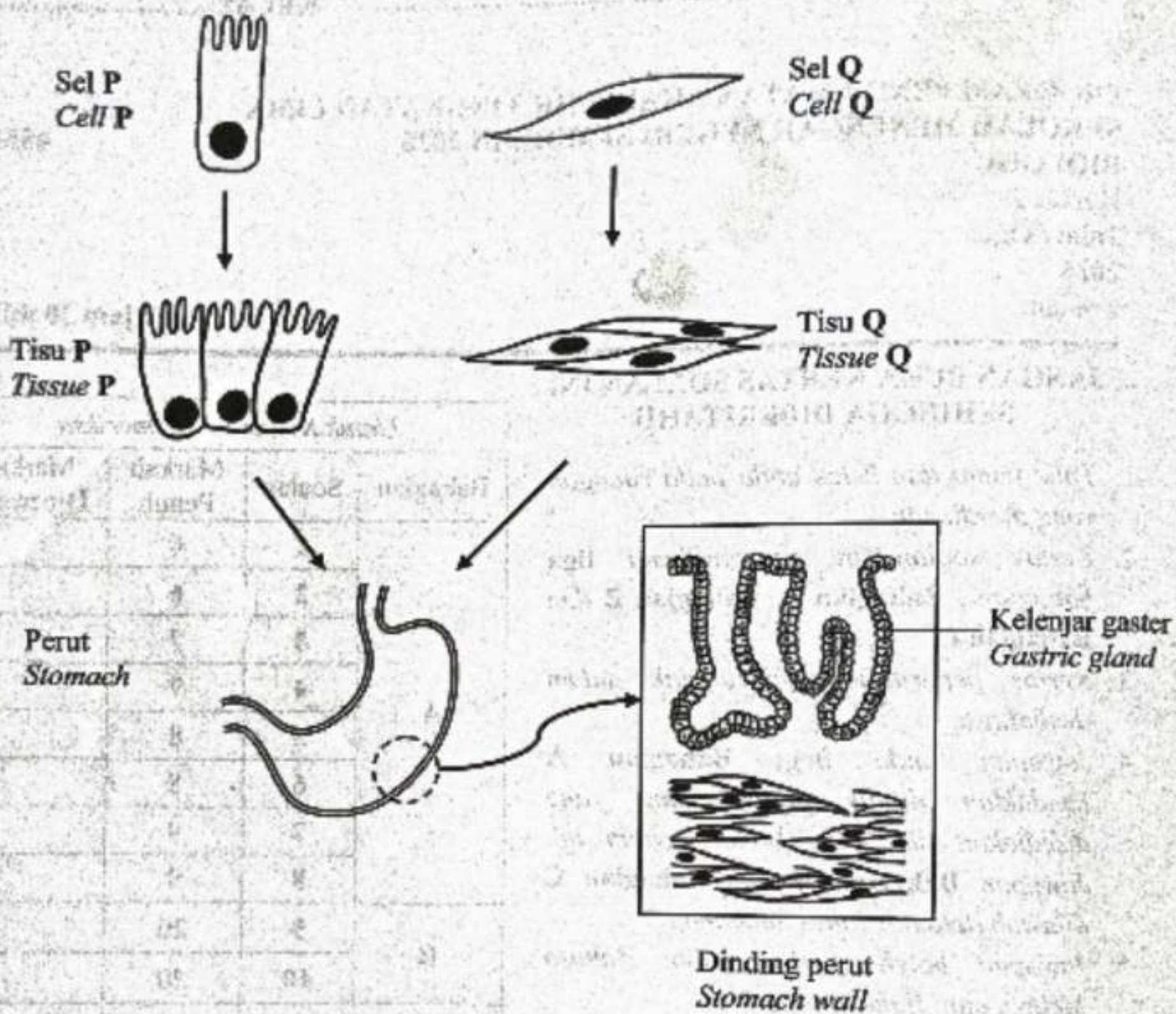


Bahagian A

[60 markah]

Jawab semua soalan.

- 1 Rajah 1 menunjukkan aras organisasi sel dalam manusia.
Diagram 1 shows the levels of cell organisation in human.



Rajah 1 / Diagram 1

- (a) Nyatakan nama sel P dan tisu Q.
State the name of cell P and tissue Q.

P:

Q:

[2 markah/marks]

- (b) (i) Berdasarkan Rajah 1, nyatakan aras organisasi sel bagi perut.
Based on Diagram 1, state the level of cell organisation for stomach.

[1 markah/mark]

- (ii) Jelaskan jawapan anda di 1(b)(i).
Explain your answer in 1(b)(i).

[1 markah/mark]

- (c) Kelenjar gaster terdiri daripada sel P yang telah mengalami pengubahsuaian struktur dan fungsi.

Berikan satu contoh sel P yang terubahsuai serta fungsinya.

The gastric gland consists of cell P that have undergone modifications in structure and function.

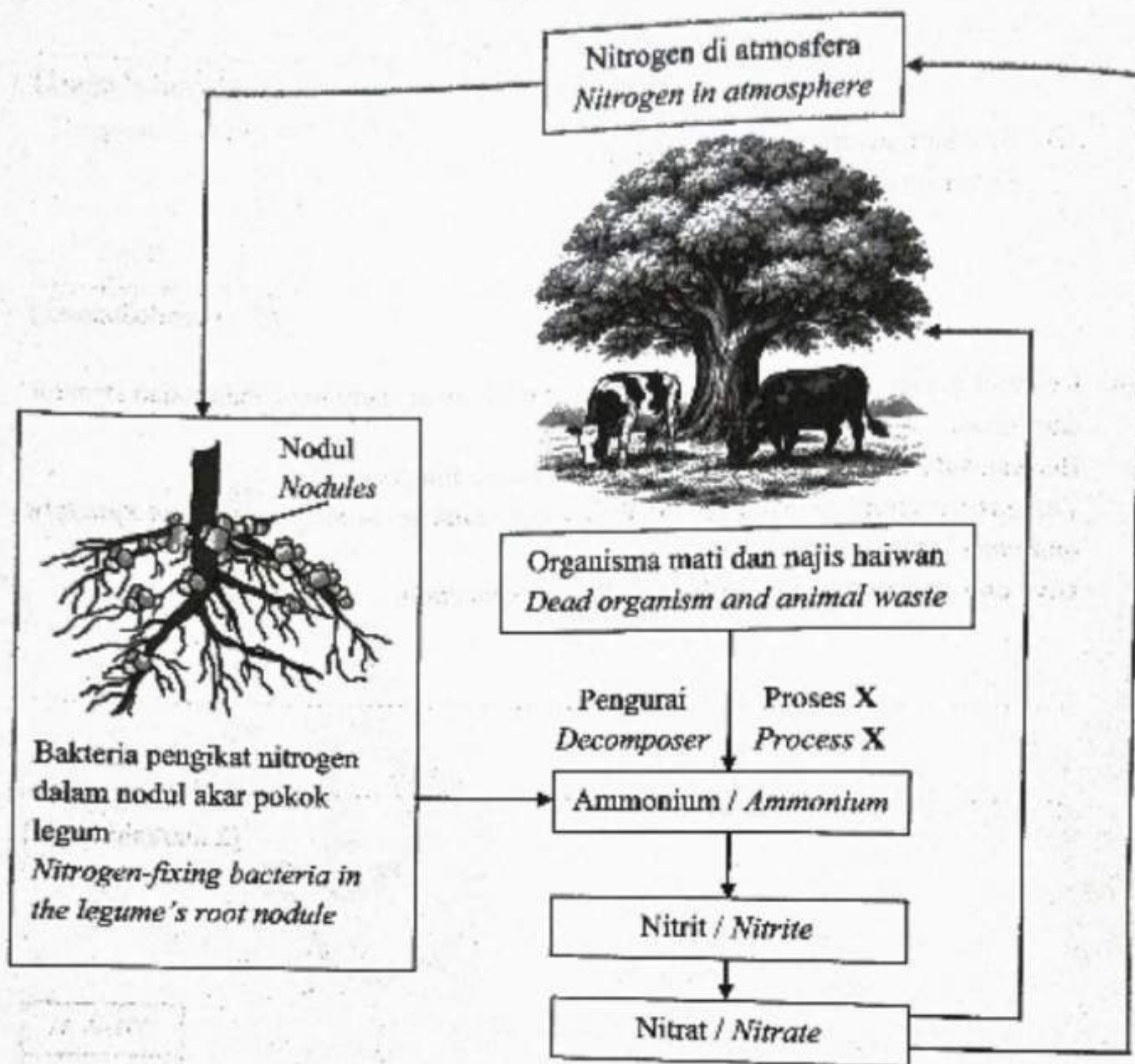
Give one example of a modified cell P and its function.

[2 markah/marks]

TOTAL AI	
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- 2 Rajah 2 menunjukkan suatu kitar nitrogen.
Diagram 2 shows a nitrogen cycle.

