

NAMA :



KELAS:.....

MODUL PINTAS PERCUBAAN SPM 2026
FIZIK
KERTAS 2
(4531/2)
TINGKATAN 5
Dua jam tiga puluh minit



JANGAN BUKA SOALAN SEHINGGA DIBERITAHU

1. Tuliskan **nama** dan **tingkatan** pada ruang yang disediakan.
2. Kertas peperiksaan ini mengandungi **tiga** bahagian : **Bahagian A, Bahagian B dan Bahagian C.**
3. Jawapan hendaklah ditulis pada ruang jawapan yang disediakan di dalam kertas peperiksaan ini.
4. Kertas soalan ini adalah dalam dwibahasa.
5. Jawapan boleh ditulis dalam Bahasa Melayu atau Bahasa Inggeris.
6. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
7. Kerja mengira anda mesti ditunjukkan.

Kod Pemeriksa:			
Bahagian	Soalan	Markah Penuh	Markah Diperolehi
A	1	4	
	2	5	
	3	6	
	4	9	
	5	9	
	6	9	
	7	9	
	8	9	
B	9	20	
	10	20	
C	11	20	
Jumlah		100	

Kertas soalan ini mengandungi 50 halamam berceta

Rumus-rumus berikut boleh membantu anda menjawab soalan. Simbol-simbol yang diberikan adalah biasa digunakan.

The following formulas can help you to answer the question. The symbols given are commonly used.

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 $v = \sqrt{\frac{2GM}{r}}$
- 10 $g = 9.81 \text{ m s}^{-2}$ @ 9.81 N kg^{-1}
- 11 $G = 6.67 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$
- 12 Jisim Bumi, $M = 5.97 \times 10^{24} \text{ kg}$
Mass of Earth, $M = 5.97 \times 10^{24} \text{ kg}$
- 13 Jejari Bumi, $R = 6.37 \times 10^6 \text{ m}$
Radius of Earth, $R = 6.37 \times 10^6 \text{ m}$

HABA HEAT

- 1 $Q = mc\Delta\theta$
- 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, $m = \frac{hi}{ho} = \frac{v}{u}$
Linear magnification, $m = \frac{hi}{ho} = \frac{v}{u}$



DAYA DAN GERAKAN II FORCE AND MOTION II

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

TEKANAN PRESSURE

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

ELEKTRIK ELECTRICITY

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

ELEKTROMAGNET 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 $E = eV$
- 2 Tenaga kinetik maksimum,
 $E_k = \frac{1}{2}mv^2$
Maximum kinetic energy,
 $E_k = \frac{1}{2}mv^2$
- 3 $\beta = \frac{I_C}{I_B}$
- 4 $V_{out} = \frac{R_2}{R_1 + R_2} V_{in}$

FIZIK NUKLEAR NUCLEAR PHYSICS

- 1 $N = \left(\frac{1}{2}\right)^n N_o$
- 2 $E = mc^2$
- 3 $c = 3.0 \times 10^8 \text{ m s}^{-1}$
- 4 $1 \text{ u.j.a} = 1.66 \times 10^{-27} \text{ kg}$
 $1 \text{ a.m.u} = 1.66 \times 10^{-27} \text{ kg}$

FIZIK KUANTUM QUANTUM PHYSICS

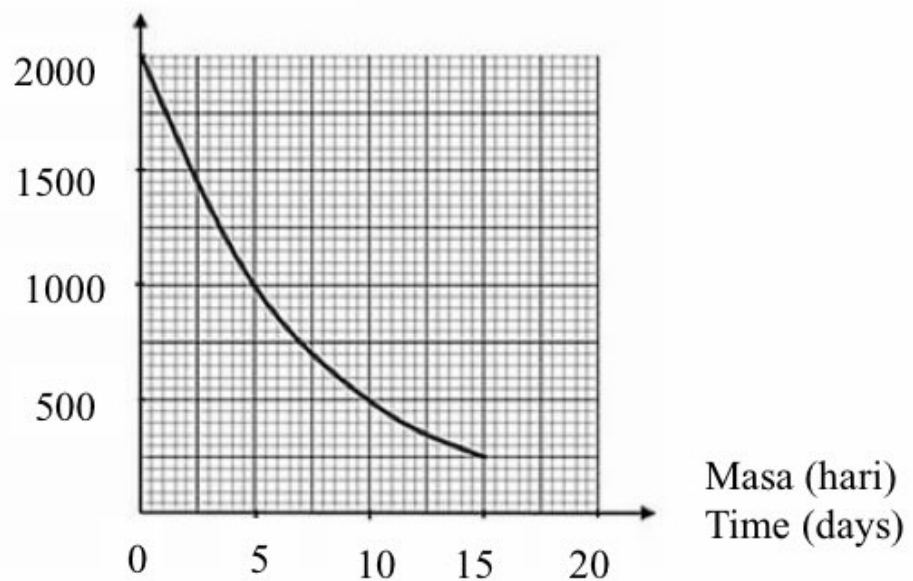
- 1 $E = hf$
- 2 $f = \frac{c}{\lambda}$
- 3 $\lambda = \frac{h}{p}$
- 4 $\lambda = \frac{h}{mv}$
- 5 $E = \frac{hc}{\lambda}$
- 6 $p = nhf$
- 7 $hf = W + \frac{1}{2}mv^2$
- 8 $W = hf_0$
- 9 $h = 6.63 \times 10^{-34} \text{ J s}$

Bahagian A
[60 markah]

Jawab semua soalan.

1. Rajah 1 menunjukkan graf lengkung bagi reputan radioaktif Xenon-133 dengan separuh hayat tertentu.
Diagram 1 shows a graph of the radioactive decay of Xenon-133 with a certain half-life.

Aktiviti (bilangan per minit)
Activity (count per minutes)



Rajah 1 / Diagram 1

- (a) Apakah maksud separuh hayat?
What is the meaning of half-life?

.....
.....

[1 markah / mark]

- (b) Apakah yang berlaku kepada aktiviti radioaktif Xenon-133?

What happens to the radioactive activity of Xenon-133?

.....

[1 markah / mark]

- (c) Berdasarkan Rajah 1, tentukan nilai separuh hayat Xenon-133.

Tunjukkan pada graf bagaimana anda menentukan separuh hayat itu.

Based on Figure 1, determine the half-life of Xenon-133.

Show on the graph how you determined the half-life.

Separuh hayat Xenon-133:

Half-life of Xenon-133:

..... hari / days

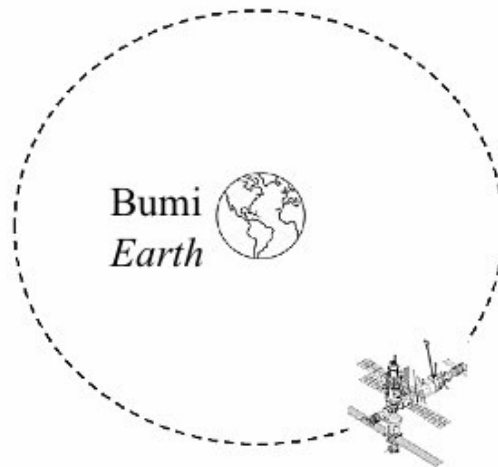
[2 markah / marks]

Total
A1

4

- 2 Rajah 2 menunjukkan Stesen Angkasa Antarabangsa, ISS sedang mengorbit Bumi dalam satu gerakan membulat disebabkan oleh wujudnya daya graviti.

Diagram 2 shows the International Space Station, ISS, orbiting the Earth in a circular motion due to gravitational force.



Stesen Angkasa Antarabangsa, ISS
International Space Station, ISS

Rajah 2 / *Diagram 2*

- (a) Pada Rajah 2, labelkan arah daya graviti, F
In Diagram 2, label the direction of the gravitational force, F .

[1 markah / mark]

- (b) Hitungkan daya graviti.
Diberi:

Jisim Stesen Angkasa Antarabangsa, ISS = $4.20 \times 10^5 \text{ kg}$

Jarak dengan pusat Bumi = $6.77 \times 10^6 \text{ m}$.

Calculate the gravitational force.

Given:

Mass of the International Space Station, ISS = $4.20 \times 10^5 \text{ kg}$

Distance from the center of the Earth = $6.77 \times 10^6 \text{ m}$.

[2 markah / marks]



- (c) Purata tempoh yang selamat bagi seorang angkasawan berada di Stesen Angkasa Antarabangsa, ISS adalah 6 bulan.

Nyatakan satu kesan terhadap tumbesaran manusia jika berada lebih lama daripada tempoh selamat. Terangkan mengapa.

The average safe duration for an astronaut to stay on the International Space Station, ISS is 6 months.

State one effect on human growth if staying on the International Space Station, ISS is longer than the safe duration. Explain why.

.....

.....

.....

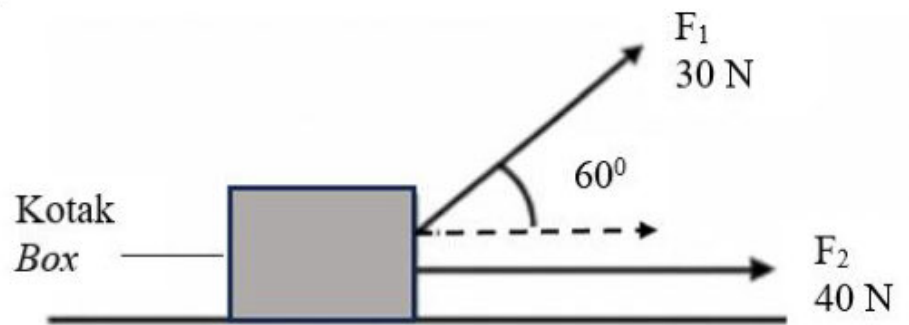
[2 markah / *marks*]

Total
A2

	5
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- 3 Rajah 3.1 menunjukkan sebuah kotak ditarik di atas suatu permukaan licin dengan daya F_1 dan F_2 dengan nilai 30 N dan 40 N masing-masing yang berbeza arah.

Diagram 3.1 shows a box being pulled on a smooth surface with forces F_1 and F_2 of values 30 N and 40 N respectively in different directions.



Rajah 3.1 / Diagram 3.1

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

.....
[1 markah / mark]

- (b) Pada Rajah 3.1, lerai dan labelkan daya, F_1 30 N kepada komponen mengufuk dan komponen menegak.
On Diagram 3. 1, resolve and label the force of F_1 30 N into horizontal components and vertical components.

[2 markah / marks]

- (c) Kira komponen mengufuk bagi daya F_1
Calculate the horizontal component of the force F_1

[1 markah / mark]

- (d) Hitungkan daya paduan yang bertindak ke atas kotak tersebut.

