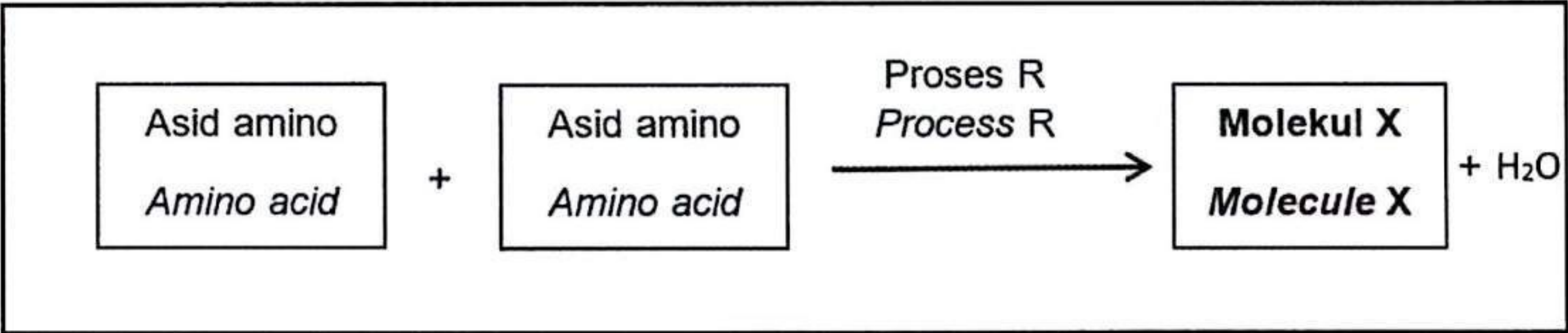


SOALAN 1

1. Rajah 1.1 menunjukkan sebahagian daripada tindak balas biokimia yang berlaku pada sebatian organik.
Diagram 1.1 shows part of the biochemical reactions that occur in organic compounds.



Rajah 1.1
Diagram 1.1

- (a) Berdasarkan Rajah 1.1, nyatakan:
Based on Diagram 1.1, state:
- (i) nama bagi Proses R:
the name for Process R:
.....
- (ii) nama ikatan yang terbentuk dalam molekul X selepas berlakunya proses yang dinyatakan di a(i).
the name of the bond formed in molecule X after the process described in a(i).
.....
- [2 markah/2 marks]

- (b) Penambahan asid amino secara berterusan berlaku pada molekul X sehingga membentuk suatu rantai.
Tuliskan persamaan perkataan bagi tindak balas biokimia yang berlaku.
The continuous addition of amino acids occurs on molecule X until a chain is formed.
Write the word equation for the biochemical reaction that occurs.
.....
- [2 markah/2 marks]

<https://t.me/cikgufazliebiosensei>

(c) Individu A menghidap penyakit Pankreatitis. Beliau telah menjalani rawatan Terapi Penggantian Enzim Pankreas (PERT) yang diambil dalam bentuk kapsul untuk membantu pencernaan protein.

Individual A suffers from Pancreatitis. He has undergone Pancreatic Enzyme Replacement Therapy (PERT), which is taken in the form of capsules to help in the digestion of proteins.

Terangkan fungsi rawatan tersebut.

Explain the function of this treatment.

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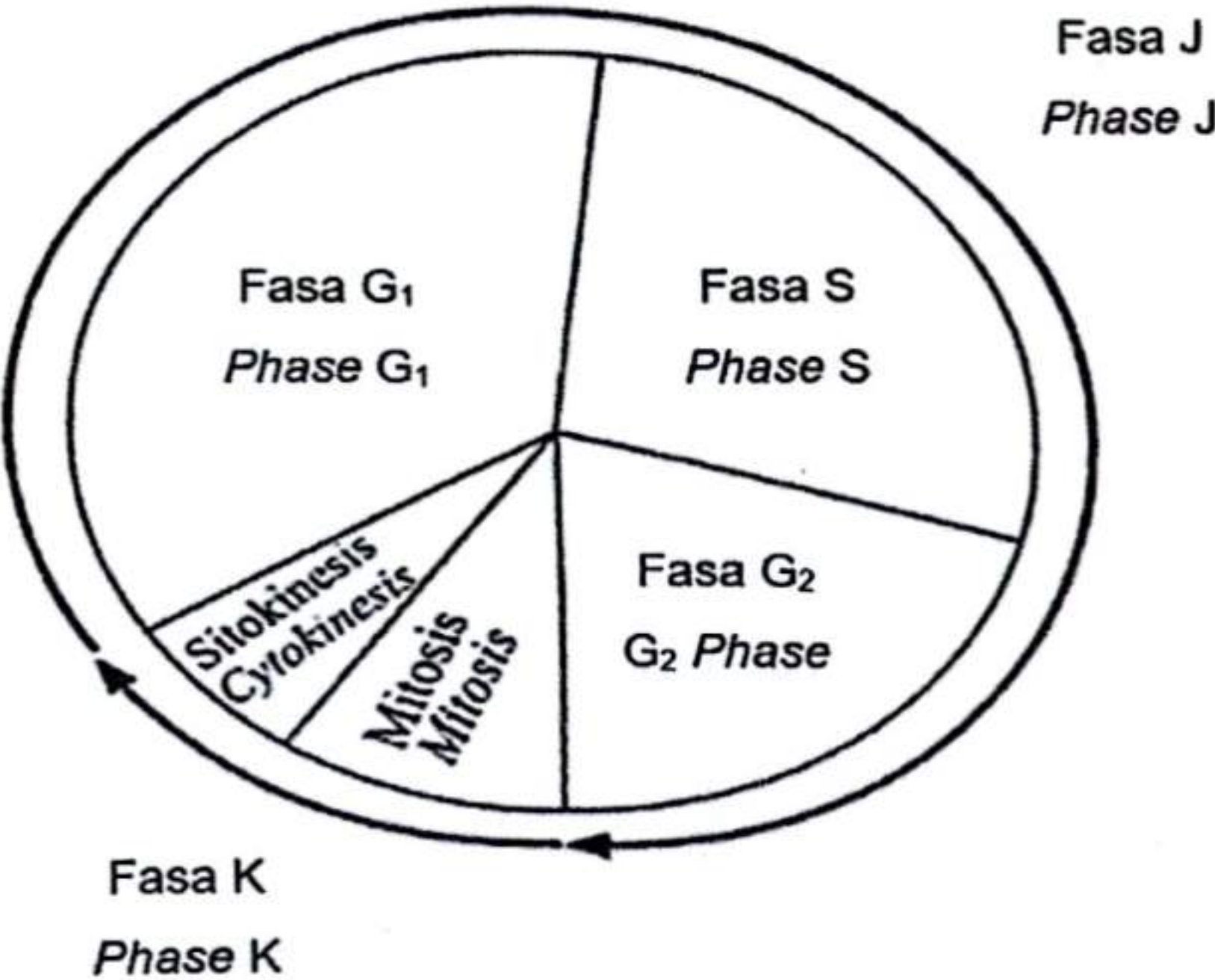
.....

[2 markah/2 marks]

SOALAN 2

2. Rajah 2.1 menunjukkan satu kitar sel.

Diagram 2.1 shows a cell cycle.



Rajah 2.1
Diagram 2.1

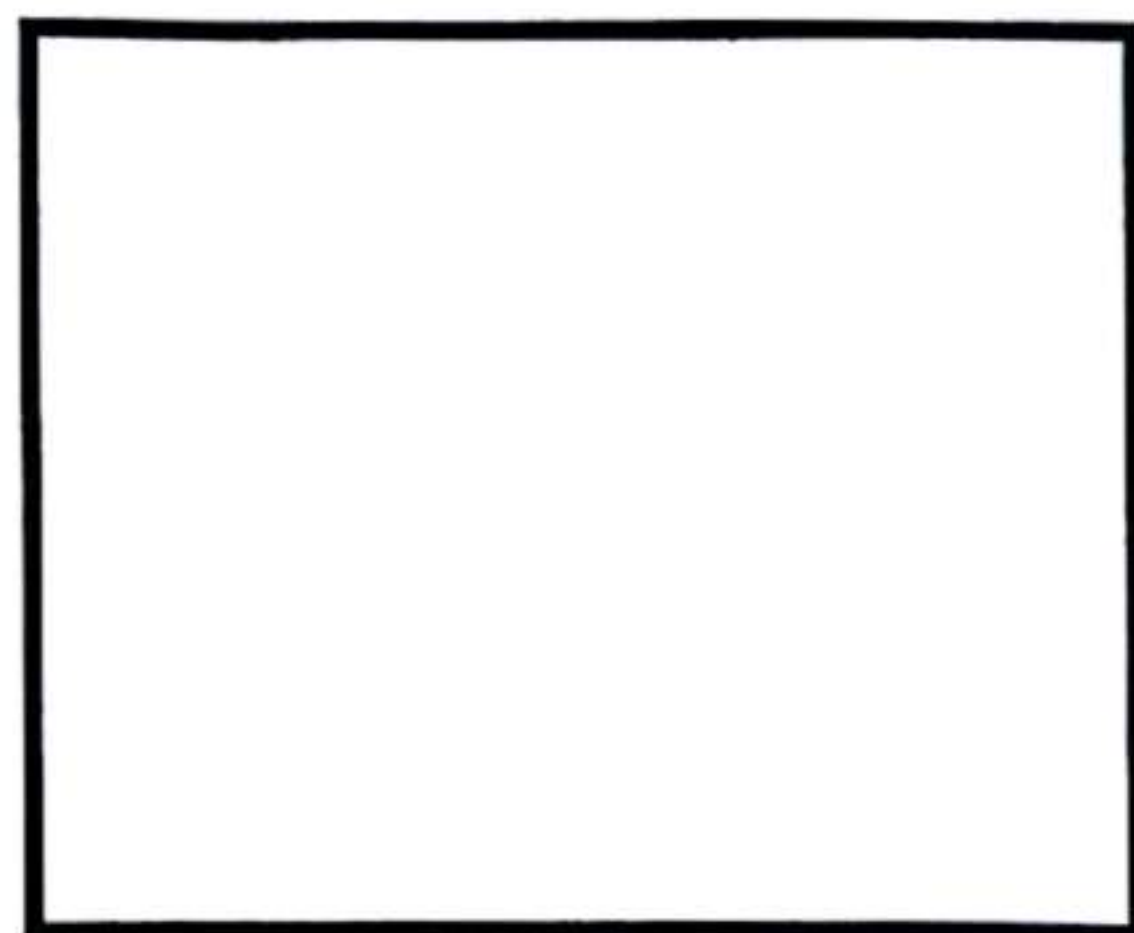
(a) Kenalpasti Fasa J:

Identify Phase J:

[1 markah/1 mark]

(b) (i) Rajah 2.2 menunjukkan suatu proses yang berlaku pada fasa S.

Diagram 2.2 shows a process that occurs at phase S.



Rajah 2.2
Diagram 2.2

Lengkapkan Rajah 2.2 untuk menunjukkan perlakuan kromosom dalam fasa tersebut.

Complete Diagram 2.2 to show the behaviour of chromosomes in that phase.

[2 markah/2 marks]

(ii) Nyatakan proses yang berlaku dalam fasa S.

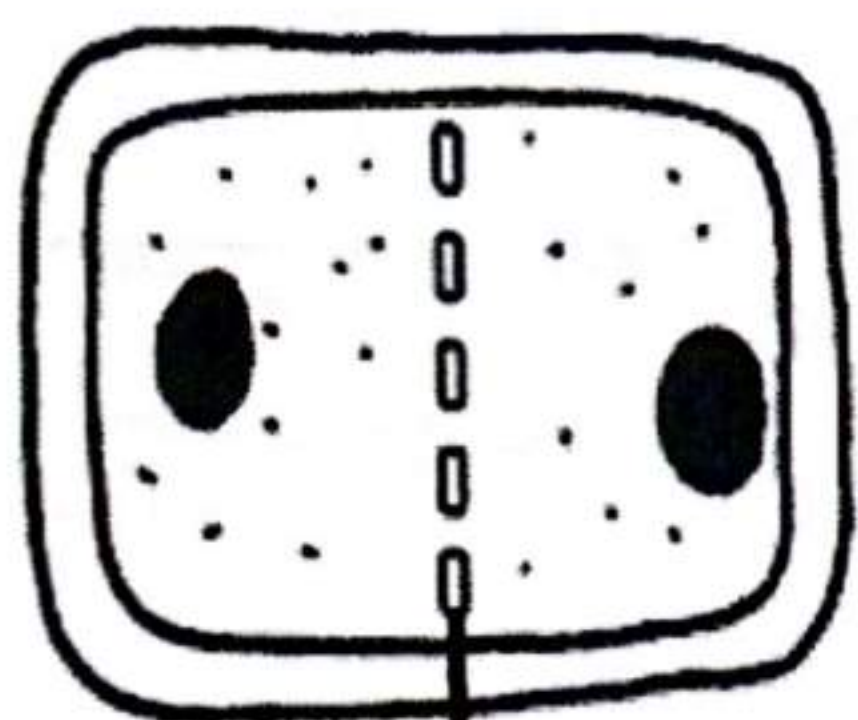
State the process that occurs in phase S.

.....

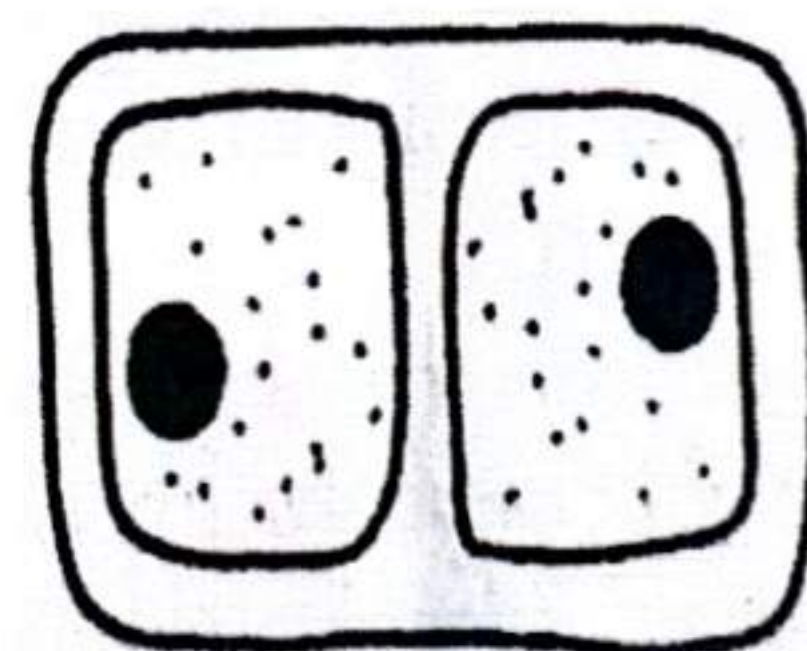
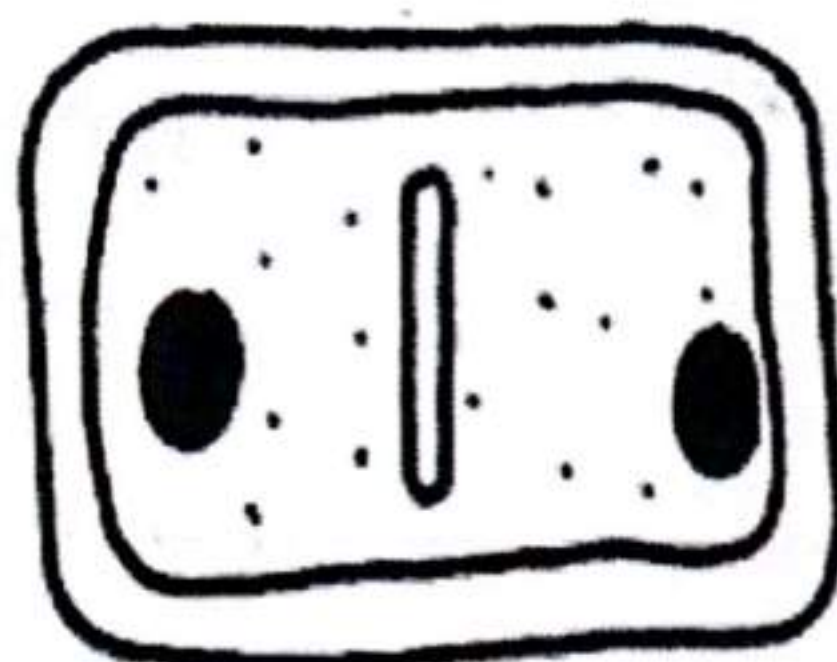
[1 markah/1 mark]

(c) Rajah 2.3 menunjukkan sitokinesis yang berlaku pada sel tumbuhan.

