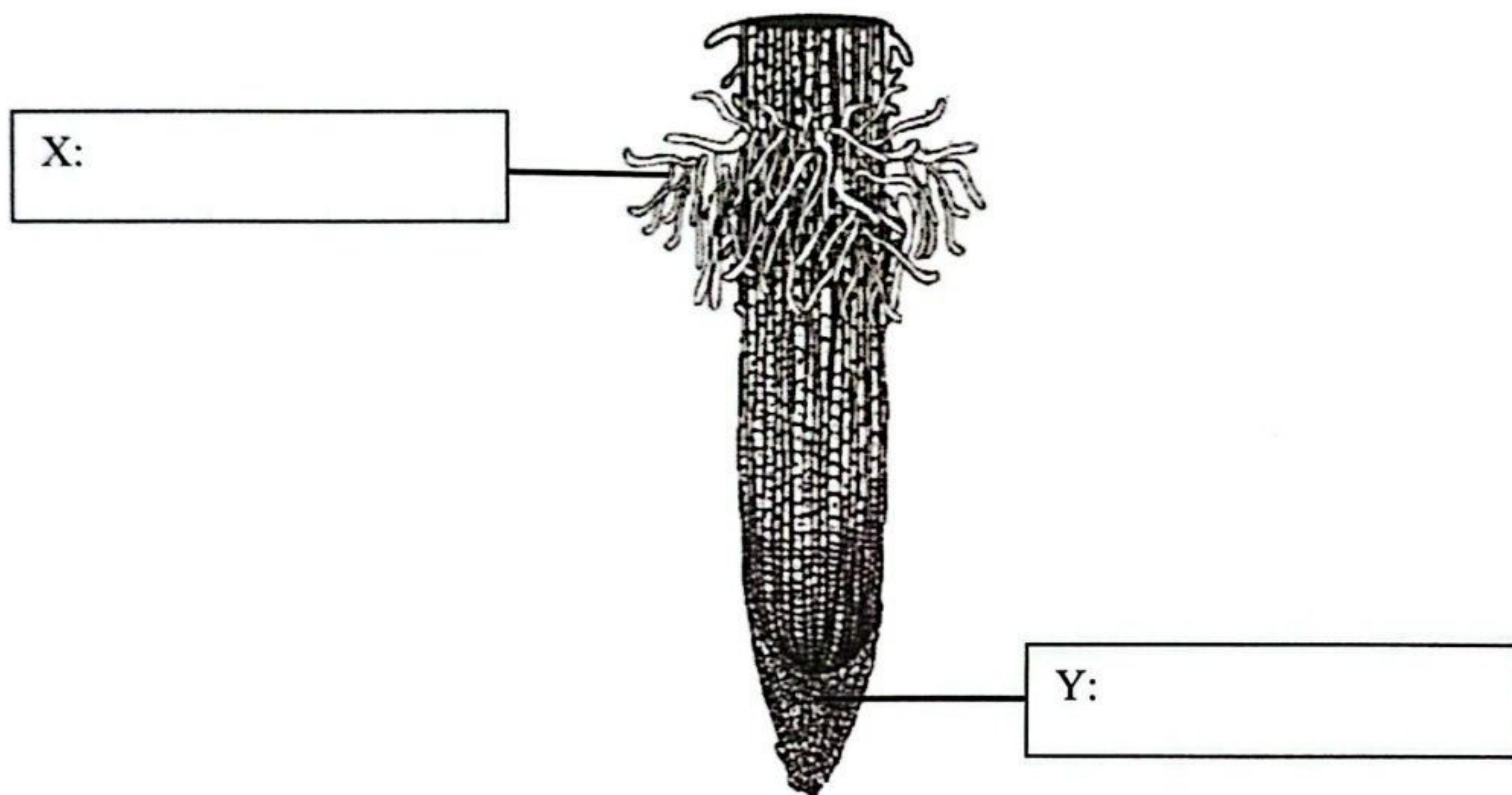


Bahagian A
Section A
[60 markah]
[60 marks]

Jawab **semua** soalan.
Answer all the questions.

1. Rajah 1.1 menunjukkan struktur akar satu tumbuhan.
Diagram 1.1 shows the structure of root in a plant.



Rajah 1.1
Diagram 1.1

- (a) Labelkan struktur X dan Y pada Rajah 1.1.
Label structure X and Y in Diagram 1.1.

[2 markah]
[2 marks]

- (b) Nyatakan **dua** fungsi utama akar.
State two main functions of root.

.....

.....

.....

[2 markah]
[2 marks]

- (c) Rajah 1.2 menunjukkan sejenis tumbuhan.
Diagram 1.2 shows a type of plant.



Rajah 1.2
Diagram 1.2

Berdasarkan Rajah 1.2,
Based on Diagram 1.2,

- (i) namakan jenis penyesuaian nutrisi bagi tumbuhan tersebut.
name the type of nutritional adaptation of the plant.

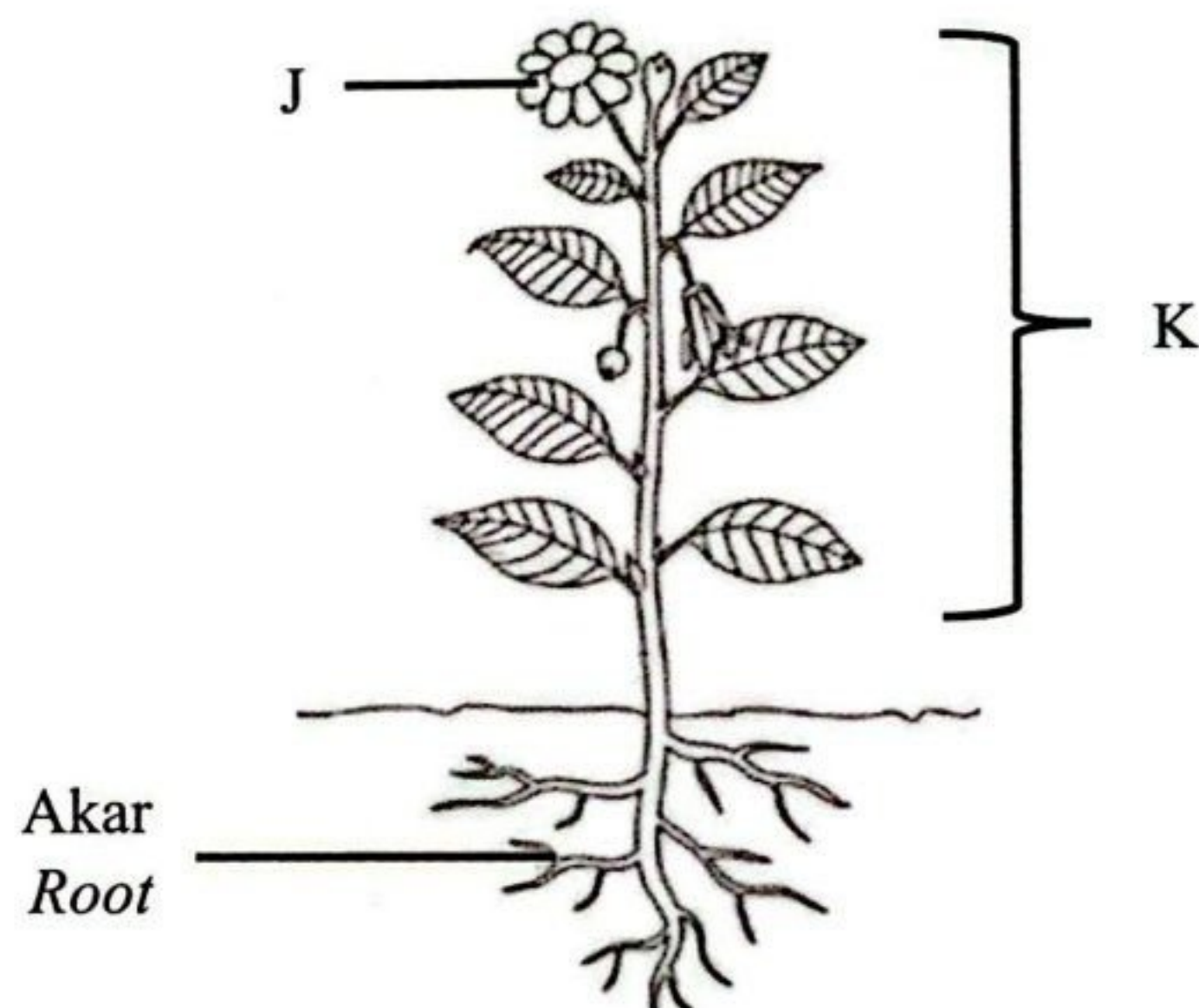
.....

[1 markah]
[1 mark]

- (ii) nyatakan **satu** ciri penyesuaian bagi tumbuhan tersebut untuk mendapatkan sumber nitrogen.
*state **one** adaptive characteristic of the plant to obtain nitrogen source.*

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

2. Rajah 2.1 menunjukkan struktur satu tumbuhan.
Diagram 2.1 shows the structure of a plant.



Rajah 2.1
Diagram 2.1

- (a) Nyatakan aras organisasi bagi J dan K.
State the level of organisation of J and K.

