

NAMA

KELAS

**MODUL PINTAS PERCUBAAN SPM
TINGKATAN 5
TAHUN 2026**

1511/2
SCIENCE
Kertas 2
2½ jam



JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Kertas peperiksaan ini adalah dalam dwibahasa.
2. Soalan dalam bahasa Melayu mendahului soalan yang sepadan dalam bahasa Inggeris.
3. Soalan ini mengandungi **13 soalan**.
4. Jawab semua soalan **Bahagian A** dan **Bahagian B**.
5. Jawab soalan **No.11 Bahagian C**.
6. Pilih mana-mana satu soalan **No. 12** atau **No. 13, Bahagian C**.
7. Lihat arahan dan kehendak soalan dengan teliti.
8. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.

Untuk Kegunaan Pemeriksa			
Kod Pemeriksa			
Bahagian	Soalan	Markah Penuh	Markah Diperoleh
A	1	5	
	2	5	
	3	5	
	4	5	
B	5	6	
	6	6	
	7	6	
	8	6	
	9	7	
	10	7	
C	11	10	
	12	12	
	13	12	
Jumlah			

Kertas soalan ini mengandungi **40** halaman bercetak

Bahagian A

[20 markah]

Jawab **semua** soalan dalam bahagian ini.

1. Rajah 1 menunjukkan keputusan ukuran panjang tapak tangan bagi murid dari kelas Tingkatan 2 Bijak.

Diagram 1 shows the results of measuring the length of the palm for students from Form 2 Bijak class.

13 cm	17 cm	15 cm	20 cm	19 cm	16 cm
17 cm	13 cm	15 cm	18 cm	16 cm	20 cm
17 cm	13 cm	18 cm	15 cm	19 cm	17 cm
16 cm	14 cm	15 cm	19 cm	18 cm	14 cm
17 cm	20 cm	16 cm	18 cm	16 cm	17 cm

Rajah 1
Diagram 1

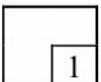
- (a) Berdasarkan Rajah 1, lengkapkan Jadual 1.
Based on Diagram 1, complete the Table 1.

Panjang tapak tangan (cm) <i>Length of the palm (cm)</i>	13-14	15-16	17-18	19-20
Bilangan murid <i>Number of students</i>		9	10	

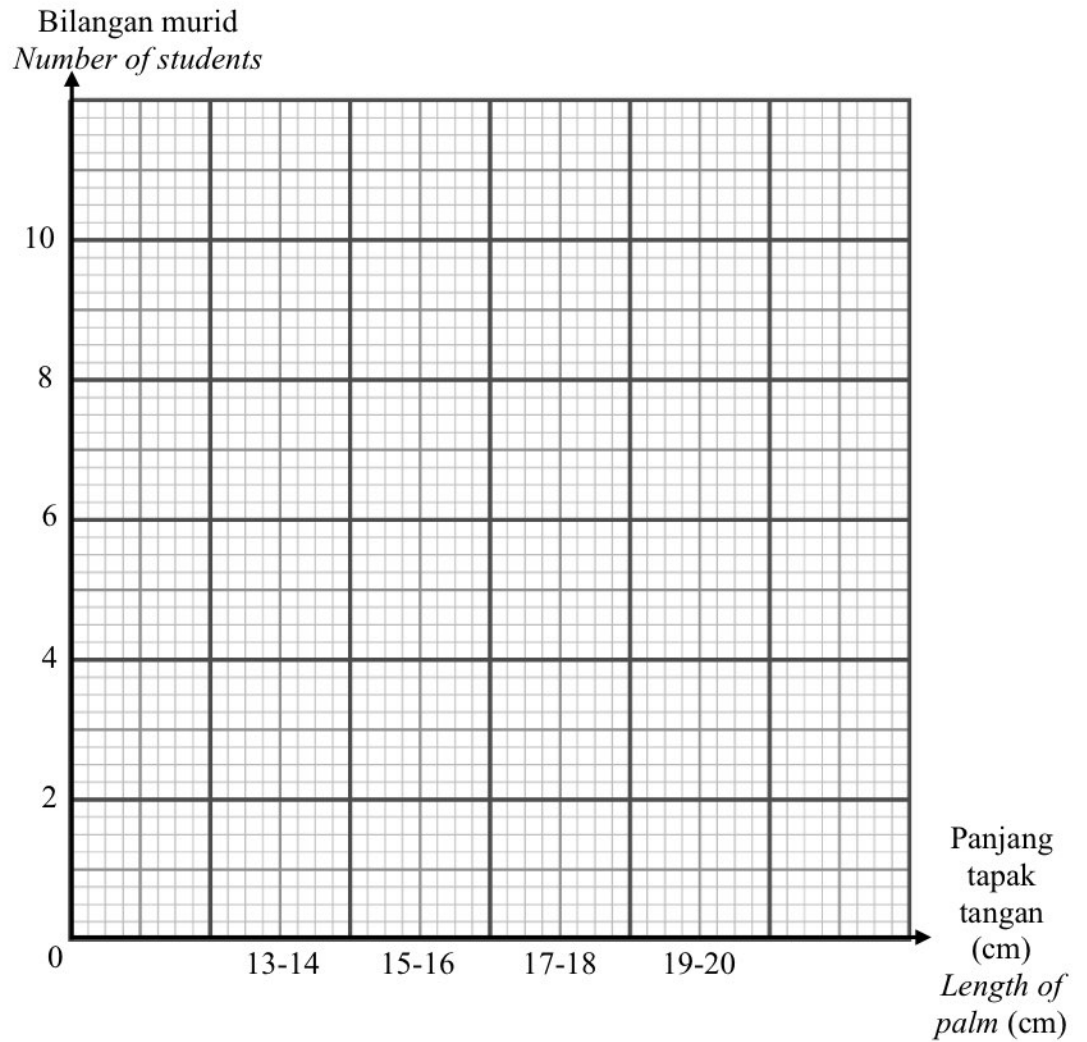
Jadual 1
Table 1

[1 markah]
[1 mark]

1(a)



- (b) Berdasarkan keputusan dalam Jadual 1, lukis histogram yang menunjukkan bilangan murid melawan panjang tapak tangan.
Based on the results in Table 1, draw a histogram that showing the number of students against the length of the palm.



[2 markah]
 [2 marks]

1(b)

2

- (c) Nyatakan **satu** ciri bagi jenis variasi ini.
*State **one** characteristic for this type of variation.*

.....

[1 markah]
 [1 mark]

1(c)

1

- (d) Pada akhir aktiviti ini, guru membuat kesimpulan bahawa panjang tapak tangan murid kelas Tingkatan 2 Bijak merupakan variasi selanjar. Dengan merujuk kepada graf di 1 (b), bagaimanakah anda dapat membuktikan bahawa kesimpulan tersebut adalah tepat?

At the end of this activity, the teacher concluded that the palm length of Form 2 Bijak students was a continuous variation. By referring to the graph in 1 (b), how can you prove that this conclusion is correct?

.....

.....