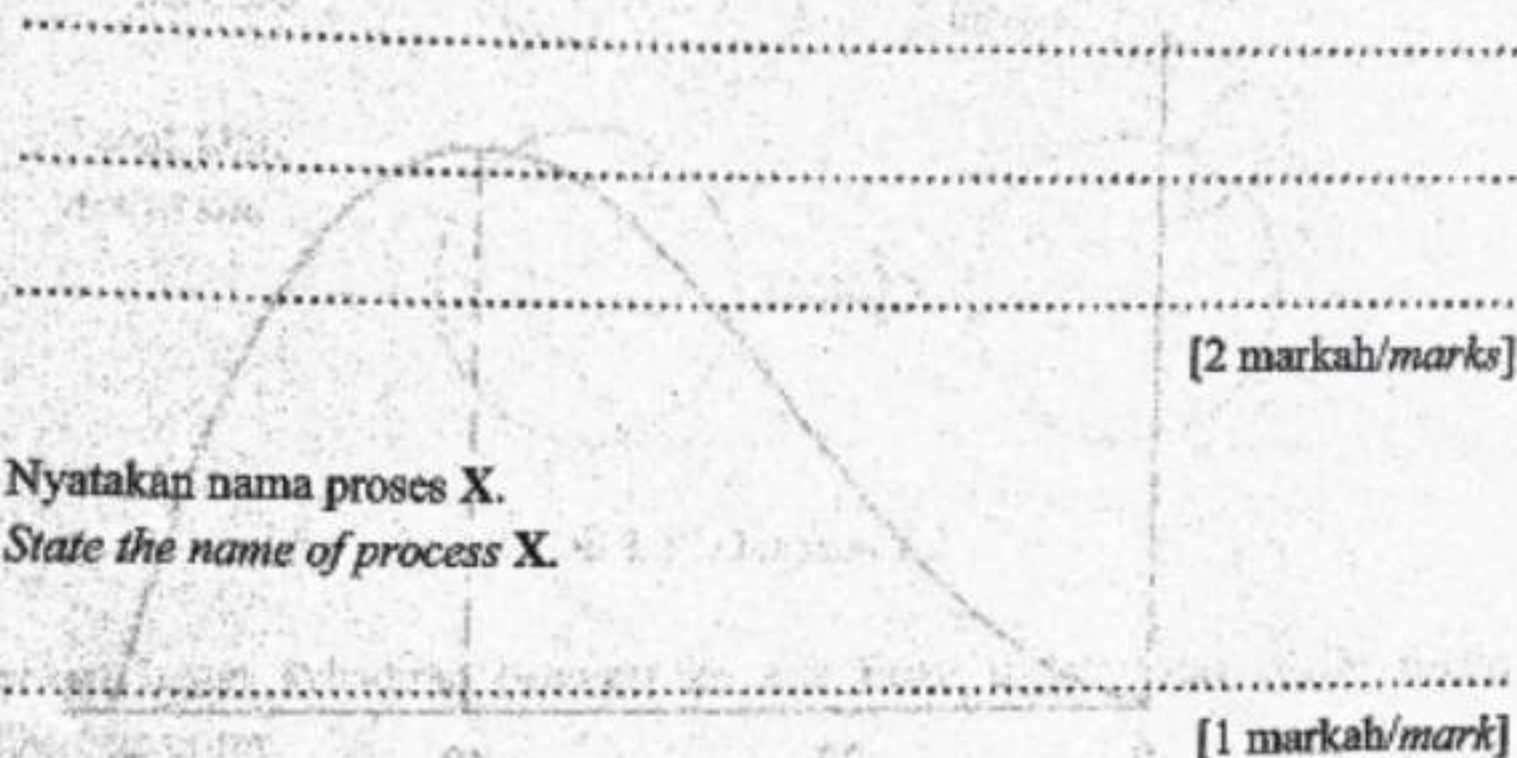


Rajah 2 / Diagram 2

- (a) (i) Berdasarkan Rajah 2, nyatakan nama bakteria yang terdapat di dalam nodul tumbuhan legum.
Based on Diagram 2, state the name of the bacteria found in the nodules of the leguminous plants.

[1 markah/mark]

- (ii) Terangkan interaksi yang wujud di antara bakteria yang dinamakan di 2(a)(i) dengan tumbuhan legum.
Explain the interaction that exists between the bacteria named in 2(a)(i) and leguminous plants.



- (b) (i) Nyatakan nama proses X.
State the name of process X.

[1 markah/mark]

- (ii) Terangkan kepentingan proses X kepada tumbuhan.
Explain the importance of process X to plants.

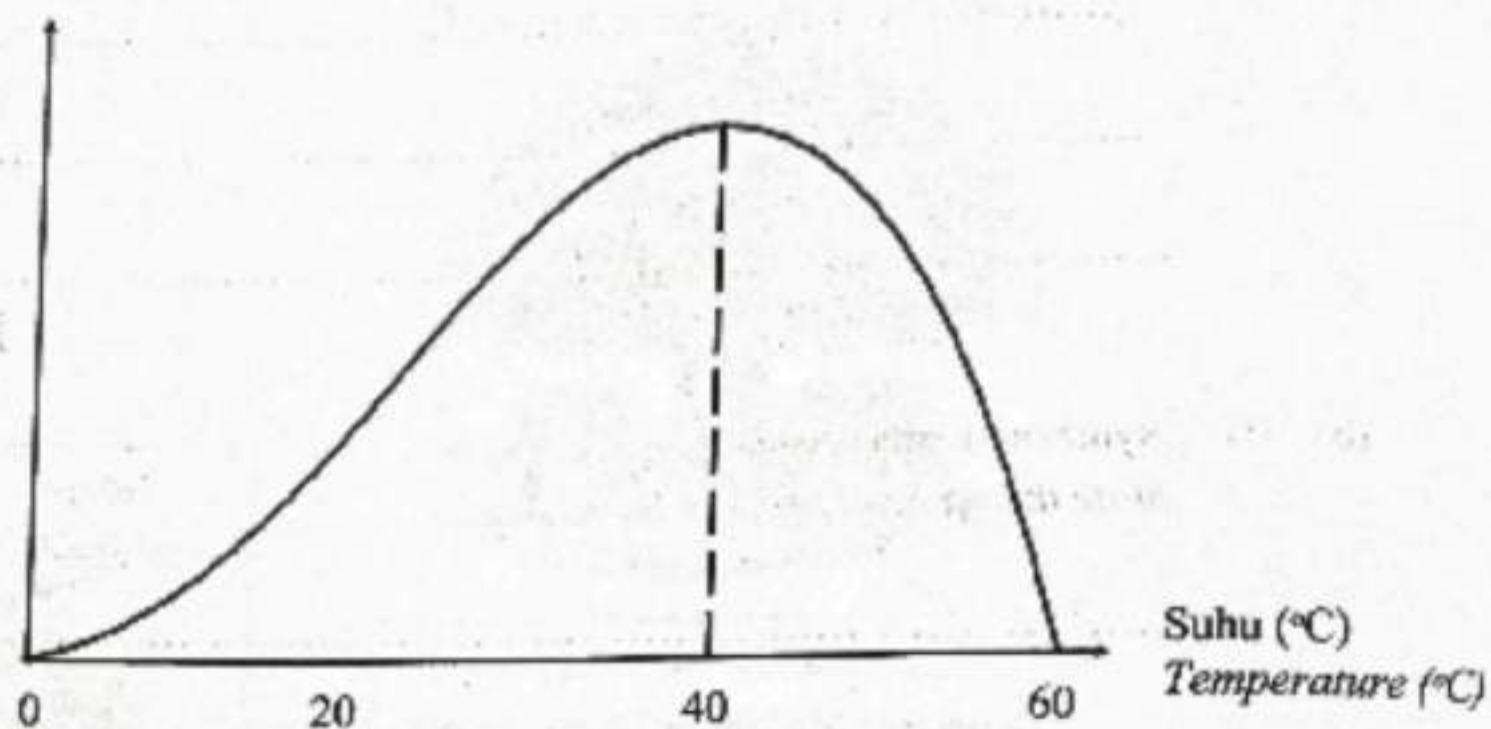
[2 markah/marks]

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6	

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- 3 Rajah 3.1 menunjukkan graf kadar tindak balas enzim melawan suhu.
 Diagram 3.1 shows a graph of the rate of enzyme reaction against temperature.

Kadar tindak balas
 Rate of reaction



Rajah 3.1 / Diagram 3.1

- (a) Berdasarkan Rajah 3.1, nyatakan suhu optimum bagi tindak balas enzim.
 Jelaskan jawapan anda.
 Based on Diagram 3.1, state the optimum temperature for the enzyme reaction.
 Explain your answer.

.....

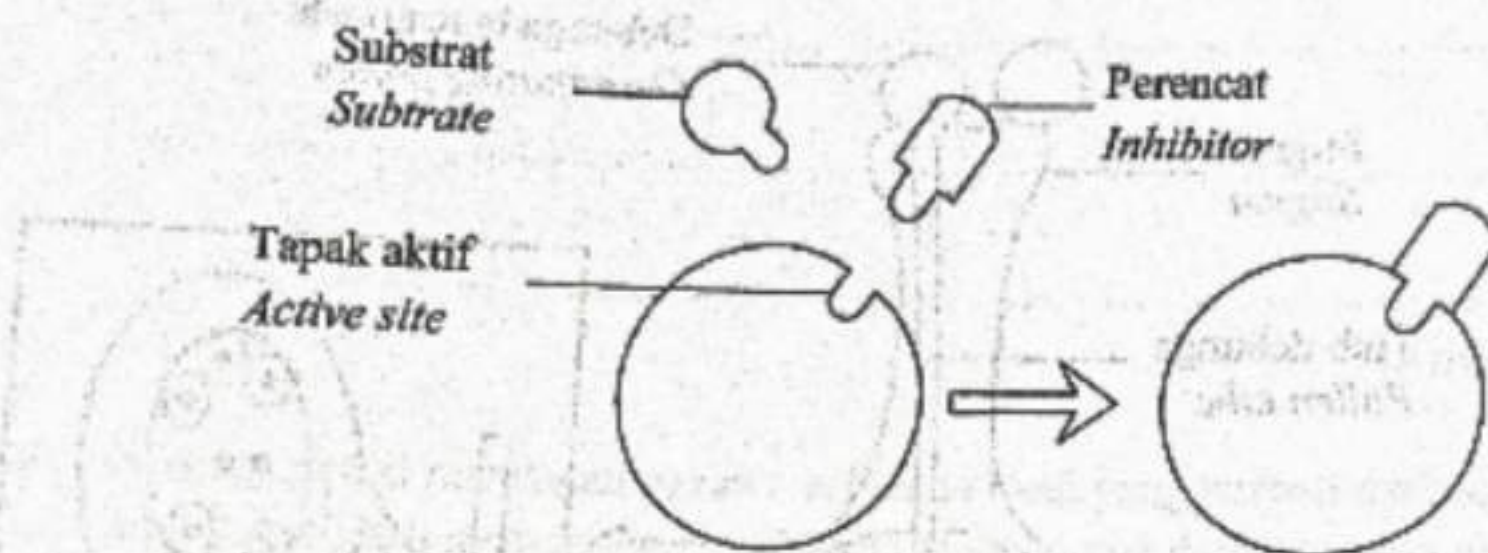
[2 markah/marks]

- (b) Jika suhu terus bertambah selepas suhu optimum, kadar tindak balas enzim akan semakin berkurangan dan akhirnya terhenti.
 Terangkan mengapa.
 If the temperature continues to increase after the optimum temperature, the rate of enzyme reaction will continue to decrease and eventually stop.
 Explain why.

