

SULIT

4531/1

4531/1  
Physics  
Paper 1  
Sept  
2009  
1  $\frac{1}{4}$  hours



JABATAN PELAJARAN NEGERI SELANGOR

---

---

PROGRAM PENINGKATAN PRESTASI  
SAINS DAN MATEMATIK SPM

2009

---

---

PHYSICS

Paper 1

One hour and fifteen minutes

---

---

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas soalan ini adalah dalam dwibahasa.*
2. *Soalan adalah dalam Bahasa Inggeris dan diikuti dengan Bahasa Melayu yang sepadan.*

---

Kertas ini mengandungi 26 halaman bercetak.

4531/1

Dapatkan skema Jawapan di Laman

SULIT

[www.banksoalanspm.com](http://www.banksoalanspm.com)

## 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. Answer each question by blackening the correct space on the answer sheet.  
*[Jawab setiap soalan dengan menghitamkan ruangan yang betul pada kertas jawapan.]*
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 menukar 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 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 3  
*[Satu senarai rumus disediakan di halaman 3]*

The following information may be useful. The symbols have their usual meaning.  
Maklumat yang berikut mungkin berfaedah. Simbol-simbol mempunyai makna yang biasa.

$$1. \quad a = \frac{v-u}{t}$$

$$2. \quad v^2 - u^2 + 2as$$

$$3. \quad s = ut + \frac{1}{2}at^2$$

$$4. \quad \text{Momentum} = mv$$

$$5. \quad F = ma$$

$$6. \quad \text{Kinetic Energy} = \frac{1}{2}mv^2$$

[Tenaga Kinetik]

$$7. \quad \text{Potential energy} = mgh$$

[Tenaga Keupayaan]

$$8. \quad \text{Elastic potential energy} = \frac{1}{2}Fx$$

[Tenaga keupayaan kenyal]

$$9. \quad \rho = \frac{m}{V}$$

$$10. \quad \text{Pressure [Tekanan]}, p = h\rho g$$

$$11. \quad \text{Pressure [Tekanan]}, p = \frac{F}{A}$$

$$12. \quad \text{Heat [Haba]}, Q = mc\theta$$

$$13. \quad \frac{PV}{T} = \text{constant}$$

$$14. \quad E = mc^2$$

$$15. \quad v = f\lambda$$

$$16. \quad \text{Power } P = \frac{\text{Energy}}{\text{Time}}$$

$$[\text{Kuasa}] P = \frac{[\text{Tenaga}]}{[\text{Masa}]}$$

$$17. \quad \frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

$$18. \quad \lambda = \frac{ax}{D}$$

$$19. \quad n = \frac{\sin i}{\sin r}$$

$$20. \quad n = \frac{\text{Real depth}}{\text{Apparent depth}} \quad \begin{matrix} [\text{Dalam nyata}] \\ [\text{Dalam ketara}] \end{matrix}$$

$$21. \quad Q = It$$

$$22. \quad V = IR$$

$$23. \quad \text{Power [Kuasa]}, P = IV$$

$$24. \quad \frac{N_s}{N_p} = \frac{V_s}{V_p}$$

$$25. \quad \text{Efficiency} = \frac{I_s V_s}{I_p V_p} \times 100\%$$

[Kecekapan]

$$26. \quad g = 9.8 \text{ m s}^{-2}$$

Each question is followed by either **three or four** options. Choose the best option for each question then blacken the correct space on the answer sheet.

Setiap 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.

1. Which of the following physical quantities has the correct S.I. unit ?  
Antara kuantiti berikut, yang manakah mempunyai unit S.I. yang betul ?

	Physical quantity <i>Kuantiti fizikal</i>	S.I. unit <i>Unit S.I.</i>
A	Charge <i>Cas</i>	C
B	Weight <i>Berat</i>	Kg
C	Power <i>Kuasa</i>	J
D	Heat <i>Haba</i>	N

2. Which of the following is a vector quantity ?  
Antara kuantiti berikut, yang manakah merupakan kuantiti vektor ?

- A Work  
*Kerja*  
B Speed  
*Laju*  
C Momentum  
*Momentum*  
D Temperature  
*Suhu*

3. Diagram 1 shows the scale of a micrometer screw gauge.  
Rajah 1 menunjukkan skala sebuah tolok skru mikrometer.

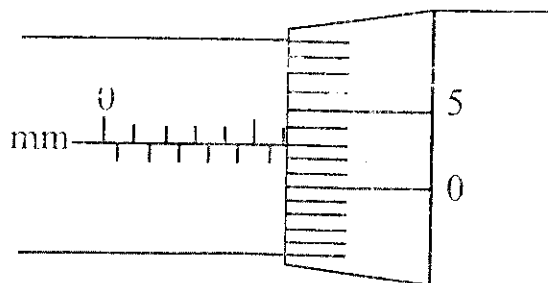


Diagram 1 / Rajah 1

What is the reading of the micrometer screw gauge ?  
Berapakah bacaan micrometer itu ?

- A 6.58 mm  
B 6.03 mm  
C 3.60 mm  
D 0.36 mm

4. Which of the following shows the relationship of base quantities for impulse ?  
Antara berikut, yang manakah menunjukkan hubungan kuantiti-kuantiti asas bagi Impuls ?

A  $\frac{\text{mass} \times \text{time}}{\text{length}}$

$\frac{\text{jisim} \times \text{masa}}{\text{panjang}}$

B  $\frac{\text{mass} \times \text{length}}{\text{time}}$

$\frac{\text{jisim} \times \text{panjang}}{\text{masa}}$

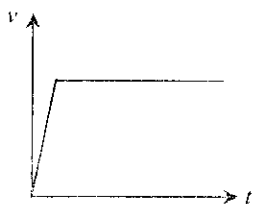
C  $\frac{\text{length} \times \text{time}}{\text{mass}}$

$\frac{\text{panjang} \times \text{masa}}{\text{jisim}}$

D  $\text{mass} \times \text{length} \times \text{time}$   
 $\text{Jisim} \times \text{panjang} \times \text{masa}$

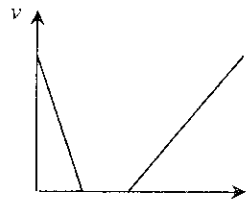
5. Which of the following graphs shows the **correct** description of motion?  
Graf yang manakah menunjukkan huraian gerakan yang **betul**?

A



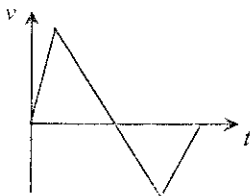
A sprinter runs in a straight line at a steady speed  
*Seorang pelari berlari dalam garisan lurus pada laju seragam.*

B



A car slows down, stops at a traffic light and then moves off  
*Sebuah kereta diperlahankan, berhenti dilampu isyarat kemudian meneruskan perjalanan.*

C



A ball is thrown in the air and then caught again  
*Sebiji bola dibaling ke udara dan ditangkap semula.*

6. Diagram 2 shows a coconut falling from a tree.  
Rajah menunjukkan sebiji buah kelapa sedang jatuh dari sebatang pokok kelapa.

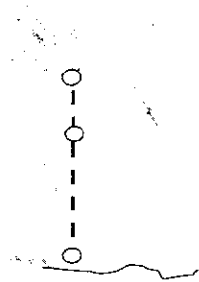


Diagram 2 / Rajah 2

Which of the following quantities remains constant as the coconut falls?  
Kuantiti yang manakah tidak berubah semasa buah kelapa itu jatuh?

