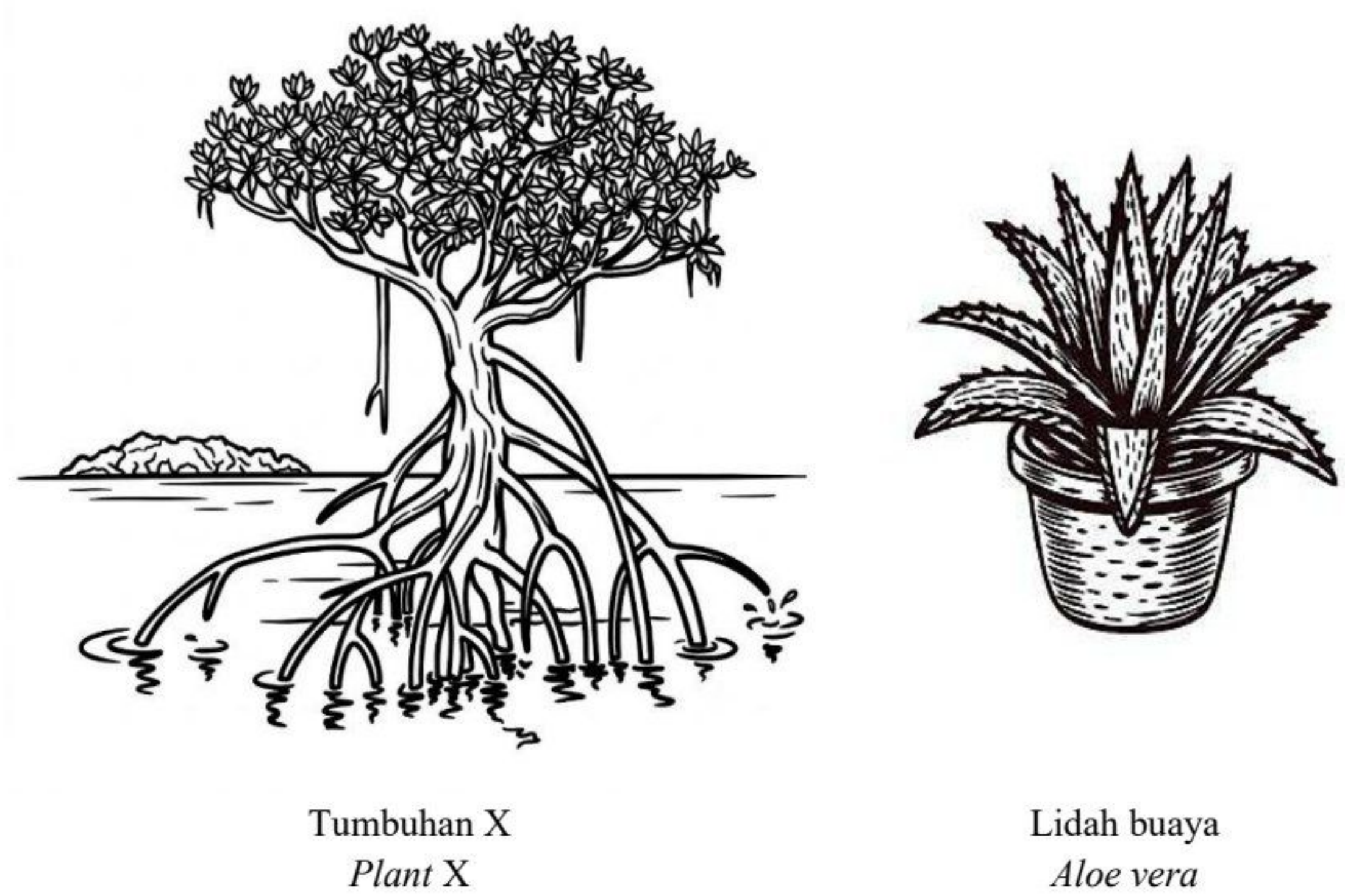


Bahagian A
Section A

[60 markah / 60 marks]

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

1. Rajah 1 menunjukkan dua jenis tumbuhan yang hidup dalam dua habitat yang berbeza.
Diagram 1 shows two types of plants that live in two different habitats.



Rajah 1
Diagram 1

- (a) Berdasarkan Rajah 1, nyatakan **satu** contoh habitat bagi tumbuhan X.
(R) Based on Diagram 1, state **one** example of habitat for plant X.

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

1(a)	
	1

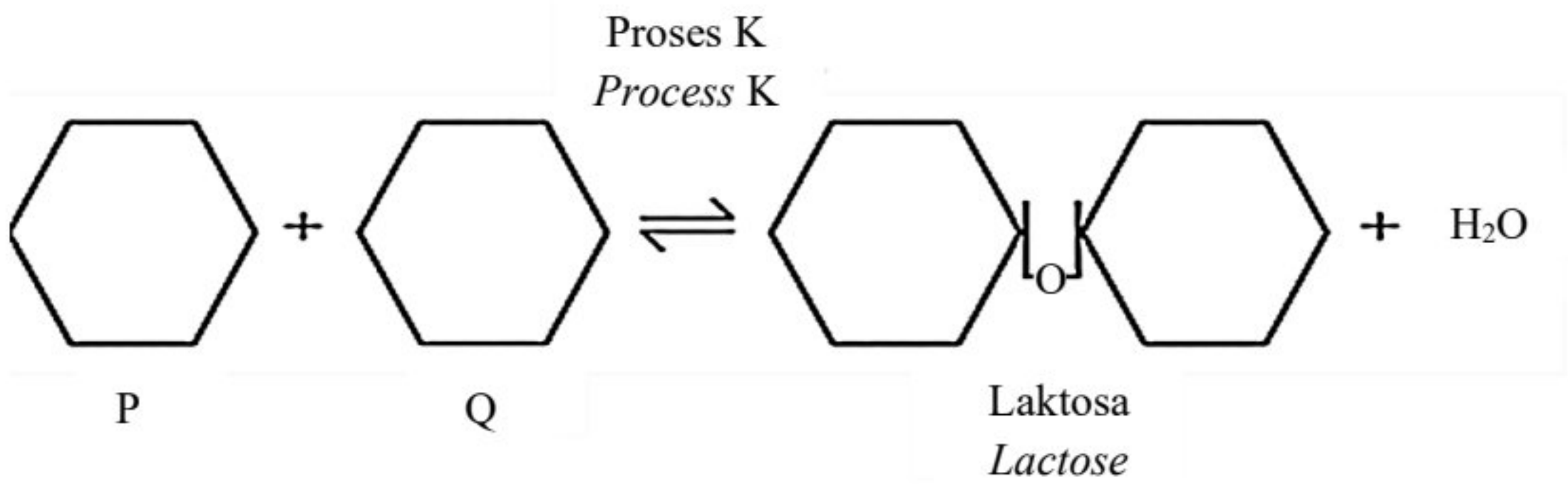
<https://t.me/cikgufazliebiosensei>

(b)	(i)	Tumbuhan X hidup dalam tanah yang lembut dan berlumpur.	
	(R)	Tumbuhan ini juga banyak menerima keamatan cahaya matahari yang tinggi. Terangkan bagaimana tumbuhan X beradaptasi untuk mengatasi masalah-masalah tersebut. <i>Plant X lives in soft and muddy soil.</i> <i>This plant also receives high intensity of sunlight.</i> <i>Explain how plant X is adapted to overcome the problems.</i> 	[2 markah / 2 marks]
(ii)	(i)	Tumbuhan X diletakkan di habitat air tawar. Terangkan kenapa tumbuhan X masih hidup.	
	(R)	<i>Plant X is placed in a freshwater habitat. Explain how plant X still survives.</i> 	[1 markah / 1 mark]
(c)	(i)	Nyatakan satu ciri yang dapat anda perhatikan pada tumbuhan lidah buaya.	
	(S)	<i>State one characteristic that you can observe on the aloe vera plant.</i> 	[1 markah / 1 mark]
(ii)	(i)	Daripada ciri yang anda nyatakan pada soalan c(i), kenal pasti jenis tumbuhan ini berdasarkan habitatnya.	
	(R)	<i>From the characteristic you stated in question c(i), identify the type of this plant based on its habitat.</i> 	[1 markah / 1 mark]

Untuk kegunaan pemeriksa

2. Rajah 2.1 menunjukkan pembentukan laktosa melalui satu tindak balas kimia.
Diagram 2.1 shows the formation of lactose through a chemical reaction.

Untuk
kegunaan
pemeriksa



Rajah 2.1
Diagram 2.1

- (a) (i) Namakan molekul P dan molekul Q.
(R) *Name molecule P and molecule Q.*

Molekul P :
Molecule P :
Molekul Q :
Molecule Q :

[2 markah / 2 marks]

1(a)(i)	
	2

- (ii) Terangkan jenis tindak balas yang berlaku dalam Proses K.
(R) *Explain the type of reaction that occurs in Process K.*

.....
.....
.....

[2 markah / 2 marks]

1(a)(ii)	
	2

- (b) Seorang individu mengamalkan diet yang tinggi lemak tepu setiap hari.
(R) Terangkan kesan amalan tersebut terhadap kesihatan individu itu.
(S) *A person consumes a diet high in saturated fats every day.
Explain the effect of this practice on the individual's health.*

.....
.....
.....

[2 markah / 2 marks]

2(b)	
	2
Jumlah	
	6

3.
- Rajah 3.1 menunjukkan sehelai daun yang mengalami klorosis.
Diagram 3.1 shows a leaf that has chlorosis.

Untuk
kegunaan
pemeriksa



Rajah 3.1
Diagram 3.1

- (a)
- Nyatakan **dua** contoh nutrien yang menyebabkan klorosis apabila tumbuhan mengalami kekurangan nutrien tersebut.
(R) *State **two** nutrients that cause chlorosis when plants experience a deficiency of those nutrients.*

- (i)
-
- (ii)
-

[2 markah / 2 marks]

3(a)	
	2

- (b)
- Rajah 3.2 menunjukkan dua jenis tumbuhan yang dijumpai di dalam hutan.
(S) *Diagram 3.2 shows two types of plant found in a forest.*



Paku pakis langsuir
Bird's-nest fern



Bunga pakma
Rafflesia sp.

Rajah 3.2
Diagram 3.2

- (b) Berikan **dua** perbezaan penyesuaian nutrisi tumbuhan yang ditunjukkan dalam Rajah 3.2.
 Give **two** differences in plant nutritional adaptations shown in Diagram 3.2.