Diagram 2.3 shows cytokinesis that occurs in plant cells.



Vesikel
Vesicle



Rajah 2.3
Diagram 2.3

Berdasarkan Rajah 2.3, terangkan peranan vesikel dalam sel tumbuhan sehingga terbentuknya dua sel anak yang baharu semasa pembahagian sel.

Based on Diagram 2.3, explains the role of vesicles in plant cells to form two new daughter cells during cell division.

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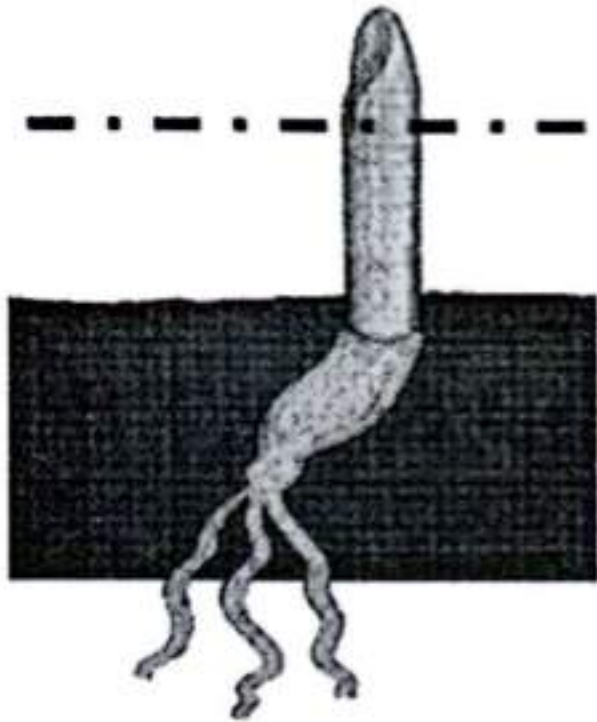
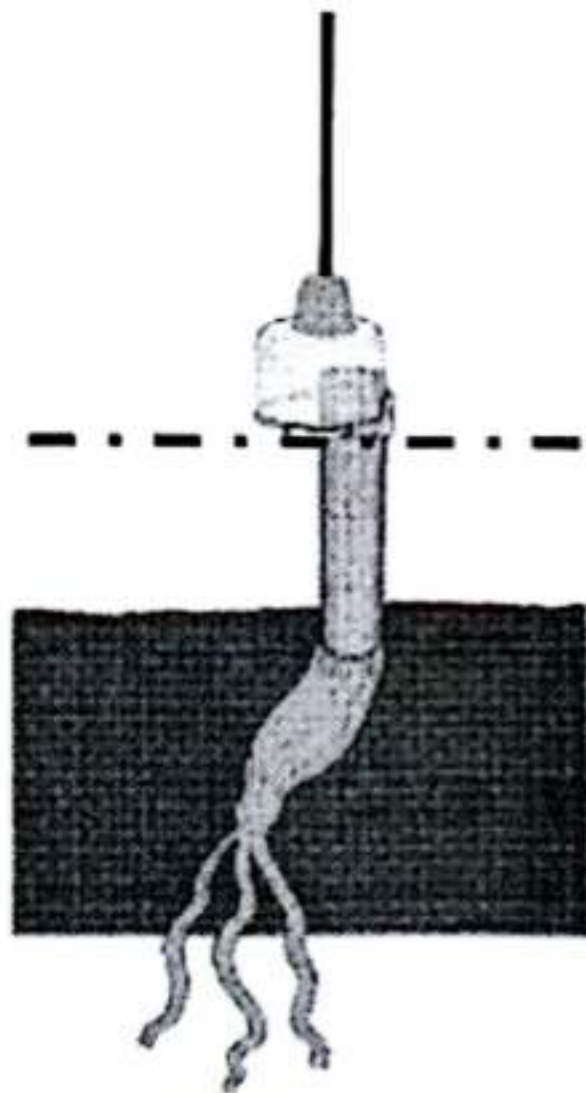
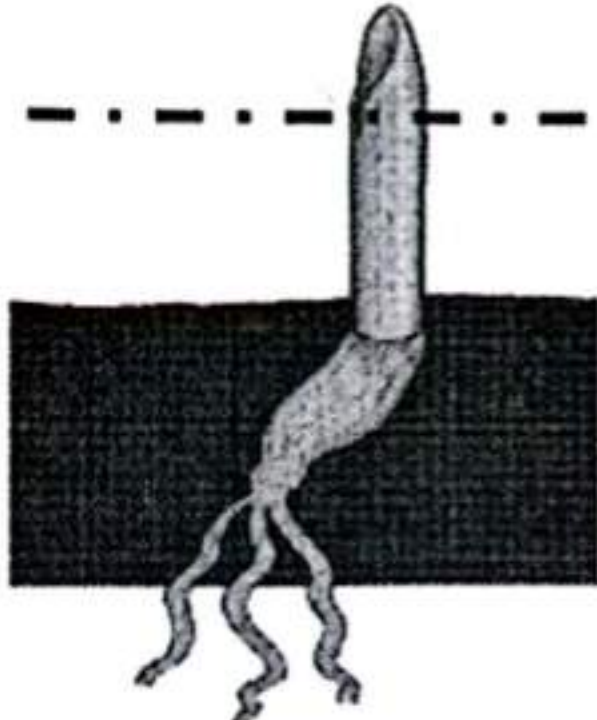
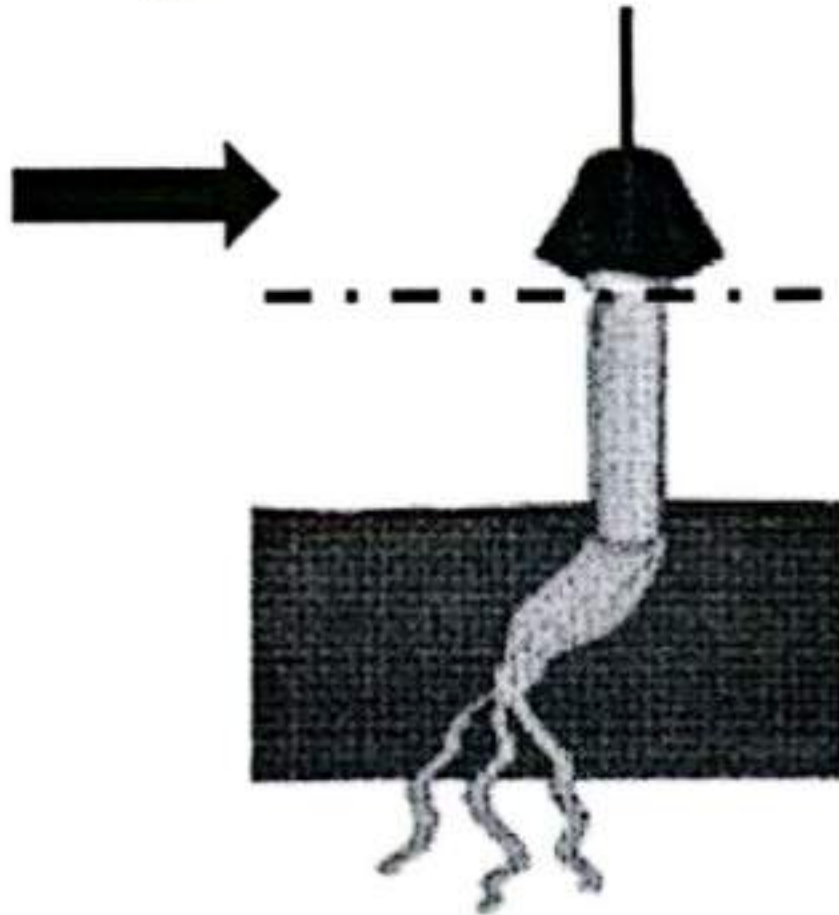
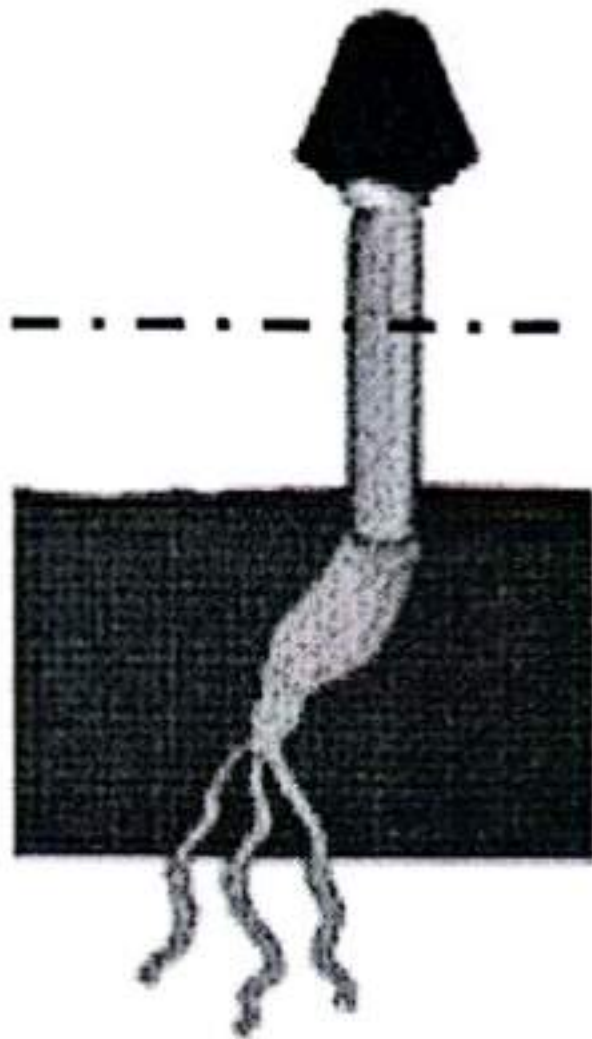
[2 markah/2 marks]

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SOALAN 3

3. Rajah 3.1 menunjukkan eksperimen untuk mengkaji kesan suatu fitohormon terhadap pertumbuhan koleoptil A dan koleoptil B di hujung pucuk.

Diagram 3.1 shows an experiment to study the effect of a phytohormone on the growth of the coleoptile A and coleoptile B at the shoot tip.

Pada awal eksperimen At the beginning of the experiment	Rawatan Treatment	Pemerhatian selepas dua hari Observation after two days
Koleoptil A Coleoptile A 	Hujung koleoptil dipotong dan diletakkan di atas blok agar The tip of the coleoptile is cut and placed on an agar block 	
Koleoptil B Coleoptile B 	Cahaya Light Kain hitam Black cloth 	

Rajah 3.1
Diagram 3.1

(a) (i) Kenalpasti hormon yang terlibat dalam kedua-dua gerak balas tersebut.
Identify the hormone involved in both responses.

.....

[1 markah/1 mark]

(ii) Lukis pemerhatian bagi gerak balas pertumbuhan koleptil A selepas dua hari di ruangan yang disediakan pada Rajah 3.1.

Draw the observation of the growth response of coleoptile A after two days in the space provided in Diagram 3.1.

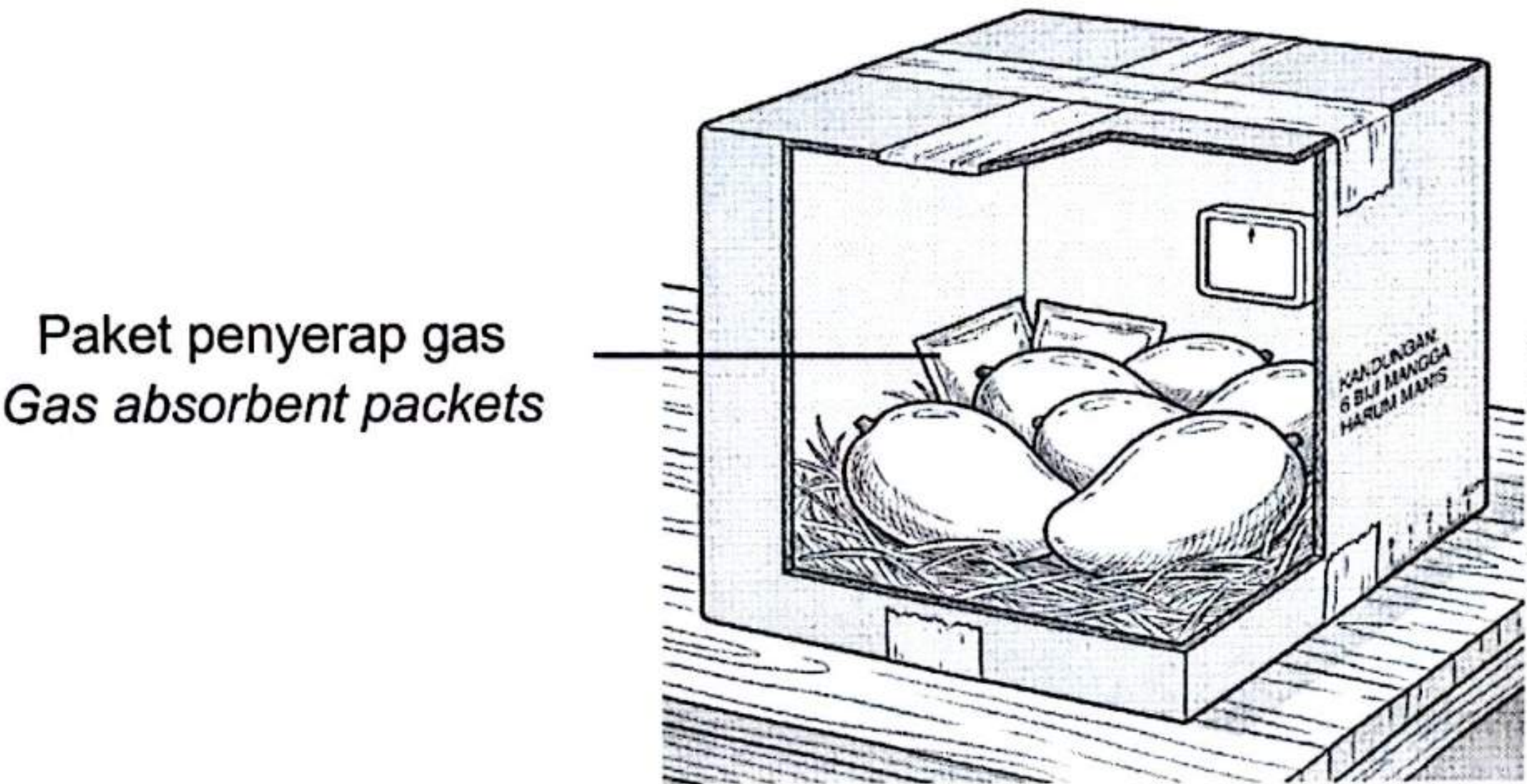
[1 markah/1 mark]

(iii) Terangkan pemerhatian bagi koleoptil B selepas dua hari rawatan dilakukan.
Explain the observation of coleoptile B after two days of treatment.

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

[2 markah/2 marks]

(b) Rajah 3.2 menunjukkan satu kaedah pembungkusan buah mangga yang akan dieksport ke luar negara.
Diagram 3.2 shows a method of packaging mangoes that will be exported overseas.



Rajah 3.2
Diagram 3.2

Paket penyerap gas telah diletakkan ke dalam kotak tersebut sebelum ditutup rapat. Terangkan kesan kepada buah mangga sekiranya langkah tersebut tidak dilakukan.

A gas absorber packet was placed inside the box before it was tightly sealed. Explain the effect on the mangoes if this step was not carried out.

