



**KEMENTERIAN  
PENDIDIKAN  
MALAYSIA**

**BAHAGIAN PENGURUSAN SEKOLAH BERASRAMA PENUH  
DAN SEKOLAH KECEMERLANGAN**

**PENTAKSIRAN DIAGNOSTIK AKADEMIK SBP 2015  
PERCUBAAN SIJIL PELAJARAN MALAYSIA**

**FIZIK**

**Kertas 1**

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**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU**

**Arahan :**

1. *Kertas soalan ini mengandungi **50** soalan.*
2. *Jawab **semua** soalan.*
3. *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 objektif.*
4. *Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.*
5. *Anda dibenarkan menggunakan kalkulator saintifik.*
6. *Satu senarai formula disediakan di halaman 2*

Kertas soalan ini mengandungi **35** halaman bercetak.

**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.  $s = ut + \frac{1}{2}at^2$
3.  $v^2 = u^2 + 2as$
4. Momentum =  $mv$
5.  $\lambda = \frac{ax}{D}$
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 / Haba,  $Q = ml$
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.  $F = ma$
20.  $n = \frac{\sin i}{\sin r}$
21.  $n = \frac{\text{real depth}}{\text{apparent depth}}$   
 $= \frac{\text{dalam nyata}}{\text{dalam ketara}}$
22. Linear magnification /  
*Pembesaran linear, m =  $\frac{v}{u}$*
23.  $Q = It$
24.  $V = IR$
25.  $E = VQ$
26. Power / Kuasa,  $P = IV$
27.  $\frac{N_p}{N_s} = \frac{V_p}{V_s}$
28. Efficiency / Kecekapan  
 $= \frac{I_s V_s}{I_p V_p} \times 100\%$
29.  $g = 10 \text{ ms}^{-2}$
30.  $c = 3.0 \times 10^8 \text{ ms}^{-1}$

1. Which statement is correct about the meaning of vector quantity?

*Pernyataan manakah yang betul tentang maksud kuantiti vektor?*

- A It is a base quantity.

*Ia adalah kuantiti asas.*

- B It can be measured.

*Ia boleh diukur.*

- C It has magnitude and direction.

*Ia mempunyai magnitud dan arah.*

- D It is a product of two or more physical quantities.

*Ia adalah hasil darab dua atau lebih kuantiti fizik.*

2. Diagram 1 shows a measuring instrument.

*Rajah 1 menunjukkan satu alat pengukur.*

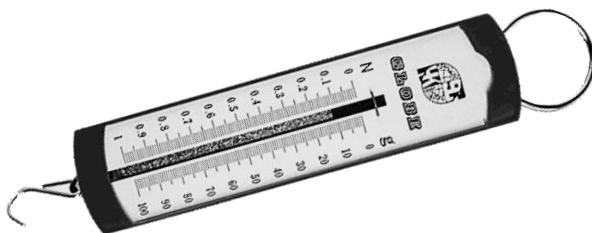


Diagram 1  
*Rajah 1*

The instrument is used to measure

*Alat ini digunakan untuk mengukur*

- A length

*panjang*

- B weight

*berat*

- C density

*ketumpatan*

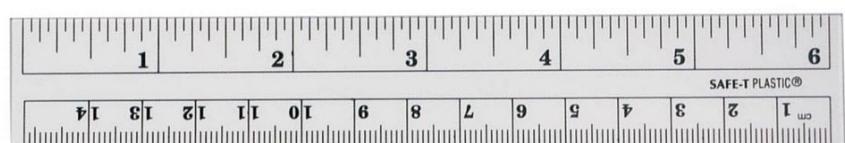
- D extension

*pemanjangan*

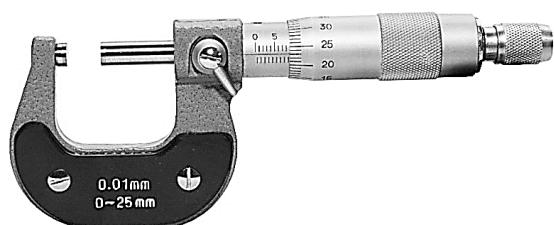
3. Which measuring instruments is the most sensitive?

*Alat pengukur manakah adalah paling peka?*

A



B



C



D



4. Which phenomenon shows the effect of impulsive force?  
*Fenomena manakah yang menunjukkan kesan daya impul?*

A



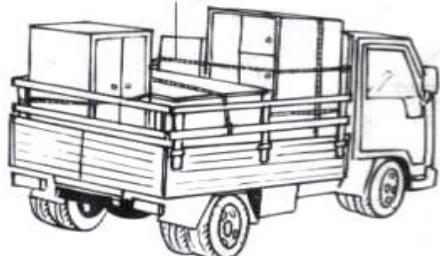
B



C



D



5. Diagram 2 shows a coconut falling from a tree.

Rajah 2 menunjukkan sebiji kelapa jatuh dari sebatang pokok.

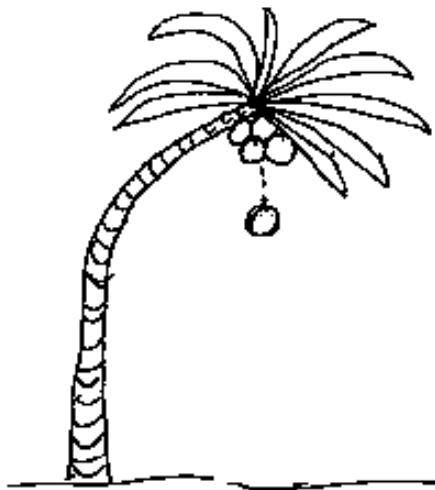
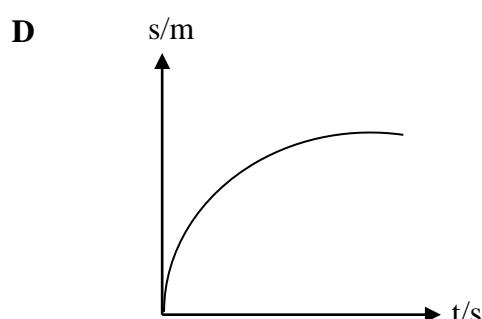
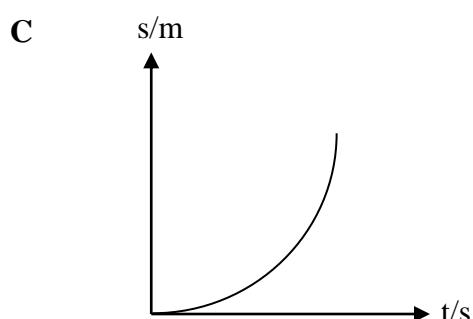
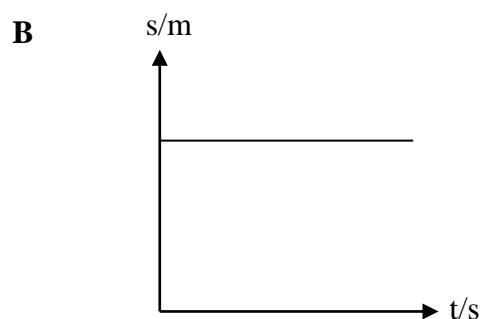
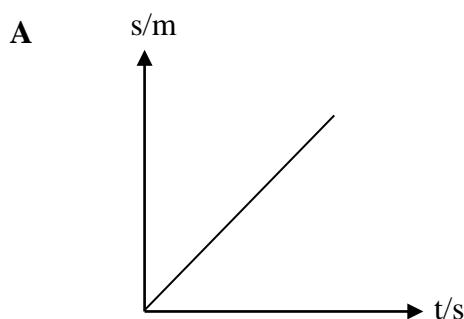


Diagram 2

Rajah 2

Which displacement-time graph represents the motion of the coconut?

Graf sesaran-masa manakah yang mewakili gerakan buah kelapa itu?



6. Diagram 3 shows two boys pull a boat with force 40 N and 30 N respectively.

*Rajah 3 menunjukkan dua budak menarik sebuah bot dengan daya 40 N dan 30 N masing-masing.*

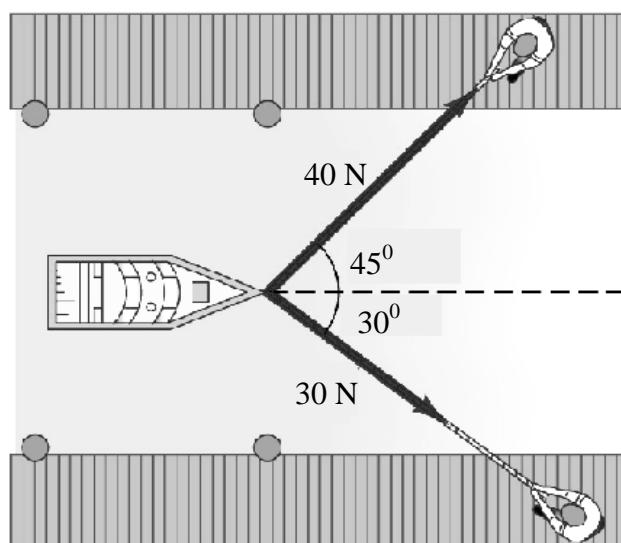


Diagram 3  
Rajah 3

What is the magnitude of the resultant force acting on the boat?