Calculate the resultant force acting on the box.

[2 markah / marks]

**Total
A3**

6

- 4 Rajah 4 menunjukkan seorang budak mendapati air laut lebih sejuk berbanding pasir pada waktu panas terik. Keadaan ini disebabkan oleh muatan haba tentu yang berbeza antara pasir dan air laut.
Diagram 4 shows a child who finds sea water cooler than sand on a hot day. This is due to the different specific heat capacities between sand and sea water.



Rajah 4 / Diagram 4

- (a) Apakah maksud muatan haba tentu?
What is the meaning of specific heat capacity?

.....

.....

[1 markah /mark]

- (b) Terangkan mengapa air laut lebih sejuk berbanding pasir.
Explain why sea water is cooler than sand.

.....

.....

.....

.....

[3 markah / marks]

- (c) Pada hari yang panas, 2000 g pasir di pantai menerima tenaga haba sebanyak 30 000 J daripada Matahari.

On a hot day, 2000 g of sand on the beach receives 30 000 J of heat energy from the Sun.

- (i) Hitung kenaikan suhu pasir pantai jika muatan haba tentu pasir adalah $800 \text{ Jkg}^{-1} \text{ }^{\circ}\text{C}^{-1}$.

Calculate the rise in temperature of sea sand if the specific heat capacity of sand is $800 \text{ Jkg}^{-1} \text{ }^{\circ}\text{C}^{-1}$.

[3 markah / marks]



- (ii) Hitung suhu akhir pasir pantai sekiranya suhu awal pasir ialah 27°C
Calculate the final temperature of sea sand if initial temperature of sand is 27°C .

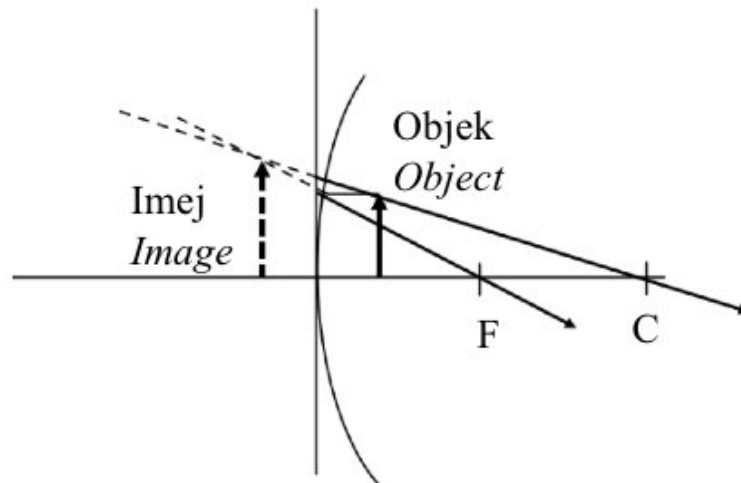
[2 markah / *mark*]

Total
A4

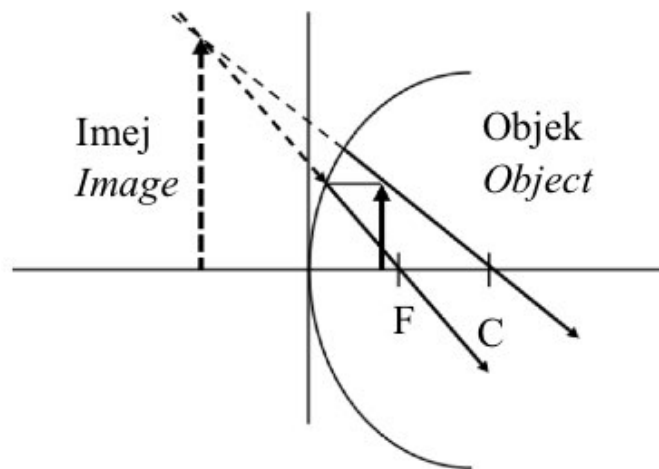
	9

- 5 Rajah 5.1 dan Rajah 5.2 menunjukkan rajah sinar bagi dua objek yang sama menggunakan cermin melengkung yang berbeza kelengkungan. C ialah pusat kelengkungan dan F ialah titik fokus cermin itu.

Diagram 5.1 and Diagram 5.2 show the ray diagrams of two identical objects using curved mirrors of different curvatures. C is the centre of curvature and F is the focal point of the mirror.



Rajah 5.1 / Diagram 5.1



Rajah 5.2 / Diagram 5.2

- (a) Nyatakan jenis cermin yang digunakan.
State the type of mirror used.

.....

[1 markah / mark]

(b) Berdasarkan Rajah 5.1 dan Rajah 5.2. Bandingkan
Based on Diagram 5.1 and Diagram 5.2. Compare

(i) kelengkungan cermin
curvature of the mirror

.....

.....

[1 markah / mark]

(ii) jarak fokus cermin
focal length of the mirror

.....

.....

[1 markah / mark]

(iii) saiz imej yang terbentuk
the size of the image formed

.....

.....

[1 markah / mark]

(c) Berdasarkan jawapan anda di 5(b),
Based on the answers in 5(b),

(i) hubungkan antara jarak fokus dan kelengkungan.
relate between the focal length and the curvature.

.....

.....

[1 markah / mark]

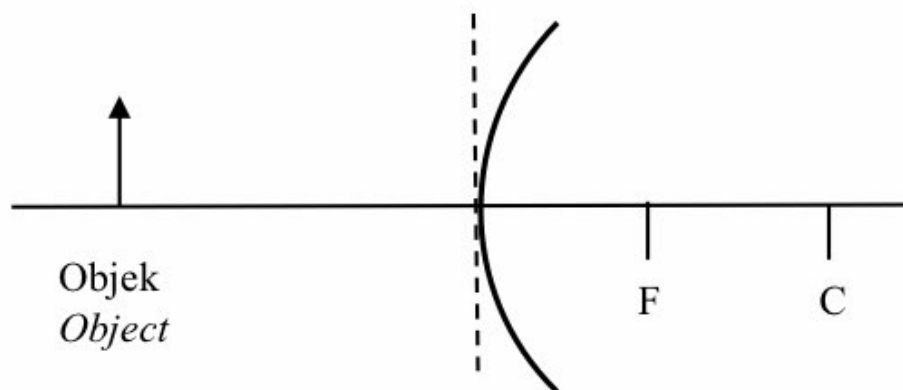
- (ii) hubungkan antara jarak fokus dan saiz imej yang terbentuk
Relate the focal length and the size of the image formed.

.....

.....

[1 markah / mark]

- (d) Pada rajah 5.3, lengkapkan sinar untuk menunjukkan imej yang terbentuk.
On the diagram 5.3, complete the rays to show the image formed.



Rajah 5.3 / Diagram 5.3

[3 markah / marks]

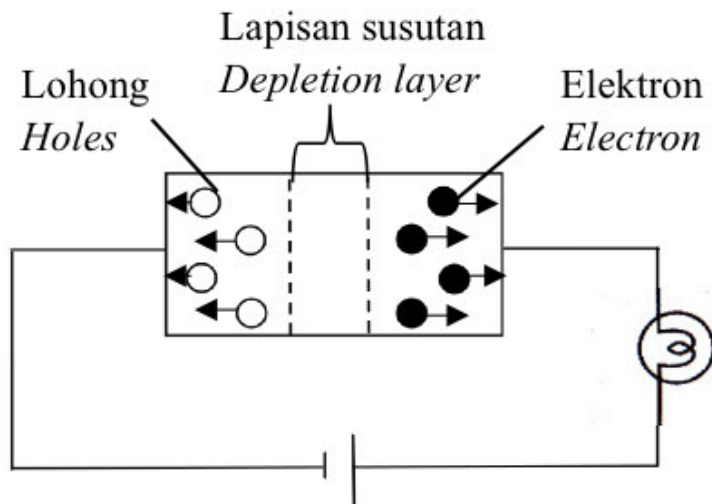
**Total
A5**

9

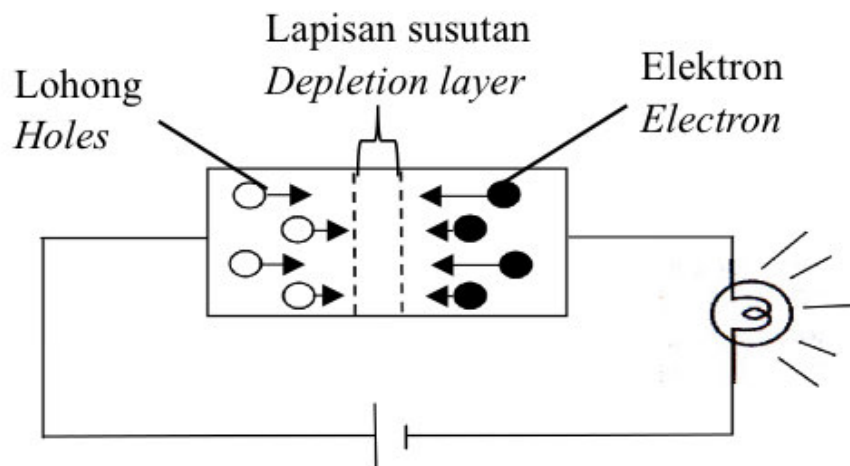


- 6 Rajah 6.1 dan Rajah 6.2 menunjukkan pergerakan pembawa cas dalam diod semikonduktor. Litar tersebut menyambungkan diod semikonduktor simpang p-n kepada sel kering.

Diagram 6.1 and Diagram 6.2 show the movement of charge carriers in a semiconductor diode. The circuit connects a p-n junction semiconductor diode to a dry cell.



Rajah 6.1 / Diagram 6.1



Rajah 6.2 / Diagram 6.2

- (a) Apakah fungsi diod?
What is the function of the diode?

