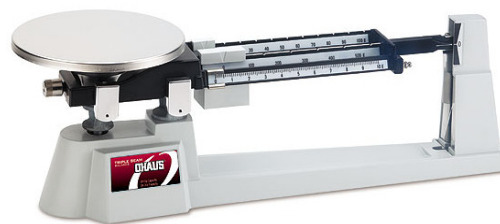
B



C



D



- 3 Which of the following is **not** an experimental procedure?

*Manakah di antara berikut **bukan** prosedur eksperimen?*

- A Make a hypothesis
Membuat suatu hipotesis
- B Control the manipulated variable
Mengawal pembolehubah manipulasi
- C Measure the responding variable
Mengukur pembolehubah bergerakbalas
- D Repeat the experiment with different values of manipulated variable
Mengulangi eksperimen dengan beberapa nilai pembolehubah manipulasi yang berbeza
- 4 Diagram 1 shows a car moving at 20 m s^{-1} slowing down when it approaches a red traffic light. The car travels 50 m before it stops completely.

Rajah 1 menunjukkan sebuah kereta bergerak pada kelajuan 20 m s^{-1} memperlahankan gerakan apabila menghampiri lampu isyarat merah. Kereta itu bergerak sejauh 50 m sebelum berhenti sepenuhnya.

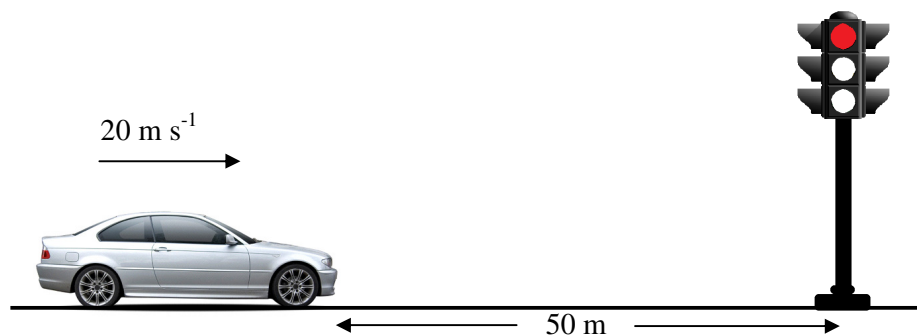


Diagram 1
Rajah 1

What is the acceleration of the car?

Apakah pecutan kereta itu?

- A 4.0 m s^{-2}
- B 8.0 m s^{-2}
- C -4.0 m s^{-2}
- D -8.0 m s^{-2}

- 5 Diagram 2 shows a Sumo wrestler with a mass of 350 kg.
Rajah 2 menunjukkan seorang ahli gusti Sumo yang berjisim 350 kg.



Diagram 2
Rajah 2

What is the advantage of the wrestler being heavy?

Apakah kelebihan ahli gusti itu berbadan berat?

- A He is more stable
Dia adalah lebih stabil
- B He has a large inertia
Dia mempunyai inersia yang besar
- C He has a large momentum
Dia mempunyai momentum yang besar.
- D He will exert a large impulsive force on impact
Dia akan mengenakan daya impuls yang besar bila berlanggar.

6 Diagram 3 shows a cross-section of a mortar and pestle placed on a piece of cloth.

Rajah 3 menunjukkan keratan rentas sebiji lesung batu dan antan yang diletakkan di atas sehelai kain.

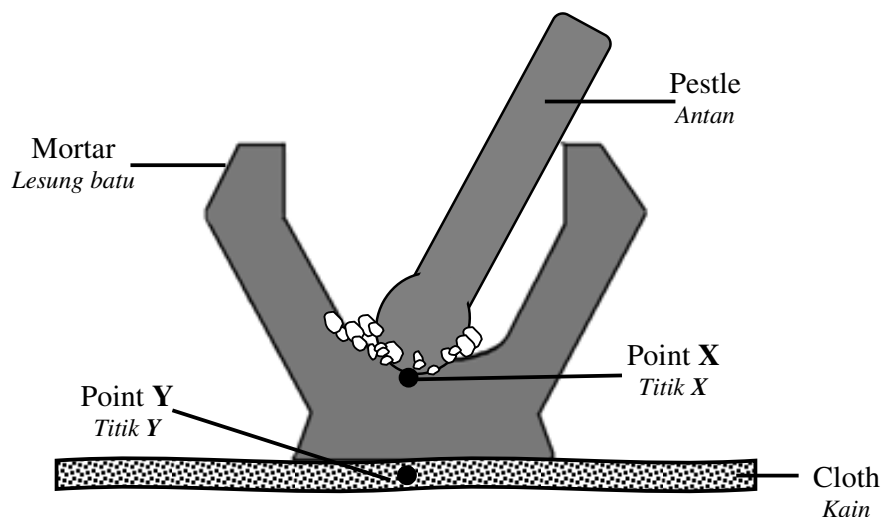


Diagram 3
Rajah 3

Which of the following correctly explains the impulsive force that acts at point X and Y when the pestle hits the mortar?

Manakah antara berikut menjelaskan dengan betul tentang daya impuls yang bertindak ke atas titik X dan Y bila antan menghentam lesung?

	At point X <i>Di titik X</i>	At point Y <i>Di titik Y</i>
A	Large <i>Besar</i>	Small <i>Kecil</i>
B	Large <i>Besar</i>	Large <i>Besar</i>
C	Small <i>Kecil</i>	Small <i>Kecil</i>
D	Small <i>Kecil</i>	Large <i>Besar</i>

- 7 Diagram 4 shows two steel ball bearings, P and Q with mass m and $2m$ respectively.

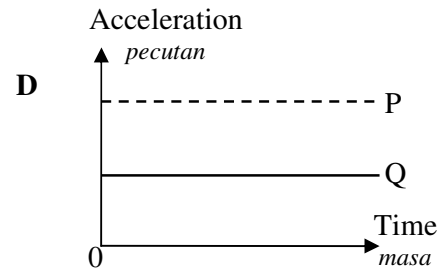
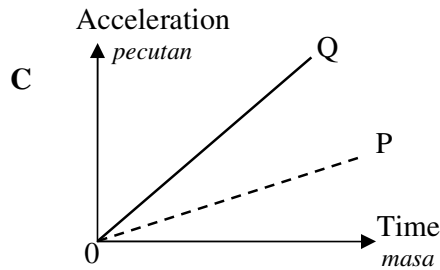
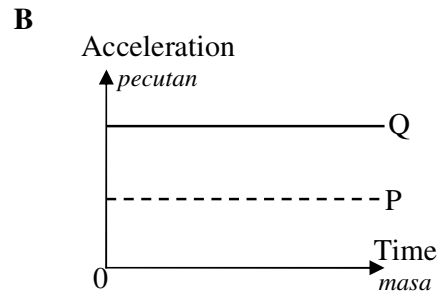
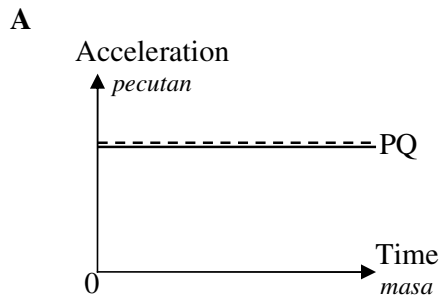
Rajah 4 menunjukkan dua bebola besi P dan Q berjisim m dan $2m$ masing-masing.



Diagram 4
Rajah 4

Which is the **correct** acceleration-time graph for the motion of P and Q if they are dropped from a tall building?

Graf pecutan-masa yang manakah **betul** mengenai pergerakan P dan Q jika keduanya dijatuhkan dari bangunan tinggi?



- 8 Diagram 5 shows a stationary trolley of mass 1.4 kg on an inclined plane.
Rajah 5 menunjukkan sebuah troli pegun yang berjisim 1.4 kg di atas sebuah satah condong.

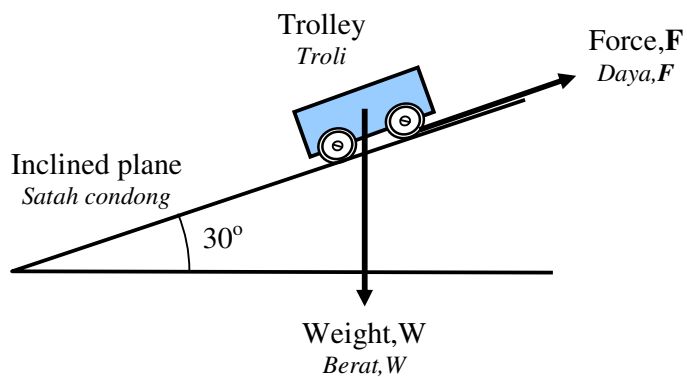


Diagram 5
Rajah 5

What is the magnitude of the force, **F** ?

*Apakah magnitud daya, **F**?*

- A 7.0 N
- B 12.7 N
- C 16.2 N
- D 28.0 N

- 9 Diagram 6 shows Amin getting ready to skate from a height of 5.0 m along a smooth track in an X-treme game competition.

Rajah 6 menunjukkan Amin sedang bersedia untuk meluncur dari ketinggian 5.0 m sepanjang landasan licin dalam satu pertandingan permainan X-treme.