*Berapakah magnitud daya paduan yang bertindak ke atas bot?*

- A 70.0 N
- B 55.9 N
- C 54.3 N
- D 43.3 N

7. Diagram 4 shows a wooden block is placed on the smooth surface of a table.

*Rajah 4 menunjukkan sebuah bongkah kayu di letakkan di atas permukaan licin sebuah meja.*

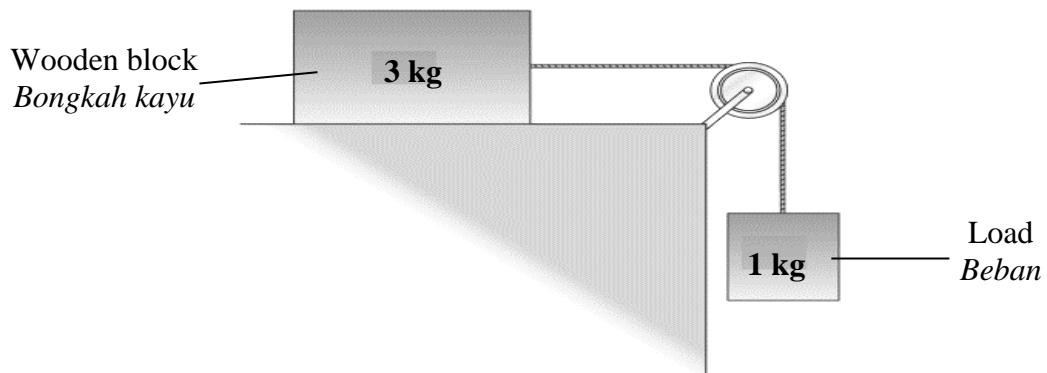


Diagram 4  
Rajah 4

Which statement describes the motion of wooden block, when a load of 1 kg is released?

*Pernyataan manakah menghuraikan pergerakan blok kayu apabila beban 1 kg dilepaskan?*

- A Remains stationary  
*Kekal pegun*
- B Moves with a uniform velocity  
*Bergerak dengan halaju seragam*
- C Moves with a uniform acceleration  
*Bergerak dengan pecutan seragam*
- D Moves with increasing acceleration  
*Bergerak dengan pecutan bertambah*

8. Diagram 5 shows a test of air bags in a car.

*Rajah 5 menunjukkan ujian beg udara di dalam sebuah kereta.*



Diagram 5  
*Rajah 5*

What is the function of air bag?

*Apakah fungsi beg udara?*

- A To increase time impact  
*Untuk menambah masa hentaman*
- B To decrease momentum  
*Untuk mengurangkan momentum*
- C To increase impulsive force  
*Untuk menambah daya impuls*
- D To increase friction  
*Untuk menambah geseran*

9. Diagram 6 shows Hazran lifting 60 kg of load.

*Rajah 6 menunjukkan Hazran mengangkat beban berjisim 60 kg.*

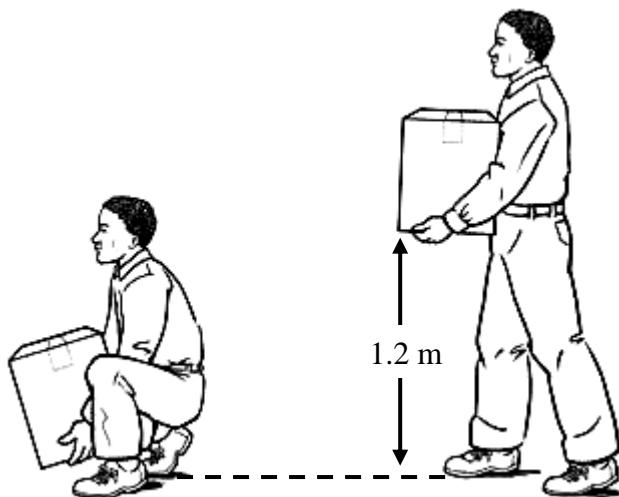


Diagram 6  
*Rajah 6*

What is work done in lifting the load?

*Berapakah kerja yang telah dilakukan untuk mengangkat beban tersebut?*

A 50 J

B 72 J

C 500 J

D 720 J

10. Diagram 7 shows P and Q are two spring arrangements made of identical springs. P and Q are stretched using similar loads.

*Rajah 7 menunjukkan P dan Q, adalah dua susunan spring yang dibuat daripada spring yang serupa. P dan Q diregang menggunakan pemberat yang serupa.*

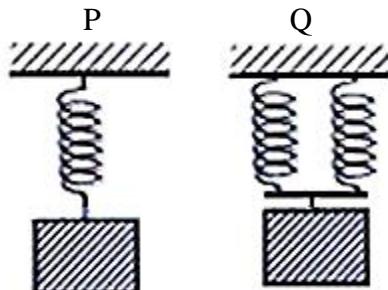
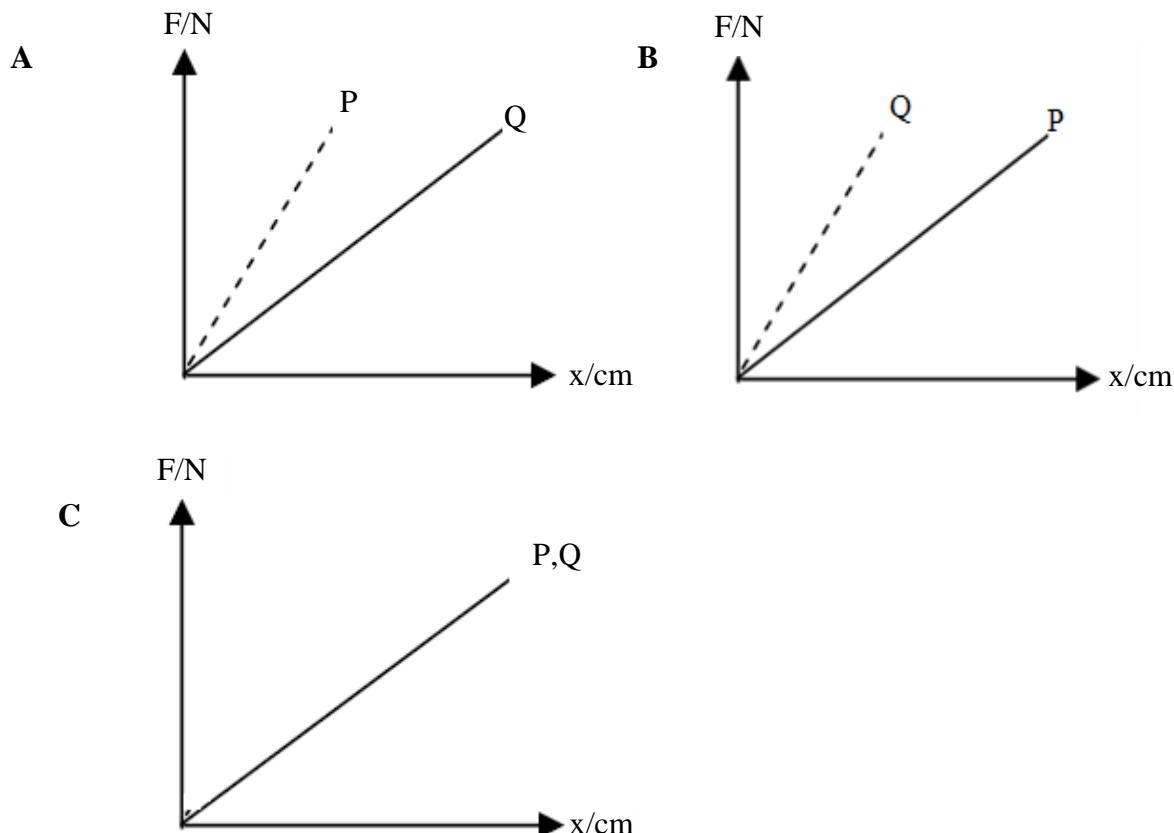


Diagram 7  
*Rajah 7*

Which graph shows the relationship between the load weight, F and the extension of spring, x, for P and Q?

*Graf manakah menunjukkan hubungan antara berat pemberat, F dan pemanjangan spring, x, untuk P dan Q?*



11. Which factor **does not** affect the pressure at a point in the liquid?

*Faktor manakah yang **tidak** mempengaruhi tekanan pada suatu titik di dalam cecair?*

- A Depth of liquid  
*Kedalaman cecair*
- B The density of liquid  
*Ketumpatan cecair*
- C Surface area of a liquid  
*Luas permukaan cecair*
- D Gravitational acceleration  
*Pecutan graviti*

- 12.** Among these situations, which can damage wooden floor that can withstand only  $2 \times 10^5$  Pa pressure?

*Antara situasi berikut, yang manakah boleh merosakkan lantai kayu yang hanya dapat menampung tekanan  $2 \times 10^5$  Pa?*

- A** A block of cement with a weight of  $2 \times 10^5$  N and a surface area of  $10\text{ m}^2$ .  
*Satu bongkah simen dengan berat  $2 \times 10^5$  N dan luas permukaan  $10\text{ m}^2$ .*
- B** An elephant with a weight of  $3 \times 10^4$  N and total area of footprints are  $0.2\text{ m}^2$ .  
*Seekor gajah dengan berat  $3 \times 10^4$  N dan jumlah luas tapak kaki  $0.2\text{ m}^2$ .*
- C** Amy with a weight of 500 N wears small heeled shoes that have surface area of  $0.0002\text{ m}^2$ .  
*Indahsari dengan berat 500 N memakai kasut bertumit kecil yang mempunyai luas permukaan  $0.0002\text{ m}^2$ .*
- D** Amir with a weight of 400 N wears sport shoes with surface area of  $0.03\text{ m}^2$ .  
*Amir dengan berat 400 N memakai kasut sukan yang mempunyai luas permukaan  $0.03\text{ m}^2$ .*

- 13.** Diagram 8 shows a manometer connected to a gas tank.