- A Velocity / halaju  
B Momentum / momentum  
C Acceleration / pecutan  
D Potential energy / tenaga keupayaan
7. Diagram 3 shows a box of weight,  $W$  at rest on an inclined plane. The forces acting on the box are in equilibrium.  
Rajah 3 menunjukkan sebuah kotak yang mempunyai berat,  $W$  pegun di atas satah condong. Daya-daya yang bertindak pada kotak tersebut berada dalam keadaan keseimbangan

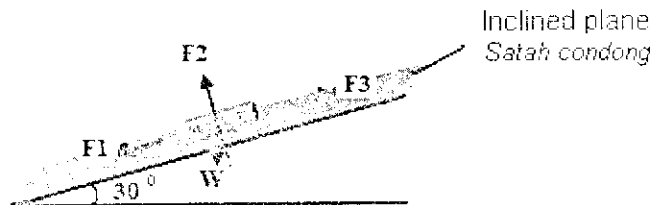


Diagram 3 / Rajah 3

The value of  $F_2$  is  
Nilai  $F_2$  ialah

- A  $(W \cos 30^\circ) \text{ N}$   
B  $(W \sin 30^\circ) \text{ N}$   
C  $(W \cos 30^\circ - F_3) \text{ N}$   
D  $(W \sin 30^\circ - F_3) \text{ N}$
8. A softball player moves his hand backwards while catching a fast-moving ball. The movement of his hand is to  
Seorang pemain bola lisut menggerakkan tangannya ke belakang semasa menangkap bola yang bergerak laju. Gerakan tangannya adalah untuk
- A increase the impulsive force  
menambahkan daya impuls  
B increase the stopping time of the ball  
meningkatkan masa berhenti bola  
C increase the horizontal distance the ball travels.  
menambahkan jarak mendatar pergerakan bola.

9. Diagram 4 shows the force acting on a 3.0 kg mass over a period of 4.0 s.  
Rajah 4 menunjukkan daya yang bertindak ke atas jisim 3.0 kg bagi tempoh 4.0 s.

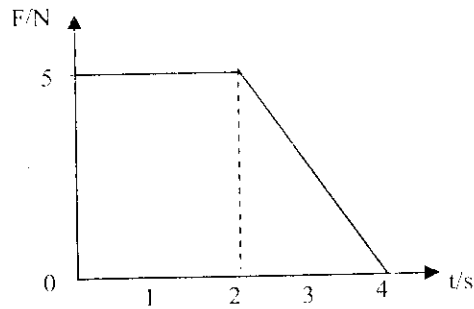


Diagram 4 / Rajah 4

What is the impulse produced by the force?  
Berapakah impuls yang dihasilkan oleh daya tersebut?

- A 7.5 Ns  
B 10 Ns  
C 15 Ns  
D 20 Ns
10. Diagram 5 shows a car accelerating uphill along a straight road.  
Rajah 5 menunjukkan sebuah kereta memecut ke atas bukit sepanjang jalan lurus.

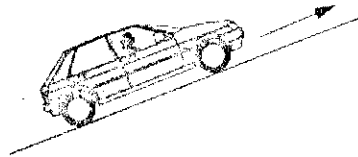


Diagram 5 / Rajah 5

Which of the following is correct?  
Pernyataan manakah yang betul

	Kinetic energy	Potential energy	Total energy
A	Decrease <i>Berkurang</i>	Decrease <i>Berkurang</i>	Decrease <i>Berkurang</i>
B	Decrease <i>Berkurang</i>	Increase <i>Bertambah</i>	Unchange <i>Tidak berubah</i>
C	Increase <i>Bertambah</i>	Decrease <i>Berkurang</i>	Unchange <i>Tidak berubah</i>
D	Increase <i>Bertambah</i>	Increase <i>Bertambah</i>	Increase <i>Bertambah</i>

11. The depth of a swimming pool is 1.2 m. What is the water pressure at the base of the swimming pool? [ Density of water =  $1000 \text{ kg m}^{-3}$  ]  
Sebuah kolam renang mempunyai kedalaman 1.2 m. Berapakah tekanan air di dasar kolam mandi tersebut? [ Ketumpatan air =  $1000 \text{ kg m}^{-3}$  ]
- A 8 kPa  
B 10 kPa  
C 12 kPa  
D 14 kPa

- 12 Diagram 6 shows two identical bricks X and Y placed in two different positions on sandy ground.  
Rajah 6 menunjukkan dua ketul bata yang sama X dan Y diletakkan pada kedudukan yang berbeza di atas permukaan berpasir.

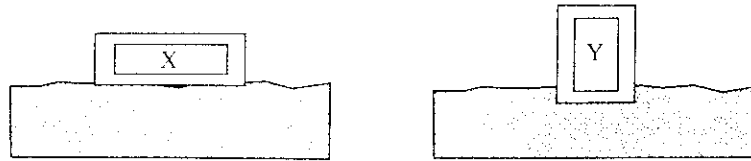


Diagram 6 / Rajah 6

What is the factor that causes brick Y to sink more into the sand?  
Apakah faktor yang menyebabkan bata Y terbenam lebih dalam ke dalam pasir?

- A Weight / Berat  
B Pressure / Tekanan  
C Force / Daya  
D Density / Ketumpatan
- 13 Diagram 7 shows a model of a hydraulic jack that is used to lift a toy car.  
Rajah 7 menunjukkan satu model jek hidraulik yang digunakan untuk mengangkat sebuah kereta mainan.

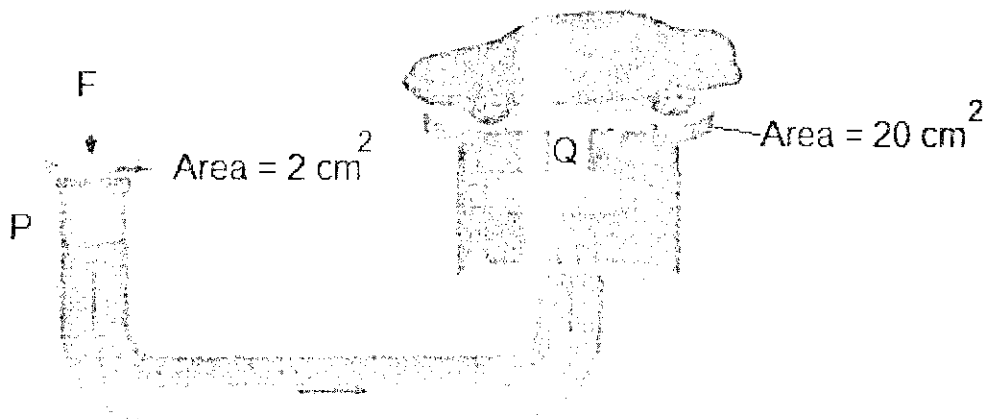


Diagram 7 / Rajah 7

When a force, F is applied on piston P, the piston will move 5 cm downwards. The distance moved by piston, Q is  
Apabila satu daya dikenakan ke atas omboh P, omboh tersebut akan bergerak ke bawah sebanyak 5 cm. Jarak gerakan bagi omboh Q ialah

- A 0.5 cm  
B 2.5 cm  
C 5.0 cm  
D 25.0 cm



14

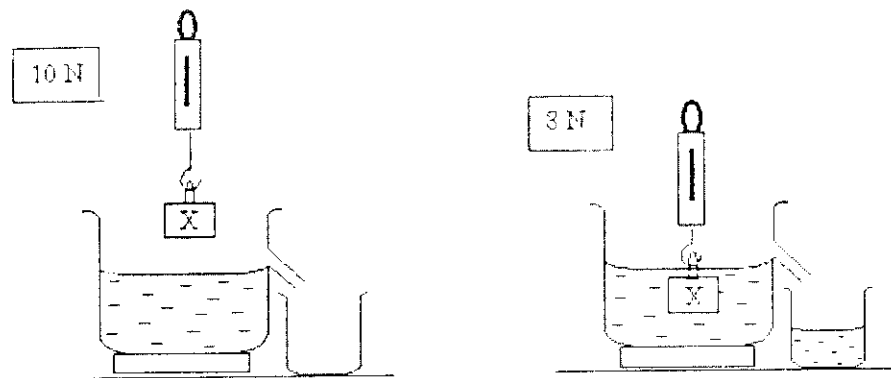


Diagram 8 / Rajah 8

Based on the observation in Diagram 8, calculate the volume of block X.  
 Berdasarkan pemerhatian pada Rajah 8, hitung isipadu blok X.