[1 markah]

[1 mark]

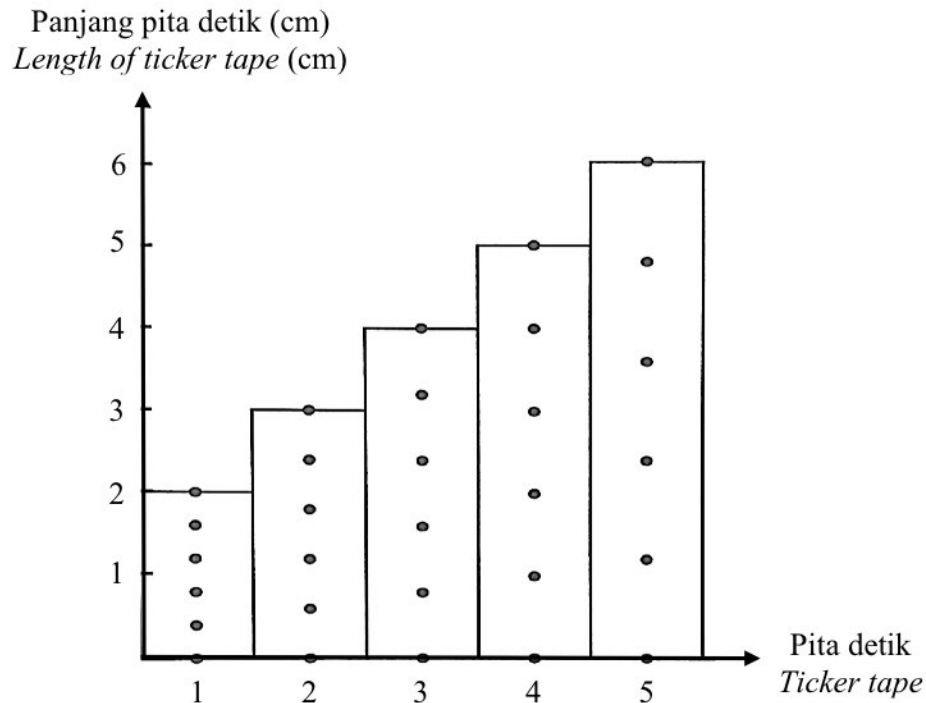
1(d)

1

**Jumlah
A1**

5

2. Rajah 2.1 menunjukkan carta pita detik yang diperoleh seorang murid apabila dia melepaskan sebuah troli menuruni satu landasan.
Diagram 2.1 shows the ticker tape chart obtained by a student when he released a trolley down a track.



Rajah 2.1
Diagram 2.1

- (a) Nyatakan **satu** pemerhatian berdasarkan Rajah 2.1.
State **one** observation based on Diagram 2.1.

.....
.....

[1 markah]
[1 mark]

2(a)

1

- (b) Berapakah panjang jalur pita detik yang ke-5 dalam sentimeter (cm)?
What is the length of the 5th ticker tape strip in centimeter (cm)?

.....
.....

[1 markah]
[1 mark]

2(b)

1

- (c) Nyatakan **satu** cara mengawal pemboleh ubah bergerak balas.
*State **one** way to control the responding variable.*

.....

.....

[1 markah]

[1 mark]

- (d) Carta pita detik dalam Rajah 2.1 dapat mewakili suatu jenis gerakan.
Apakah jenis gerakan itu?

The ticker tape chart in Diagram 2.1 can represent a type of motion.

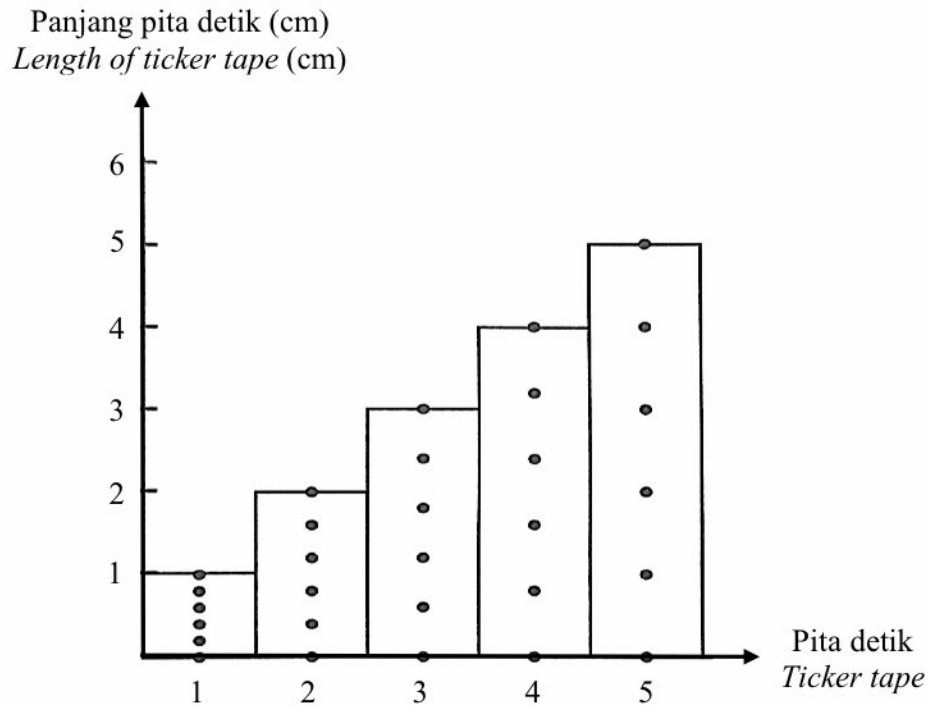
What is the type of motion?

.....

[1 markah]

[1 mark]

- (e) Rajah 2.2 menunjukkan carta pita detik yang dihasilkan apabila murid tersebut melepaskan sebuah troli pada landasan yang berbeza.
Diagram 2.2 shows the ticker tape chart produced when the student releases a trolley on a different track.



Rajah 2.2
 Diagram 2.2

Mengapakah panjang jalur pita detik dalam Rajah 2.2 berbeza daripada Rajah 2.1?
Why is the length of ticker tape strips in Diagram 2.2 different from Diagram 2.1?

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

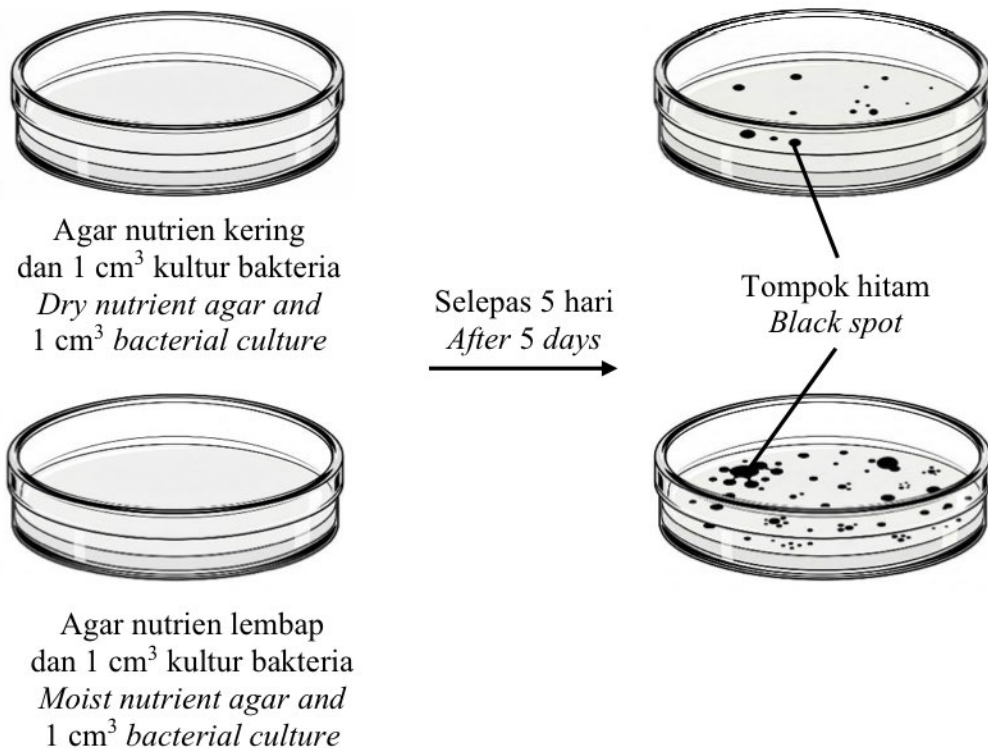
2(e)

1

**Jumlah
 A2**

5

3. Rajah 3.1 menunjukkan piring petri yang mengandungi agar nutrien yang berbeza. Piring petri tersebut disimpan dalam keadaan gelap selama 5 hari.
Diagram 3.1 shows petri dishes containing different nutrient agars. The petri dishes were kept in the dark for 5 days.