*Rajah 8 menunjukkan sebuah manometer yang disambungkan kepada sebuah tangki gas.*

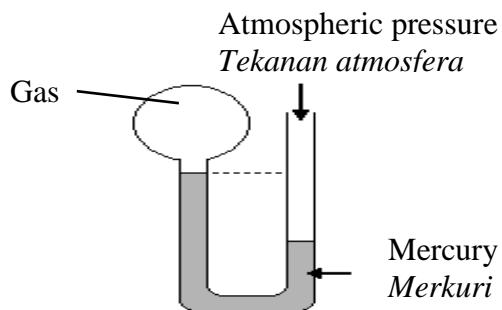


Diagram 8  
Rajah 8

If the atmospheric pressure is 76 cm Hg, which statement is true about the pressure of gas in the tank?

*Jika tekanan atmosfera ialah 76 cm Hg, pernyataan yang manakah adalah benar tentang tekanan gas dalam tangki?*

- A** Equal to 76 cm Hg  
*Sama dengan 76 cm Hg*
- B** Larger than 76 cm Hg  
*Lebih besar daripada 76 cm Hg*
- C** Smaller than 76 cm Hg  
*Lebih kecil daripada 76 cm Hg*
- D** Equivalent to 0 cm Hg  
*Sama dengan 0 cm Hg*

**14.** Diagram 9 shows a hydraulic system

*Rajah 9 menunjukkan satu sistem hidraulik.*

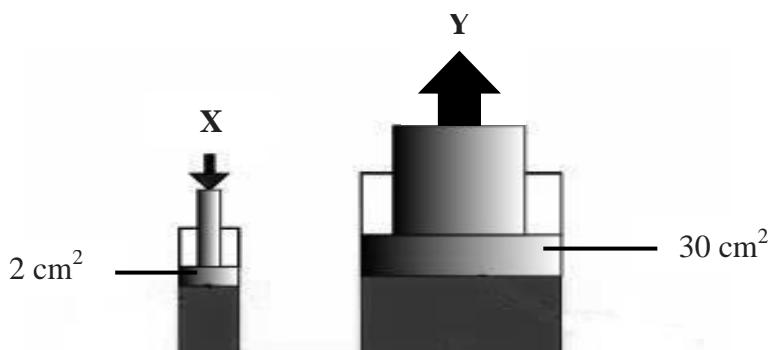


Diagram 9  
*Rajah 9*

Which pair of forces X and Y is true?

*Pasangan daya X dan Y yang manakah adalah benar?*

	Force X / N <i>Daya X / N</i>	Force Y / N <i>Daya Y / N</i>
<b>A</b>	20	200
<b>B</b>	60	900
<b>C</b>	80	480
<b>D</b>	100	1000

- 15.** Diagram 10 shows the weight of an object X is measured in the air and then in the water.

Rajah 10 menunjukkan berat suatu objek X diukur di udara dan kemudian di dalam air.

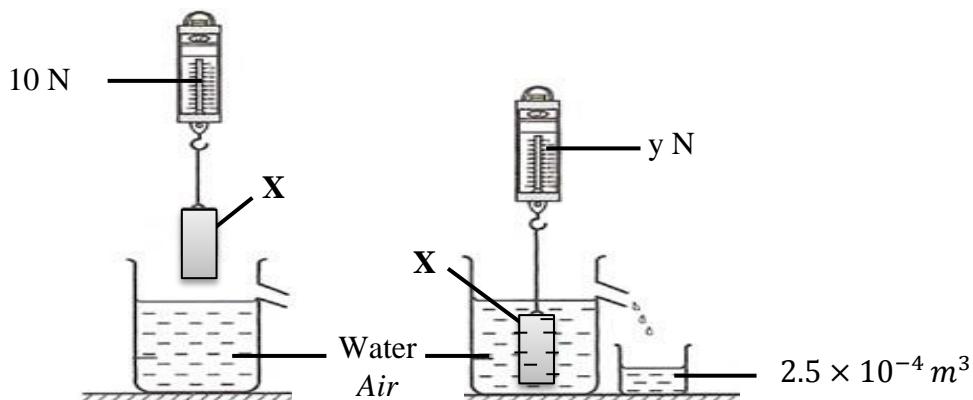


Diagram 10

Rajah 10

What is the reading of y?

(The density of water =  $1000 \text{ kg m}^{-3}$ )

Berapakah bacaan y?

(Ketumpatan air =  $1000 \text{ kg m}^{-3}$ )

A 2.5 N

B 7.5 N

C 10.0 N

D 12.5 N

- 16.** Diagram 11 shows a car.

Rajah 11 menunjukkan sebuah kereta.

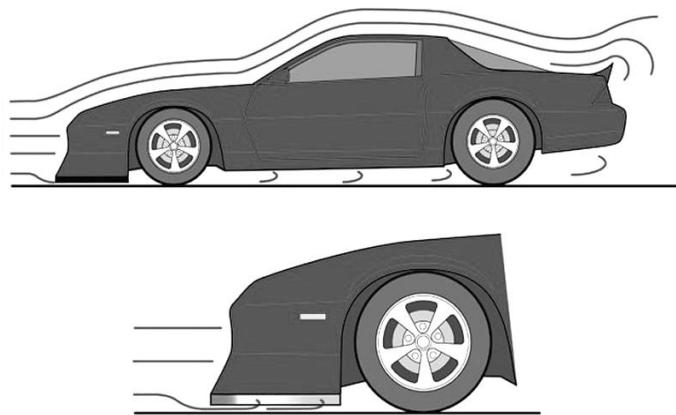


Diagram 11

Rajah 11

Physics principles which contribute to the stability of the car when it accelerates and moves at high speed is

*Prinsip fizik yang menyumbang kepada kestabilan kereta itu apabila ia memecut dan bergerak dengan laju tinggi ialah*

A Pascal's principle

*Prinsip Pascal*

B Bernoulli's principle

*Prinsip Bernoulli*

C Archimedes' principle

*Prinsip Archimedes*

17. Diagram 12 shows a manometer tube filled with mercury and liquid X.

*Rajah 12 menunjukkan satu tiub manometer diisi dengan merkuri dan cecair X.*

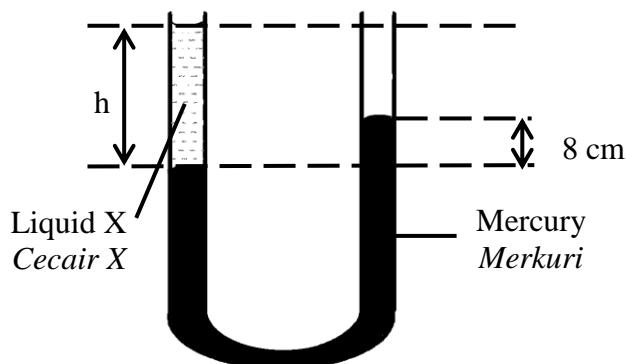


Diagram 12  
Rajah 12

What is the height, h of the liquid X ?

(Density of mercury =  $13\ 600\ \text{kg m}^{-3}$  and density of liquid X =  $3\ 400\ \text{kg m}^{-3}$ )

*Berapakah ketinggian, h cecair X?*

*(Ketumpatan merkuri =  $13\ 600\ \text{kg m}^{-3}$  dan ketumpatan cecair X =  $3\ 400\ \text{kg m}^{-3}$ )*

A 8 cm

B 16 cm

C 32 cm

D 64 cm

- 18.** Mercury is used in the liquid-in-glass thermometer because it  
*Merkuri digunakan di dalam termometer cecair dalam kaca kerana ia*
- A** sticks to the glass wall  
*melekat pada dinding kaca*
  - B** has low boiling point  
*mempunyai takat didih yang rendah*
  - C** expands and contracts uniformly  
*mengembang dan mengecut dengan sekata*
  - D** is transparent and easier to read  
*adalah lutsinar dan mudah dibaca*

- 19.** Diagram 13 shows a stone at  $60^{\circ}\text{C}$  is immersed in a cooler liquid Y.

*Rajah 13 menunjukkan seketul batu pada suhu  $60^{\circ}\text{C}$  direndamkan ke dalam satu cecair Y yang lebih sejuk.*

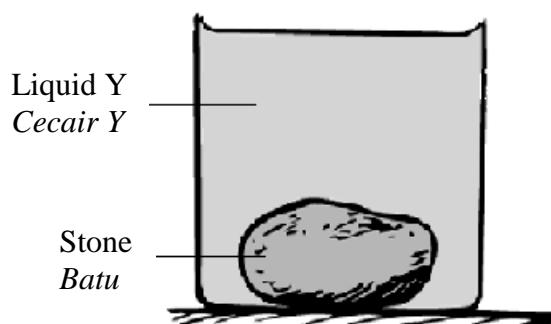


Diagram 13  
*Rajah 13*

Thermal equilibrium is reached when

*Keseimbangan terma dicapai apabila*

- A** Volume of stone = volume of liquid Y  
*Isipadu batu = isipadu cecair Y*
- B** Mass of stone = mass of liquid Y displaced  
*Jisim batu = jisim cecair Y yang disesarkan*
- C** Temperature of stone = temperature of liquid Y  
*Suhu batu = suhu cecair Y*
- D** Specific heat capacity of stone = specific heat capacity of liquid Y  
*Muatan haba tentu batu = muatan haba tentu cecair Y*

- 20.** Diagram 14 shows a cooling curve of a substance.