J :

K :

[2 markah]
[2 marks]

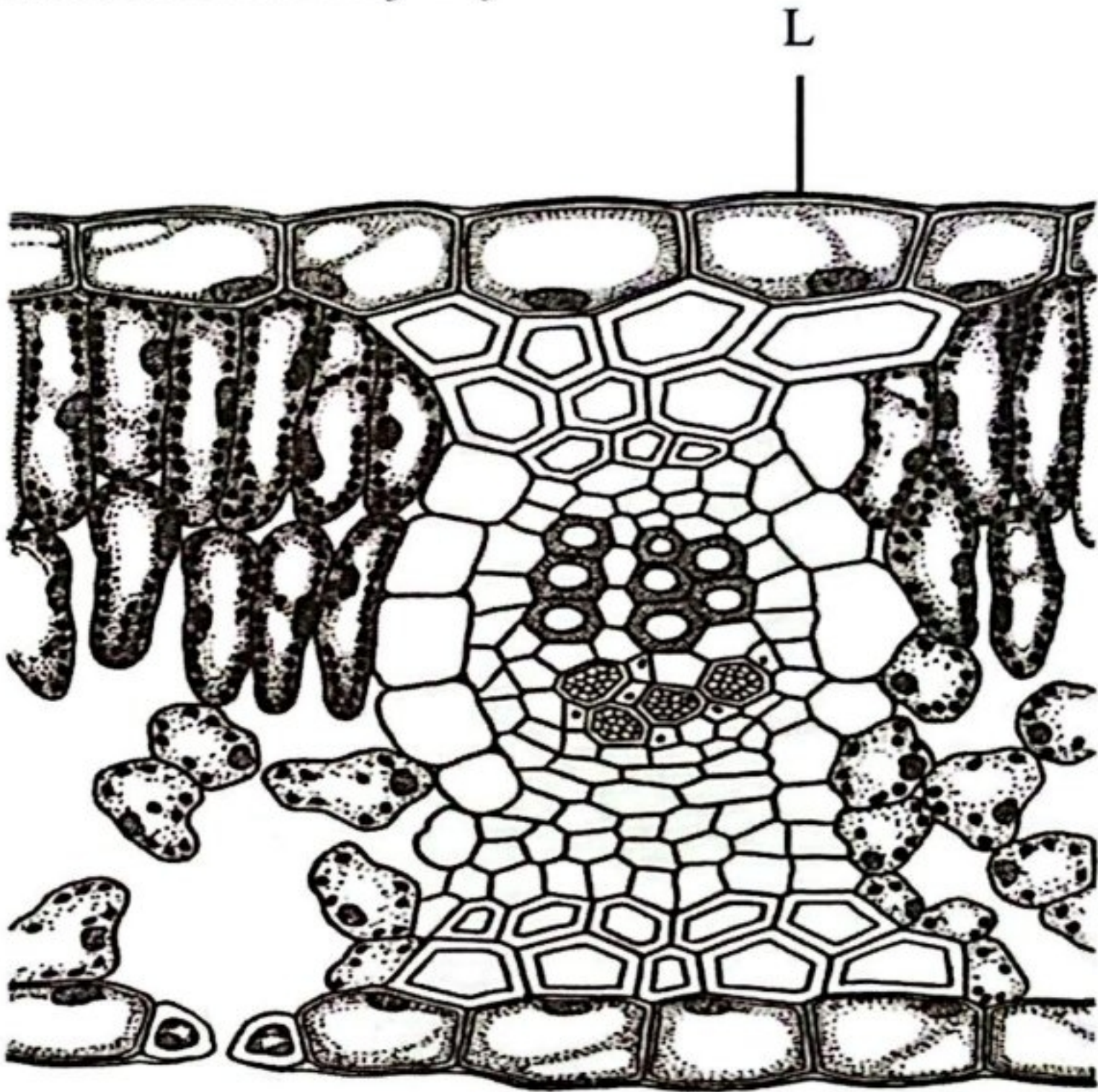
- (b) Nyatakan **satu** fungsi bagi struktur J.
*State **one** function of structure J.*

.....

.....

[1 markah]
[1 mark]

- (c) Rajah 2.2 menunjukkan keratan rentas daun.
Diagram 2.2 shows the cross section of leaf.



Rajah 2.2
Diagram 2.2

Tisu L terdapat pada bahagian atas daun.
Nyatakan **satu** fungsi tisu tersebut.
*Tissue L is found on the upper part of the leaf.
State **one** function of the tissue.*

.....

[1 markah]
[1 mark]

- (d) Tisu epidermis di hujung akar telah menjalani penyesuaian bagi membolehkan pengambilan air dan garam mineral menjadi lebih cekap.

Terangkan **satu** ciri penyesuaian tisu epidermis pada akar.

The epidermal tissue at the root tip has undergone adaptations to enable the uptake of water and mineral salts becomes more efficient.

*Explain **one** adaptive characteristic of root epidermal tissue.*

.....

.....

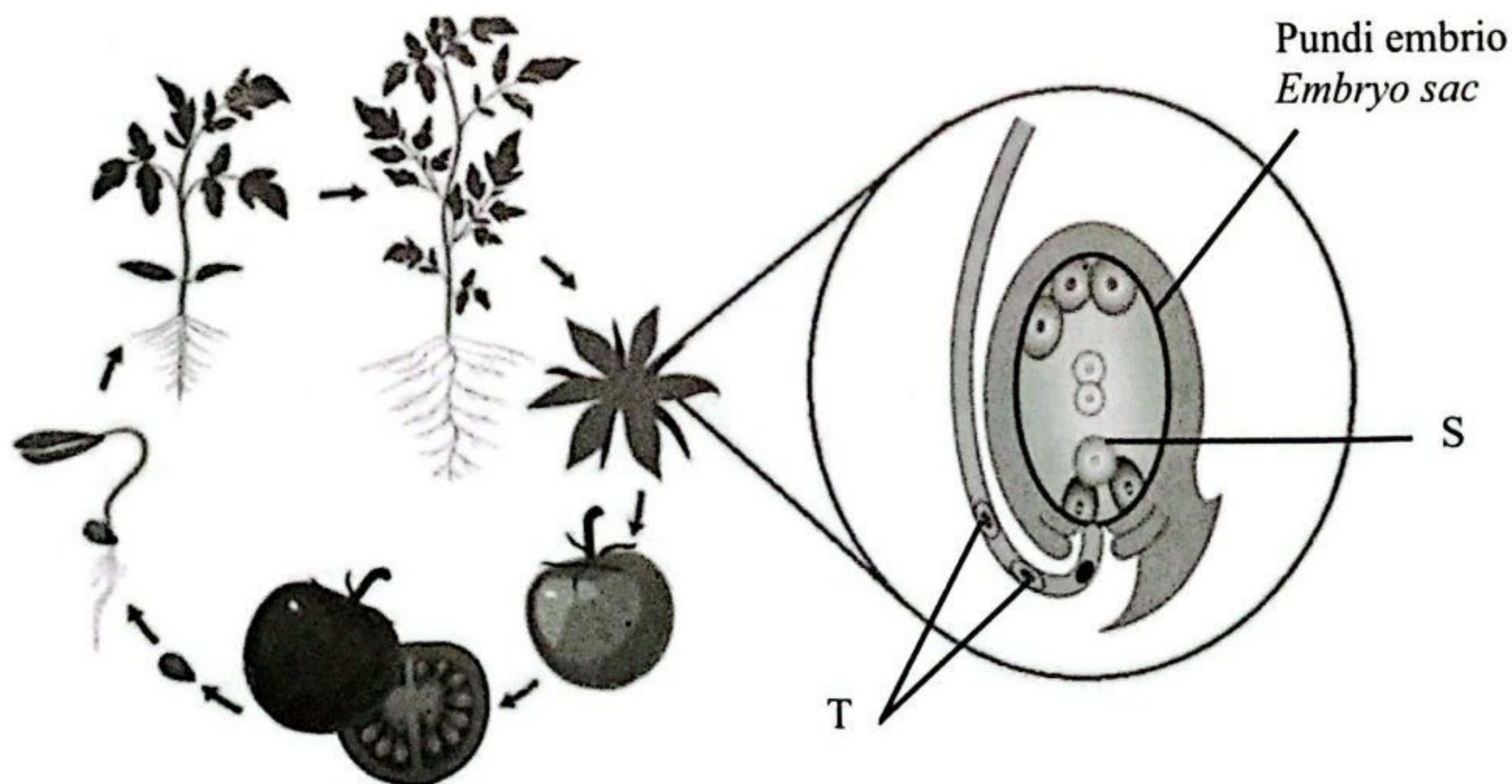
.....

[2 markah]

[2 marks]

3. Rajah 3 menunjukkan persenyawaan ganda dua yang berlaku di dalam pundi embrio bagi pokok tomato.

Diagram 3 shows double fertilisation that occurs in embryo sac of tomato plant.



Rajah 3
Diagram 3

- (a) (i) Berdasarkan Rajah 3, berikan nama S dan T.
Based on Diagram 3, give name S and T.

S :

T :

[2 markah]
[2 marks]

- (ii) Terangkan bagaimana T terbentuk di dalam tiub debunga.
Explain how T are formed in the pollen tube.

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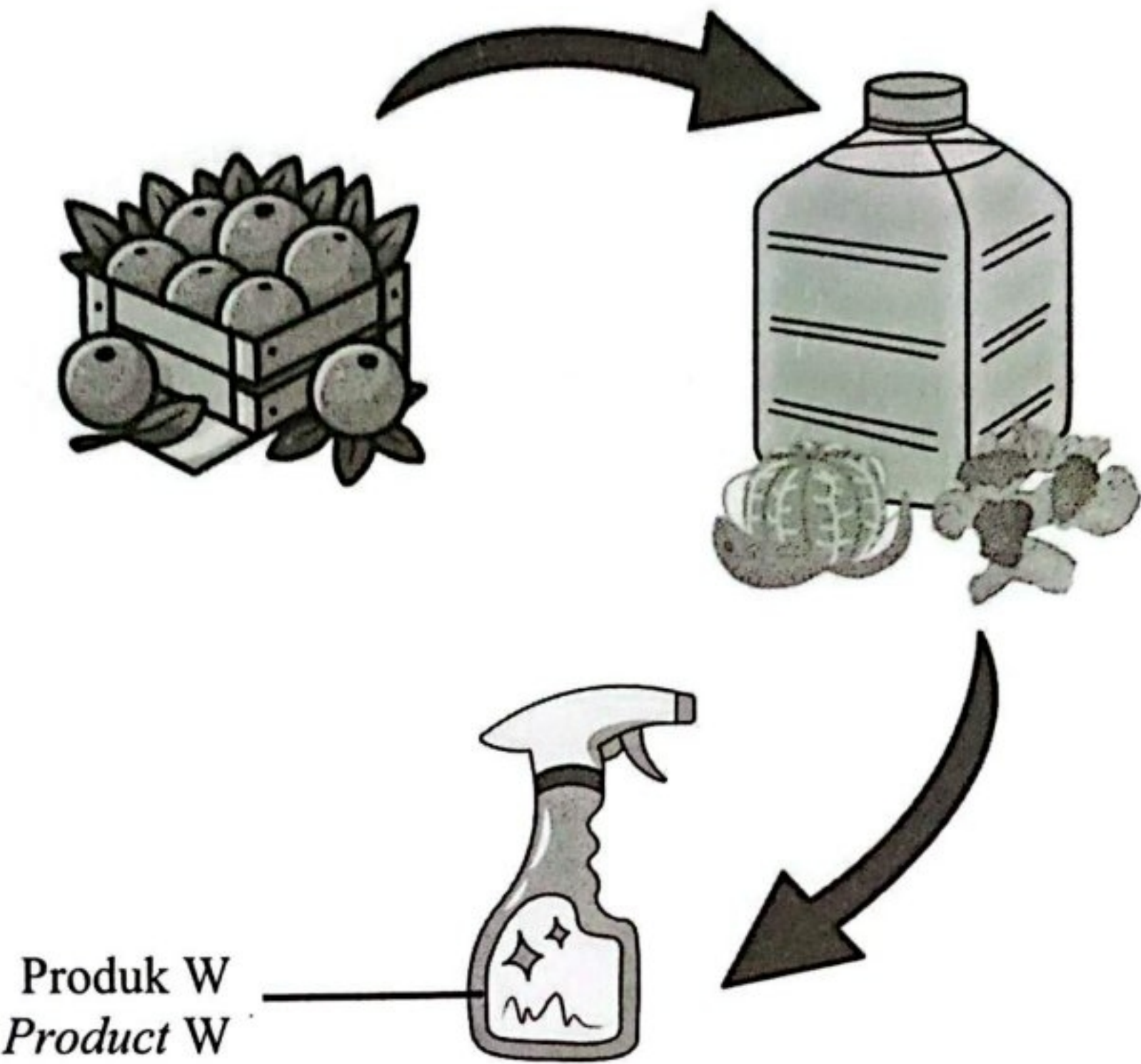
[2 markah]
[2 marks]

- (b) Terangkan kesan ke atas pembentukan buah tomato sekiranya bunga bagi pokok tomato gugur sebelum disenyawakan.
Explain the effect to the formation of tomato fruit if the flower of the tomato plant falls off before being fertilised.