Untuk
kegunaan
pemeriksa

.....

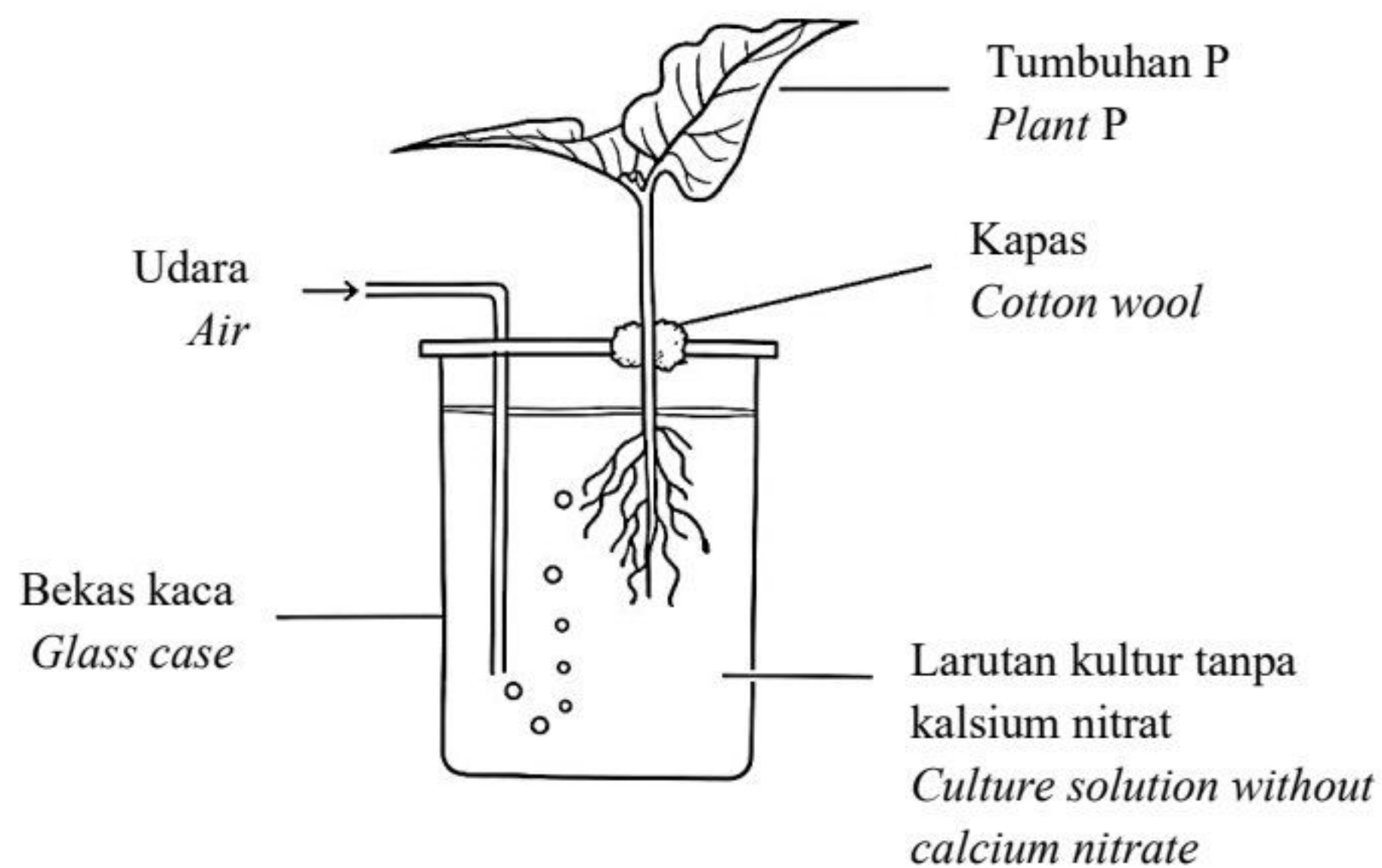
.....

.....

[2 markah / 2 marks]

3(b)
2

- (c) Rajah 3.3 menunjukkan tumbuhan P yang dimasukkan ke dalam larutan kultur tetapi
 (s) tanpa kalsium nitrat, $\text{Ca}(\text{NO}_3)_2$.
 Diagram 3.3 shows plants P placed in a culture solution but without calcium nitrate, $\text{Ca}(\text{NO}_3)_2$.



Rajah 3.3
 Diagram 3.3

Ramalkan keadaan tumbuhan P dalam Rajah 3.3 selepas satu bulan dimasukkan ke dalam larutan kultur tersebut.
 Predict the condition of plant P in Diagram 3.3 after one month of being placed in the culture solution.

.....

.....

.....

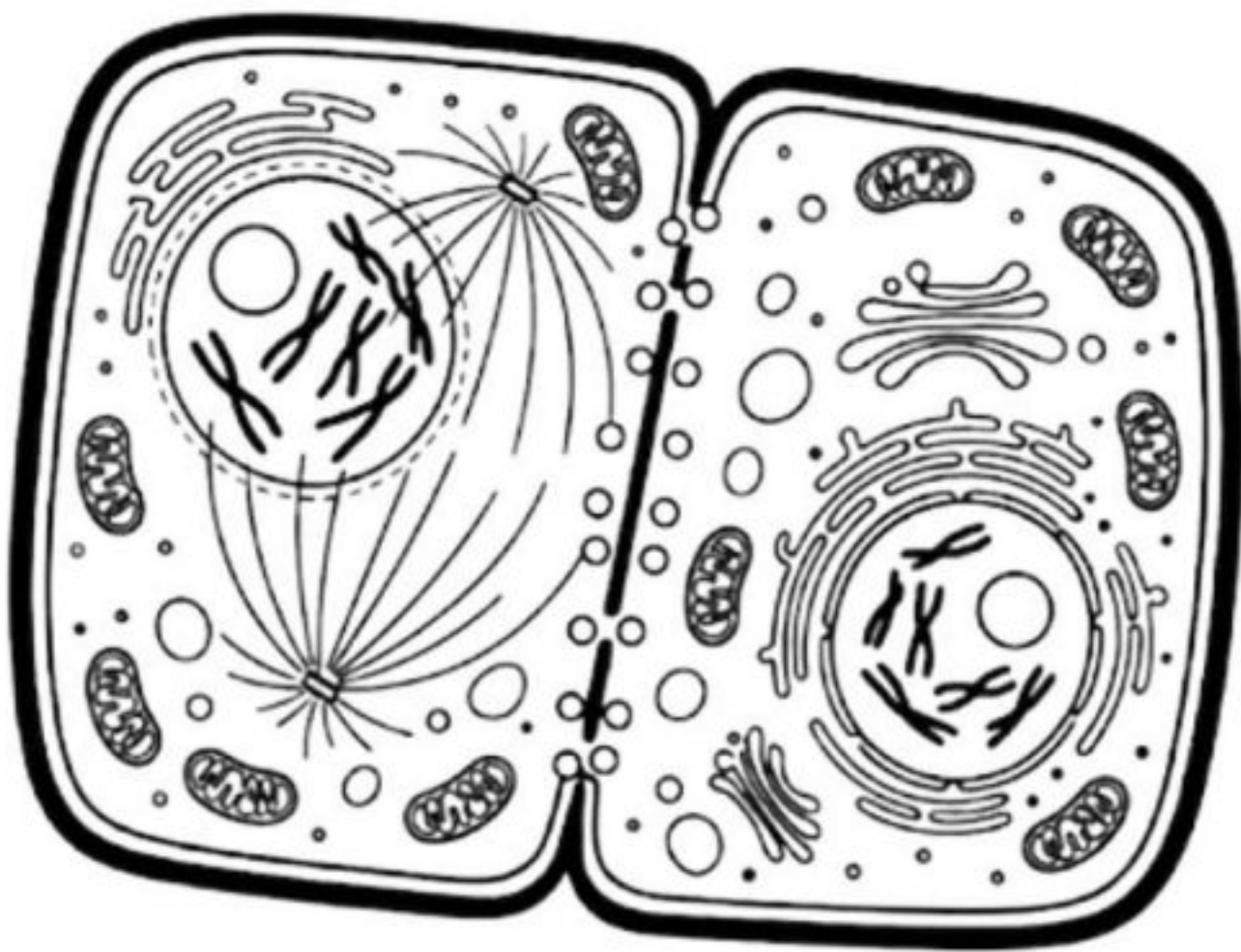
[3 markah / 3 marks]

3(c)
3
Jumlah
7

<https://t.me/cikgufazliebiosensei>

4.
- Rajah 4.1 menunjukkan sel meristem tumbuhan yang sedang giat membahagi secara mitosis.
Diagram 4.1 shows a plant meristem cell that is actively dividing by mitosis.

Untuk
kegunaan
pemeriksa



Rajah 4.1
Diagram 4.1

- (a)

(i)

Namakan komponen yang banyak ditemui dalam sel ini.
(R) *Name the component found in abundance in this cell.*

.....

[1 markah / 1 mark]
- (ii)

Nyatakan fungsi komponen di (a) (i).
(R) *State the function of the component in (a) (i).*

.....

[1 markah / 1 mark]
- (b)

Sel mesofil palisad tersusun dengan rapat di dalam daun dan mempunyai kepadatan kloroplas yang sangat tinggi. Terangkan keadaan ini.
(R) *Palisade mesophyll cells are closely arranged in the leaf and have a very high density of chloroplast. Explain this condition.*

.....

.....

.....