.....

[3 markah/marks]

- (c) Rajah 3.2 menunjukkan tindak balas enzim dalam kehadiran perencat.
 Diagram 3.2 shows the reaction of an enzyme in the presence of inhibitors.



Rajah 3.2 / Diagram 3.2

Terangkan kesan kehadiran perencat ke atas kadar tindak balas enzim dalam kehadiran perencat.

Explain the effect on the presence of inhibitors to the rate of enzyme reaction.

.....

.....

[2 markah/marks]

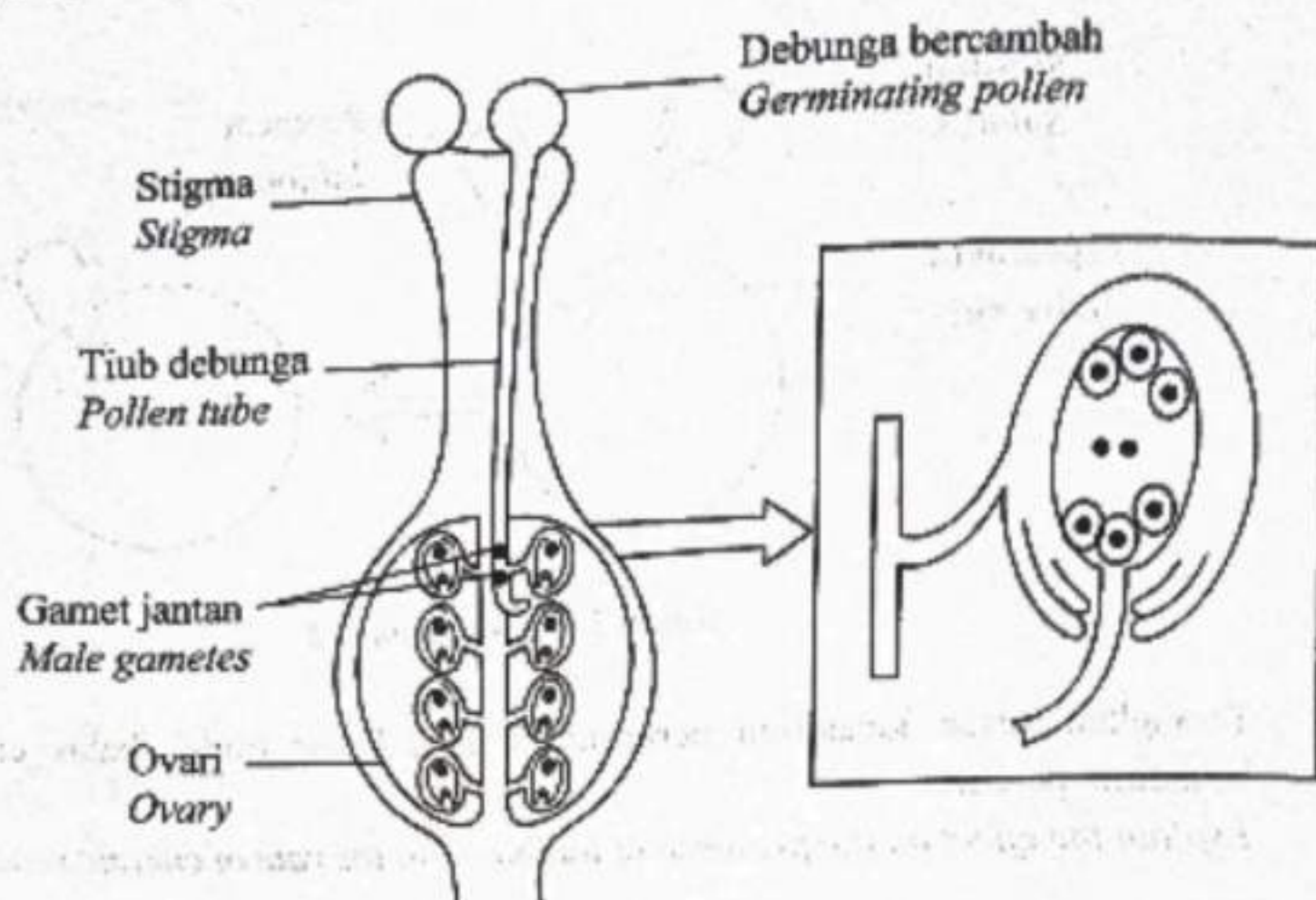
TOTAL A3	
7	

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- 4 Rajah 4 menunjukkan proses persenyawaan dalam tumbuhan berbunga.
Diagram 4 shows the process of fertilisation in a flowering plant.



Rajah 4 / Diagram 4

- (a) Berdasarkan Rajah 4,
Based on Diagram 4,

- (i) Nyatakan jenis buah yang akan terbentuk daripada bunga ini. Terangkan jawapan anda.
State the type of fruit that will develop from the flower. Explain your answer.

[2 markah/marks]

- (ii) Berapakah bilangan biji benih yang akan terbentuk jika semua ovul disenyawakan?
How many seeds will be produced if all the ovules are fertilised?

[1 markah/mark]

- (b) Terangkan peristiwa yang berlaku apabila kedua-dua gamet jantan tiba di ovul.
Explain the event that occurs when both male gametes reach the ovule.

.....

.....

.....

[2 markah/marks]

- (c) Seorang petani mendapati bahawa beberapa buah yang terhasil daripada bunga ini adalah kecil dan mengandungi biji benih yang kurang daripada yang dinyatakan di 4(a)(ii). Cadangkan satu alasan yang mungkin bagi situasi ini. Terangkan alasan anda.

A farmer notices that a few fruits produced by this plant are small and contain less seeds than stated in 4(a)(ii). Suggest one possible reason for this situation. Explain your suggestion.

.....

.....

.....

[2 markah/marks]

TOTAL A4	
	7

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- 5 Rajah 5.1 menunjukkan proses pembahagian sel pada organisma hidup.
Diagram 5.1 shows a cell division process in a living organism.

Peringkat 1
Stage 1



Peringkat 2
Stage 2



Peringkat 3
Stage 3



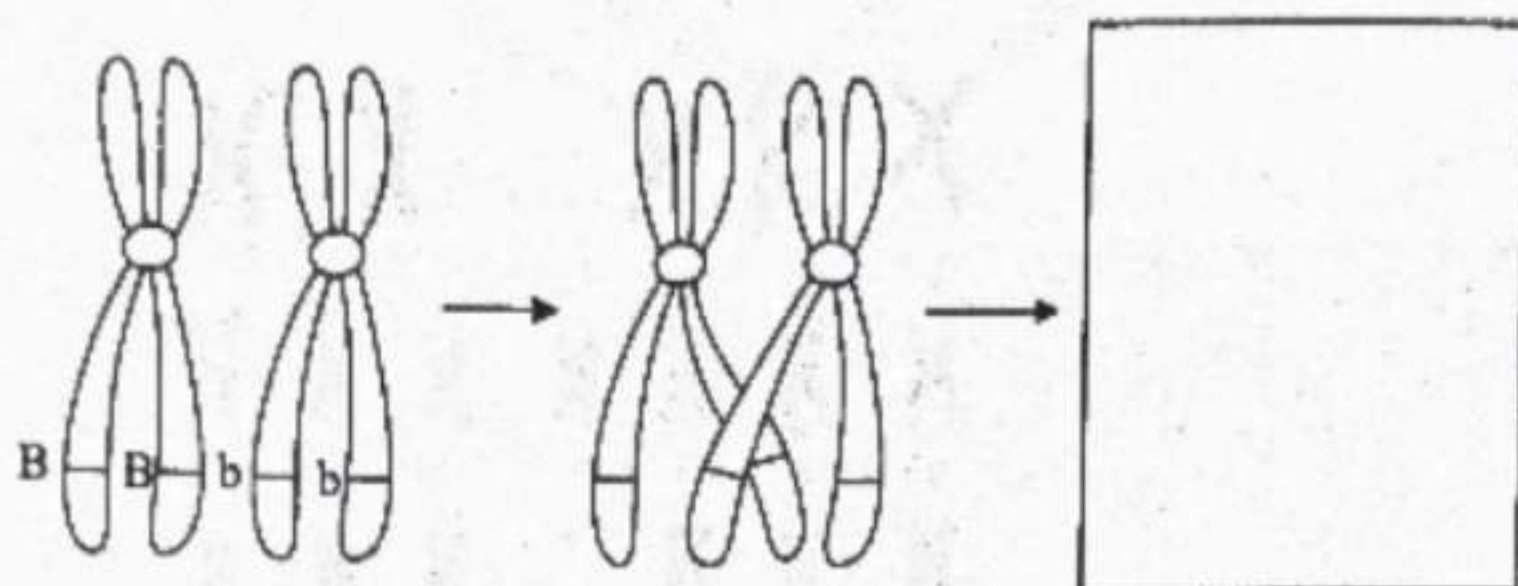
Rajah 5.1 / *Diagram 5.1*

- (a) Nyatakan jenis pembahagian sel yang ditunjukkan dalam Rajah 5.1
State the cell division shown in Diagram 5.1

[1 markah/mark]

- (b) Rajah 5.2 menunjukkan satu proses yang berlaku semasa pembahagian sel yang dinyatakan di 5(a).

Diagram 5.2 shows a process that occurs during the cell division stated in 5(a).



Rajah 5.2 / Diagram 5.2

- (i) Nyatakan nama proses yang berlaku.
State the name of the process occur.

[1 markah/mark]

- (ii) Nyatakan satu kepentingan proses yang dinyatakan di 5(b)(i).
State one importance of the process stated in 5(b)(i).