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

[3 markah]
[3 marks]

4. Rajah 4.1 menunjukkan satu aplikasi teknologi hijau yang dilakukan oleh seorang suri rumah.
Diagram 4.1 shows an application of green technology carried out by a housewife.



Rajah 4.1
Diagram 4.1

- (a) (i) Namakan produk W.
Name product W.
-
- [1 markah]
[1 mark]
- (ii) Berdasarkan Rajah 4.1, terangkan bagaimana produk W dihasilkan.
Based on Diagram 4.1, explain how product W is made.
-
-
-
- [2 markah]
[2 marks]

- (iii) Nyatakan **satu** kegunaan produk tersebut.
*State **one** use of the product.*

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

- (b) Rajah 4.2 menunjukkan aktiviti penyahutanan.
Diagram 4.2 shows the activity of deforestation.



Rajah 4.2
 Diagram 4.2

- (i) Cadangkan **dua** langkah untuk menyelamatkan haiwan yang terancam.
*Suggest **two** ways to save the endangered animal.*

.....

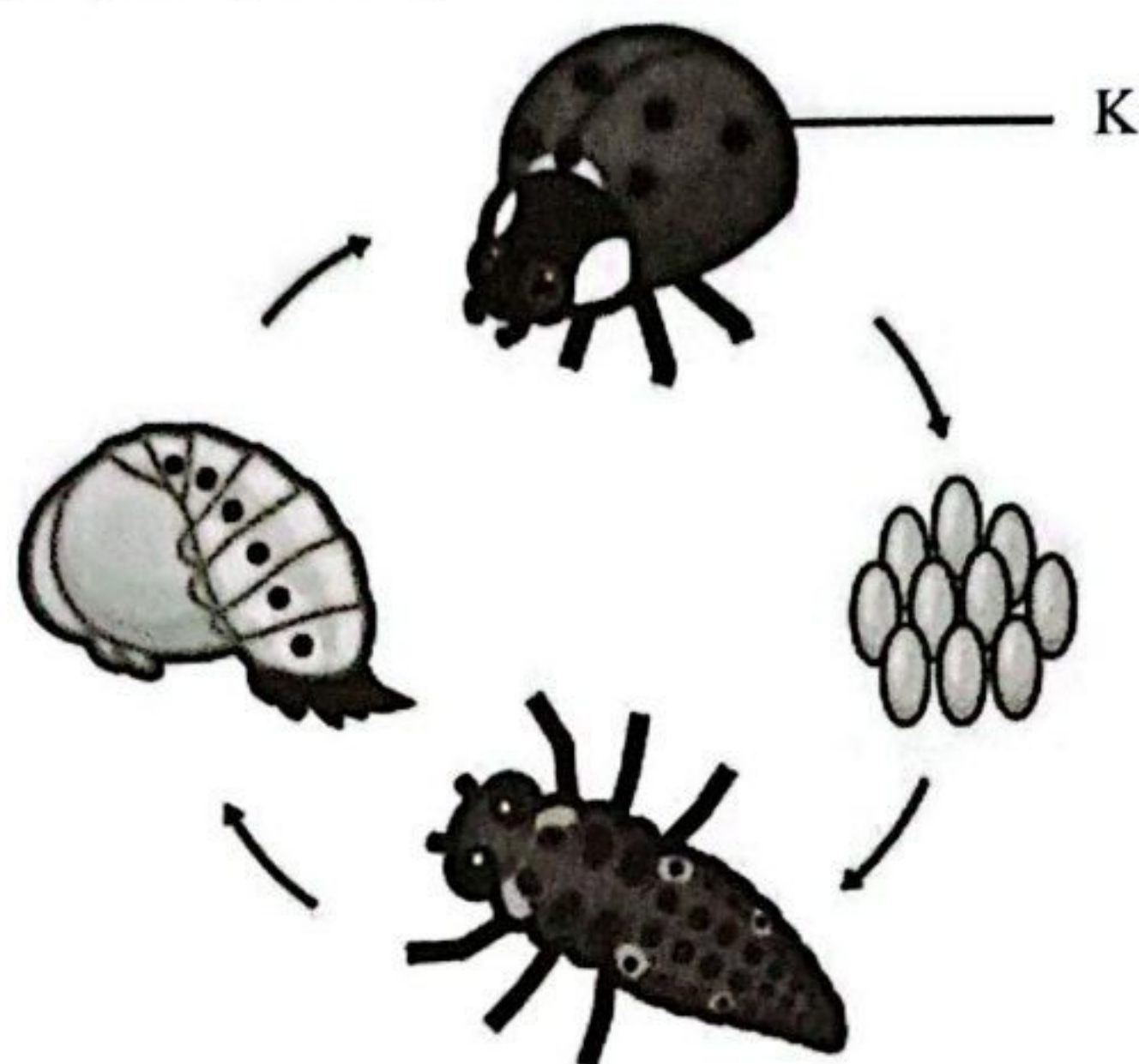
 [2 markah]
 [2 marks]

- (ii) Nyatakan **satu** kesan negatif jika langkah dalam 4(b)(i) tidak dijalankan
*State **one** negative impact if the step in 4(b)(i) is not taken.*

.....

 [1 markah]
 [1 mark]

5. Rajah 5.1 menunjukkan kitar hidup satu organisma.
Diagram 5.1 shows the life cycle of an organism.



Rajah 5.1
Diagram 5.1

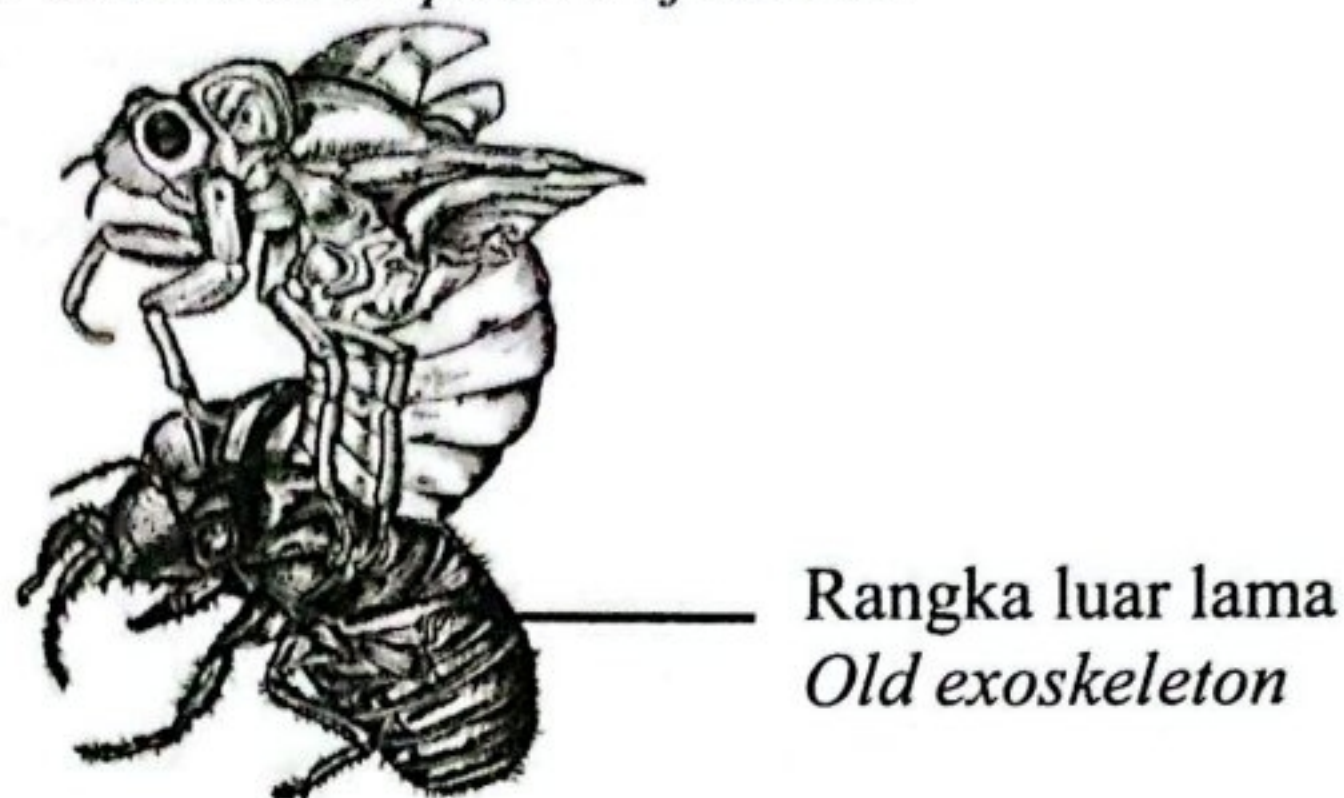
- (a) (i) Berdasarkan Rajah 5.1, namakan jenis pertumbuhan organisma tersebut.
Based on Diagram 5.1, name the type of growth of the organism.

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

- (ii) Nyatakan nic bagi peringkat K.
State the niche for stage K.

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

- (b) Rajah 5.2 menunjukkan satu proses yang berlaku pada satu spesies serangga.
Diagram 5.2 shows a process that occurs in a species of insect.