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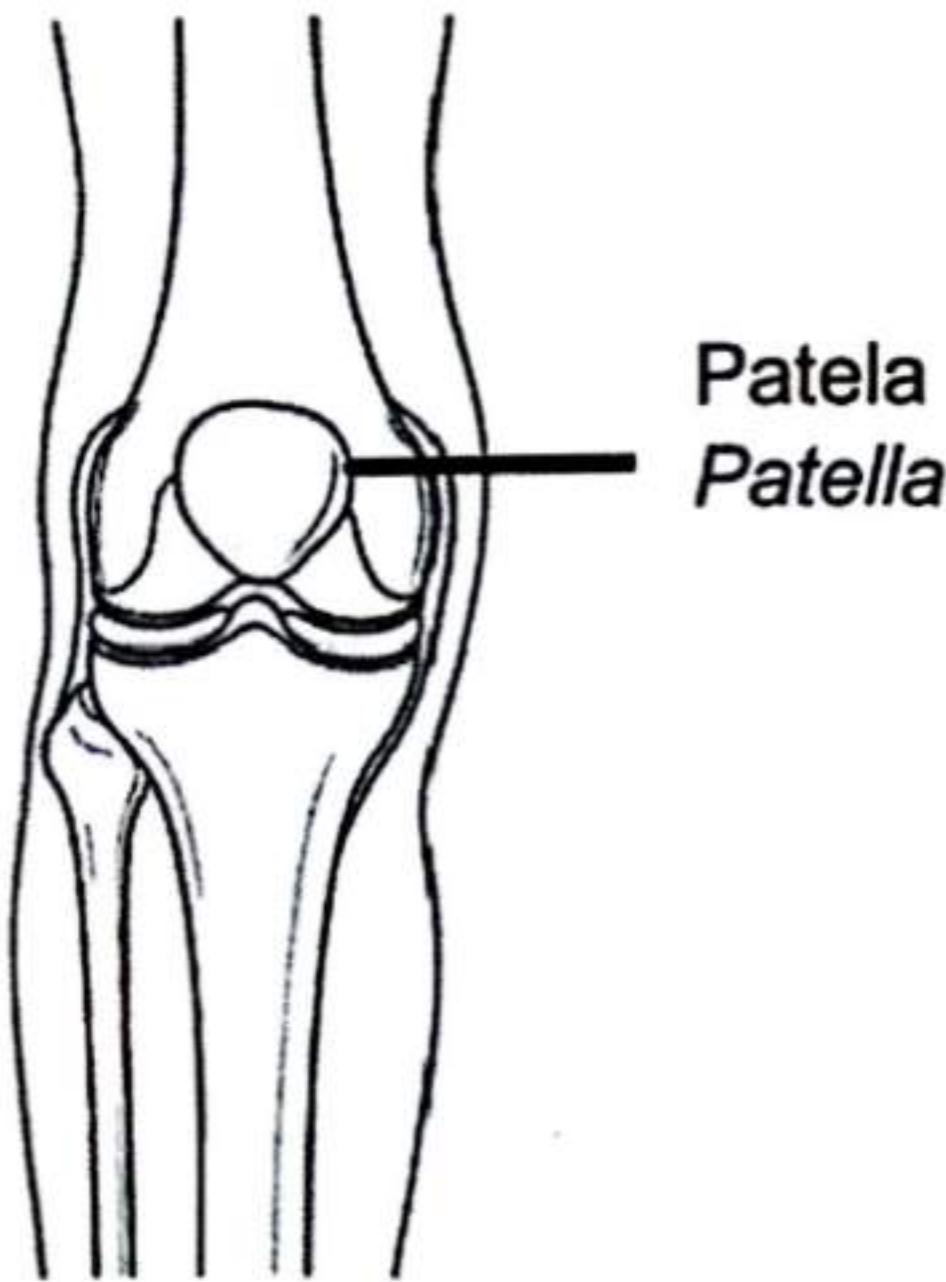
.....

[3 markah/3 marks]

SOALAN 4

Rajah 4.1 menunjukkan sebahagian struktur dalam rangka apendaj pada seorang individu.

Diagram 4.1 shows some of the structures in the appendicular skeleton of an individual.



Rajah 4.1
Diagram 4.1

- (a) Berdasarkan Rajah 4.1,
Based on Diagram 4.1,
 - (i) Labelkan tulang femur dengan huruf Y.
Label the femur bone with the letter Y.

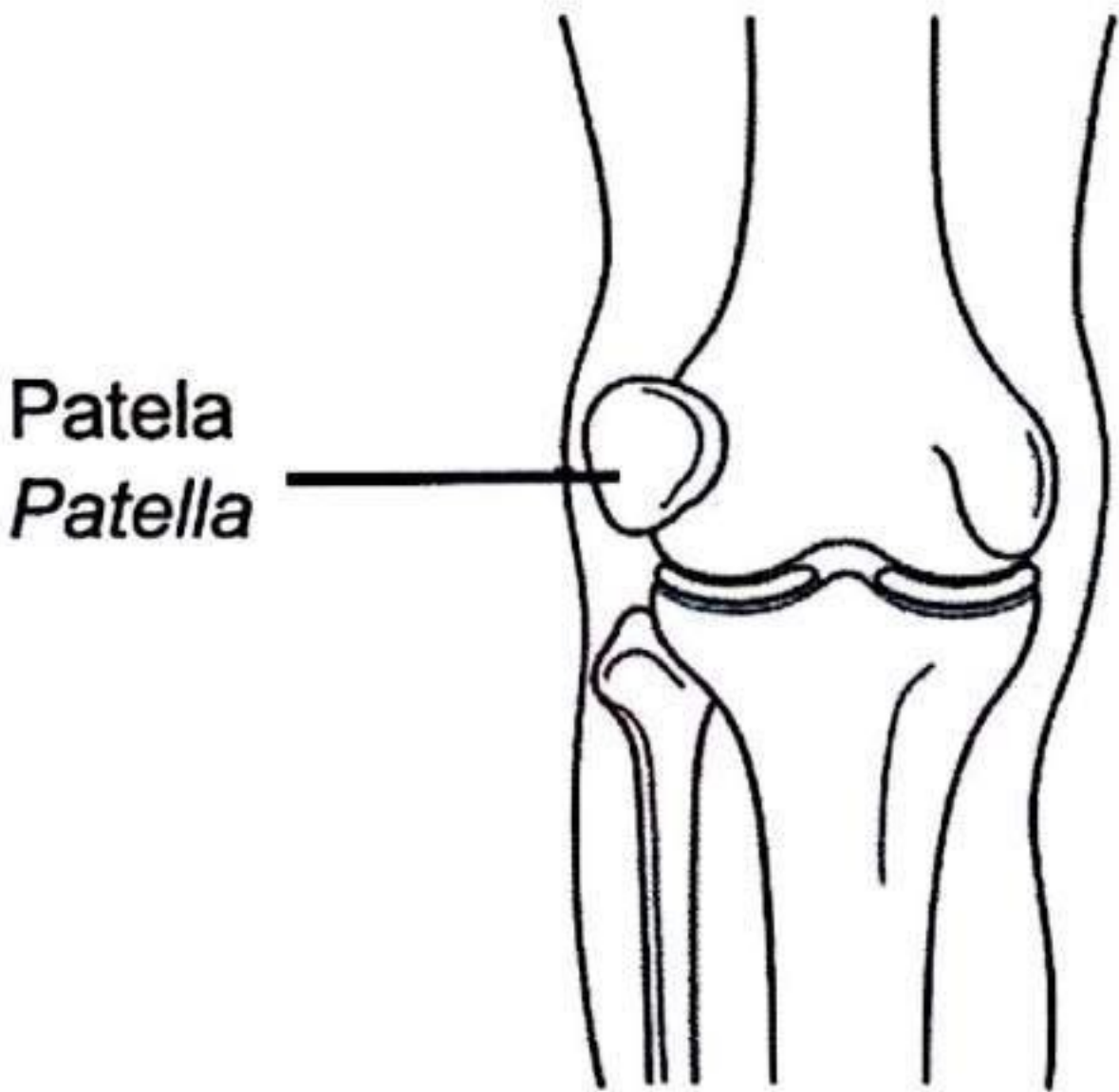
[1 markah/1 mark]

- (ii) Berikan **dua** kepentingan tulang yang dilabelkan dalam a (i).
*Give **two** importance of the bone labelled in a(i).*

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

[2 markah/2 marks]

- (b) Rajah 4.2 menunjukkan keadaan patela seorang pemain bola sepak yang telah mengalami kecederaan.
Diagram 4.2 shows the condition of the patella of a football player who has suffered an injury.



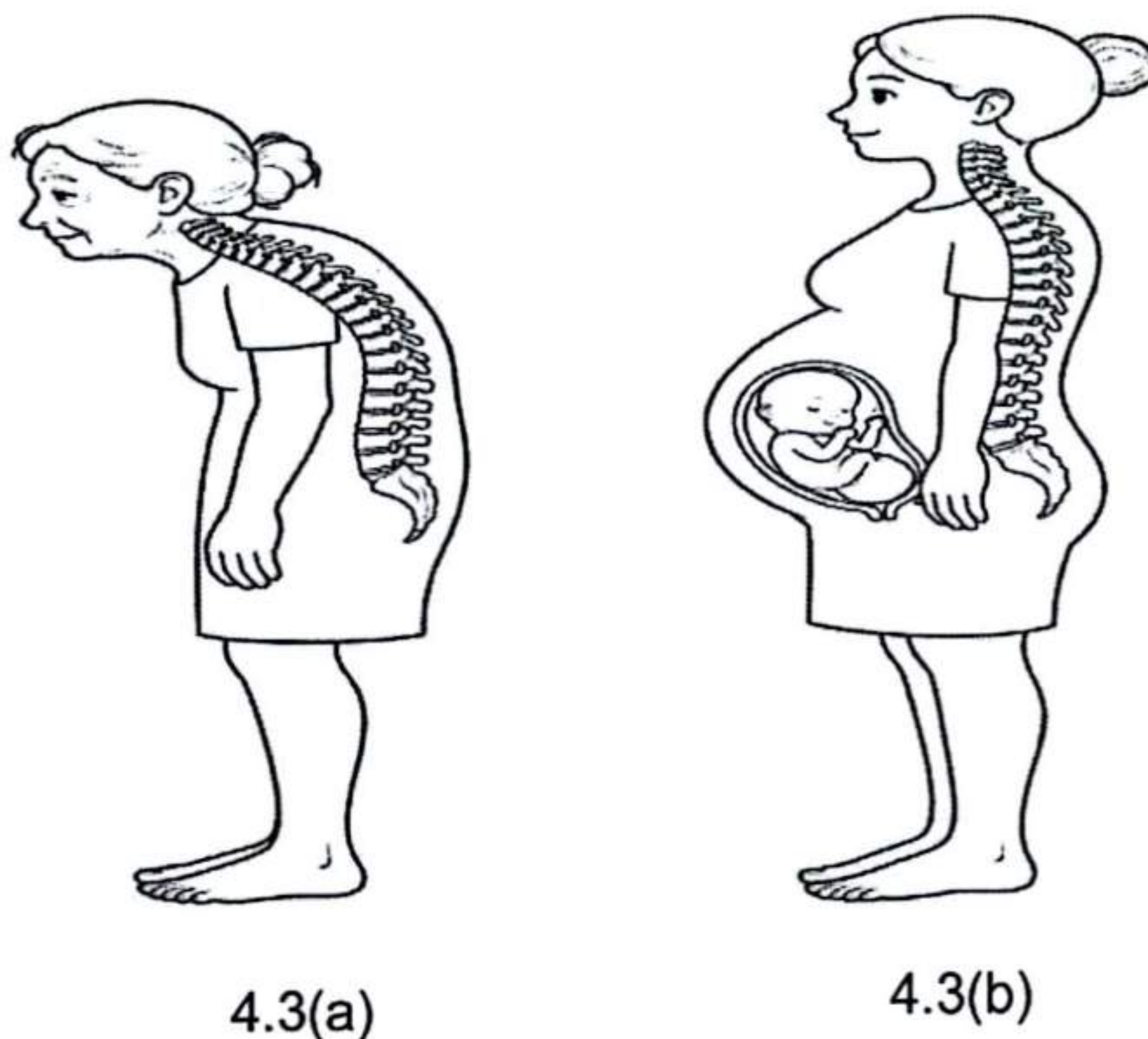
Rajah 4.2
Diagram 4.2

Terangkan bagaimana kecederaan itu meyukarkan pergerakan pemain tersebut.
Explain how the injury makes movement difficult for the player.

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

[2 markah /2 marks]

- (c) Rajah 4.3 menunjukkan dua individu yang mengalami penyakit berkaitan dengan sistem otot rangka. Kedua-duanya mengalami kekurangan kalsium dan vitamin D. *Diagram 4.3 shows two individuals suffering from diseases related to the musculoskeletal system. Both experience deficiencies in calcium and vitamin D.*



Rajah 4.3
Diagram 4.3

Bezakan penyakit yang dihadapi oleh individu 4.3 (a) dan 4.3 (b).
Differentiate the diseases suffered by individuals 4.3 (a) and 4.3 (b).

.....

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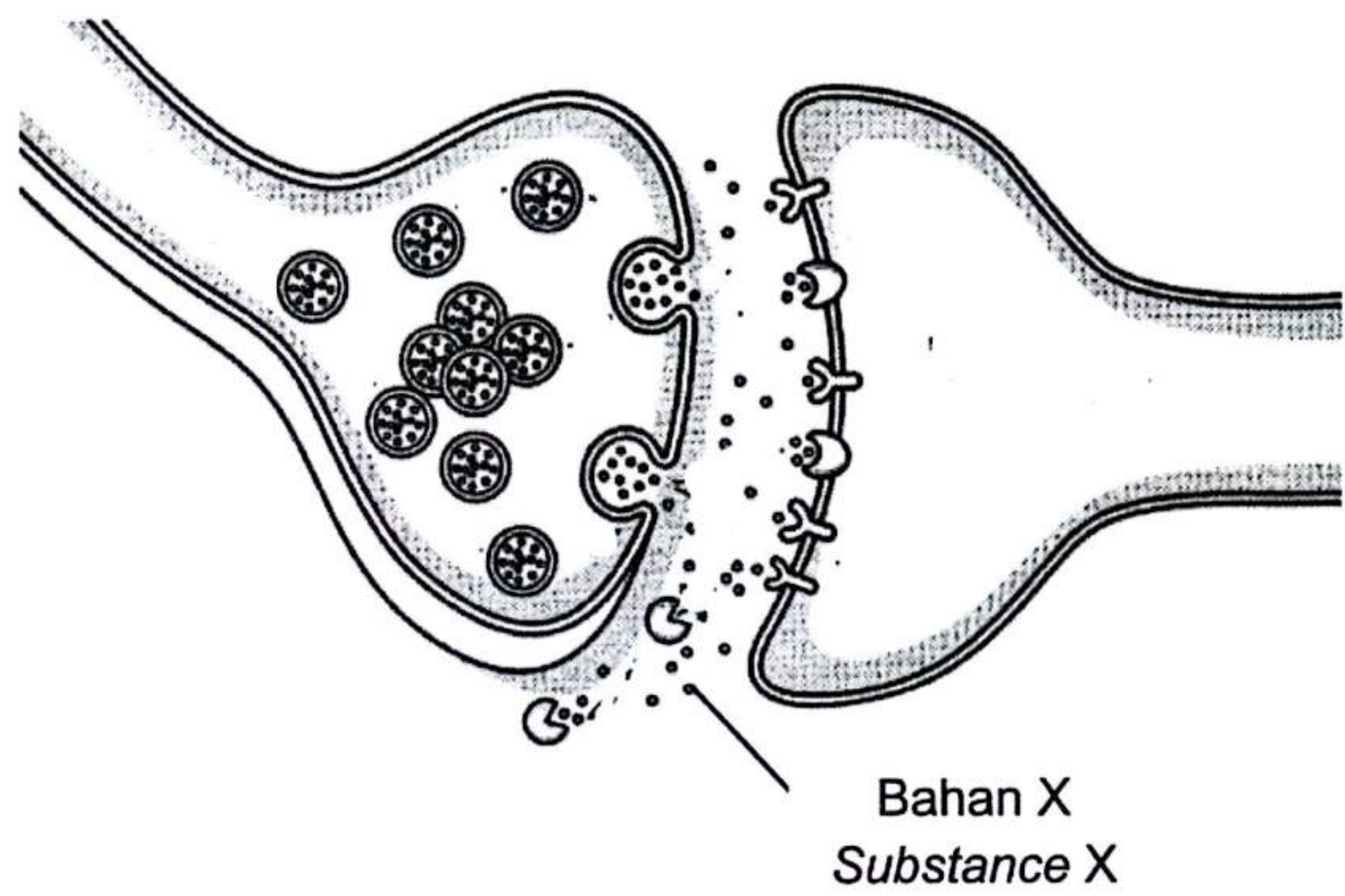
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[2 markah/2 marks]

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SOALAN 5

5. Rajah 5.1 menunjukkan penghantaran impuls merentasi sinaps.
Diagram 5.1 shows the transmission of nerve impulses across a synapse.



