

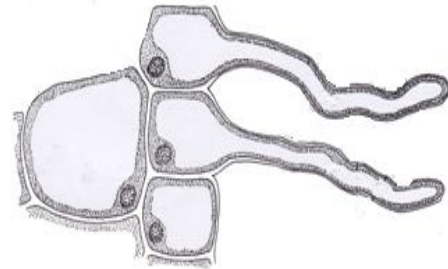
Section A
Bahagian A
[60 marks]
[60 markah]

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

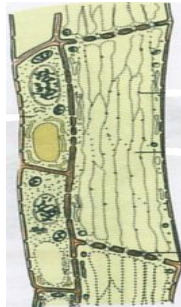
1 Diagram 1 shows some specialised cells and tissue.
Rajah 1 menunjukkan beberapa sel khusus dan tisu.



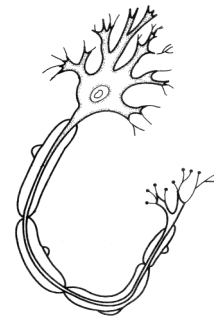
Cell P
Sel P



Tissue Q
Tisu Q



Tissue R
Tisu R



Cell S
Sel S

Diagram 1
Rajah 1

(a) (i) Name cell P and tissue R.
Namakan sel P dan tisu R.

P :

R :

[2 marks]
[2 markah]

1 (a)(i)

2

- (ii) State **one** function of cell P and cell R.
*Nyatakan **satu** fungsi sel P dan sel R.*

Cell P / *Sel P* :

.....

Cell R / *Sel R* :.....

.....

[2 marks]
[2 markah]

1 (a)(ii)

	2
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- (b) (i) Name the system which consist cell S.
Namakan sistem yang mengandungi sel S.

.....

[1 mark]
[1 markah]

1 (b)(i)

	1
--	---

- (ii) Explain **one** role of cell S in the system named in (b)(i).
*Terangkan **satu** peranan sel S di dalam sistem yang dinamakan di (b)(i).*

.....

.....

.....

[2 marks]
[2 markah]

1 (b)(ii)

	2
--	---

- (c) Explain **one** characteristic of tissue Q to facilitate water absorption from soil.
*Terangkan **satu** ciri tisu Q untuk membantu penyerapan air daripada tanah.*

.....

.....

.....

[2 marks]
[2 markah]

1 (c)

	2
--	---

(d) Herbicide is capable to stop the transportation of some mineral into a plant through tissue Q.
Explain why.
Racun rumpai boleh menghentikan pengangkutan mineral tertentu ke dalam tumbuhan melalui tisu Q.
Terangkan mengapa.

.....

.....

.....

.....

[3 marks]
[3 markah]

1 (d)

3

**TOTAL
A1**

12

2

Diagram 2.1 shows a photomicrograph showing stages in a cell cycle that occur in the animal skin.

Rajah 2.1 menunjukkan fotomikrograf bagi peringkat-peringkat di dalam kitar sel yang terjadi dalam kulit haiwan.

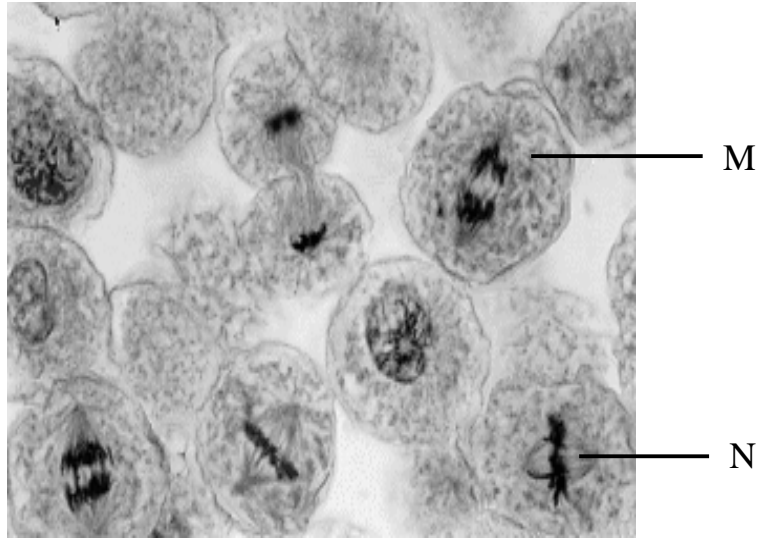


Diagram 2.1
Rajah 2.1

- (a) (i) State the type of cell division involved in the cell cycle.
Nyatakan jenis pembahagian sel yang terlibat di dalam kitar sel itu.