Rajah 5.2
Diagram 5.2

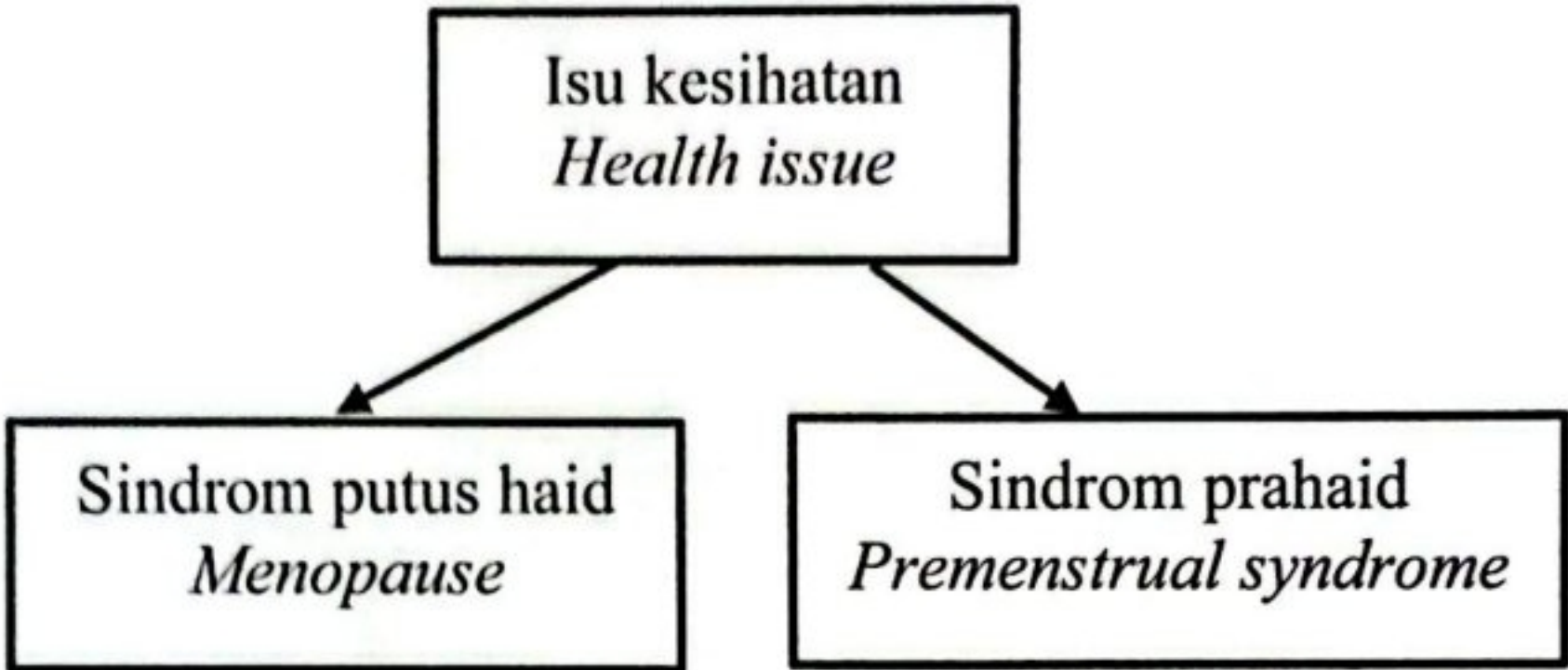
- (i) Namakan proses dalam Rajah 5.2.
Name the process in Diagram 5.2.

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

- (ii) Terangkan bagaimana proses tersebut menyebabkan pertumbuhan serangga.
Explain how the process causes the growth of the insect.

.....
.....
.....
.....
[3 markah]
[3 marks]

- (c) Rajah 5.3 menunjukkan dua isu kesihatan berkaitan kitar haid.
Diagram 5.3 shows two health issues related to menstrual cycle.



Rajah 5.3
Diagram 5.3

Banding bezakan kedua-dua isu kesihatan tersebut.
Compare and contrast the two health issues.

.....

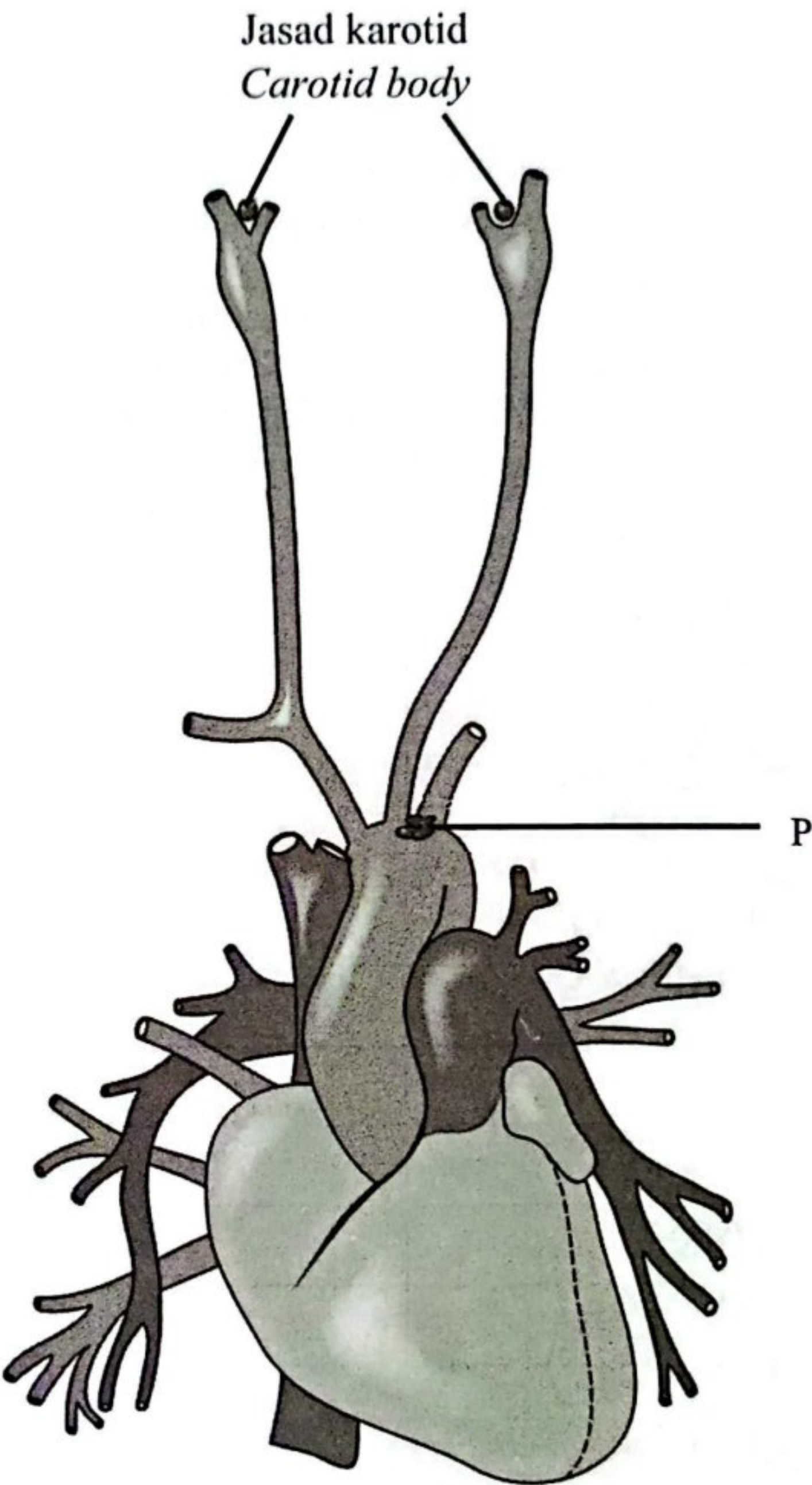
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.....

.....

[2 markah]
[2 marks]

6. Rajah 6.1 menunjukkan kedudukan reseptor deria dalam mekanisme pengawalan tekanan separa karbon dioksida dalam darah.
Diagram 6.1 shows the position of sensory receptors in the regulation of partial pressure of carbon dioxide in the blood.



Rajah 6.1
Diagram 6.1

- (a) Namakan jenis reseptor deria P.
Name the type of sensory receptor P.

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

- (b) Nyatakan perubahan yang dikesan oleh P.
State the change detected by P.

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

- (c) Rajah 6.2 menunjukkan maklumat berkaitan satu homeostasis bagi dua individu berbeza.
Diagram 6.2 shows an information related to a homeostasis for two different individuals.

Aktiviti <i>Activity</i>	Isi padu air yang diminum sebelum aktiviti <i>Volume of water dranked before activity</i> (ml)	Isi padu air kencing yang terhasil selepas 1 jam <i>Volume of urine produced after 1 hour</i> (ml)
 Individu Q <i>Individual Q</i>	200	50
 Individu R <i>Individual R</i>	200	130

Rajah 6.2
Diagram 6.2

- (i) Berdasarkan Rajah 6.2, terangkan mengapa individu Q menghasilkan isipadu air kencing tersebut.
Based on Diagram 6.2, explain why individual Q produces the volume of urine.

.....

.....

.....

[2 markah]
[2 marks]

- (ii) Nyatakan aras rembesan hormon dalam individu R.
State the level of hormone secretion in individual R.

.....

[1 markah]
[1 mark]

- (d) Jadual 6 menunjukkan maklumat kehadiran glukosa di dalam nefron individu J dan individu K.
Table 6 shows information on the presence of glucose in the nephron of individual J and individual K.

Individu <i>Individual</i>	Glomerulus <i>Glomerulus</i>	Kapsul Bowman <i>Bowman's capsule</i>	Tubul berlingkar proksimal <i>Proximal convoluted tubule</i>	Liku Henle <i>Loop of Henle</i>	Tubul berlingkar distal <i>Distal convoluted tubule</i>	Tubul pengumpul <i>Collecting duct</i>
J	✓	✓	✗	✗	✗	✗
K	✓	✓	✓	✓	✓	✓

Petunjuk:
Key:

✓

kehadiran glukosa
Presence of glucose

✗

Tiada kehadiran glukosa
Absent of glucose

Jadual 6
Table 6

Berdasarkan maklumat dalam Jadual 6, kenal pasti individu manakah yang menghadapi masalah kesihatan.

Terangkan jawapan anda.

Based on the information in Table 6, identify which individual has a health problem.

Explain your answer.

.....

.....

.....