[2 markah / 2 marks]

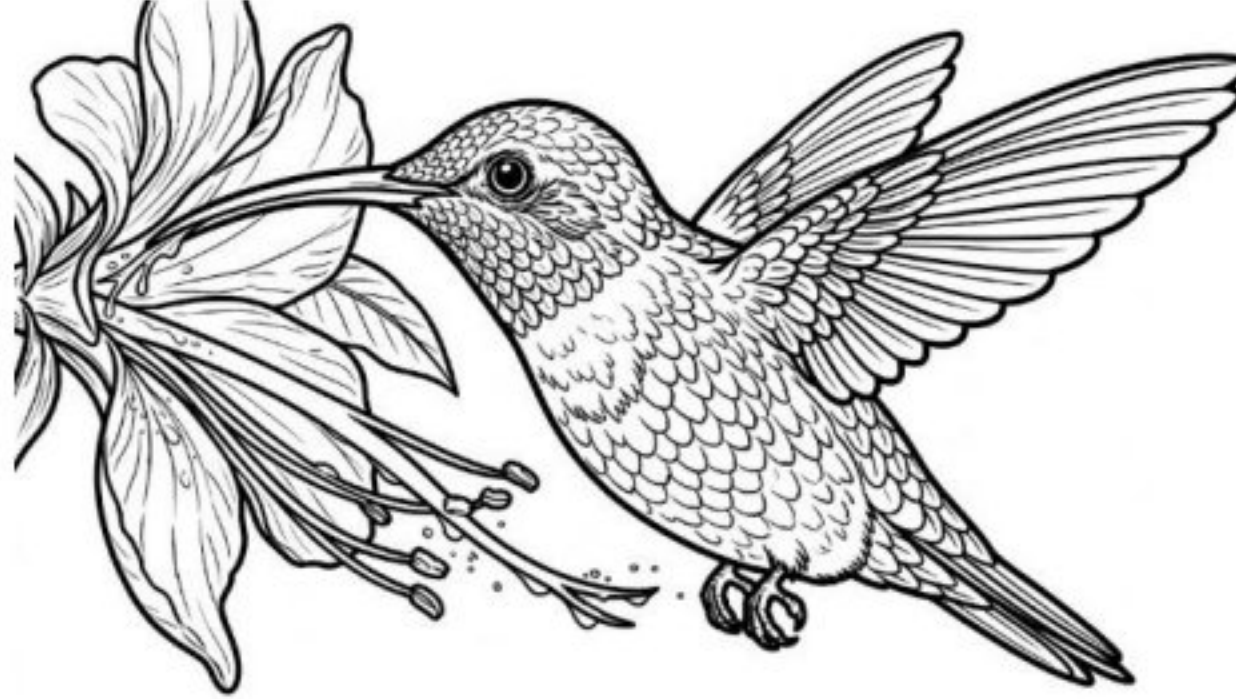
4(a)(i)	
	1

4(a)(ii)	
	1

4(b)	
	2

- (c) Rajah 4.2 menunjukkan seekor burung kelicap yang kelihatan pegun semasa sedang
(S) menghisap nektar. Burung ini mampu mengepakkan sayapnya sehingga 80 kali
(T) sesaat.

Diagram 4.2 shows a hummingbird that appears to be stationary while sucking nectar. This bird can flap its wings up to 80 times per second.



Rajah 4.2
Diagram 4.2

Berdasarkan situasi di atas, jelaskan adaptasi pada sel di kepak burung kelicap tersebut.

Based on the situation above, explain the adaptation in the cells in the hummingbird's wings.

.....

.....

.....

.....

[3 markah / 3 marks]

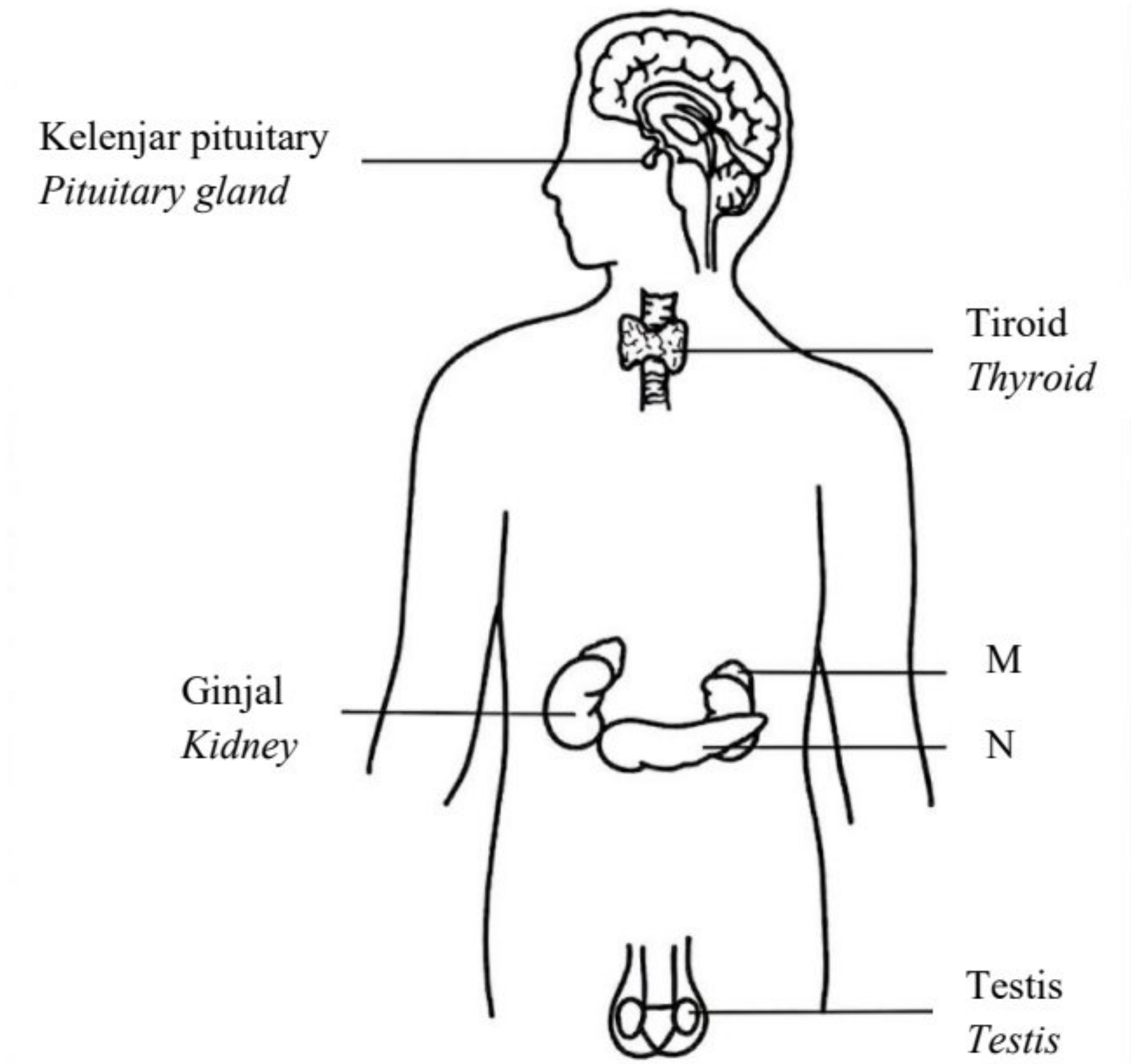
Untuk
kegunaan
pemeriksa

4(c)
3

Jumlah
7

5. Rajah 5.1 menunjukkan sistem endokrin manusia.
Diagram 5.1 shows the human endocrine system.

Untuk
kegunaan
pemeriksa



Rajah 5.1
Diagram 5.1

- (a) (i) Namakan kelenjar M.
Name the M gland.
-
- [1 markah / 1 mark]
- (ii) Nyatakan **satu** contoh hormon yang dirembeskan oleh organ N dan **funksinya** mengawalatur aras glukosa dalam darah.
*State **one** example of hormone secreted by organ N and **its function** in regulating glucose levels in the blood.*

Hormon :
Hormone :
Fungsi :
Function :
.....

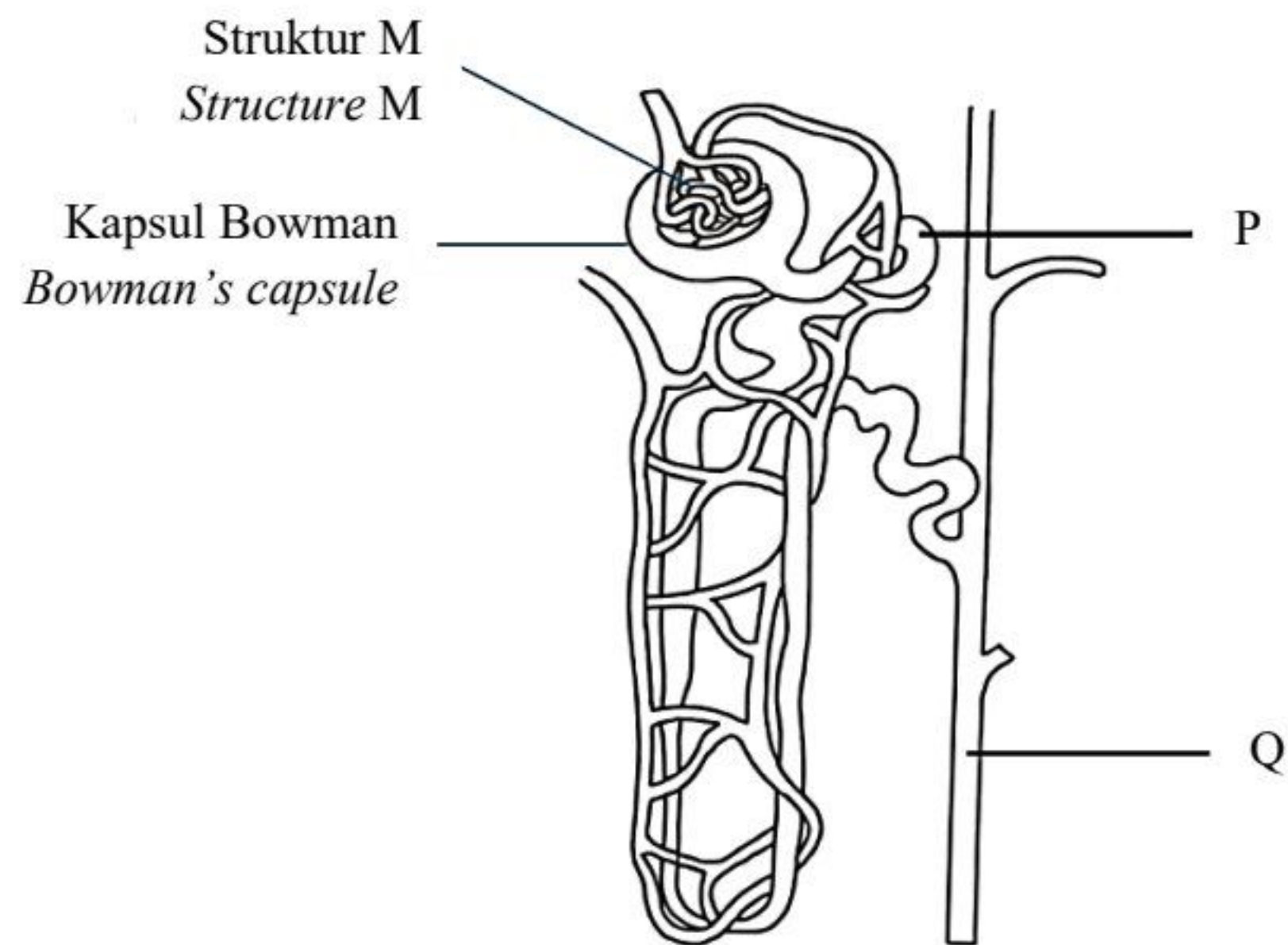
[2 markah / 2 marks]

5(a)(i)	
	1

5(a)(ii)	
	2

- (b) Rajah 5.2 menunjukkan struktur nefron dalam ginjal manusia.
Diagram 5.2 shows the structure of a nephron in the human kidney.