[ Density of water =  $1000 \text{ kg m}^{-3}$  and  $g = 10 \text{ m s}^{-2}$  ]  
 [ Ketumpatan air =  $1000 \text{ kg m}^{-3}$  and  $g = 10 \text{ m s}^{-2}$  ]

- A  $1.8 \times 10^{-3} \text{ m}^3$
- B  $1.0 \times 10^{-3} \text{ m}^3$
- C  $8.0 \times 10^{-4} \text{ m}^3$
- D  $2.0 \times 10^{-4} \text{ m}^3$

- 15 A polystyrene ball is placed in a metal cylinder. When air is blown hard so that it moves fast over the opening, the ball is lifted as shown in Diagram 9.  
 Rajah 9 menunjukkan satu silinder logam ditiup dengankuat supaya ia bergerak laju di permukaan bukaan. Didapati bola polisterin itu terangkat ke bukaan tiub logam itu.

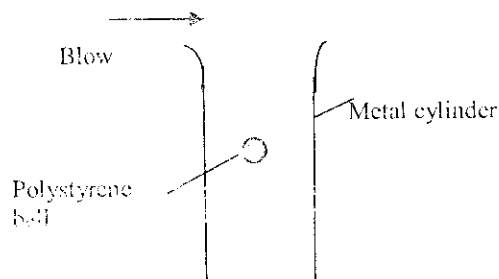


Diagram 9 / Rajah 9

This phenomenon occurs due to  
 Fenomena ini berlaku disebabkan oleh

- A Archimedes' Principle
- B Bernoulli's Principle
- C Pascal's Principle

16

Diagram 10 shows a clinical thermometer designed to respond quickly to changes in temperature and to have high sensitivity.

Rajah 10 menunjukkan termometer klinik direka untuk bertindakbalas dengan cepat terhadap perubahan suhu dan mempunyai kepekaan yang tinggi.

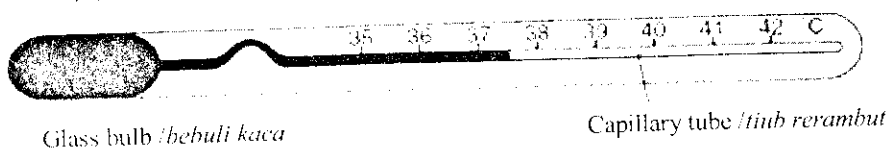


Diagram 10/ Rajah 10

Which features should the clinical thermometer have?  
Ciri yang manakah harus ada pada termometer klinik?

	Glass Bulb Bebuli kaca	Capillary tube Tiub rerambut
A	Thick glass Kaca tebal	Narrow Sempit
B	Thick glass Kaca tebal	Wide Lebar
C	Thin glass Kaca nipis	Narrow Sempit
D	Thin glass Kaca nipis	Wide Lebar

17 The graph in Diagram 11 is obtained when 500 g of liquid P is heated by a 60 W immersion heater. The specific heat capacity of liquid P is  
Rajah 11 menunjukkan graf pemanasan bagi cecair P berjisim 500g oleh pemanas rendam berkuasa 60 W. Muatan haba tentu cecair P itu ialah

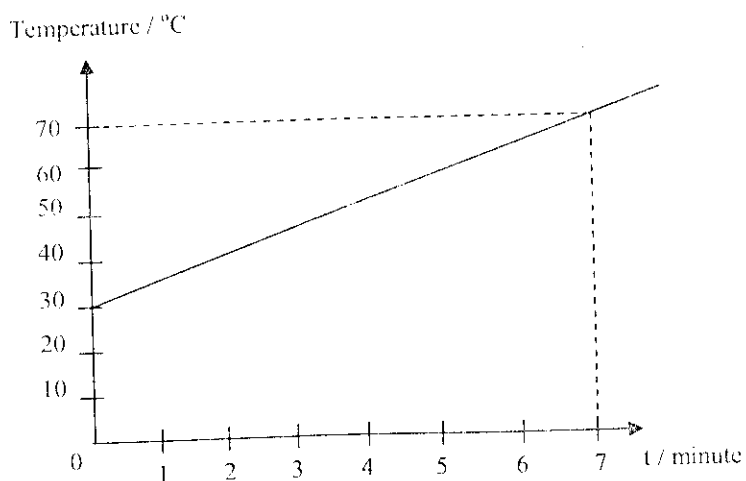


Diagram 11 / Rajah 11

- A  $21 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$
- B  $1260 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$
- C  $1680 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$
- D  $1800 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$

- 18 Why do people feel cold if they do not dry themselves after swimming in the sea?  
 Mengapa seseorang merasa sejuk jika mereka tidak mengeringkan badan selepas berenang di laut?

- A Water is evaporated and causes cooling  
 Air tersejat dan menyebabkan penyejukan  
 B Water insulates them from the warm air  
 Air menghalang mereka dari udara panas  
 C Water is a good conductor of heat  
 Air adalah pengalir haba yang baik  
 D Water is cooler than the air  
 Air lebih sejuk daripada udara

- 19 Diagram 12 shows the air pressure in a car tyre.  
 Rajah 12 menunjukkan tekanan udara didalam tayar sebuah kereta.

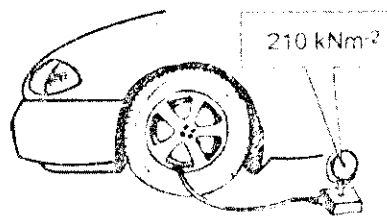


Diagram 12 / Rajah 12

After a long non-stop journey, the pressure of the tyre is  $215.0 \text{ kN m}^{-2}$ . This is because  
 Selepas perjalanan jauh tanpa berhenti, tekanan tayar ialah  $215.0 \text{ kN m}^{-2}$ . Ini kerana

- A the volume of air in the tyre decreases.  
 isipadu di dalam tayar berkurangan.  
 B the temperature of air in the tyre increases.  
 suhu udara di dalam tayar bertambah  
 C the number of air molecules in the tyre increases.  
 bilangan molekul udara di dalam tayar bertambah  
 D the frequency of collision between the air molecules and the inner walls of the tyre decreases.  
 kekerapan perlanggaran di antara molekul udara di dalam tayar berkurangan.
20. A light ray is bent towards the normal when it propagates from air to glass. This is because  
 Sinar cahaya membengkok ke arah normal apabila dipancarkan dari udara ke dalam kaca. Ini kerana
- A the amplitude of the light wave decreases  
 amplitude gelombang cahaya berkurang  
 B the frequency of the light wave increases  
 frekuensi cahaya bertambah  
 C the speed of the light wave decreases  
 laju gelombang cahaya berkurang  
 D the wavelength of the light wave increases  
 panjang gelombang cahaya bertambah

- 21 Diagram 13 shows a light ray from an object reflected by a plane mirror.  
Rajah 13 menunjukkan sinar cahaya yang dipantulkan dari satu objek melalui satu cermin satah.