.....
[1 markah / mark]

- (b) Berdasarkan Rajah 6.1 dan Rajah 6.2, bandingkan
Based on Diagram 6.1 and Diagram 6.2, compare
(i) arah pengaliran elektron dalam semikonduktor
direction of electron flow in semiconductor

.....
[1 markah / mark]

- (ii) nyatakan jenis sambungan diod
state the connection of diode

.....
[1 markah / mark]

- (iii) keadaan mentol
condition of bulb

.....
[1 markah / mark]

- (c) Berdasarkan jawapan anda di 6(b)(i), 6(b)(ii), dan 6(b)(iii),
nyatakan hubungan antara
*Based on your answers in 6(b)(i), 6(b)(ii), 6(b)(iii), state the
relationship between*

- (i) sambungan diod dengan arah pengaliran elektron
dalam semikonduktor
*connection of diode and direction of electron flow in
semiconductor*

.....
.....
[2 markah / marks]

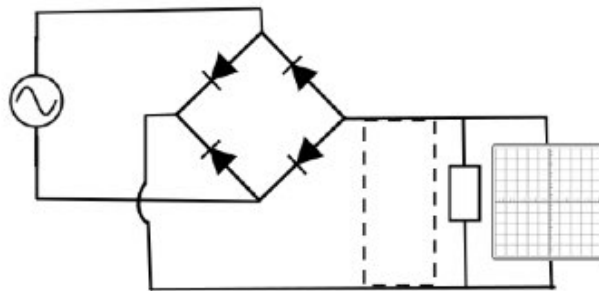
- (ii) sambungan diod dengan keadaan mentol
connection of diode and condition of bulb

.....

.....

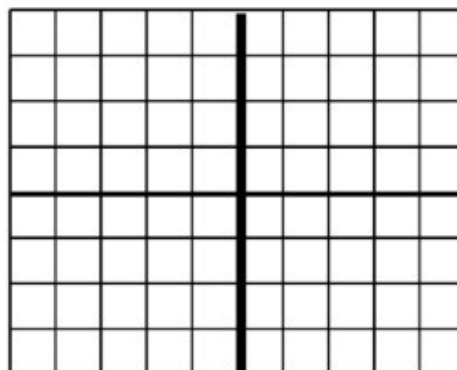
[2 markah / marks]

- (d) Rajah 6.3 menunjukkan satu litar rektifikasi yang terdiri daripada susunan komponen elektronik yang disambungkan kepada Osiloskop Sinar Katod (O.S.K.).
Diagram 6.3 shows a rectification circuit consisting of an arrangement of electronic components connected to a Cathode Ray Oscilloscope (CRO).



Rajah 6.3/Diagram 6.3

- (i) Lakarkan surihan yang terhasil pada skrin output berdasarkan Rajah 6.3.
Sketch the resulting trace on the output screen based on Diagram 6.3.



Output Skrin O.S.K
C.R.O Output Screen

[2 markah / marks]

- (ii) Kapasitor digunakan sebagai perata arus output. Lukiskan sambungan kapasitor yang betul pada Rajah 6.3.
The capacitor is used as an output current regulator. Draw the correct capacitor connection in Diagram 6.3

[1 markah / mark]

**Total
A6**

9

- 7 Rajah 7.1 menunjukkan mentol yang digunakan dalam lampu meja belajar. Mentol berlabel 9 W, 240 V dengan arus 0.04 A.
Diagram 7.1 shows the bulb used in the study desk lamp. The specification of the bulb 9 W, 240 V with a current of 0.04 A.



Rajah 7.1 / Diagram 7.1

- (a) Apakah yang dimaksudkan dengan 9 W, 240 V?
What is meant by 9 W, 240 V?

.....

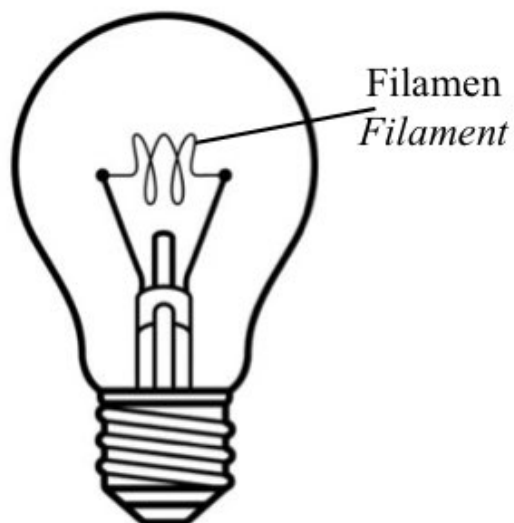
.....

[1 markah / mark]

- (b) Mentol tersebut digunakan 4 jam setiap hari.
Hitung jumlah tenaga yang digunakan.
The bulb is used 4 hours every day.
Calculate the amount of energy used.

[3 markah / marks]

- (c) Rajah 7.2 menunjukkan mentol berfilamen yang digunakan dalam lampu meja belajar tersebut tetapi menghasilkan cahaya yang malap.
Diagram 7.2 shows the filament bulb used in the study desk lamp but produces dim light.



Rajah 7.2 / Diagram 7.2

Jadual 1 menunjukkan tiga jenis mentol berbeza J, K dan L yang boleh digunakan untuk menggantikan mentol lampu meja di atas.

Table 1 shows three different types of bulbs J, K and L that can be used to replace the table lamp bulb above.

Mentol <i>Bulb</i>	Bahan filamen <i>Material of filament</i>	Ketebalan dawai filamen <i>Thickness of filament wire</i>
J	Tungsten	Nipis <i>Thin</i>
K	Konstantan <i>Constantant</i>	Nipis <i>Thin</i>
L	Tungsten	Tebal <i>Thick</i>

Berdasarkan Jadual 1, nyatakan ciri-ciri yang sesuai untuk mentol yang paling terang.

Based on Table 1, state the characteristics that are suitable for the brightest bulb.

(i) Bahan filamen

Material of filament

.....

Sebab

Reason

.....

[2 markah / *marks*]

- (ii) Ketebalan dawai filamen

Thickness of filament wire

.....

Sebab

Reason

.....

[2 markah / *marks*]

- (iii) Berdasarkan jawapan di 7(c), pilih mentol yang paling sesuai.

Based on the answer in 7(c), choose the suitable bulb.

.....

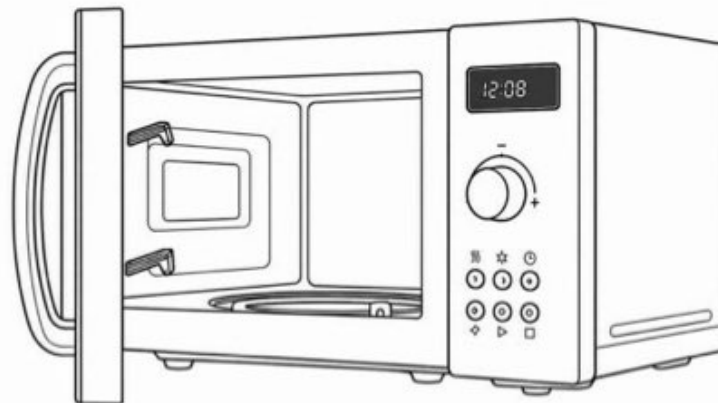
[1 markah / 1 *mark*]

Total
A7

	9

8. Rajah 8.1 menunjukkan sebuah ketuhar gelombang elektromagnet yang digunakan untuk memanaskan makanan.

Diagram 8.1 shows an electromagnetic wave oven used to heat food.



Rajah 8.1 / Diagram 8.1

- (a) Apakah yang dimaksudkan dengan gelombang elektromagnet?

What is the meaning of electromagnetic wave?

.....

[1 markah / mark]

- (b) Bagaimana gelombang tersebut dapat memanaskan makanan?

How the wave heat the food?

.....

.....

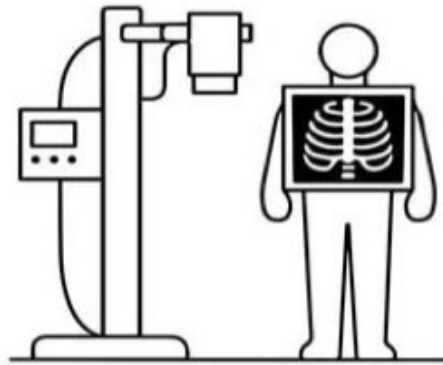
.....

[2 markah / marks]



- (c) Rajah 8.2 menunjukkan mesin x-ray yang digunakan di hospital.

Diagram 8.2 shows an x-ray machine used in a hospital.



Rajah 8.2 / *Diagram 8.2*

Anda dikehendaki untuk mengubahsuai mesin tersebut supaya menghasilkan imej x-ray yang lebih jelas berdasarkan aspek-aspek berikut:

You are required to modify the machine to produce clearer x-ray images based on the following aspects:

- (i) jenis gelombang
type of waves

.....

sebab
reason

.....

[2 markah / *marks*]

- (ii) frekuensi gelombang
frequency of waves

.....

sebab
reason

.....

[2 markah / *marks*]

(iii) tempoh pendedahan kepada gelombang
duration of exposure to waves

.....

sebab
reason

.....

[2 markah / *marks*]

Total
A8

	9

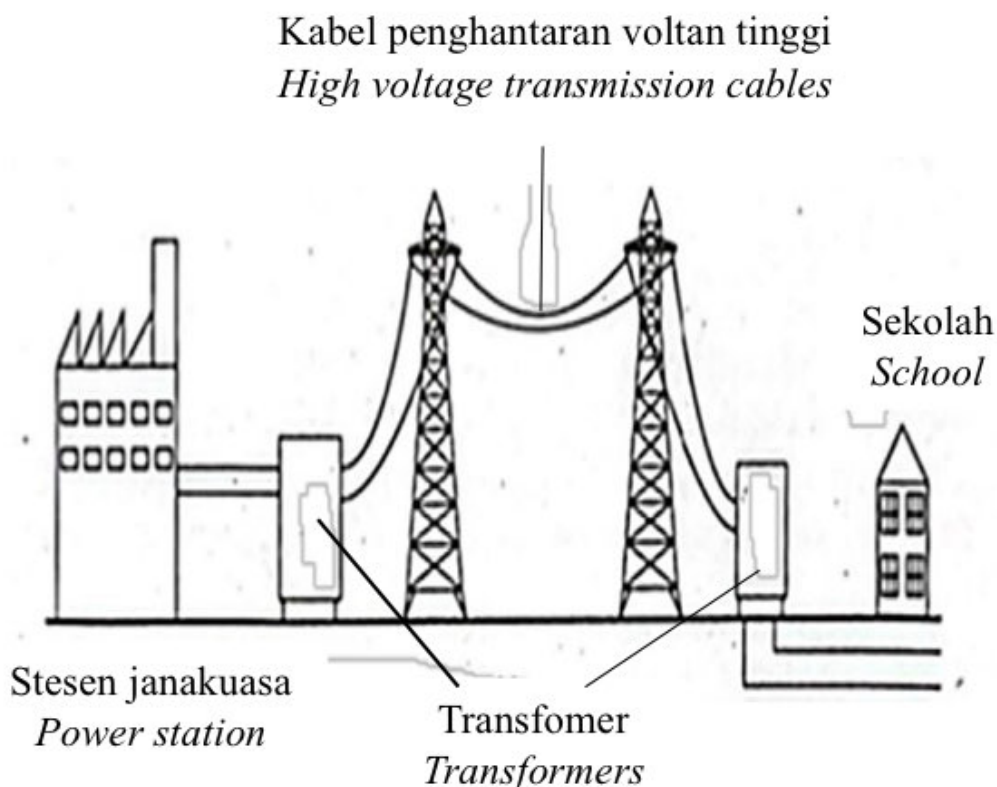
Bahagian B

[20 markah]

Bahagian ini mengandungi **dua** soalan. Jawab **satu** soalan.