Rajah 5.1
Diagram 5.1

(a) (i) Kenal pasti:

Identify:

Bahan X :
Substance X

Satu contoh bahan X :
One example of substance X

[2 markah/2 marks]

(ii) Pada Rajah 5.1, tandakan arah penghantaran impuls.

In Diagram 5.1, mark the direction of impulse transmission.

[1 markah/1 mark]

(b) Rajah 5.2 menunjukkan maklumat satu produk kesihatan yang digunakan untuk merawat masalah keresahan melampau.

Diagram 5.2 shows information about a health product used to treat severe anxiety problems.

	Peringatan: Penggunaan adalah mengikut pengawasan doktor. <i>Caution: To be used only under medical supervision.</i> Indikasi: Simptom keresahan melampau <i>Indications: Symptoms of severe anxiety</i> • Susah tidur / <i>Difficult sleeping</i> • Badan menggigil / <i>Body shaking</i> • Sesak nafas / <i>Shortness of breath</i> • Jantung berdebar-debar / <i>Heart palpitations</i> • Risau berlebihan / <i>Excessive worry</i>
--	--

Rajah 5.2
Diagram 5.2

Terangkan kesan pengambilan pil tersebut ke atas penghantaran impuls melalui sinaps seorang individu yang mengalami keresahan melampau.

Explain the effect of taking the pill on the transmission of impulses through the synapse of an individual suffering from severe anxiety.

.....

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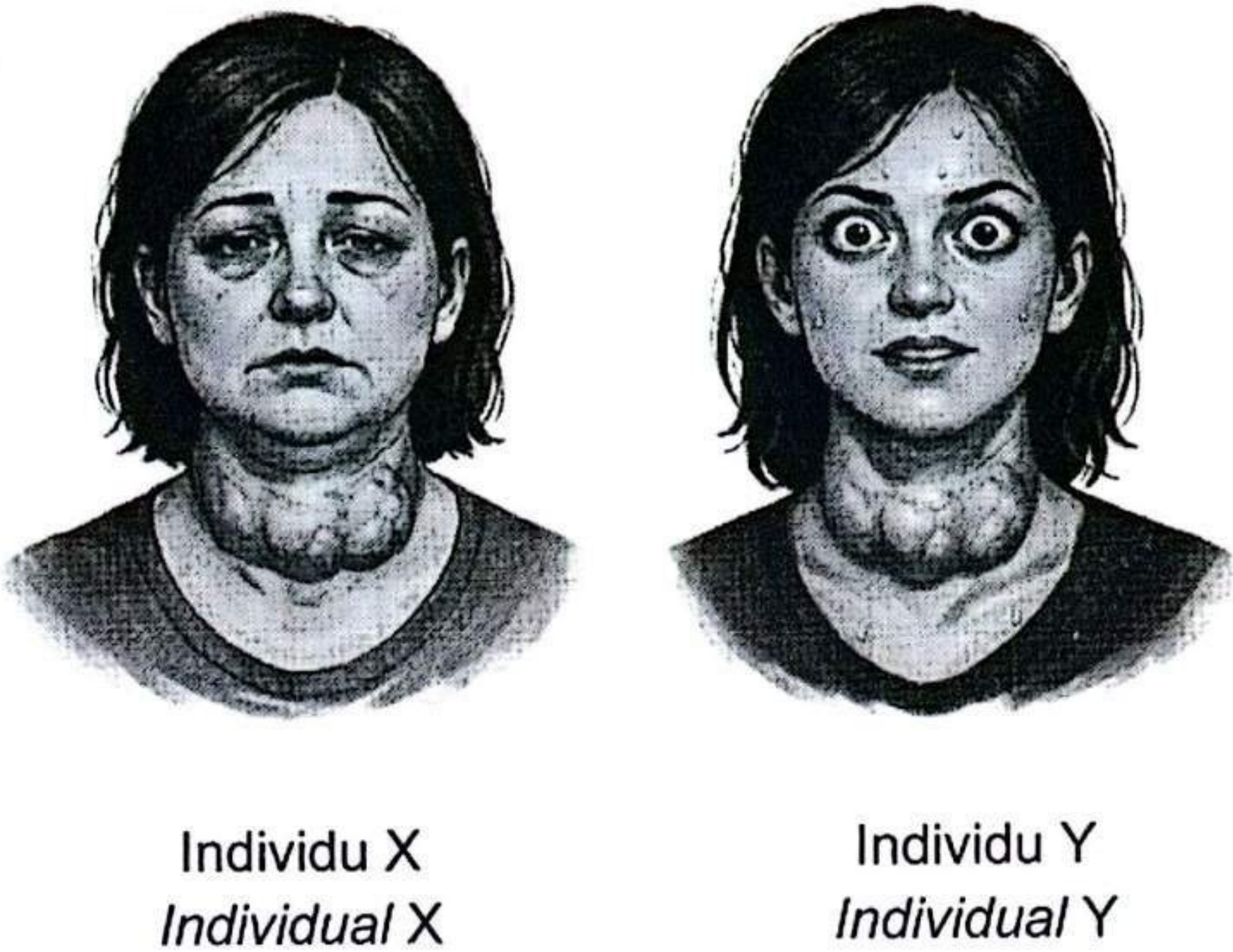
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[3 markah/3 marks]

(c) Rajah 5.3 menunjukkan individu X dan individu Y yang mempunyai masalah kesihatan yang berkaitan dengan sistem endokrin.

Diagram 5.3 shows individual X and individual Y who have health problems related to the endocrine system.



Rajah 5.3
Diagram 5.3

Bezakan Individu X dan Individu Y berdasarkan aspek berikut:

Differentiate Individual X and Individual Y based on the following aspects:

- Masalah kesihatan
Health problems
- Rembesan hormon
Hormone secretion

.....

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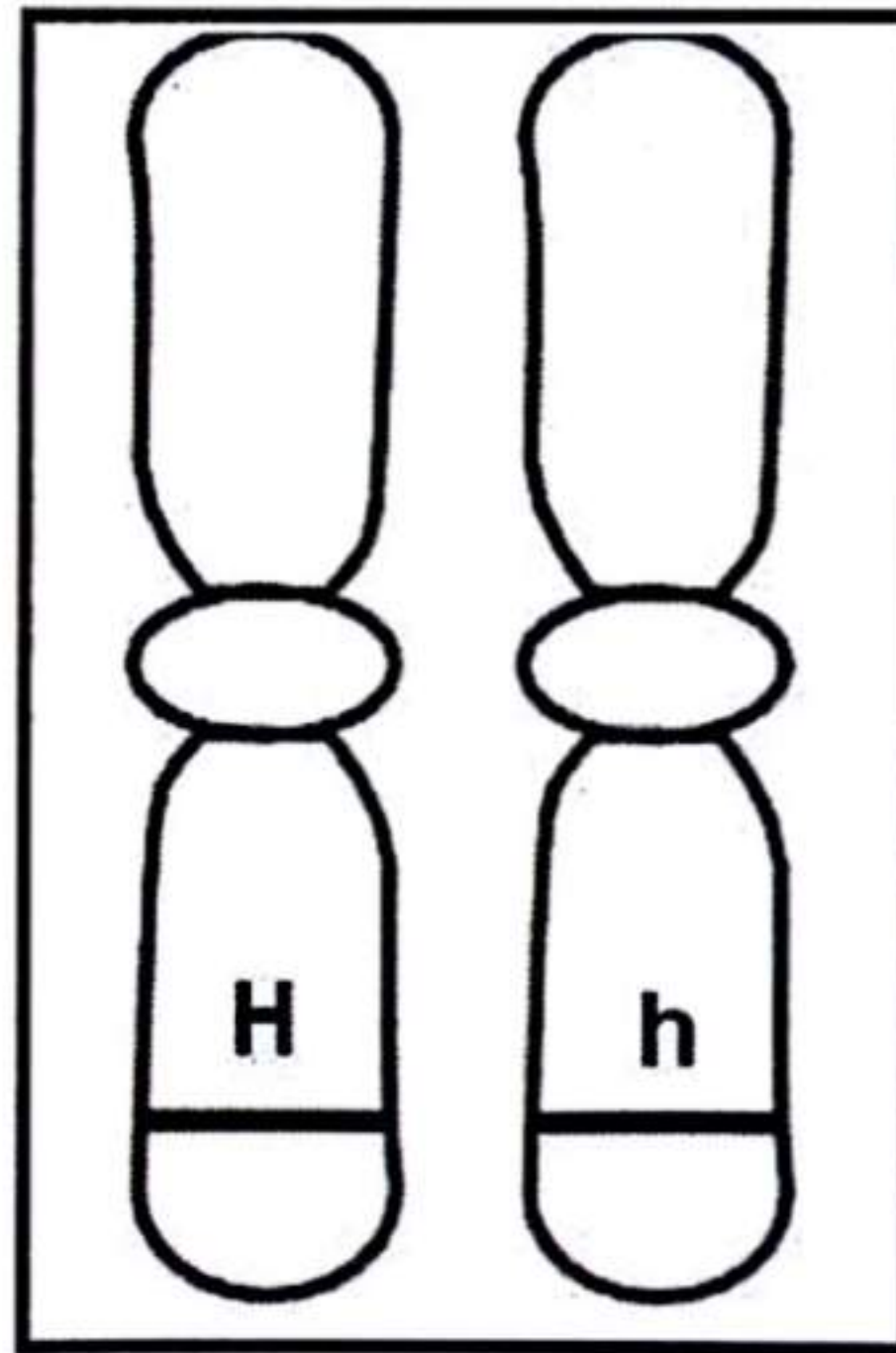
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[2 markah/2 marks]

SOALAN 6

6. Rajah 6.1 menunjukkan sepasang kromosom homolog seorang individu yang mengandungi sepasang alel, iaitu H mewakili trait warna mata hitam dan h mewakili trait warna mata biru.

Diagram 6.1 shows a pair of homologous chromosomes of an individual that contains a pair of alleles, namely H representing the trait of black eye color and h representing the trait of blue eye color.



Rajah 6.1
Diagram 6.1

- (a) Berdasarkan Rajah 6.1, definisikan alel.

Based on Diagram 6.1, define alleles.

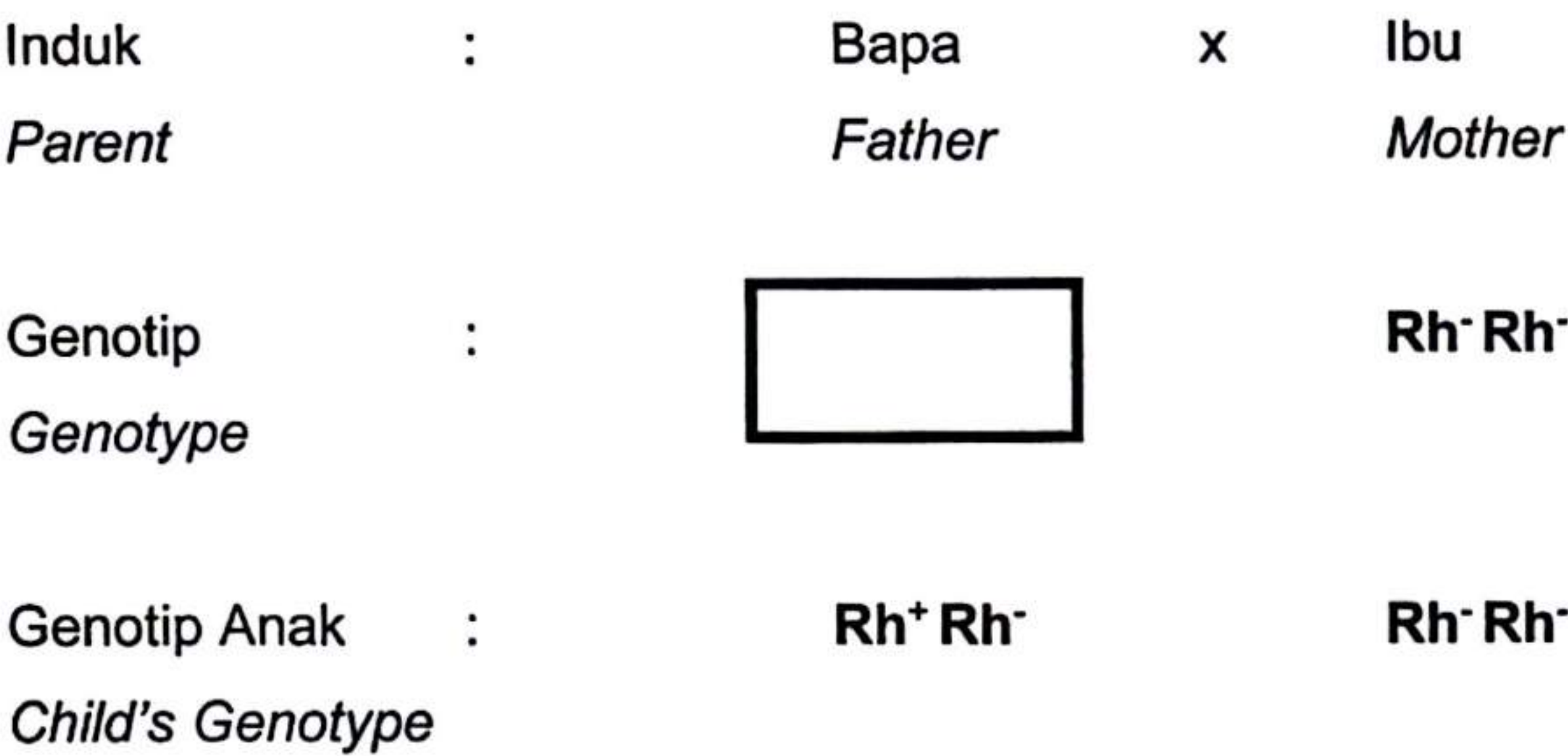
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.....

[2 markah/2 marks]

(b) Rajah 6.2 ialah sebahagian rajah skema kacukan pewarisan faktor Rhesus dalam satu keluarga.

Diagram 6.2 is a partial diagram of a cross-sectional scheme of inheritance of the Rhesus factor in a family.



Rajah 6.2
Diagram 6.2

- (i)

Lengkapkan Rajah 6.2.
Complete Diagram 6.2.

[1 markah/1 mark]
- (ii)

Pasangan ini mempunyai dua orang anak yang mewarisi faktor Rhesus bapanya. Anak pertama lahir dengan selamat tetapi anak kedua mengalami komplikasi kelahiran menyebabkan kematian.

Terangkan dari segi faktor Rhesus.

This couple has two children who inherited their father's Rhesus factor. The first child was born safely, but the second child experienced birth complications that led to death.

Explain in terms of the Rhesus factor.

.....

.....

.....

.....

.....

[3 markah/3 marks]

- (iii) Isterinya disarankan oleh doktor untuk menerima rawatan globulin anti-Rhesus bagi mengatasi komplikasi kelahiran mati untuk kelahiran seterusnya.

Wajarkan kepentingan saranan doktor tersebut.

His wife was advised by the doctor to receive anti-Rhesus globulin treatment to overcome complications of stillbirth for the next birth.

Justify the importance of the doctor's recommendation.