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

2 (a)(i)

1

- (ii) State **one** reason for your answer in (a)(i).
*Nyatakan **satu** sebab untuk jawapan anda di (a)(i).*

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

2 (a)(ii)

1

(b) (i) Explain the chromosomal behaviour in stage N.
Terangkan perlakuan kromosom dalam peringkat N.

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

2 (b)(i)

2

[2 marks]
[2 markah]

(ii) State the importance of the chromosomal behaviour in mentioned in (b)(i).
Nyatakan kepentingan perlakuan kromosom yang dinyatakan dalam (b)(i).

.....
.....

2 (b)(ii)

1

[1 mark]
[1 markah]

(c) Somatic cells of the animal has four chromosomes.
In Diagram 2.2, draw and label a diagram showing the chromosomal behavior after stage M.
*Sel-sel soma haiwan itu mempunyai empat kromosom.
Pada Rajah 2.2, lukis dan label rajah menunjukkan perlakuan kromosom selepas peringkat M.*



Diagram 2.2
Rajah 2.2

2 (c)

3

[3 marks]
[3 markah]

(d) (i) A farmer wants to breed a good variety of banana plants for commercial production.
Suggest a suitable method to be used which involved the cell cycle in Diagram 2.1.

*Seorang peladang hendak membiakkan variasi tanaman pisang yang baik untuk penghasilan komersial.
Cadangkan kaedah yang sesuai digunakan, melibatkan kitar sel dalam Rajah 2.1.*

.....
.....

2 (d)(i)

	1
--	---

[1 mark]
[1 markah]

(ii) Explain how the method named in (d)(i) can increased the crop yield.
Terangkan bagaimana kaedah yang dinamakan di (d)(i) boleh meningkatkan hasil tanaman.

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

2 (d)(ii)

	3
--	---

[3 marks]
[3 markah]

TOTAL
A2

	12
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- 3 (a) Diagram 3 shows a terrestrial ecosystem.
Rajah 3 menunjukkan ekosistem daratan.



Diagram 3
Rajah 3

- (i) State the definition of ecosystem.
Nyatakan definisi ekosistem.

.....
.....

[1 mark]
[1 markah]

3 (a)(i)

1

- (ii) A niche of an organism is its roles in the ecosystem.
Based on organisms in Diagram 3, state an example of niche.
*Nic bagi organisma adalah peranannya dalam suatu ekosistem.
Berdasarkan organism dalam Rajah 3, nyatakan satu contoh nic.*

.....
.....

[1 mark]
[1 markah]

3 (a)(ii)

1

- (b) (i) Based on the Diagram 3, construct a food web showing the interaction of **four** organisms.
Berdasarkan Rajah 3, bina satu jaringan makanan menunjukkan interaksi empat organism.

[2 marks]
[2 markah]

3 (b)(i)

2

- (b) (ii) Based on constructed food web in (b)(i) construct a pyramid of numbers.
Berdasarkan jaringan makanan yang telah dibina di (b)(i) binakan pyramid nombor.

[2 marks]
[2 markah]

3 (b)(ii)

2

(c) (i) The organisms in the first trophic level absorbs 15 000kJ solar energy. Energy loss at each trophic level is 90%. Calculate the total energy transferred to the organisms in the third trophic level.
Organisma-organisma dalam aras trof pertama menyerap 15 000kJ tenaga matahari. Tenaga hilang sebanyak 90% pada setiap aras trof. Kirakan jumlah tenaga yang dipindahkan kepada organism pada aras trof ketiga.

3 (c)(i)

	2
--	---

=.....kJ

[2 marks]
[2 markah]

(ii) State **two** ways in which energy may be lost in the food web.
*Nyatakan **dua** cara yang memungkinkan kehilangan tenaga dalam jaringan makanan.*

3 (c)(ii)

	2
--	---

1.

2.

[2marks]
[2 markah]

(d) Many problems related to the environment are the results of human activities. Explain **one** bad effect of the activities on the ecosystem.
*Banyak masalah berkaitan alam sekitar adalah disebabkan oleh aktiviti manusia. Terangkan **satu** kesan buruk aktiviti-aktiviti itu ke atas ekosistem.*

3 (d)

	2
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.....

.....

.....

[2 marks]
[2 markah]

**TOTAL
A3**

	12
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4

Diagram 4 shows a human foetus in his mother's uterus
Rajah 4 menunjukkan fetus manusia dalam uterus ibunya.