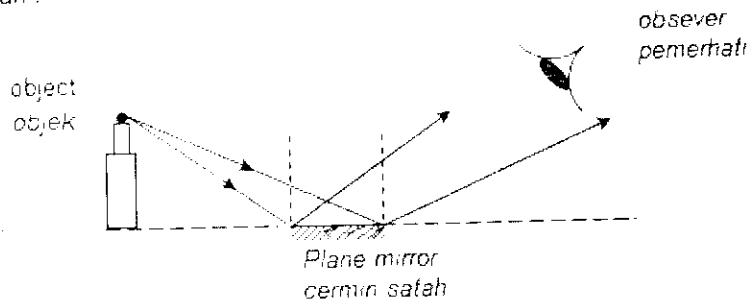


Diagram 13 / Rajah 13

The image formed is  
Imej yang terbentuk adalah

- A diminished / mengecil  
B magnified / diperbesarkan  
C virtual / maya  
D Real/nyata
- 22 Diagram 14 shows an incident ray directed into a semicircular transparent block.  
The critical angle of the transparent block is  $40^\circ$ .  
Rajah 14 menunjukkan sinar tuju di pancarkan ke dalam blok lutsinar semibulatan. Sudut genting bagi blok lutsinar itu adalah  $40^\circ$ .

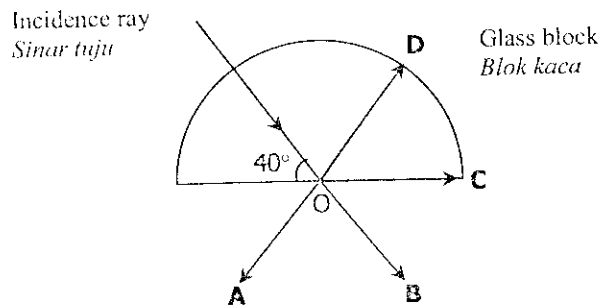


Diagram 14 / Rajah 14

Based on the information which light ray A, B, C or D is correct?  
Berdasarkan maklumat, sinar cahaya A, B, C atau D manakah yang betul?

- 23 Diagram 15 shows how a shark can see a diver behind the obstacle.  
Rajah 15 menunjukkan bagaimana seekor jerung sedang memerhatikan seorang penyelam di sebalik halangan.

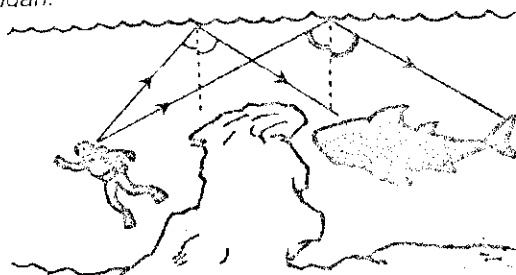


Diagram 15 / Rajah 15

This phenomenon can be explained by  
*Fenomena ini dapat diterangkan oleh*

- A Diffraction / *Belauan*
- B Reflection / *Pantulan*
- C Refraction / *Biasan*
- D Total internal reflection / *Pantulan dalam penuh*

- 24 Diagram 16 shows the ray diagram for a magnifying glass.  
*Rajah 16 menunjukkan rajah sinar bagi sebuah kanta pembesar.*

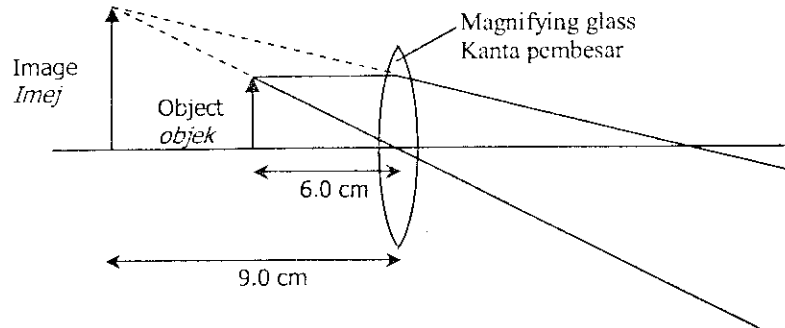
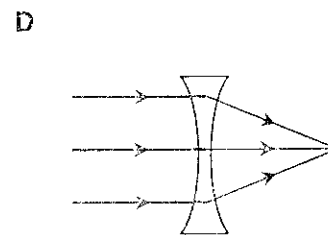
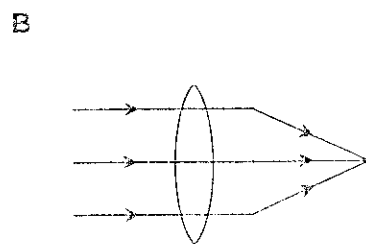
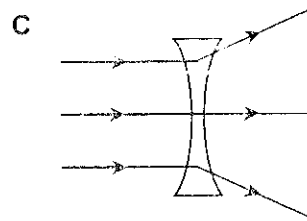
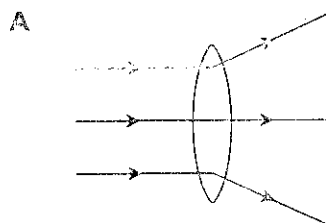


Diagram 16 / *Rajah 16*

What is the focal length of the lens?  
*Berapakah jarak fokus kanta tersebut?*

- A 3.0 cm
  - B 3.6 cm
  - C 15.0 cm
  - D 18.0 cm
- 25 Which of the following diagrams shows the correct path for light rays passing through a thin lens?  
*Antara rajah berikut yang manakah menunjukkan laluan yang betul bagi sinar cahaya yang melalui kanta nipis?*



- 26 Diagram 17 shows the propagation of a wave using a slinky spring.  
Rajah 17 menunjukkan perambatan gelombang menggunakan spring slinki.

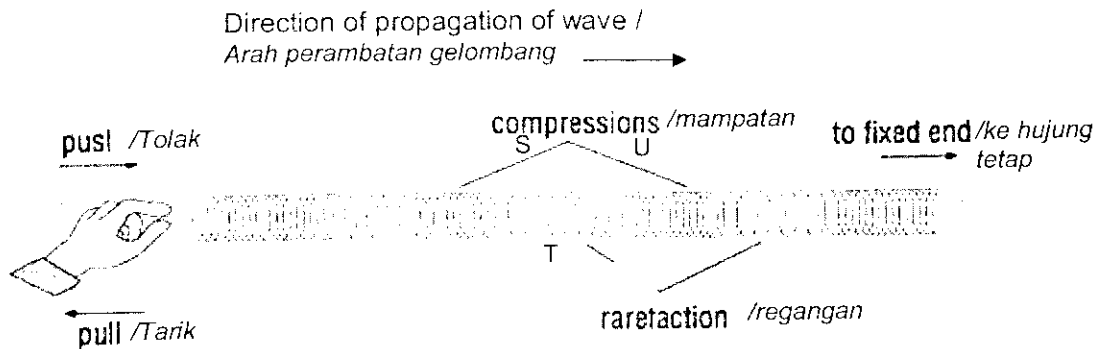


Diagram 17 / Rajah 17

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

- A. Wave energy is transferred from position S to U  
Tenaga gelombang dipindahkan dari kedudukan S ke U
  - B. The wavelength is the distance between S and T  
Panjang gelombang ialah jarak di antara S dan T
  - C. A particle at T oscillates perpendicularly to the direction of the propagation of the wave  
Satu zarah di T berayun secara bersudut tepat dengan arah rambatan gelombang
27. Diagram 18 shows the displacement against time graph for a wave.  
Rajah 18 menunjukkan graf sesaran lawan masa bagi suatu gelombang.