*Rajah 14 menunjukkan lengkung penyejukan suatu bahan.*

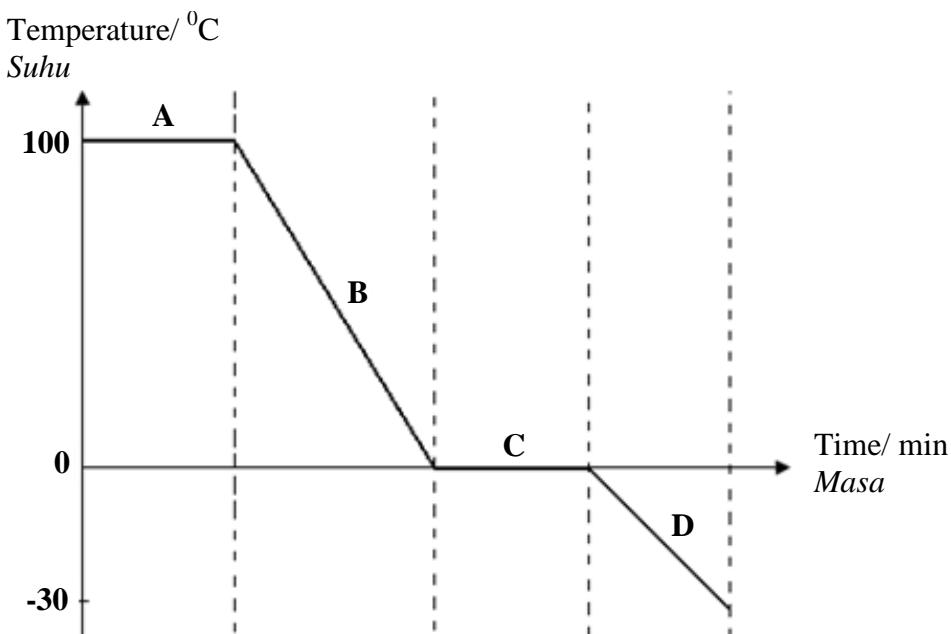


Diagram 14  
*Rajah 14*

Which of the phases **A**, **B**, **C** or **D**, shows the substance is in solid and liquid at the same time?

*Fasa manakah antara **A**, **B**, **C** atau **D**, yang menunjukkan bahan itu dalam keadaan pepejal dan cecair pada masa yang sama?*

- 21.** Diagram 15 shows sea breeze phenomenon.

*Rajah 15 menunjukkan fenomena bayu laut.*

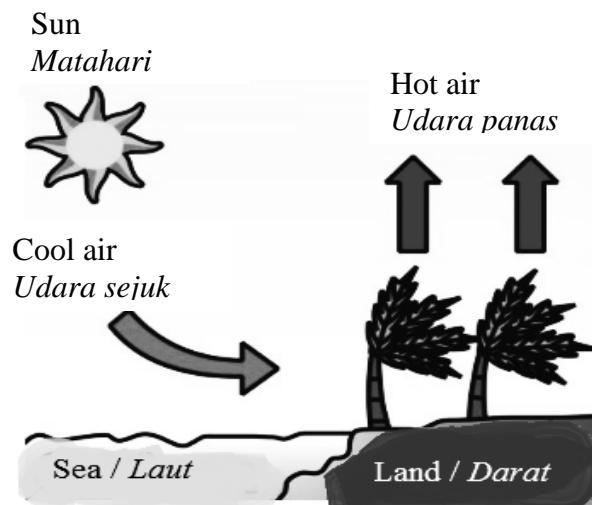


Diagram 15  
*Rajah 15*

Which physics concept explains the phenomenon?

Konsep fizik manakah yang menerangkan fenomena tersebut?

- A Thermal equilibrium  
*Keseimbangan terma*
- B Specific heat capacity  
*Muatan haba tentu*
- C Specific latent heat  
*Haba pendam tentu*
- D Thermal conductivity  
*Kekonduksian haba*

22. Diagram 16 shows the length of an air trapped column at  $27^{\circ}\text{C}$ .

Rajah 16 menunjukkan panjang turus udara terperangkap pada  $27^{\circ}\text{C}$ .

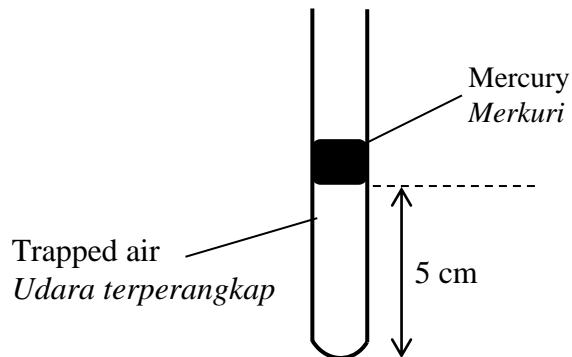


Diagram 16  
Rajah 16

What is the length of the air column at  $100^{\circ}\text{C}$ ?

Berapakah panjang turus udara pada  $100^{\circ}\text{C}$ ?

- A 1.35 cm
- B 4.02 cm
- C 6.22 cm
- D 18.52 cm

23. Diagram 17 shows Yusuf is conducting an eye test. The distance between Yusuf and the object is 2.5 m.

*Rajah 17 menunjukkan Yusuf sedang menjalani ujian mata. Jarak di antara Yusuf dengan objek adalah 2.5 m.*

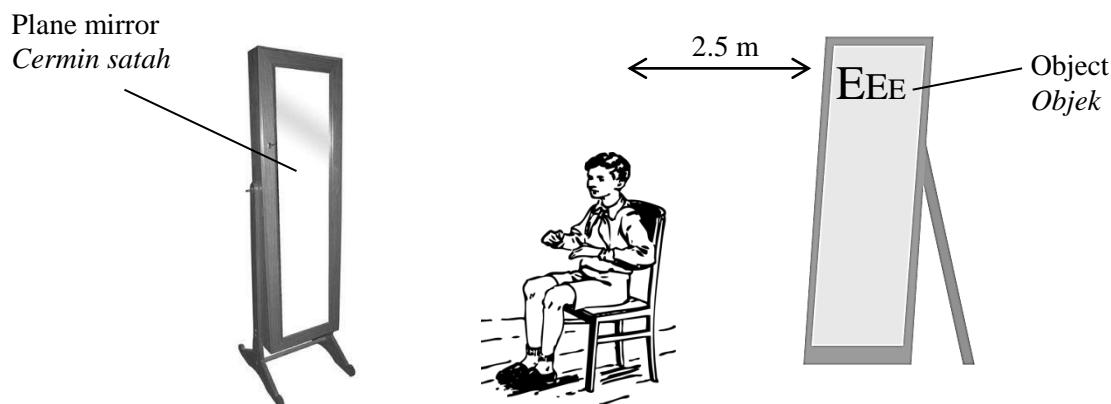


Diagram 17  
Rajah 17

If the distance between Yusuf and the image is 7 m, what is the distance between Yusuf and the plane mirror?

*Jika jarak di antara Yusuf dengan imej adalah 7 m, berapakah pula jarak di antara Yusuf dengan cermin satah itu?*

- |          |          |
|----------|----------|
| A 2.25 m | B 2.50 m |
| C 3.50 m | D 7.00 m |

24. Diagram 18 shows a vehicle with word **AMBULANCE** in front of it.

*Rajah 18 menunjukkan sebuah kenderaan dengan perkataan **AMBULANCE** di hadapannya.*



Diagram 18  
Rajah 18

What is the characteristic of image from a plane mirror to explain the situation?

*Apakah ciri imej daripada cermin satah untuk menerangkan situasi tersebut?*

- |                                      |   |
|--------------------------------------|---|
| <b>A</b> Real<br><i>Nyata</i>        | <b>B</b> Virtual<br><i>Maya</i>                     |
| <b>C</b> Inverted<br><i>Songsang</i> | <b>D</b> Laterally inverted<br><i>Songsang sisi</i> |

25. Diagram 19 shows a light ray enters the glass block with an angle.

*Rajah 19 menunjukkan satu alur cahaya memasuki satu blok kaca dengan suatu sudut.*

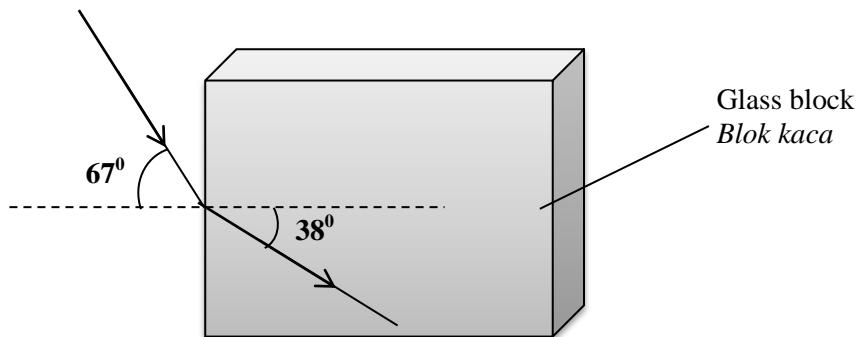


Diagram 19  
*Rajah 19*

What is the critical angle of the glass block?

*Berapakah nilai sudut genting bagi blok kaca tersebut?*

- |                 |                 |
|-----------------|-----------------|
| <b>A</b> $39^0$ | <b>B</b> $42^0$ |
| <b>C</b> $50^0$ | <b>D</b> $69^0$ |

26. Which characteristics of image formed by a magnifying glass?

*Ciri-ciri imej yang manakah terbentuk oleh sebuah kanta pembesar?*

- |   |   |
|---|---|
| <b>A</b> Real and upright<br><i>Nyata dan tegak</i>     | <b>B</b> Virtual and upright<br><i>Maya dan tegak</i>     |
| <b>C</b> Real and inverted<br><i>Nyata dan songsang</i> | <b>D</b> Virtual and inverted<br><i>Maya dan songsang</i> |

27. Diagram 20 shows the apparatus used to determine the relationship between the object distance,  $u$ , the image distance,  $v$  and the focal length,  $f$ , of a convex lens.