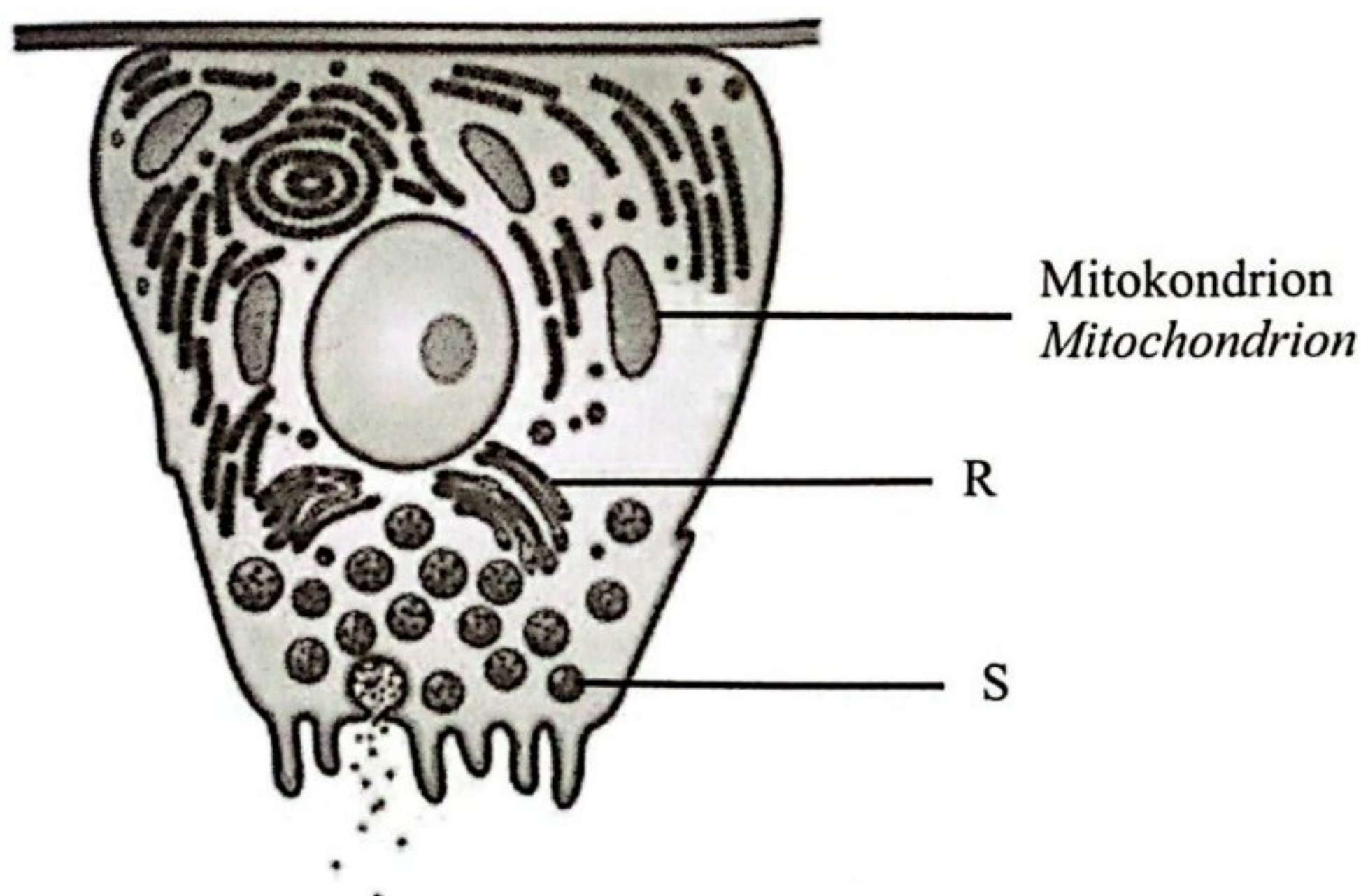
.....

[3 markah]

[3 marks]

7. Rajah 7.1 menunjukkan penghasilan enzim tripsin dalam satu sel manusia.

Diagram 7.1 shows the production of trypsin enzyme in a human cell.



Rajah 7.1
Diagram 7.1

- (a) Namakan organ yang menghasilkan enzim tersebut.

Name the organ that produces the enzyme.

.....

[1 markah]

[1 mark]

- (b) Nyatakan fungsi enzim tersebut.
State the function of the enzyme.

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

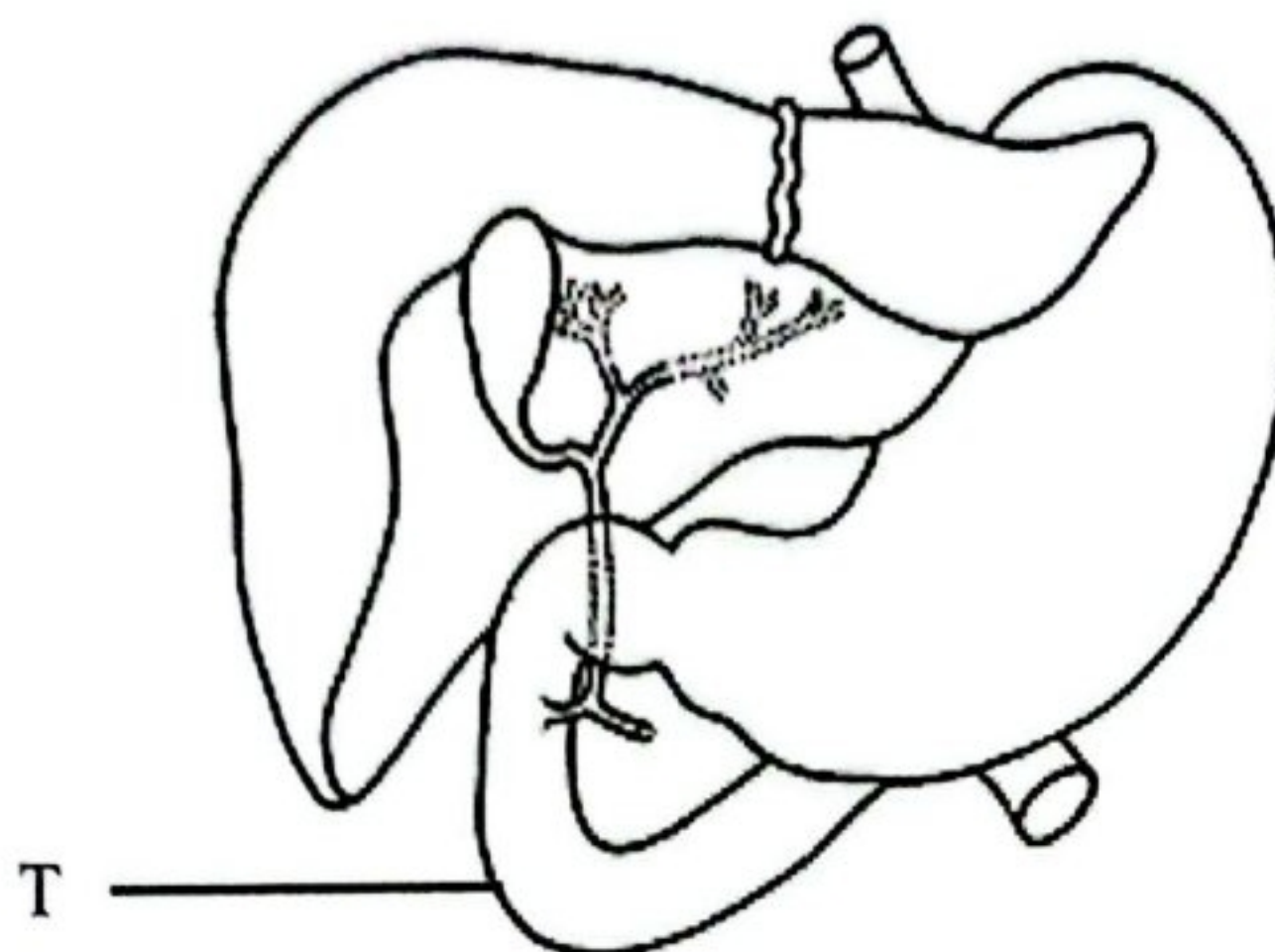
- (c) (i) Terangkan peranan komponen sel R dan S dalam penghasilan enzim ekstrasel.
Explain the role of component cell R and S in the production of the extracellular enzyme.

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

- (ii) Sel dalam Rajah 7.1 terdedah kepada sianida, sejenis racun yang menyebabkan mitokondria tidak berfungsi.
Terangkan kesan racun ini ke atas sintesis enzim ekstrasel.
The cell in Diagram 7.1 is exposed to cyanide, a type of poison that causes mitochondrion not functioning.
Explain the effect of this poison on extracellular enzyme synthesis.

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

- (d) Rajah 7.2 menunjukkan sebahagian daripada sistem pencernaan manusia.
Diagram 7.2 shows part of the human digestive system.



Rajah 7.2
Diagram 7.2

Seorang remaja gemar makan jeruk dan mengambilnya dalam jangka masa yang panjang.
Terangkan kesan tabiat tersebut ke atas mekanisme tindakan enzim lipase dalam T.

A teenager likes to eat pickles and taking it for a long time.

Explain the effect of the habit on the mechanism of action on lipase enzyme in T.

.....

.....

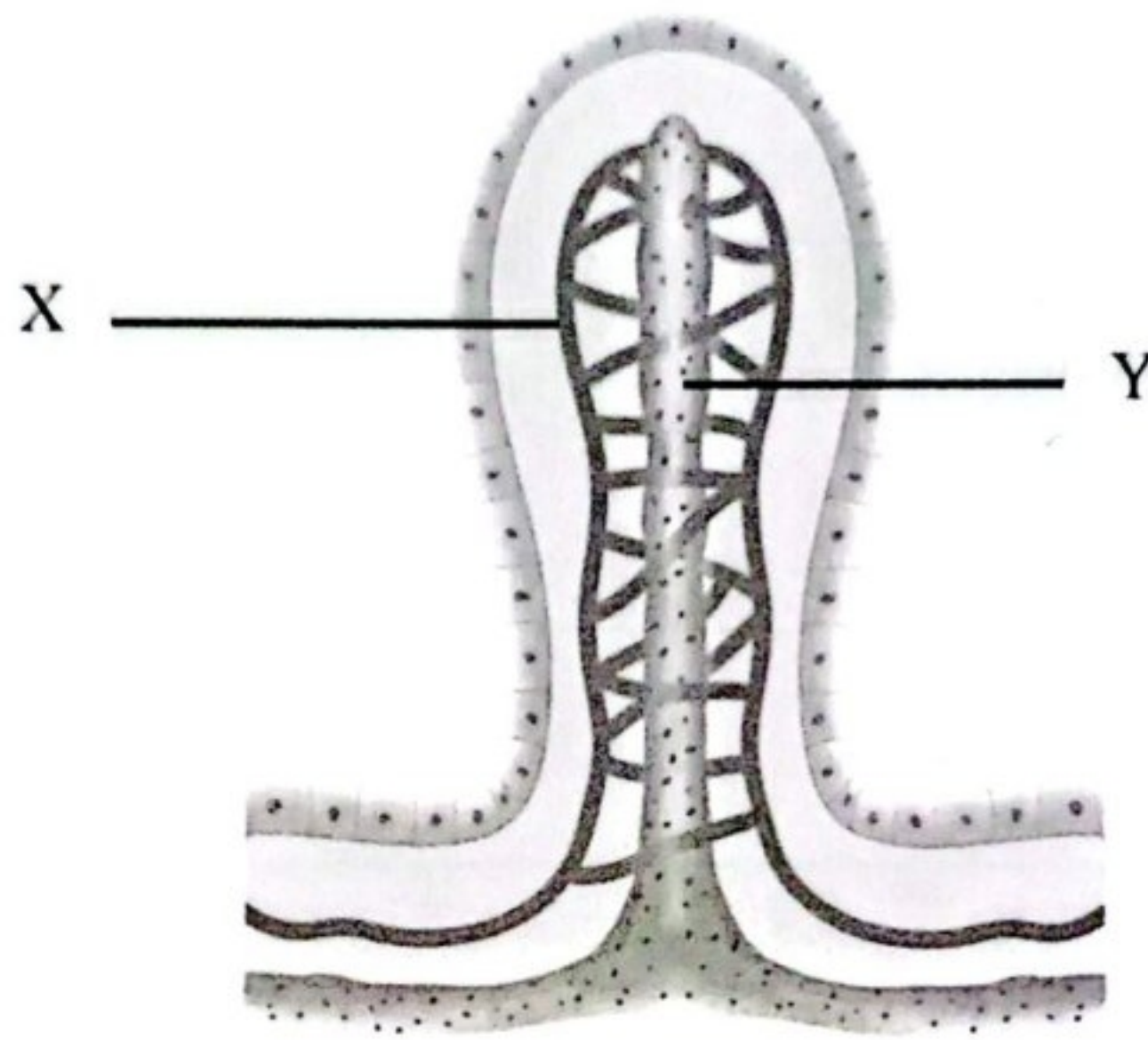
.....

