

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

DAYA DAN GERAKAN I
FORCE AND MOTION I

1. $v = u + at$
2. $s = \frac{1}{2}(u + v)t$
3. $s = ut + \frac{1}{2}at^2$
4. $v^2 = u^2 + 2as$
5. Momentum = mv
6. $F = ma$

KEGRAVITIAN
GRAVITATION

1. $F = \frac{Gm_1m_2}{r^2}$
2. $g = \frac{Gm}{r^2}$
3. $F = \frac{mv^2}{r}$
4. $a = \frac{v^2}{r}$
5. $v = \frac{2\pi r}{T}$
6. $\frac{T_1^2}{r_1^3} = \frac{T_2^2}{r_2^3}$
7. $v = \sqrt{\frac{GM}{r}}$
8. $u = -\frac{GMm}{r}$
9. $v = \sqrt{\frac{2GM}{r}}$

HABA
HEAT

1. $Q = mc\theta$
2. $Q = ml$
3. $Q = Pt$
4. $P_1V_1 = P_2V_2$
5. $\frac{V_1}{T_1} = \frac{V_2}{T_2}$
6. $\frac{P_1}{T_1} = \frac{P_2}{T_2}$

GELOMBANG
WAVES

1. $v = f\lambda$
2. $\lambda = \frac{ax}{D}$

CAHAYA DAN OPTIK
LIGHT AND OPTICS

1. $n = \frac{c}{v}$
2. $n = \frac{\sin i}{\sin r}$
3. $n = \frac{1}{\sin c}$
4. $n = \frac{H}{h}$
5. $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$
6. $n_1 \sin\theta_1 = n_2 \sin\theta_2$
7. Pembesaran linear, $m = \frac{v}{u}$
Linear magnification

DAYA DAN GERAKAN II
FORCE AND MOTION II

1. $F = kx$
2. $E = \frac{1}{2} Fx$
3. $E = \frac{1}{2} Fx^2$

TEKANAN
PRESSURE

1. $P = \frac{F}{A}$
2. $P = h\rho g$
3. $\rho = \frac{m}{V}$

ELEKTRIK
ELECTRICITY

- | | |
|------------------------------|---------------------------|
| 1. $E = \frac{F}{Q}$ | 6. $\varepsilon = V + Ir$ |
| 2. $I = \frac{Q}{t}$ | 7. $P = VI$ |
| 3. $V = \frac{E}{Q}$ | 8. $P = \frac{E}{t}$ |
| 4. $V = IR$ | 9. $E = \frac{V}{d}$ |
| 5. $R = \frac{\rho \ell}{A}$ | |

KEELEKTROMAGNETAN
ELECTROMAGNETISM

1. $\frac{Vs}{Vp} = \frac{Ns}{Np}$
2. $\eta = \frac{\text{Kuasa output}}{\text{Kuasa input}} \times 100\%$
 $\eta = \frac{\text{Output power}}{\text{Input power}} \times 100\%$

ELEKTRONIK
ELECTRONICS

1. Tenaga keupayaan elektrik, $E = eV$
Electrical potential energy
2. Tenaga kinetik maksimum, $E = \frac{1}{2} mv^2$
Maximum kinetic energy
3. $\beta = \frac{I_C}{I_B}$

FIZIK NUKLEAR
NUCLEAR PHYSICS

1. $N = \left(\frac{1}{2}\right)^8 N_0$
2. $E = mc^2$
3. $c = 3.00 \times 10^8 \text{ ms}^{-1}$
4. 1 u.j.a. = $1.66 \times 10^{-27} \text{ kg}$
1 a.m.u.

FIZIK KUANTUM
QUANTUM PHYSICS

1. $E = hf$
2. $f = \frac{c}{\lambda}$
3. $\lambda = \frac{h}{p}$
4. $\lambda = \frac{h}{mv}$
5. $E = \frac{hc}{\lambda}$
6. $p = nhf$
7. $hf = W + \frac{1}{2} mv^2_{\text{maks}}$
8. $w = hf_0$
9. $g = 9.81 \text{ ms}^{-2} @ 9.81 \text{ Nkg}^{-1}$
10. $G = 6.67 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2}$
11. $h = 6.63 \times 10^{-34} \text{ Js}$

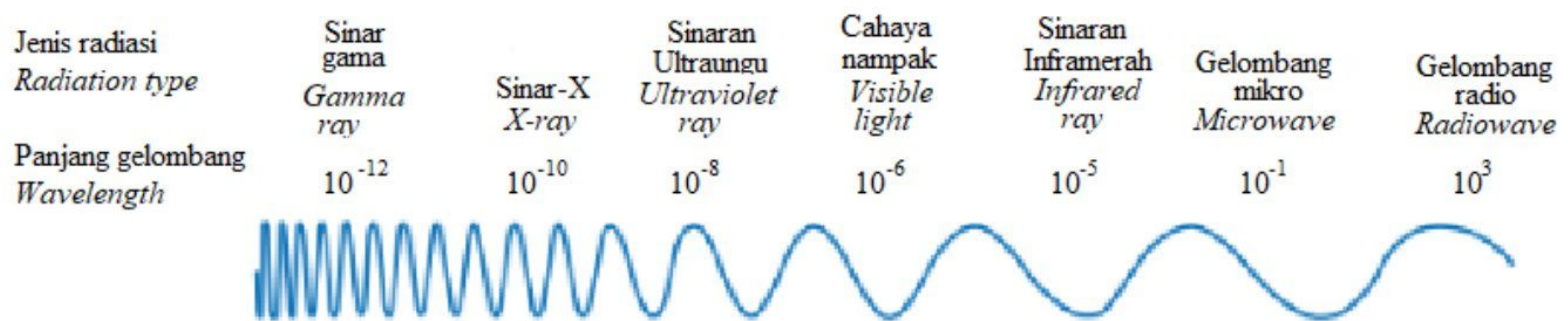
BAHAGIAN A
Section A

[60 markah / marks]

Jawab **semua** soalan dalam bahagian ini.
*Answer **all** the questions in this section*

- 1 Rajah 1 menunjukkan tujuh jenis gelombang elektromagnet membentuk satu spektrum selanjur yang dikenali sebagai spektrum elektromagnet.

Diagram 1 shows seven types of electromagnetic waves form a continuous spectrum known as electromagnetic spectrum.



Rajah 1
Diagram 1

- (a) Gariskan pada jawapan yang betul.
Underline the correct answer.

Gelombang elektromagnet terdiri daripada medan elektrik dan medan magnet yang berayun secara (berserenjang / selari) dengan satu sama lain.

Electromagnetic waves are made up of an electric field and a magnetic field that oscillate (perpendicularly / parallel) to one another.

[1 markah/mark]

- (b) Berdasarkan Rajah 1, nyatakan
Based on Diagram 1, state

- (i) gelombang elektromagnet yang mempunyai frekuensi yang paling tinggi.
the electromagnetic waves that have the highest frequency.

.....
[1 markah/mark]

- (ii) gelombang elektromagnet yang diaplikasikan untuk mengeringkan cat pada kereta.
the electromagnetic waves applied to drying paint on cars.

.....
[1 markah/mark]

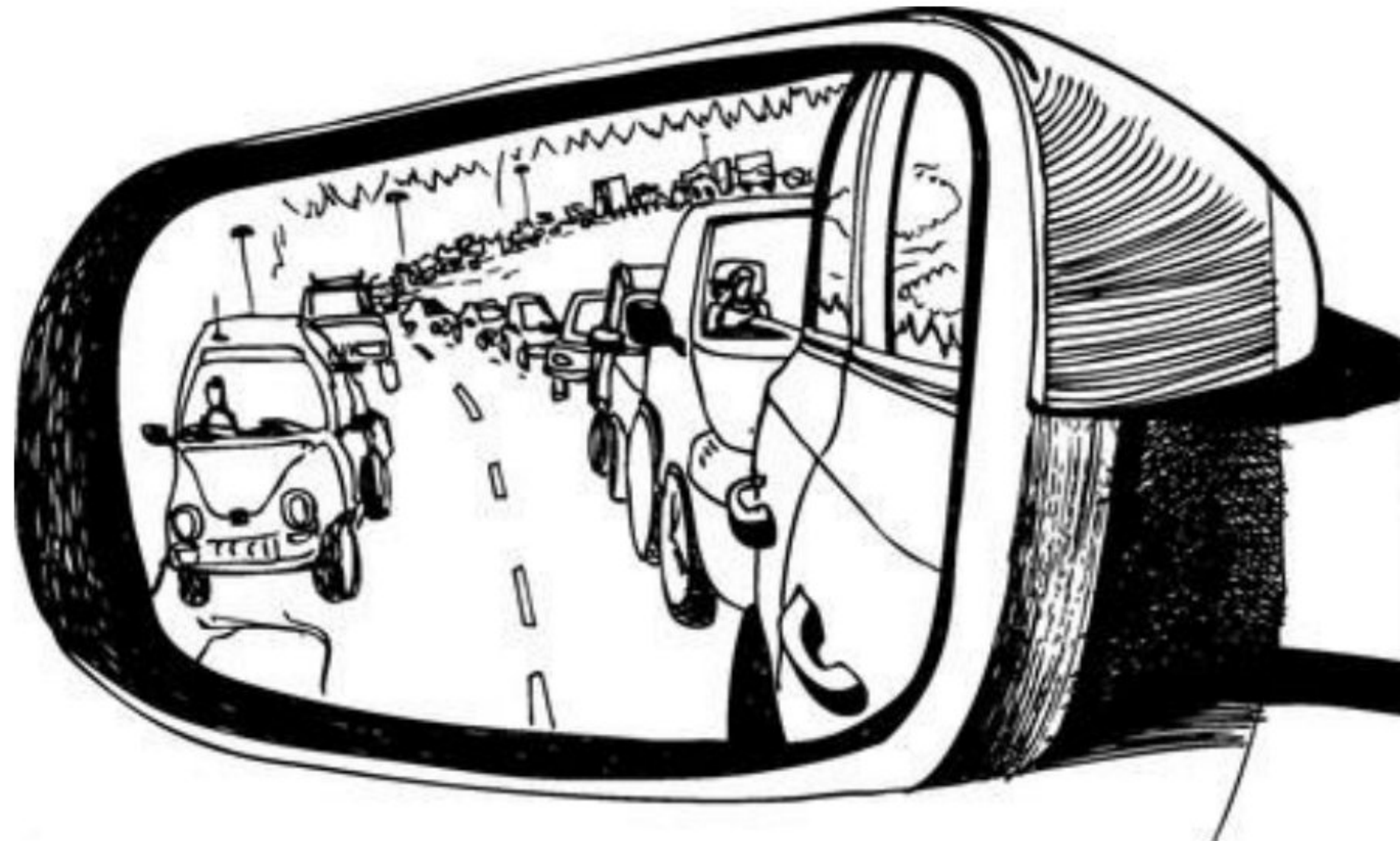
- (c) Berikan satu ciri gelombang elektromagnet.
Give one characteristic of an electromagnetic wave.

.....
[1 markah/mark]

Total A1

| |
|---|
| |
| 4 |

- 2 Rajah 2.1 menunjukkan imej yang terbentuk dari cermin sisi kenderaan.
Diagram 2.1 shows the image formed from the side mirror of the vehicle.