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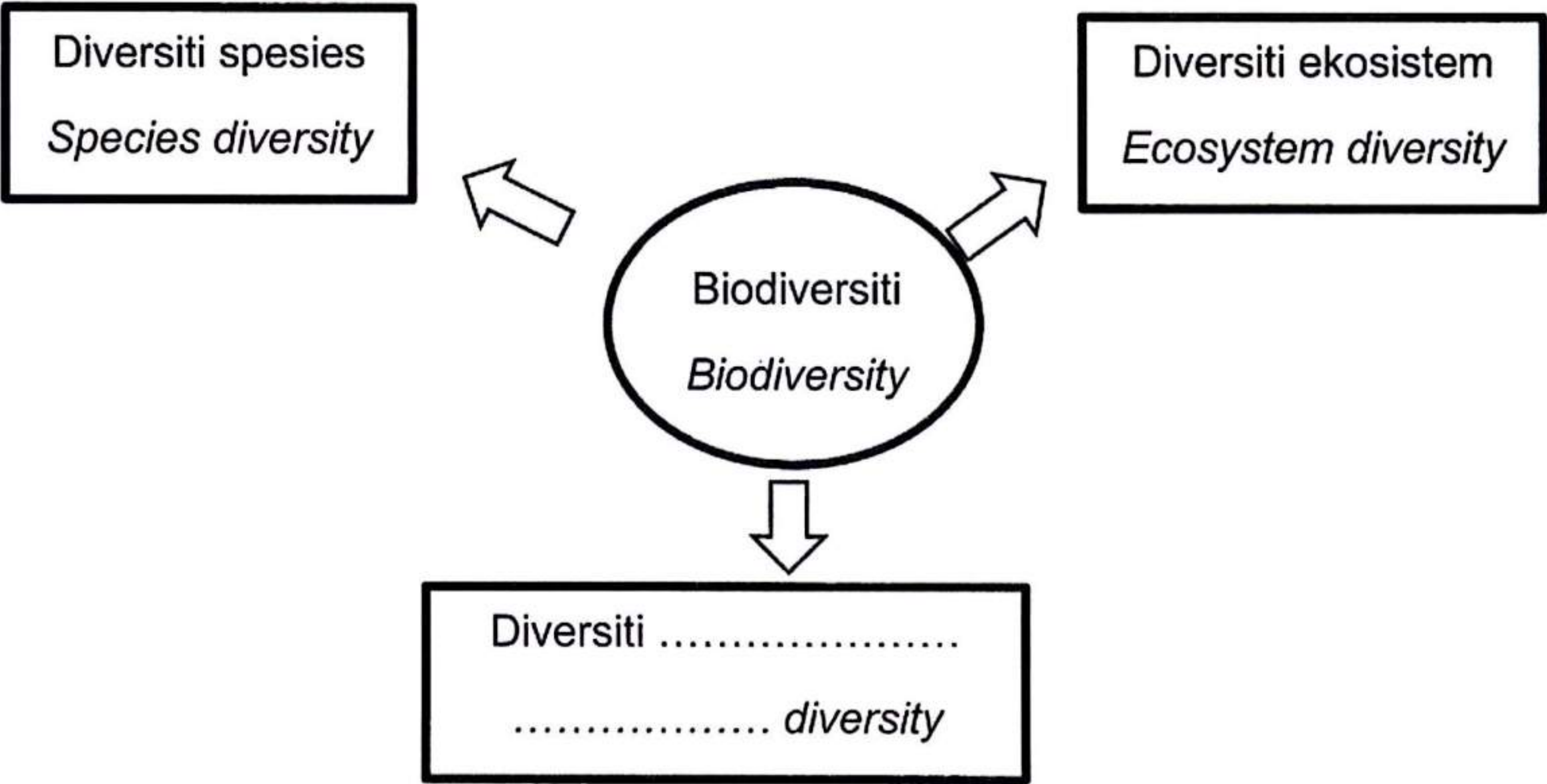
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[2 markah/2 marks]

SOALAN 7

7. Rajah 7.1 menunjukkan jenis biodiversiti.

Diagram 7.1 shows the type of biodiversity.



Rajah 7.1
Diagram 7.1

<https://t.me/cikgufazliebiosensei>

- (a) (i) Lengkapkan Rajah 7.1.
Complete Diagram 7.1

[1 markah/1 mark]

- (ii) Nyatakan **satu** contoh diversiti ekosistem.

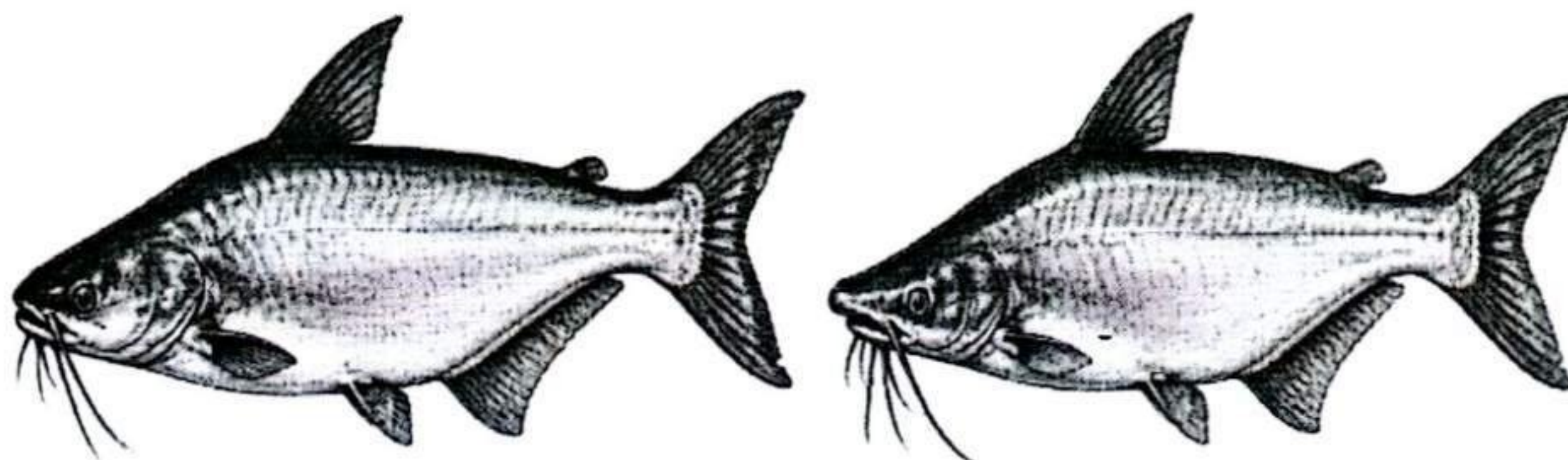
State one example of ecosystem diversity.

.....
.....

[1 markah/1 mark]

- (b) Rajah 7.2 menunjukkan dua spesies ikan yang ditemui di kawasan sungai di Malaysia.

Diagram 7.2 shows two species of fish found in river areas in Malaysia.



Ikan Patin Juara
Fish Patin Juara
Pangasius polyuranodon

Ikan Patin Buah
Fish Patin Buah
Pangasius nasutus

Rajah 7.2
Diagram 7.2

- (i) Kedua-dua spesies ikan ini mempunyai morfologi yang hampir serupa.
Terangkan kaedah yang dapat digunakan untuk menentukan kedua-dua spesies ikan ini adalah daripada spesies yang sama atau spesies yang berlainan.
Both fish species have very similar morphology.
Explain the method that can be used to determine whether these two fish are from the same species or different species.

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[3 markah/3 marks]

- (ii) Program Pelan Pembangunan Baka dan Benih Akuakultur oleh Kementerian Pertanian dan Keterjaminan Makanan dapat membantu meningkatkan bilangan kedua-dua spesies ikan Patin yang semakin diancam kekurangan akibat kehadiran spesies ikan larangan.
Bincangkan kepentingan program tersebut dalam pengekalan spesies.
The Aquaculture Seed and Breed Development Plan Program by the Ministry of Agriculture and Food Security can help increase the population of both Patin fish species, which are increasingly threatened by shortages due to the presence of prohibited fish species.
Discuss the importance of the programme in species conservation.

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[2 markah/2 marks]

(c) Maklumat keratan di bawah adalah mengenai kejadian keracunan makanan.
The excerpt below is about an incident of food poisoning.

Gulai ayam disyaki punca 343 individu di sebuah kolej keracunan makanan

KOTA BHARU: Gara-gara gulai ayam, seramai 343 individu dalam kalangan pelajar kemasukan baru, ahli jawatankuasa dan kakitangan orientasi sebuah kolej mengalami keracunan makanan pada Rabu.

Pengarah Jabatan Kesihatan Negeri Kelantan, Datuk Dr Zaini Hussin berkata, mangsa menikmati hidangan tersebut semasa makan malam pada hari Selasa

Mereka mengalami gejala sakit perut (97.9 peratus), cirit-birit (82.2 peratus), pening (43.1 peratus), loya (35.8 peratus), muntah (9.6 peratus) dan demam (7.3 peratus)," katanya kepada pemberita pada Khamis.

Menurut beliau, organisma yang disyaki adalah *Salmonella* sp.

Sumber/Source: www.astroawani.com/berita
10 Julai 2025 / 10 July 2025

Terangkan tindakan yang sepatutnya diambil oleh pengendali makanan semasa proses penyediaan gulai ayam tersebut bagi mengelakkan kejadian ini daripada berlaku.
Explain the actions that should be taken by food handlers during the preparation process of the chicken curry to prevent this incident from occurring.

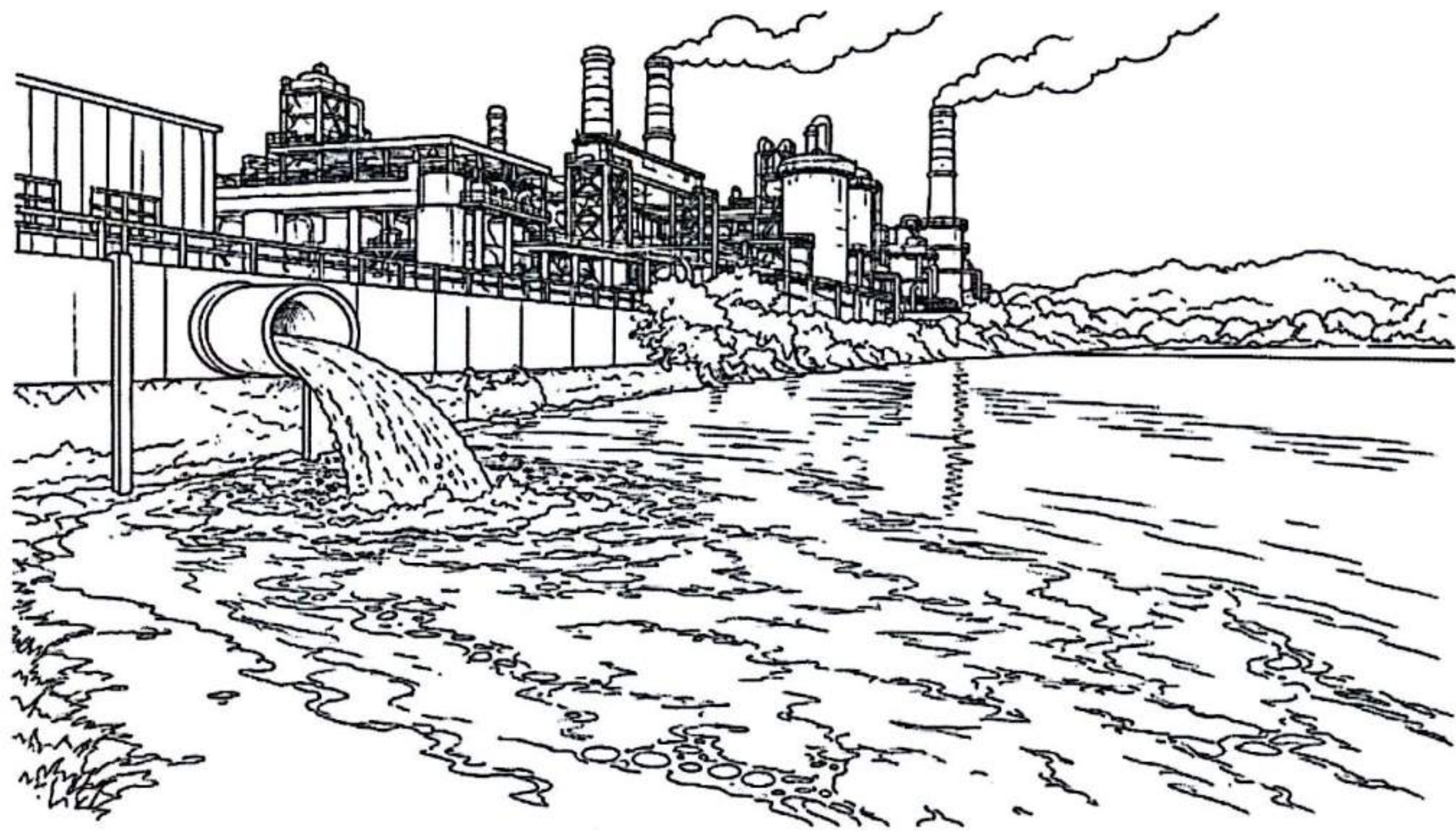
[2 markah/2 marks]

SOALAN 8

8. Rajah 8.1 menunjukkan pelepasan sisa kumbahan dari sebuah kilang makanan dan minuman. Sisa kumbahan tersebut dilepaskan tanpa rawatan yang sempurna.

Diagram 8.1 shows the discharge of sewage from a food and beverage factory.

The sewage is discharged without proper treatment.



Rajah 8.1
Diagram 8.1

(a) Terangkan bagaimana sisa kumbahan itu boleh memusnahkan habitat akuatik tersebut.
Explain how sewage waste can destroy the aquatic habitat.

.....

.....

.....

.....

.....