Untuk
kegunaan
pemeriksa



Rajah 5.2
Diagram 5.2

- (i) Encik Y telah menghidap diabetes mellitus selama 15 tahun.
 Penyakit ini telah menyebabkan kerosakan pada struktur M dalam Rajah 5.2.
 Huraikan kesan kerosakan pada struktur M terhadap sistem urinari Encik Y.
Mr. Y has had diabetes mellitus for 15 years.
This disease has caused damage to the structure M in Diagram 5.2.
Describe the effect of the damage to the structure M on his urinary system.

.....

.....

.....

.....

.....

[3 markah / 3 marks]

5(b)(i)	
	3

<https://t.me/cikgufazliebiosensei>

- (ii) Jadual 1 menunjukkan sebahagian kandungan hasil turasan dalam P dan Q.
Table 1 shows some of the contents of the filter result in P and Q.

Untuk
kegunaan
pemeriksa

Kandungan hasil turasan <i>Filtrate contents</i>	Kepekatan kandungan hasil turasan (%) <i>Concentration of filtrate content (%)</i>	
	P	Q
Glukosa <i>Glucose</i>	0.1	0
Asid amino <i>Amino acids</i>	8.0	0

Jadual 1
Table 1

Terangkan **satu** perbezaan kandungan dalam P dan Q.
*Explain **one** difference between the content in P and Q.*

.....

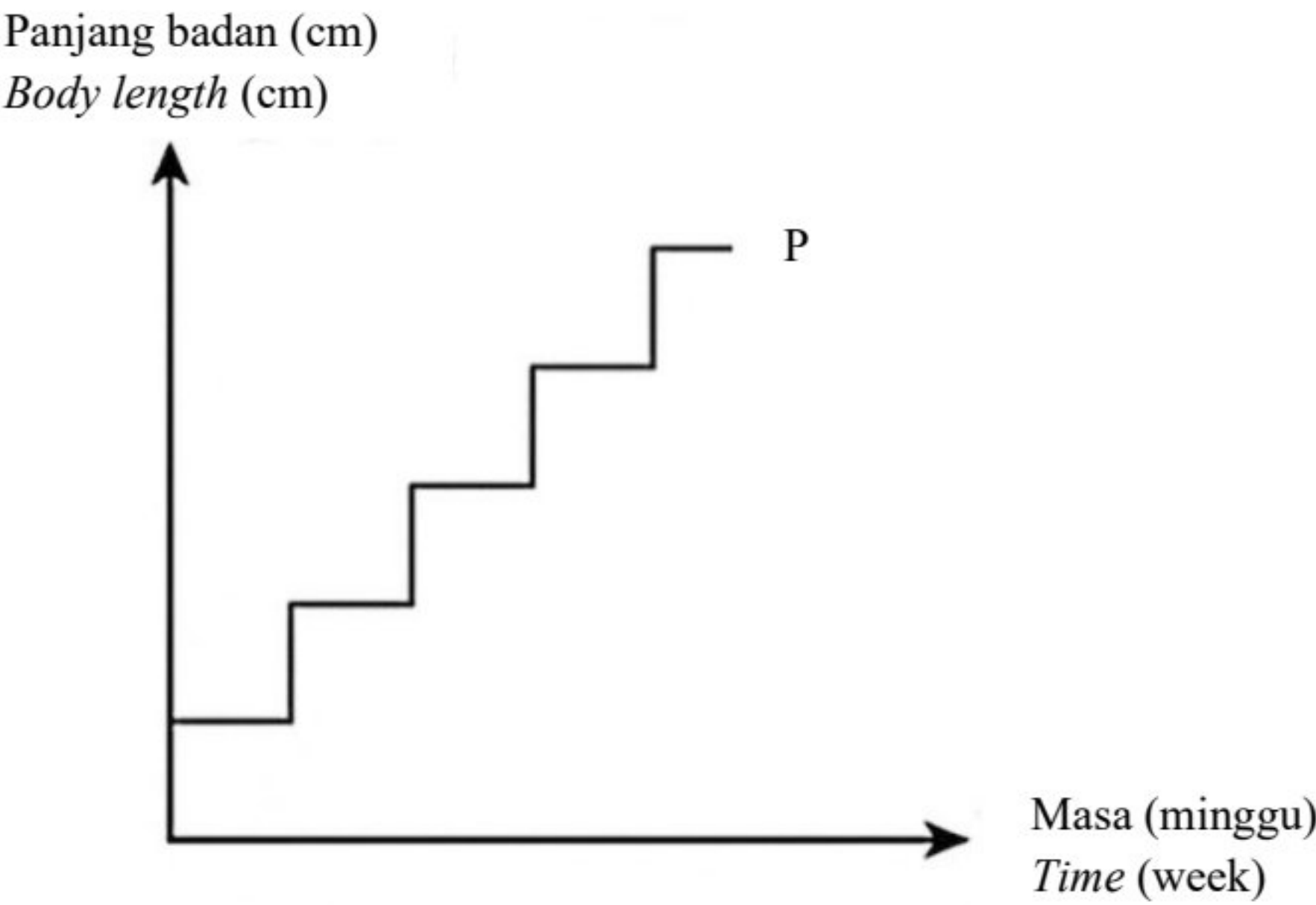
.....

.....

[2 markah / 2 marks]

5(b)(ii)	
	2
Jumlah	
	8

6. Rajah 6 menunjukkan lengkung pertumbuhan suatu organisma.
Diagram 6 the growth curve of an organism.



Rajah 6
Diagram 6

- (a) Namakan jenis organisma yang mempunyai lengkung pertumbuhan seperti yang ditunjukkan dalam Rajah 6.
(R) *Name the type of organism that has the growth curve shown in Diagram 6.*

.....

[1 markah / 1 mark]

Untuk
kegunaan
pemeriksa

6(a)	
	1

- (b) Nyatakan **satu** contoh organisma yang mengalami pertumbuhan jenis ini.
(R) *Name **one** example of organism that experienced this type of growth.*

.....

[1 markah / 1 mark]

6(b)	
	1

- (c) Bezakan lengkung pertumbuhan dalam Rajah 6 dengan lengkung pertumbuhan manusia.
(S) *Differentiate the growth curve in Diagram 6 with the growth curve in humans.*

Lengkung Pertumbuhan P <i>Growth Curve P</i>	Lengkung Pertumbuhan Manusia <i>Human Growth Curve</i>

[2 markah / 2 marks]

6(c)	
	2

- (d) Terangkan mengapa organisma jenis ini mempunyai lengkung pertumbuhan seperti yang ditunjukkan dalam Rajah 6.
(R) *Explain why this organism has the growth curve as shown in the Diagram 6.*

.....

.....

.....

[2 markah / 2 marks]

6(d)	
	2

- (e) (i) Ekdisis ialah proses penyalinan rangka luar bagi organisma yang menjalani pertumbuhan ini. Tandakan **X** untuk proses ekdisis pada Rajah 6.
(R) *Ecdysis is the moulting process of the exoskeleton for the organism that undergoes this growth. Mark **X** for the ecdysis process in Diagram 6.*

[1 markah / 1 mark]

6(e)(i)	
	1

- (ii) Ramalkan apakah yang akan berlaku jika organisma ini gagal menjalani proses X.
(T) *Predict what will happen to the organism if the organism fails to undergo process X.*

Untuk
kegunaan
pemeriksa

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

6(e)(ii)	
	1
Jumlah	
	8

7. Rajah 7 menunjukkan satu ekosistem.
Diagram 7 shows an ecosystem.



Rajah 7
Diagram 7

- (a) (i) Nyatakan maksud pengguna tertier.
State the definition of tertiary consumer.

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

- (ii) Terangkan **satu** kepentingan tumbuhan hijau dalam ekosistem tersebut.
*Explain **one** importance of green plants in the ecosystem.*

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

7(a)(i)	
	1

7(a)(ii)	
	1

- (iii) Bina **satu** rantai makanan yang terdiri daripada empat aras trof.
*Construct **one** food chain consisting of four trophic levels.*

[2 markah / 2 marks]

- (iv) Ramalkan apa yang berlaku jika semua pengguna primer mati?
Predict what will happen if all primary consumers die?

.....

.....

[1 markah / 1 mark]

- (b) Pernyataan berikut mengenai populasi panda gergasi.
The following statement is about a population of giant pandas.

Kajian ada menunjukkan populasi panda gergasi (*Ailuropoda melanoleuca*) di China menurun sebanyak 70% sejak 50 tahun yang lalu. Panda gergasi kini dilindungi sepenuhnya di bawah Akta Pemuliharaan Hidupan Liar 2020 dan dikelaskan sebagai Species Terancam Kritikal oleh IUCN.

-The Guardian,
5 September 2016

*Studies have shown that the population of giant pandas (*Ailuropoda melanoleuca*) in China has declined by 70% over the past 50 years. The giant panda is now fully protected under the 2020 Wildlife Conservation Act and classified as Critically Endangered by IUCN.*

-The Guardian,
5 September 2016

- (i) Nyatakan nama saintifik bagi panda gergasi.
State the scientific name of giant pandas.

.....

[1 markah / 1 mark]

Untuk
kegunaan
pemeriksa

7(a)(iii)

1

7(a)(iv)

1

7(b)(i)

1

- (ii) Penurunan populasi panda gergasi boleh memberi kesan kepada biodiversiti. Wajarkan kepentingan usaha pemuliharaan panda gergasi terhadap keseimbangan ekosistem.
The decline in the population of giant pandas can affect biodiversity. Justify the importance of conservation efforts for giant pandas in maintaining ecosystem balance.