.....

[3 markah]
[3 marks]

8. Rajah 8.1 menunjukkan struktur vilus yang terlibat dalam proses penyerapan makanan tercerna.

Diagram 8.1 shows the structure of villus that involved in the process of absorption of digested food.



Rajah 8.1
Diagram 8.1

Seorang murid makan sekeping roti yang disapu mentega dan minum segelas susu sebagai sarapan pagi. Makanan tersebut mengalami proses pencernaan dan akhirnya diserap ke dalam vilus.

A student eats a slice of bread spread with butter and drinks a glass of milk as breakfast. The foods are digested and finally absorbed into the villus.

- (a) (i) Berdasarkan makanan yang dimakan oleh murid tersebut, bezakan penyerapan makanan tercerna yang diserap melalui X dan Y berdasarkan aspek yang diberi.
Based on the foods eaten by the student, differentiate the absorption of digested food via X and Y based on the aspect given.

Aspek <i>Aspect</i>	X	Y
Contoh makanan tercerna <i>Example of digested food</i>		
Cara penyerapan <i>Method of absorption</i>		

[2 markah]
[2 marks]

- (ii) Hati merupakan organ yang menjalankan metabolisme makanan tercerna. Terangkan bagaimana asid amino mengalami proses asimilasi dalam hati.
Liver is the organ that carries out metabolism of digested food. Explain how amino acids undergoes the process of assimilation in the liver.

.....

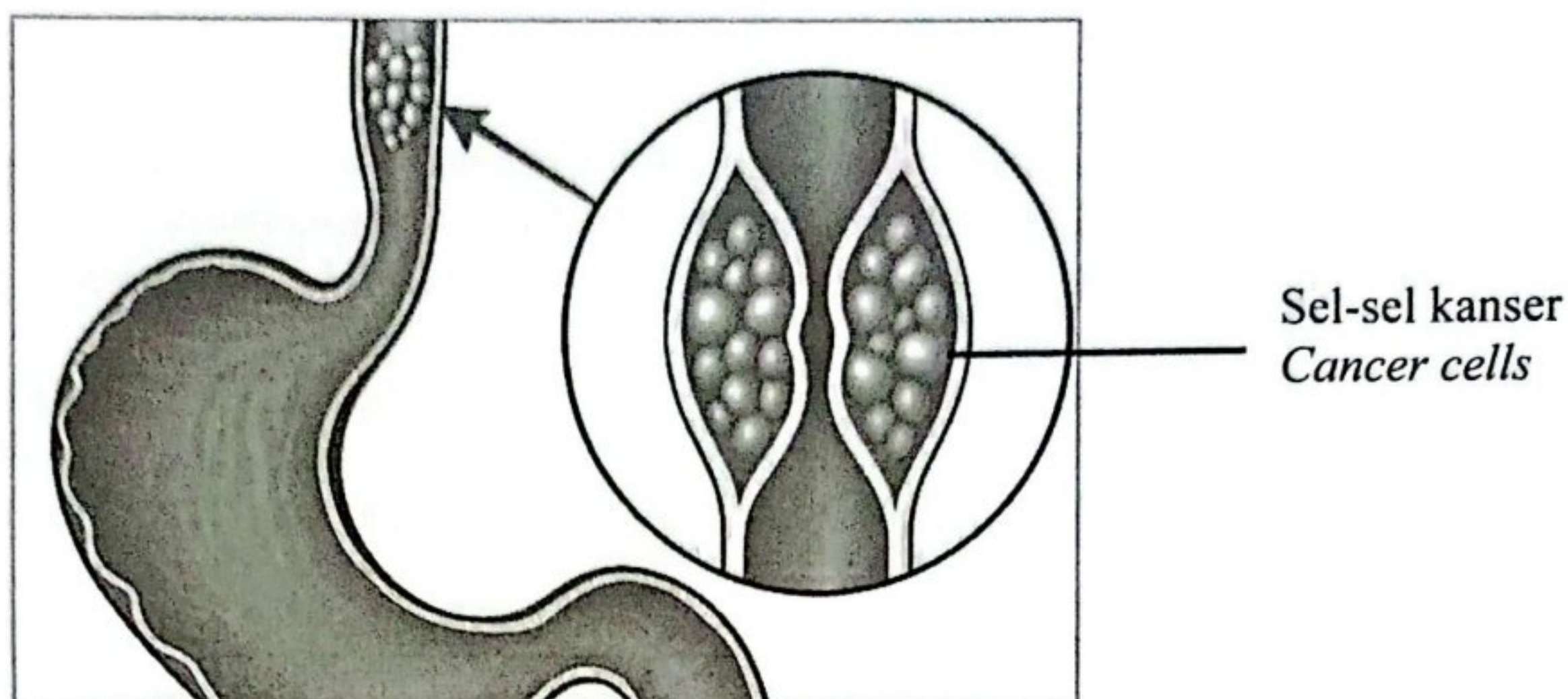
.....

.....

.....

[2 markah]
[2 marks]

- (b) Rajah 8.2 menunjukkan pembentukan sel-sel kanser dalam salur alimentari manusia.
Diagram 8.2 shows the formation of cancer cells in the human alimentary tract.



Rajah 8.2
 Diagram 8.2

- (i) Nyatakan **satu** faktor yang menyebabkan pembentukan sel-sel kanser.
*State **one** factor that causes the formation of cancer cells.*

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

- (ii) Berdasarkan Rajah 8.2, terangkan bagaimana sel-sel kanser boleh menjejaskan fungsi organ tersebut.
Based on Diagram 8.2, explain how the cancer cells can impair the function of the organ.

.....

 [2 markah]
 [2 marks]

- (iii) Pesakit kanser itu menjalani rawatan kemoterapi. Pakar pemakanan mencadangkan pesakit perlu mengubah suai diet bagi mengurangkan risiko jangkitan dan sembuh dengan lebih cepat.
Cadangkan **dua** langkah bagi mengubah suai diet yang boleh dilakukan oleh pesakit tersebut.

The cancer patient undergoes chemotherapy treatment. Dietician suggests that he has to modifies his diet to reduce the risk of infection and to enable quick recovery. Suggest two steps to modify his diet that can be done by the patient.

.....

.....

.....

[2 markah]
[2 marks]

Bahagian B
Section B
[20 markah]
[20 marks]

Bahagian ini mengandungi **dua** soalan. Jawab **satu** soalan.
*This section has **two** questions. Answer **one** question.*

9. (a) Kumpulan darah ABO dalam manusia ditentukan oleh tiga alel yang berbeza iaitu I^A , I^B dan I^O .
The ABO blood group in humans is determined by three different alleles, I^A , I^B and I^O

Alel A dan Alel B adalah kodominan antara satu sama lain.
Allele A and Allele B are codominant to each other.

- (i) Nyatakan maksud kodominan.
State the meaning of codominant.

[2 markah]
[2 marks]

- (ii) Lengkapkan jadual di bawah dengan menulis genotip bagi kumpulan darah berikut.
Complete the table below by writing the genotypes for the following blood groups.

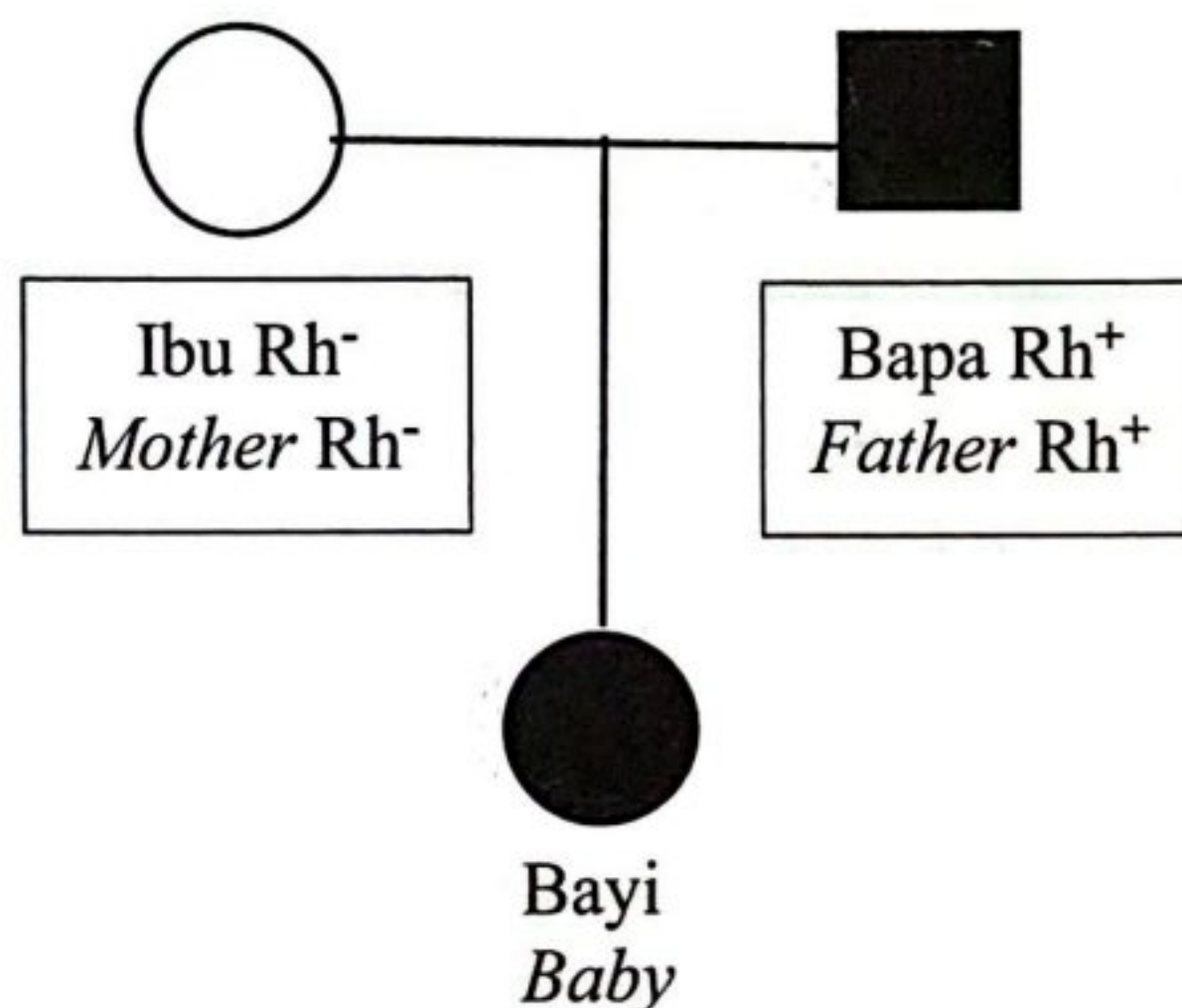
Fenotip <i>Phenotype</i>	Genotip <i>Genotype</i>
A	$I^A I^A$ atau $I^A I^O$
B	
AB	
O	$I^O I^O$