- 9 Rajah 9.1 menunjukkan sistem penghantaran kuasa elektrik dari stesen janakuasa ke sekolah menggunakan kabel penghantaran voltan tinggi dan beberapa buah transformer.

Diagram 9.1 shows an electrical power transmission system from a power station to a school using high voltage transmission cables and several transformers.



Rajah 9.1 / Diagram 9.1

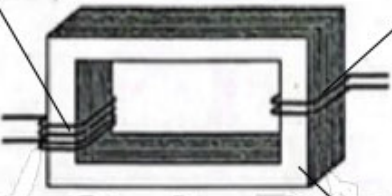
- (a) Nyatakan jenis arus yang dihantar melalui kabel penghantaran voltan tinggi itu.

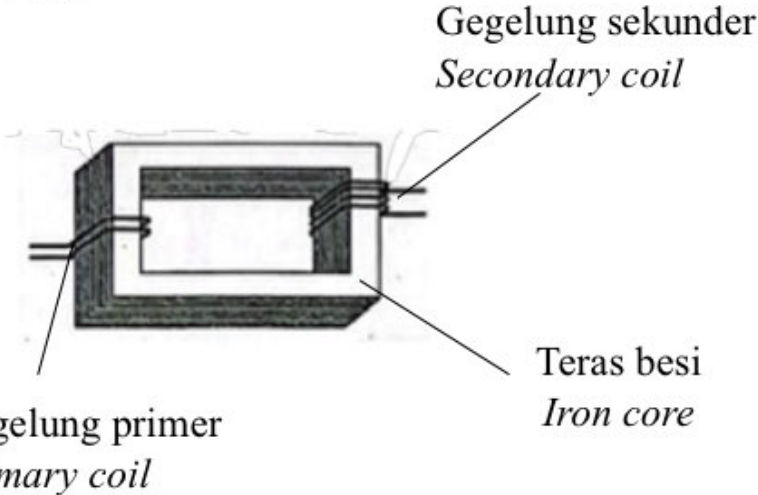
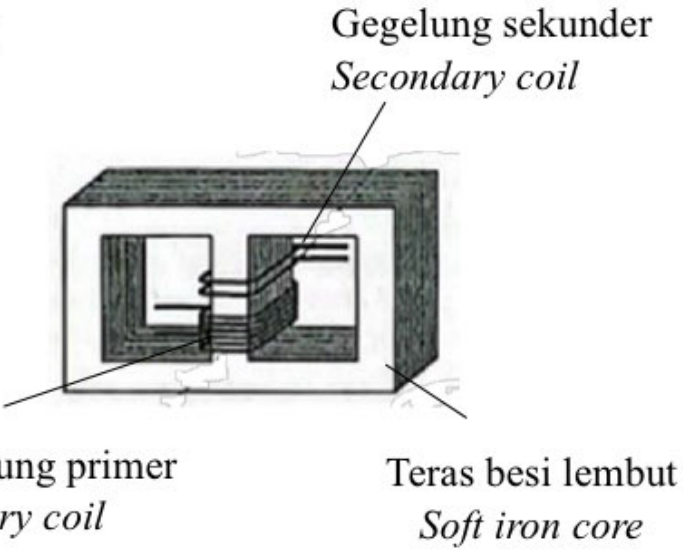
State the type of current that is transmitted through the high voltage transmission cables.

[1 markah / mark]

- (b) Terangkan prinsip kerja transformer.
Explain the working principle of the transformers.
[4 markah / marks]
- (c) Kuasa output dan voltan output pada kabel penghantaran voltan tinggi masing-masing ialah 20 MW dan 33 kV. Jumlah rintangan kabel penghantaran voltan tinggi ialah 0.5Ω .
The output power and output voltage of a high voltage transmission cable are 20 MW and 33 kV respectively. The total resistance of the high voltage transmission cable is 0.5Ω .
Hitung,
Calculate,
- (i) Arus yang mengalir melalui kabel penghantaran voltan tinggi.
Current flowing through high voltage transmission cables.
[2 markah / marks]
- (ii) Kehilangan kuasa dalam kabel penghantaran voltan tinggi.
Power loss in high voltage transmission cables.
[3 markah /marks]
- (d) Jadual 9 menunjukkan ciri-ciri empat model transformer, P, Q, R dan S yang boleh digunakan untuk menurunkan voltan dari 240 V ke 12 V.
Table 9 shows the characteristics of four transformer models, P, Q, R and S that can be used to step down the voltage from 240 V to 12 V.



Model Models	Ciri-ciri Characteristics
P	- Bentuk teras: Segiempat tepat <i>Shape of core: Rectangular</i> - Kaedah lilitan gegelung: I <i>Coil winding method: I</i> $N_p: N_s$ 16: 1  Gegelung primer <i>Primary coil</i> Gegelung sekunder <i>Secondary coil</i> Teras besi lembut <i>Soft iron core</i>
Q	- Bentuk teras: Tiga kaki <i>Shape of core: Three-legged</i> - Kaedah lilitan gegelung: II <i>Coil winding method: II</i> $N_p: N_s$ 1 :20  Gegelung sekunder <i>Secondary coil</i> Gegelung primer <i>Primary coil</i> Teras besi <i>Iron core</i>

R	• Bentuk teras: Segiempat <i>Shape of core: Rectangular</i> • Kaedah lilitan gegelung: I <i>Coil winding method: I</i> • $N_p: N_s$ 1 : 16  The diagram shows a rectangular iron core. The primary coil (Gegelung primer) is wound on the left vertical leg, and the secondary coil (Gegelung sekunder) is wound on the same leg. The top and bottom horizontal sections of the core are labeled as the iron core (Teras besi).
S	• Bentuk teras: Tiga kaki <i>Shape of core: Three-legged</i> • Kaedah lilitan gegelung: II <i>Coil winding method: II</i> • $N_p: N_s$ 20 : 1  The diagram shows a three-legged soft iron core. The primary coil (Gegelung primer) is wound on the left vertical leg, and the secondary coil (Gegelung sekunder) is wound on the right vertical leg. The horizontal sections of the core are labeled as the soft iron core (Teras besi lembut).

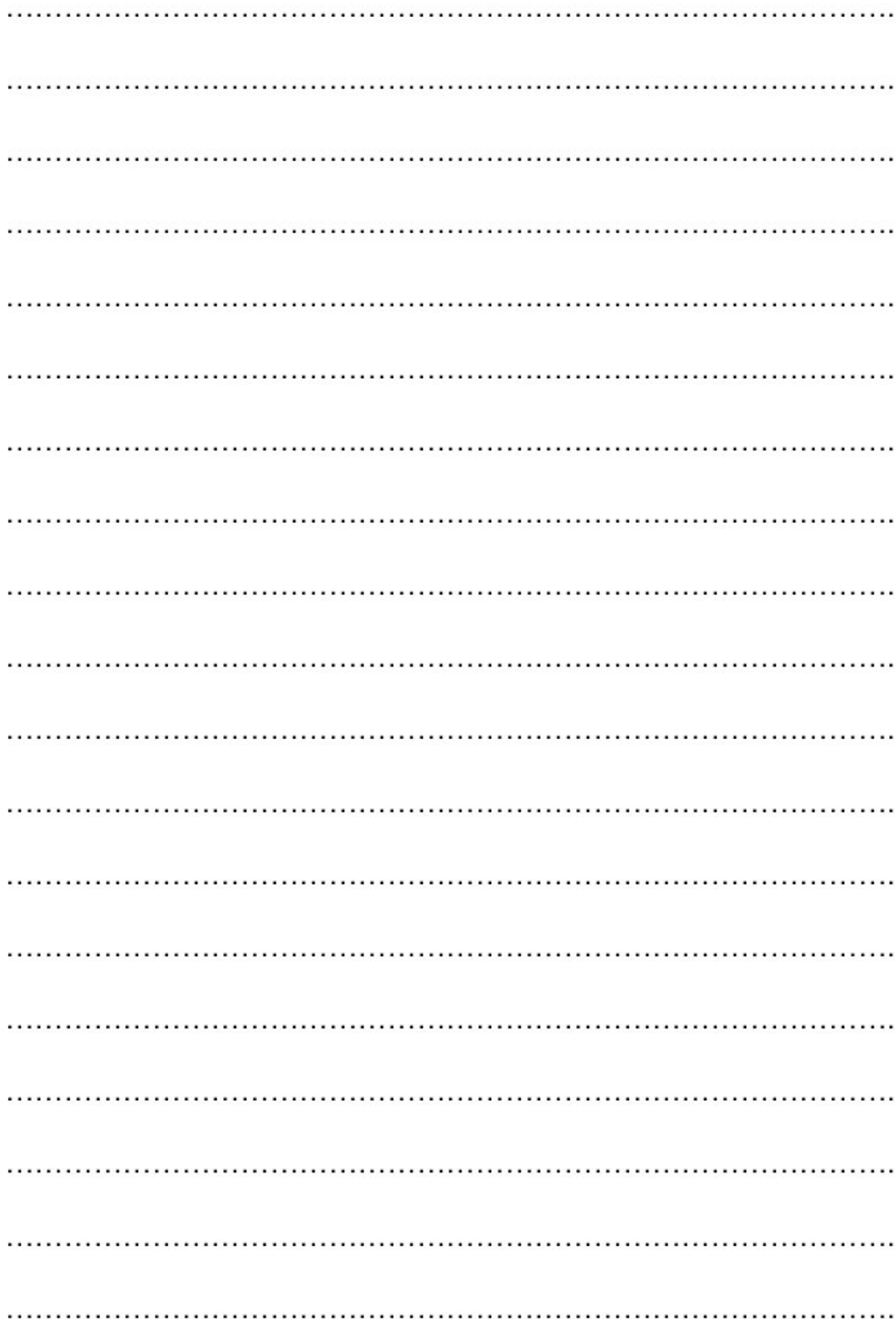
Kaji setiap ciri model transformer P,Q,R,dan S dalam Jadual 9 dan terangkan kesesuaian setiap ciri. Tentukan model transformer yang paling sesuai.Berikan sebab untuk pilihan anda.