Rajah 20 menunjukkan radas eksperimen untuk menentukan hubungan di antara jarak objek,  $u$ , jarak imej,  $v$  dan jarak fokus,  $f$ , bagi sebuah kanta cembung.

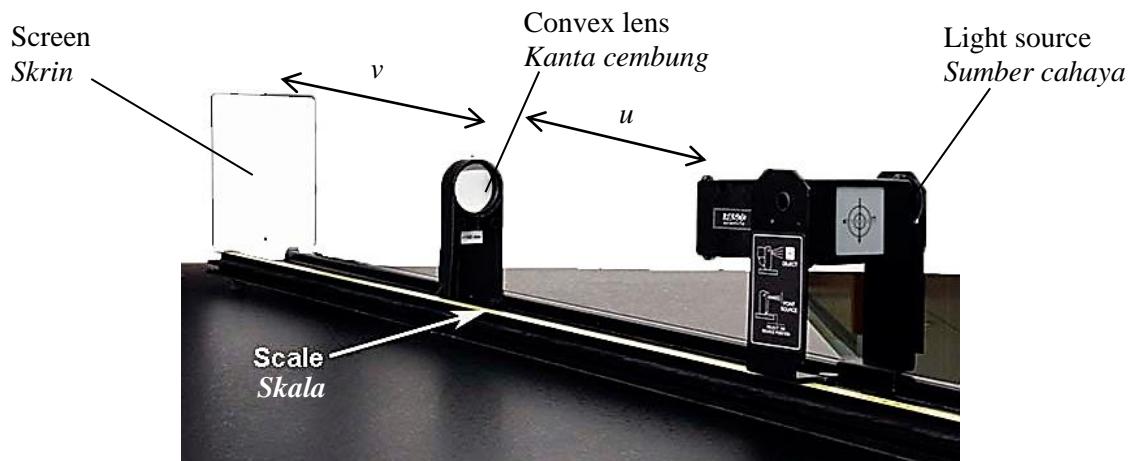
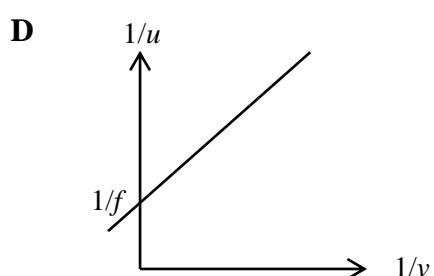
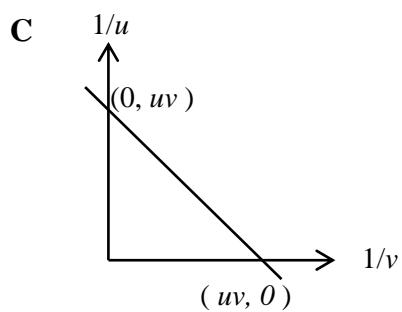
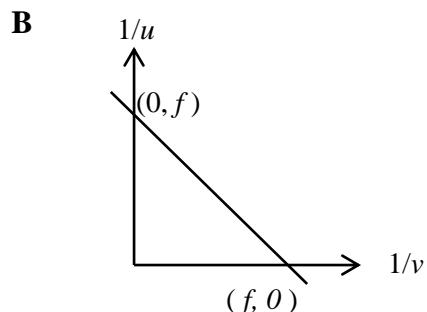
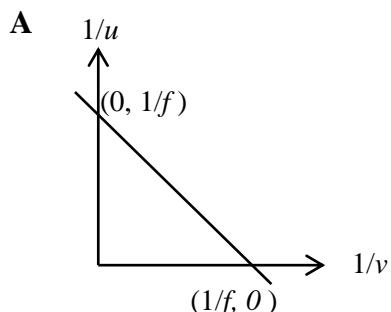


Diagram 20  
Rajah 20

Which graph shows the correct result?

Graf yang manakah menunjukkan keputusan yang betul?



- 28.** Diagram 21 shows a graph of velocity against wavelength for three experiments X, Y and Z.

*Rajah 21 menunjukkan graf halaju melawan panjang gelombang bagi tiga eksperimen X, Y dan Z.*

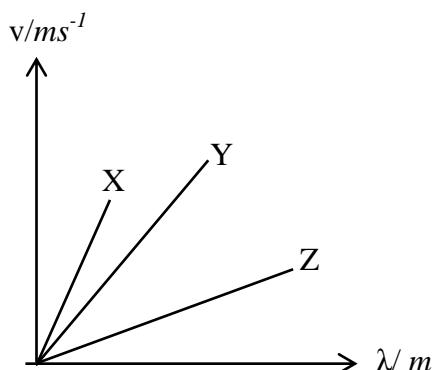


Diagram 21  
*Rajah 21*

Which experiment shows the highest frequency?

*Eksperimen manakah menunjukkan frekuensi tertinggi?*

- A** X
- B** Y
- C** Z

- 29.** Diffraction of waves is

*Pembelauan gelombang adalah*

- A** superposition effect of two waves from two coherent sources.  
*kesan superposisi dua gelombang daripada dua sumber koheren.*
- B** when the waves are deflected after it encounters an obstacle.  
*apabila gelombang dipesongkan selepas bertemu halangan.*
- C** the spreading of waves when it moves through a gap or around an obstacle.  
*penyebaran gelombang apabila ia bergerak melalui celah atau mengelilingi halangan.*
- D** change of direction of propagation of waves when travelling from a medium to another medium due to a change of speed  
*perubahan arah perambatan gelombang apabila bergerak dari satu medium kepada medium yang lain disebabkan oleh perubahan laju.*

30. Diagram 22 shows a poster about the tsunami.

*Rajah 22 menunjukkan poster tentang tsunami.*

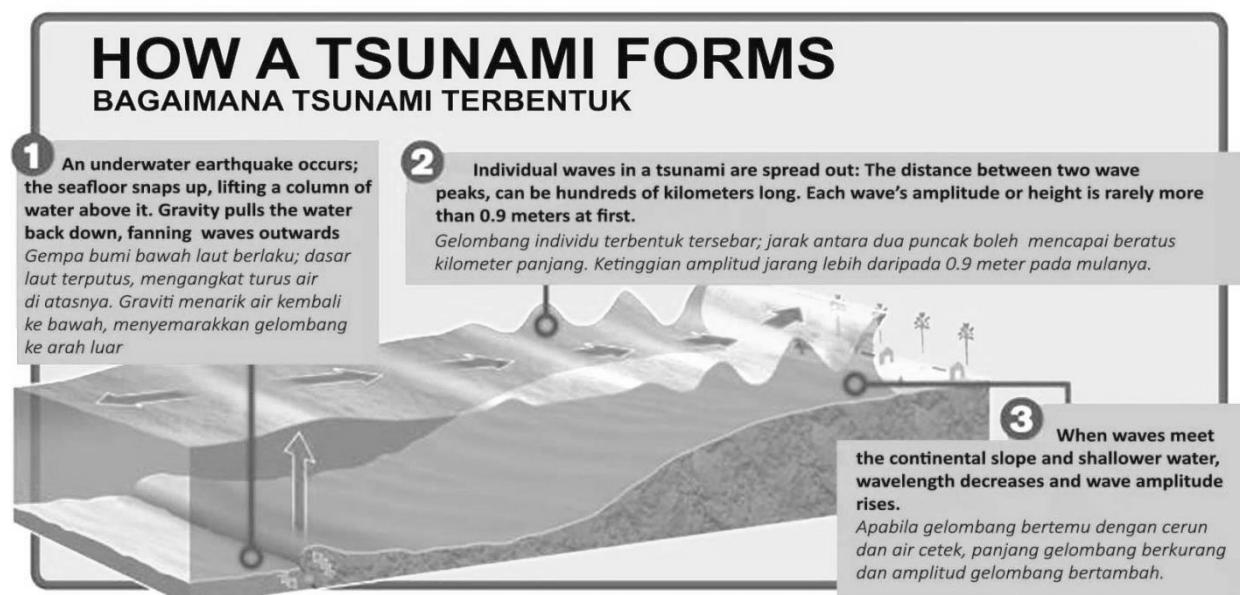


Diagram 22  
*Rajah 22*

Which statement is correct about the tsunami?