[2 markah]
[2 marks]



- (b) Rajah 9.1 menunjukkan pewarisan faktor Rhesus dalam darah manusia. Terdapat satu jenis antigen iaitu antigen D atau dikenali sebagai faktor Rhesus (Rh). Seorang ibu yang membawa Rhesus negatif tidak mengalami apa-apa masalah kesihatan, akan tetapi akan mempunyai risiko mengandungkan bayi Rhesus positif yang diwarisi oleh bapanya yang mempunyai darah Rhesus positif.

Diagram 9.1 shows the inheritance of the Rhesus factor in human blood. There is one type of antigen, antigen D also known as the Rhesus (Rh) factor. A mother who carries Rhesus negative does not experience any health problems, but will have the risk of giving birth to a Rhesus positive baby inherited from her father who has Rhesus positive blood.



Rajah 9.1
Diagram 9.1

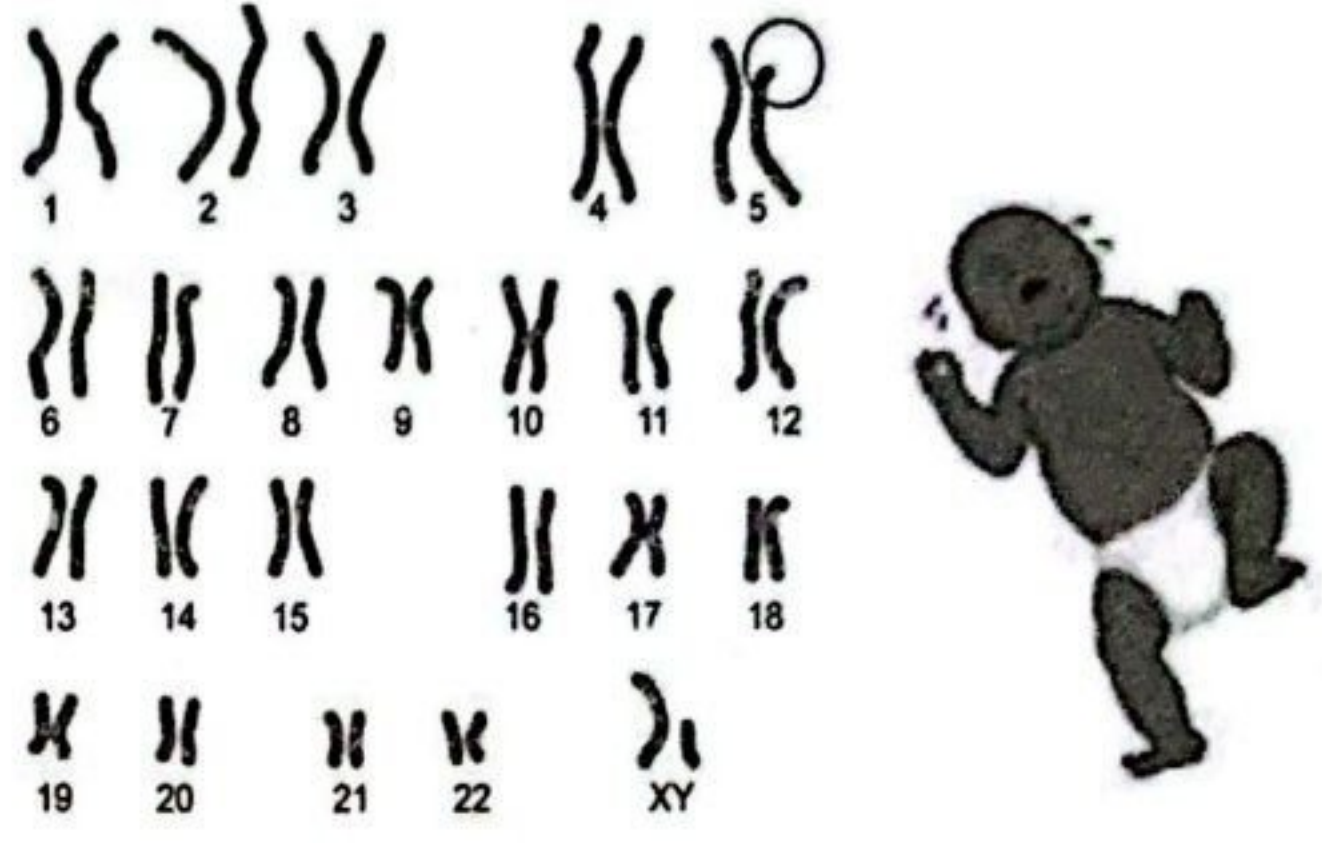
Terangkan bagaimana pewarisan faktor Rhesus diwarisi dan jelaskan bagaimana ia boleh menyebabkan masalah kepada ibu yang mengandung dan bayi.

Explain how the Rhesus factor is inherited and explain how it can cause problems for pregnant mothers and a baby.

[6 markah]

[6 marks]

- (c) Rajah 9.2 menunjukkan maklumat berkaitan dua jenis penyakit akibat mutasi.
Diagram 9.2 shows information related to two types of diseases caused by mutations.

Penyakit X <i>Disease X</i>	Penyakit Y <i>Disease Y</i>
	

Rajah 9.2
Diagram 9.2

Banding dan bezakan antara penyakit X dan penyakit Y.
Compare and contrast between disease X and disease Y.

[10 markah]
 [10 marks]

10. (a) Rajah 10.1 menunjukkan satu aktiviti yang dijalankan oleh individu M.
Diagram 10.1 shows an activity of an individual M.



Rajah 10.1
Diagram 10.1

- (i) Nyatakan jenis respirasi sel bagi individu M.
Namakan dua proses yang terlibat dalam respirasi sel tersebut.
State the type of cellular respiration of individual M.
Name two processes involved in the cellular respiration.

[3 markah]
[3 marks]

- (ii) Rajah 10.2 menunjukkan produk yang dihasilkan dengan menggunakan bakteria N.
Diagram 10.2 shows the product produced using bacteria N.



Rajah 10.2
Diagram 10.2

Tuliskan persamaan perkataan bagi jenis respirasi sel yang dijalankan oleh bakteria N.
Write the word equation for the type of cellular respiration carried out by bacteria N.

[1 markah]
[1 mark]

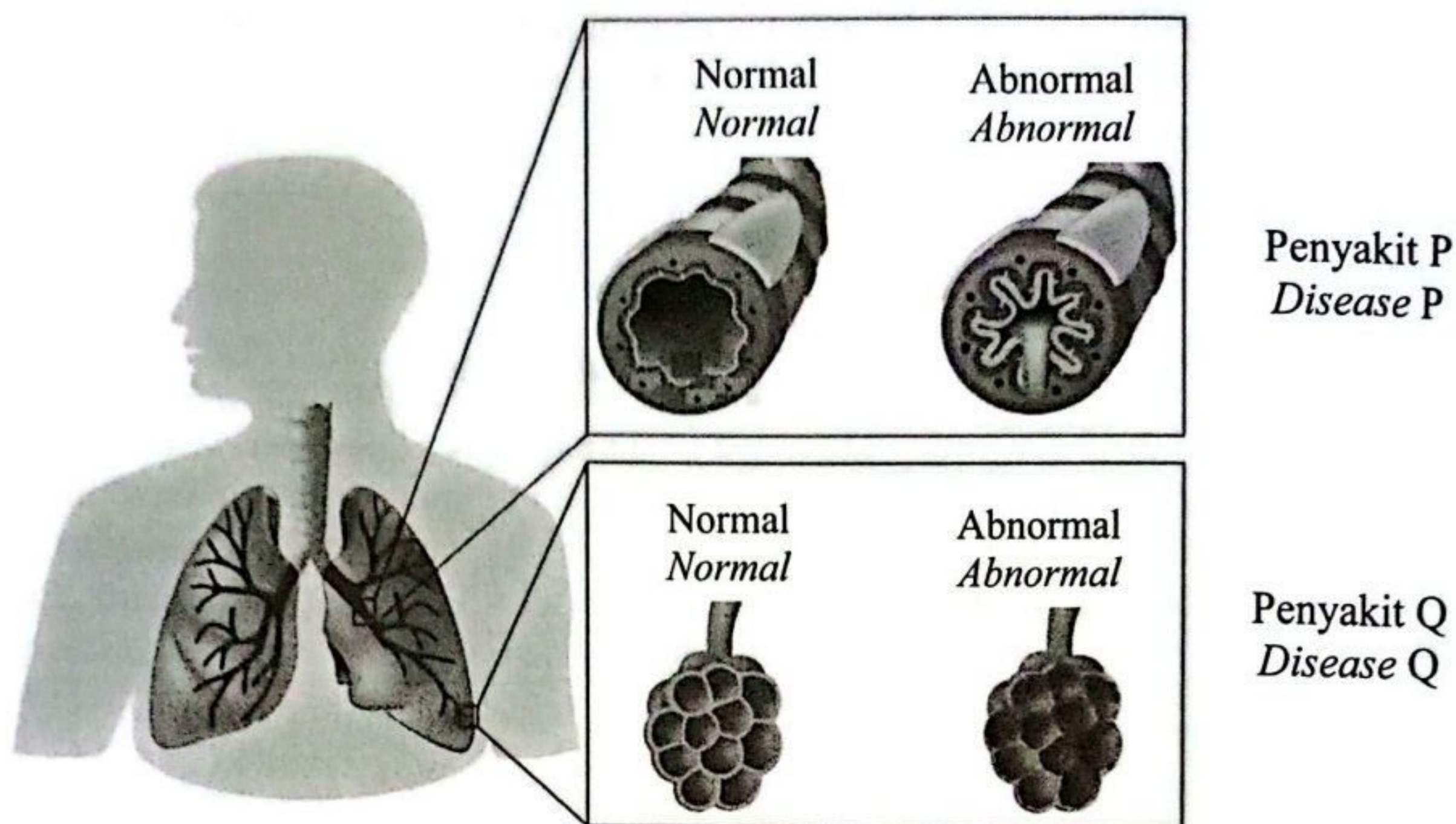
- (iii) Banding bezakan respirasi sel dalam Rajah 10.1 dan dalam Rajah 10.2.
Compare and contrast cellular respiration in Diagram 10.1 and Diagram 10.2.