Rajah 2.1
Diagram 2.1

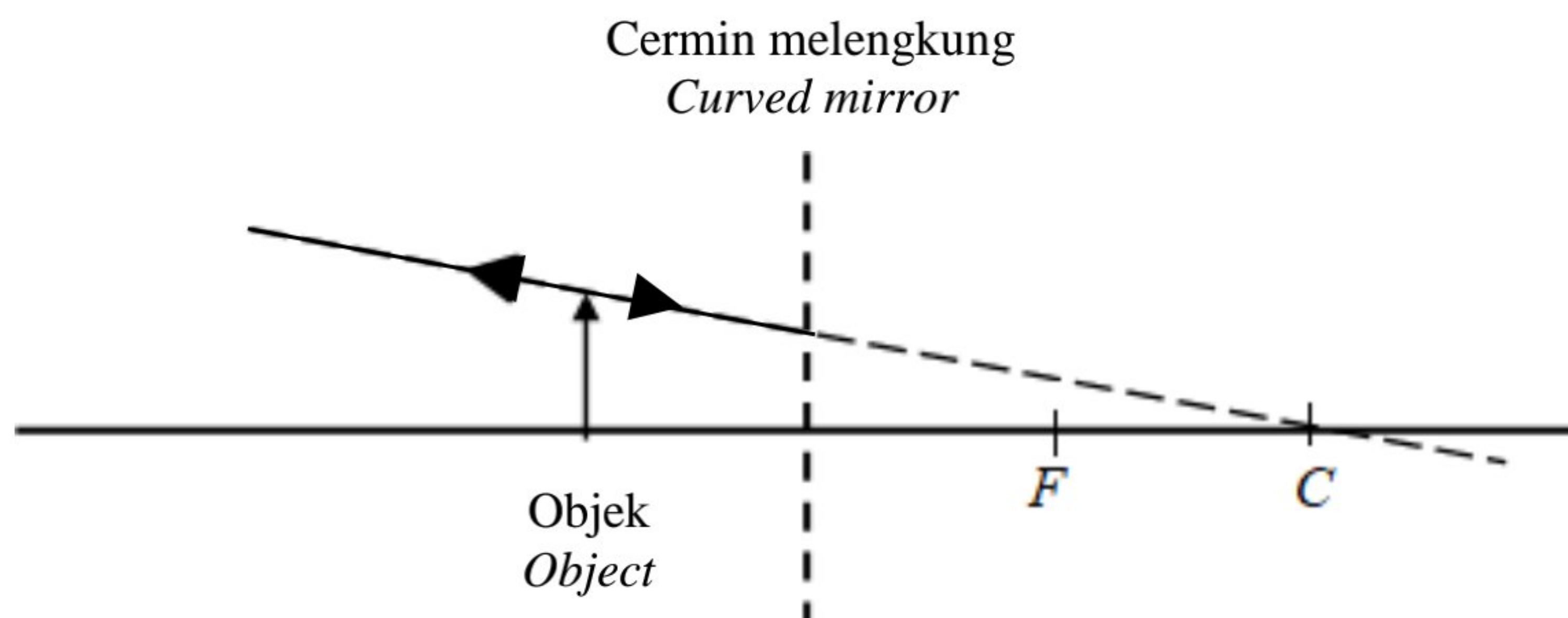
- (a) (i) Nyatakan cermin melengkung yang digunakan dalam Rajah 2.1.
State the curved mirror used in Diagram 2.1.

.....
[1 markah/mark]

- (ii) Jelaskan jawapan anda di 2(a)(i).
Explain your answer in 2(a)(i).

.....
[1 markah/mark]

- (b) Tentukan kedudukan imej dalam Rajah 2.1 dengan melengkapkan rajah sinar dalam Rajah 2.2.
Determine the position of an image in Diagram 2.1 by completing the ray diagram in Diagram 2.2.



Rajah 2.2
Diagram 2.2

[2 markah/marks]

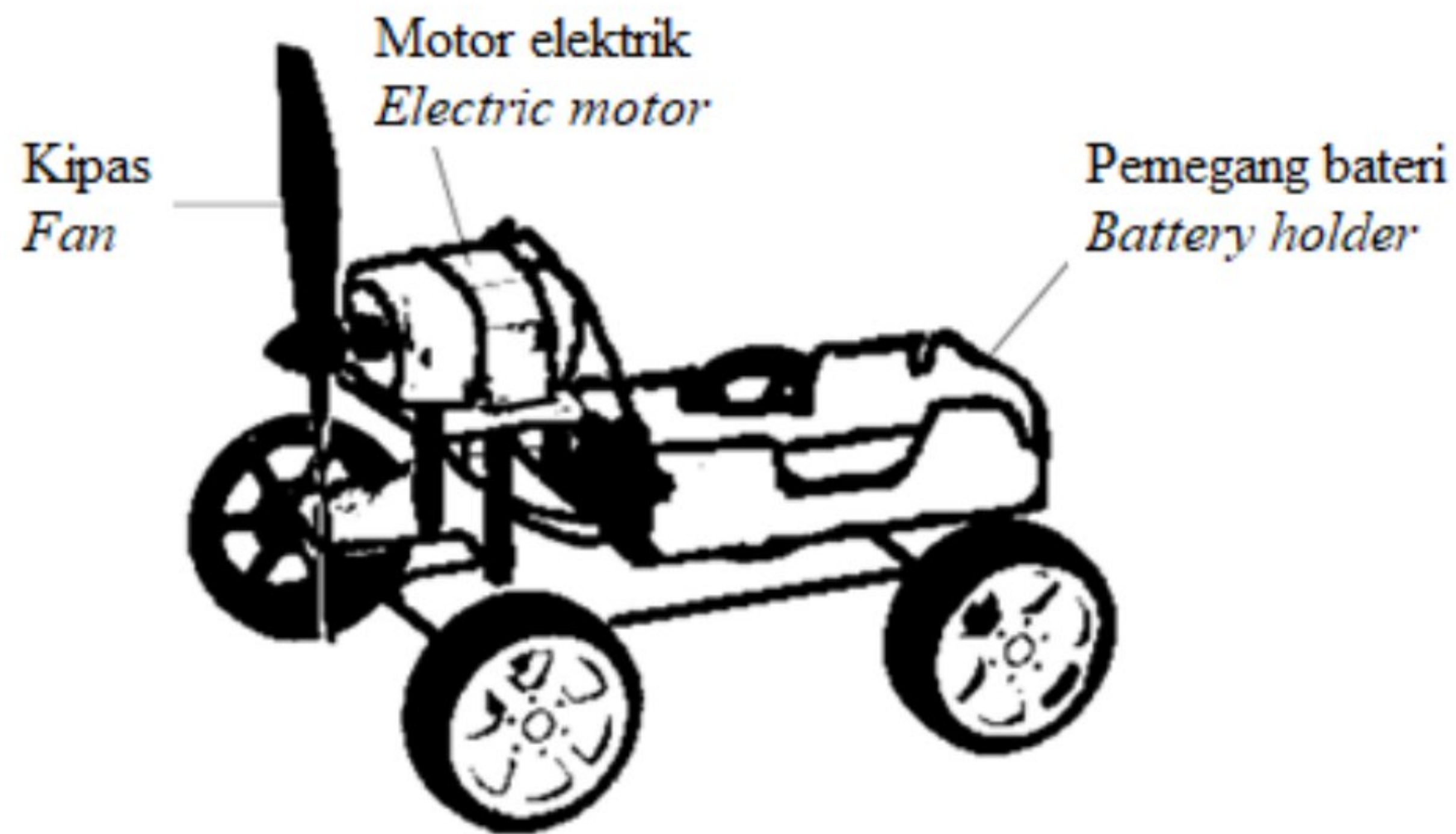
- (c) Apakah yang berlaku kepada saiz imej apabila kelengkungan cermin ditambah?
What happen to the size of image when the curvature of mirror is increased?

.....
[1 markah/mark]

Total A2

| |
|---|
| 5 |
|---|

- 3 Rajah 3.1 menunjukkan sebuah kereta mainan.
Diagram 3.1 shows a toy car.



Rajah 3.1
Diagram 3.1

- (a) (i) Tandakan (✓) pada jawapan yang betul.
Tick (✓) the correct answer.

Kipas pada Rajah 3.1 akan berpusing dalam arah
The fan on Diagram 3.1 will rotate in the direction of

lawan jam sahaja atau ikut jam sahaja
anticlockwise only or clockwise only

lawan jam dan ikut jam
anticlockwise and clockwise

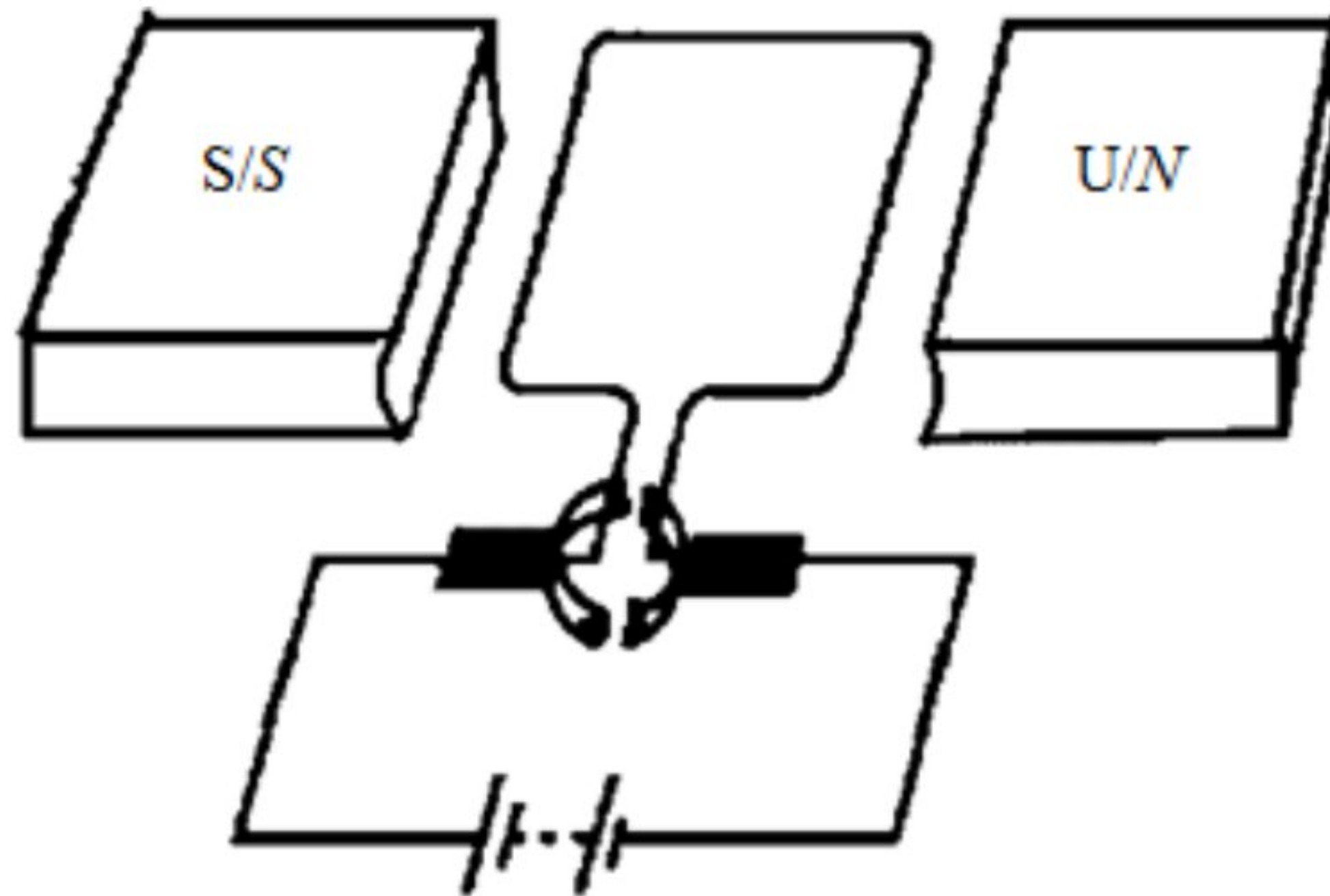
[1 markah/mark]

- (ii) Namakan peraturan fizik yang digunakan untuk menentukan arah putaran kipas pada kereta mainan.
Name the physics' rule used to determine the direction of fan rotation on the toy car.