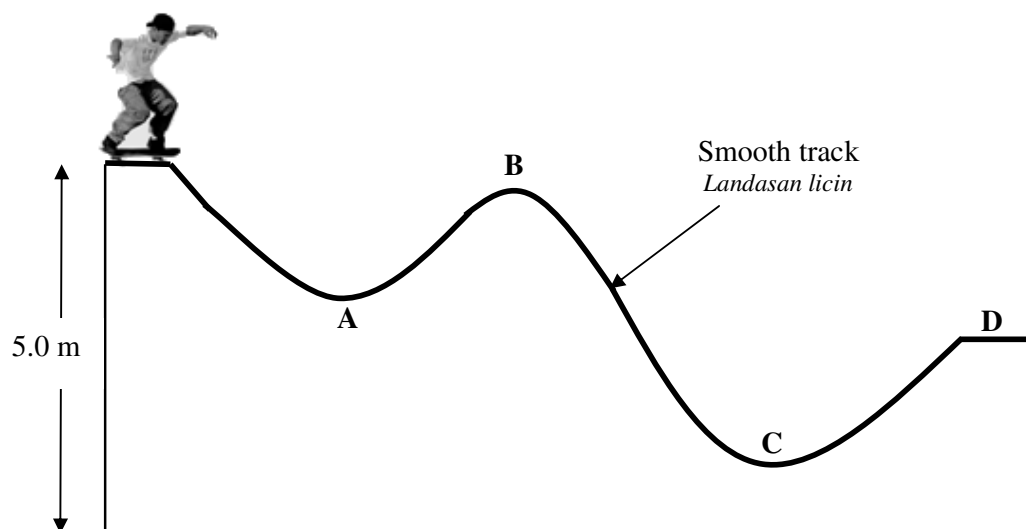


Diagram 6
Rajah 6

At which position does his velocity become maximum?

Pada kedudukan manakah halajunya menjadi maksimum?

- 10 Diagram 7(a) shows a spring without any load. When a load of mass m is placed on the spring, the compression of the spring is x cm.

Rajah 7(a) menunjukkan sebuah spring tanpa beban. Apabila suatu beban berjisim m diletakkan di atasnya, mampatan spring ialah x cm.

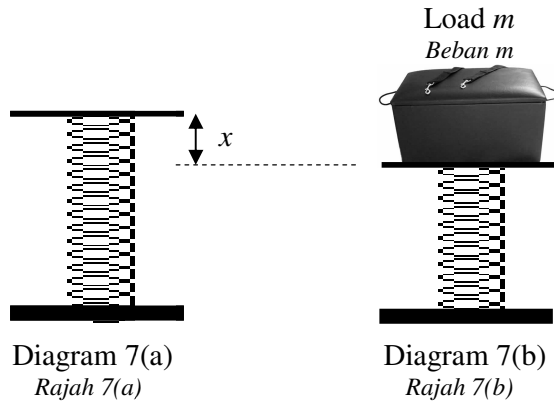


Diagram 7(c) shows two springs similar to the spring in (a), arranged in parallel and bearing a load of mass $2m$.

Rajah 7(c) menunjukkan dua spring yang serupa dengan spring di (a) disusun secara selari dan beban berjisim $2m$ diletakkan di atasnya.



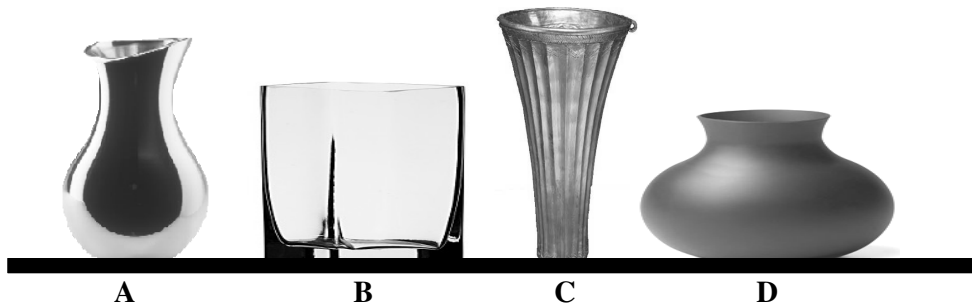
What is the compression of the spring in Diagram 7(c)?

Apakah mampatan spring dalam rajah 7(c)?

- A $\frac{1}{2} x$
- B x
- C $2x$
- D $4x$

11 Four vases of the same mass but of different shapes are placed on a table.

Empat buah pasu bunga yang berjisim sama tetapi mempunyai bentuk berbeza diletakkan di atas meja.



Which vase exerts the greatest pressure on the table?

Pasu bunga yang manakah mengenakan tekanan paling tinggi ke atas meja?

12 Diagram 8 shows some fishes in an aquarium.

Rajah 8 menunjukkan beberapa ekor ikan di dalam akuarium.

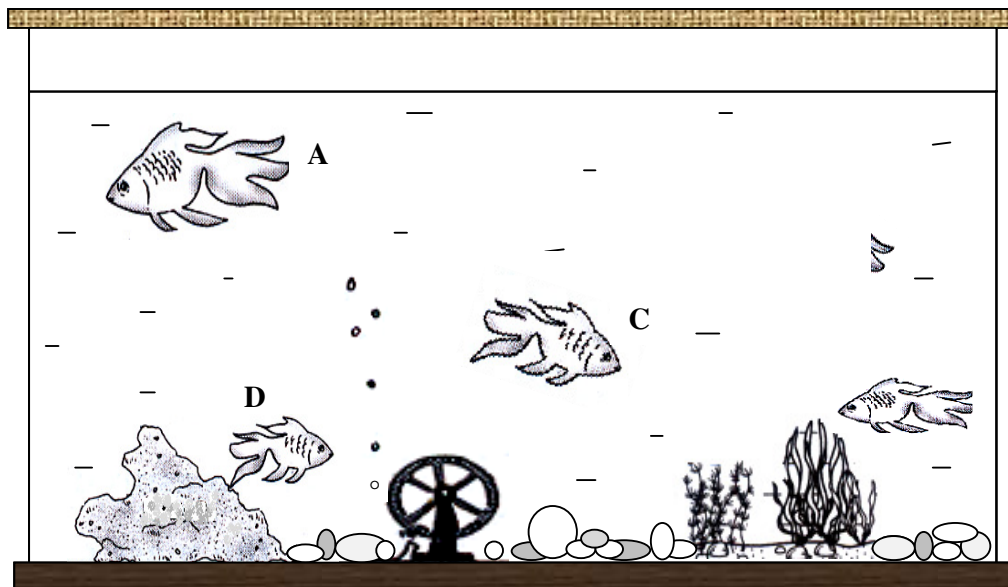


Diagram 8
Rajah 8

Which fish experiences the lowest pressure?

Ikan yang manakah mengalami tekanan paling rendah?

13 Diagram 9 shows a manometer connected to a gas supply.

Rajah 9 menunjukkan sebuah manometer disambung kepada suatu bekalan gas.

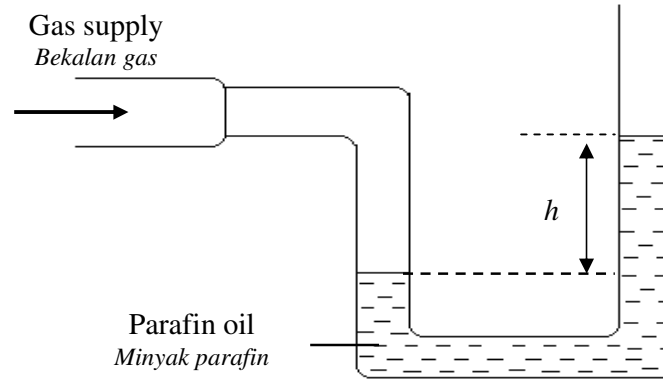


Diagram 9
Rajah 9

Which statement is **correct**?

[ρ = density of paraffin oil; g = gravitational field strength]

Penyataan yang manakah **betul**?

[ρ = ketumpatan minyak parafin; g = kekuatan medan graviti]

- A Gas pressure = ρhg
Tekanan gas = ρhg
- B Gas pressure + Atmospheric pressure = ρhg
Tekanan gas + Tekanan atmosfera = ρhg
- C Gas pressure + ρhg = Atmospheric pressure
Tekanan gas + ρhg = Tekanan atmosfera
- D Gas pressure = Atmospheric pressure + ρhg
Tekanan gas = Tekanan atmosfera + ρhg

- 14 Diagram 10 shows a man using a suction pump to lift the windscreen of a car.

Rajah 10 menunjukkan seorang lelaki sedang menggunakan pam penyedut untuk mengangkat cermin hadapan sebuah kereta.

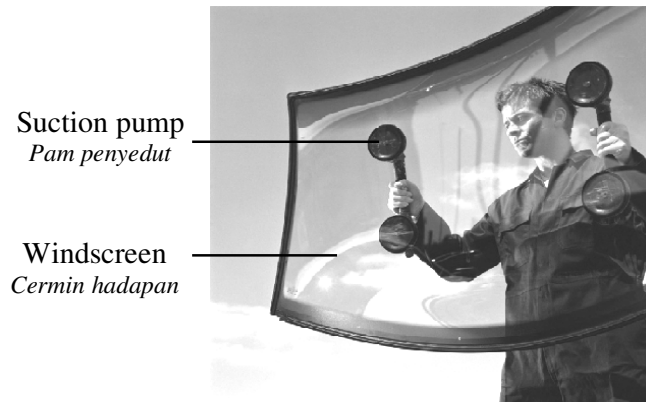


Diagram 10
Rajah 10

Why does the windscreen stick to the suction pump?

Mengapakah cermin itu melekat pada pam penyedut?