Rajah 3.1
Diagram 3.1

- (a) Berdasarkan Rajah 3.1, nyatakan
Based on Diagram 3.1, state
- (i) pemboleh ubah dimanipulasi
manipulated variable

3(a)(i)

1

[1 markah]
 [1 mark]

- (ii) pemboleh ubah bergerak balas.
responding variable.

3(a)(ii)

1

[1 markah]
 [1 mark]

- (b) Nyatakan **satu** hipotesis bagi eksperimen ini.
*State **one** hypothesis for this experiment.*

.....

.....

[1 markah]
[1 mark]

3(b)

1

- (c) Nyatakan definisi secara operasi bagi pertumbuhan bakteria
State the operational definition of bacterial growth.

.....

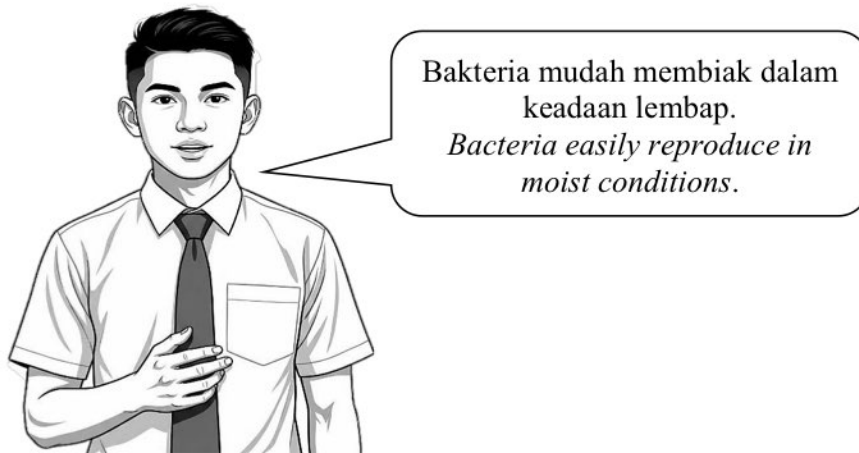
.....

[1 markah]
[1 mark]

3(c)

1

- (d) Rajah 3.2 menunjukkan pernyataan seorang murid.
Diagram 3.2 shows a statement from a student.



Rajah 3.2
Diagram 3.2

Berdasarkan pemerhatian dalam Rajah 3.1, wajarkan pernyataan ini.
Based on the observations in Diagram 3.1, justify this statement.

.....

.....

[1 markah]
[1 mark]

3(d)

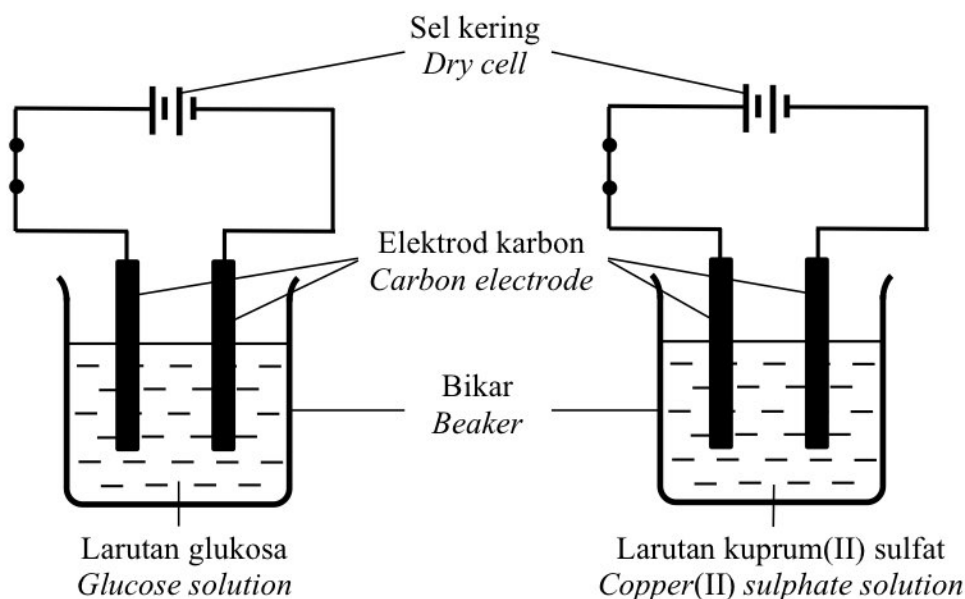
1

**Jumlah
A3**

5

4. Rajah 4.1 menunjukkan satu eksperimen yang melibatkan dua sel elektrolitik dengan dua elektrolit yang berbeza.

Diagram 4.1 shows an experiment involving two electrolytic cells with two different electrolytes.



Rajah 4.1
Diagram 4.1

Jadual 2 menunjukkan keputusan eksperimen tersebut.

Table 2 shows the results of the experiment.

Jenis elektrolit <i>Type of electrolyte</i>	Pemerhatian di anod <i>Observation on anode</i>
Larutan glukosa <i>Glucose solution</i>	Tiada perubahan <i>No change</i>
Larutan kuprum(II) sulfat <i>Copper(II) sulphate solution</i>	Gelembung-gelembung gas terbentuk <i>Gas bubbles are formed</i>

Jadual 2
Table 2

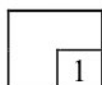
- (a) Berdasarkan Jadual 2, nyatakan cara anda mengawal pemboleh ubah dimanipulasi.
Based on Table 2, state way to control the manipulated variable.

.....

.....

[1 markah]
[1 mark]

4(a)



- (b) Nyatakan **satu** pemerhatian anda bagi eksperimen ini.
*State **one** of your observation for this experiment.*

.....

[1 markah]
[1 mark]

4(b)

1

- (c) Nyatakan **satu** sebab mengapa tiada perubahan yang dapat diperhatikan di anod sel elektrolitik bagi larutan glukosa.
*State **one** reason why no change can be observed at the anode of an electrolytic cell for glucose solution.*

.....

[1 markah]
[1 mark]

4(c)

1

- (d) Ramalkan pemerhatian di anod jika bilangan sel kering bertambah pada sel elektrolitik yang menggunakan larutan glukosa.
Predict the observation at the anode if the number of dry cells is increasing on the electrolytic cell that uses glucose solution.

.....

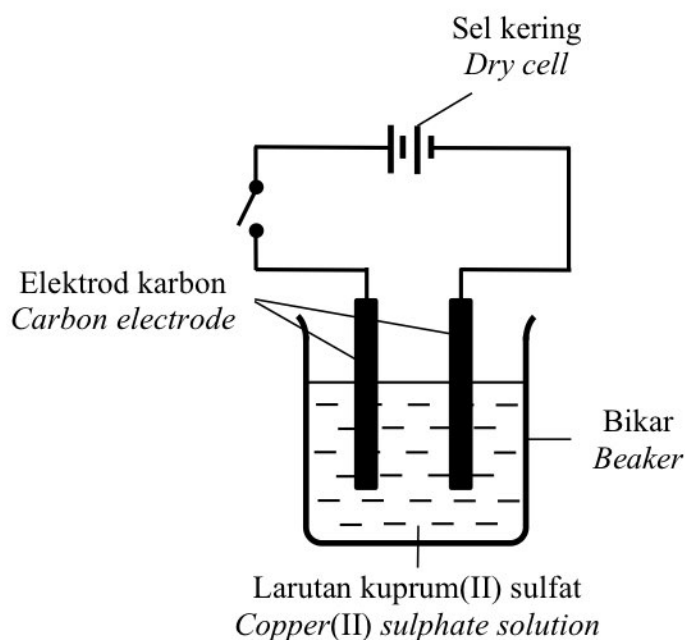
[1 markah]
[1 mark]

4(d)

1

- (e) Seorang murid menjalankan eksperimen yang sama bagi larutan kuprum(II) sulfat seperti dalam Rajah 4.2.