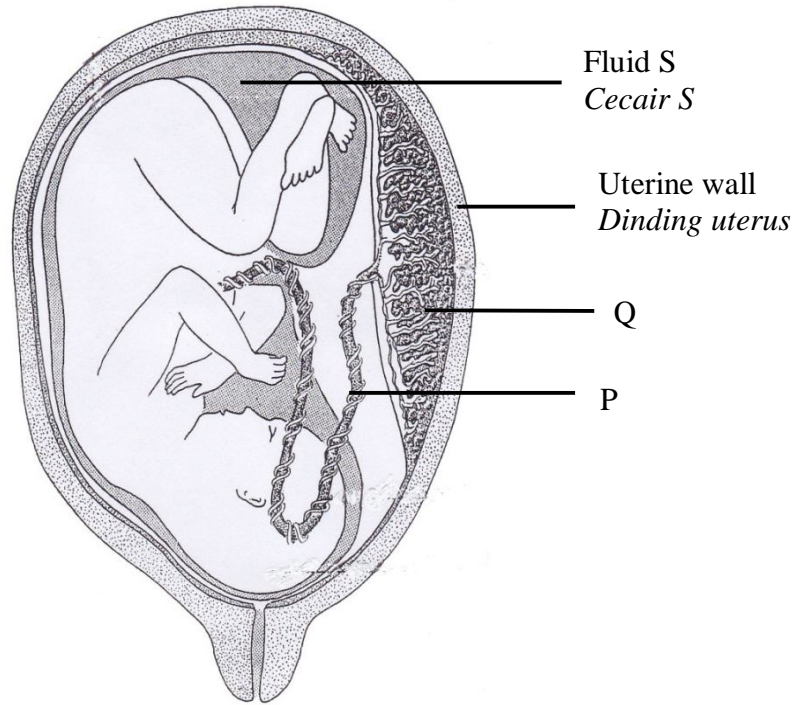


Diagram 4
Rajah 4

(a) State the importance of fluid S.
Nyatakan kepentingan cecair S.

.....
.....

[1 mark]
[1 markah]

(b) (i) Structure P consist of two types of blood vessels.
Name both blood vessels
*Struktur P terdiri daripada dua jenis salur darah.
Namakan kedua-dua salur darah tersebut*

1.
2.

[2 marks]
[2 markah]

4 (a)

1

4 (b)(i)

2

(ii) State the function of each blood vessels named in (b)(i)
Nyatakan fungsi bagi setiap salur darah yang dinamakan di (b)(i).

- 1.
- 2.

[2 marks]
[2 markah]

4 (b)(ii)

	2
--	---

(c) In the 16th week, a pregnant mother is infected with a disease. The infection causes structure Q to stop functioning. The mother miscarry. Explain this statement.
Pada minggu ke 16, ibu hamil dijangkiti penyakit. Jangkitan itu menyebabkan struktur Q berhenti berfungsi. Ibu mengalami keguguran. Jelaskan pernyataan ini.

-
-
-

[2 marks]
[2 markah]

4 (c)

	2
--	---

(d) Explain why the foetus has a separate blood circulatory system from his mother.
Terangkan mengapa fetus mempunyai sistem peredaran darah yang berasingan daripada ibunya.

-
-
-

[2 marks]
[2 markah]

4(d)

	2
--	---

(e)

Human chorionic gonadotrophin hormone (HCG) has a similar role to luteinizing hormone (LH).
A wife has a problem conceiving due to the failure in ovulation. The wife becomes pregnant after a doctor has given her injections of HCG.
Hormon gonadotrofin manusia (HCG) mempunyai satu persamaan dengan hormon peluteinan. Seorang isteri mempunyai masalah untuk hamil

Based on above statement, explain how HCG injections enable the process of pregnancy.

Berdasarkan pernyataan di atas, terangkan bagaimana suntikan HCG menyebabkan kehamilan.

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

[3 marks]
[3 markah]

4 (e)

3

TOTAL
A4

12

5

Diagram 5.1 shows a dihybrid cross of pure-breeding round and yellow seeds with wrinkled and green seeds of pea plant.

Rajah 5.1 menunjukkan kacukan dihibrid baka tulen, biji bulat berwarna kuning dengan biji berkedut berwarna hijau pokok kacang pea.