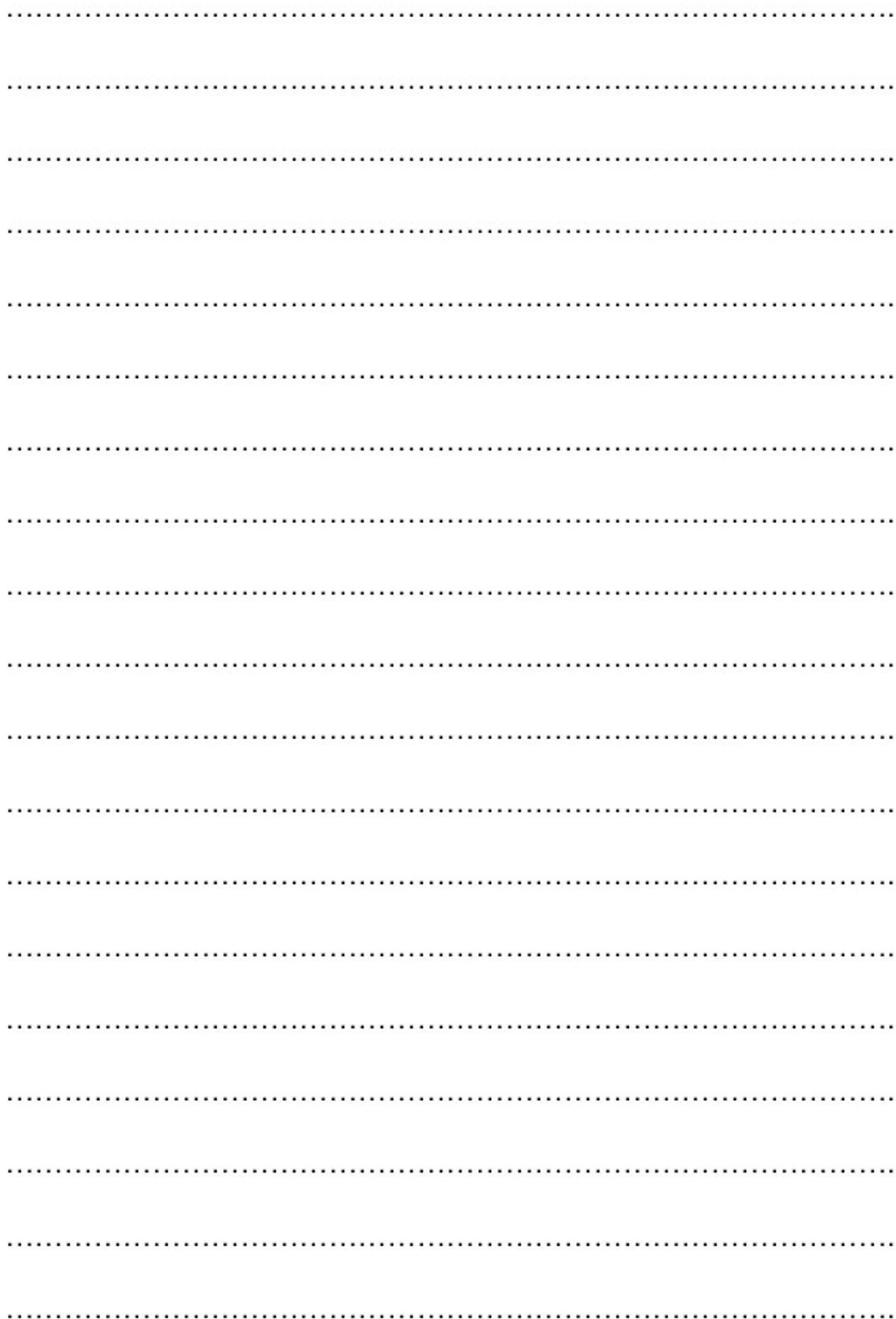
Study each characteristic of the P, Q, R, and S transformer models in table 9 and explain the suitability of each characteristic. Determine the most suitable transformer model. Give reasons for your choice.

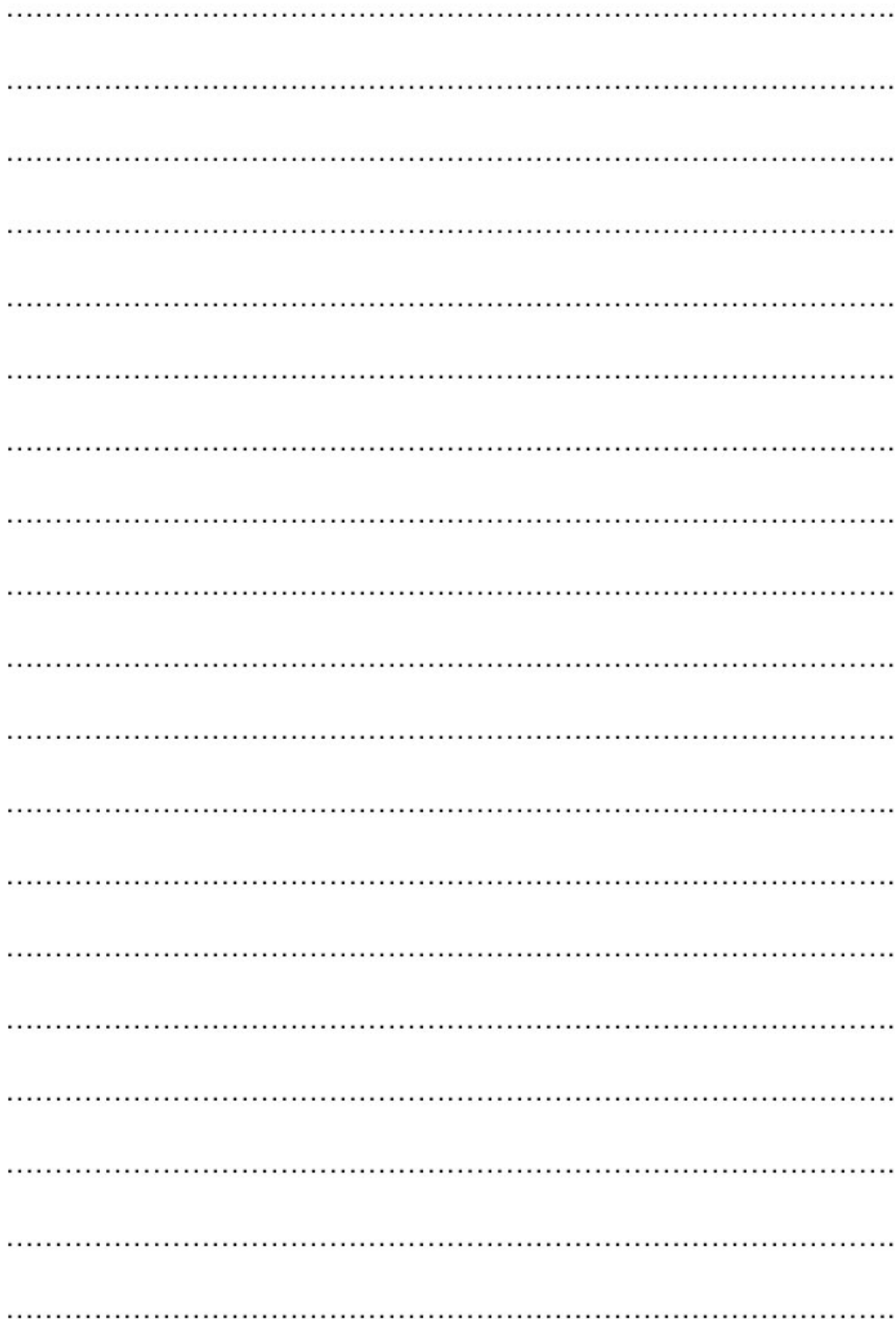
[10 markah / marks]

Soalan 9

This image shows a full page of primary-ruled paper. It features multiple sets of horizontal dashed lines spaced evenly down the page, providing a guide for handwriting practice. The background is white, and there are no margins or other markings present.

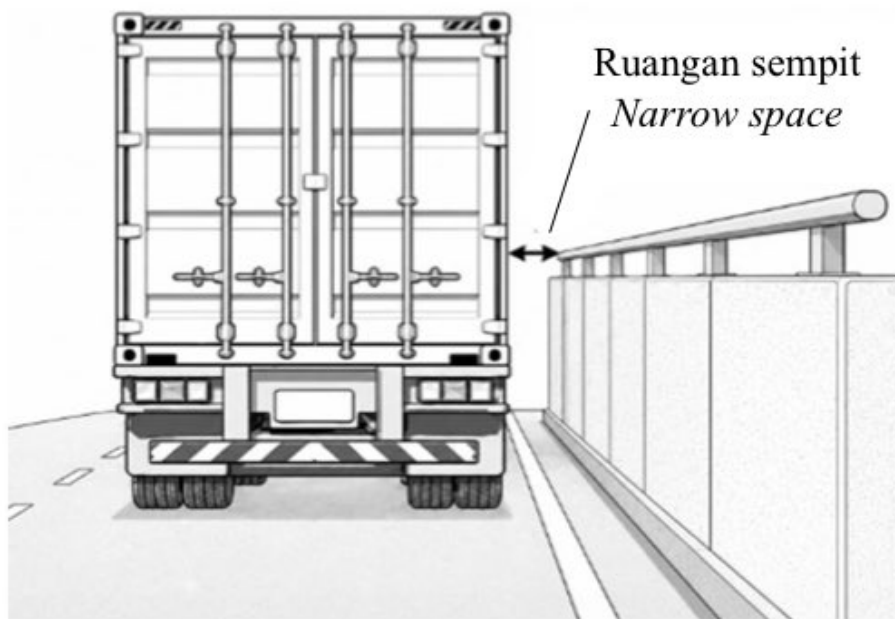








- 10 Rajah 10.1 menunjukkan apabila sebuah lori bergerak. Udara di ruang sempit antara lori dan penghadang akan bergerak lebih laju. Keadaan ini boleh menyebabkan lori tertarik ke arah penghadang. *Diagram 10.1 shows a lorry moving at high speed, the air in the narrow space between the lorry and the barrier moves faster compared to the outside. This situation can cause the lorry to be pulled towards the barrier.*