[1 markah/mark]

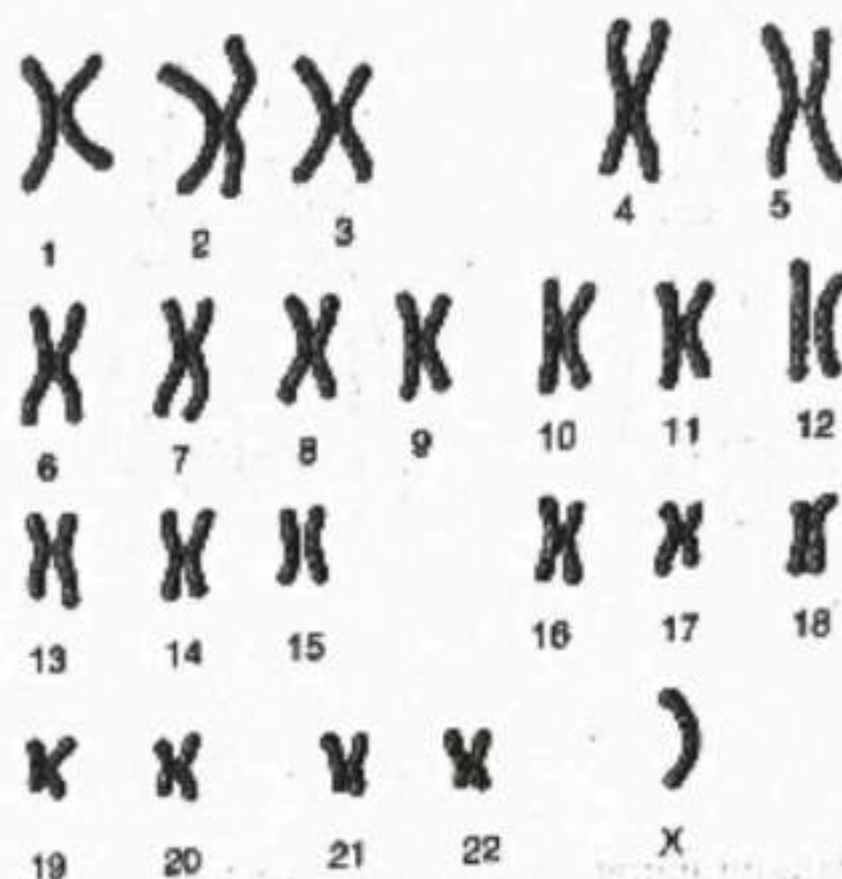
- (iii) Lengkapkan Rajah 5.2 dengan melukis keadaan kromosom homolog selepas berlaku proses yang dinamakan di 5(b)(i).
Complete Diagram 5.2 by drawing the condition of homologous chromosomes after the process named in 5(b)(i) has taken place.

[2 markah/marks]

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- (c) Rajah 5.3 menunjukkan kariotip bagi individu yang mempunyai sejenis penyakit genetik.
 Diagram 5.3 shows the karyotype of an individual with a genetic disorder.



Rajah 5.3 / Diagram 5.3

Nyatakan nama penyakit genetik ini.

Terangkan bagaimana penyakit ini terhasil.

State the name of this genetic disorder.

Explain how this disorder occurs.

.....

.....

.....

.....

[3 markah/marks]

TOTAL AS
8

- 6 Rajah 6.1 menunjukkan satu ekosistem sawah padi.
 Diagram 6.1 shows an ecosystem of the paddy field.



Rajah/ Diagram 6.1

- (a) (i) Berdasarkan Rajah 6.1, kenal pasti organisma yang terlibat dalam persaingan interspesies dan persaingan intraspesies di dalam ekosistem tersebut.
 Based on Diagram 6.1, identify the organisms that involved in interspecific competition and intraspecific competition in the ecosystem.

Persaingan interspesies:

Interspecific competition:

Persaingan intraspesies:

Intraspecific competition:

[2 markah/marks]

- (ii) Huraikan mengapa persaingan intraspesies berlaku di antara organisma yang dinyatakan di 6(a)(i).

Explain why the intraspecific competition occurs between the organisms stated in 6(a)(i).

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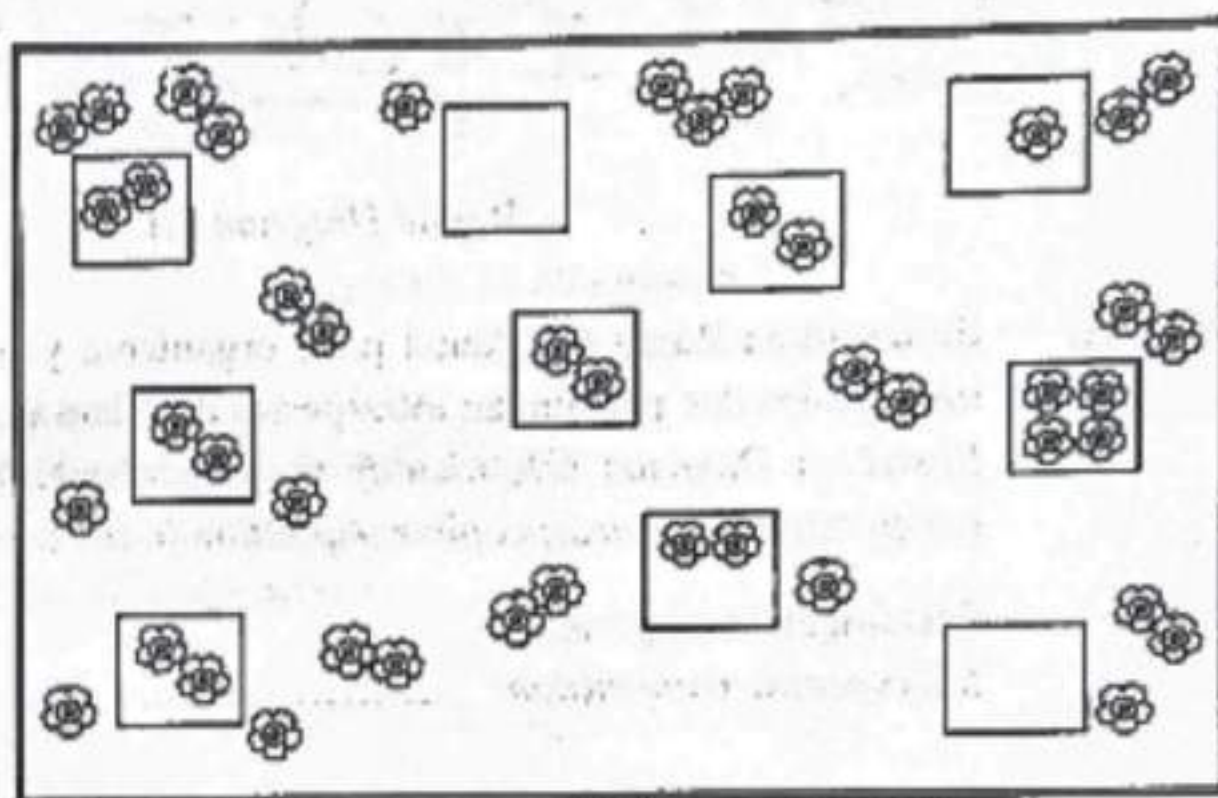
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[2 markah/marks]

- (iii) Terangkan bagaimana persaingan interspesies di antara organisma yang dinyatakan di 6(a)(i) membantu mengekalkan keseimbangan ekosistem.
Explain how the interspecific competition between the organisms stated in 6(a)(i) helps in maintaining a balanced ecosystem.

[2 markah/ marks]

- (b) Sekumpulan murid ingin menganggarkan saiz populasi tumbuhan X di padang sekolah. Rajah 6.2 menunjukkan taburan tumbuhan X dalam 10 kuadrat yang berukuran 1m x 1m setiap satu.
A group of students wants to estimate the population size of plant X in a school field. Diagram 6.2 shows the distribution of plant X in 10 quadrats, each measuring 1m x 1m.



Rajah/ Diagram 6.2

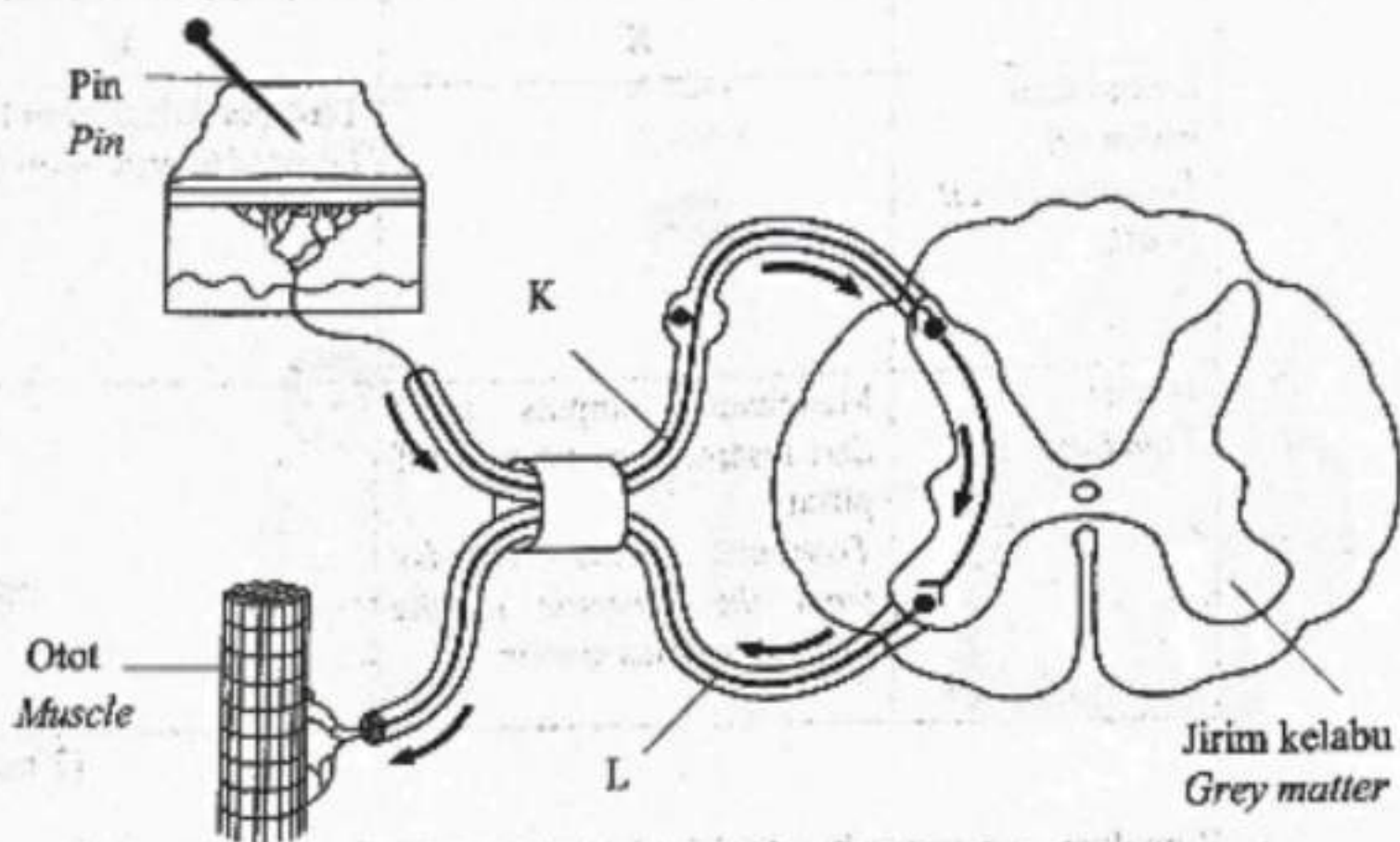
Berdasarkan Rajah 6.2, kira peratus litupan tumbuhan spesies X di padang itu.
Based on Diagram 6.2, calculate the percentage coverage of plant X in the field.