.....

.....

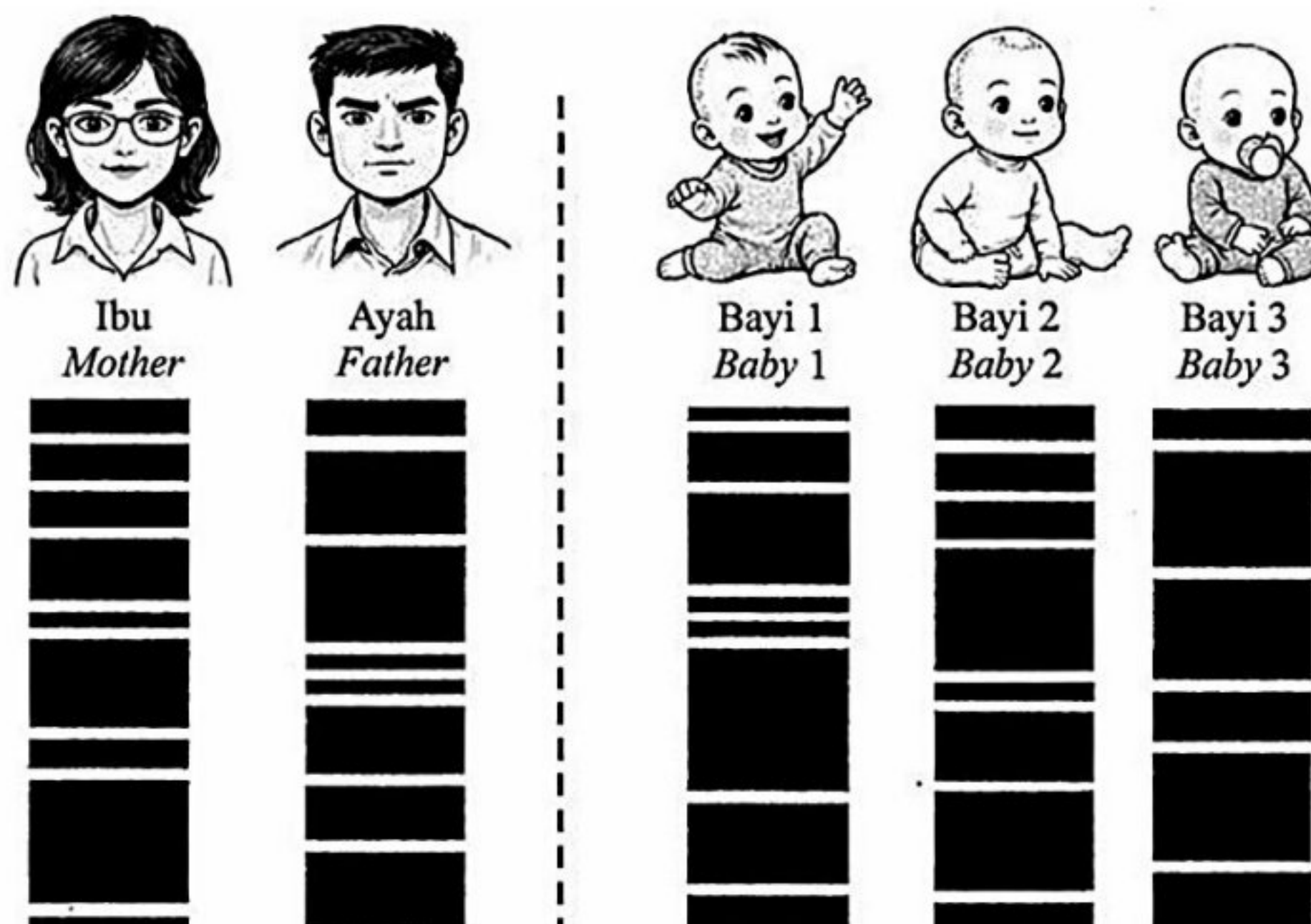
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.....

[3 markah / 3 marks]

8. Rajah 8.1 menunjukkan jalur DNA bagi seorang ibu, seorang bapa dan tiga orang bayi. Kedua-dua ibu bapa ingin menentukan yang manakah anak mereka.
Diagram 8.1 shows DNA bands for mother, father and three babies. Both parents want to determine which is their child.



Rajah 8.1
 Diagram 8.1

- (a) (i) Berdasarkan Rajah 8.1 namakan aplikasi teknologi yang telah digunakan.
Based on Diagram 8.1, name the biotechnology application used.

.....

[1 markah / 1 mark]

- (ii) Nyatakan **dua** contoh sampel yang boleh diambil daripada bayi tersebut.
*State **two** examples of sample that can be taken from the baby.*

1 :

2 :

[2 markah / 2 marks]
- (b) Berdasarkan jalur DNA dalam Rajah 8.1, tentukan bayi yang mana adalah anak kandung pasangan tersebut? Terangkan jawapan anda.
Based on DNA bands shown in Diagram 8.1 which is their real baby? Explain your answer.

Bayi :

Baby :

Penerangan :

Explanation :

[2 markah / 2 marks]
- (c) Dalam satu kes pembunuhan, sebilah kapak yang mempunyai kesan darah telah ditemukan oleh pihak polis di tempat kejadian. Sampel DNA diekstrak daripada kesan darah pada bilah kapak. Suspek utama kes pembunuhan ini didapati mempunyai kembar seiras.
In a murder case, an axe with blood stains was found by the police at the crime scene. A DNA sample was extracted from the blood stain on the blade of the axe. The main suspect in this murder case was found to have an identical twin.

(i) Terangkan apakah masalah yang akan timbul dalam mengenalpasti penjenayah sebenar menggunakan teknik di (a) (i).
Explain the problem that would arise in identifying the actual criminal using the technique in (a) (i).

.....

.....

[2 markah / 2 marks]

(ii) Nyatakan langkah untuk mengatasi masalah tersebut.
State how to overcome the problem.

.....

.....

.....

[2 markah / 2 marks]
- Untuk
kegunaan
pemeriksa
- | | |
|----------|---|
| 8(a)(ii) | |
| | 2 |
- | | |
|------|---|
| 8(b) | |
| | 2 |
- | | |
|---------|---|
| 8(c)(i) | |
| | 2 |
- | | |
|----------|---|
| 8(c)(ii) | |
| | 2 |
- | | |
|--------|---|
| Jumlah | |
| | 9 |
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SULIT

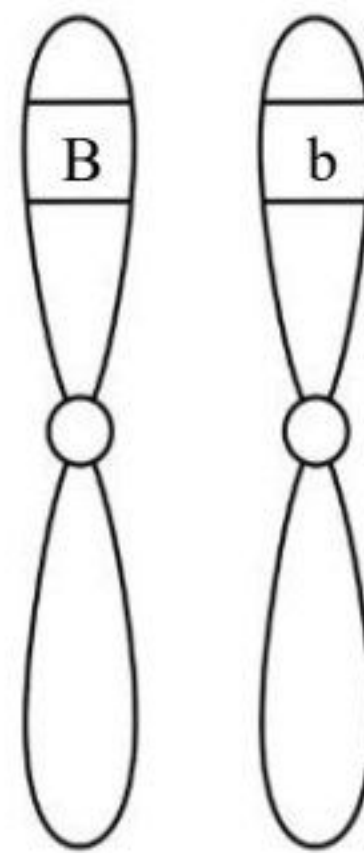
[Lihat halaman sebelah

Bahagian B
Section B

[20 markah / 20 marks]

Jawab **satu sahaja** soalan dalam bahagian ini.
*Answer **only one** question from this section.*

9. Rajah 9.1 menunjukkan sepasang kromosom homolog di dalam seekor arnab. B dan b mewakili alel bagi ciri bagi warna bulu.
Diagram 9.1 shows a pair of homologous chromosomes in a rabbit. Allele B and b represent the alleles for the characteristic of fur colour.



Rajah 9.1
Diagram 9.1

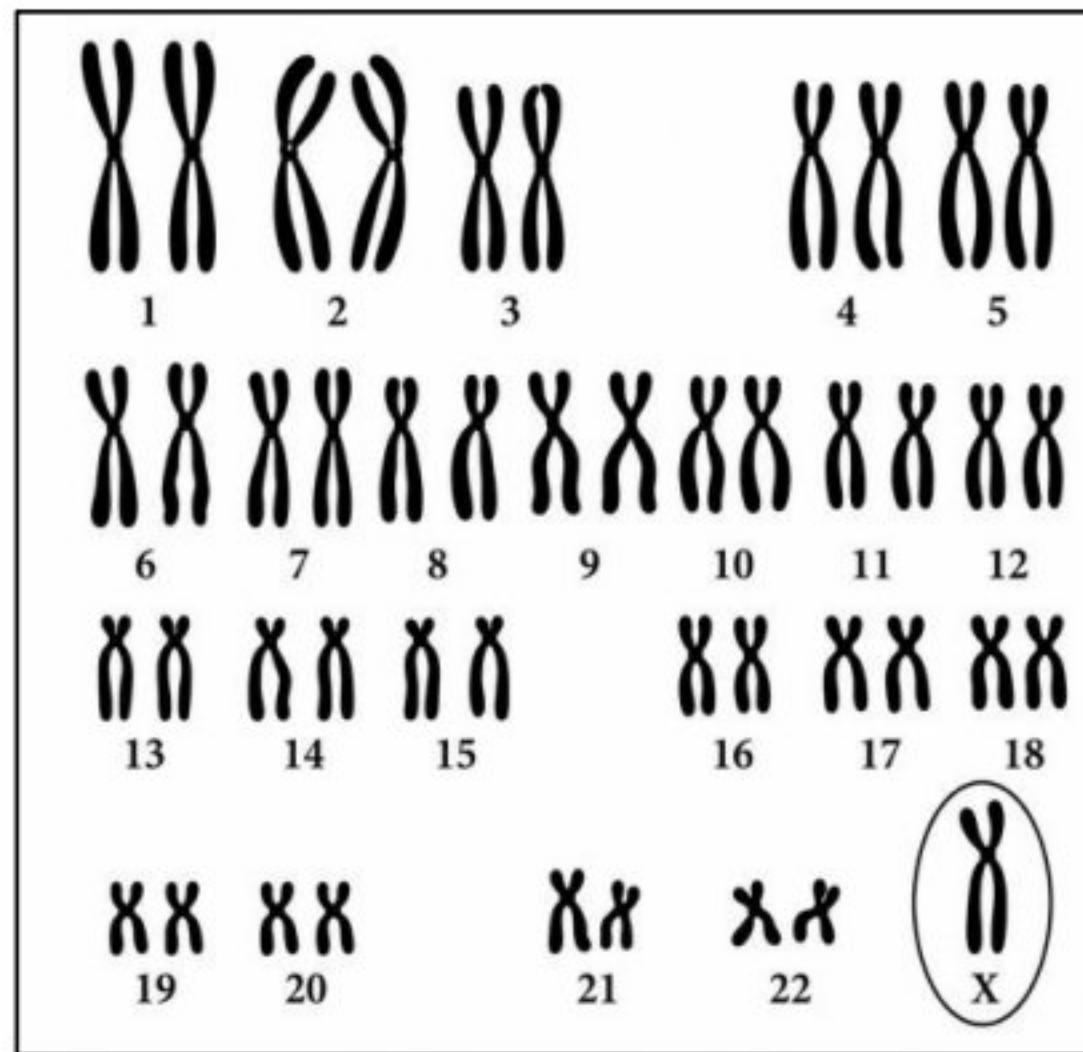
- (a) (i) Berdasarkan Rajah 9.1, terangkan bagaimana ciri warna bulu ditentukan.
(R) *Based on Diagram 9.1, explain how the characteristic of fur colour is determined.*