[2 markah/2 marks]

<https://t.me/cikgufazLiebiosensei>

(b) Terangkan **satu** kaedah semulajadi yang boleh meningkatkan kualiti air kolam tersebut.
*Explain **one** natural method that can improve the water quality of the pond.*

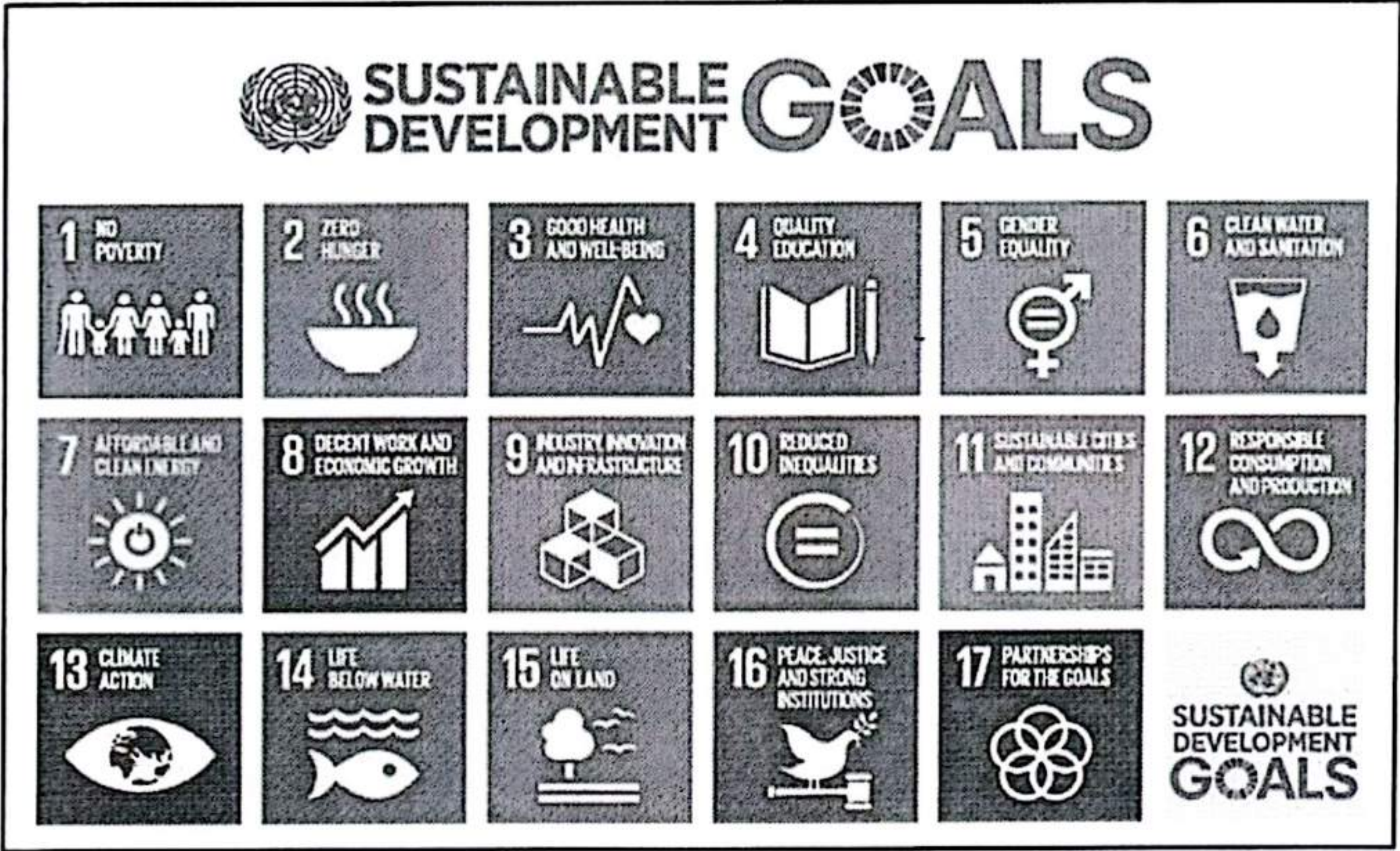
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[2 markah/2 marks]

(c) Rajah 8.2 menunjukkan Matlamat Pembangunan Mampan (Sustainable Development Goals) menjelang 2030. Air bersih dan sanitasi adalah sebahagian daripada matlamat tersebut untuk memastikan kesejahteraan untuk semua.
Diagram 8.2 shows the Sustainable Development Goals by 2030. Clean water and sanitation are part of these goals to ensure well-being for all.



Rajah 8.2
Diagram 8.2

Cadangkan **dua** kaedah yang boleh dilakukan di peringkat domestik untuk menyokong matlamat tersebut untuk mendapatkan air bersih dan sanitasi yang baik.

*Suggest **two** methods that can be done at the domestic level to support the goal of obtaining clean water and good sanitation.*

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[3 markah/3 marks]

- (d) Rajah 8.3 menunjukkan satu ekosistem yang telah dijadikan kawasan ekopelancongan.
Diagram 8.3 shows an ecosystem that has been developed into an ecotourism area.



Rajah 8.3
Diagram 8.3

Cadangkan **dua** contoh kaedah yang boleh dilakukan untuk memulihara ekosistem tersebut dari aspek:

*Suggest **two** examples of methods that can be used to conserve the ecosystem based on the following aspects:*

(i) in situ:
in situ

.....

.....

.....

(ii) ex situ:
ex situ

.....

.....

.....

[2 markah/2 marks]

BAHAGIAN B

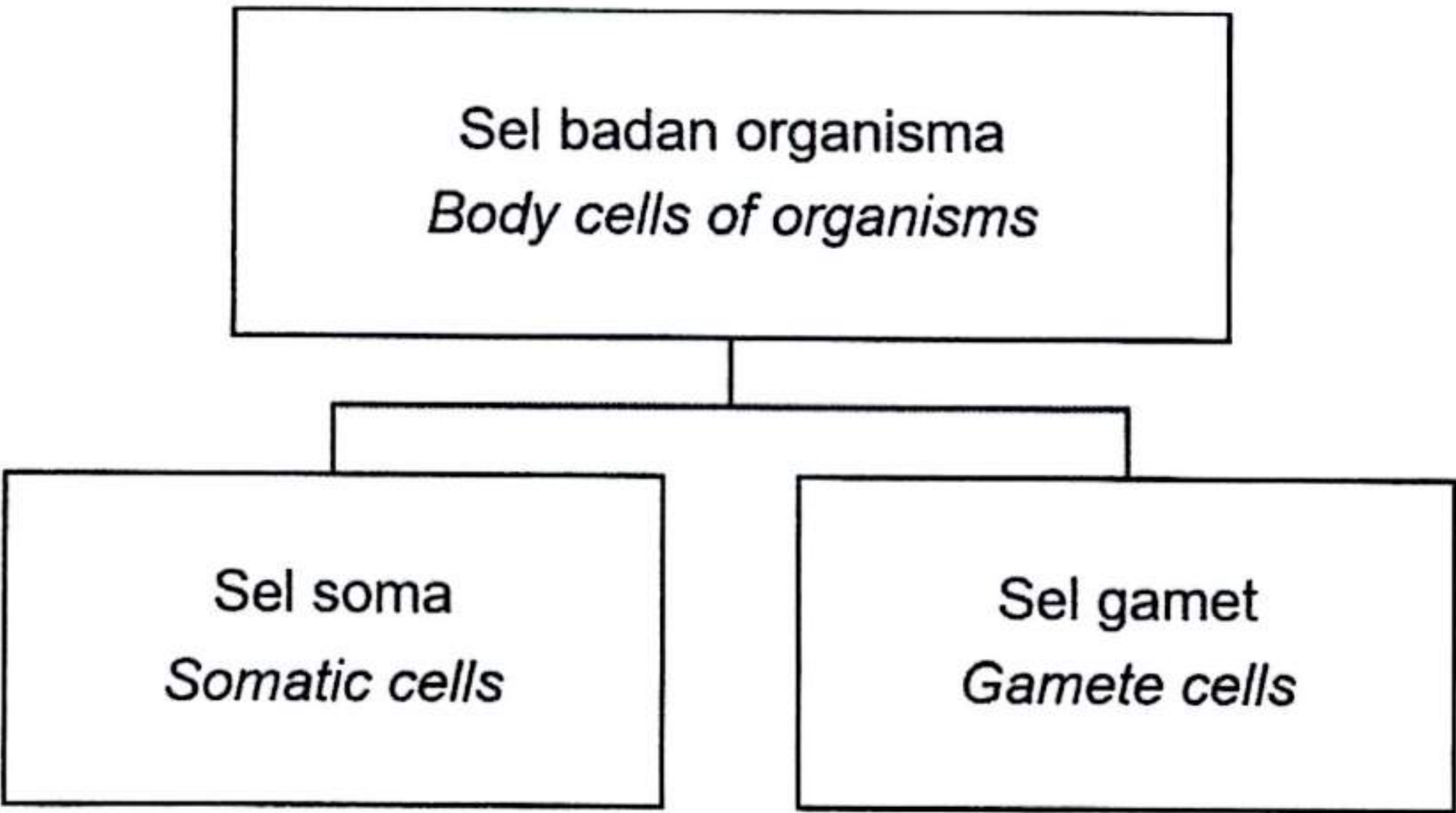
[20 markah]

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

Soalan 9

9. (a) Rajah 9.1 menunjukkan jenis sel yang terdapat dalam badan organisma hidup.

Diagram 9.1 shows the types of cells found in the body of a living organism



Rajah 9.1
Diagram 9.1

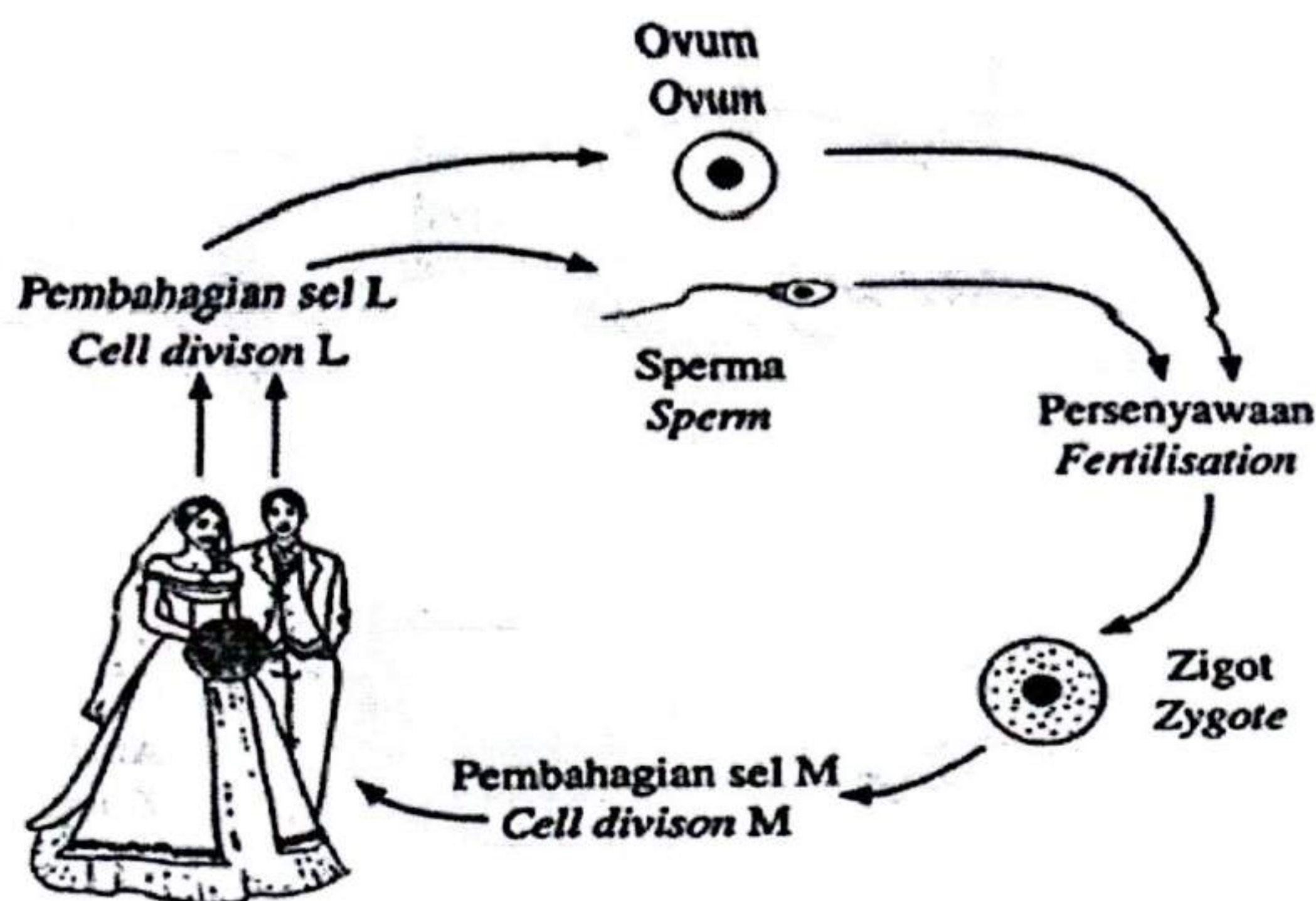
Definisikan kedua-dua jenis sel tersebut

Define both types of cells.

[3 markah/3 marks]

(b) Rajah 9.2 menunjukkan kitar hidup manusia yang melibatkan dua proses pembahagian sel

Diagram 9.2 shows the human life cycle which involve two processes of cell division.



Rajah 9.2
Diagram 9.2

Berdasarkan Rajah 9.2, terangkan persamaan antara proses pembahagian sel L dan proses pembahagian sel M.

Based on Diagram 9.2, explain the similarities between the cell division L process and the cell division M process.

[4 markah/4 marks]

- (c) Salah satu proses pembahagian sel L mengalami ketidaknormalan menyebabkan sperma yang terhasil mempunyai bilangan kromosom yang tidak normal.

One of the cell division processes in L is abnormal, causing the sperm produced to have an abnormal number of chromosomes.

Huraikan punca ketidaknormalan yang berlaku pada proses pembahagian sel L sehingga anak yang dilahirkan mempunyai penyakit genetik seperti mata sepet, lidah pendek dan kerencatan mental.

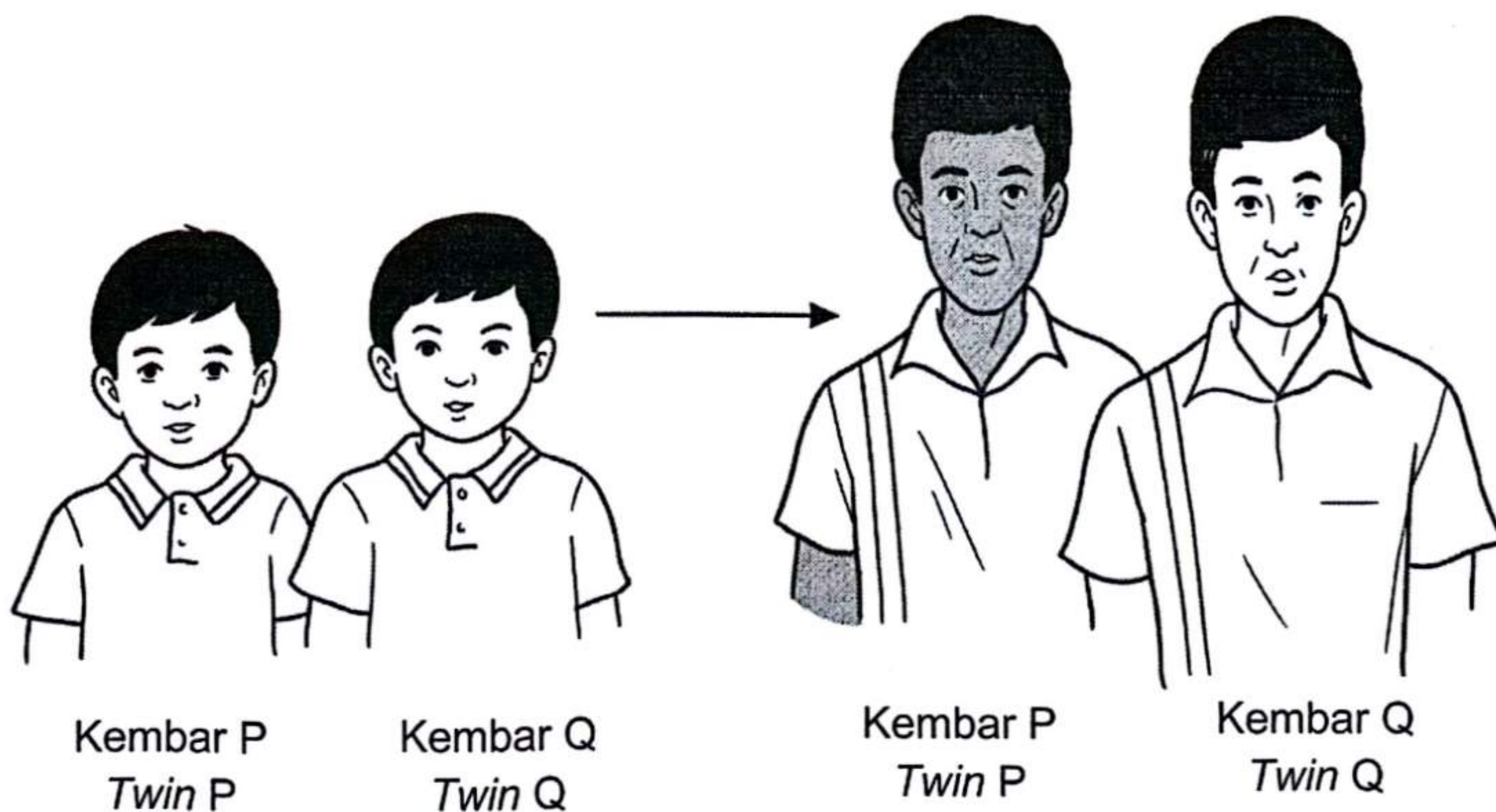
Describe the cause of abnormalities that occur in the process of cell division L so that children are born with genetic diseases such as slanted eyes, short tongue and mental retardation.