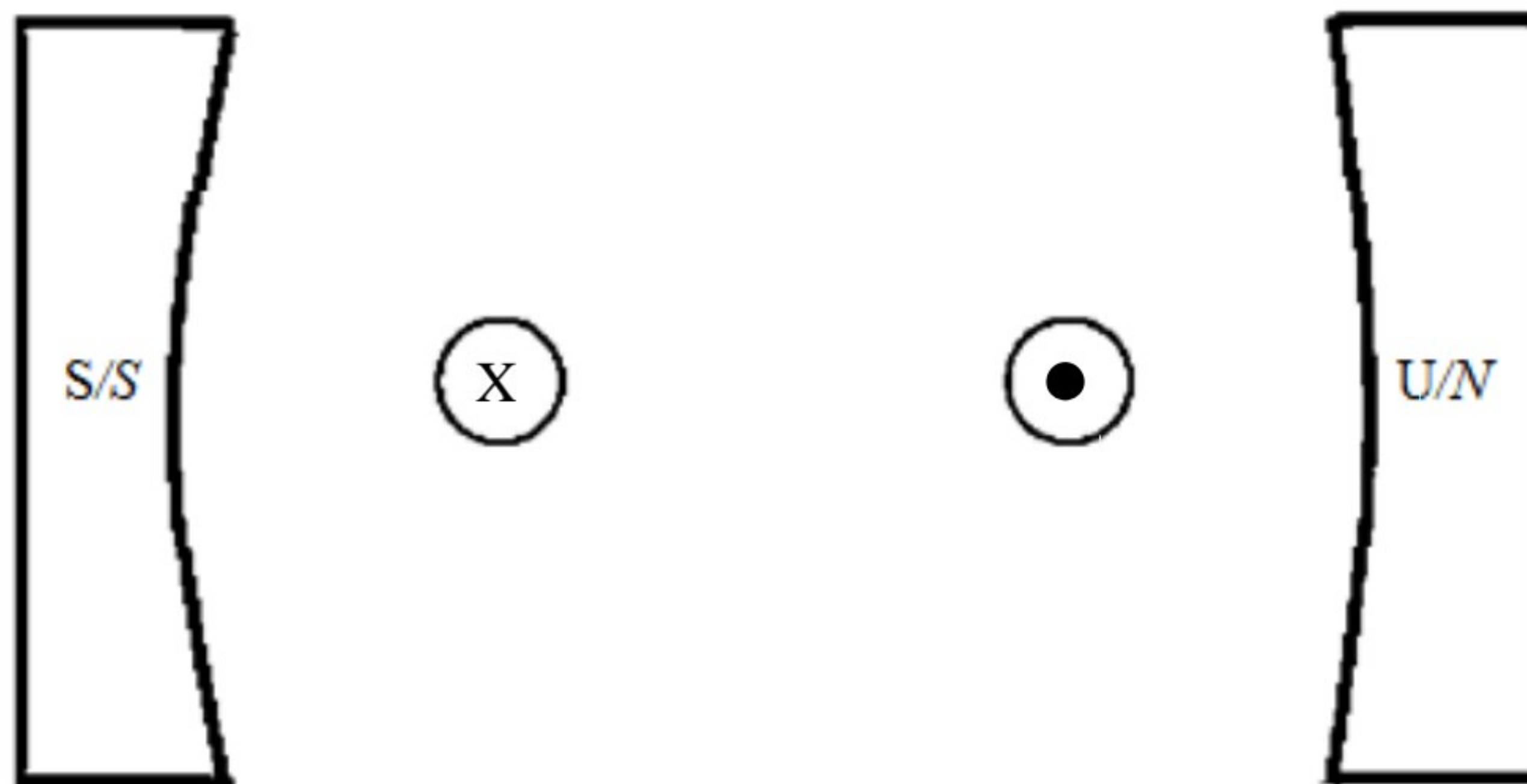
.....

[1 markah/mark]

- (b) (i) Apabila sel kering dipasangkan, kipas mula berputar. Dengan menggunakan bantuan Rajah 3.2, lengkapkan Rajah 3.3 tersebut.
 When the switch is turned on, the coil starts spinning. With the help of Diagram 3.2, complete the Diagram 3.3.



Rajah 3.2
 Diagram 3.2



Rajah 3.3
 Diagram 3.3

[2 markah/marks]

- (ii) Nyatakan perubahan tenaga yang berlaku semasa kipas berputar.
 State the energy change when the fan is rotates.

.....
 [1 markah/mark]

- (iii) Nyatakan **satu** kaedah lain yang boleh meningkatkan kelajuan putaran kipas.
 State one other method that can increase the rotational speed of the fan.

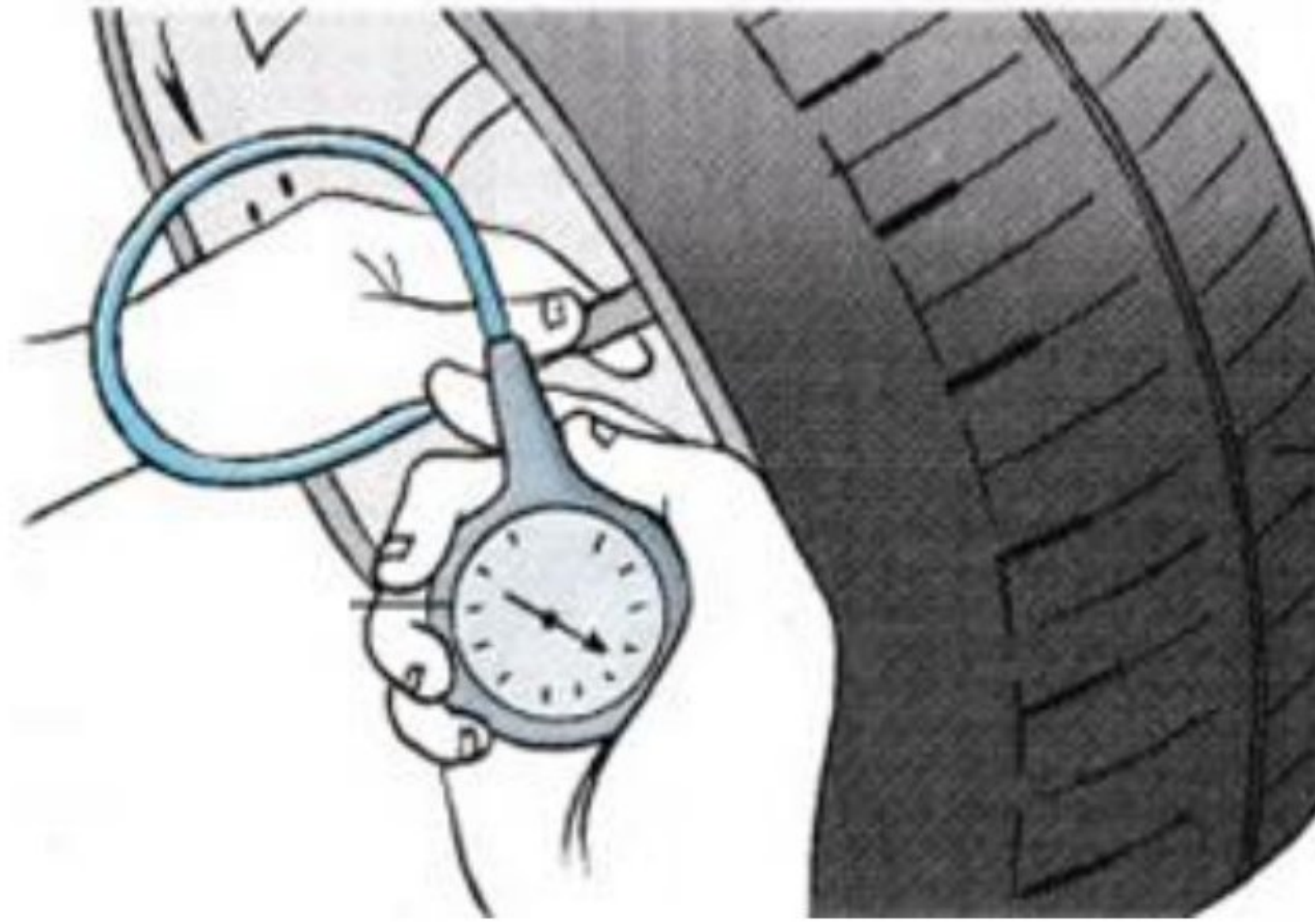
.....
 [1 markah/mark]

Total A3

| |
|---|
| 6 |
|---|

SULIT

- 4 Rajah 4 menunjukkan tekanan pada tayar kereta Encik Khairul pada awal pagi sebelum bertolak ke Ipoh. Suhu awal tayar sebelum dia bertolak ialah 25°C .
Diagram 4 shows the pressure on Mr Khairul's car tyres in the early morning before departure to Ipoh. The initial temperature of the tyre is 25°C .



Tekanan tayar = 220 kPa
 Pressure of tyre = 220 kPa

Rajah 4
 Diagram 4

- (a) Nyatakan fungsi Tolok Bourdon.
State the function of Bourdon Gauge.

 [1 markah/mark]
- (b) Berdasarkan Rajah 4, nyatakan hukum gas yang terlibat.
Based on Diagram 4, state the gas law involved.

 [1 markah/mark]
- (c) Nyatakan hubungan di antara tekanan udara dan suhu.
State the relationship between pressure of air and temperature.

 [1 markah/mark]
- (d) Berdasarkan teori kinetik gas, terangkan hubungan di antara tekanan udara dalam tayar dengan suhu?
Based on kinetic theory of gas, explain the relationship between the pressure of air in the tyre with temperature?

 [2 markah/marks]

- (e) Berdasarkan Rajah 4, hitung suhu tayar kereta setelah tiba di Ipoh jika tekanan tayar ialah 240 kPa.

Based on Diagram 4, calculate the temperature of the tyres after arriving at Ipoh if the pressure of the tyres is 240 kPa.

[2 markah/marks]

- (f) Seorang pemilik kenderaan mengisi angin tayar kenderaannya pada tekanan 2.7×10^5 Pa di Cameron Highland, Pahang semasa pukul 5.00 pagi ketika suhu 17°C . Beliau kemudiannya memandu pulang sejauh 220 km ke Kuala Lumpur dengan suhu persekitaran 34°C , berapakah tekanan tayarinya pada masa itu?