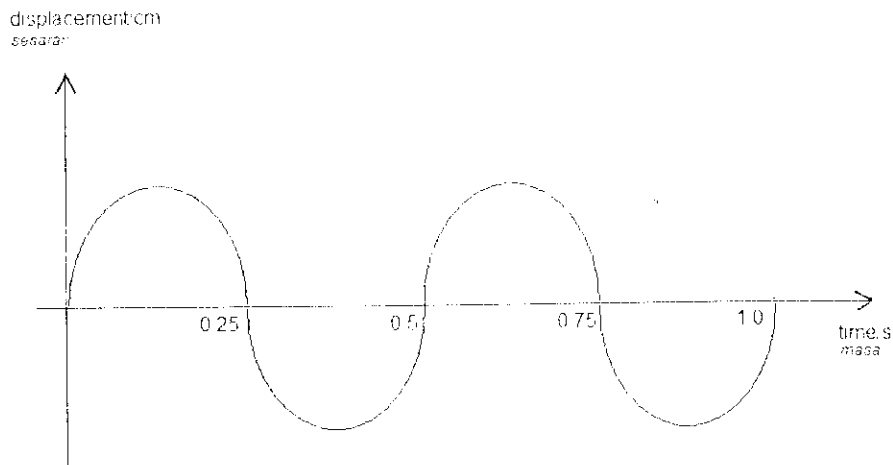


Diagram 18 / Rajah 18

Calculate the frequency of the wave  
Hitungkan frekuensi gelombang tersebut.

- A 0.5 Hz
- B 1.0 Hz
- C 2.0 Hz
- D 4.0 Hz

28

Diagram 19 shows ultrasonic waves sent from a transmitter to the sea bed to measure the depth of the sea.

Rajah 19 menunjukkan gelombang ultrasonik dihantar dari sebuah pemancar ke dasar laut untuk mengukur kedalaman laut.

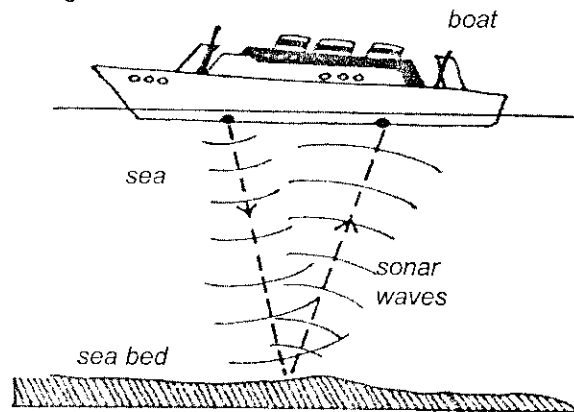


Diagram 19 / Rajah 19

What is the wave phenomenon involved?  
Apakah fenomena gelombang yang terlibat?

- A Refraction /Pembiasan
- B Reflection /Pantulan
- C Diffraction /Belauan
- D Interference /Interferens

29

Diagram 20 shows wave phenomenon of occurring at positions P and Q

Rajah 20 menunjukkan fenomena-fenomena gelombang yang berlaku di kedudukan P dan Q

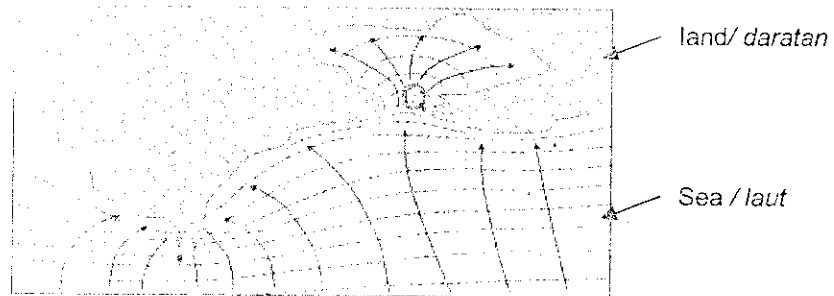


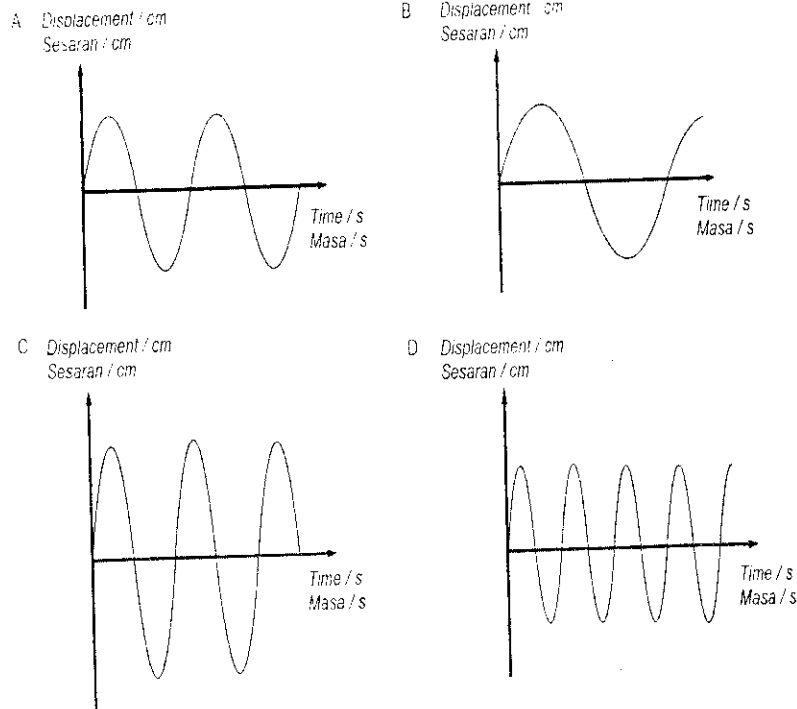
Diagram 20 / Rajah 20

Which of the following names the correct phenomena occurings at position P and Q?

Antara berikut yang manakah menunjukkan fenomena gelombang yang betul berlaku pada kedudukan P dan Q?

- | <u>Position P</u><br>Kedudukan P | <u>Position Q</u><br>Kedudukan Q |
|----------------------------------|----------------------------------|
| A Diffraction / Belauan          | Refraction /Pembiasan            |
| B Refraction /Pembiasan          | Diffraction / Belauan            |
| C Interference / Interferens     | Reflection /Pantulan             |
| D Reflection /Pantulan           | Interference / Interferens       |

- 30 A thin guitar string is plucked hard to produce a high pitched sound. Which of the following graphs best represents the situation?  
*Tali gitar yang halus dipetik dengan kuat untuk menghasilkan bunyi yang kelangsingannya tinggi. Antara berikut graf yang manakah mewakili situasi tersebut?*



- 31 Diagram 21 shows an interference pattern of water waves.  
*Rajah 21 menunjukkan corak interferens bagi gelombang air.*

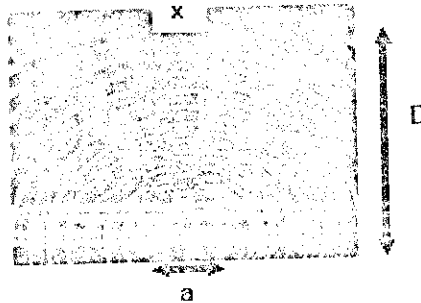


Diagram 21 / Rajah 21

The distance between two consecutive nodes,  $x$  will increase if the  
*Jarak antara dua nod berturutan,  $x$  akan meningkat jika*

- A frequency of water waves is increased  
*frekuensi gelombang air bertambah*
- B wave length of water waves is decreased  
*panjang gelombang air berkurang*
- C distance between two coherent sources,  $a$  is decreased.  
*jarak antara dua sumber koheren,  $a$  berkurang*
- D perpendicular distance from the sources to where  $x$  is measured,  $D$  is decreased.  
*jarak bersudut tepat dari sumber ke kedudukan dimana  $x$  diukur,  $D$  berkurang*