A student conducted the same experiment for copper(II) sulphate solution as in Diagram 4.2.



Rajah 4.2
Diagram 4.2

Sepanjang eksperimen dijalankan, dia mendapati tiada gelembung gas terbentuk di anod. Apakah kesilapan yang mungkin telah dilakukan oleh murid tersebut?

Throughout the experiment, the student found that no gas bubbles formed at the anode. What mistake might the student have made?

.....

.....

[1 markah]
[1 mark]

4(e)

1

Jumlah
A4

5

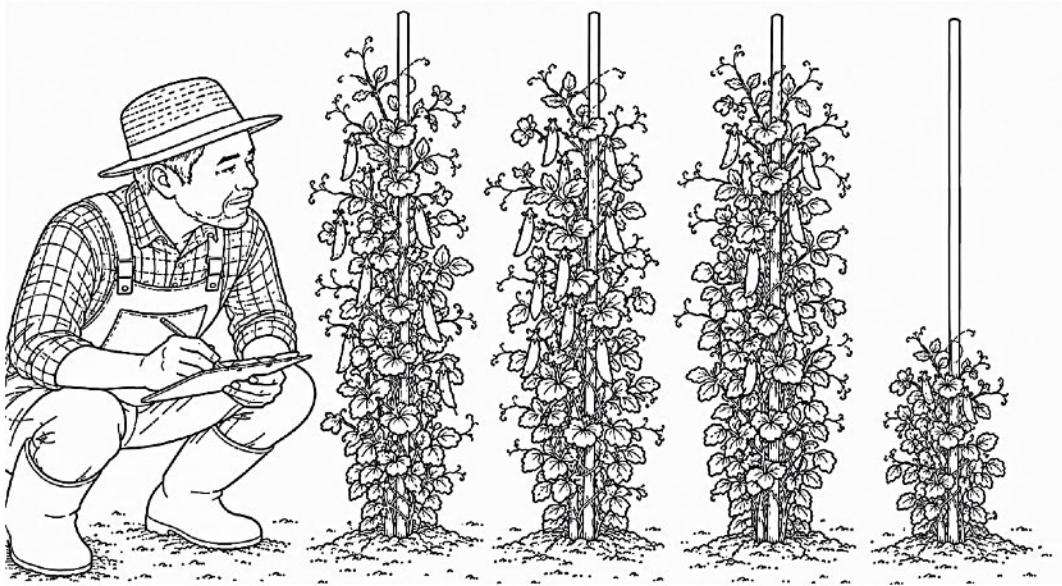
Bahagian B

[38 markah]

Jawab **semua** soalan dalam bahagian ini.

5. Rajah 5.1 menunjukkan seorang pekebun sedang merekodkan hasil kacukan kacang pea di kebunnya.

Diagram 5.1 shows a farmer is recording the yield of pea crossing in his garden.



Saya menjalankan kajian variasi pokok kacang pea di kebun saya dengan mengacukkan dua pokok kacang pea tinggi berbaka tidak tulen.

I conducted a study on pea plant variation in my garden by grafting two non pure-breeding tall pea plants.

Petunjuk:

Keys:

Trait tinggi diwakili oleh gen dominan, T

Trait for tall is represented by dominant gene, T

Trait kerdil diwakili oleh gen resesif, t

Trait for dwarf is represented by recessive gene, t

Rajah 5.1
Diagram 5.1

- (a) Berdasarkan Rajah 5.1, nyatakan trait dominan yang dikaji.
Based on Diagram 5.1, state the dominant trait that is being studied.

.....

[1 markah]

[1 mark]

5(a)

1

- (b) Pekebun mendapati terdapat satu daripada pokok kacang pea adalah kerdil. Apakah kemungkinan genotip yang dibawa oleh pokok kacang pea ini?

*The farmer found that one of the pea plants was dwarf.
What is the possible genotype carried by this pea plant?*

5(b)

1

[1 markah]

[1 mark]

- (c) Lengkapi rajah skema pewarisan di bawah bagi menunjukkan hasil kacukan pekebun ini.

Complete the inheritance schematic diagram below to show the results of this farmer's crossing.

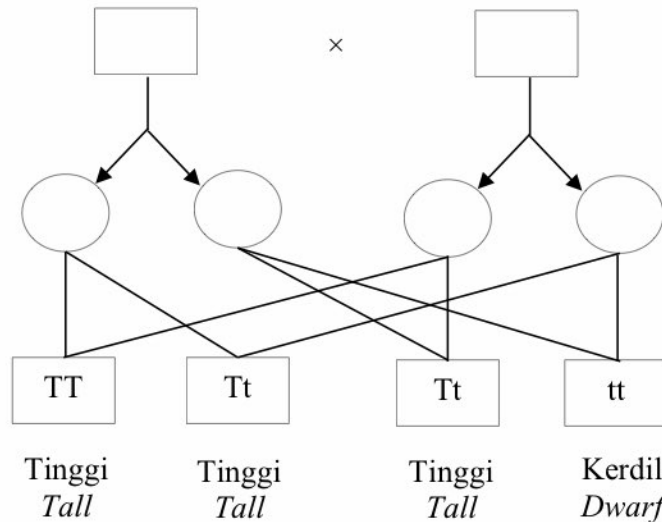
Fenotip induk : Tinggi berbaka tidak tulen Tinggi berbaka tidak tulen
Parental phenotypes *Non pure-breeding tall* *Non pure-breeding tall*

Genotip induk :
Parental genotypes

Gamet
Gametes

Genotip anak F₁ :
F₁ offspring genotypes

Fenotip anak F₁ :
F₁ offspring phenotypes



[2 markah]

[2 marks]

5(c)

2

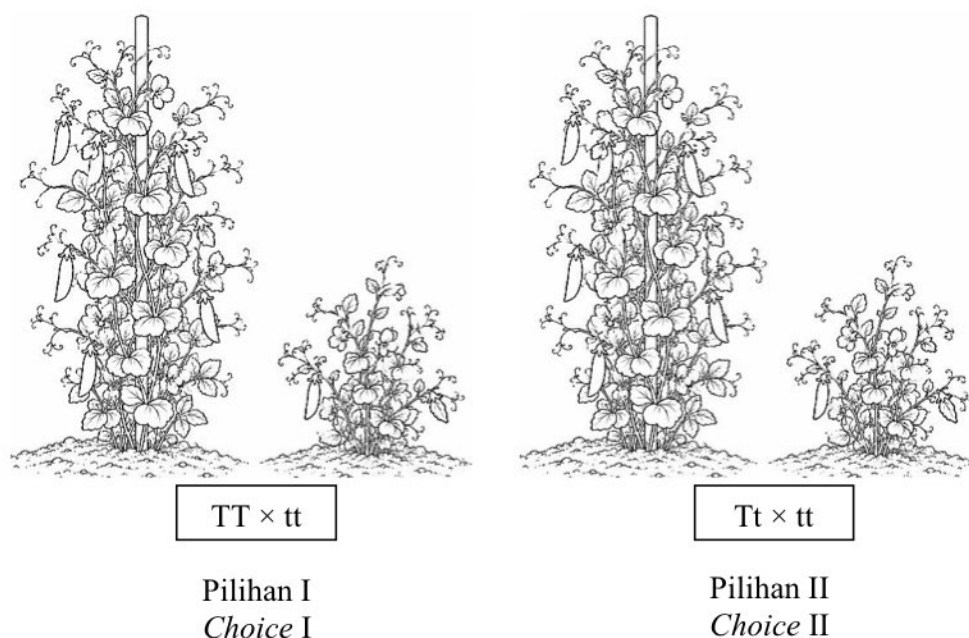


- (d) Pekebun meneruskan kacukan pokok kacang pea tetapi tidak menginginkan hasil pokok kacang pea kerdil.