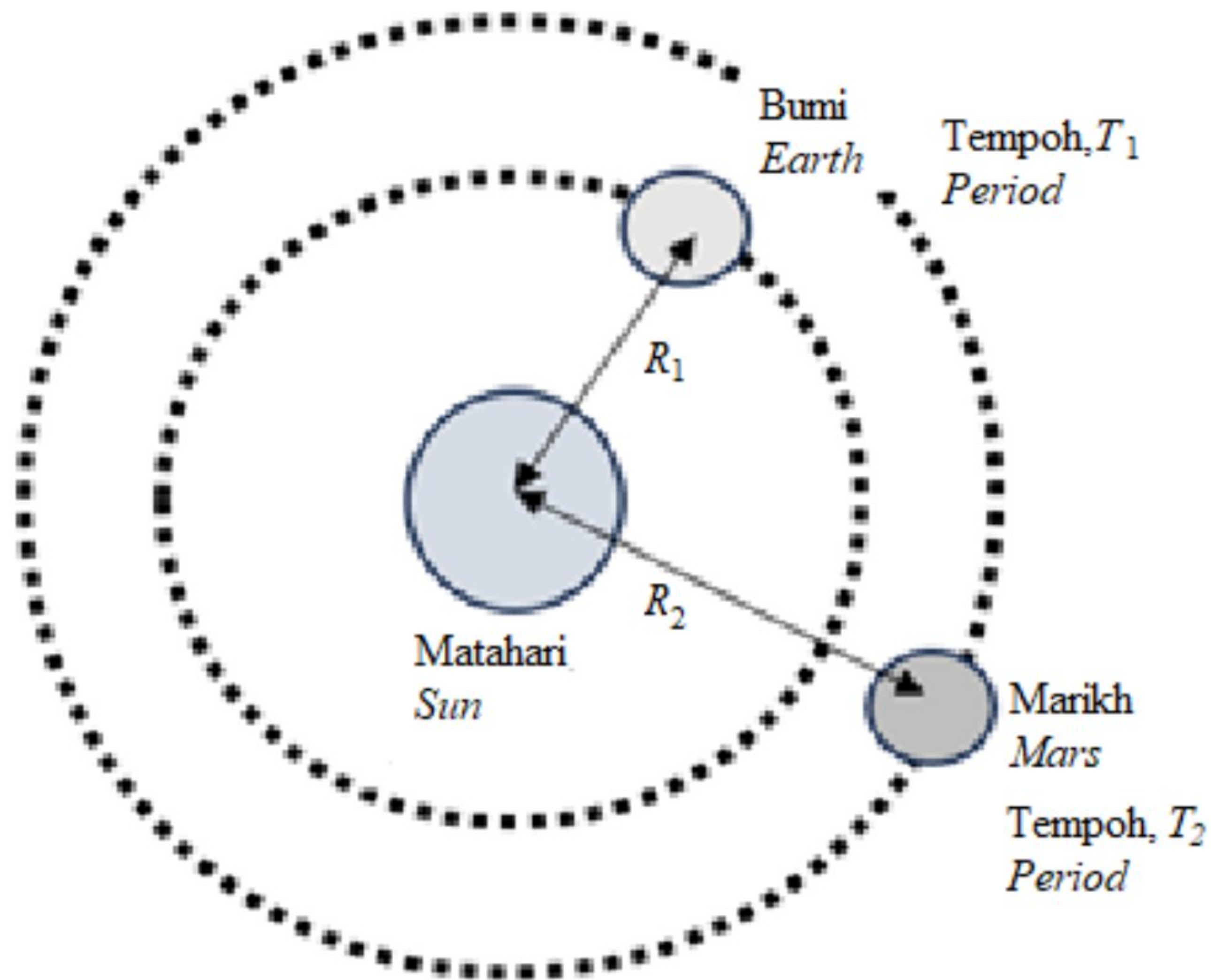
A vehicle owner inflated his vehicle tyres to a pressure of 2.7×10^5 Pa at Cameron Highland, Pahang at 5.00 am when the temperature was 17°C . He then drove 220 km back to Kuala Lumpur with a surrounding temperature of 34°C , what was his tyre pressure at that time?

[2 markah/marks]

Total A4

| |
|---|
| |
| 9 |

- 5 Rajah 5.1 menunjukkan planet Bumi dan Marikh yang mengorbit Matahari.
Diagram 5.1 shows the Earth and Mars planets orbiting the Sun.



Rajah 5.1
 Diagram 5.1

- (a) Jisim adalah kuantiti.....
Mass is a quantity. [1 markah/mark]
- (b) Berdasarkan Rajah 5.1,
Based on Diagram 5.1,
- (i) bandingkan jisim planet Bumi dan planet Marikh.
compare the mass of Earth planet and Mars planet.
 [1 markah/mark]
- (ii) bandingkan jejari orbit bagi planet Bumi dan planet Marikh.
compare the orbital period of Earth and Mars planet.
 [1 markah/mark]
- (iii) nyatakan hubungan antara jejari orbit dan tempoh orbit.
state the relationship between orbital radius and orbital period.
 [1 markah/mark]

- (iv) bentuk orbit planet Bumi dan planet Marikh.
shape of the orbit of Earth and Mars planet.

.....
[1 markah/mark]

- (c) Nyatakan hukum yang terlibat dalam 5(b)(iv).
State the law involved in 5(b)(iv).

.....
[1 markah/mark]

- (d) Apakah yang terjadi kepada tempoh orbit jika jisim planet bertambah?
What happen to the orbital period if the mass of planet increased?

.....
[1 markah/mark]

- (e) Planet P mengambil masa 15 tahun untuk membuat satu orbit lengkap dan jaraknya dari Matahari ialah 7.78×10^8 m. Jika planet Q mengambil masa 24 tahun untuk membuat satu orbit lengkap mengelilingi Matahari, berapakah jarak di antara planet Q dengan Matahari?

Planet P takes 15 years to make one complete orbit and its distance from the Sun is 7.78×10^8 m. If planet Q takes 24 years to make one complete orbit around the Sun, what is the distance between planet Q and the Sun?

[2 markah/marks]

Total A5

| | |
|--|---|
| | 9 |
|--|---|

- 6 Rajah 6 menunjukkan dua litar sel foto yang diselaputi oleh dua bahan berbeza. Apabila sel-sel foto disinari oleh cahaya, arus fotoelektrik akan terhasil dalam litar.

Diagram 6 shows two photocell circuits covered with two different materials. When the photo cells are irradiated by light, photoelectric current will be produced in the circuit.

| Cesium <i>Caesium</i> | Litium <i>Lithium</i> |
|--|--|
| | |
| Fungsi kerja cesium, $W = 3.43 \times 10^{-19} \text{ J}$ <i>Work function of cesium, $W = 3.43 \times 10^{-19} \text{ J}$</i> | Fungsi kerja litium, $W = 3.64 \times 10^{-19} \text{ J}$ <i>Work function of lithium, $W = 3.64 \times 10^{-19} \text{ J}$</i> |
| Frekuensi ambang, $f_0 = 5.16 \times 10^{14} \text{ Hz}$ <i>Threshold frequency, $f_0 = 5.16 \times 10^{14} \text{ Hz}$</i> | Frekuensi ambang, $f_0 = 6.03 \times 10^{14} \text{ Hz}$ <i>Threshold frequency, $f_0 = 6.03 \times 10^{14} \text{ Hz}$</i> |
| Panjang gelombang maksimum untuk penghasilan arus fotoelektrik, $\lambda = 579 \text{ nm}$ <i>Maximum wavelength for the production of photoelectric current, $\lambda = 579 \text{ nm}$</i> | Panjang gelombang maksimum untuk penghasilan arus fotoelektrik, $\lambda = 496 \text{ nm}$ <i>Maximum wavelength for the production of photoelectric current, $\lambda = 496 \text{ nm}$</i> |

Rajah 6
Diagram 6

- (a) Apakah maksud fungsi kerja?
What is meant by work function?

.....
.....

[1 markah/mark]

- (b) Sel-sel foto yang diselaputi oleh bahan cesium disinari oleh cahaya biru berfrekuensi 6.67×10^{14} Hz.

Photocells covered with caesium material are irradiated with blue light of frequency 6.67×10^{14} Hz.

- (i) Kira tenaga foton menggunakan $E = hf$.
Calculate the photon energy using $E = hf$.

[2 markah/marks]

- (ii) Berapakah halaju maksimum fotoelektron yang terpancar keluar menggunakan rumus $E = W + \frac{1}{2}mv^2$.

(Jisim elektron, $m = 9.11 \times 10^{-31}$ kg)

What is the maximum velocity of the emitted photoelectrons using formula $E = W + \frac{1}{2}mv^2$

(Mass of electron, $m = 9.11 \times 10^{-31}$ kg)

[2 markah/marks]

- (c) Berdasarkan Rajah 6,
Based on Diagram 6,

- (i) sel foto manakah yang mempunyai fungsi kerja logam yang lebih besar?
which photocell has the greater metal work function?

.....
 [1 markah/mark]

- (ii) sel foto manakah yang mempunyai panjang gelombang maksimum untuk penghasilan arus fotoelektrik yang lebih besar?
which photocell has the maximum wavelength for the production of a larger photoelectric current?

.....
 [1 markah/mark]

- (iii) Sel foto manakah yang mempunyai frekuensi ambang yang lebih besar?
Which photocell has the greater threshold frequency?

.....
[1 markah/mark]

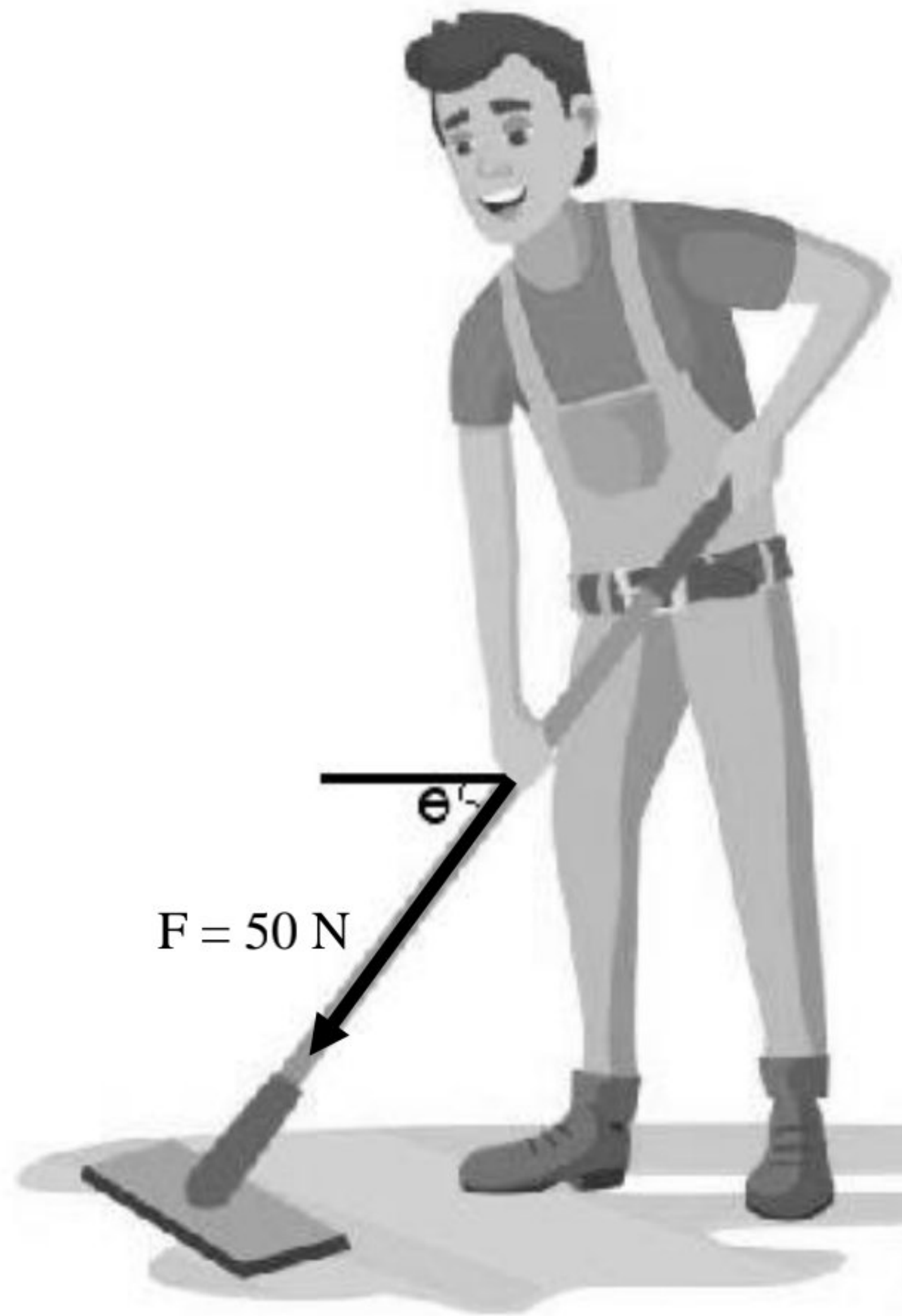
- (d) Menggunakan jawapan anda di 6 (c), hubungkan fungsi kerja logam dan panjang gelombang maksimum yang diperlukan untuk penghasilan arus fotoelektrik.
Using your answer in 6 (c), relate the work function of the metal and the maximum wavelength required for the production of a photoelectric current.