- A Atmospheric pressure $>$ pressure inside the suction pump
Tekanan atmosfera $>$ tekanan di dalam pam penyedut
- B Atmospheric pressure = pressure inside the suction pump
Tekanan atmosfera = tekanan di dalam pam penyedut
- C Atmospheric pressure $<$ pressure inside the suction pump
Tekanan atmosfera adalah $<$ tekanan di dalam pam penyedut

- 15 Diagram 11 shows a simple hydraulic system which consists of piston A and piston B. F_A and F_B are the forces which act on the piston.

Rajah 11 menunjukkan suatu sistem hidraulik yang terdiri daripada omboh A dan omboh B. F_A dan F_B adalah daya-daya yang bertindak ke atas omboh

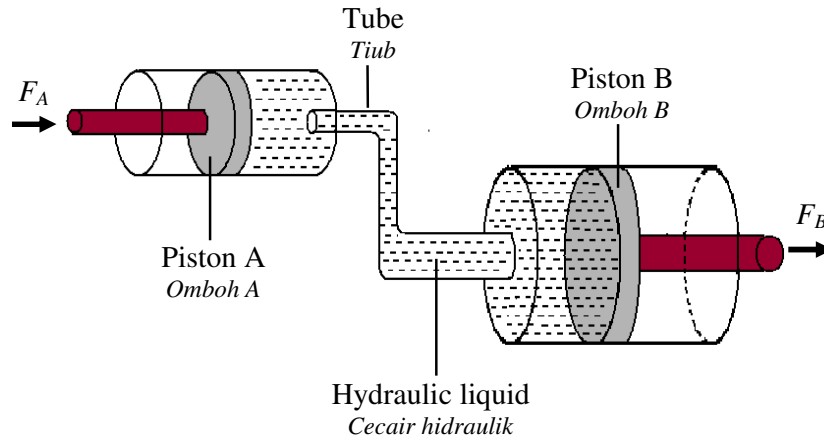


Diagram 11

Rajah 11

Which comparison is **correct**?

Perbandingan yang manakah betul?

- A The forces on piston A and on piston B are equal
Tekanan pada omboh A dan omboh B adalah sama
- B The pressures on piston A and on piston B are equal
Tekanan pada omboh A dan omboh B adalah sama
- C The distances moved by piston A and by piston B are equal
Jarak pergerakan omboh A dan omboh B adalah sama
- D The volumes of liquid displaced at piston A and at piston B are equal
Isipadu cecair yang disesarkan pada omboh A dan B adalah sama

- 16 Diagram 12 shows a hot air balloon which is stationary in the air.

Rajah 12 menunjukkan sebuah belon udara panas yang pegun di udara.



Diagram 12
Rajah 12

Which of the following will **not** make the balloon rise higher?

*Manakah antara berikut **tidak** akan membuatkan belon itu naik lebih tinggi?*

- A Replace the air with helium
Gantikan udara dengan gas helium
 - B Reduce the weight of the balloon
Mengurangkan berat belon
 - C Increase the temperature of the hot air
Tingkatkan suhu udara panas
 - D Use a higher density material for the balloon
Gunakan belon bahan yang lebih tinggi ketumpatan untuk belon
- 17 An aeroplane takes off with the help of an upward lift.

Sebuah kapal terbang berlepas dengan bantuan daya angkatan.

Which principle explains this situation?

Prinsip manakah menerangkan situasi di atas?

- A Bernoulli's principle
Prinsip Bernoulli
- B Archimedes' principle
Prinsip Archimedes
- C Pascal's principle
Prinsip Pascal
- D Charles' principle
Prinsip Charles

- 18 Some ice cubes are added into a cup of hot coffee. The graph shown in Diagram 13 shows the temperature change of the coffee.

Beberapa ketul ais dimasukkan ke dalam secawan kopi panas. Graf yang ditunjukkan dalam Rajah 13 menunjukkan perubahan suhu air kopi tersebut.

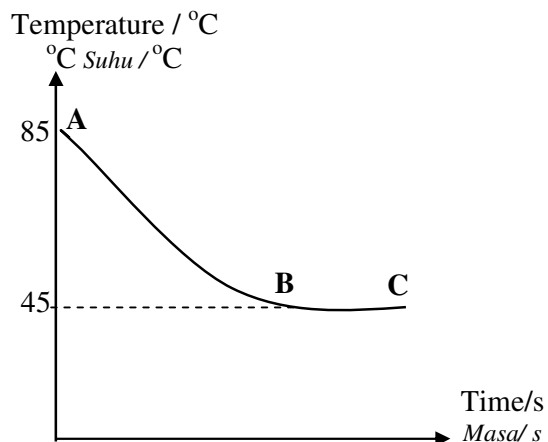


Diagram 13

Rajah 13

What is the physics concept which explains the phase labeled BC?

Apakah konsep fizik yang menerangkan fasa berlabel BC?

- A Specific heat capacity
Muatan haba tentu
- B Thermal equilibrium
Keseimbangan terma
- C Specific latent heat of fusion
Haba pendam tentu pelakuran
- D Specific latent heat of vaporization
Haba pendam tentu pengewapan

- 19 Three types of liquid **A**, **B** and **C** of equal mass are heated at a constant rate. Diagram 14 shows the temperature-time graph of the three liquids.

Tiga jenis cecair A, B dan C yang berjisim sama dipanaskan pada kadar yang sama. Rajah 14 menunjukkan graf suhu melawan masa untuk ketiga-tiga cecair tersebut.

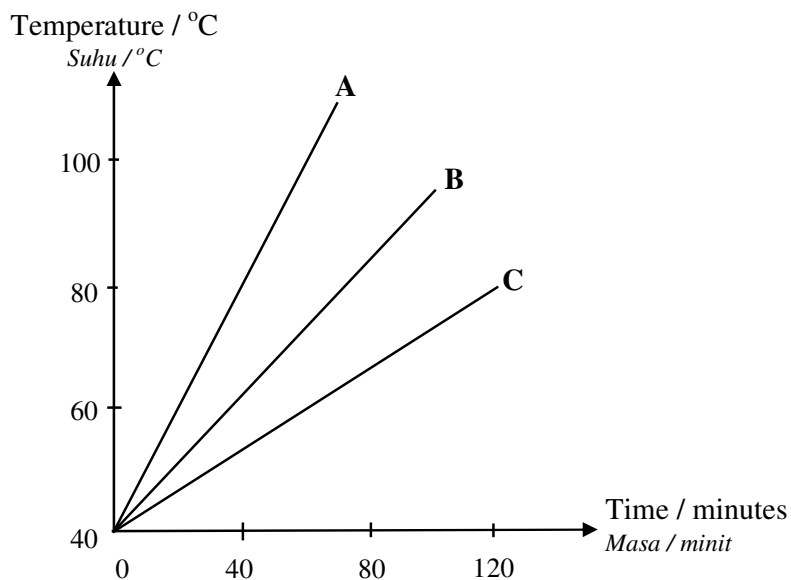


Diagram 14
Rajah 14

Which liquid has the largest specific heat capacity?

Cecair manakah mempunyai muatan haba tentu yang paling tinggi?

20 Diagram 15 shows an electric kettle which is used to boil some water.

Rajah 15 menunjukkan sebuah cerek elektrik digunakan untuk memasak air.

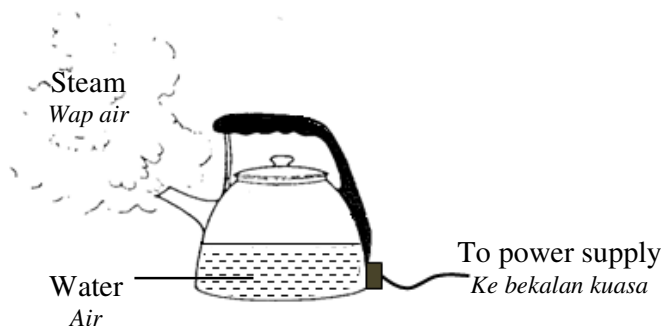


Diagram 15

Rajah 15

When the water boils, the energy supplied is used to

Apabila air mendidih, tenaga yang dibekalkan digunakan untuk

- A increase the kinetic energy of water particles
meningkatkan tenaga kinetic zarah-zarah air
- B break the bonds between water particles
memutuskan ikatan antara zarah-zarah air
- C increase the vibrations of water particles
meningkatkan getaran zarah-zarah air
- D increase the distance between water particles
meningkatkan jarak di antara zarah-zarah air

- 21 Diagram 16 shows a girl holding a balloon containing 20 cm^3 of air at a temperature of 20°C .

Rajah 16 menunjukkan seorang budak perempuan memegang belon yang mengandungi 20 cm^3 udara pada suhu 20°C .

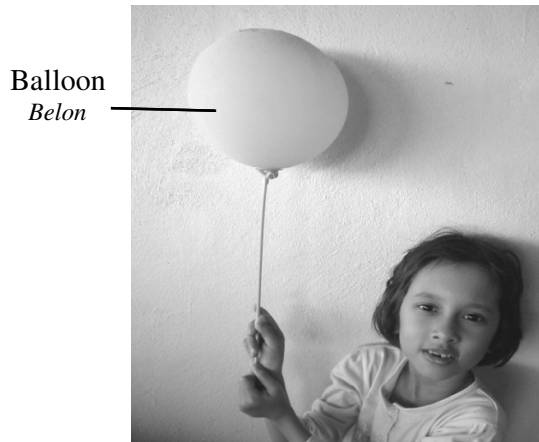


Diagram 16
Rajah 16

What will happen to the volume of the air in the balloon if the balloon is brought outdoors where the temperature is 32°C ?