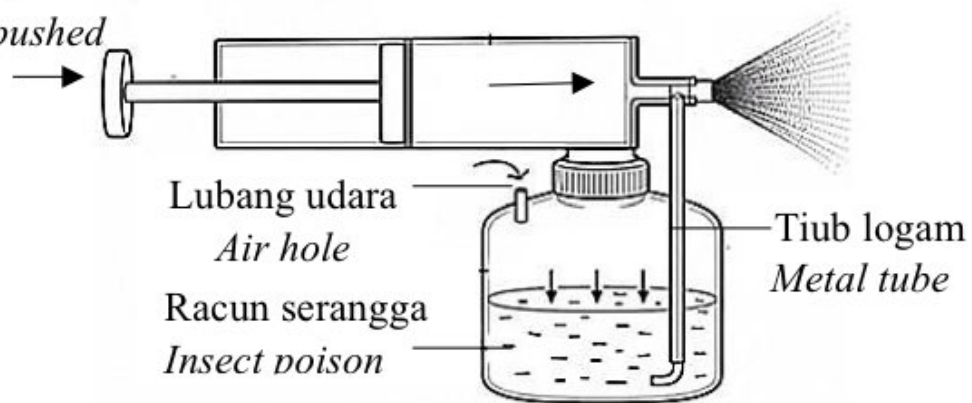


Rajah 10.1 / Diagram 10.1

- (a) Nyatakan Prinsip Bernoulli.
State Bernoulli's Principle.
[1 markah / mark]
- (b) Terangkan mengapa lori cenderung tertarik ke arah penghadang.
Explain why lorries tend to be attracted towards barriers.
[4 markah / marks]
- (c) Rajah 10.2 menunjukkan sebuah penyembur racun serangga yang berfungsi berdasarkan Prinsip Bernoulli. Apabila omboh ditolak, udara bergerak dengan laju melalui muncung penyembur .
Diagram 10.2 shows an insecticide sprayer that works on Bernoulli's Principle. When the piston is pushed, air moves at high speed through the sprayer nozzle.

Ombok ditolak

The piston is pushed



Rajah 10.1 / *Diagram 10.1*

Merujuk kepada bantuan anak panah pada Rajah 10.1, terangkan bagaimana racun serangga dapat disembur keluar daripada bekas.

Referring to the help of the arrows in Diagram 10.1, explain how the insecticide can be sprayed out of the container.

[3 markah / *marks*]

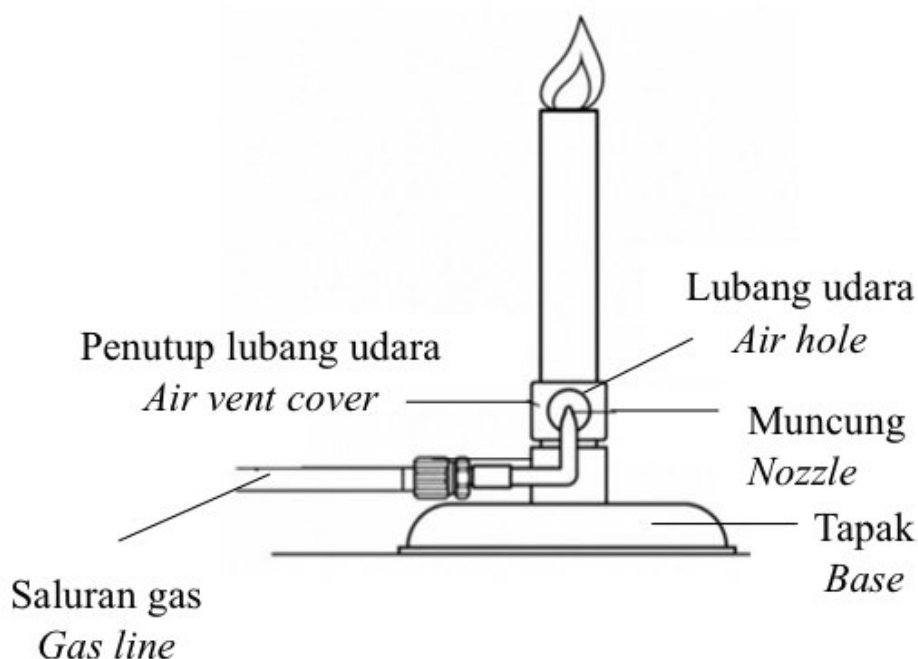
Nyatakan hubungan antara halaju udara dengan tekanan udara dan halaju udara dengan luas permukaan muncung.

State the relationship between air velocity and air pressure and air velocity and nozzle surface area

[2 markah / *marks*]

- (d) Rajah 10.3 menunjukkan sebuah penunu bunsen yang digunakan di dalam makmal sekolah.

Diagram 10.3 shows a bunsen burner used in the school laboratory.



Rajah 10.2 / *Diagram 10.2*

Penunu bunsen <i>Bunsen burner</i>	Lubang udara <i>Air hole</i>	Saiz Muncung <i>Nozzle size</i>	Saiz Tapak <i>Based size</i>	Penutup Lubang Udara
T	Kecil <i>Small</i>	Sempit <i>Narrow</i>	Kecil <i>Small</i>	Boleh laras <i>Adjustable</i>
U	Besar <i>Big</i>	Sempit <i>Narrow</i>	Lebar <i>Wide</i>	Boleh laras <i>Adjustable</i>
V	Besar <i>Big</i>	Luas <i>Wide</i>	Lebar <i>Wide</i>	Tidak boleh laras <i>Non adjustable</i>
W	Kecil <i>Small</i>	Luas <i>Wide</i>	Lebar <i>Low</i>	Tidak boleh laras <i>Non adjustable</i>

Jadual 10 / *Table 10*

Jadual 10 menunjukkan empat reka bentuk penunu bunsen T, U, V dan W dengan spesifikasi yang berbeza. Berdasarkan spesifikasi dalam Jadual 10, anda dikehendaki untuk menentukan penunu bunsen yang paling sesuai digunakan untuk pembakaran lengkap berlaku. Beri sebab bagi pilihan anda.

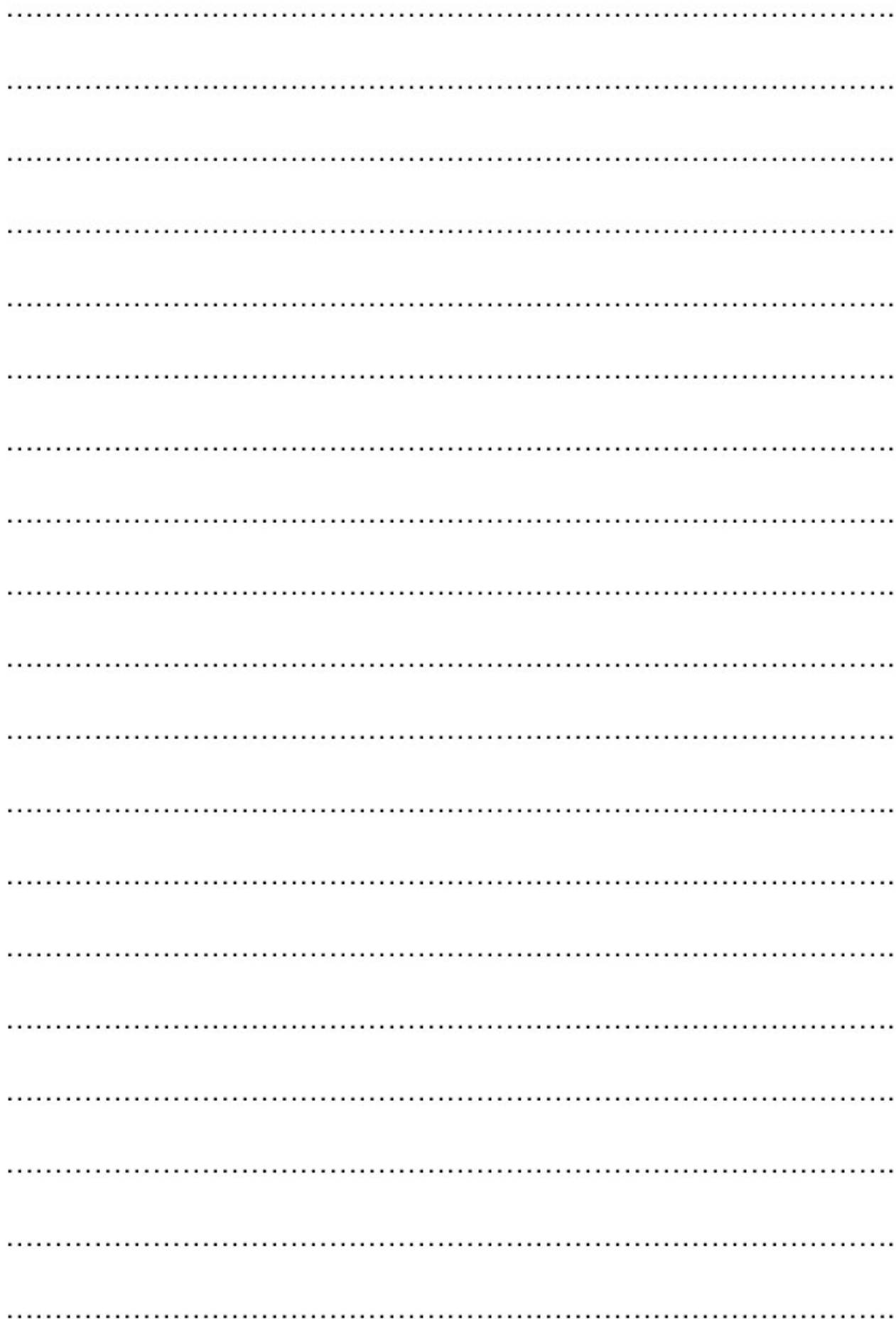
Table 10 shows four designs of Bunsen burners T, U, V and W with different specifications. Based on the specifications in Table 10, you are required to determine which Bunsen burner is most suitable for complete combustion to occur. Give reasons for your choice.