Rajah 5.2 menunjukkan dua kacukan yang telah dicadangkan oleh MARDI.

Farmer's continue to crossing the pea plants but do not want to produce dwarf pea plants.

Diagram 5.2 shows two crossings that have been proposed by MARDI.



Rajah 5.2
Diagram 5.2

Pilih kacukan yang akan menghasilkan pokok kacang pea seperti yang diinginkan oleh pekebun tersebut. Wajarkan.

Choose a crossing that will produce the pea plant desired by the farmer. Justify.

.....

[2 markah]
[2 marks]

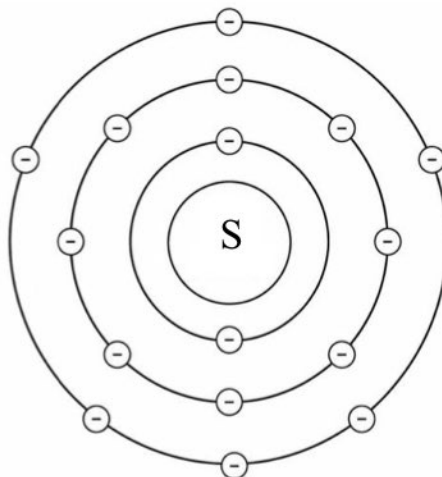
5(d)

2

**Jumlah
B5**

6

6. Rajah 6.1 menunjukkan susunan elektron bagi atom neutral.
Diagram 6.1 shows the electron arrangement of a neutral atom.



Rajah 6.1
Diagram 6.1

- (a) Berdasarkan Rajah 6.1,
Based on Diagram 6.1,
- (i) apakah bilangan proton bagi atom tersebut?
what is the number of protons for this atom?
- (ii) nyatakan susunan elektron bagi atom tersebut.
state the electron arrangement for this atom.

6(a)(i)

1

[1 markah]
[1 mark]

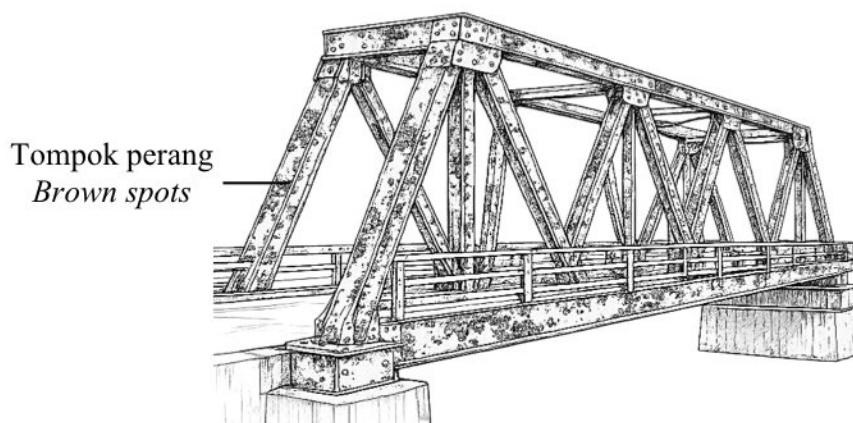
6(a)(ii)

1

[1 markah]
[1 mark]

- (b) Rajah 6.2 menunjukkan salah satu masalah yang dihadapi di sebuah jambatan besi kereta api.

Diagram 6.2 shows one of the problems encountered on a railway bridge.



Rajah 6.2
Diagram 6.2

Masalah ini berpunca daripada atom logam besi yang cenderung untuk mendermakan elektron bagi membentuk ion positif dan seterusnya bergabung dengan ion oksida.

Cadangkan **dua** langkah yang boleh diambil bagi mengatasi masalah ini.

This problem is caused by iron metal atoms which tend to donate electrons to form positive ions and then combine with oxide ions.

*Suggest **two** steps that can be taken to overcome this problem.*

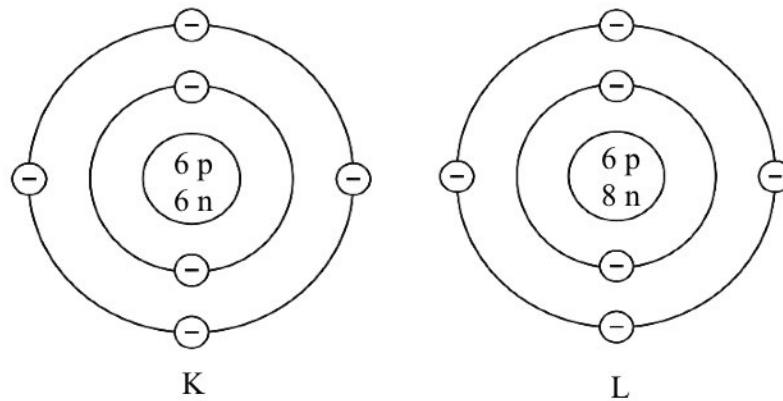
.....

[2 markah]
[2 marks]

6(b)

2

- (c) Rajah 6.3 menunjukkan dua atom yang berbeza.
Diagram 6.3 shows two different atoms.



Rajah 6.3
Diagram 6.3

Berdasarkan Rajah 6.3, banding bezakan kedua-dua atom tersebut.
Based on Diagram 6.3, compare and contrast the both atoms.

Persamaan:

Similarity:

.....

.....

Perbezaan:

Difference:

.....

.....

[2 markah]
[2 marks]

6(c)

2

Jumlah
B6

6

7. Rajah 7.1 menunjukkan dua objek yang diperbuat daripada dua bahan yang berbeza.
Diagram 7.1 shows two objects that was made from two different materials.



Rajah 7.1
Diagram 7.1

- (a) (i) Berdasarkan Rajah 7.1, objek manakah yang diperbuat daripada silika?
Based on Diagram 7.1, which object is made of silica?

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

7(a)(i)

1

- (ii) Puan Aminah adalah seorang pengusaha restoran di Kuala Lumpur. Semua pinggan di restorannya diperbuat daripada bahan yang sama dengan Q. Nyatakan **dua** kelebihan bahan Q.

*Mrs. Aminah is a restaurant's owner in Kuala Lumpur.
All the plates in her restaurant are made from the same substance as Q.
State **two** advantages of substance Q.*

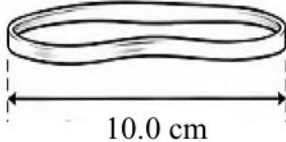
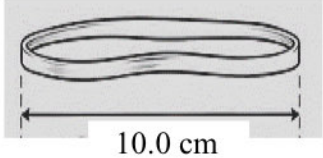
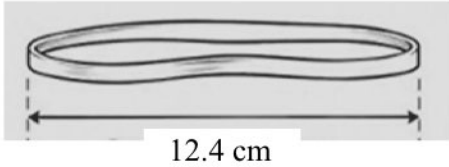
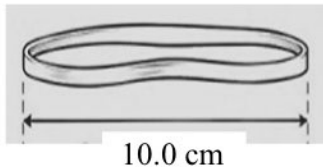
.....
[2 markah]
[2 marks]

7(a)(ii)

2

- (b) Rajah 7.2 menunjukkan keadaan dua jenis getah yang sama saiz setelah diregangkan dengan daya yang sama.