Apakah yang akan berlaku pada isipadu udara dalam belon jika belon itu di bawa keluar di mana suhu persekitaran ialah 32°C ?

- A Decreases
Berkurang
- B Increases
Bertambah
- C Remains unchanged
Tidak berubah

- 22 Diagram 17 shows the different placements of a capillary tube where air is trapped using 5 cm of mercury. P_1 , P_2 and P_3 are the pressures of the trapped air.

Rajah 17 menunjukkan kedudukan berbeza sebuah tiub kapilari di mana udara diperangkap oleh merkuri. P_1 , P_2 dan P_3 adalah tekanan udara yang terperangkap.

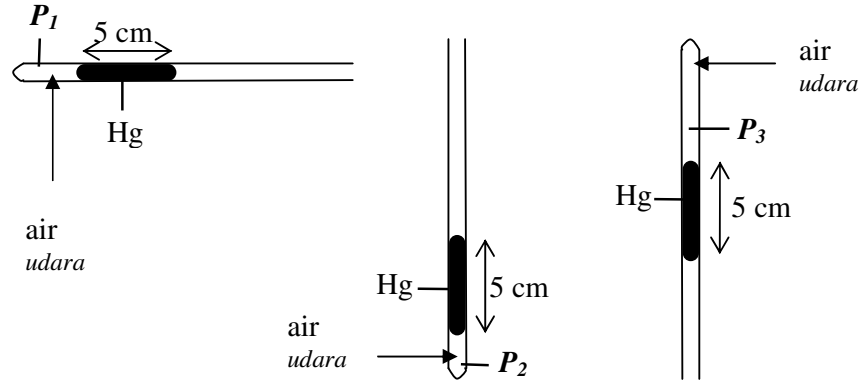


Diagram 17
Rajah 17

Which comparison is **correct**?

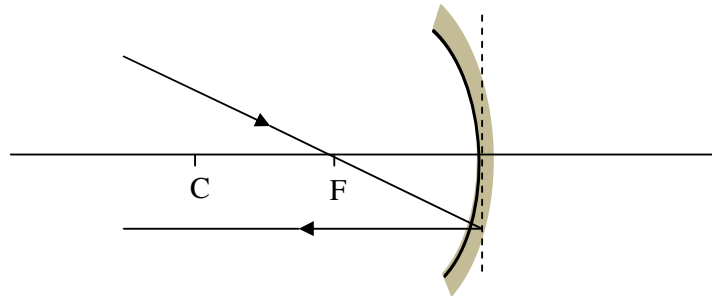
Perbandingan manakah yang **betul**?

- A $P_1 = P_2 = P_3$
- B $P_3 > P_2 > P_1$
- C $P_2 > P_1 > P_3$
- D $P_1 < P_3 < P_2$

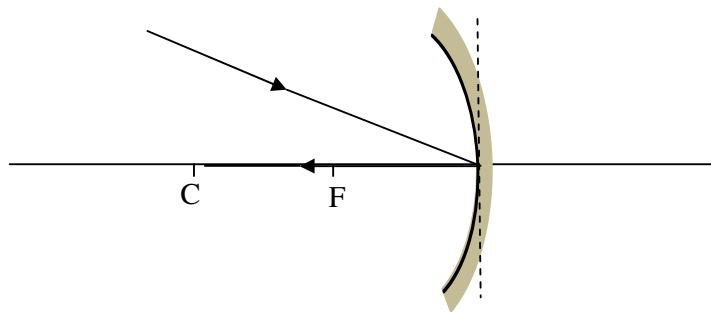
23 Which ray diagram is **correct** for a concave mirror?

Rajah sinar manakah **betul** bagi cermin cekung?

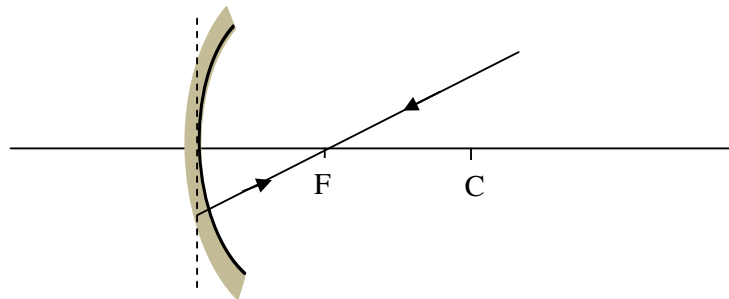
A



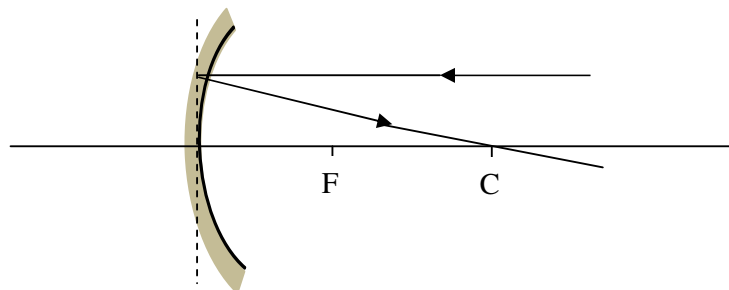
B



C



D



- 24 Diagram 18 shows a ray of light passing through a glass prism.

Rajah 18 menunjukkan satu sinar cahaya melalui satu prisma kaca.

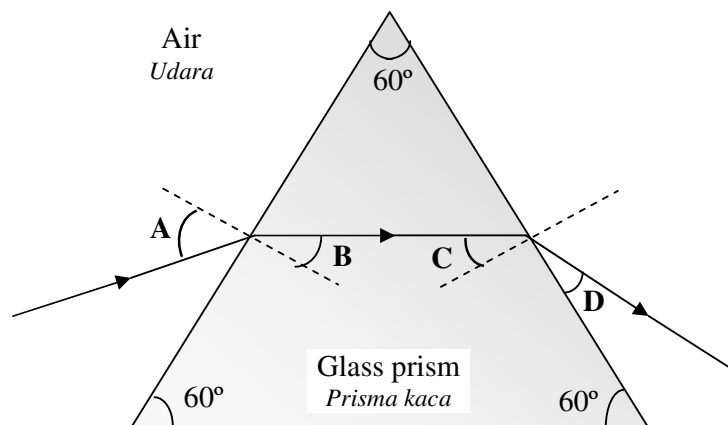


Diagram 18

Rajah 18

Which of the angles **A**, **B**, **C** or **D** shows the angle of refraction?

*Antara sudut **A**, **B**, **C** dan **D**, yang manakah menunjukkan sudut pembiasan?*

- 25 Diagram 19 shows a light ray travelling from medium Y to Medium X with an angle of incidence of 42°

Rajah 19 menunjukkan sinar cahaya merambat dari medium Y ke medium X dengan sudut tuju 42° .

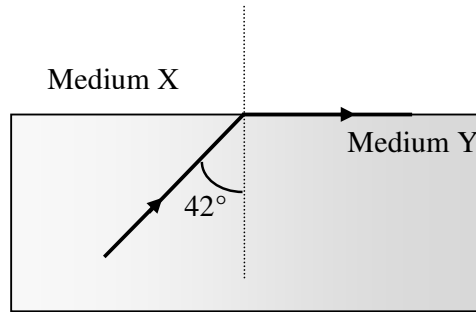
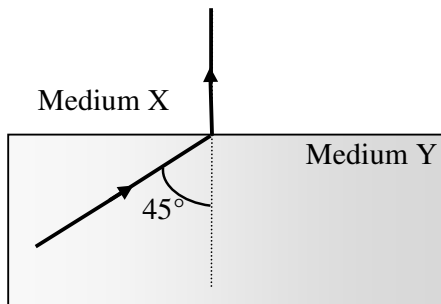


Diagram 19
Rajah 19

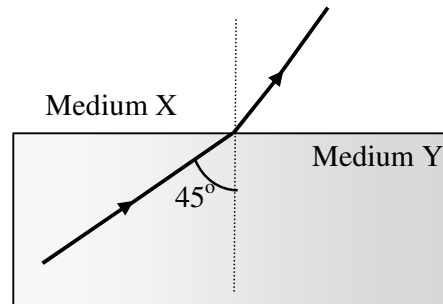
If the angle of incidence is increased to 45° , which diagram shows the **correct** pathway?

Jika sudut tuju dibesarkan menjadi 45° , rajah manakah menunjukkan laluan cahaya yang **betul**?

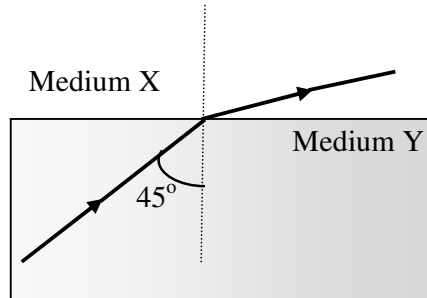
A



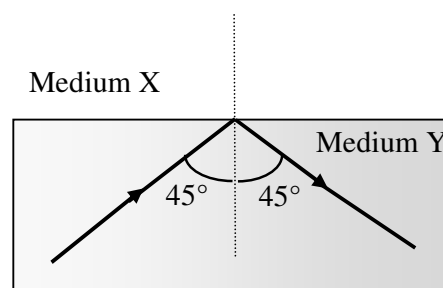
B



C



D



26 Diagram 20 shows a positioning of bulb-lens-screen which produces a sharp image on the screen.

Rajah 20 menunjukkan kedudukan mentol-kanta-skrin dan jarak pemisahan yang menghasilkan satu imej yang tajam di atas skrin.