.....
.....
[1 markah/mark]

Total A6

| | |
|--|---|
| | 9 |
|--|---|

- 7 Rajah 7.1 menunjukkan seorang pekerja sedang membersihkan lantai dengan sebatang mop. Daya yang dikenakan ke atas batang mop itu dilabelkan sebagai F .
Diagram 7.1 shows a worker cleaning the floor with a mop. Force acted on the mop is labelled as F .



Rajah 7.1
 Diagram 7.1

- (a) (i) Pada Rajah 7.1, lakarkan dua komponen leraian daya yang bertindak ke atas batang mop tersebut.
In Diagram 7.1, sketch resolution of forces acting on the mop rod into two components.
- [1 markah/mark]
- (ii) Kira magnitud daya komponen menegak dan komponen mengufuk yang dikenakan jika sudut $\theta = 65^\circ$.
Calculate the magnitude of vertical component and horizontal component of the force if angle $\theta = 65^\circ$.

[2 markah/marks]

- (b) Apakah maksud leraian daya?
What is the meaning of resolution of forces?

.....

[1 markah/mark]

- (c) Rajah 7.2 menunjukkan kanak-kanak sedang bermain gelongsor di taman permainan.
Diagram 7.2 shows the child playing slide in a playground.



Rajah 7.2
 Diagram 7.2

- Jadual 7 menunjukkan ciri-ciri bagi gelongsor P, Q dan R.
Table 7 shows the characteristics of slides P, Q and R.

| Gelongsor <i>Slide</i> | Jenis permukaan <i>Type of surface</i> | Sudut kecondongan, $\theta/^\circ$ <i>Angle of inclination, $\theta/^\circ$</i> |
|---------------------------|---|---|
| P | Licin <i>Smooth</i> | 10 |
| Q | Kasar <i>Rough</i> | 35 |
| R | Licin <i>Smooth</i> | 35 |

Jadual 7
 Table 7

Berdasarkan Jadual 7, nyatakan ciri-ciri kesesuaian gelongsor. Berikan sebab.
Based on Table 7, state the suitable characteristics of a slide. Give a reason.

(i) Jenis permukaan
Type of surface

.....

Sebab
Reason

.....

[2 markah/marks]

(ii) Sudut kecondongan
Angle of inclination

.....

Sebab
Reason

.....

[2 markah/marks]

(d) Berdasarkan jawapan anda di 7c(i) dan 7 c(ii), tentukan gelongsor yang paling sesuai.
Based on your answer in 7c(i) dan 7c(ii) determine the most suitable slide.

.....

.....

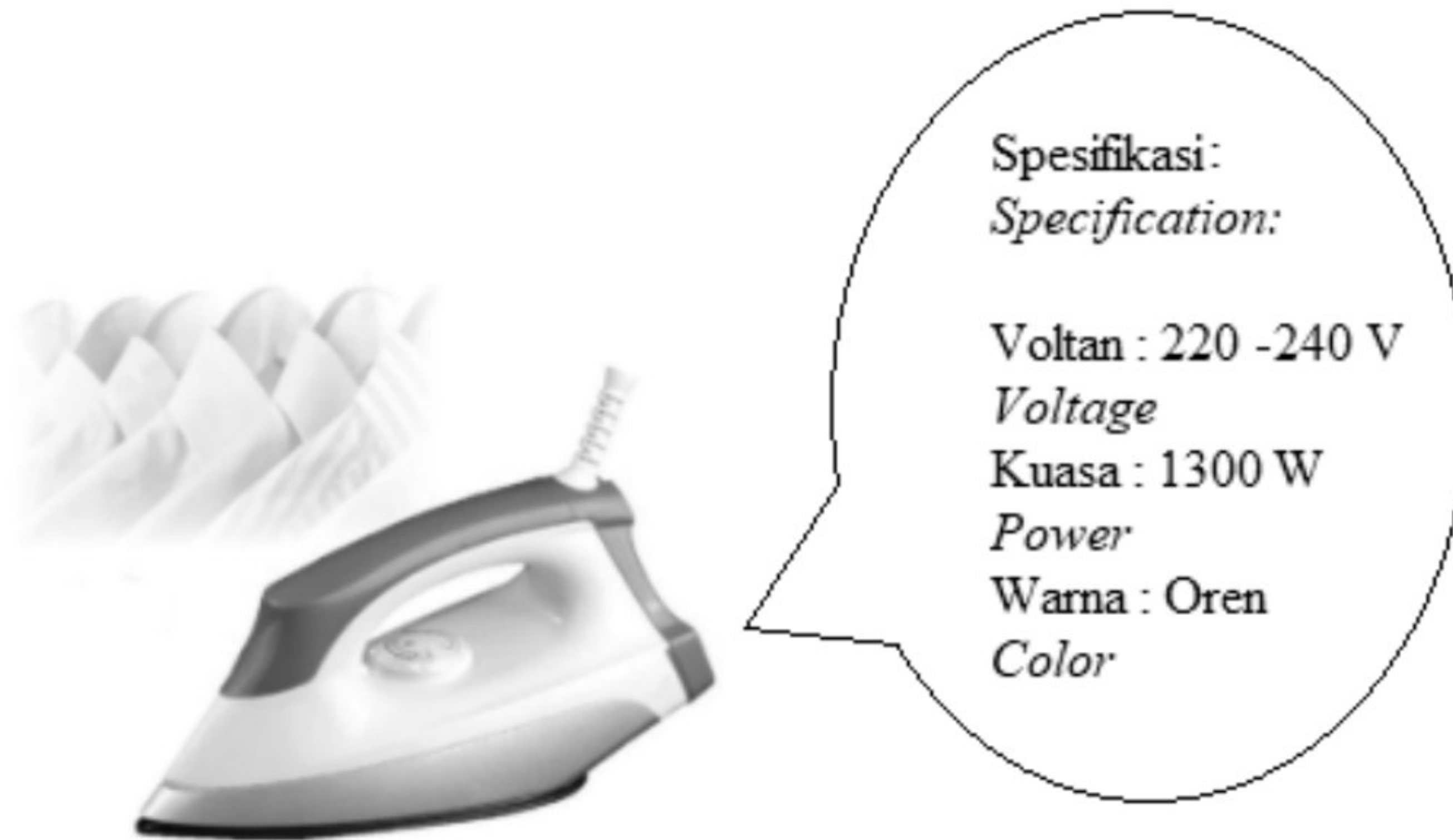
[1 markah/mark]

Total A7

| | |
|--|---|
| | 9 |
|--|---|

- 8 Rajah 8 menunjukkan satu label yang memaparkan voltan dan kuasa elektrik yang diperlukan oleh sebuah seterika untuk beroperasi.

Diagram 8 shows a label that displays the voltage and electrical power required by an iron to operate.



Rajah 8
Diagram 8

- (a) Berdasarkan Rajah 8, apakah yang dimaksudkan dengan label '240 V, 1300 W' pada seterika itu?

Based on Diagram 8, what is meant by the label '240 V, 1300 W' on the iron?

.....
.....

[1 markah/mark]

- (b) Tentukan tenaga elektrik yang digunakan oleh seterika itu selama 10 minit.

Determine the electrical energy used by the iron for 10 minutes.

[2 markah/marks]

- (c) Sebagai seorang warden asrama, anda di tugaskan untuk membeli seterika elektrik baru yang jimat tenaga, mudah dibawa dan mempunyai ciri-ciri keselamatan yang tinggi.

As a hostel warden, you are tasked to buy a new electric iron that have energy-saving, easy to carry and has high safety features.

Nyatakan ciri-ciri seterika elektrik yang sesuai. Berikan satu sebab bagi jawapan anda. *Indicate the suitable characteristics of the electric iron. Give a reason for your answer.*

- (i) Kuasa seterika elektrik:

Power of electric iron:

.....

Sebab:

Reason:

.....

[2 markah/marks]

- (ii) Jisim seterika:

Mass of iron:

.....

Sebab:

Reason:

.....

[2 markah/marks]

- (iii) Fius terma:

Thermal fuse:

.....

Sebab:

Reason:

.....

[2 markah/marks]