- 32 Diagram 20 shows a circuit consisting of two similar resistors, R and S connected in series. X, Y and Z are the readings of each meter.  
*Rajah 20 menunjukkan litar di bawah terdiri dari dua perintang serupa, R dan S yang disambung bersiri. X, Y dan Z adalah bacaan pada setiap meter.*

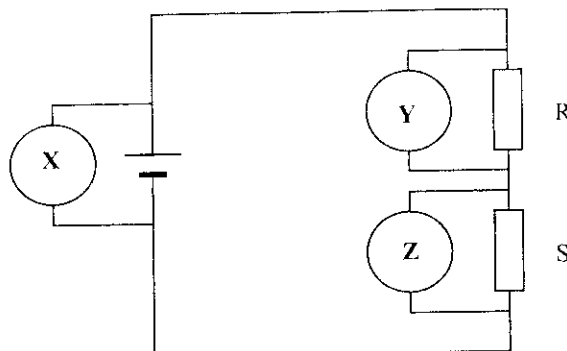


Diagram 22 / Rajah 22

Which of the following is true?  
*Yang manakah antara berikut adalah benar?*

- A.  $X > Y > Z$   
 B.  $X < Y < Z$   
 C.  $X > Y = Z$   
 D.  $X < Y = Z$

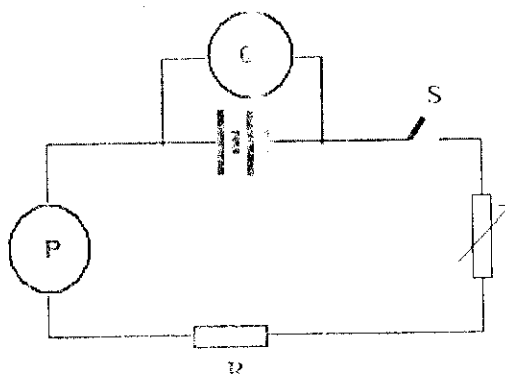


Diagram 2 / Rajah 23

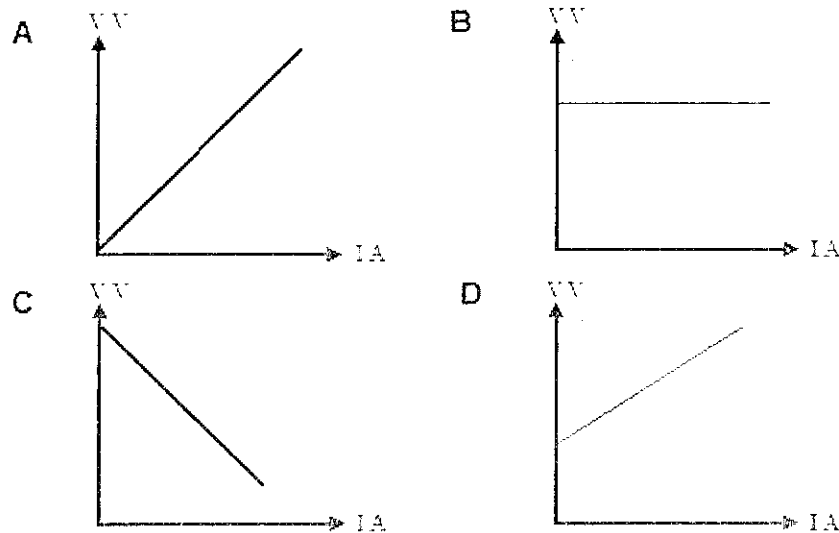
- 33 Diagram 23 shows an electric circuit. Name the electrical instruments P and Q.  
*Rajah 23 menunjukkan satu litar elektrik. Namakan alat pengukuran P and Q.*

	Meter P	Meter Q
A	Voltmeter	Ammeter
B	Ammeter	Voltmeter
C	Ammeter	Ammeter
D	Voltmeter	Voltmeter

- 34 Calculate the number of electrons that flow through an electric bulb labelled 60 W, 240 V in 2 minutes. (Charge of an electron =  $1.6 \times 10^{-19}$  C)  
Cari bilangan elektron yang mengalir melalui suatu mentol elektrik berlabel 60 W, 240 V dalam masa 2 minit. (Cas suatu elektron =  $1.6 \times 10^{-19}$  C)

- A  $3.0 \times 10^{21}$   
B  $1.9 \times 10^{20}$   
C  $5.0 \times 10^{19}$   
D  $3.2 \times 10^{18}$

- 35 Which graph shows the correct relationship between V and T of a constant wire  
Graf yang manakah menunjukkan hubungan yang betul antara V dan T bagi satu dawai konstantan



- 36 Diagram 24 shows the arrangement of apparatus to investigate the strength of an electromagnet.

Rajah 24 menunjukkan susunan radas untuk mengkaji kekuatan suatu elektromagnet.

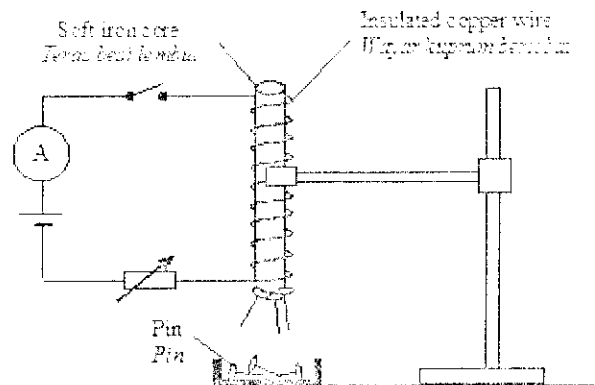


Diagram 24 / Rajah 24

The number of pins attracted to the soft iron core can be increased by  
*Bilangan pin yang tertarik kepada teras besi lembut boleh ditambah dengan*

- A changing the soft iron core to an aluminium core  
*Menukarkan teras besi lembut dengan teras aluminium*
- B decreasing the number of turns of the coil.  
*mengurangkan bilangan lilitan gegelung.*
- C increasing the thickness of the insulated copper wire.  
*menambahkan ketebalan wayar kuprum bertebat.*
- D increasing the resistance of the rheostat.  
*menambahkan rintangan reostat.*

- 37 Diagram 25 shows a current carrying conductor in a permanent magnetic field.  
*Rajah 25 menunjukkan satu konduktor membawa arus berada dalam medan magnet kekal.*

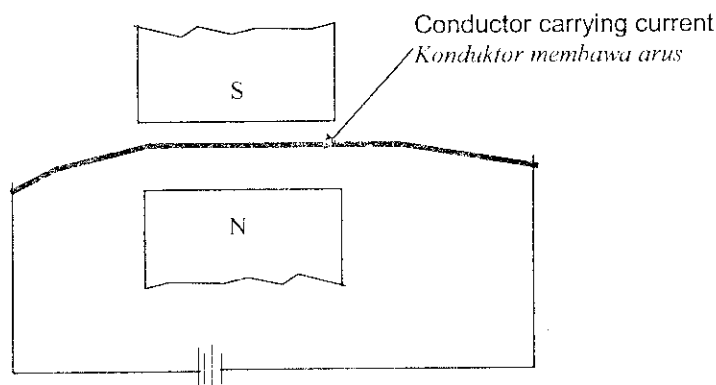


Diagram 25 / Rajah 25

In which direction will the conductor move?  
*Ke arah manakah konduktor itu akan bergerak?*

- A Out of the paper  
*Keluar daripada kertas*
  - B Into the paper  
*Masuk ke dalam kertas*
  - C Upward  
*Ke atas*
  - D Downward  
*Ke bawah*
- 38 Diagram 26 shows an ideal transformer.  
*Rajah 26 menunjukkan sebuah transformer unggul.*

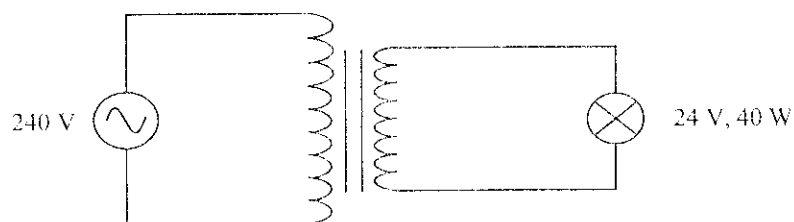


Diagram 26 / Rajah 26

What is the ratio of  $N_p$  to  $N_s$ ?