Diagram 7.2 shows the condition of two types of rubber of the same size after being stretched with the same force.

Getah R <i>Rubber R</i>	Getah S <i>Rubber S</i>
Sebelum diregangkan <i>Before stretching</i>	
	
Selepas diregangkan <i>After stretching</i>	
	

Rajah 7.2
Diagram 7.2

- (i) Berdasarkan Rajah 7.2, nyatakan jenis getah R. Jelaskan jawapan anda.
Based on Diagram 7.2, state the type of rubber R. Explain your answer.

.....
.....

[2 markah]

[2 marks]

- (ii) Getah S sesuai digunakan untuk membuat tayar kenderaan. Wajarkan.
Rubber S is suitable to make vehicle tyres. Justify.

.....
.....

[1 markah]

[1 mark]

7(b)(i)

2

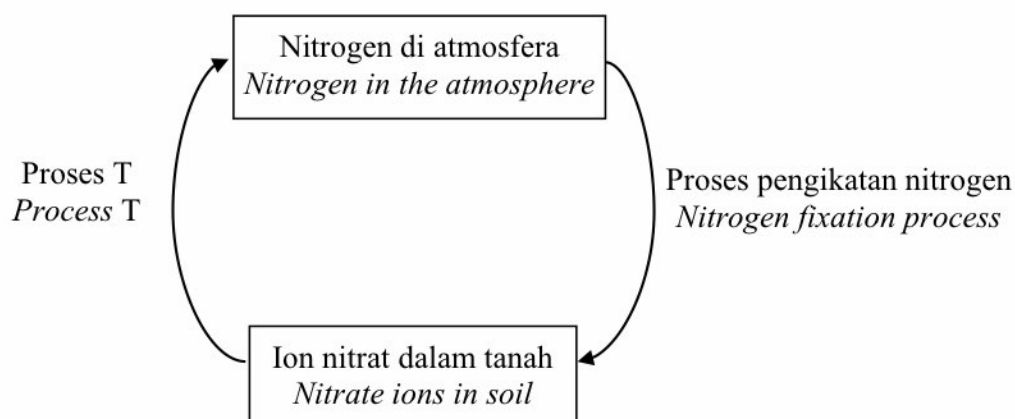
7(b)(ii)

1

Jumlah
B7

6

8. Rajah 8.1 menunjukkan sebahagian proses yang berlaku dalam kitar nitrogen.
Diagram 8.1 shows some of the processes that occur in the nitrogen cycle.



Rajah 8.1
Diagram 8.1

- (a) Apakah proses T?
What is process T?

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

8(a)

1

- (b) Seorang pekebun menebang pokok sawit untuk melakukan proses tanam semula setelah usia pokok mencapai 25 tahun.
Cadangkan **satu** kaedah yang boleh dilakukan oleh pekebun tersebut untuk menambahkan kesuburan tanah. Wajarkan.

A farmer cuts down oil palm trees to carry out a replanting process after the trees reach the age of 25 years.

*Suggest **one** method that can be carried out by the farmer to increase soil fertility. Justify.*

.....
.....

[2 markah]
[2 marks]

8(b)

2



- (c) Kaji maklumat di bawah.
Study the information below.

Satu kawasan pertanian yang sering dilanda banjir mengalami kemerosotan hasil tanaman disebabkan tanah yang kurang subur.
An agricultural area that is often hit by floods experiences a reduce in crop yields due to less fertile soil.

Berdasarkan maklumat di atas, jelaskan bagaimana banjir mempengaruhi kandungan ion nitrat dalam tanah.

Based on the information above, explain how flooding affects the content of nitrate ions in the soil.

.....

.....

[2 markah]

[2 marks]

- (d) Kitar nitrogen adalah penting dalam mengekalkan keseimbangan alam semula jadi. Wajarkan.

The nitrogen cycle is important in maintaining the balance of nature. Justify.

.....

.....

[1 markah]

[1 mark]

8(c)

	2
--	---

8(d)

	1
--	---

**Jumlah
B8**

	6
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9. Rajah 9.1 menunjukkan hasil tanaman yang mempunyai nilai komersil yang tinggi di Malaysia. Hasil tanaman ini boleh diproses untuk menghasilkan minyak.
Diagram 9.1 shows crops yield that have high commercial value in Malaysia. This crops yield can be processed to produce oil.



Rajah 9.1
 Diagram 9.1

- (a) Nyatakan **satu** kandungan nutrisi yang terdapat di dalam minyak tersebut khusus untuk meningkatkan tahap kesihatan manusia.
*State **one** nutritional content that is contained in the oil specifically to improve human health.*

9(a)

[1 markah]
 [1 mark]

1

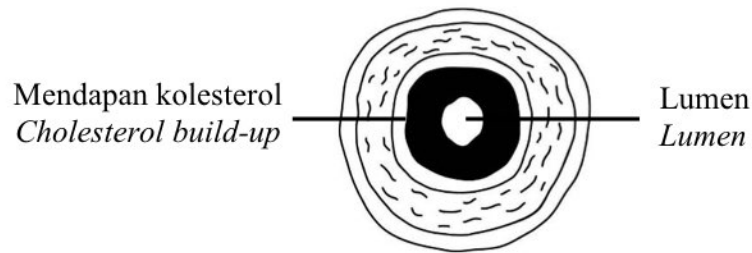
- (b) Selain dijadikan sebagai pelbagai jenis makanan, nyatakan aplikasi lain minyak tersebut dalam bidang penjagaan kesihatan diri.
Besides of being used in various types of food, state another application of the oil in the field of personal healthcare.

9(b)

[1 markah]
 [1 mark]

1

- (c) Rajah 9.2 menunjukkan keadaan arteri seorang individu.
Diagram 9.2 shows a condition of an individual artery.



Rajah 9.2
Diagram 9.2

Doktor menasihatinya supaya mengurangkan pengambilan lemak.
Wajarkan tindakan doktor tersebut.
The doctor advised him to reduce the intake of fat.
Justify the doctor's action.

.....

.....

.....

[2 markah]
[2 marks]

9(c)

2

- (d) Seorang suri rumah mempunyai lebih minyak masak terpakai. Dia bercadang untuk menghasilkan lilin daripada minyak masak terpakai tersebut.
A housewife has excess used of cooking oil. She plans to make candle from the used cooking oil.

Alat dan bahan yang diperlukan adalah seperti berikut:

The tools and materials needed are as follows:

- Minyak masak terpakai
Used cooking oil
- Gelas kaca
Glass
- Benang tebal
Thick thread
- Penapis
Sieve

Tuliskan langkah-langkah untuk menghasilkan lilin tersebut.

Write the steps to make the candle.

1.
.....
2.
.....
3.
.....

[3 markah]
[3 marks]

9(d)

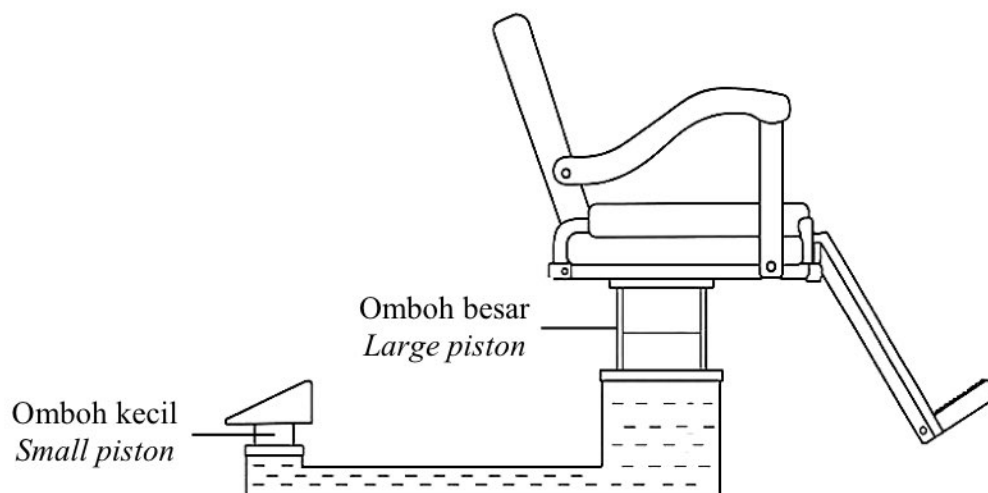
3

**Jumlah
B9**

7

10. Rajah 10.1 menunjukkan suatu sistem yang terdapat pada kerusi di kedai gunting rambut Mahadi.

Diagram 10.1 shows a system found in a chair at Mahadi's hair salon.