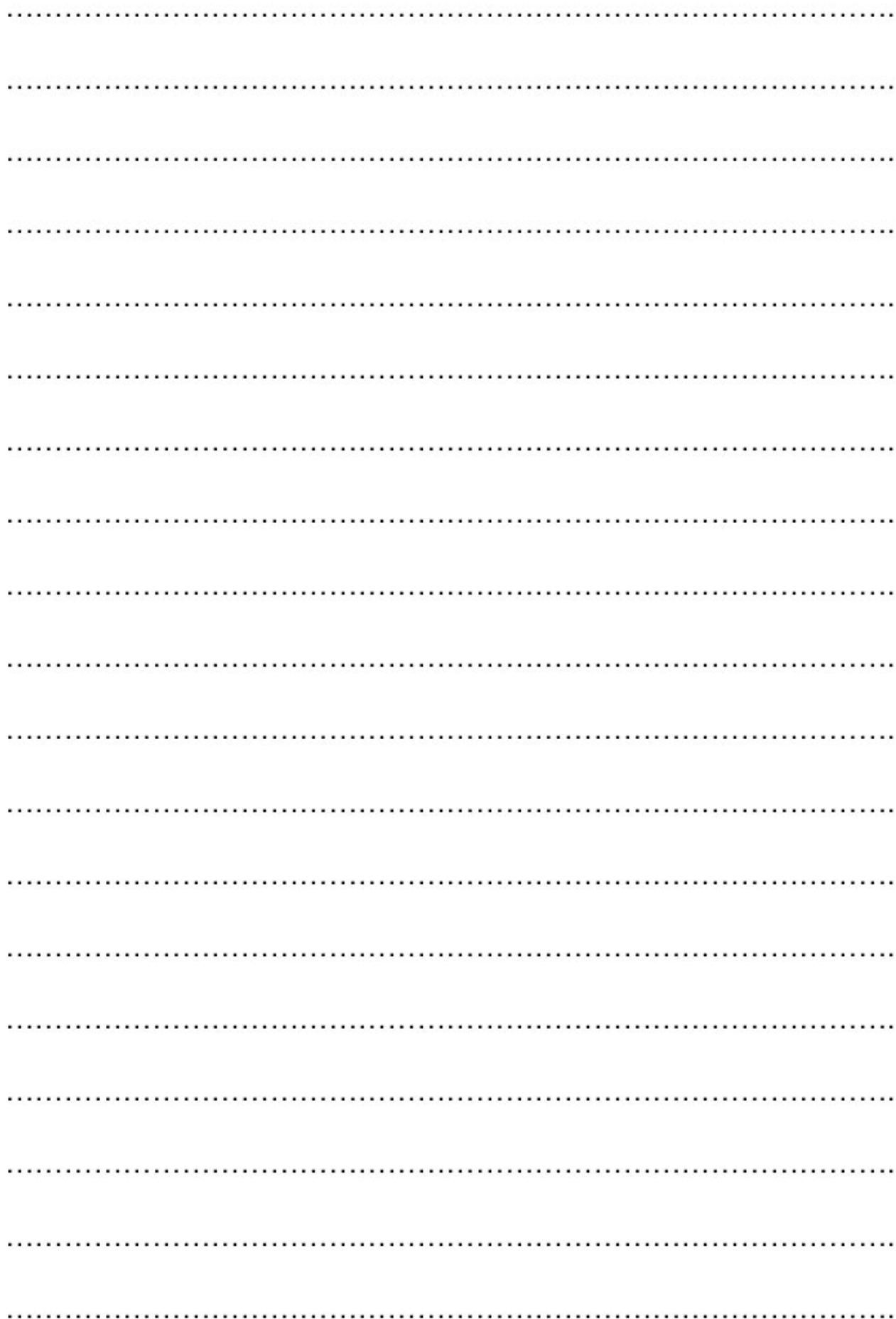
[10 markah / marks]

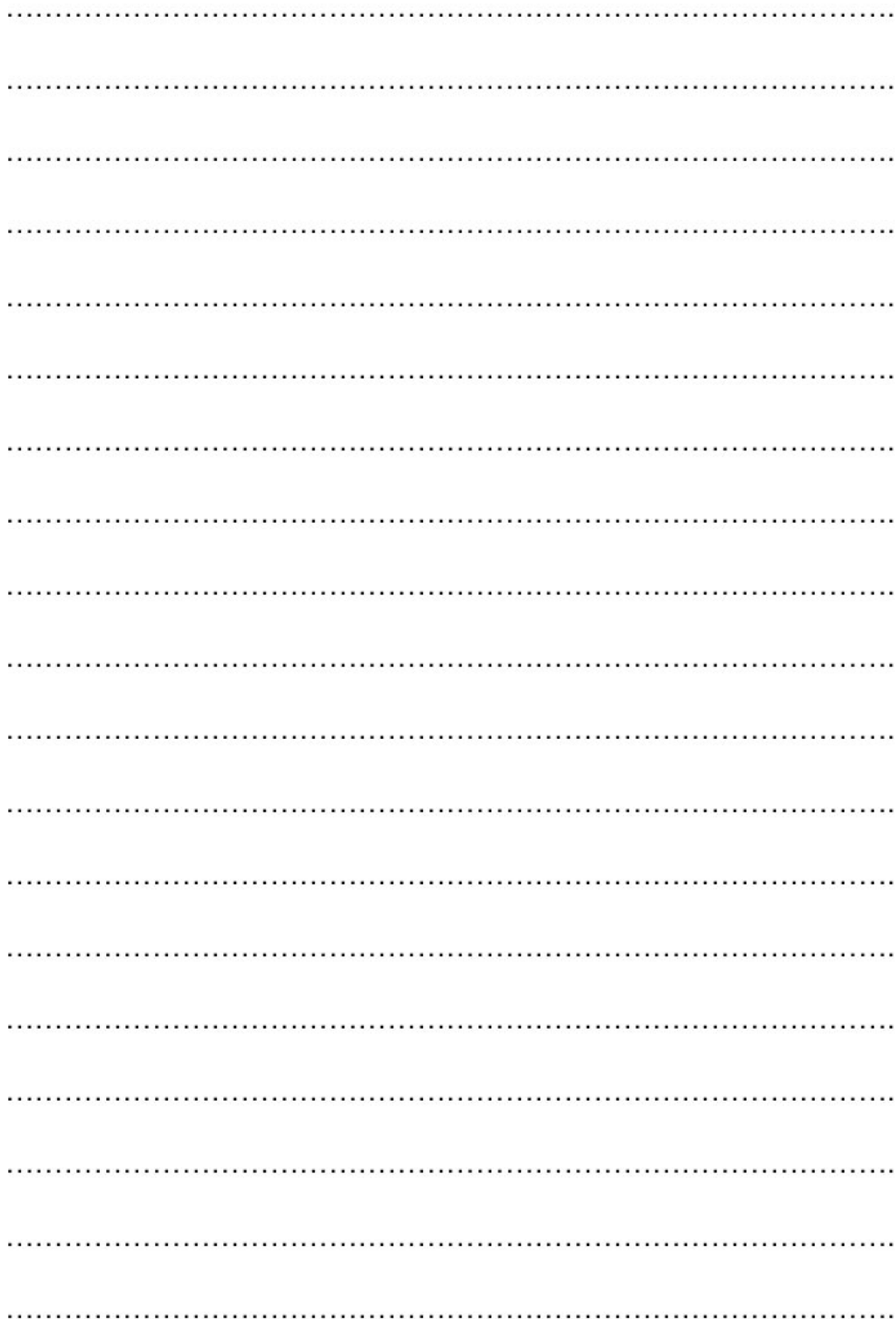


Soalan 10

This image shows a full page of white paper with horizontal dashed lines, typical of primary-ruled notebook paper. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.









Bahagian C

[20 markah]

Soalan ini mesti dijawab

- 11 Rajah 11.1 dan Rajah 11.2 menunjukkan dua perahu serupa Y dan Z yang mempunyai jisim yang sama. Perahu Y dikayuh oleh seorang lelaki manakala perahu Z dikayuh oleh dua orang lelaki. Dalam masa 30 minit, jarak yang dilalui oleh perahu Y ialah 1.5 km dan jarak yang dilalui oleh perahu Z ialah 3.0 km. *Diagram 11.1 and Diagram 11.2 show two similar boats Y and Z which have the same mass. Boat Y is rowed by one man while boat Z is rowed by two men. In 30 minutes, the distance covered by boat Y is 1.5 km and the distance travelled by boat Z is 3.0 km.*



Perahu Y
Boat Y

Rajah 11.1 / Diagram 11.1



Perahu Z
Boat Z

Rajah 11.2 / Diagram 11.2

- (a) Nyatakan Hukum Gerakan Newton Kedua.
State Newton's Second Law of Motion.
[1 markah / mark]
- (b) Perhatikan Rajah 11.1 dan Rajah 11.2, bandingkan jarak yang dilalui dalam masa 30 minit, daya yang dikenakan dan pecutan perahu.
Hubungkan jarak yang dilalui dengan daya dikenakan.
Seterusnya deduksikan hubungan antara daya dikenakan dengan pecutan perahu.

Observe Diagram 11.1 and Diagram 11.2, compare the distance traveled, the force applied and the acceleration of the boat.

Relate the distance traveled to the force applied. Then deduce the relationship between the force applied and the acceleration of the boat.

[5 markah / marks]

- (c) Berdasarkan definisi Hukum Gerakan Newton Kedua, terbitkan rumus $F=ma$.

Seterusnya nyatakan hubungan di antara jisim dan pecutan dan lakarkan graf tersebut.

Based on the definition of Newton's Second Law of Motion, derive the formula $F = ma$.

Next, state the relationship between mass and acceleration and sketch the graph.

[4 markah / marks]

- (d) Rajah 11.3 menunjukkan sebuah perahu yang digunakan untuk menyertai Pertandingan Perahu Naga Terpantas.

Diagram 11.3 shows a boat used to participate in a Fastest Dragon Boat Competition.



Rajah 11.3 / Rajah 11.3

Anda dikehendaki merekacipta sebuah perahu yang bergerak lebih cepat dan mampu membawa pendayung dengan selamat.

Nyatakan dan terangkan cadangan anda berdasarkan aspek perahu, pendayung, dayung dan ciri keselamatan lain.