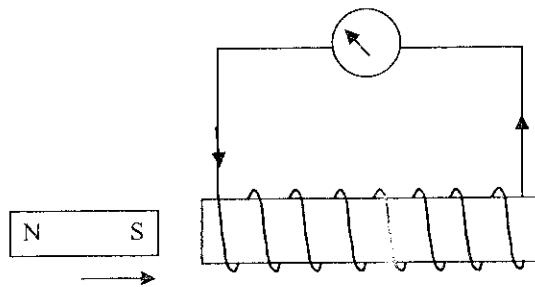
Berapakah nisbah  $N_p$  terhadap  $N_s$ ?

- A 10 : 1
- B 1 : 10
- C 6 : 1
- D 1 : 6

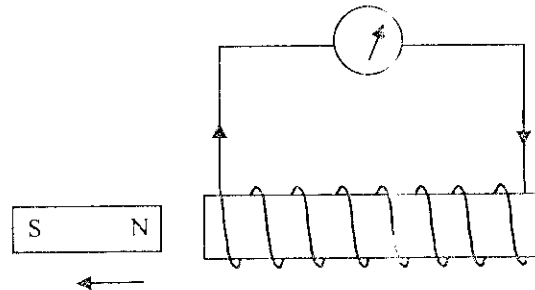
- 39 The following diagrams show the direction of induced current flow in a solenoid when the magnet is moved as shown. Which direction of the induced current shown **is not correct**?

Rajah menunjukkan arah arus aruhan dalam solenoid apabila magnet digerakkan seperti ditunjukkan. Yang manakah arah arus aruhan yang ditunjukkan adalah **salah**?

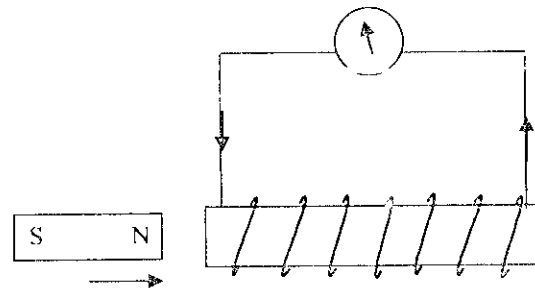
A



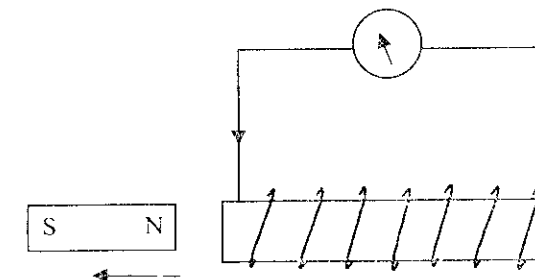
B



C



D



- 40 Which of the following activities will produce induced current?  
Antara aktiviti-aktiviti yang berikut yang manakah akan menghasilkan arus teraruh?

Symbol Simbol	Activities Aktiviti
P	A bar magnet is moved in a static solenoid Satu magnet bar berayun dalam solenoid pegun.
Q	A copper wire is moved parallel to the direction of a magnetic field Dawai kuprum digerakkan selari dengan arah medan magnet
R	A copper wire is stationary in a magnetic field Dawai kuprum pegun dalam medan magnet

- A P only  
B Q only  
C Q and R only  
D P and Q only
- 41 Diagram 27 shows a model of electric transmission using power cable.  
Rajah 27 dibawah menunjukkan model penghantaran kuasa elektrik menggunakan kabel kuasa.

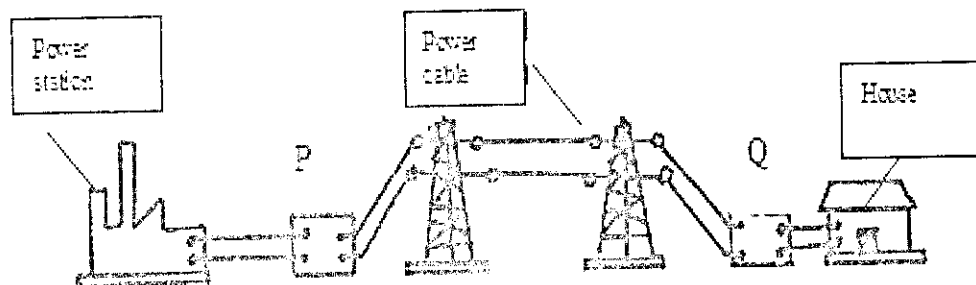


Diagram 27 / Rajah 27

What type of transformer is P and Q?  
Apakah jenis transformator P dan Q?

	P	Q
A	Step-up Injak naik	Step-down Injak turun
B	Step-up Injak naik	Step-up Injak naik
C	Step-down Injak turun	Step-down Injak turun
D	Step-down Injak turun	Step-up Injak naik

- 42 Thermionic emission is  
Pancaran termionik ialah
- A the release of electrons from the surface of a metal when it is in a magnetic field  
pembebasan elektron daripada permukaan logam apabila berada di dalam medan magnet
- B the release of electrons from a surface of a metal when it is heated  
pembebasan elektron daripada permukaan logam apabila dipanaskan
- C the accelerating of electrons from a heated metal surface by a high voltage power supply  
pecutan elektron daripada permukaan logam yang dipanaskan oleh bekalan kuasa voltan tinggi
- D the conversion of kinetic energy of high speed electrons into light energy on a fluorescent screen  
pertukaran tenaga kinetik elektron berhalaju tinggi kepada tenaga cahaya di atas skrin berpendaflor
- 43 Diagram 28 shows a trace on the screen of a C.R.O. when an input voltage is connected to the Y- plates.  
Rajah 28 menunjukkan surihan pada skrin O.S.K apabila voltan input disambungkan pada plat -Y.

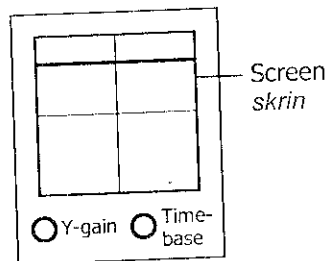


Diagram 28 / Rajah 28

Which of the following correctly describes the input voltage and the time base knob of the C.R.O. ?  
Antara berikut yang manakah menerangkan dengan betul tentang voltan input dan tombol dasar masa O.S.K?

	Input voltage Voltan input	Time-base Dasar masa
A	d.c./d.t.	on / dihidupkan
B	d.c./ d.t	off/ dimatikan
C	a.c./ a.u	on/ dihidupkan
D	a.c./ a.u	off / dimatikan

- 44 Diagram 29 shows a circuit containing two identical bulbs P and Q that are connected in series to a battery and two diodes.  
Rajah 29 menunjukkan litar yang mengandungi dua mentol yang serupa P dan Q yang disambungkan secara bersiri kepada sel kering dan dua diod.

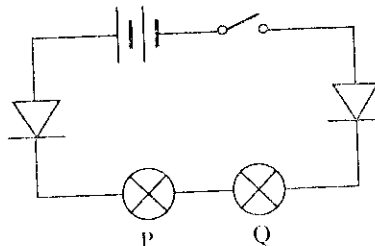


Diagram 29 / Rajah 29

What happens to the bulbs when the switch is on?  
 Apakah yang terjadi kepada mentol-mentol tersebut apabila suis dihidupkan?