Rajah 10.1
Diagram 10.1

- (a) Nyatakan mengapa sistem pada alat dalam Rajah 10.1 dikenali sebagai sistem tertutup.

State why the system of the tool in Diagram 10.1 is known as a enclosed system.

.....

.....

[1 markah]

[1 mark]

- (b) Jika minyak di dalam sistem tersebut digantikan dengan air, nyatakan persamaan ciri-ciri minyak dan air yang menyebabkan sistem tersebut masih boleh berfungsi.

If the oil in the system is replaced with water, state the similarity of the oil and water characteristics that causes the system to still be able to function.

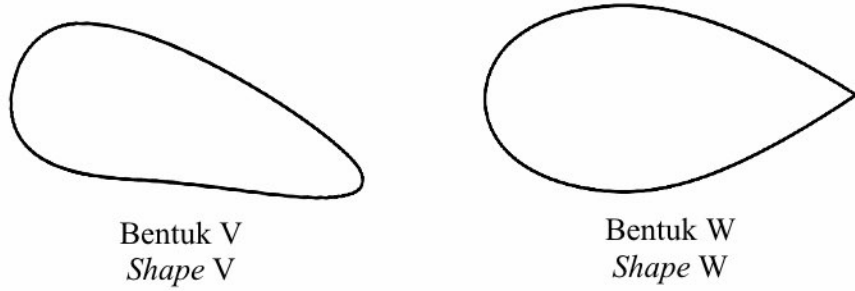
.....

.....

[1 markah]

[1 mark]

- (c) Rajah 10.2 menunjukkan dua bentuk yang berbeza pada sayap kenderaan udara.
Diagram 10.2 shows two different shapes on an aircraft wing.



Rajah 10.2
Diagram 10.2

Berdasarkan Rajah 10.2, bentuk yang manakah paling sesuai untuk dijadikan sayap kapal terbang? Terangkan jawapan anda.

Based on Diagram 10.2, which of the shape is most suitable to make an aeroplane wing? Explain your answer.

.....

.....

.....

[2 markah]
[2 marks]

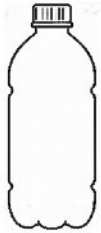
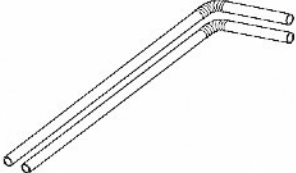
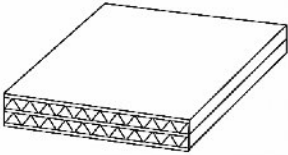
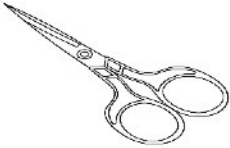
10(c)

2



- (d) Rajah 10.3 menunjukkan bahan-bahan yang digunakan untuk mereka bentuk model kereta lumba.

Diagram 10.3 shows the materials that are used to design a racing car model.

 Botol mineral <i>Mineral bottle</i>	 Gam <i>Glue</i>	 Penyedut minuman <i>Straw</i>
 Kadbod <i>Cardboard</i>	 4 penutup botol <i>4 bottle caps</i>	 Gunting <i>Scissor</i>

Rajah 10.3
Diagram 10.3

Lakarkan dan label model kereta lumba anda dalam ruang yang disediakan.
Sketch and label your racing car model in the space provided.

Terangkan model anda.
Explain your model.

.....

.....

[3 markah]
[3 marks]

10(d)

3

Jumlah
B10

7

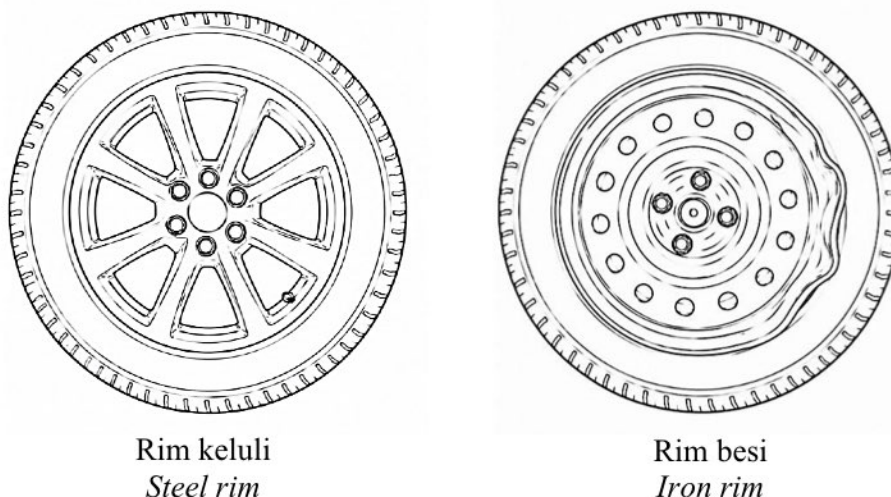
Bahagian C

[22 markah]

Jawab **Soalan 11** dan sama ada **Soalan 12** atau **Soalan 13**.

11. Rajah 11 menunjukkan keadaan dua buah rim kereta selepas melanggar sebuah lubang di tengah jalan raya.

Diagram 11 shows the condition of two car rims after hitting a hole in the middle of the road.



Rajah 11
Diagram 11

Berdasarkan Rajah 11, rancang satu eksperimen dalam makmal dengan menggunakan bongkah keluli, bongkah besi, bebola keluli, pemberat 1 kg, benang, kaki retort dan radas lain.

Based on Diagram 11, plan an experiment in the laboratory using a steel block, an iron block, a steel ball, a 1 kg weight, a thread, a retort stand and other apparatus.

Perancangan anda haruslah mengandungi aspek-aspek berikut:

Your planning should include the following aspects:

- | | |
|--|-------------------------|
| (a) Pernyataan masalah
<i>Problem statement</i> | [1 markah]
[1 mark] |
| (b) Hipotesis
<i>Hypothesis</i> | [1 markah]
[1 mark] |
| (c) Faktor yang diperhatikan dan cara mengawalinya
<i>Factor that can be observed and way to control it</i> | [2 markah]
[2 marks] |
| (d) Lakaran susunan radas yang berlabel
<i>Sketching of the labelled apparatus arrangement</i> | [2 markah]
[2 marks] |

- (e) Jangkaan pemerhatian [1 markah]
Expected observation [1 mark]
- (f) **Tiga** aspek yang diperlukan untuk melukis carta palang eksperimen. [3 markah]
Three aspects that are needed to draw the bar chart. [3 marks]

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This image shows a full page of white paper with horizontal dashed lines, typical of primary school writing 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.

12. Amerika Syarikat, Rusia dan Perancis merupakan sebahagian negara yang menggunakan tenaga nuklear sebagai sumber tenaga.

The United States of America, Russia and France are among the countries that use nuclear energy as a source of energy.

- (a) Nyatakan kebaikan menggunakan sumber tenaga nuklear berbanding sumber tenaga yang lain.