Total A8

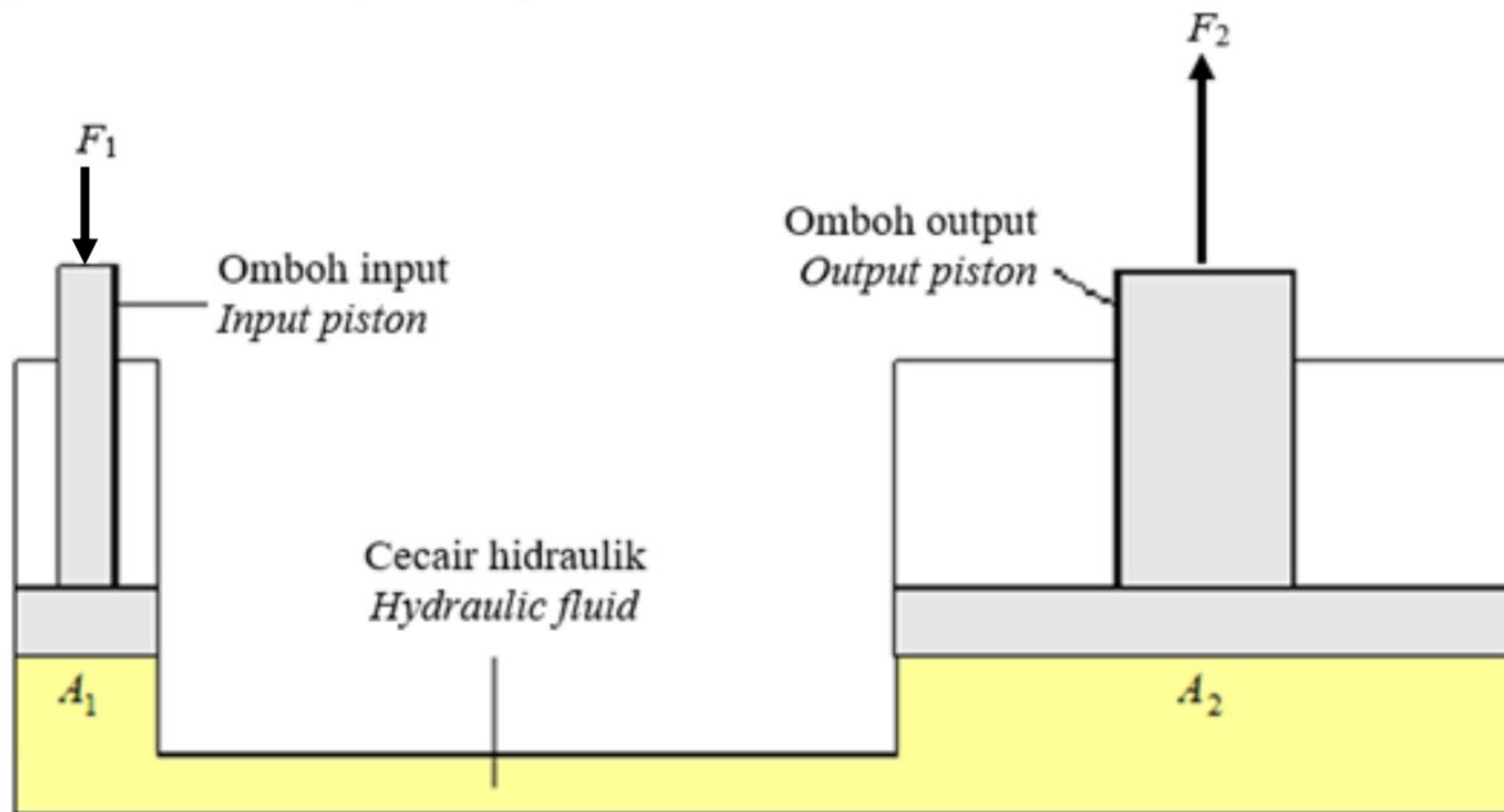
| | |
|--|---|
| | 9 |
|--|---|

Bahagian B
Section B

[20 markah/marks]

Jawab mana-mana **satu** soalan daripada bahagian ini.
Answer any one question from this section.

- 9 Rajah 9.1 menunjukkan sebuah jek hidraulik.
Diagram 9.1 shows a hydraulic jack.



Rajah 9.1
Diagram 9.1

- (a) Berdasarkan Rajah 9.1,
Based on Diagram 9.1,

- (i) namakan prinsip fizik yang terlibat.
name the physics principle involved.

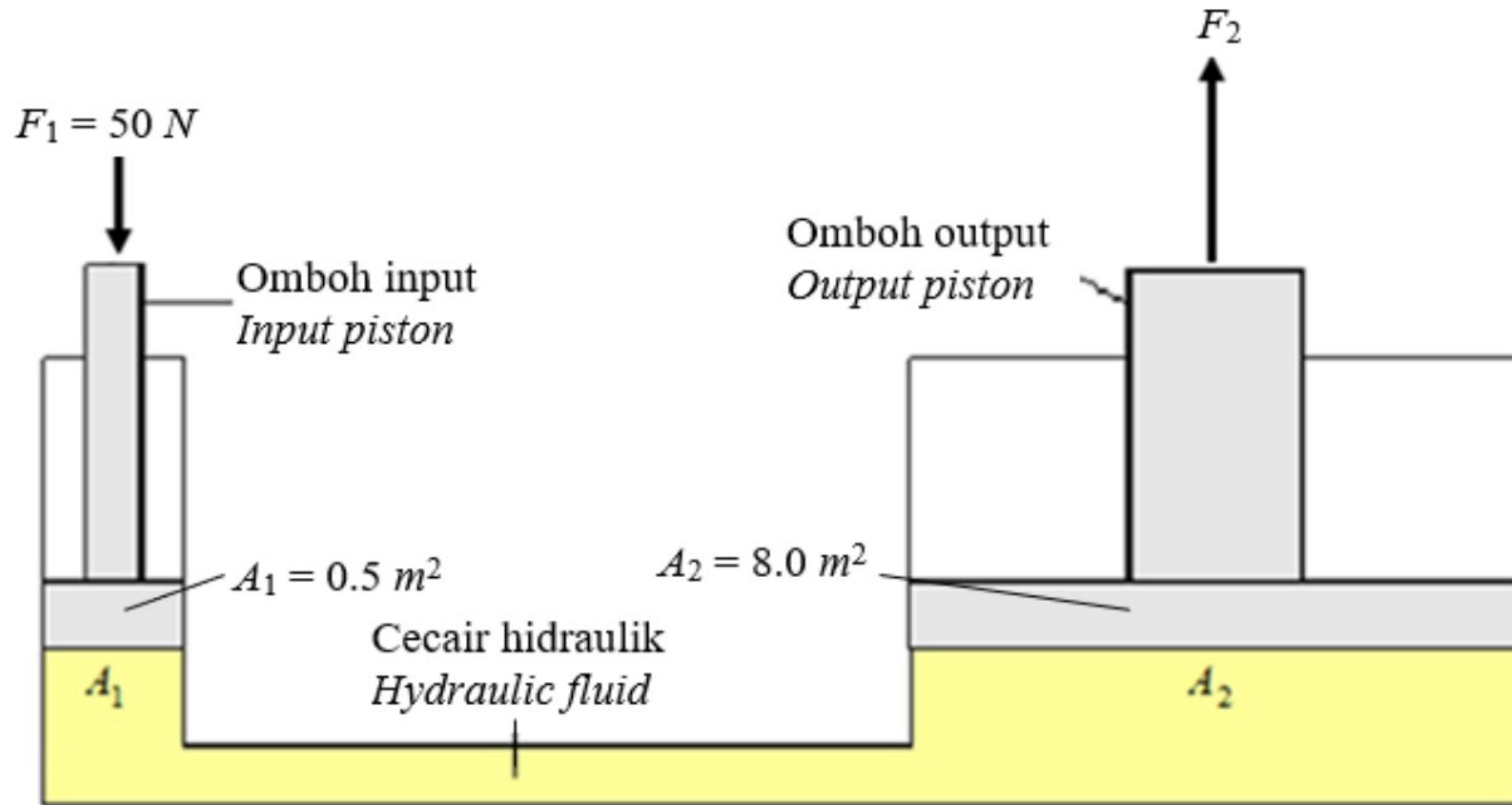
[1 markah/mark]

- (ii) Terangkan prinsip kerja bagaimana jek hidraulik berfungsi.
Explain the working principle on how hydraulic jack is functioning.

[4 markah/marks]

- (b) Rajah 9.2 menunjukkan jek hidraulik yang sama dikenakan daya, $F_1 = 50 \text{ N}$ pada omboh input.

Diagram 9.2 shows the same hydraulic jack applied to a force, $F_1 = 50 \text{ N}$ on the input piston.



Rajah 9.2
Diagram 9.2

- (i) Hitung tekanan pada omboh input.
Calculate the pressure on input piston. [2 markah/marks]
- (ii) Tentukan tekanan yang bertindak pada omboh output.
Determine the pressure acting on output piston. [1 markah/mark]
- (iii) Hitung daya, F_2 .
Calculate force, F_2 . [2 markah/marks]

- (c) Jadual 9 menunjukkan ciri-ciri bagi empat jek hidraulik P, Q, R dan S.
Table 9 shows the characteristics of four hydraulic jacks P, Q, R and S.

| Jek hidraulik <i>Hydraulic jack</i> | Cecair hidraulik <i>Hydraulic fluid</i> | Takat didih cecair hidraulik <i>Boiling point of hydraulic fluid</i> | Luas omboh input <i>Area of input piston</i> | Luas omboh output <i>Area of output piston</i> |
|--|--|---|---|---|
| P | Minyak <i>Oil</i> | Tinggi <i>High</i> | Kecil <i>Small</i> | Besar <i>Large</i> |
| Q | Air <i>Water</i> | Tinggi <i>High</i> | Besar <i>Large</i> | Kecil <i>Small</i> |
| R | Minyak <i>Oil</i> | Rendah <i>Low</i> | Besar <i>Large</i> | Kecil <i>Small</i> |
| S | Air <i>Water</i> | Rendah <i>Low</i> | Kecil <i>Small</i> | Besar <i>Large</i> |

Jadual 9

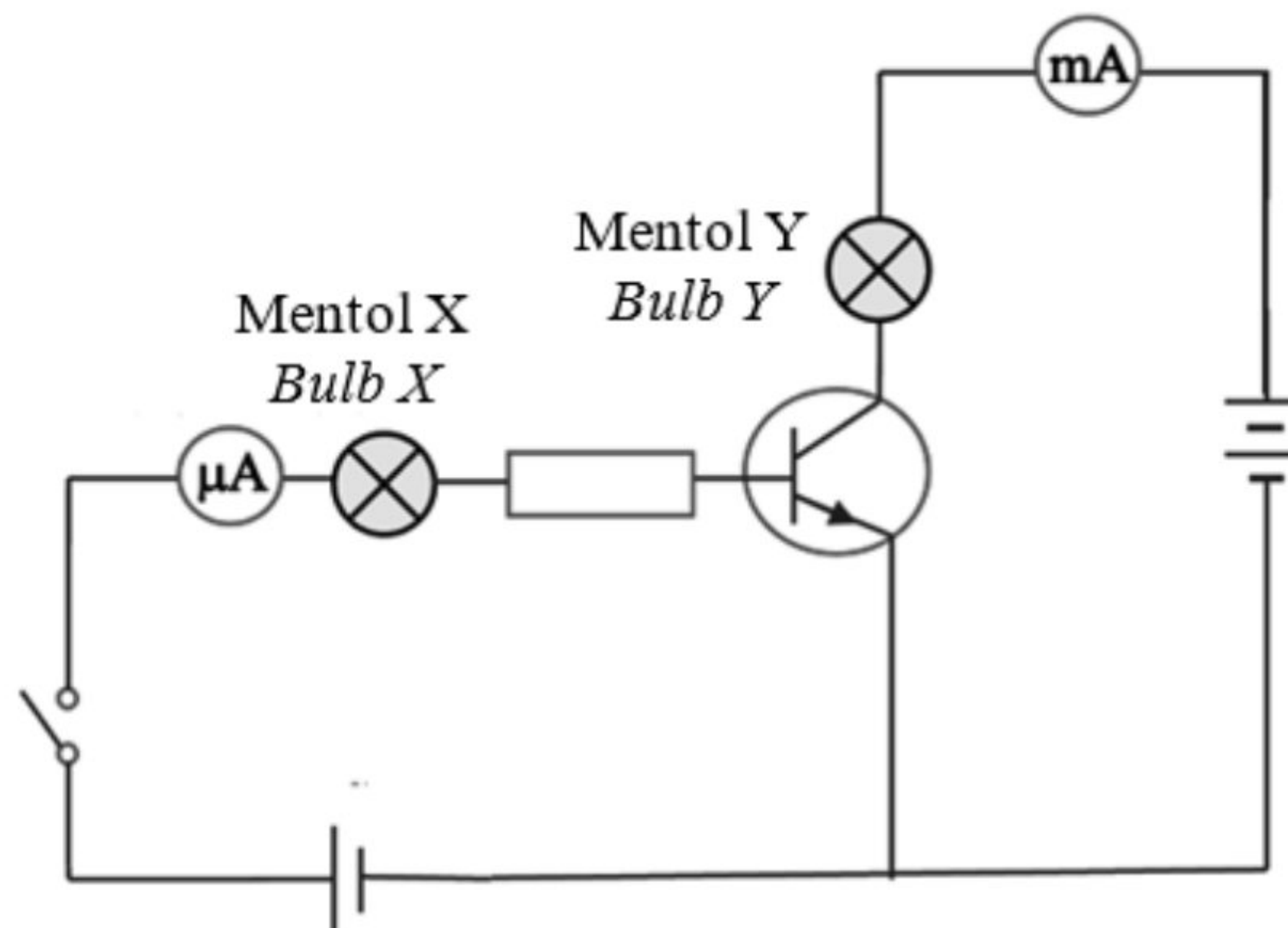
Table 9

Anda dikehendaki untuk menentukan jek hidraulik yang paling sesuai untuk mengangkat kereta yang berjisim besar. Kaji ciri-ciri keempat-empat jek hidraulik. Terangkan kesesuaian setiap ciri dan tentukan jek hidraulik yang paling sesuai. Beri sebab untuk pilihan anda.