[5 markah/5 marks]

<https://t.me/cikgufazliebiosensei>

(d) Rajah 9.3 menunjukkan kembar seiras. Sewaktu kecil kedua-duanya mempunyai warna kulit yang sama. Selepas 25 tahun, warna kulit kembar P lebih gelap berbanding kembarnya.

Diagram 9.3 shows identical twins. When they were young, both had the same skin colour. After 25 years, twin P skin colour is darker than the other twin.



Rajah 9.3
Diagram 9.3

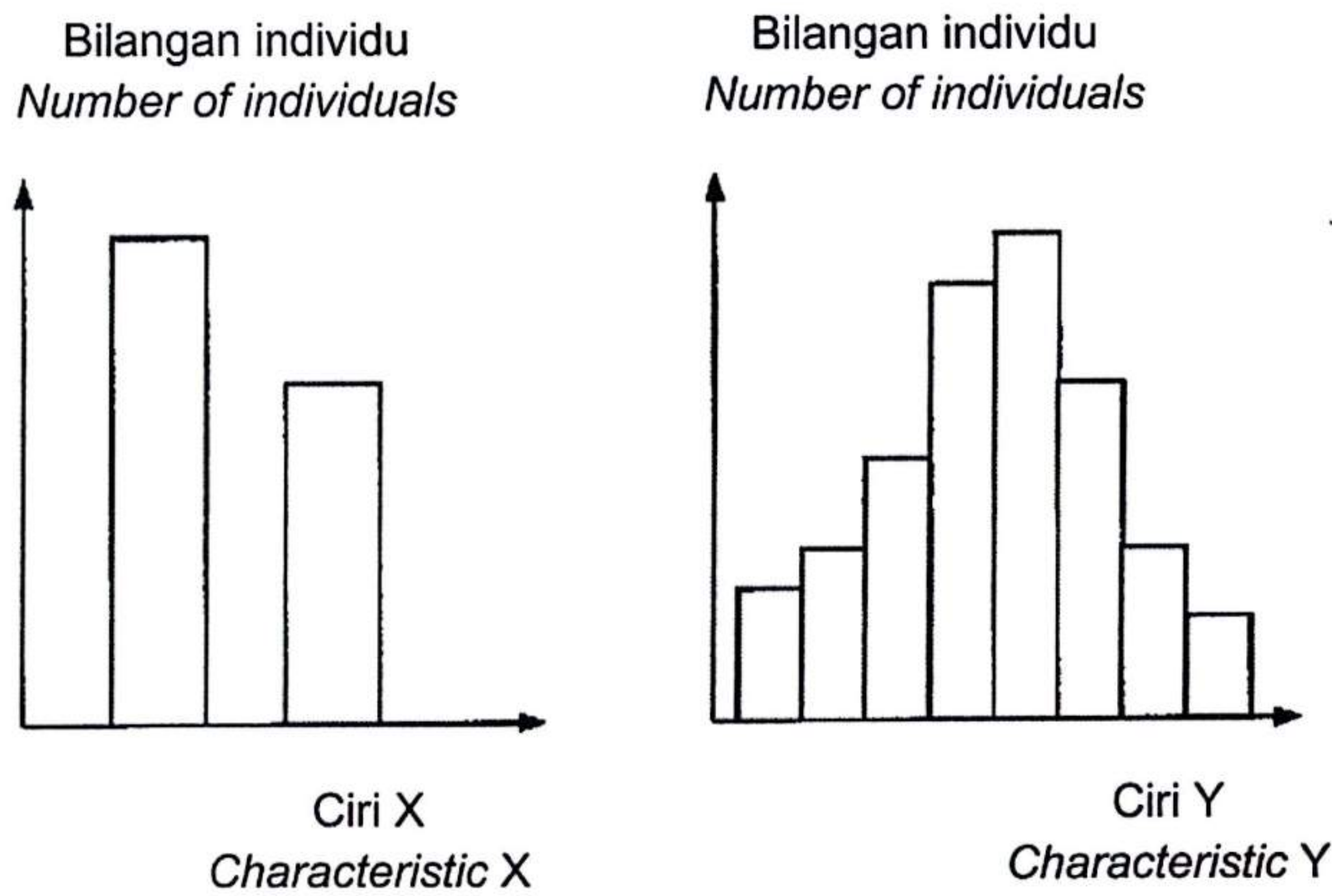
Terangkan bagaimana perbezaan warna kulit pada kembar seiras tersebut boleh berlaku.

Explain how the difference in skin colour in the identical twins can occur.

[2 markah/2 marks]

(e) Rajah 9.4 menunjukkan graf bagi dua jenis variasi pada manusia.

Diagram 9.4 shows graphs of two types of variation in humans.



Rajah 9.4
Diagram 9.4

Berdasarkan Rajah 9.4, banding bezakan dua jenis variasi tersebut.

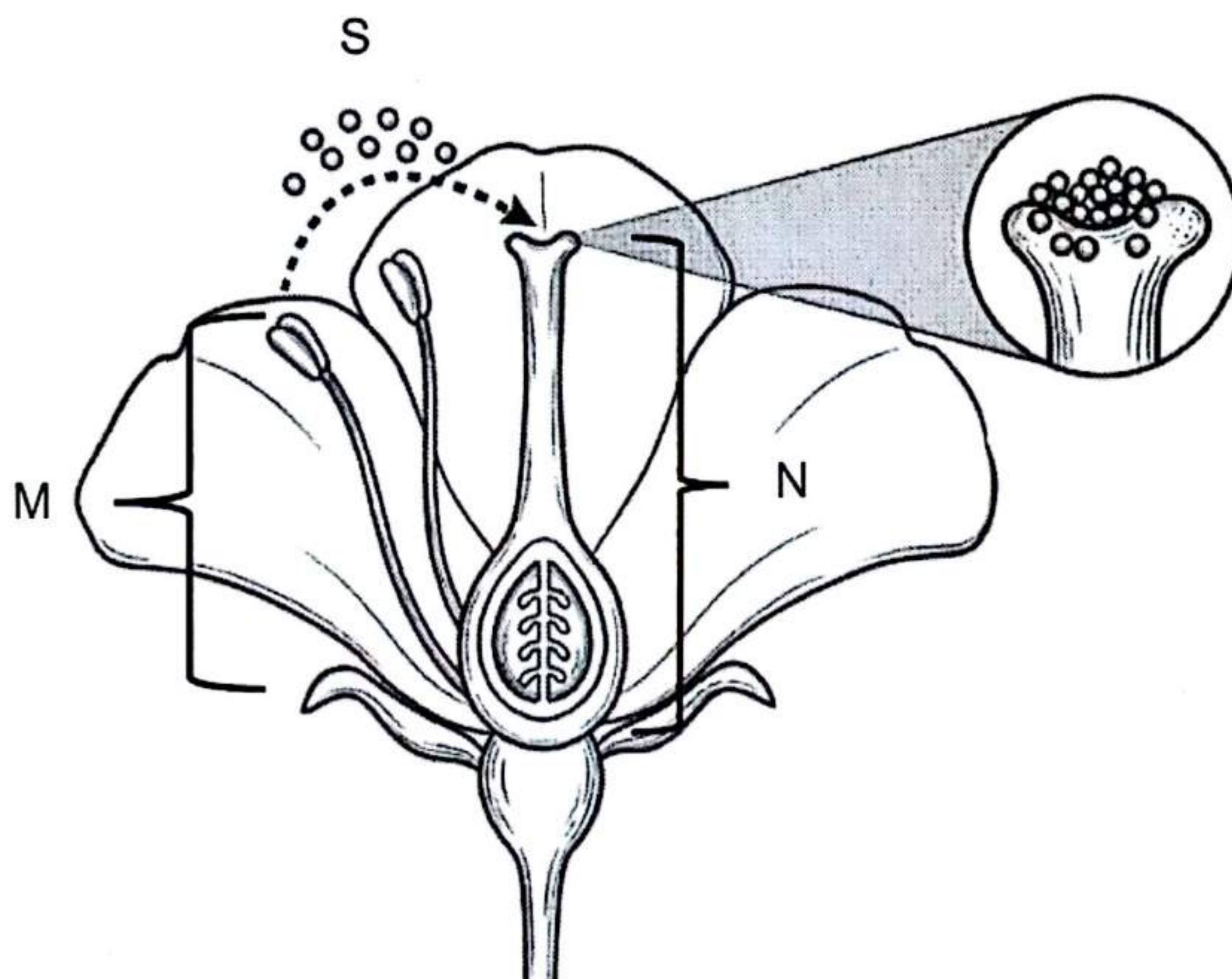
Based on Diagram 9.4, compare and contrast the two types of variations.

[6 markah/6 marks]

Soalan 10

10. Rajah 10.1 menunjukkan proses yang berlaku dalam tumbuhan berbunga.

Diagram 10.1 shows a process that occurs in flowering plants.



Rajah 10.1
Diagram 10.1

(a) (i) Berdasarkan Rajah 10.1, terangkan proses S.

Based on Diagram 10.1, explain process S.

[2 markah/2 marks]

(ii) Banding bezakan struktur M dan struktur N.

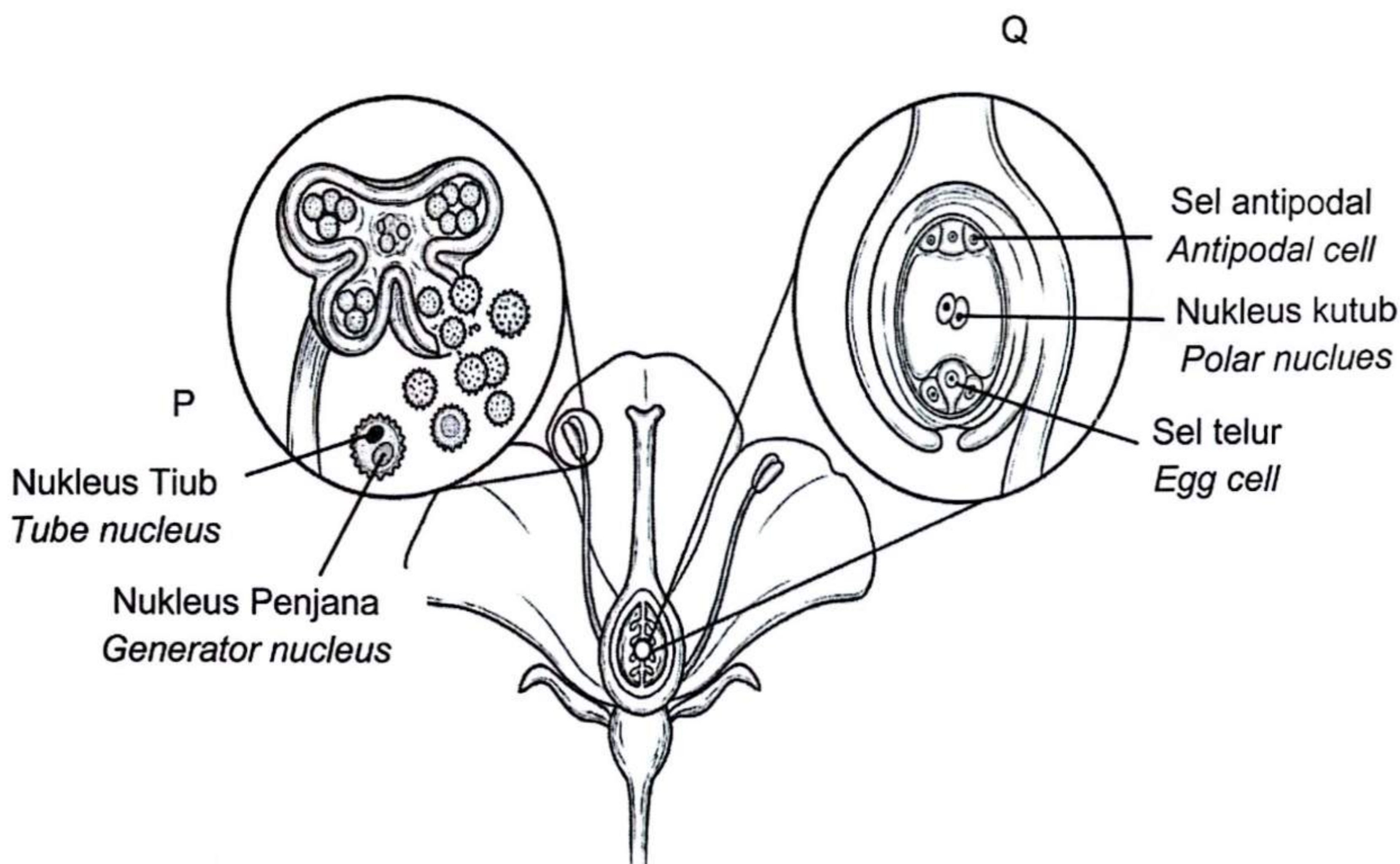
Compare and contrast structure M and structure N.

[5 markah/5 marks]



(b) Rajah 10.2 menunjukkan struktur P dan Q.

Diagram 10.2 shows structure P and Q.



Rajah 10.2
Diagram 10.2

Banding bezakan proses penghasilan P dan proses penghasilan Q.

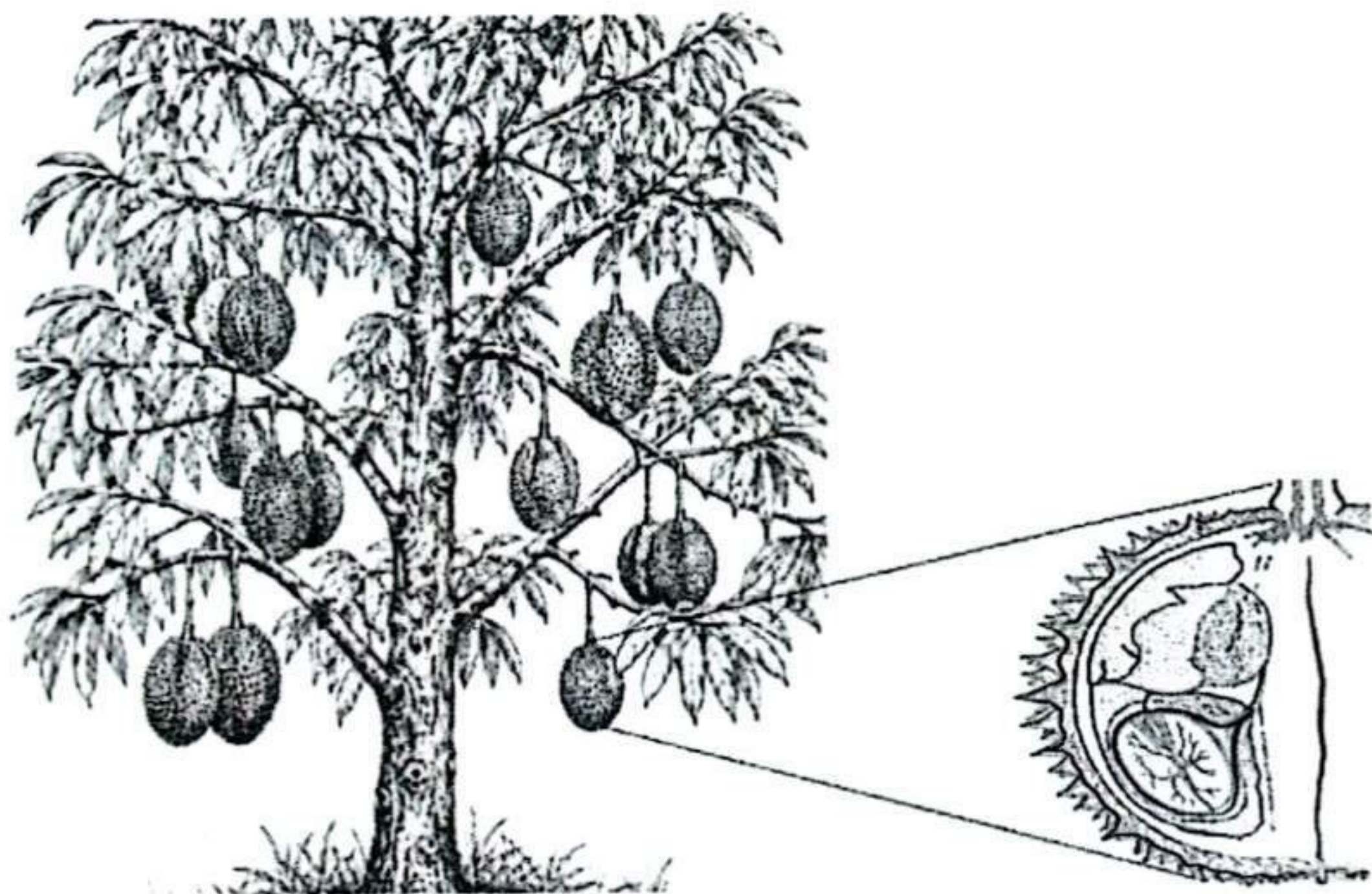
Compare and contrast production process P and production process Q.