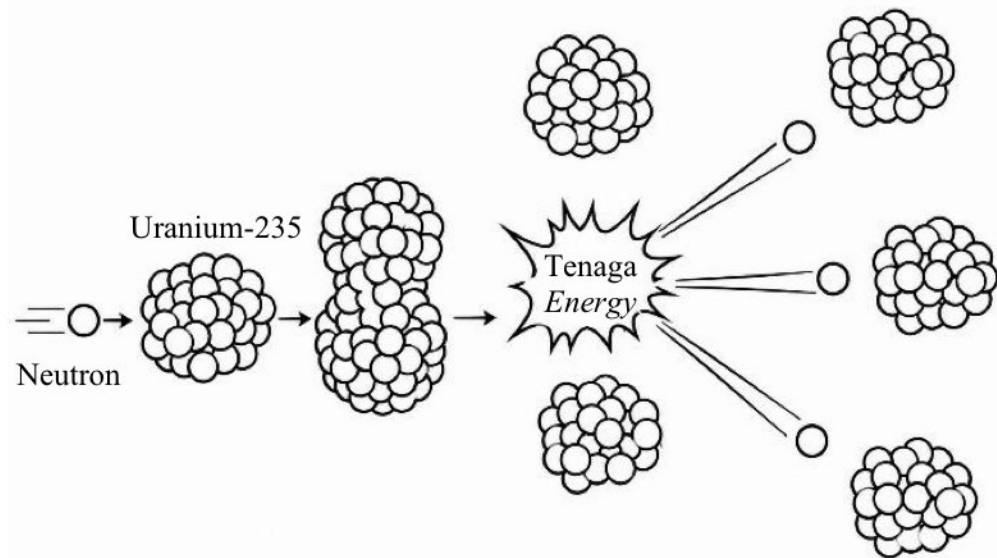
State the advantages of using nuclear energy sources compared to other energy sources.

[2 markah]

[2 marks]

- (b) Rajah 12 menunjukkan satu proses penghasilan tenaga nuklear.

Diagram 12 shows a nuclear energy production process.



Rajah 12
Diagram 12

Terangkan bagaimana proses dalam Rajah 12 dapat menghasilkan tenaga nuklear.

Explain how the process in Diagram 12 can produce nuclear energy.

[2 markah]

[2 marks]

- (c) Jadual 3 menunjukkan anggaran kuasa letupan beberapa jenis bom.
Table 3 shows the estimated explosive power of several types of bombs.

Jenis bom <i>Type of bomb</i>	Anggaran kuasa letupan (kiloton) <i>Estimated explosive power (kilotone)</i>
Bom atom X <i>Atomic bomb X</i>	15000
Bom atom Y <i>Atomic bomb Y</i>	21000
Bom hidrogen Z <i>Hydrogen bomb Z</i>	50000

Jadual 3
Table 3

Berdasarkan Jadual 3, pilih jenis bom yang akan menyebabkan kemusnahan yang paling besar.

Huraikan kesan penggunaan bom hidrogen Z terhadap manusia dan alam sekitar.

Based on Table 3, choose the type of bomb that will cause the most destruction.

Describe the effects of the use of hydrogen bombs Z on humans and the environment.

[4 markah]

[4 marks]

- (d) 70% daripada sumber tenaga negara A dijana daripada gas asli. Gas asli merupakan sumber bahan api fosil yang tidak boleh baharu. Bagi menampung permintaan penggunaan tenaga yang semakin meningkat, kerajaan negara A bercadang untuk menggunakan tenaga nuklear bagi mengurangkan kebergantungan terhadap penggunaan gas asli. Wajarkan.

70% of country A energy resources are generated from natural gas. Natural gas is a non-renewable source of fossil fuel. To meet the increasing in demand of energy consumption, the government of country A plans to use nuclear energy to reduce the dependence on natural gas. Justify.

[4 markah]

[4 marks]



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This image shows a full page of a document template. It consists of approximately 28 evenly spaced horizontal dotted lines across the entire width of the page, providing a guide for handwriting or typing. There are no margins, text, or other markings present.

13. Satelit merupakan objek yang mengorbit planet atau bintang.
A satellite is an object which orbits a planets or stars.

- (a) Nyatakan **dua** bentuk orbit.
*State **two** orbital shapes.*

[2 markah]
[2 marks]

- (b) Orbit satelit yang mengelilingi Bumi dikelaskan mengikut ketinggian orbit (altitud).
Nyatakan hubungan antara ketinggian orbit dengan halaju satelit.
Satellite orbits that circle the Earth are classified according to the height of the orbit (altitude).
State the relationship between the orbital height and the velocity of the satellite.

[2 markah]
[2 marks]

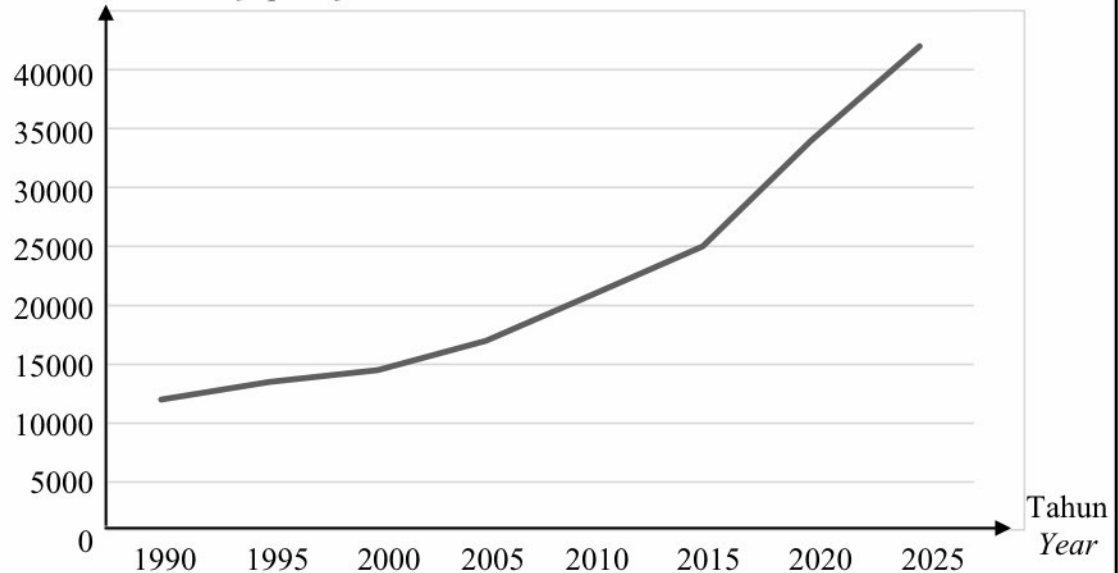


- (c) Rajah 13 menunjukkan bilangan bahan buangan angkasa lepas dari tahun 1990 hingga tahun 2025.

Diagram 13 shows the number of space junks from year 1990 to year 2025.

Bilangan bahan buangan angkasa lepas

Number of space junks



Rajah 13
Diagram 13

Terangkan perubahan bahan buangan angkasa lepas dari tahun 1990 hingga tahun 2025.

Describe the change in space junks from year 1990 to year 2025.

[4 markah]

[4 marks]

- (d) Seorang pendaki gunung menggunakan telefon pintar yang dilengkapi aplikasi Sistem Penentu Sejagat (GPS) semasa aktiviti pendakian di kawasan hutan.

Wajarkan kepentingan penggunaan GPS kepada pendaki gunung tersebut.

A mountain hiker's uses a smartphone equipped with a Global Positioning System (GPS) application during a hiking activity in a forest area.

Justify the importance of using the GPS to the mountain hiker.

[4 markah]

[4 marks]

[illegible]

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