[2 markah / 2 marks]

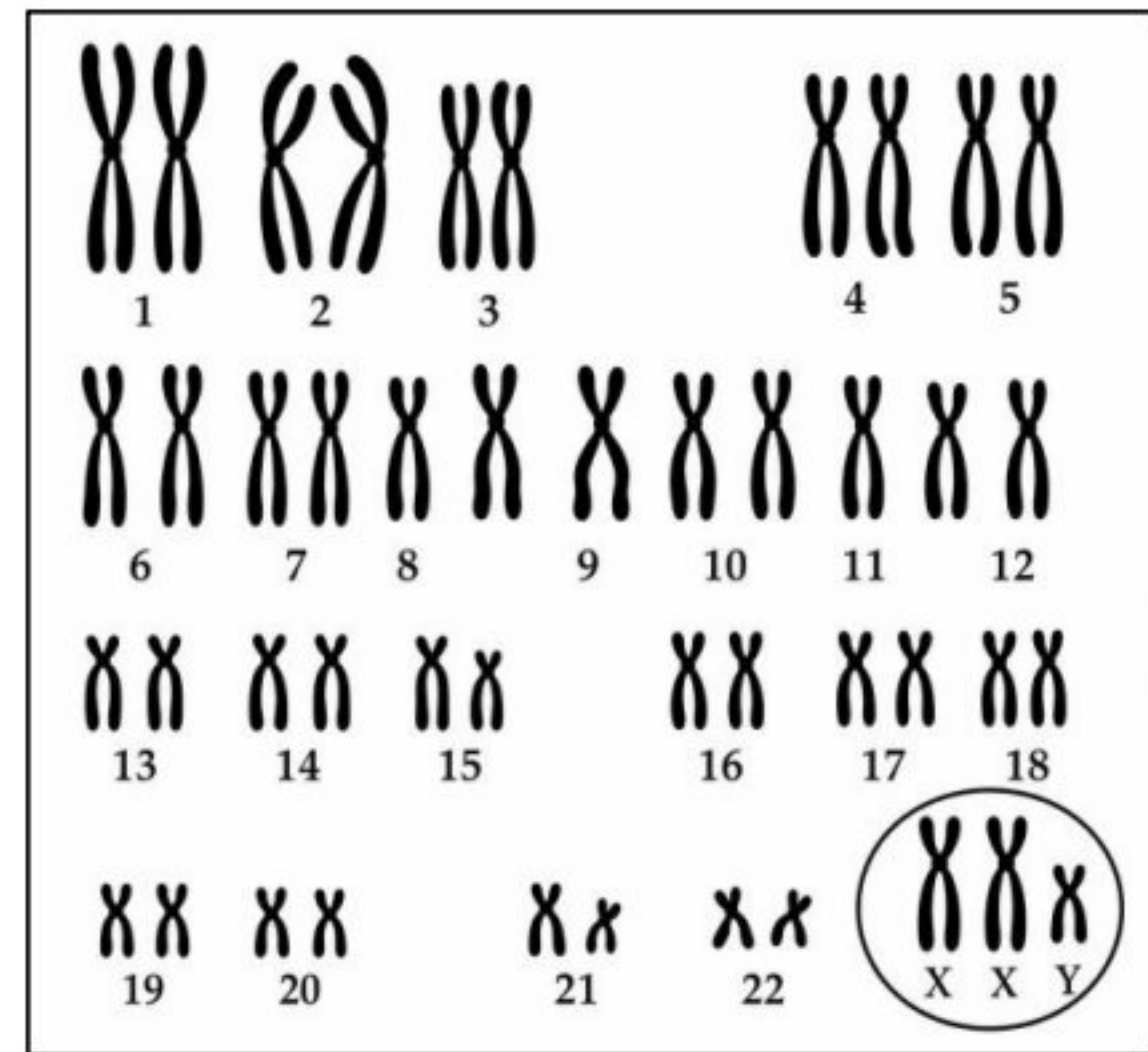
<https://t.me/cikgufazliebiosensei>

- (b) Rajah 9.3(a) dan Rajah 9.3(b) menunjukkan kariotip bagi dua individu yang mempunyai penyakit genetik.

Diagram 9.3(a) and Diagram 9.3(b) shows the karyotypes of two individuals with genetic diseases.



Rajah 9.3(a)
Diagram 9.3(a)



Rajah 9.3(b)
Diagram 9.3(b)

- (i) Banding dan bezakan penyakit yang dihidapi bagi kedua-dua individu tersebut.
(S) *Compare and contrast the diseases suffered by both individuals.*

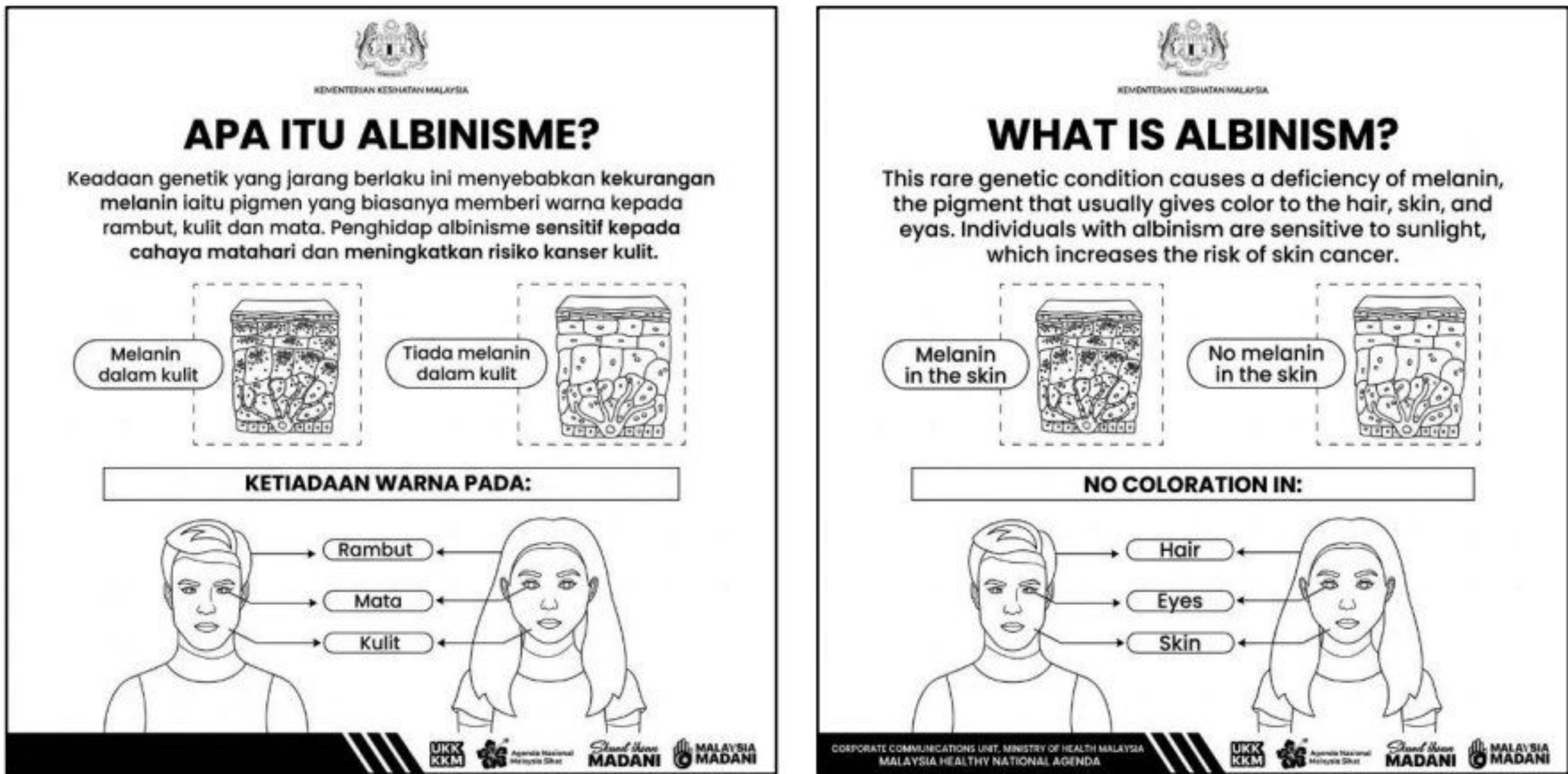
[4 markah / 4 marks]

- (b)
- (ii)

(R)

Rajah 9.4 menunjukkan poster berkaitan penyakit albinisme dari Kementerian Kesihatan Malaysia.

Diagram 9.4 shows poster on albinism disease by Ministry of Health Malaysia.