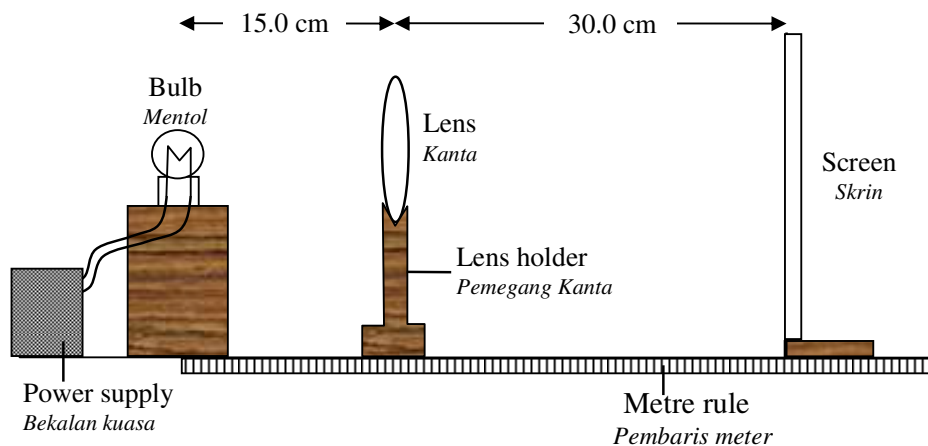


Diagram 20
Rajah 20

Calculate the focal length of the lens.

Kirakan panjang fokus kanta.

- A 2.0 cm
- B 10.0 cm
- C 15.0 cm
- D 45.0 cm

- 27 Diagram 21 shows a spring with a slotted weight of mass m that is allowed to oscillate. The mass m is later replaced with the mass $2m$.

Rajah 21 menunjukkan satu spring dengan jisim m dan dibiarkan berayun. Jisim m kemudian digantikan dengan jisim $2m$.

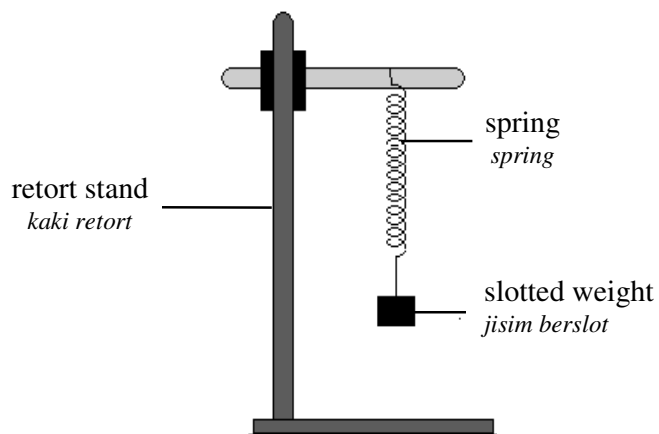
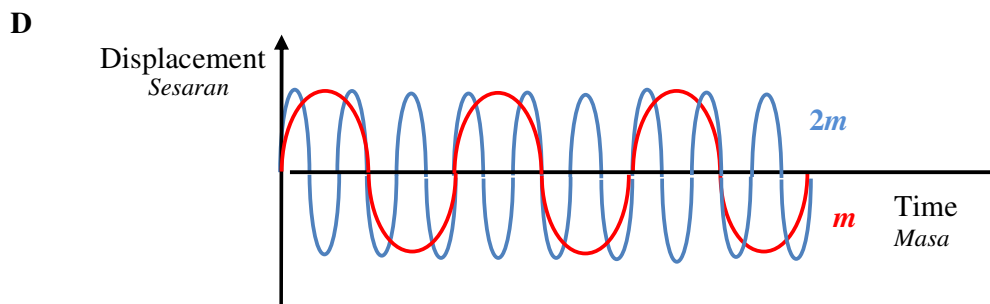
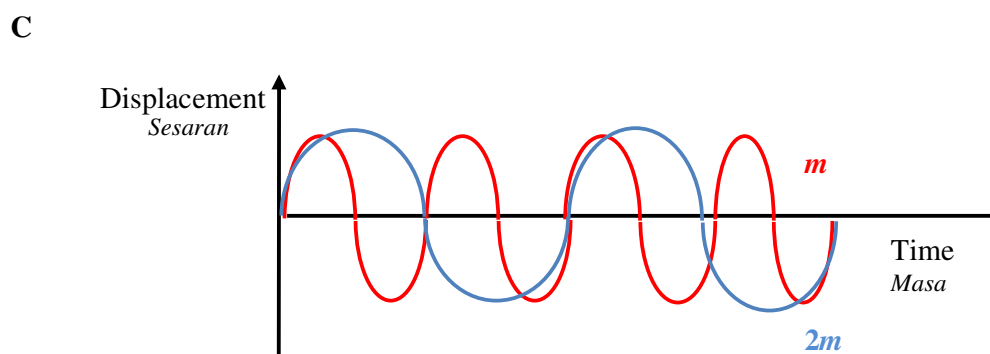
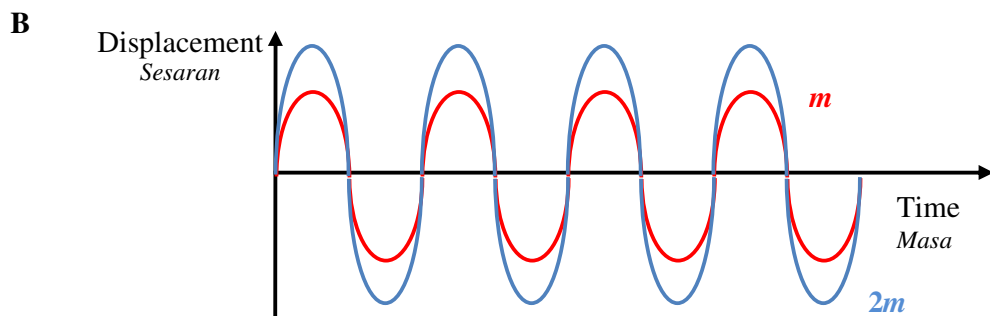
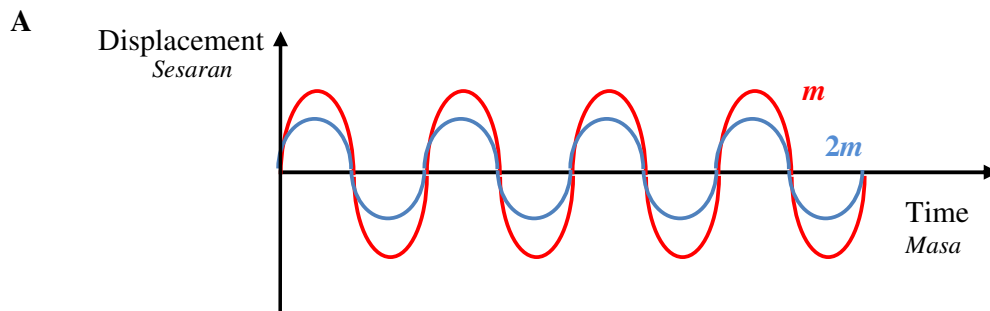


Diagram 21
Rajah 21

Which of the following shows the **correct** displacement-time graph?

Manakah di antara berikut menunjukkan graf sesaran-masa yang betul?



28 Diagram 22 shows a plane wave moving towards a convex reflector placed in the ripple tank .

Rajah 22 menunjukkan gelombang satah merambat ke arah pemantul cembung yang terletak di dalam tangki riak.

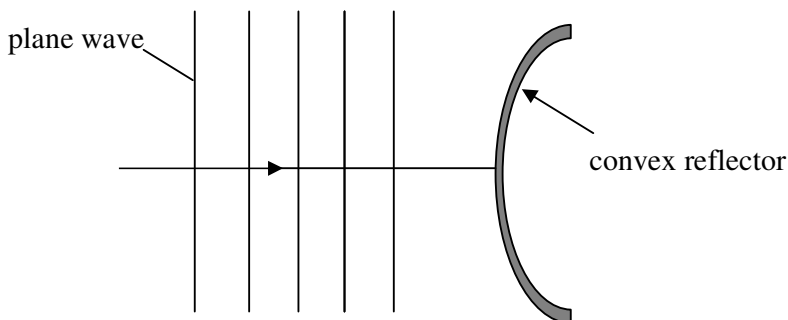


Diagram 22
Rajah 22

Which diagram show the **correct** reflected wave pattern?

Rajah yang manakah menunjukkan corak gelombang yang **betul**?

A **B** **C** **D**

Diagram A shows a convex reflector on the right. The reflected wave pattern consists of several curved lines with arrows pointing away from the reflector, indicating a diverging wave pattern. Diagram B shows a convex reflector on the right. The reflected wave pattern consists of several curved lines with arrows pointing towards the reflector, indicating a converging wave pattern. Diagram C shows a convex reflector on the right. The reflected wave pattern consists of several curved lines with arrows pointing away from the reflector, indicating a diverging wave pattern. Diagram D shows a convex reflector on the right. The reflected wave pattern consists of several curved lines with arrows pointing towards the reflector, indicating a converging wave pattern.

29 Which statement is **correct** about refraction of waves?

Pernyataan manakah betul bagi pembiasan gelombang?