[2 markah/ marks]

TOTAL A6	
	8

SULIT

- 7 Rajah 7.1 menunjukkan satu arka refleks dalam badan manusia.
Diagram 7.1 shows a reflex arc in the human body.



Rajah 7.1 / Diagram 7.1

- (a) Nyatakan kepentingan tindakan refleks.
State the importance of reflex action.

[1 markah/mark]

- (b) (i) Nyatakan nama neuron K dan L.
State the name of neurones K and L.

K:

L:

[2 markah/marks]

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SULIT



SULIT

- (ii) Lengkapkan jadual di bawah untuk menunjukkan perbezaan antara neuron K dan L.
 Complete the table below to show the differences between neurones K and L.

	K	L
Kedudukan badan sel <i>Location of cell body</i>		Terdapat dalam jirim kelabu <i>Located in grey matter</i>
Fungsi <i>Function</i>	Menghantar impuls saraf dari reseptor ke sistem saraf pusat <i>Transmits nerve impulse from the receptor to the central nervous system</i>	

[2 markah/marks]

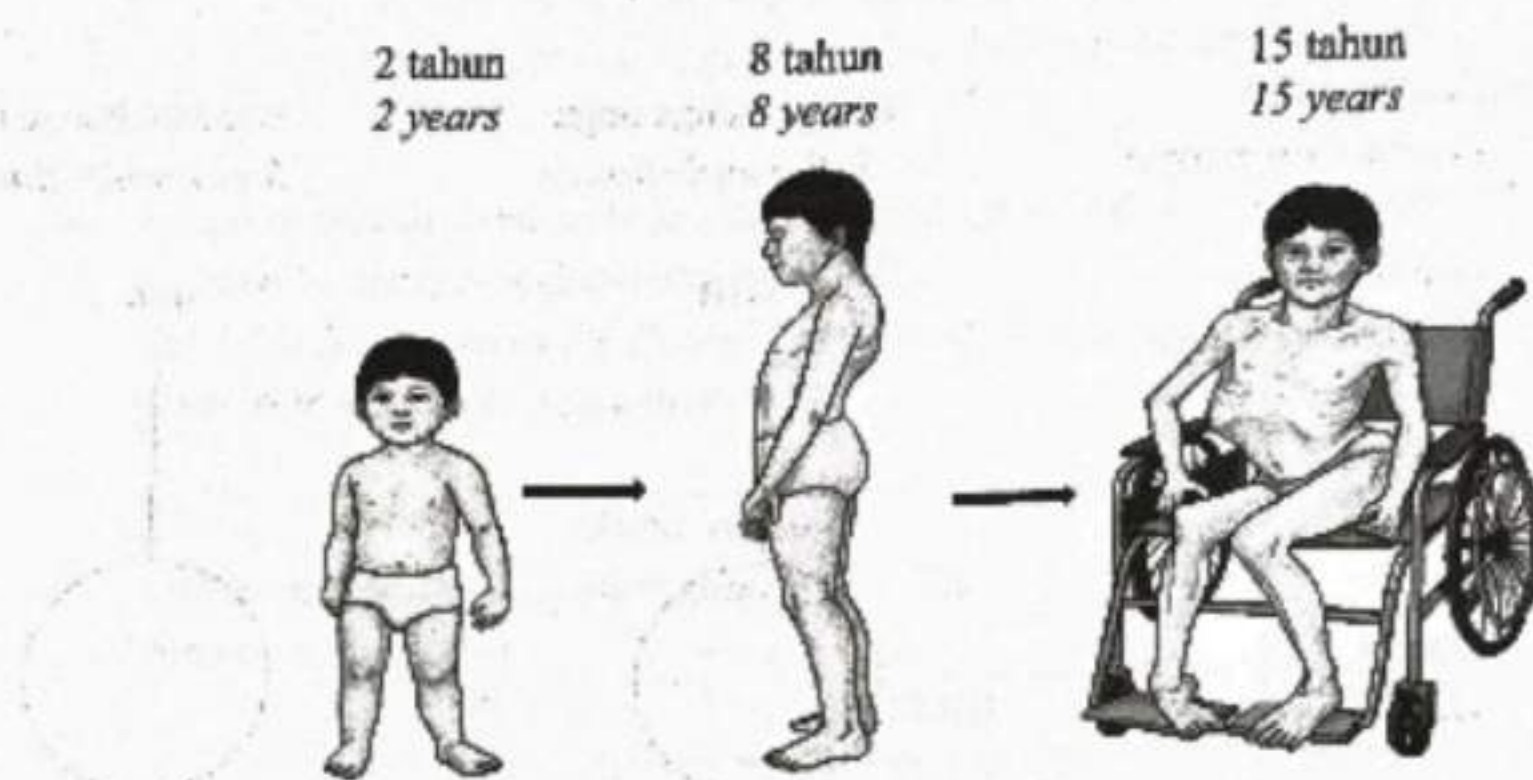
- (c) Ramalkan apa yang akan berlaku kepada gerak balas yang ditunjukkan dalam Rajah 7.1 jika L tercedera. Terangkan.
 Predict what will happen to the response shown in the Diagram 7.1 if L is injured. Explain.

.....

.....

[2 markah/marks]

- (d) Rajah 7.2 menunjukkan perubahan yang berlaku kepada seorang kanak-kanak yang menghadapi penyakit sklerosis berganda.
Diagram 7.2 shows the changes that occurs to a child suffering from multiple sclerosis disease.



Rajah 7.2 / Diagram 7.2

Berdasarkan Rajah 7.2, terangkan punca dan kesan penyakit sklerosis berganda terhadap individu.

Based on Diagram 7.2, explain the cause and effect of multiple sclerosis disease to an individual.

.....

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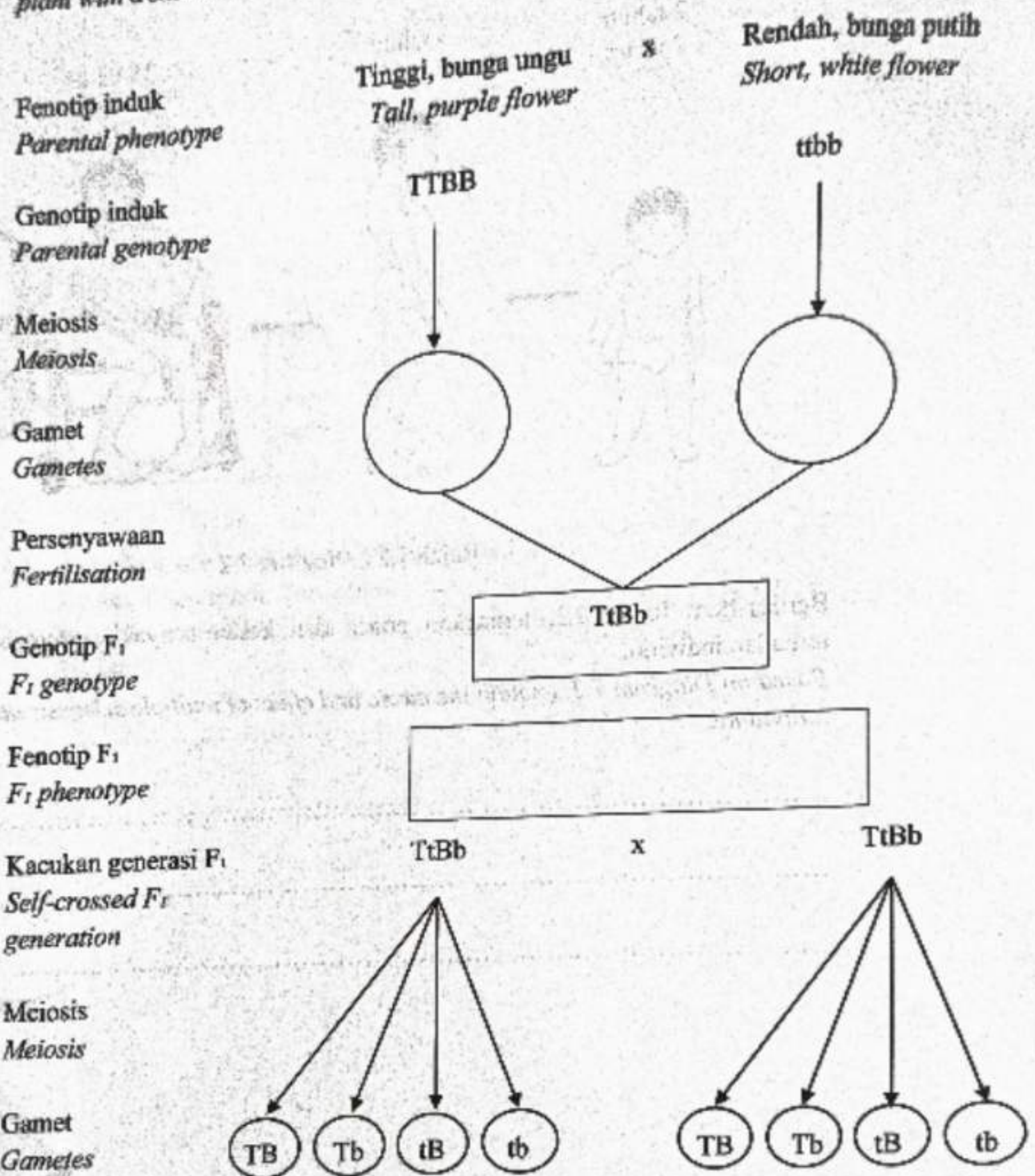
[2 markah/marks]

TOTAL A7	
	9

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SULIT

8. Rajah 8.1 menunjukkan rajah genetik bagi kacukan antara pokok kacang pis baka tulen tinggi, bunga ungu dengan pokok kacang pis baka tulen rendah, bunga putih.
 Diagram 8.1 shows the genetic diagram of the cross between tall and purple flower pea plant with a short and white flower pea plant.