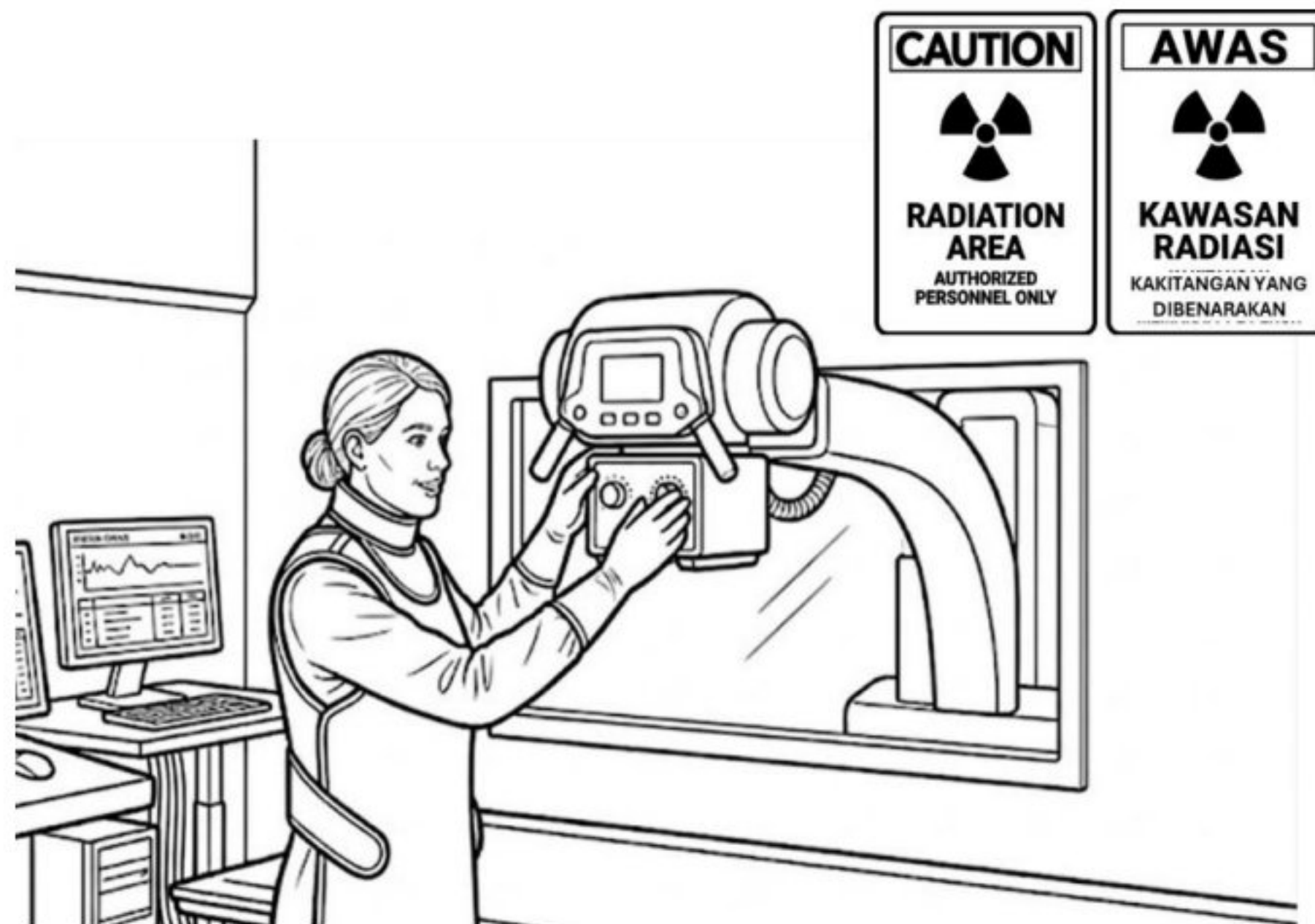
Rajah 9.4
Diagram 9.4

Berdasarkan Rajah 9.4, cadangkan cara mengurangkan gejala penyakit tersebut.
Based on Diagram 9.4, suggest ways to reduce the symptoms of the diseases.

[4 markah / 4 marks]

<https://t.me/cikgufazliebiosensei>

- (c) Rajah 9.5 menunjukkan seorang juru X-ray sedang mengendalikan mesin X-ray.
(R) *Diagram 9.5 shows an X-ray technician operating an X-ray machine.*



Rajah 9.5
Diagram 9.5

Terangkan bagaimana pendedahan di tempat kerja tersebut boleh memberi risiko terhadap tahap kesihatan juru X-ray tersebut.

Explain how the exposure in the workplace can pose health risks to the X-ray technician.

[4 markah / 4 marks]

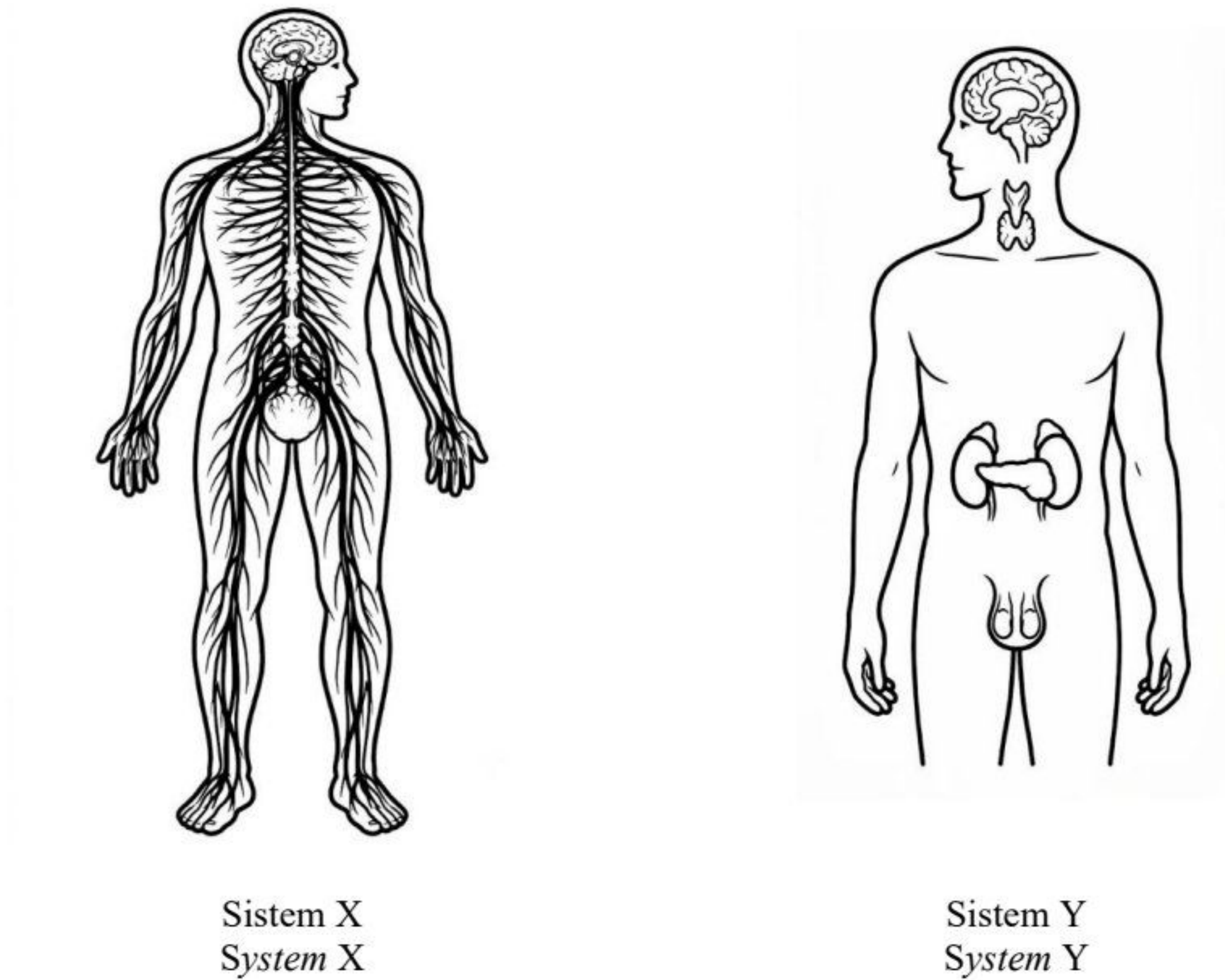
RUANGAN JAWAPAN / *SPACE FOR ANSWERS*
BAHAGIAN B / *SECTION B*

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RUANGAN JAWAPAN / *SPACE FOR ANSWERS*
BAHAGIAN B / *SECTION B*

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

10. Rajah 10.1 menunjukkan sistem X dan sistem Y.
Diagram 10.1 shows system X and system Y.



Rajah 10.1
Diagram 10.1

- (a) (i) Nyatakan **dua** fungsi sistem X.
(R) *State **two** functions of system X.* [2 markah / 2 marks]
- (ii) Berdasarkan Rajah 10.1, banding dan bezakan sistem X dan sistem Y.
(R) *Based on Diagram 10.1, compare and contrast system X and system Y.* [4 markah / 4 marks]
- (iii) Murid P tiba-tiba dikejar oleh seekor anjing semasa berjalan pulang dari sekolah.
(S) Terangkan bagaimana sistem X dan sistem Y membantu murid P menghadapi situasi tersebut.
Student P was suddenly chased by a dog while walking home from school. Explain how system X and system Y help student P respond to the situation. [4 markah / 4 marks]

<https://t.me/cikgufazliebiosensei>

- (b) Rajah 10.2 menunjukkan gerak balas M dan gerak balas N.
(s) *Diagram 10.2 shows response M and response N.*



Gerak balas M
Response M



Gerak balas N
Response N

Rajah 10.2
Diagram 10.2

Banding dan bezakan antara gerak balas M dan gerak balas N.
Compare and contrast between response M and response N.