- A** Blue light is refracted more than red light.
Cahaya biru dibiaskan lebih banyak dari cahaya merah.
- B** Light wave is refracted towards the normal when the wave propagates from denser to less dense medium.
Gelombang cahaya dibiaskan mendekati garis normal apabila merambat dari medium tumpat ke medium kurang tumpat.
- C** Sound wave is refracted away from the normal when the wave propagates from hot air to cold air.
Gelombang bunyi dibiaskan menjauhi garis normal apabila merambat dari medium kurang tumpat ke medium lebih tumpat.
- D** Water wave is refracted away from the normal when the wave propagates from shallow to deep area.
Gelombang air dibiaskan menjauhi garis normal apabila merambat dari kawasan cetek ke kawasan dalam.

30 Which of the following describes the changes in wavelength and amplitude when sound waves are diffracted?

Antara berikut, yang manakah menerangkan perubahan panjang gelombang dan amplitud apabila gelombang bunyi dibelaukan?

	Wavelength <i>Panjang gelombang</i>	Amplitude <i>Amplitud</i>
A	Unchanged <i>Tidak berubah</i>	Decreases <i>Berkurang</i>
B	Unchanged <i>Tidak berubah</i>	Unchanged <i>Tidak berubah</i>
C	Increases <i>Bertambah</i>	Decreases <i>Berkurang</i>
D	Decreases <i>Berkurang</i>	Increases <i>Bertambah</i>

- 31 Diagram 23 shows an interference pattern formed when a monochromatic light passes through a double slit. The slit separation is 0.022 cm and the distance between the screen and the double slit is 125 cm.

Rajah 23 menunjukkan corak interferens yang terbentuk bila cahaya monokromatik melalui dwicelah. Pemisahan dwi celah adalah 0.022 cm dan jarak antara skrin dan dwi celah ialah 125 cm.

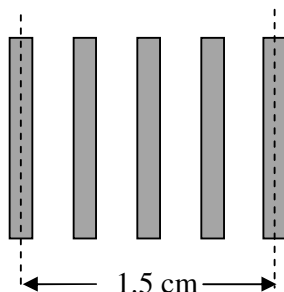


Diagram 23
Rajah 23

Calculate the wavelength of the monochromatic light.

Kirakan panjang gelombang cahaya monokromatik tersebut.

- A 8.80×10^{-5} cm
- B 6.60×10^{-5} cm
- C 2.64×10^{-4} cm
- D 1.83×10^{-4} cm
- 32 In which medium does sound travel the fastest?

Dalam medium apakah bunyi bergerak paling laju?

- A Solid
Pepejal
- B Liquid
Cecair
- C Gas
Gas
- D Vacuum
Vakum

- 33 Which of the following characteristics of microwave makes it suitable to be used in satellite communication?

Manakah antara sifat gelombang mikro berikut menjadikan ia sesuai digunakan dalam komunikasi satelit?

- A It is neutral
Ia bersifat neutral
- B It has a high frequency
Ia mempunyai frekuensi yang tinggi
- C It has a long wavelength
Ia mempunyai panjang gelombang yang panjang
- D It needs a medium to propagate
Ia memerlukan medium untuk merambat
- 34 Diagram 24 shows a Van de Graaff generator.

Rajah 24 menunjukkan sebuah penjana Van de Graaff.

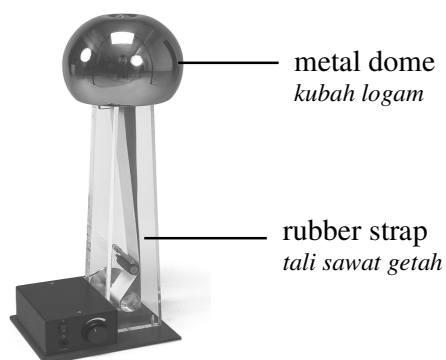


Diagram 24
Rajah 24

The generator is used to produce

Penjana ini digunakan untuk menjana

- A electric current
arus elektrik
- B high resistance
rintangan yang tinggi
- C electric charges
cas-cas elektrik
- D magnetic field
medan magnet

35 Diagram 25 shows a circuit used to investigate the relationship between voltage and electric current. Ignore the internal resistance of the battery.

Rajah 25 menunjukkan satu litar elektrik digunakan untuk mengkaji hubungan di antara voltan dan arus elektrik. Abaikan rintangan dalam bateri.

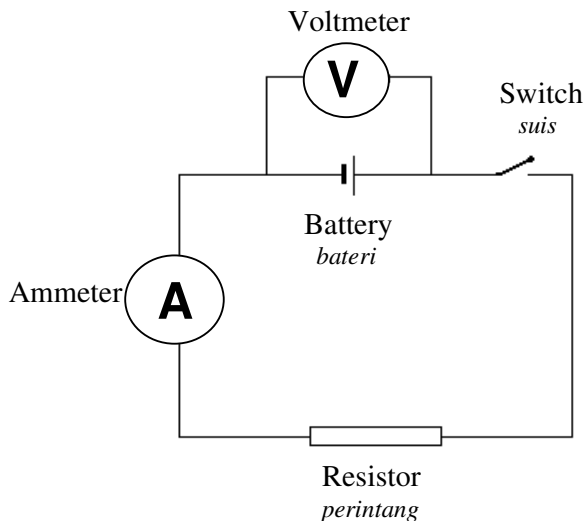


Diagram 25
Rajah 25

Which of the following is **correct** about the ammeter and voltmeter readings if a similar resistor is connected parallel to the existing resistor and the switch is closed?

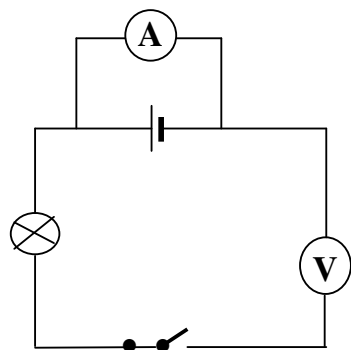
Yang manakah di antara berikut adalah **betul** mengenai bacaan ammeter dan voltmeter jika satu perintang yang serupa disambung secara selari dengan perintang sedia ada dan suis ditutup?

	Ammeter Reading <i>Bacaan ammeter</i>	Voltmeter Reading <i>Bacaan voltmeter</i>
A	Increases <i>Bertambah</i>	Decreases <i>Berkurang</i>
B	Decreases <i>Berkurang</i>	Increases <i>Bertambah</i>
C	Increases <i>Bertambah</i>	No change <i>Tiada perubahan</i>
D	Decreases <i>Berkurang</i>	No change <i>Tiada perubahan</i>

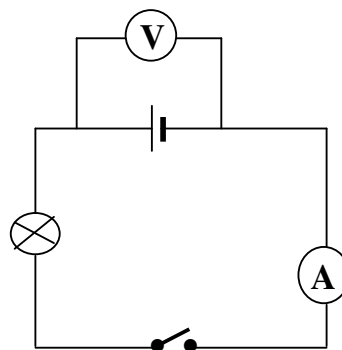
36 Which circuit is used to determine the electromotive force of a cell?

Litar yang manakah digunakan untuk menentukan daya gerak elektrik suatu sel?

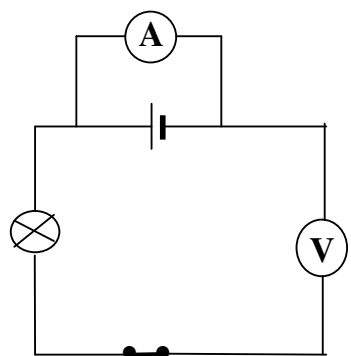
A



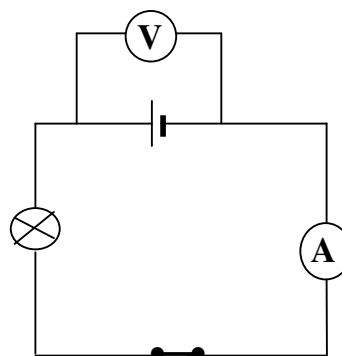
B



C



D



- 37 Diagram 26 shows an electric circuit which consists of three resistors.
Rajah 26 menunjukkan satu litar elektrik yang terdiri daripada tiga perintang.

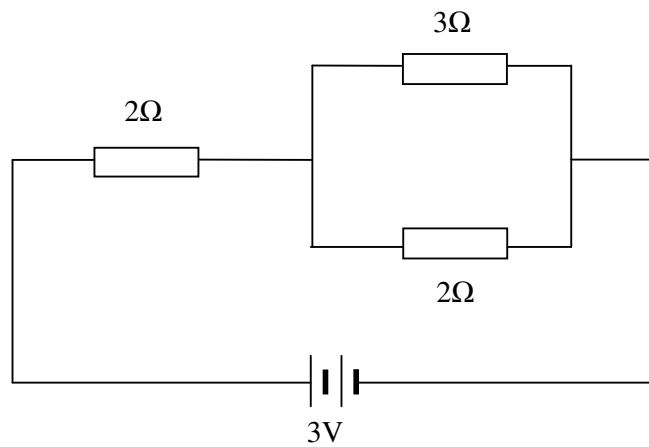


Diagram 26
Rajah 26

What is the effective resistance of the circuit?

Berapakah rintangan berkesan litar di atas?

- A 1.33 Ω
- B 2.83 Ω
- C 3.20 Ω
- D 4.33 Ω

38 Diagram 27 shows the heating element of an electric iron.

Rajah 27 menunjukkan elemen pemanas dalam sebuah seterika elektrik.