*Pernyataan manakah yang betul tentang tsunami?*

- A The energy decreases as the amplitude of the wave increases  
*Tenaga berkurang apabila amplitud gelombang bertambah.*
- B The energy and wave amplitude increases due to the effect of superposition between the waves.  
*Tenaga dan amplitud gelombang bertambah disebabkan oleh kesan superposisi antara gelombang.*
- C The energy produced by the earthquake at sea moving along the water particle to the shore.  
*Tenaga yang terhasil akibat gempa bumi di tengah laut bergerak bersama-sama zarah-zarah air ke pantai.*
- D The energy produced by the earthquake at sea is transferred by water particle to the shore.  
*Tenaga yang terhasil akibat gempa bumi di tengah laut di pindahkan oleh zarah air ke pantai.*

31. Diagram 23 shows the fringes obtained when red light is used in a Young's double slit experiment.

*Rajah 23 menunjukkan pinggir-pinggir yang diperoleh apabila cahaya merah digunakan dalam eksperimen dwicelah Young.*

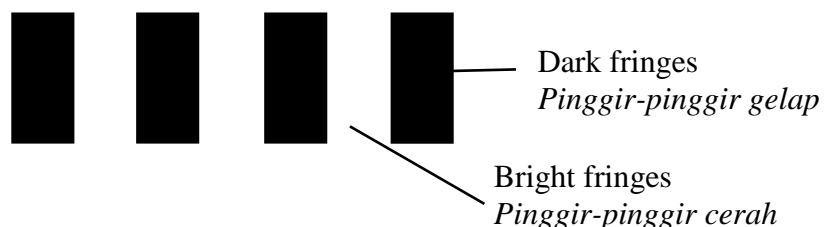
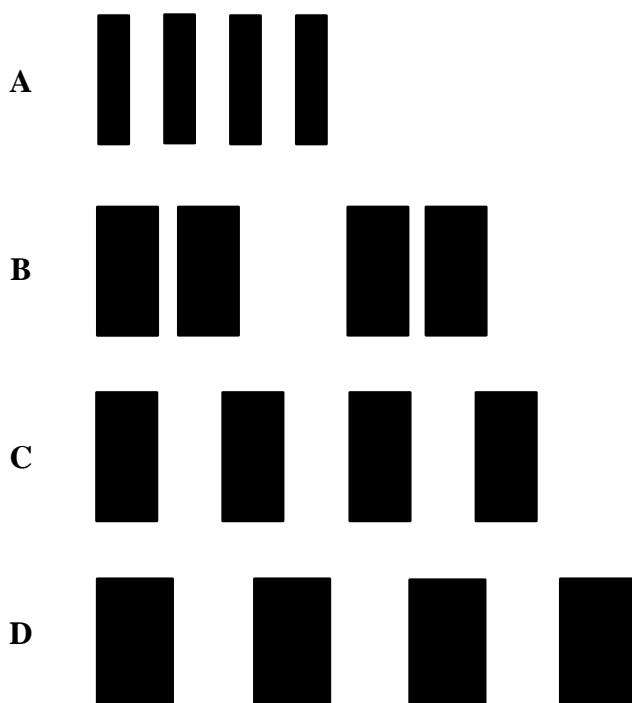


Diagram 23  
Rajah 23

Which fringes are observed when the red light is replaced by blue light?

*Pinggir-pinggir manakah yang diperhatikan jika cahaya merah digantikan dengan cahaya biru?*



32. Diagram 24 shows sound waves propagating towards a wall.

*Rajah 24 menunjukkan gelombang bunyi merambat ke arah sebuah dinding.*

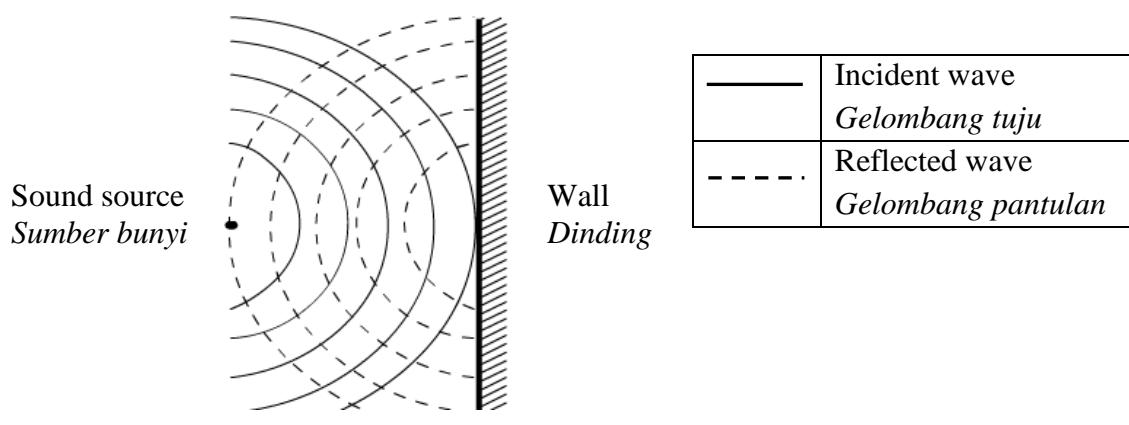


Diagram 24  
*Rajah 24*

Which of the characteristics changes after reflection occurs?

*Ciri manakah yang berubah selepas pantulan berlaku?*

- |                                  |   |
|----------------------------------|---|
| <b>A</b> Speed<br><i>Laju</i>    | <b>B</b> Direction<br><i>Arah</i>               |
| <b>C</b> Period<br><i>Tempoh</i> | <b>D</b> Wavelength<br><i>Panjang gelombang</i> |

33. Mammography is a process to examine the human breast which able to detect breast cancer earlier.

*Mamografi adalah satu proses untuk memeriksa payu dara manusia yang boleh mengesan kanser payu dara lebih awal.*

Which electromagnetic wave is used for this purpose?

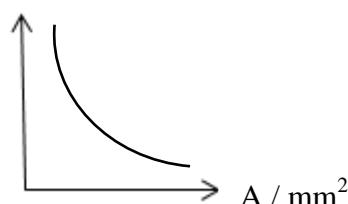
*Gelombang elektromagnet manakah digunakan untuk tujuan ini?*

- |   |   |
|---|---|
| <b>A</b> X-ray<br><i>Sinar-X</i>        | <b>B</b> Microwave<br><i>Gelombang mikro</i>  |
| <b>C</b> Infrared<br><i>Infra merah</i> | <b>D</b> Radio wave<br><i>Gelombang radio</i> |

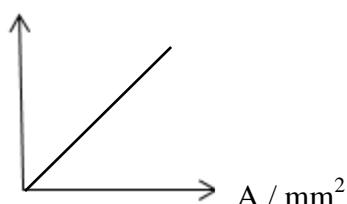
34. Which graph shows the correct relationship between the resistance, R and its cross-sectional area, A for a conductor?

*Graf manakah yang menunjukkan hubungan yang betul antara rintangan, R dengan luas keratan rentas, A bagi konduktor?*

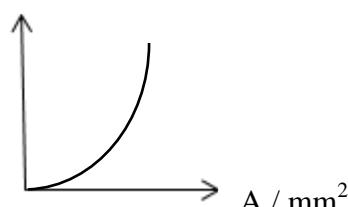
A  $R / \Omega$



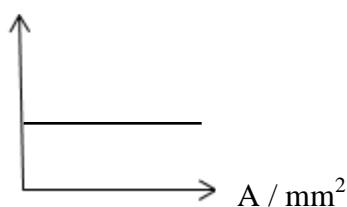
B  $R / \Omega$



C  $R / \Omega$



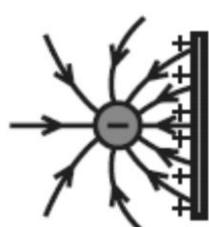
D  $R / \Omega$



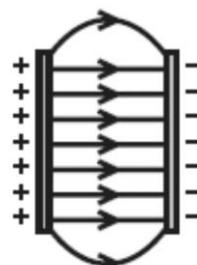
35. Which diagram does **not** show the pattern of an electric field correctly?

*Rajah manakah yang **tidak** menunjukkan corak medan magnet yang betul?*

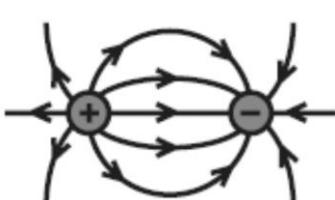
A



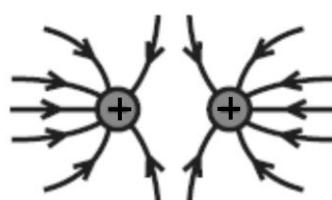
B



C



D



36. Diagram 25 shows a rheostat X and resistor Y are connected in series to two batteries.

Voltmeter  $V_1$  and  $V_2$  are connected across the rheostat and resistor respectively.

*Rajah 25 menunjukkan reostat X dan perintang Y yang disambung secara sesiri dengan dua bateri. Voltmeter  $V_1$  dan  $V_2$  masing-masing disambung merentasi reostat X dan perintang Y.*

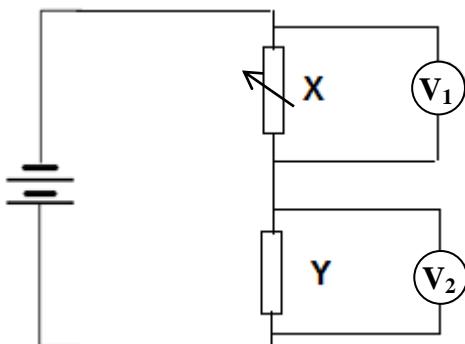


Diagram 25  
Rajah 25

Which pair of the voltmeters' reading is correct when the resistance of the rheostat X is reduced?

*Pasangan bacaan voltmeter yang manakah betul apabila rintangan pada reostat X dikurangkan?*

	Voltmeter $V_1$	Voltmeter $V_2$
A	Decreases <i>Berkurang</i>	Decreases <i>Berkurang</i>
B	Decreases <i>Berkurang</i>	Increases <i>Bertambah</i>
C	Increases <i>Bertambah</i>	Increases <i>Bertambah</i>
D	Increases <i>Bertambah</i>	Decreases <i>Berkurang</i>

37. Diagram 26 shows an electric kettle labeled ‘240 V, 2200 W’.

*Rajah 26 menunjukkan sebuah cerek elektrik berlabel ‘240 V, 2200 W’.*



Diagram 26  
*Rajah 26*

What is the current that flow in wires?