Rajah 8.1 / Diagram 8.1

- (a) (i) Tuliskan genotip gamet dalam petak yang disediakan dalam Rajah 8.1.
Write the genotype of gametes in the boxes provided in Diagram 8.1.
 [2 markah/marks]
- (ii) Nyatakan fenotip bagi generasi F_1 dalam petak yang disediakan dalam Rajah 8.1.
State the phenotype of F_1 generation in the box provided in Diagram 8.1.
 [1 markah/mark]
- (b) Jadual di bawah menunjukkan segi empat Punnet bagi kacukan sesama sendiri anak generasi F_1 untuk menghasilkan generasi F_2 .
The table below shows the Punnett's square of the self-cross between offsprings in F_1 generation to form F_2 generation.

Gamet betina Female gamete \ Gamet jantan Male gamete	TB	Tb	tB	tb
TB	TTBB	TTBb	TtBB	TtBb
Tb				
tB	TtBB	TtBb	ttBB	ttBb
tb				

Lengkapkan segi empat Punnet dengan mengisi genotip F_2 ke dalam ruang kosong dalam jadual di atas.

Complete the Punnett's square by filling the F_2 genotype in the empty spaces in the table above.

[2 markah/ marks]

- (c) Talasemia adalah penyakit warisan yang boleh diwarisi dari satu generasi ke generasi yang seterusnya.
Thalasemia is a genetic disease that can be inherited from one generation to another generation.

- (i) Nyatakan punca penyakit talasemia.
State the cause of thalassemia disease.

[1 markah/ mark]

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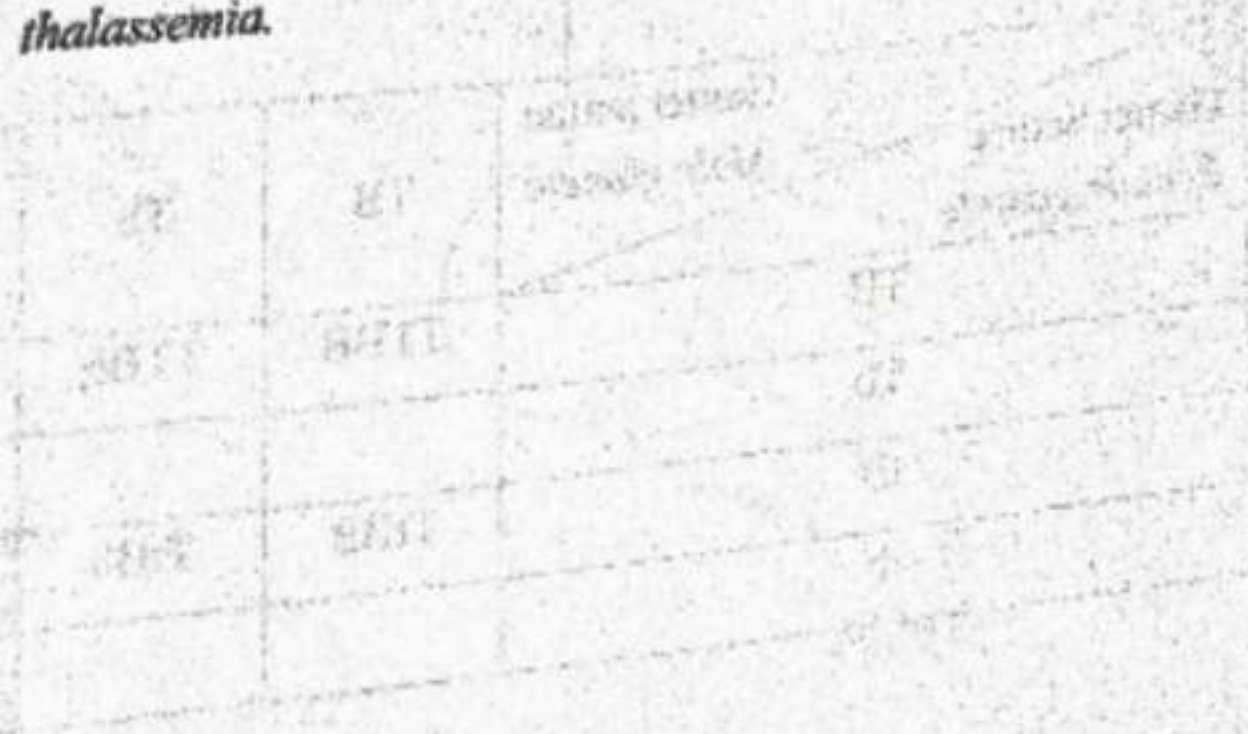
SULIT

- (ii) Seorang lelaki pembawa talasemia berkahwin dengan seorang perempuan yang juga pembawa talasemia. Mereka mempunyai seorang anak lelaki yang menghidap talasemia.

A male thalassemia carrier marries a female who is also a thalassemia carrier. They have a son who suffers from thalassemia.

Dengan menggunakan simbol yang diberikan (T: alel dominan, t: alel resesif), lukis rajah skema untuk menunjukkan pewarisan yang menghasilkan anak lelaki penghidap talasemia tersebut.

Using the symbols given (T: dominant allele, t: recessive allele), draw a schematic diagram to show the inheritance that results in the son with thalassemia.



[3 markah/ marks]

TOTAL A8	
	9

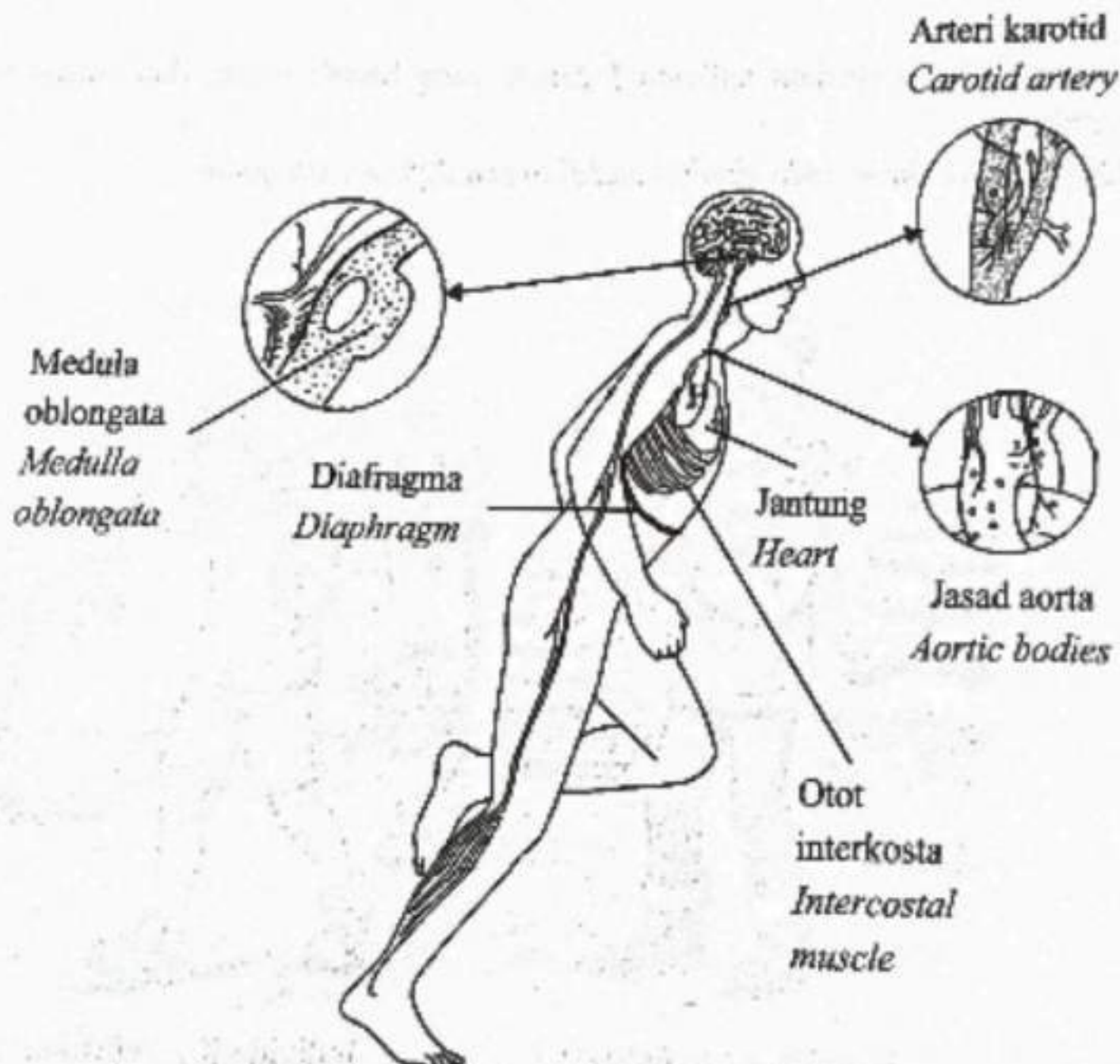
Bahagian B

[20 markah]

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

- 9 (a) Rajah 9.1 menunjukkan struktur yang terlibat di dalam pengawalaturan tekanan separa karbon dioksida dalam darah.

Diagram 9.1 shows the structures involved in the regulation of carbon dioxide partial pressure in the blood.