[5 markah / 5 marks]

- (c) Semasa pemeriksaan kesihatan, doktor mengetuk tendon di bawah tempurung lutut seorang pesakit Z menggunakan tukul refleks. Kaki pesakit Z tersentak ke hadapan. Terangkan bagaimana gerak balas tersebut berlaku.
(T) *During a medical examination, a doctor tapped the tendon below a patient Z kneecap using a reflex hammer. The patient Z leg jerked forward. Explain how this response occurs*

[5 markah / 5 marks]

RUANGAN JAWAPAN / *SPACE FOR ANSWERS*
BAHAGIAN B / *SECTION B*

[illegible]

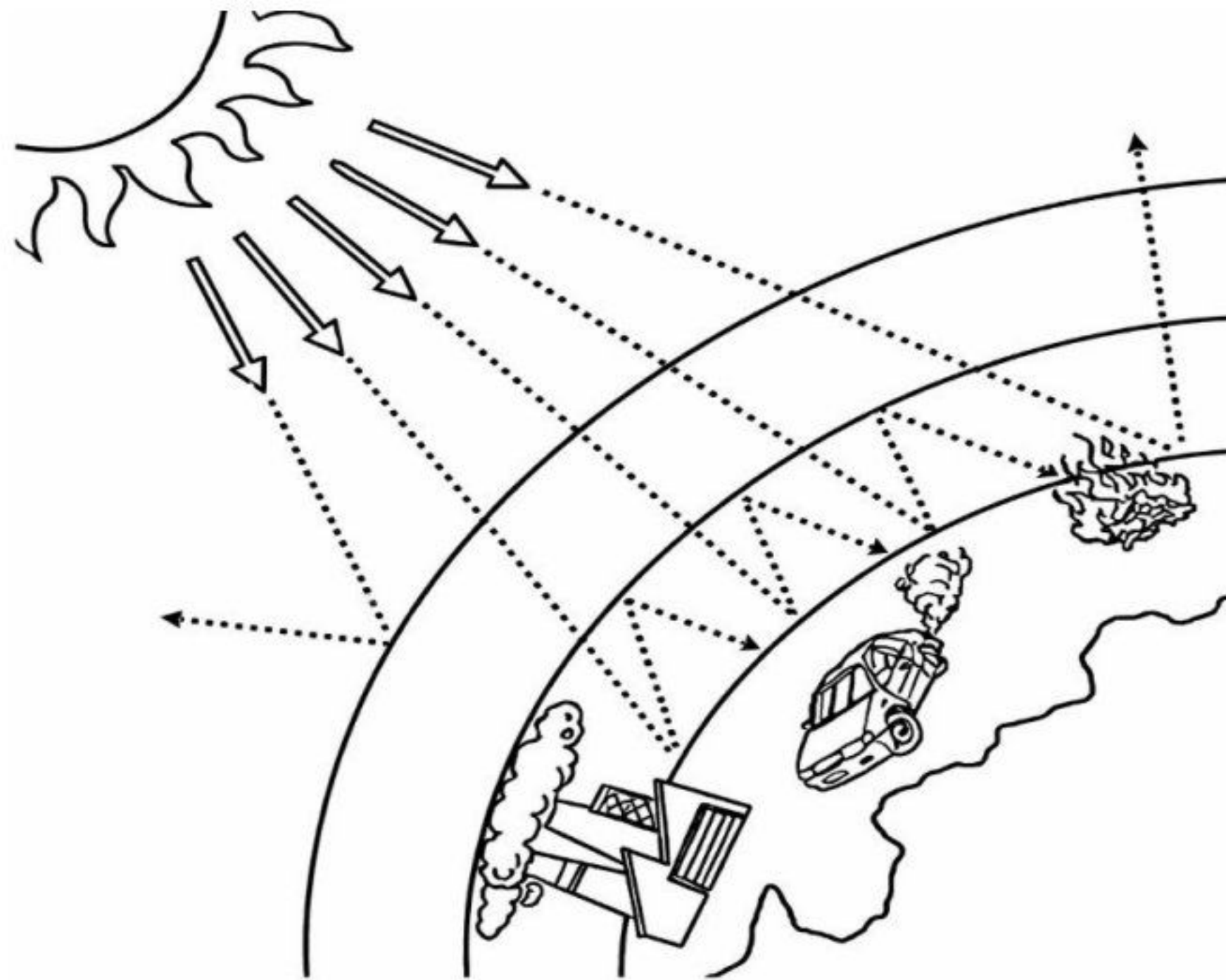
[illegible]

Bahagian C
Section C

[20 markah / 20 marks]

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

11. Rajah 11.1 menunjukkan aktiviti manusia yang memberi kesan negatif terhadap ekosistem.
Diagram 11.1 shows human activities that negatively affect the ecosystem.



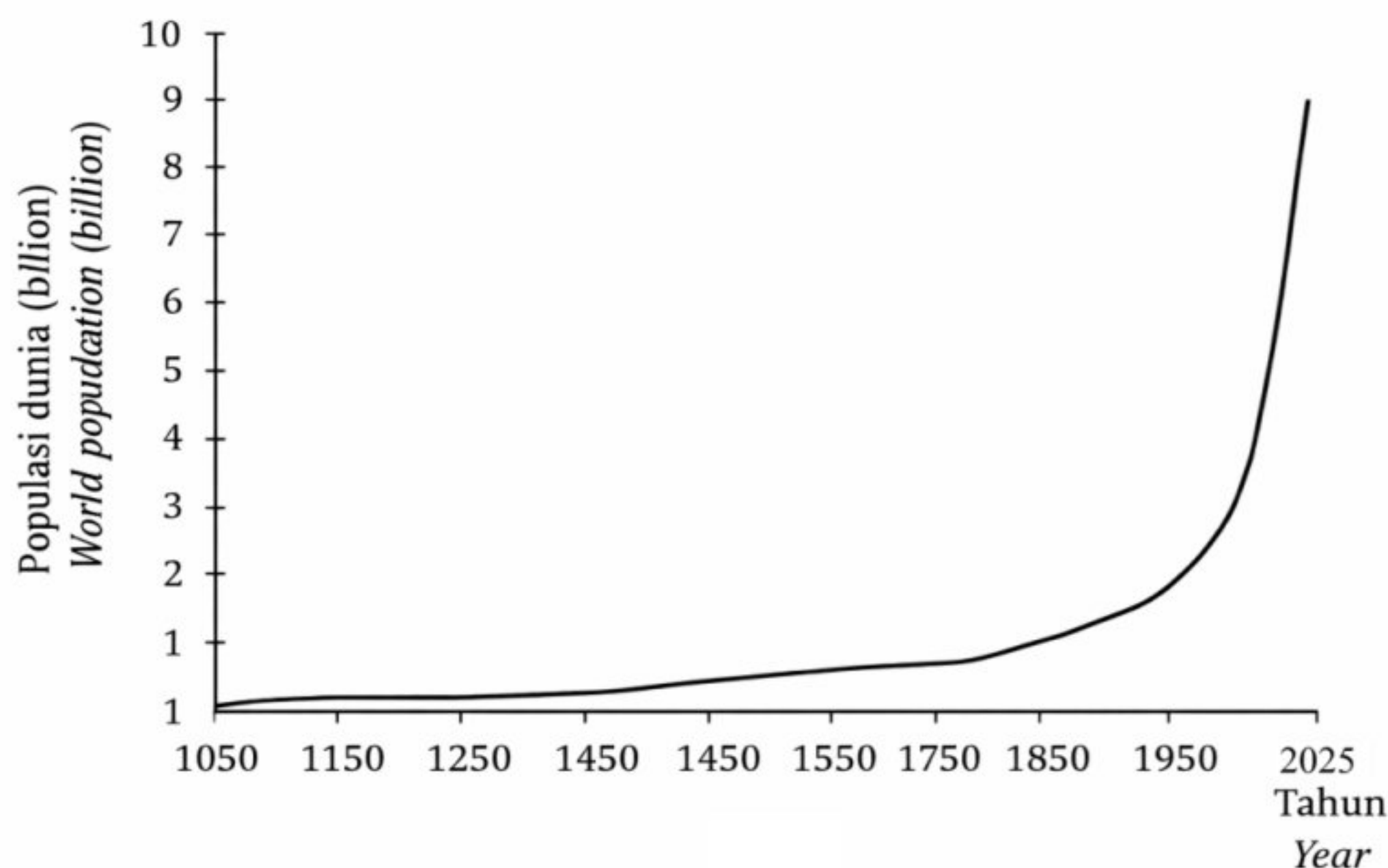
Rajah 11.1
Diagram 11.1

- (a) (i) Terangkan kesan aktiviti tersebut terhadap ekosistem.
(R) *Explain the effects of the activities on the ecosystem.* [4 markah / 4 marks]
- (ii) Cadangkan langkah-langkah untuk mengurangkan kesan tersebut.
(R) *Suggest ways to reduce the effects.*
(S) [6 markah / 6 marks]

<https://t.me/cikgufazLiebiosensei>

- (b) Rajah 11.2 menunjukkan perubahan populasi manusia di dunia dari tahun 1050 hingga 2025.
(S)

Diagram 11.2 shows the change in world human population from year 1050 to 2025.



Rajah 11.2
Diagram 11.2

Seorang pemaju mencadangkan pembukaan kawasan hutan untuk pembangunan perumahan bagi menampung peningkatan populasi manusia. Wajarkah cadangan tersebut.

A developer proposes clearing forest areas for housing development to accommodate the increasing human population. Justify the proposal.

[4 markah / 4 marks]

- (c) Penduduk di kawasan M semakin meningkat sehingga menyebabkan kekurangan kawasan perumahan. Bagi memenuhi keperluan penduduk yang semakin bertambah, pihak berkuasa merancang untuk membuka sebuah penempatan baharu yang dilengkapi dengan kemudahan asas seperti sekolah, hospital, sistem pengangkutan dan kawasan rekreasi. Walau bagaimanapun, pembangunan tersebut perlu dilaksanakan secara lestari bagi meminimumkan kesan negatif terhadap alam sekitar.

The population in area M has increased, resulting in a shortage of housing areas. To meet the needs of the growing population, the authorities plan to open a new settlement equipped with basic facilities such as schools, hospitals, transportation systems and recreational areas. However, the development must be carried out sustainably to minimise negative impacts on the environment.

Sebagai seorang perancang bandar, rancang satu pelan pembangunan lestari bagi kawasan M yang dapat memenuhi keperluan penduduk tanpa menjejaskan alam sekitar.
As an urban planner, plan a sustainable development plan for area M that can meet the needs of the population without affecting the environment.

[6 markah / 6 marks]

RUANGAN JAWAPAN / *SPACE FOR ANSWERS*
BAHAGIAN C / *SECTION C*

This image shows a full page of a handwriting practice worksheet. It consists of multiple rows of horizontal dotted lines spaced evenly down the page, providing a guide for letter height and placement. The background is plain white, and there are no other markings or text present.

RUANGAN JAWAPAN / *SPACE FOR ANSWERS*
BAHAGIAN C / *SECTION C*

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.