[6 markah]
[6 marks]

- (b) (i) Rajah 10.3 menunjukkan seorang individu yang menghisap rokok elektronik.
Rajah 10.4 menunjukkan dua gejala *Chronic Obstructive Pulmonary Disease* (COPD) yang mungkin dialami oleh individu itu kesan dari aktiviti tersebut.
Diagram 10.3 shows an individual smoking an electronic cigarette.
Diagram 10.4 shows two symptoms of Chronic Obstructive Pulmonary Disease (COPD) that the individual may experience as a result of the activity.



Rajah 10.3
Diagram 10.3



Rajah 10.4
Diagram 10.4

Berdasarkan Rajah 10.4, namakan penyakit COPD P dan Q.
Based on Diagram 10.4, name COPD disease P and Q.

[2 markah]
[2 marks]

- (ii) Terangkan bagaimana penyakit P dan Q mempengaruhi sistem pernafasan individu tersebut.

Explain how disease P and Q affect the respiratory system of the individual.

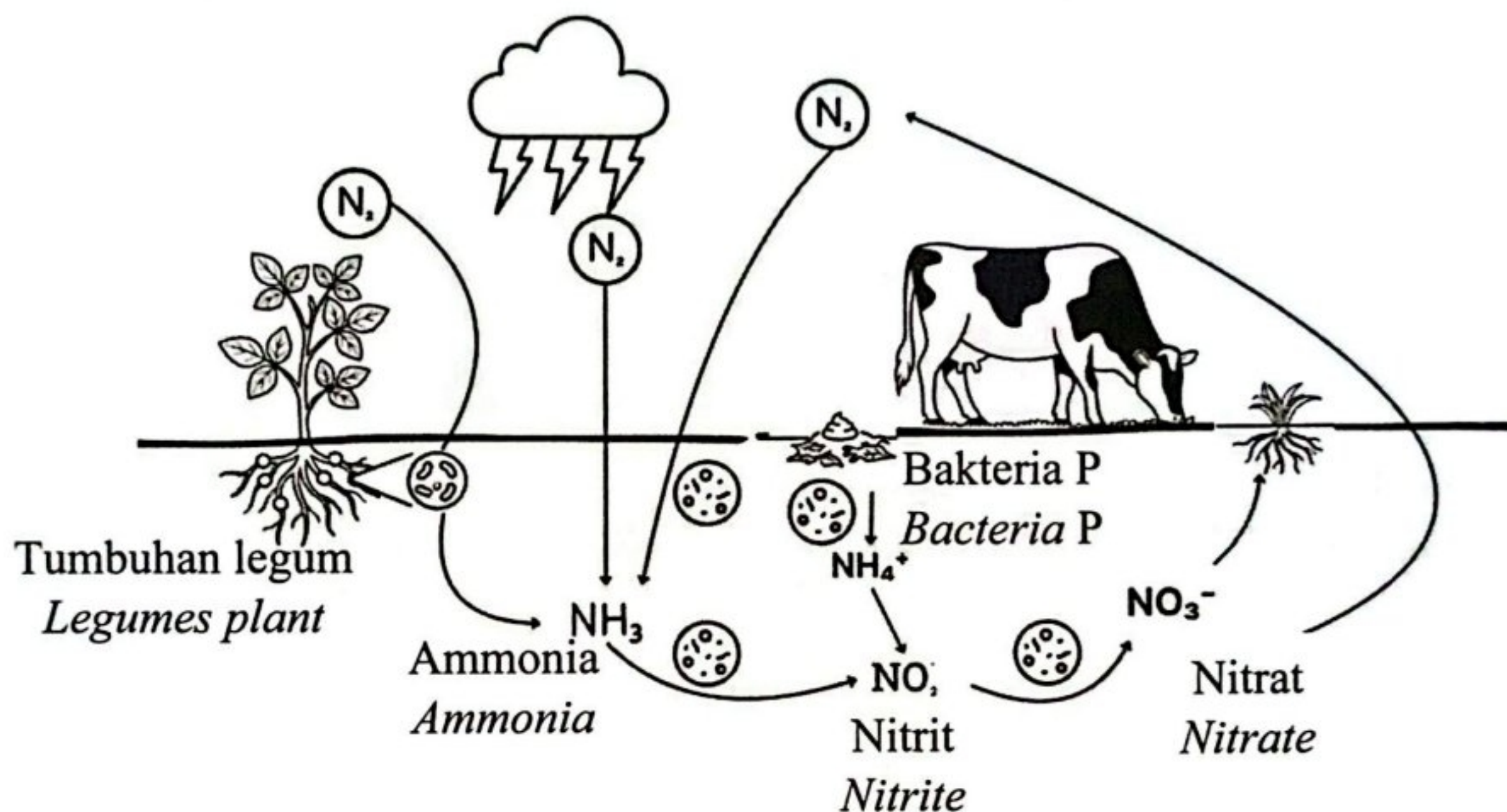
[8 markah]
[8 marks]



Bahagian C
Section C
 [20 markah]
 [20 marks]

Soalan ini **mesti** dijawab.
*This question **must** be answered.*

11. Rajah 11.1 menunjukkan satu kitar nitrogen.
Diagram 11.1 shows a nitrogen cycle.



Rajah 11.1
 Diagram 11.1

- (a) (i) Namakan **dua** proses yang mengikat nitrogen ke dalam tanah.
*Name **two** processes that fix the nitrogen into the soil.*
- (ii) Ramalkan apa yang berlaku kepada haiwan jika bakteria P tiada.
 Terangkan ramalan anda.
Predict what would happen to the dead animal if bacteria P absent.
Explain your prediction.

[2 markah]
 [2 marks]

[4 markah]
 [4 marks]

- (iii) Seorang petani mendapati hasil tanaman berkurang kerana kesuburan tanah merosot.

Cadangkan cara untuk membantu petani meningkatkan kesuburan tanah.

A farmer finds that crop yields are decreasing because soil fertility is declining.

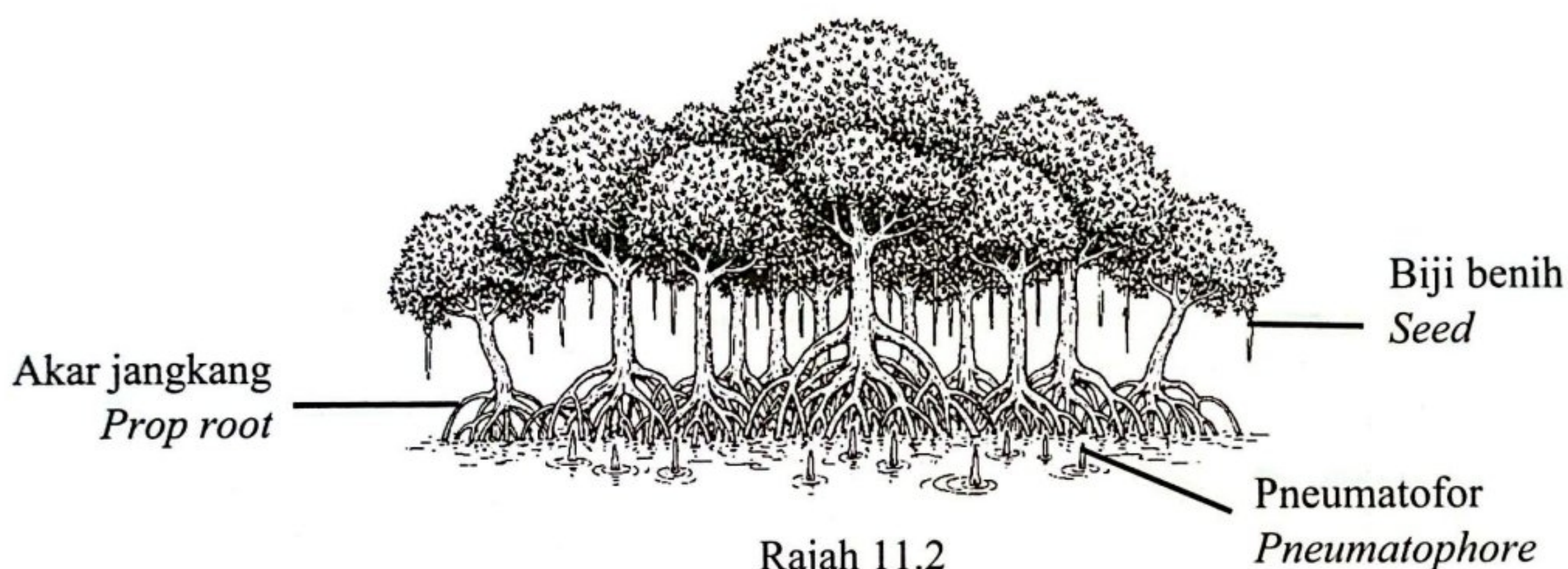
Suggest ways to help farmers improve soil fertility.

[4 markah]

[4 marks]

- (b) Rajah 11.2 menunjukkan adaptasi tumbuhan paya bakau untuk hidup di kawasan yang mengalami pasang surut.

Diagram 11.2 shows the adaptations of the mangrove plants to live in the intertidal area.



Rajah 11.2
Diagram 11.2

- (b) (i) Berdasarkan Rajah 11.2, nyatakan masalah-masalah yang dihadapi oleh tumbuhan paya bakau dan terangkan ciri penyesuaian untuk mengatasi masalah-masalah tersebut.

Based on Diagram 11.2, state the problems faced by the mangrove plant and explain the adaptive characteristics to overcome the problems.

[6 markah]

[6 marks]

- (ii) Terangkan kepentingan ekosistem paya bakau.

Explain the importance the of mangrove ecosystem.

[4 markah]

[4 marks]

KERTAS SOALAN TAMAT
END OF QUESTION PAPER