*Berapakah arus yang mengalir melalui dawai?*

- A 4.80
- B 8.80
- C 9.17
- D 10.00

38. Diagram 27 shows a plotting compass placed beside a current-carrying wire.

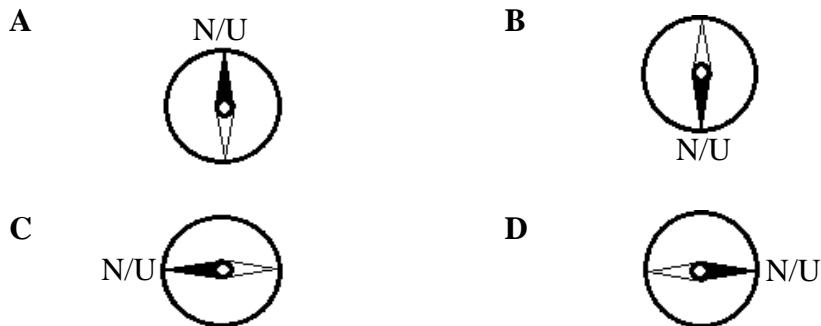
Rajah 27 menunjukkan sebuah kompas diletakkan di sebelah suatu dawai yang mengalirkan arus elektrik.



Diagram 27  
Rajah 27

Which compass pointer shows the correct direction?

Jarum kompas yang manakah menunjukkan arah yang betul?



39. Diagram 28 shows wire X and wire Y connected in a circuit.

Rajah 28 menunjukkan dawai X dan dawai Y disambung dalam satu litar.

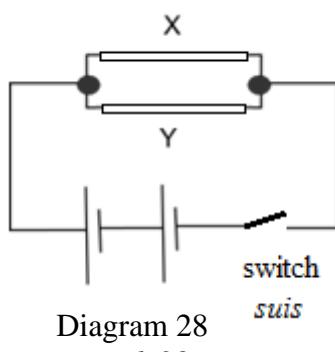


Diagram 28  
Rajah 28

Which direction of the electromagnetic forces acting on wire X and wire Y is correct when the switch is closed?

Apakah arah daya elektromagnet yang bertindak ke atas dawai X dan dawai Y adalah betul apabila suis ditutup?

	Wire X Dawai X	Wire Y Dawai Y
A	↑	↑
B	↑	↓
C	↓	↓
D	↓	↑

40. Diagram 29 shows an electrically-controlled water valve.

Rajah 29 menunjukkan suatu injap pengawal air elektrik.

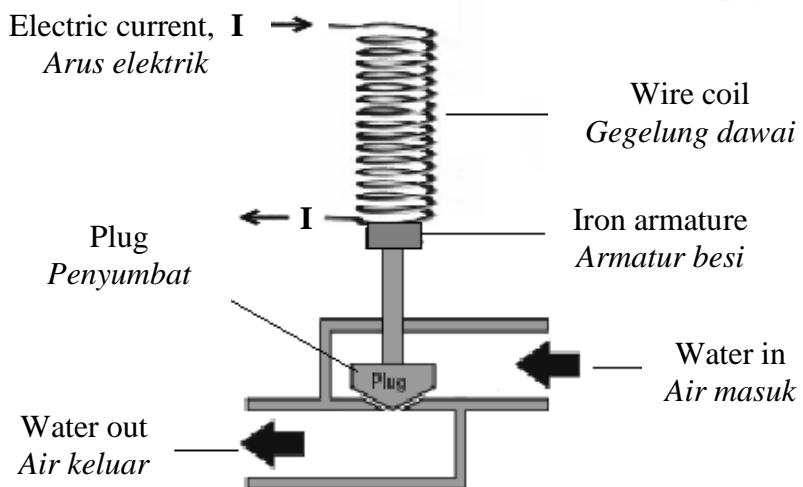


Diagram 29  
Rajah 29

The design engineer discovers that the valve did not function like it was supposed to.

What is possible reason for this type of failure?

Jurutera rekabentuk mendapati injap tidak berfungsi seperti yang sepatutnya. Apakah sebab yang mungkin bagi kegagalan tersebut?

- A The diameter of the coil is small

*Diameter gegelung adalah kecil*

- B The coil wire has low resistivity

*Gegelung dawai mempunyai kerintangan rendah*

- C The electric current flows is small

*Arus elektrik yang mengalir adalah kecil*

- D The number of iron armatures is less

*Bilangan armatur besi adalah kurang*

41. Diagram 30 shows the deflection of galvanometer pointer when a bar magnet is dropped vertically through the coil linked to the center-zero galvanometer.

Rajah 30 menunjukkan pesongan jarum galvanometer apabila sebatang magnet bar dijatuhkan secara menegak menerusi satu gegelung yang disambungkan kepada galvanometer sifar tengah.

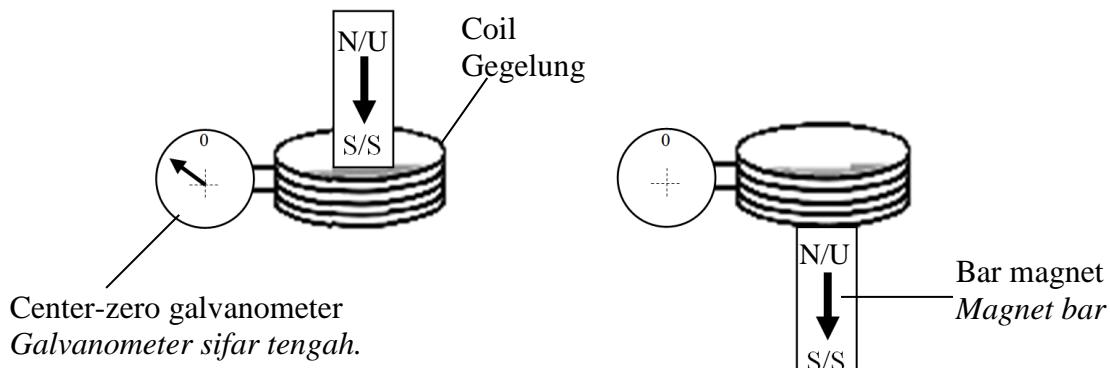
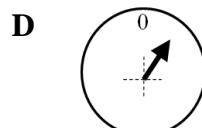
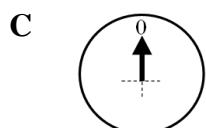
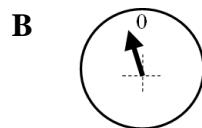
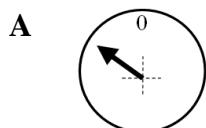


Diagram 30  
Rajah 30

Diagram 31  
Rajah 31

Which compass pointer shows the correct deflection for Diagram 31?

Jarum kompas yang manakah menunjukkan pesongan arah yang betul untuk Rajah 31?



- 42.** Transformers are used in transmission of electricity to reduce energy loss by  
*Transformer digunakan dalam penghantaran kuasa elektrik untuk mengurangkan kehilangan tenaga melalui*

- A** providing better insulator  
*menyediakan penebat yang lebih baik*
- B** reducing the resistance of the cable  
*mengurangkan rintangan kabel*
- C** increasing the thickness of the cable  
*menambahkan ketebalan kabel*
- D** reducing current by increasing voltage  
*mengurangkan arus dengan meningkatkan beza keupayaan*

- 43.** Diagram 32 shows trace on a Cathode Ray Oscilloscope (CRO) screen.  
The Y-gain and the time-base are set at 3 volt / division and 5 ms / division respectively.  
*Rajah 32 menunjukkan surih di atas skrin Osiloskop Sinar Katod (OSK).*  
*Gandaan-Y dan dasar masa telah disetkan pada 3 volt / bahagian dan 5 ms / bahagian masing-masing.*

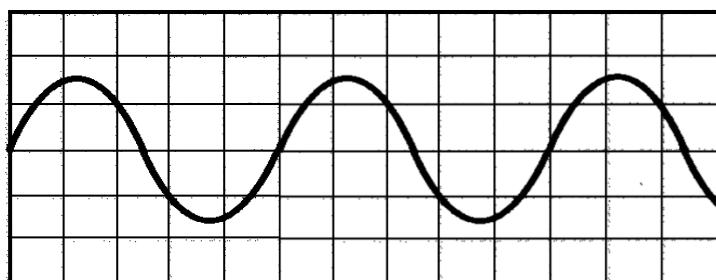


Diagram 32  
*Rajah 32*

What are the peak voltage and the frequency of the alternating current supply that connected to the C.R.O?

*Apakah voltan puncak dan frekuensi arus ulang alik yang disambungkan ke OSK?*

Peak voltage / V <i>Voltan puncak / V</i>	Frequency / Hz <i>Frekuensi / Hz</i>
<b>A</b> 4.5	20
<b>B</b> 4.5	25
<b>C</b> 4.5	40
<b>D</b> 9.0	25

44. Diagram 33 shows a circuit that has five identical bulbs P, Q, R, S and T.

Rajah 33 menunjukkan suatu litar yang mempunyai lima mentol serupa P, Q, R, S dan T.

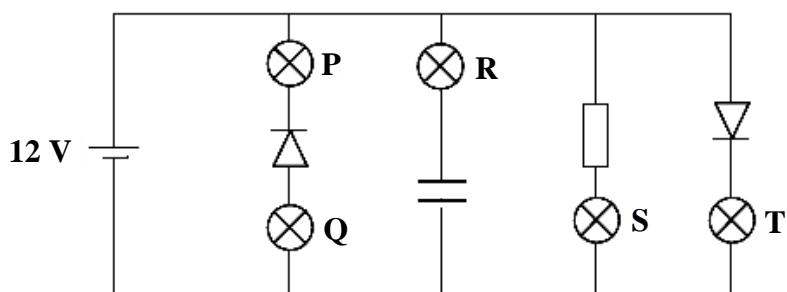


Diagram 33

Rajah 33

Which of the bulbs will light up?