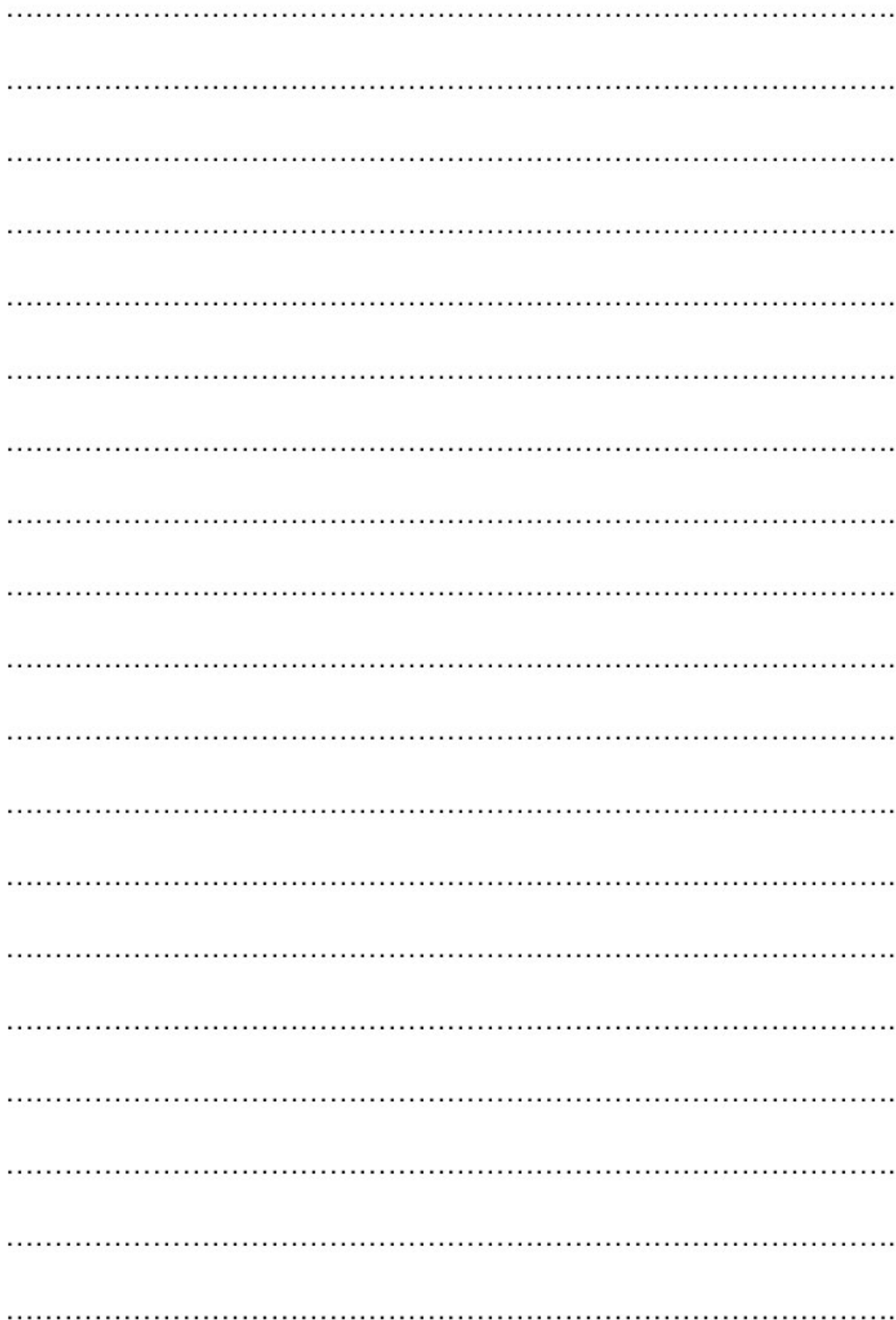
You are required to design a boat that moves faster and can carry a rower safely.

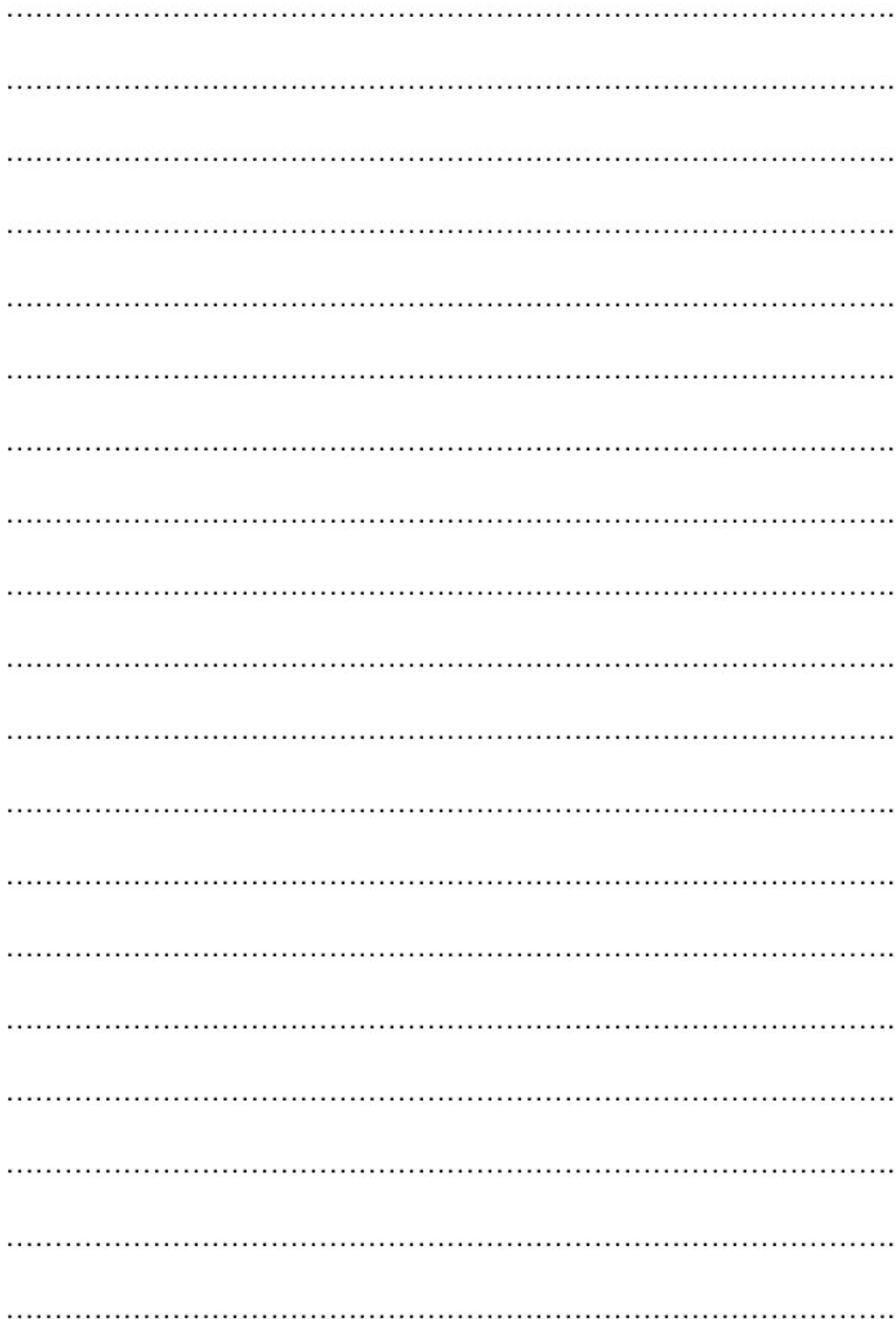
State and explain your proposal based on the specification of the boat, rower, paddle and other safety features.

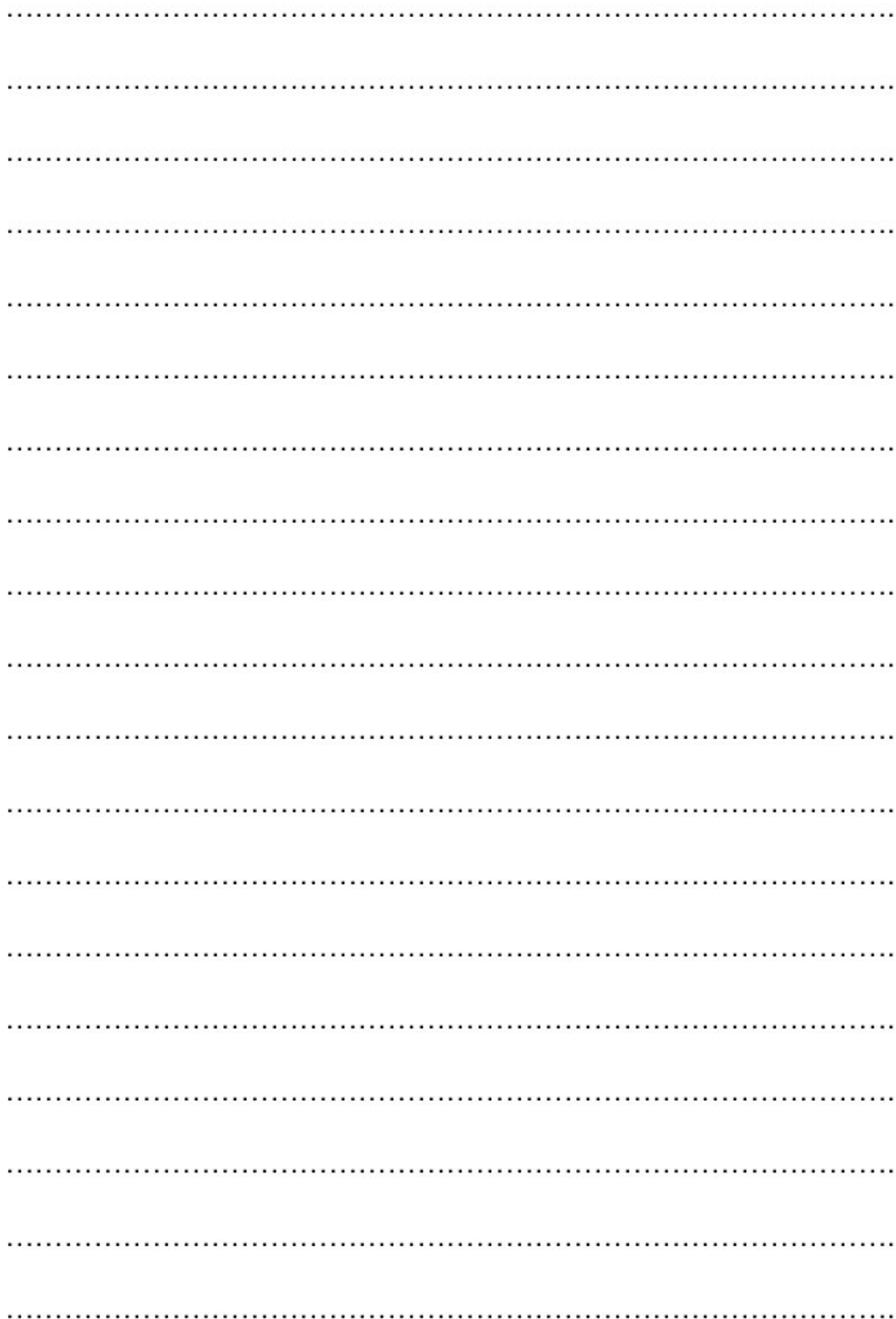
[10 markah / marks]

Soalan 11

[illegible]







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KERTAS PEPERIKSAAN TAMAT