You are required to determine the most suitable hydraulic jack to lift up larger mass of car. Study the characteristics of the four hydraulic jacks. Explain the suitability of each characteristic and then determine the most suitable hydraulic jack. Give reason for your choice.

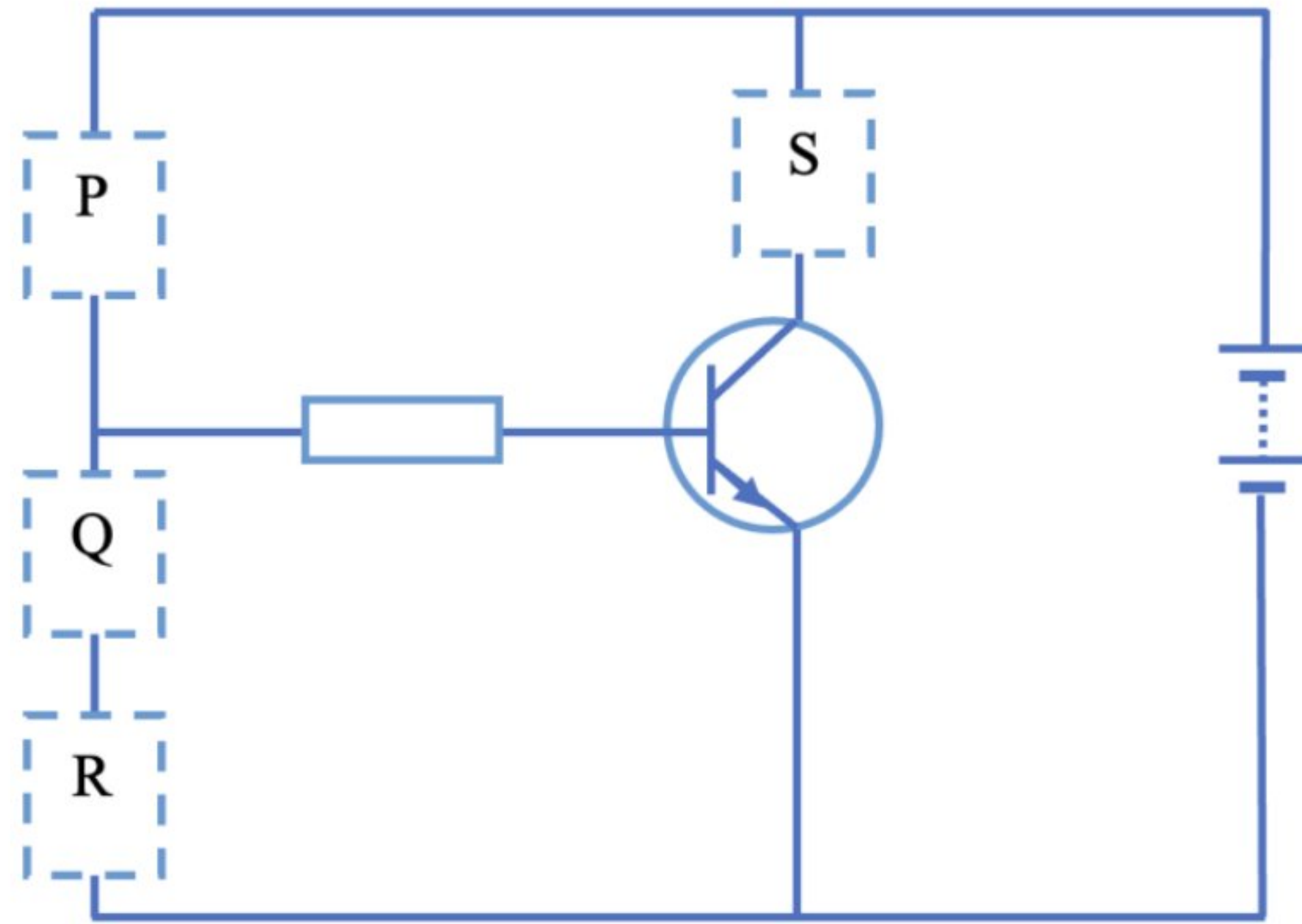
[10 markah/marks]

- 10 Rajah 10.1 menunjukkan litar yang digunakan sebagai amplifier arus.
Diagram 10.1 shows the circuit used as a current amplifier.



Rajah 10.1
 Diagram 10.1

- (a) (i) Namakan jenis transistor yang digunakan dalam litar tersebut.
Name the type of transistor used in the circuit. [1 markah/mark]
- (ii) Apabila suis ditutup, kecerahan mentol X dan mentol Y berbeza. Terangkan bagaimana keadaan ini berlaku.
When the switch is closed, brightness of bulb X and bulb Y is different. Explain how this situation occurs. [4 markah/marks]
- (b) Puan Sheila perlu mengawasi bayinya yang tidur di bilik lain. Dia memerlukan sejenis pencetus di biliknya untuk menyedarkannya jika bayinya bangun dan mula menangis pada waktu malam. Rajah 10.2 menunjukkan satu litar bertransistor tidak lengkap. Jadual 10 menunjukkan empat komponen elektronik yang mungkin boleh disambungkan untuk melengkapkan litar itu.
Mrs Sheila needs to monitor her baby who sleeps in another room. She needs a trigger in her room to alert her if her baby wakes up and starts crying at night. Diagram 10.2 shows an incomplete transistor circuit.
Table 10 shows four possible electronic components that can be connected to complete the circuit.



Rajah 10.2
Diagram 10.2

| | Terminal P | Terminal Q | Terminal R | Terminal S |
|---|------------------------------|-------------------------------|--------------------------------|--------------------------|
| W | | | | |
| | Reostat <i>Rheostat</i> | Kapasitor <i>Capasitor</i> | Termistor <i>Thermistor</i> | Penggera <i>Alarm</i> |
| X | | | | |
| | Perintang <i>Resistor</i> | Kapasitor <i>Capasitor</i> | Mikrofon <i>Microphone</i> | Mentol <i>Bulb</i> |
| Y | | | | |
| | Reostat <i>Rheostat</i> | Kapasitor <i>Capasitor</i> | Mikrofon <i>Microphone</i> | Penggera <i>Alarm</i> |
| Z | | | | |
| | Perintang <i>Resistor</i> | Kapasitor <i>Capasitor</i> | Termistor <i>Thermistor</i> | Mentol <i>Bulb</i> |

Jadual 10
Table 10

Menggunakan pengetahuan anda tentang elektronik, pilih mana-mana empat komponen elektronik yang sesuai dalam Jadual 10 untuk melengkapkan litar bertransistor dalam Rajah 10.2.

Beri sebab bagi pilihan anda.

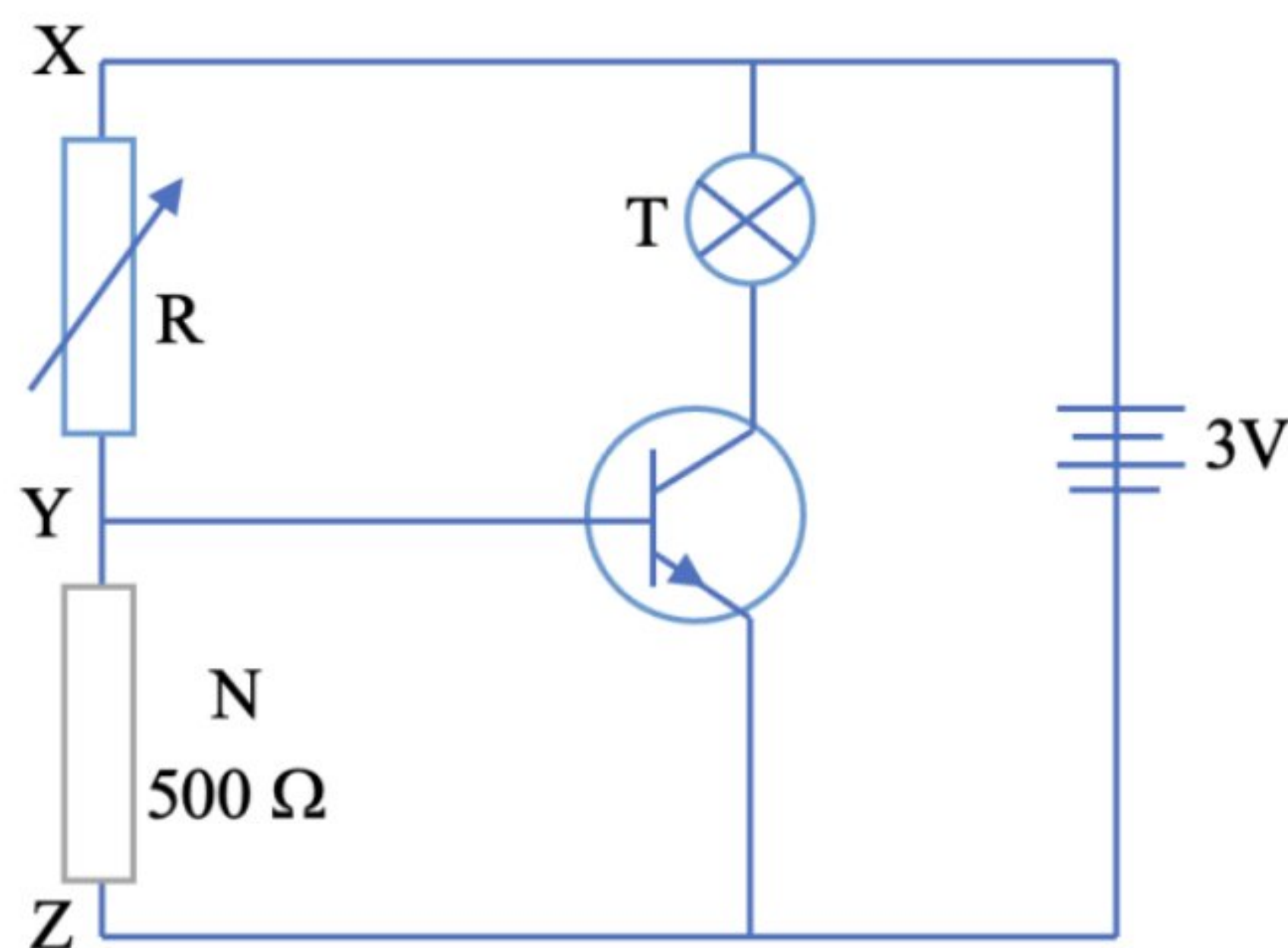
Using your knowledge of electronics, choose any four appropriate electronic components in Table 10 to complete the transistorized circuit in Diagram 10.2.

Give reasons for your choice.

[10 markah/marks]

(c) Rajah 10.3 menunjukkan satu litar transistor.

Diagram 10.3 shows a transistor circuit.