Rajah 9.1 / Diagram 9.1

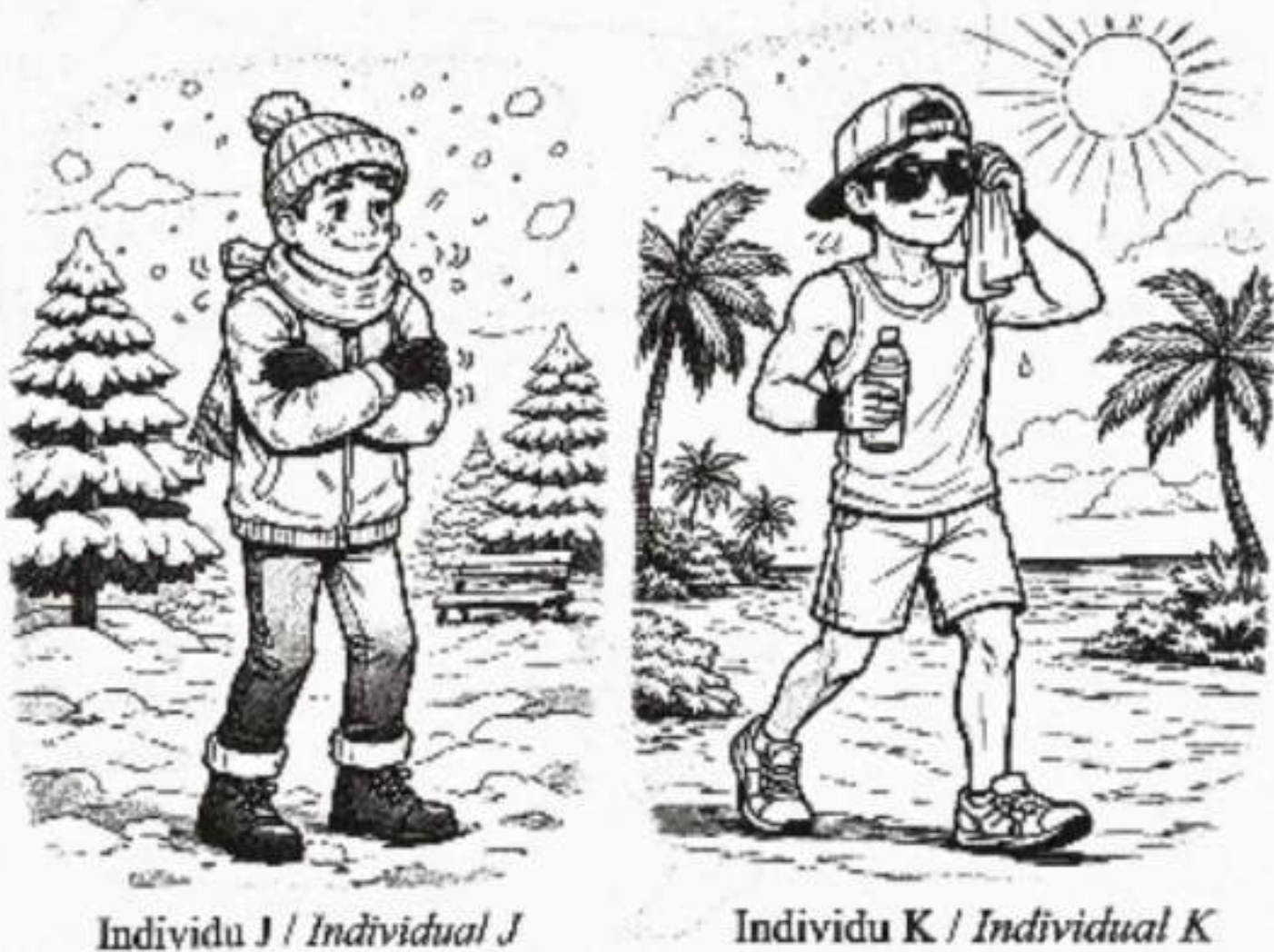
- (i) Nyatakan **dua** sistem yang terlibat dalam pengawalaturan tekanan separa karbon dioksida darah.

State two systems that are involved in the regulation of the partial pressure of carbon dioxide in the blood.

[2 markah/marks]

SULIT

- (ii) Aras pH darah menurun semasa melakukan aktiviti cergas.
Terangkan mengapa.
Blood pH level decreases during vigorous activity.
Explain why. [4 markah/marks]
- (iii) Berdasarkan Rajah 9.1, terangkan bagaimana penurunan pH darah dikawal atur oleh badan.
Based on Diagram 9.1, explain how the decrease in blood pH is regulated by the body. [3 markah/marks]
- (b) Rajah 9.2 menunjukkan individu J dan K yang berada dalam dua situasi yang berbeza.
Diagram 9.2 shows individuals J and K in two different situations.



Rajah 9.2 / Diagram 9.2

Bezakan mekanisme pembetulan yang berlaku pada kedua-dua individu untuk mengembalikan tekanan osmosis darah ke julat normal.

Differentiate the corrective mechanisms that occur in both individuals to return the blood osmotic pressure to the normal range.

[6 markah/marks]

SULIT

23

4551/2

- (c) Ujian air kencing yang melibatkan atlet, terutamanya dalam sukan angkat berat dan bina badan, mengesahkan beberapa orang atlet positif menggunakan bahan terlarang seperti steroid androgenik anabolik.

Berdasarkan pengetahuan biologi anda, terangkan bagaimana bahan tersebut boleh dikesan dalam air kencing.

Urine tests involving athletes, especially in weightlifting and bodybuilding, have confirmed that several athletes have been tested positive for banned substances such as anabolic androgenic steroids.

Based on your knowledge in biology, explain how such substances can be detected in the urine.

[5 markah/marks]

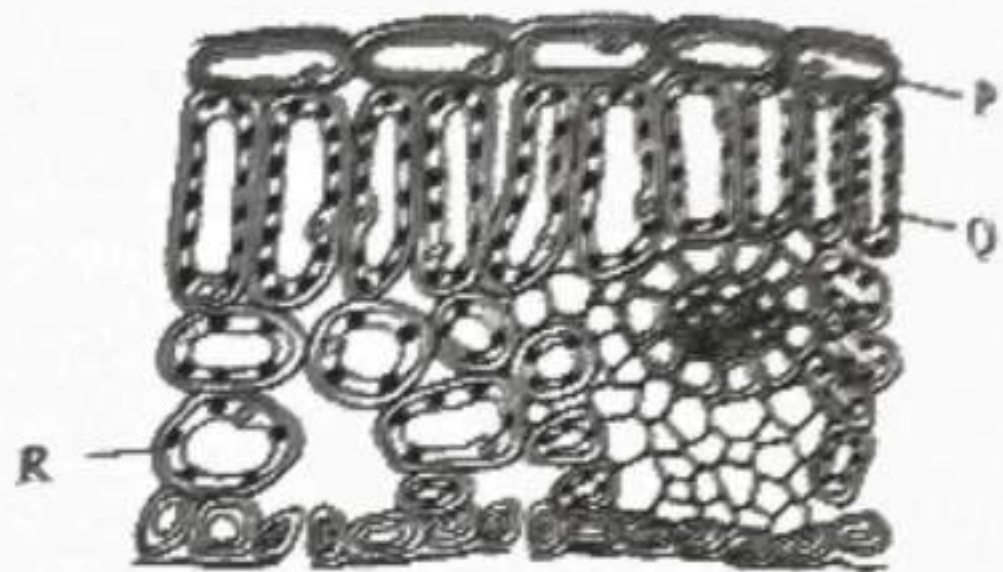
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- 10 (a) Rajah 10.1 menunjukkan lamina daun dan Rajah 10.2 menunjukkan keratan rentas daun.
Diagram 10.1 shows the leaf lamina and Diagram 10.2 shows the cross-section of a leaf.



Rajah 10.1 / Diagram 10.1

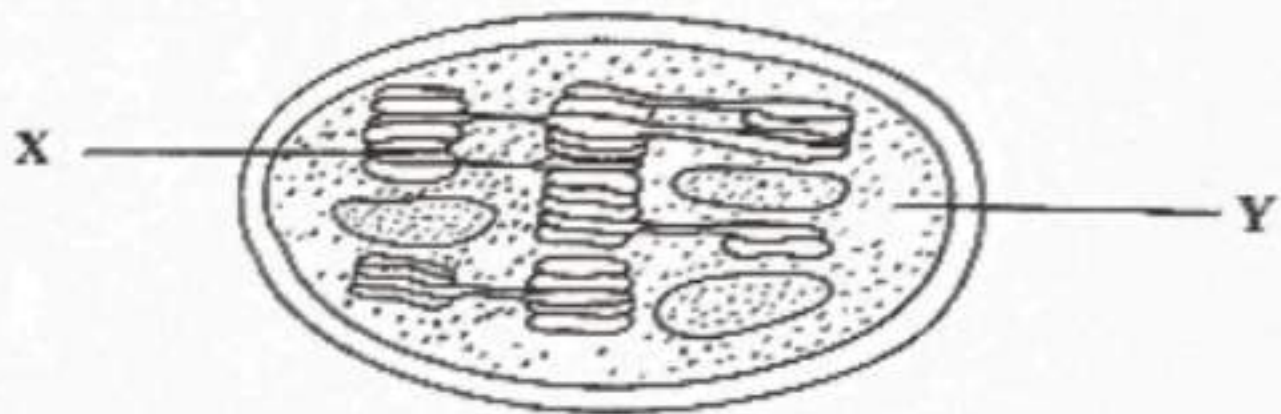


Rajah 10.2 / Diagram 10.2

Berdasarkan Rajah 10.1 dan Rajah 10.2, terangkan penyesuaian daun untuk meningkatkan kadar fotosintesis.
Based on Diagram 10.1 and Diagram 10.2, explain the adaptations of the leaf to increase the rate of photosynthesis.

[8 markah/marks]

- (b) Rajah 10.3 menunjukkan struktur kloroplas.
Diagram 10.3 shows the structure of a chloroplast.



Rajah 10.3 / Diagram 10.3

- (i) Nyatakan nama tindak balas biokimia yang berlaku dalam struktur berlabel X dan Y.

State the name of the biochemical reaction in the structure labeled X and Y.

[2 markah/marks]

- (ii) Terangkan perbezaan di antara kedua-dua tindak balas yang dinamakan dalam 10(b)(i).