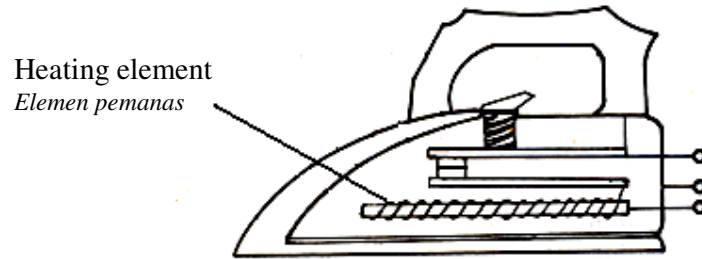


Diagram 27
Rajah 27

The heating element is made in the shape of a coil to

Elemen pemanas itu dibuat dalam bentuk gelung untuk

- A allow a large current flow
membenarkan arus yang besar mengalir
- B produce a large potential difference
menghasilkan beza upaya yang besar
- C decrease the resistance in the circuit
mengurangkan rintangan dalam litar
- D increase the power of heat released
meningkatkan kuasa haba yang terbebas

- 39 Diagram 28 shows a piece of insulated wire wound round an iron nail. When the switch is closed, the nail becomes an electromagnet.

Rajah 28 menunjukkan seutas dawai bertebat dililit mengelilingi sebatang paku besi. Bila suis ditutup, paku itu menjadi sebuah elektromagnet.

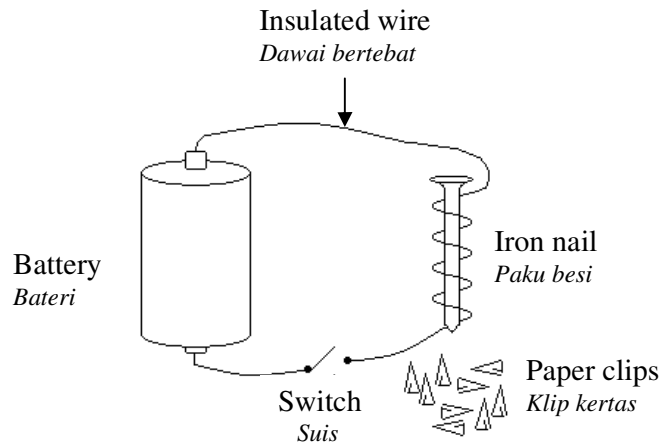


Diagram 28
Rajah 28

The strength of the electromagnet increases when

Kekuatan elektromagnet bertambah apabila

- A the magnitude of the current is decreased
magnitud arus berkurang.
- B insulated wire of smaller diameter is used for the coil
wayar bertebat dengan diameter yang lebih kecil digunakan
- C the diameter of the coil is decreased
diameter gelung dikurangkan
- D the number of turns of the coil is decreased
bilangan lilitan gegelung berkurang

- 40 Diagram 29 shows a coil placed between the poles of a permanent magnet and is connected to the external circuit.

Rajah 29 menunjukkan gegelung diletakkan di antara dua kutub magnet dan disambungkan ke litar luar.

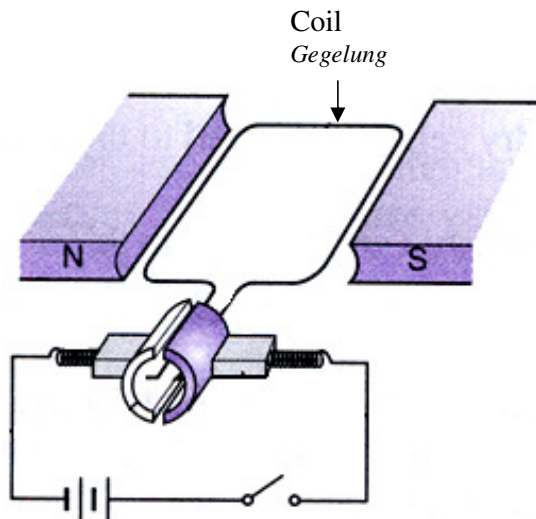


Diagram 29
Rajah 29

Determine the direction of rotation of the coil when the switch is closed.

Tentukan arah putaran gegelung apabila suis dihidupkan.

- A Clock wise
Pusingan ikut jam
- B Anti clock wise
Pusingan lawan jam
- C Alternately, anticlockwise then clockwise
Berulangalik,, pusingan lawan jam diikuti pusingan ikut jam
- D Alternately, clockwise then anticlockwise
Berulangalik,, pusingan ikut jam diikuti pusingan lawan jam

41 Diagram 30(a) shows a magnet being moved slowly towards a solenoid and the pointer of the galvanometer deflects to the right as shown in Diagram 30(b).

Rajah 30(a) menunjukkan satu magnet bergerak dengan perlahan kearah gegelung dan jarum penunjuk galvanometer terpesong ke kanan seperti yang ditunjukkan pada rajah 30(b).

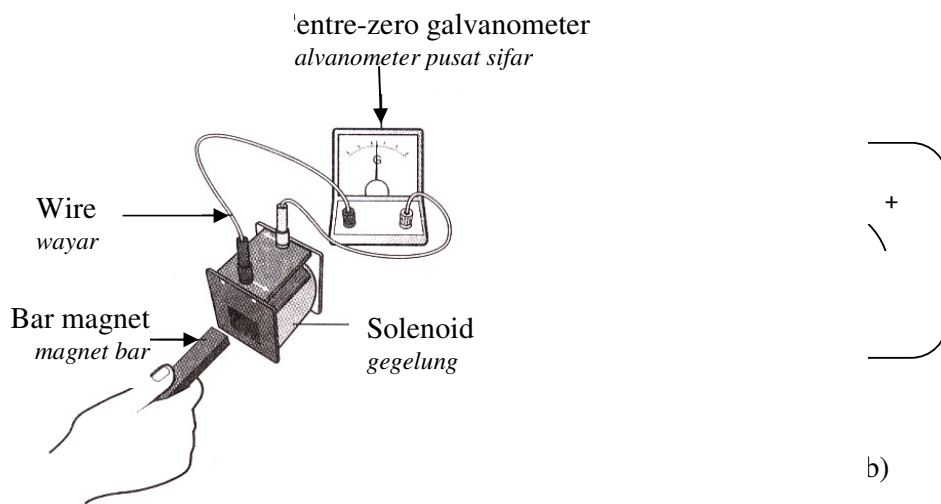
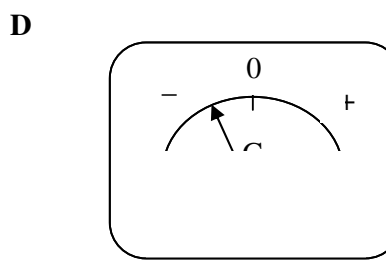
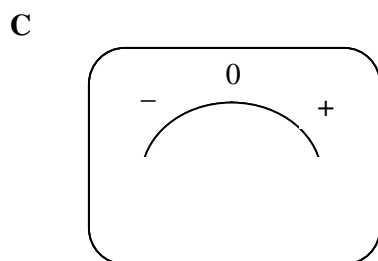
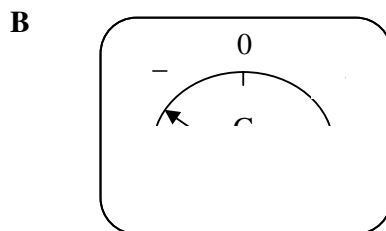
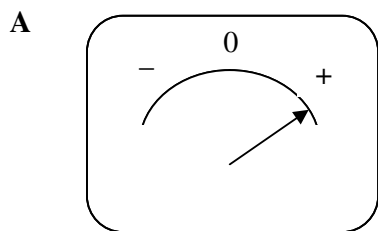


Diagram 30(a)
Rajah 30(a)

What is the deflection of the pointer if the same magnet pole is pulled away **quickly** from the same end of the solenoid?

Bagaimanakah pesongan jarum penunjuk jika kutub magnet yang sama ditarik dengan **laju** dari hujung solenoid yang sama?



42 Diagram 31 shows a step down transformer.

Rajah 31 menunjukkan transformer injak turun.

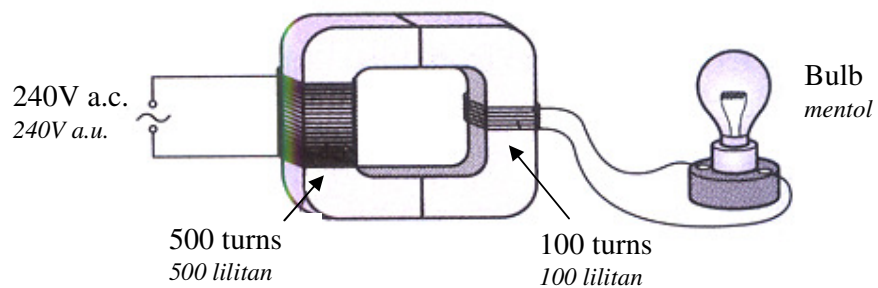


Diagram 31
Rajah 31

What is the potential difference across the bulb?

Apakah beza keupayaan merentasi mentol?

- A 4.0 V
- B 4.8 V
- C 48.0 V
- D 60.0 V

- 43 Why is the electrical energy generated at a voltage of 25 kV in power stations increased to 132 kV before transmission?

Mengapakah tenaga elektrik yang dihasilkan pada beza upaya 25 kV di stesen-stesen janakuasa dinaikkan ke 132 kV sebelum penghantaran ?