Rajah 10.3
Diagram 10.3

Perintang R merupakan perintang boleh laras manakala perintang N mempunyai rintangan tetap sebanyak 500Ω . Transistor boleh dihidupkan apabila beza keupayaan merentasi YZ adalah sama atau lebih tinggi daripada 1 V. Apabila beza keupayaan merentasi Y dan Z ialah 1 V, tentukan

Resistor R is a variable resistor while resistor N has a fixed resistance of 500Ω . Transistor can be turned on when the potential across YZ is equal to or higher than 1 V. When the potential difference across Y and Z is 1 V, determine.

(i) beza keupayaan merentasi XZ,
the potential difference across XZ,

[1 markah/mark]

(ii) beza keupayaan merentasi XY,
the potential difference across XY,

[2 markah/marks]

(iii) rintangan maksimum, R supaya mentol T menyala.
the maximum resistance, R so that the bulb T lights up.

[2 markah/marks]

Bahagian C
Section C

[20 markah/marks]

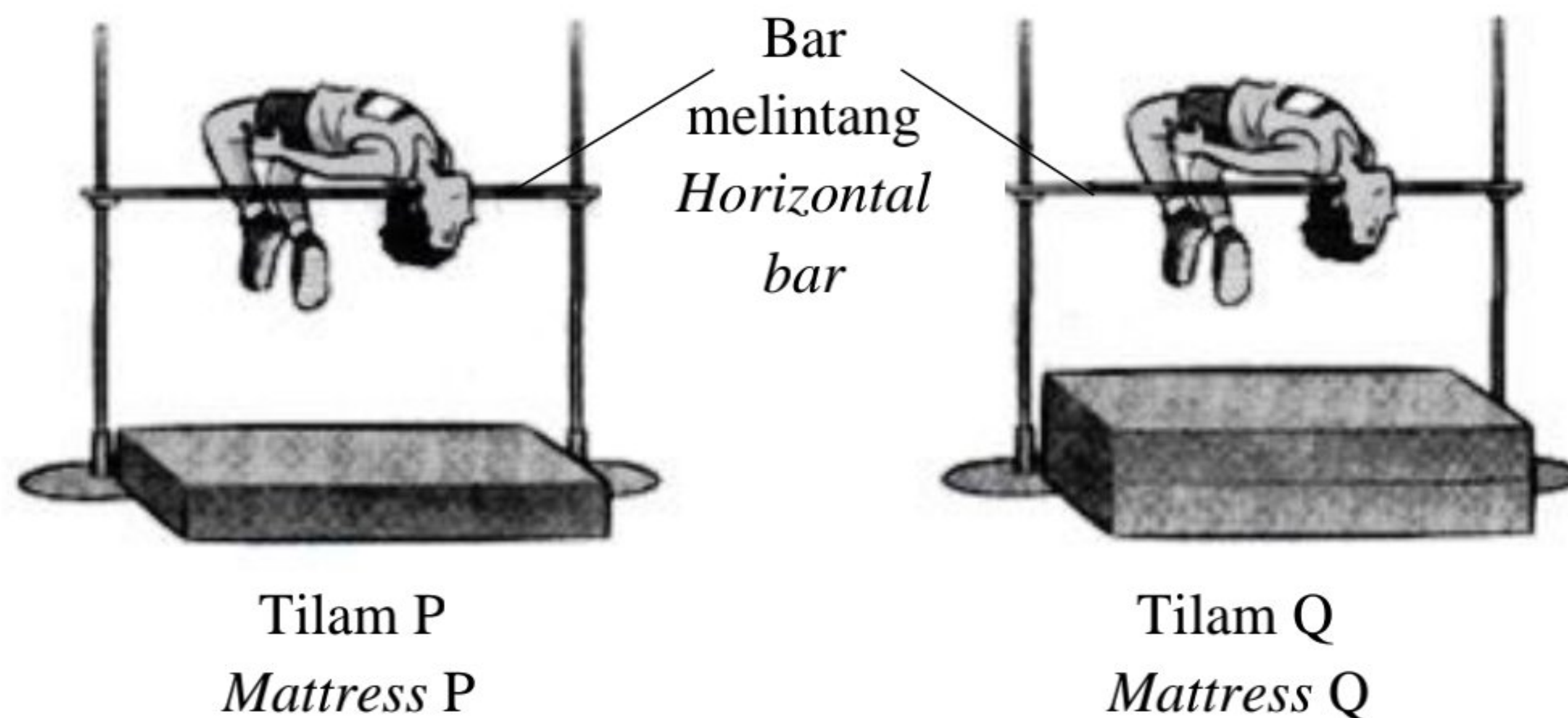
Jawab **semua** soalan dalam bahagian ini.

Answer all questions in this section.

11 Rajah 11.1 menunjukkan seorang atlet membuat lompatan pada suatu ketinggian sebelum mendarat di atas tilam P.

Rajah 11.2 menunjukkan atlet yang sama membuat lompatan pada ketinggian yang sama sebelum mendarat di atas tilam Q.

Diagram 11.1 shows a high jump athlete jumping at a height before landing on mattress P. Diagram 11.2 shows the same athlete jumping at same height before landing on mattress Q.



Rajah 11.1
Diagram 11.1

Rajah 11.2
Diagram 11.2

- (a) Apakah yang dimaksudkan dengan daya?
What is meant by force?

[1 markah/mark]

- (b) Dengan menggunakan Rajah 11.1 dan Rajah 11.2, bandingkan ketebalan tilam, masa impak atlet dan daya impuls atlet.

By using Diagram 11.1 and Diagram 11.2, compare the thickness of the mattress, the athlete's impact time and the athlete's impulsive force.

Hubung kaitkan antara masa impak atlet dan daya impuls atlet selepas dia jatuh ke atas tilam itu.

Namakan Hukum yang terlibat

Relate the athlete's impact time and the athlete's impulsive force after he falls on it.

Name the law's involved.

[5 markah/marks]

- (c) Lompat jauh ialah sukan trek dan padang yang melibatkan lompatan mendatar untuk jarak jauh. Rajah 11.3 menunjukkan gerakan seorang atlet yang melakukan lompat jauh.

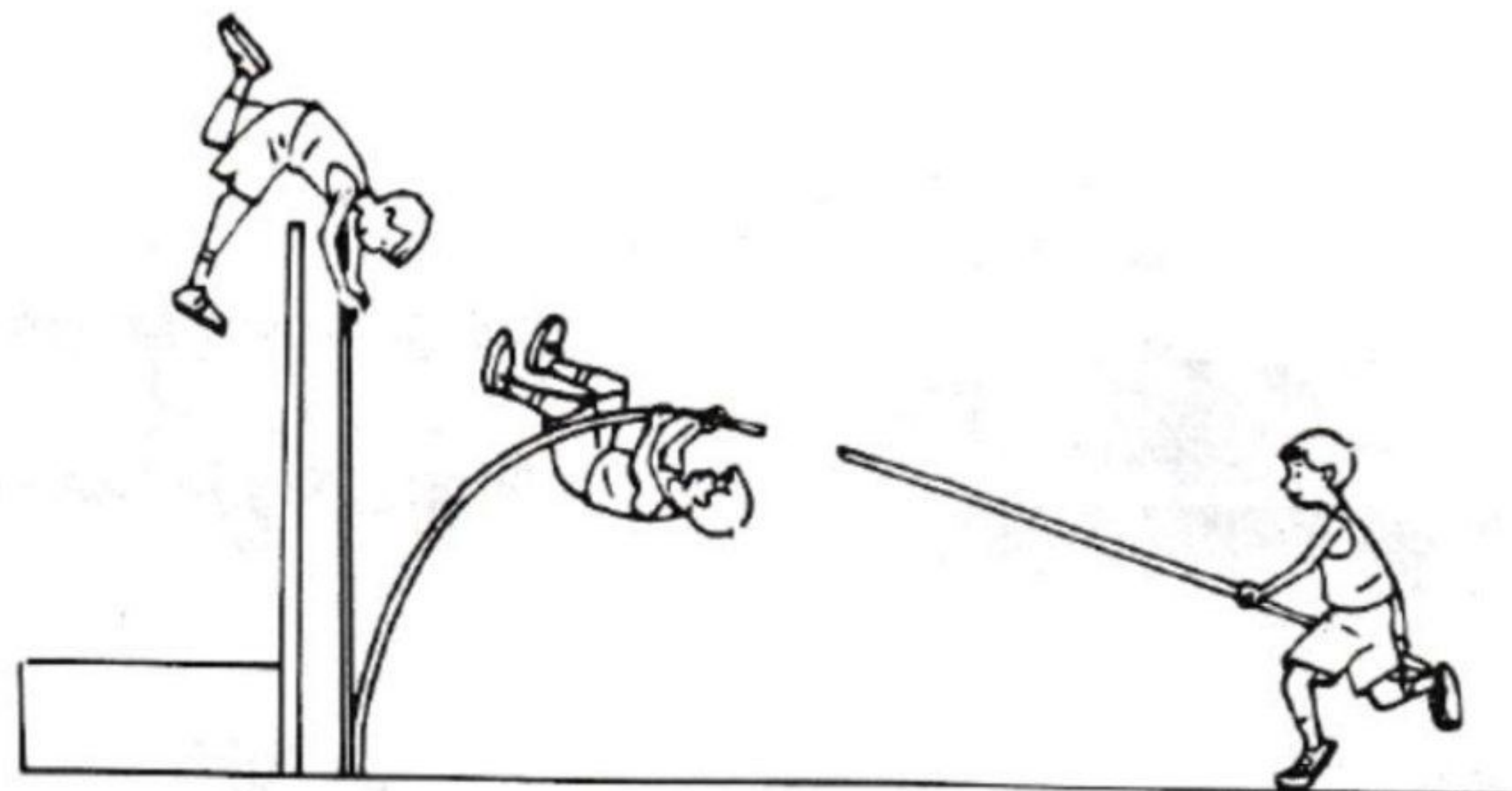
Long jump is a track-and-field sport that involves horizontal jump over a long distance. Diagram 11.3 shows the motion of an athlete performing the long jump.



Rajah 11.3
Diagram 11.3

Berdasarkan Rajah 11.3,
Based on Diagram 11.3,

- (i) nyatakan sebab atlet itu membengkokkan lutut ketika mendarat.
state the reason for the athlete to bend his knees when landing.
[3 markah/marks]
- (ii) nyatakan daya yang bertindak pada atlet semasa dia berada di udara.
state the force acting on the athlete when he is in the air.
[1 markah/mark]
- (d) Lompat bergalah ialah acara olahraga di mana seseorang menggunakan galah panjang sebagai alat bantuan untuk lompat melepasi palang. Rajah 11.4 menunjukkan seorang atlet lompat bergalah sedang melakukan lompatan tinggi.
Pole vaulting is an athletics event whereby a person uses a long pole as an aid to jump over a bar. Diagram 11.4 shows a pole vault performing a high jump.



Rajah 11.4
Diagram 11.4

Dengan menggunakan konsep fizik yang dipelajari, cadangkan peralatan dan teknik yang sesuai akan membolehkan atlet itu mencapai prestasi yang lebih baik. Cadangan anda harus merangkumi aspek – aspek berikut:-

By applying the physics concepts learned, suggest the suitable equipment and techniques that will enable the athlete to achieve better performance. Your suggestions should include the following aspects:-

- Galah yang digunakan
The pole used
- Pergerakan atlet
The movement of the athlete
- Pakaian atlet
Athlete clothing
- Keselamatan atlet
Safety of the athlete

[10 markah/marks]

KERTAS PEPERIKSAAN TAMAT
END OF QUESTION PAPER