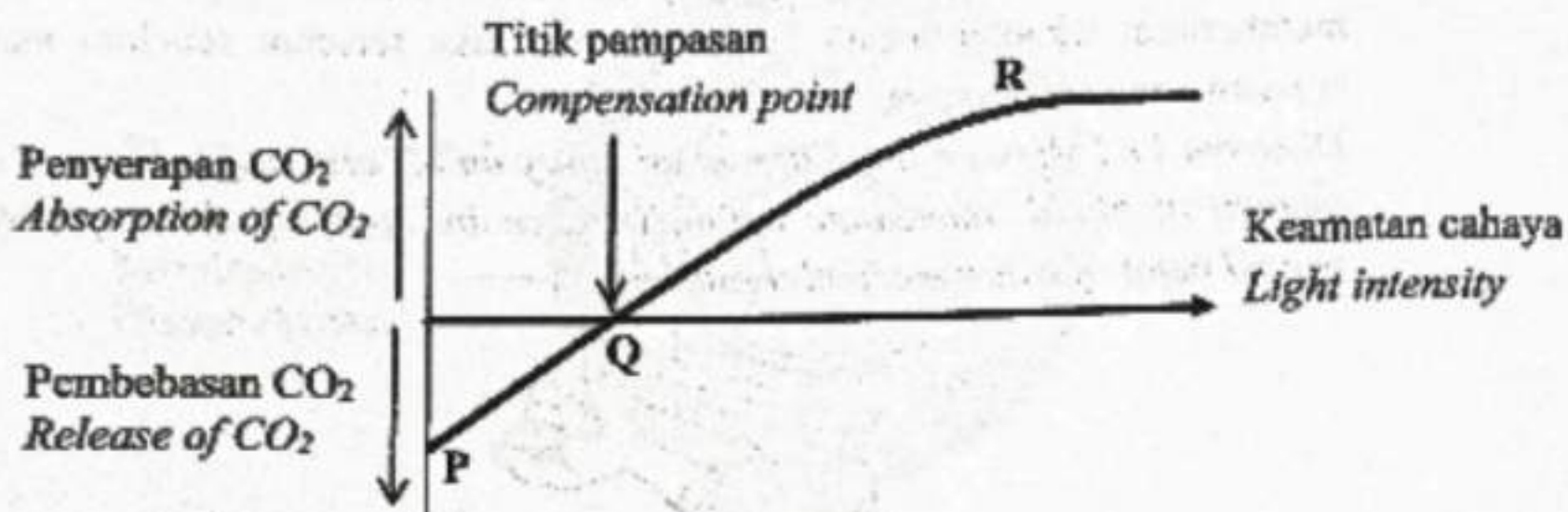
Explain the differences between both biochemical reactions stated in 10(b)(i).

[4 markah/marks]



- (c) Rajah 10.4 menunjukkan graf hubungan antara keamatan cahaya dengan kadar fotosintesis dan kadar respirasi sel dalam tumbuhan.

Diagram 10.4 shows a graph of the relationship between light intensity and the rate of photosynthesis and cellular respiration in plant.



Rajah 10.4 / Diagram 10.4

Analisis graf dalam Rajah 10.4 dan terangkan hubungan di antara keamatan cahaya dan hasil tanaman pada titik-titik P, Q dan R.

Analyse the graph in Diagram 10.4 and explain the relationship between light intensity and crop yield at points P, Q and R.

[6 markah/marks]

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Bahagian C
[20 markah]

Soalan ini mesti dijawab.

- 11 (a) Rajah 11.1 menunjukkan seorang budak lelaki yang mengalami kecederaan pada lengan dan kehilangan darah yang banyak. Tindakan segera diambil dengan memberikan tekanan secara langsung pada luka tersebut sebelum mendapatkan rawatan yang selanjutnya.
Diagram 11.1 shows a boy suffered an injury on his arm and is losing a significant amount of blood. Immediate action is taken by applying direct pressure to the wound before further medical treatment.



Rajah 11.1 / Diagram 11.1

- (i) Terangkan kesan kehilangan darah yang banyak terhadap badan manusia.
Explain the effects of excessive blood loss on the human body.

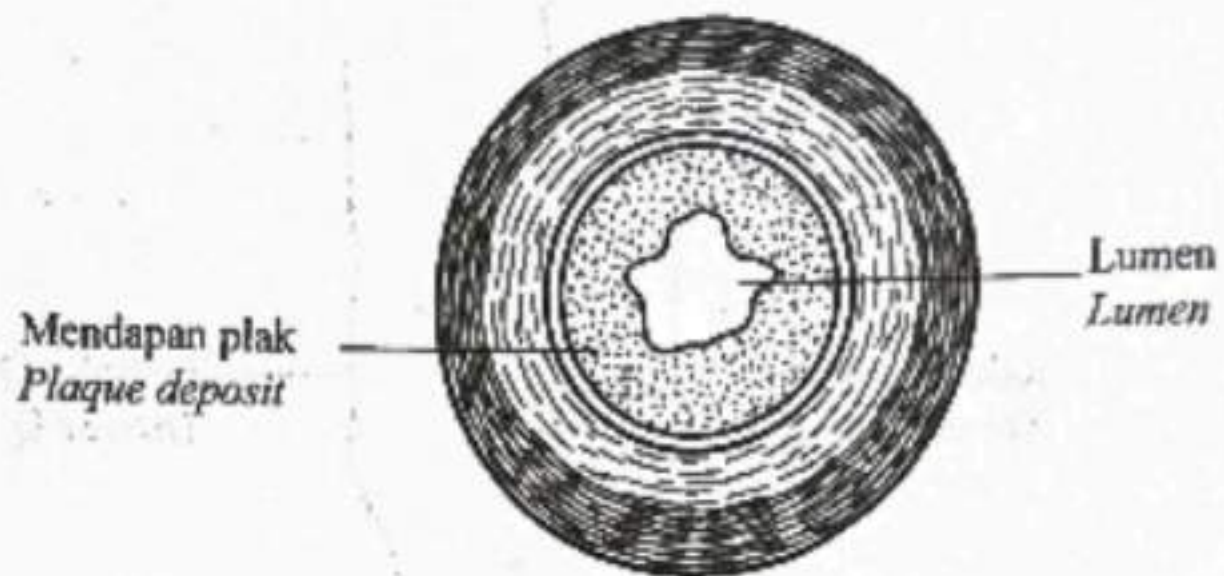
[4 markah/marks]

- (ii) Wajarkan kepentingan memberi tekanan pada luka seperti yang ditunjukkan dalam Rajah 11.1.
Justify the importance of applying pressure on the wound as shown in Diagram 11.1.

[6 markah/marks]

- (b) Rajah 11.2 menunjukkan keratan rentas arteri seorang individu yang mengamalkan tabiat pemakanan yang tidak sihat.

Diagram 11.2 shows a cross-section of an artery in an individual who practices an unhealthy eating habit.



Rajah 11.2 / Diagram 11.2

Terangkan kesan tabiat pemakanan yang tidak sihat itu terhadap kesihatannya.

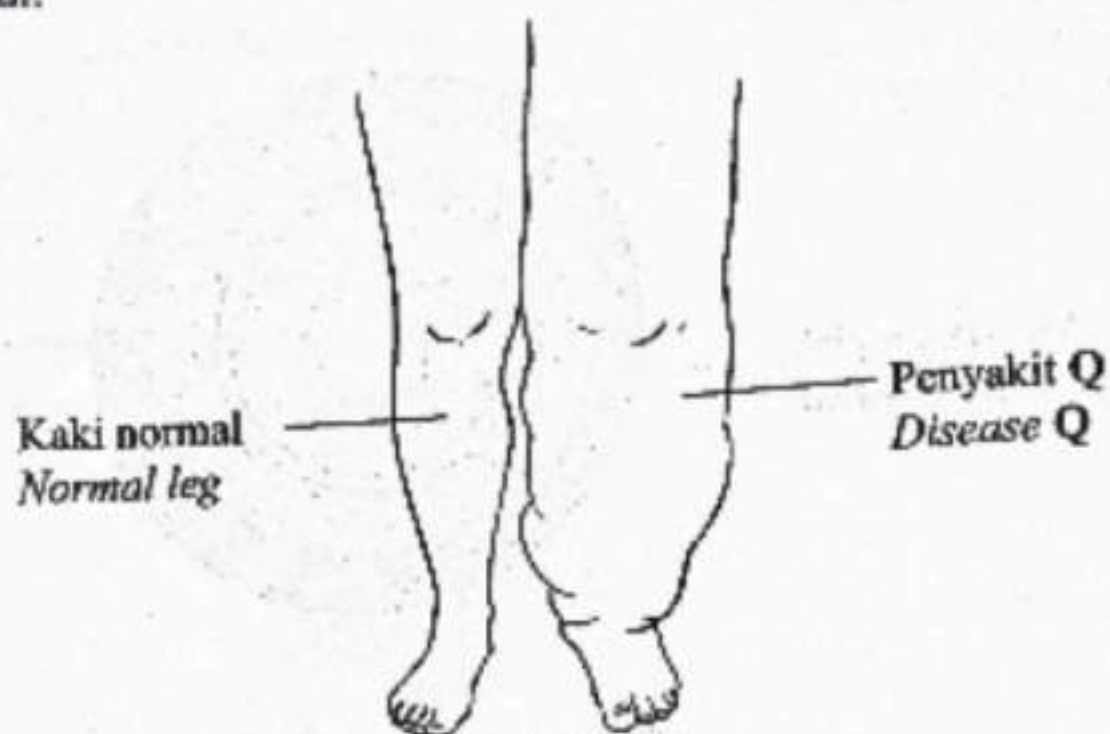
Explain the effect of the unhealthy eating habit to his health.

[4 markah/marks]

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- (b) Rajah 11.3 menunjukkan penyakit Q yang disebabkan oleh jangkitan parasit ke atas seorang individu.
Diagram 11.3 shows disease Q which is caused by parasitic infection in an individual.



Rajah 11.3 / Diagram 11.3

Bincangkan bagaimana penyakit Q terjadi.

Cadangkan langkah-langkah untuk mengelakkan penyakit tersebut berlaku.

Discuss how disease Q occurs.

Suggest ways to prevent the disease.

[6 markah/marks]

KERTAS SOALAN TAMAT