	Bulb P	Bulb Q
A	Light off <i>Tidak menyala</i>	Light off <i>Tidak menyala</i>
B	Light off <i>Tidak menyala</i>	Light up <i>Menyala</i>
C	Light up <i>Menyala</i>	Light off <i>Tidak menyala</i>
D	Light up <i>Menyala</i>	Light up <i>Menyala</i>

- 45 Diagram 30 shows a heat-controlled switch in a transistor circuit.  
 Rajah 30 menunjukkan suis kawalan haba yang digunakan dalam litar bertransistor.

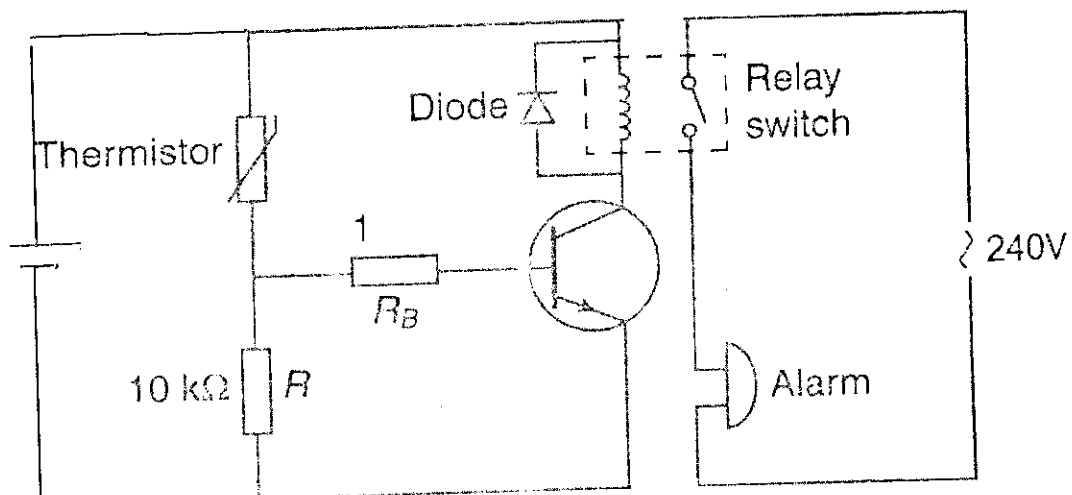


Diagram 30 / Rajah 30

Which of the following statements is true?  
 Pernyataan manakah yang benar?

- A The transistor is a pnp.  
*Transistor adalah jenis pnp*
- B The alarm will be turned on when it is cold.  
*Penggera akan dihidupkan dalam keadaan sejuk.*
- C The voltage across the  $10\text{ k}\Omega$  resistor increases when it is hot.  
*Voltan yang merentas perintang  $10\text{ k}\Omega$  bertambah dalam keadaan panas*
- D The resistance of the thermistor increases linearly to the temperature.  
*Rintangan termistor bertambah secara linear dengan suhu*

- 46 Diagram 31 shows an electric circuit.  
Rajah 31 menunjukkan satu litar elektrik.

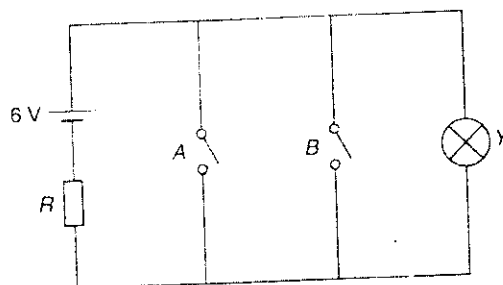
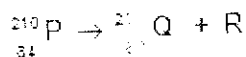


Diagram 31 / Rajah 31

The logic gate that can represent this circuit is  
Get logic yang boleh diwakili oleh litar tersebut ialah

- A OR  
B AND  
C NOR  
D NAND
47. The radioactive isotope of  ${}_{84}^{210}\text{P}$  disintegrates to form  ${}_{82}^{206}\text{Q}$  and particle R.  
Isotop radioaktif bagi  ${}_{84}^{210}\text{P}$  mereput untuk membentuk  ${}_{82}^{206}\text{Q}$  dan zarah R.



Name particle R  
Namakan zarah R

- A alpha  
B beta  
C X ray  
D gamma ray

SULIT



- 48 Table 1 below shows the characteristics of radioisotope P, Q, R dan S.  
 Jadual di bawah menunjukkan ciri-ciri radioaktif P, Q dan R.

Radioisotope	Characteristics of radioisotope Ciri-ciri radioisotop		
	State of matter Keadaan jirim	Type of Radiation Jenis Sinaran	Half life Separuh hayat
P	Solid /Pepejal	Beta	5 years / tahun
Q	Solid/Pepejal	Gamma	5 years / tahun
R	Gas/gas	Beta	3 months / bulan
S	Liquid/Cecair	Alfa	17 years / tahun

Table 1

Based on the information in the table 1, select the most suitable radioisotope to be used to detect the thickness of paper  
 Berdasarkan maklumat dalam jadual pilih radioisotop yang paling sesuai digunakan untuk mengesan ketebalan kertas.

- A P  
 B Q  
 C R  
 D S

- 49 In a certain nuclear reaction,  $3.6 \times 10^{-10}$  J energy is released. Calculate the mass defect in the reaction.  
 Dalam suatu tindakbalas nuklear,  $3.6 \times 10^{-10}$  J tenaga telah dibebaskan. Hitung cacat jisim dalam tindakbalas tersebut.  
 [Speed of light  $c = 3 \times 10^8$  m s<sup>-1</sup>]  
 [Halaju cahaya,  $c = 3 \times 10^8$  m s<sup>-1</sup>]

- A  $1.1 \times 10^{-1}$  kg  
 B  $1.2 \times 10^{-18}$  kg  
 C  $4.0 \times 10^{-27}$  kg  
 D  $8.3 \times 10^{17}$  kg

50

Diagram 32 shows the radioactive decay series of Uranium-238 to Radium-226.  
 Rajah 32 menunjukkan siri pereputan radioaktif nukleus uranium-238 kepada nucleus radium-226.

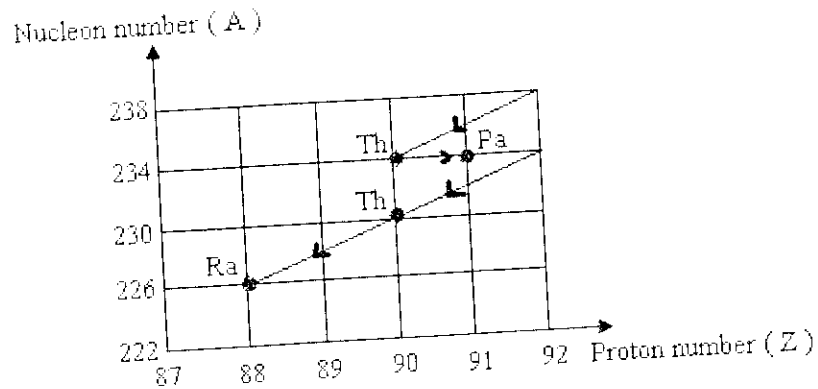


Diagram 32 / Rajah32

What is the number of alpha particles and beta particles emitted during this process?  
 Berapakah bilangan zarah alfa dan zarah beta yang dihasilkan semasa proses ini?

	The number of alpha particles Bilangan zarah alfa	The number of beta particles Bilangan zarah beta
A	2	3
B	3	2
C	4	1
D	1	1

END OF QUESTION PAPER  
 [KERTAS SOALAN TAMAT]

SULIT