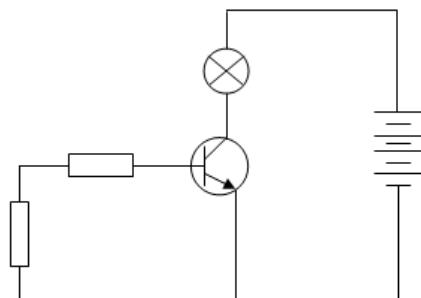
Mentol-mentol yang manakah akan menyala?

- |              |              |
|--------------|--------------|
| A P and Q    | B S and T    |
| P dan Q      | S dan T      |
| C P, S and T | D R, S and T |
| P, S dan T   | R, S dan T   |

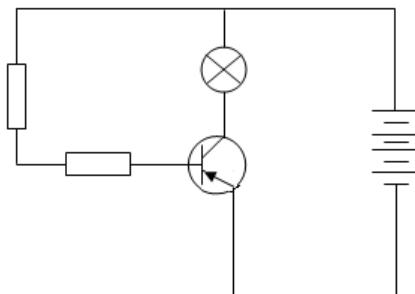
45. Which transistor circuits will lights up the bulb?

Litar bertransistor yang manakah akan menyalakan mentol?

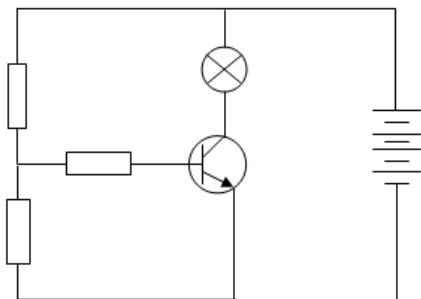
A



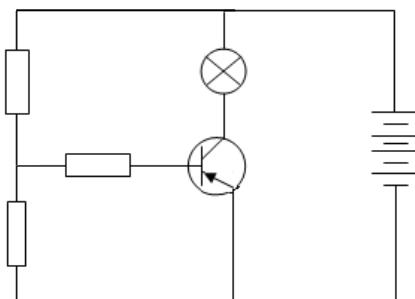
B



C



D



- 46.** Diagram 34 shows a logic gate circuit which has two inputs, X and Y.

Rajah 34 menunjukkan satu litar get logik yang mempunyai dua input, X dan Y.

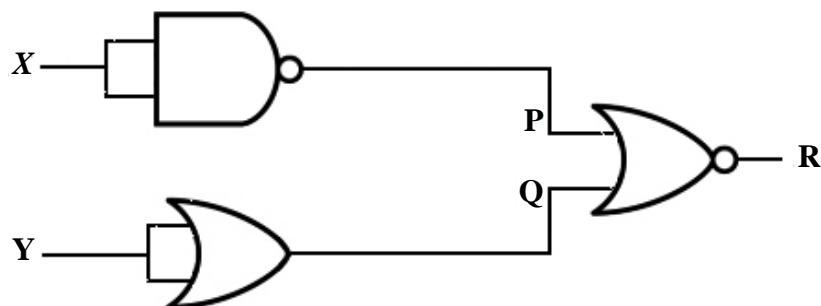


Diagram 34  
Rajah 34

If the logic state of X is 0 and the logic state of Y is 1, what are the logic states at P, Q and R?

Jika keadaan logik X ialah 0 dan keadaan logik Y ialah 1, apakah keadaan logik bagi P, Q dan R ?

	P	Q	R
A	1	1	0
B	1	1	1
C	0	1	0
D	0	1	1

- 47.** Diagram 35 shows three types of radioactive rays, P, Q and R, directed towards a sheet of paper, a sheet of aluminium and a sheet of lead.

Rajah 35 menunjukkan tiga jenis sinaran radioaktif, P, Q dan R, dihalakan kepada kepingan kertas, kepingan aluminium dan kepingan plumbum.

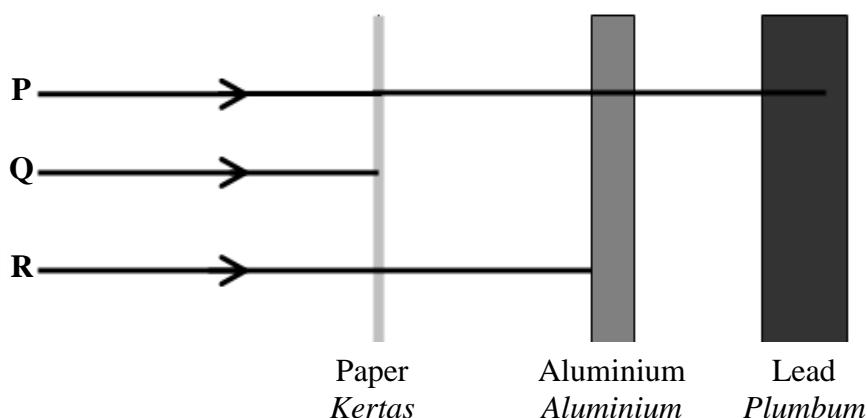


Diagram 35  
Rajah 35

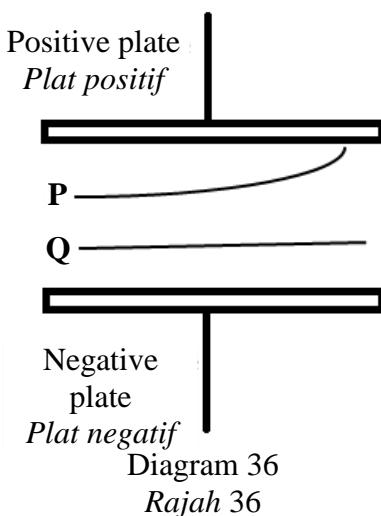
Which rays are represented by P, Q and R?

*Sinaran yang manakah diwakili oleh P, Q dan R?*

	P	Q	R
A	Beta <i>Beta</i>	Gamma <i>Gama</i>	Alpha <i>Alfa</i>
B	Beta <i>Beta</i>	Alpha <i>Alfa</i>	Gamma <i>Gama</i>
C	Gamma <i>Gama</i>	Alpha <i>Alfa</i>	Beta <i>Beta</i>
D	Gamma <i>Gama</i>	Beta <i>Beta</i>	Alpha <i>Alfa</i>

48. Diagram 36 shows the deflection of two types of radioactive emission in an electric field.

*Rajah 36 menunjukkan pesongan dua jenis pancaran radioaktif di dalam medan elektrik.*



What are the type of emissions P and Q?

*Apakah jenis pancaran P dan Q?*

	Emission P <i>Pancaran P</i>	Emission Q <i>Pancaran Q</i>
A	Alpha particles <i>Zarah alfa</i>	Gamma rays <i>Sinaran gama</i>
B	Beta particles <i>Zarah beta</i>	Gamma rays <i>Sinaran gama</i>
C	Gamma rays <i>Sinaran gama</i>	Alpha particles <i>Zarah alfa</i>
D	Gamma rays <i>Sinaran gama</i>	Beta particles <i>Zarah beta</i>

- 49.** Diagram 37 shows a series of radioactive decays for the nucleus of uranium-238 to nucleus of radium-226.

*Rajah 37 menunjukkan siri pereputan radioaktif bagi nukles uranium-238 kepada nukleus radium-226.*

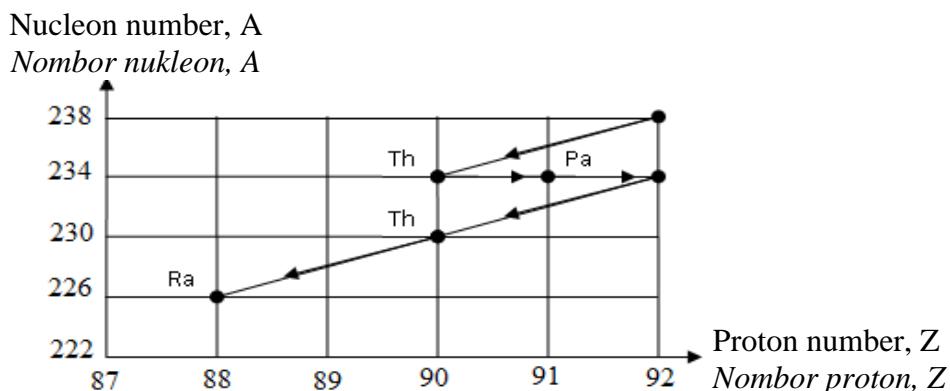


Diagram 37

Rajah 37

What is the number of the alpha particles and beta particles emitted during this process?

*Berapakah bilangan zarah alfa dan zarah beta yang dipancarkan dalam proses ini?*

	The number of alpha particles <i>Bilangan zarah alfa</i>	The number of beta particles <i>Bilangan zarah beta</i>
A	2	3
B	3	2
C	3	1
D	1	3

- 50.** The half-life of a phosphorus-32 is 15 days. A sample is tested and found to contain 45.0 g of the phosphorus-32.

How much of the phosphorus-32 was present in the sample 45 days before the sample was tested?

*Separuh hayat fosforus-32 ialah 15 hari. Satu sampel diuji dan ia mengandungi 45.0 g bahan tersebut.*

*Berapa banyaknya fosforus-32 dalam sampel tersebut ketika 45 hari sebelum sampel itu diuji?*

A 5.62 g

B 11.25 g

C 180.00 g

D 360.00 g

**END OF QUESTION PAPER**

*KERTAS SOALAN TAMAT*