[5 markah/5 marks]

<https://t.me/cikgufazLiebiosensei>

(c) Rajah 10.3 menunjukkan keratan memanjang buah durian.

Diagram 10.3 shows longitudinal section of durian fruit.



Rajah 10.3
Diagram 10.3

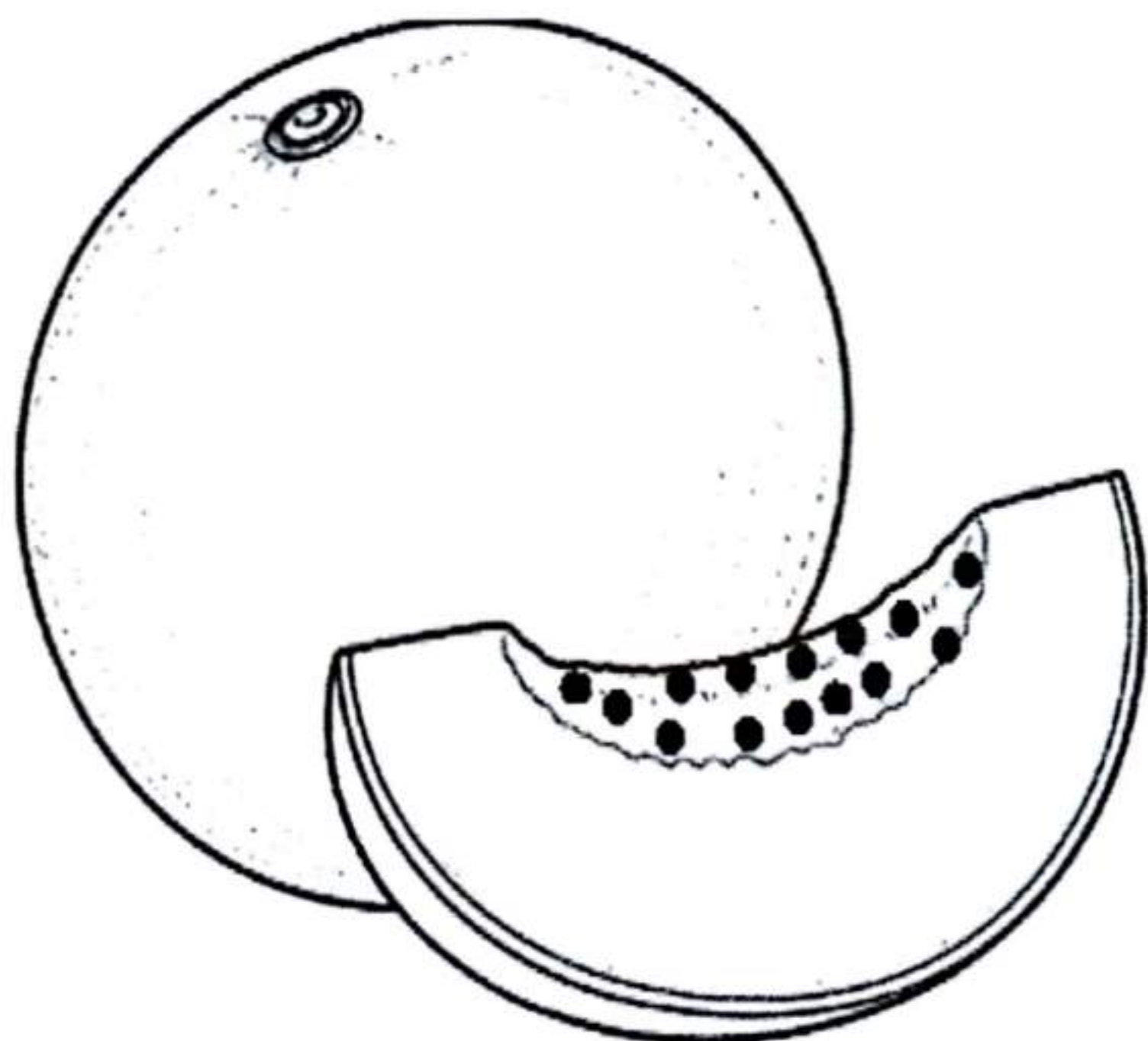
Terangkan kepentingan biji benih untuk kemandirian spesies pokok durian.

Explain the importance of seed for the survival of durian tree species.

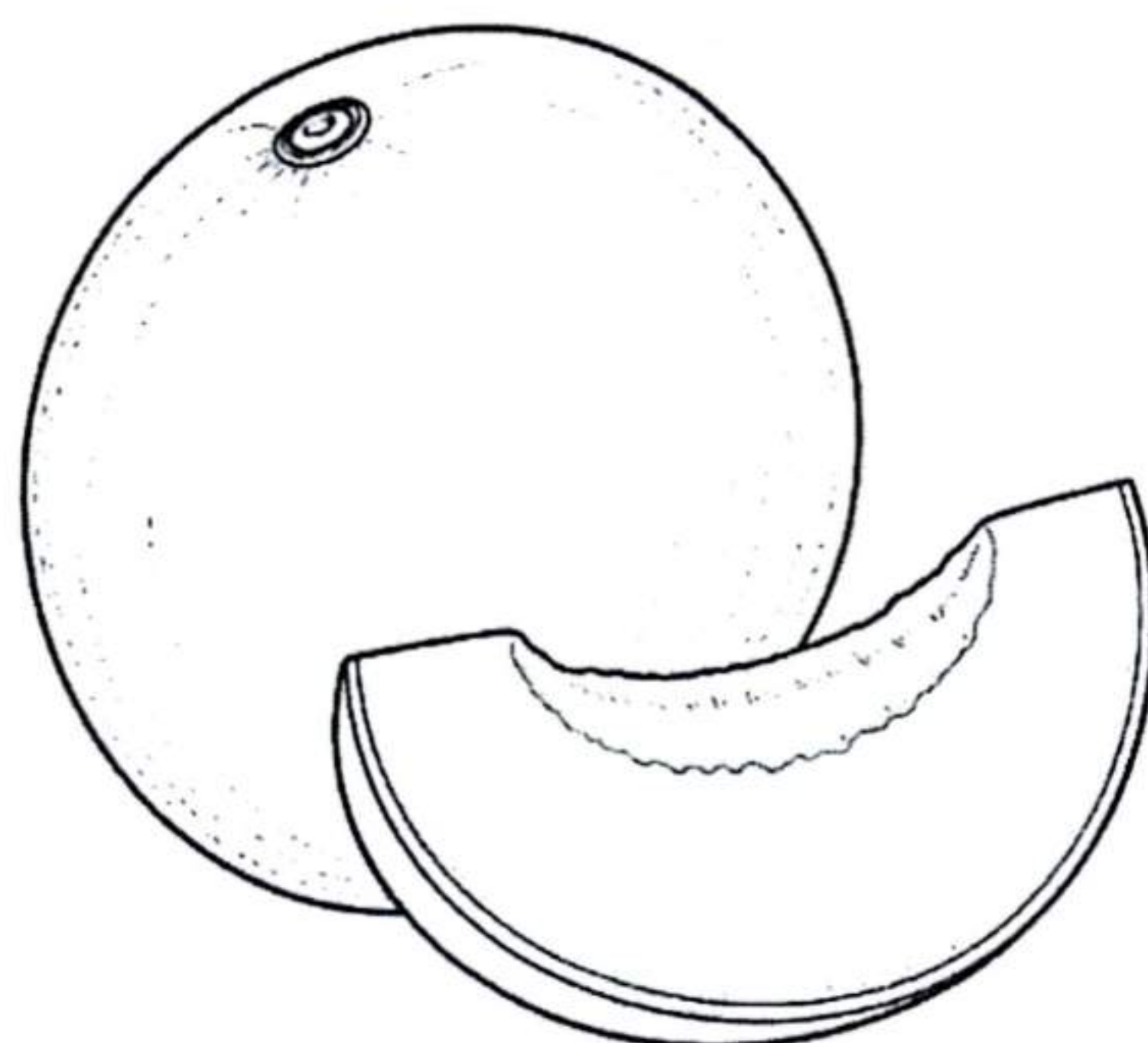
[4 markah/4 marks]

- (d) Rajah 10.4(a) ialah buah yang dihasilkan melalui pendebungaan semulajadi manakala Rajah 10.4(b) ialah buah yang dihasilkan menggunakan teknik X.

Diagram 10.4(a) is fruit produced by natural pollination while Diagram 10.4(b) is fruit produced using technique X.



Rajah 10.4(a)
Diagram 10.4(a)



Rajah 10.4(b)
Diagram 10.4(b)

Terangkan teknik X dan kesan negatif yang mungkin timbul hasil penggunaan teknik tersebut.

Explain technique X and the negative effects that may occur by using the technique.

[4 markah/4 marks]

BAHAGIAN C

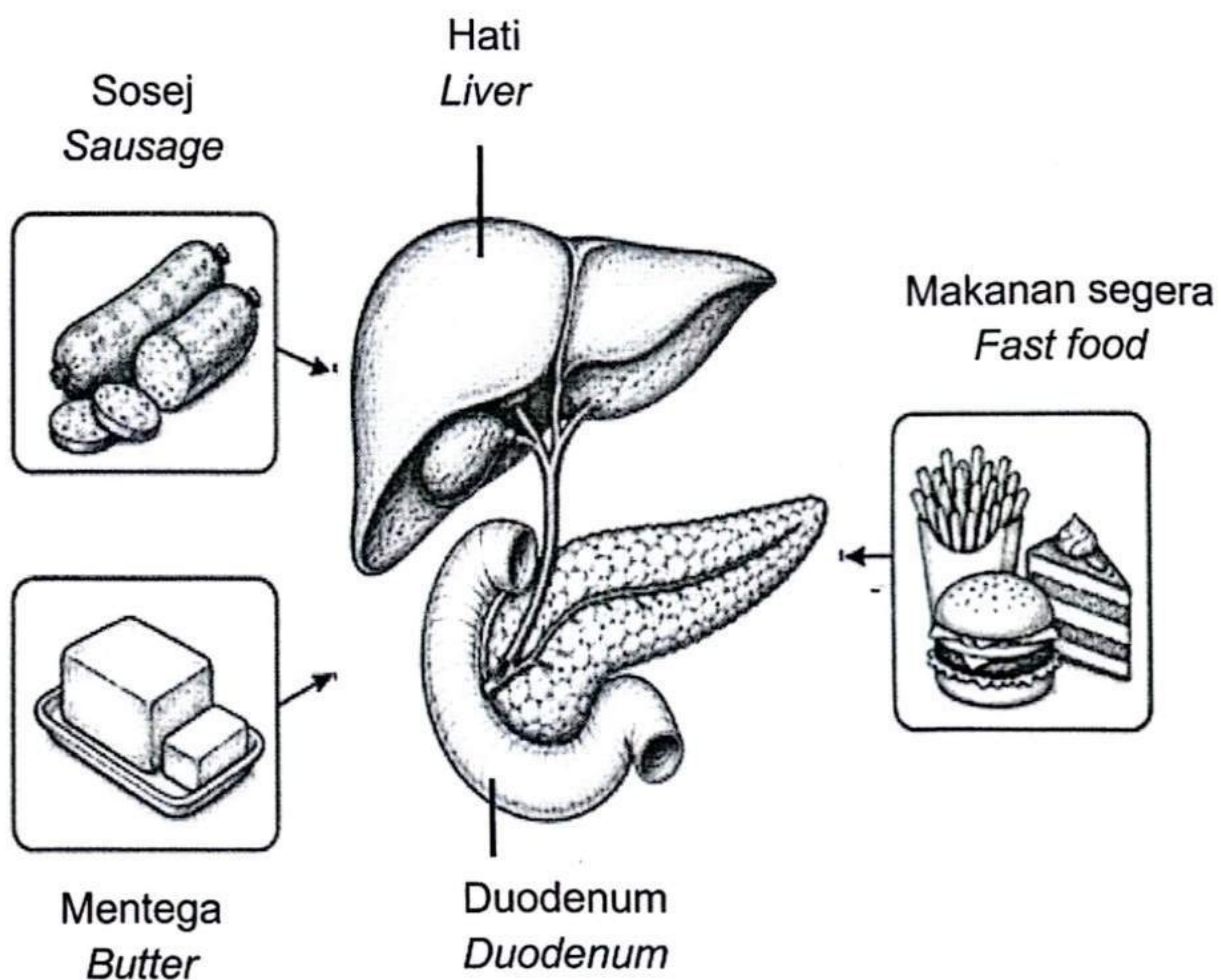
[20 markah]

Soalan ini **mesti** dijawab.

Soalan 11

11. (a)(i) Rajah 11.1 menunjukkan beberapa organ yang terlibat dalam proses pencernaan kelas makanan X yang sering diambil oleh seorang individu.

Diagram 11.1 shows several organs involved in the digestion process of food class X that is frequently consumed by an individual.



Rajah 11.1
Diagram 11.1

Berdasarkan Rajah 11.1, terangkan peranan hati dalam pencernaan kelas makanan X di duodenum.

Based on Diagram 11.1, explain the role of the liver in the digestion of food class X in the duodenum.

[3 markah/3 marks]

- (ii) Individu tersebut telah disahkan oleh doktor mempunyai masalah hati berlemak, steatosis hepatic yang berpunca daripada tabiatnya yang gemar mengambil kelas makanan X dalam jangka masa panjang.

Bincangkan kesan masalah hati berlemak terhadap proses asimilasi makanan tercerna dalam hati.

The individual has been diagnosed by a doctor with fatty liver disease, hepatic steatosis, resulting from their habit of frequently consuming food class X over a long period.

Discuss the effects of fatty liver disease on the assimilation process of digested food in the liver.

[7 markah/7 marks]

- (b) Rajah 11.2 menunjukkan perbualan di antara seorang pakar pemakanan dengan seorang pesakit yang mempunyai masalah berkaitan tabiat pemakanan.

Diagram 11.2 shows a conversation between a nutritionist and a patient who has a problem related to eating.

Awak perlu:

You need to:

- makan buah-buahan dan sayur-sayuran berdaun hijau yang segar
eat fresh fruits and green leafy vegetables
- Ambil makanan yang mempunyai kalori tinggi secara sihat
take healthy high-calorie foods
- mendapatkan bantuan kaunseling dan pemeriksaan berkala
seek counselling and undergo regular check-ups
- menyediakan makanan dalam bentuk dan warna yang menarik
prepared in attractive shapes and colours



Rajah 11.2

Diagram 11.2

Wajarkan bagaimana saranan kesihatan tersebut dapat menyumbang kepada pemulihan kesihatan pesakit tersebut.

Justify how the health recommendations can contribute to the recovery of the patient's health

[4 markah/4 marks]

(c)



- Ketinggian 145cm
Height 145cm
- Jisim badan 95kg
Body mass: 95kg
- 45 tahun
45 years old
- Bekerja sebagai pereka grafik
Working as a graphic designer
- Mempunyai masalah lutut
Having knee problems

Pernyataan berikut adalah mengenai Puan S.

The following statement is about Mrs. S.

Cadang dan terangkan menu makan tengahari yang mengandungi karbohidrat, protein dan pelawas untuk diambil oleh Puan S bagi menjamin kesihatan beliau.

Suggest and explain a suitable lunch menu containing carbohydrates, proteins and fibre for Mrs. S to ensure her health.

[6 markah/6 marks]