- A To increase the current in the transmission cables.
Untuk mengurangkan arus dalam kabel penghantaran.
- B So that step-down transformers can be used in the substations.
Supaya transformer injak turun boleh digunakan di substesen.
- C To distribute the power equally to all consumers.
Untuk menyebarkan kuasa sama rata kepada semua pengguna.
- D To reduce the power loss in the transmission cables.
Untuk mengurangkan kehilangan kuasa alam kabel penghantaran.
- 44 Diagram 33 shows the trace formed on the screen of a cathode ray oscilloscope.

Rajah 33 menunjukkan surihan yang terhasil pada skrin osiloskop sinar katod, OSK.

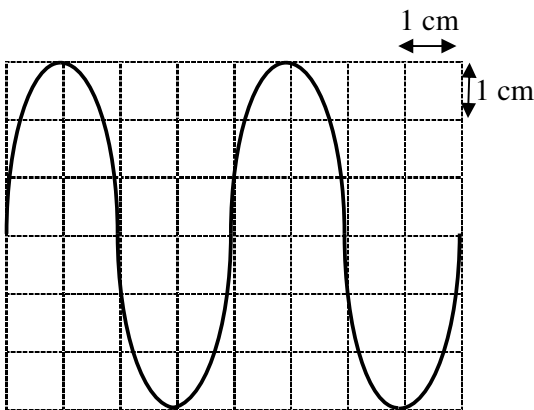


Diagram 33

Rajah 33

What is the potential difference if the Y-gain is set to 4.00 V/cm?

Berapakah beza keupayaan jika gandaan-Y ditetapkan pada 4.00 V/cm?

- A 4.0 V
- B 10.0 V
- C 12.0 V
- D 24.0 V

45 Diagram 34 shows a rectifier circuit.

Rajah 34 menunjukkan litar rektifikasi.

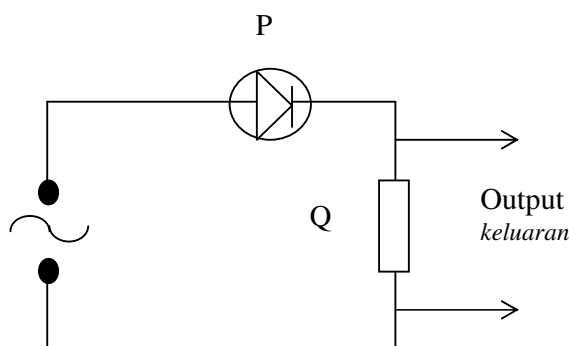


Diagram 34

Rajah 34

Which statement is **correct** about the circuit or its components?

*Pernyataan yang manakah **betul** tentang litar di atas atau komponennya?*

- A Component Q acts as a rectifier
Komponen Q bertindak sebagai rektifier
- B Component P allows current to flow in any direction
Komponen P membenarkan arus mengalir dalam semua arah
- C A rectifier changes direct current to alternating current
Rektifier menukarkan arus terus kepada arus ulangalik
- D The rectifier circuit will still function if component P is reversed
Litar rektifikasi di atas masih berfungsi jika komponen P di songsangkan.

46 Diagram 35 shows a transistor circuit which functions as an alarm system.

Rajah 35 menunjukkan litar transistor yang berfungsi sebagai satu sistem penggera

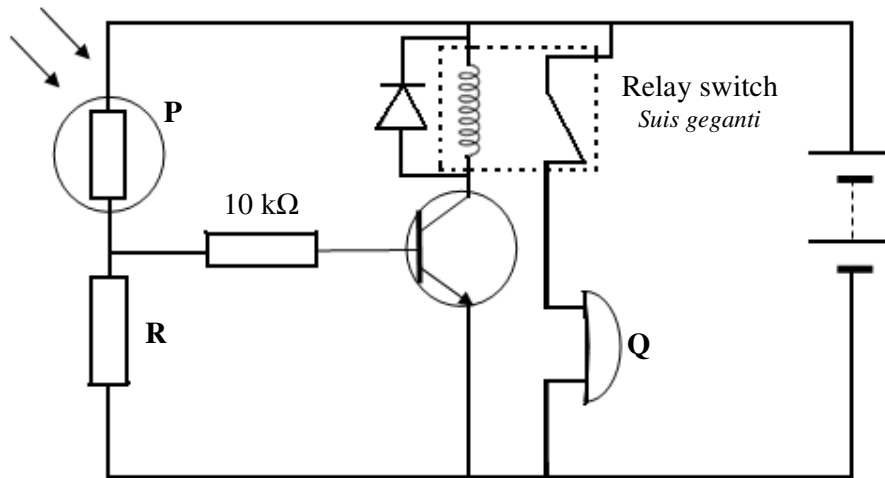


Diagram 35

Rajah 35

What happens to the resistance of **P** and the state of **Q** when the surrounding is dark?

Apakah yang berlaku kepada rintangan **P** dan keadaan **Q** apabila persekitarannya menjadi gelap?

	Resistance of P <i>Rintangan P</i>	State of Q <i>Keadaan Q</i>
A	Low <i>Rendah</i>	Activated <i>Dihidupkan</i>
B	Low <i>Rendah</i>	Not activated <i>Tidak dihidupkan</i>
C	High <i>Tinggi</i>	Activated <i>Dihidupkan</i>
D	High <i>Tinggi</i>	Not activated <i>Tidak dihidupkan</i>

47 Diagram 36 shows a combination of two logic gates with two input signals, J and K.

Rajah 36 menunjukkan satu kombinasi dua get logik dengan dua isyarat input, J dan K.

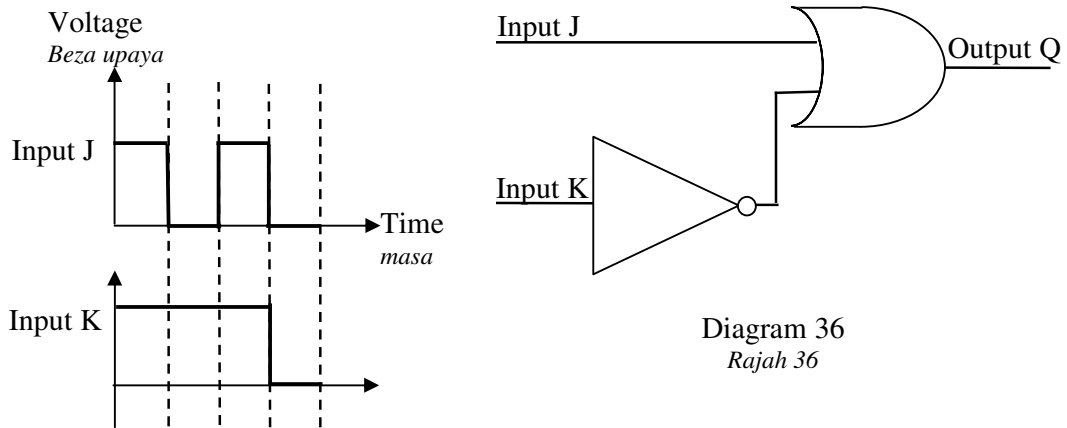


Diagram 36
Rajah 36

Which is the **correct** signal for output Q?

Isyarat yang manakah **betul** untuk output Q?

- A Time Masa
- B Time Masa
- C Time Masa
- D Time Masa

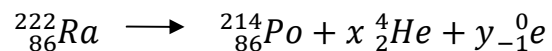
- 48 How many protons, neutrons and electrons are there in the radioisotope ${}_{15}^{32}\text{P}$?

Berapakah bilangan proton, neutron dan elektron bagi radioisotop ${}_{15}^{32}\text{P}$?

	Number of protons <i>Bilangan proton</i>	Number of neutrons <i>Bilangan neutron</i>	Number of electrons <i>Bilangan elektron</i>
A	15	17	15
B	17	15	17
C	15	32	15
D	32	15	32

- 49 The following equation shows the decay of a radon nucleus.

Persamaan berikut menunjukkan pereputan bagi nukleus radon.



What are the values of x and y ?

Apakah nilai x dan y ?

	x	y
A	1	1
B	1	4
C	2	1
D	2	4

50 Diagram 37 shows a nuclear reaction.

Diagram 37 menunjukkan tindak balas nucleus.

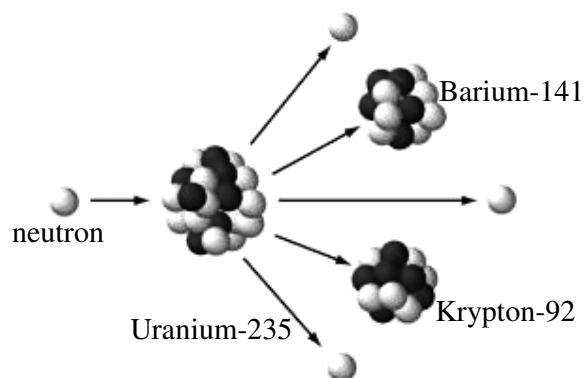


Diagram 37

Rajah 37

The above reaction occurs when

Tindakbalas di atas berlaku apabila

- A the pressure is very high
tekanan amat tinggi.
- B the temperature is very high
suhu amat tinggi
- C the radioactive sample exceeds its critical mass
jisim sampel bahan radioaktif melebihi jisim genting
- D the heavy nucleus is knocked by a slow neutron
nukleus berat dihentam oleh neutron yang perlahan

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.
Gambarajah yang mengiringi soalan tidak dilukiskan 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.