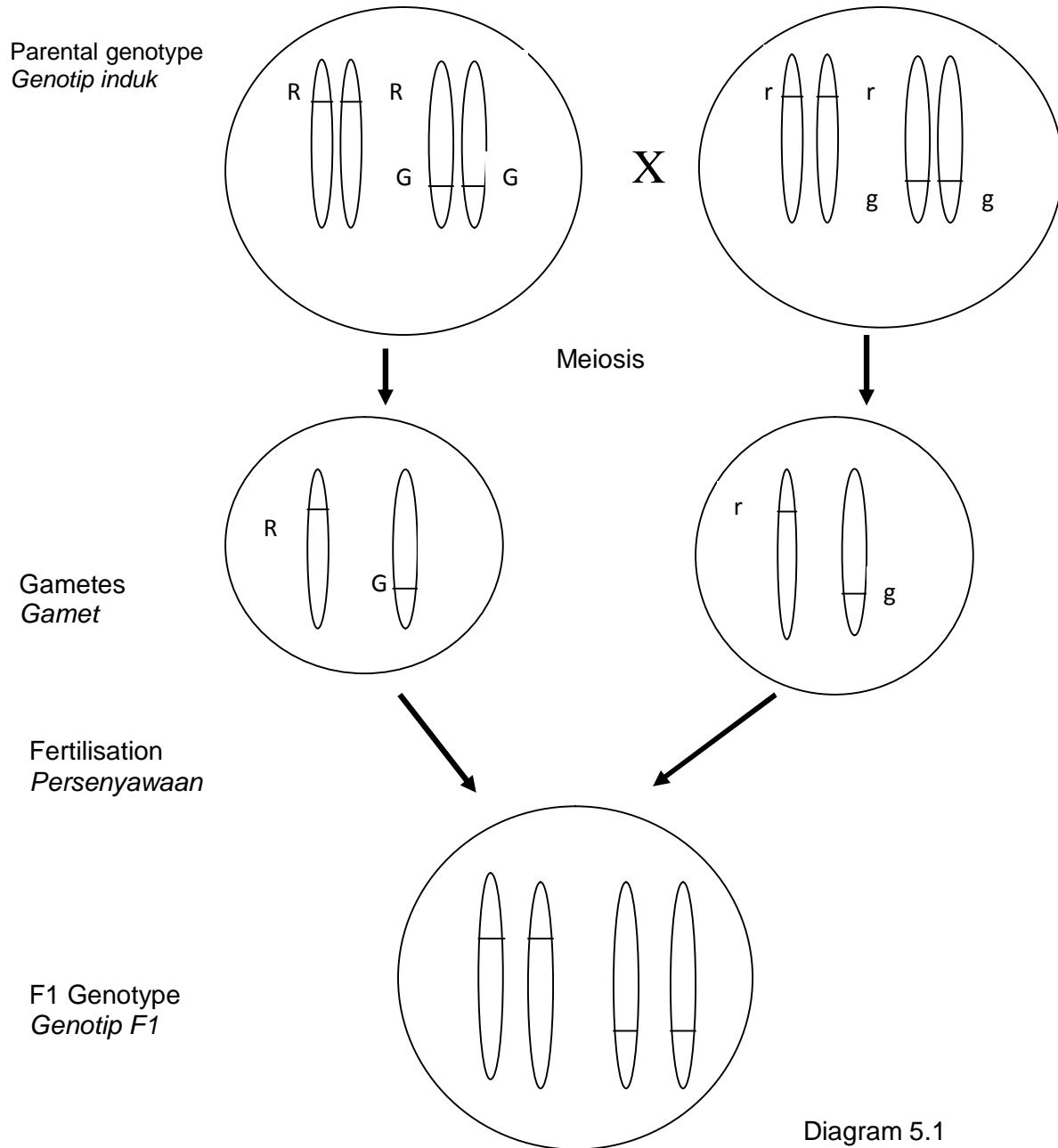


Diagram 5.1
Rajah 5.1

Key / *kekunci*:

R : Represents dominant allele round seed

Mewakili alel dominan biji bulat

G : Represents dominant allele yellow colour

Mewakili alel dominan biji berwarna kuning

- (a) (i) In Diagram 5.1, label the alleles for F1 genotype.
Dalam Rajah 5.1, label alel-alel untuk genotip F1.

[1 mark]
[1 markah]

5 (a)(i)

	1
--	---

- (ii) State the phenotype for F1 generation.
Nyatakan fenotip untuk generasi F1.

[1 mark]
[1 markah]

5 (a)(ii)

	1
--	---

- (b) Diagram 5.2 shows two possibilities of gametes formation by F1 generation.
Rajah 5.2 menunjukkan dua kemungkinan gamet-gamet yang terbentuk oleh generasi F1.

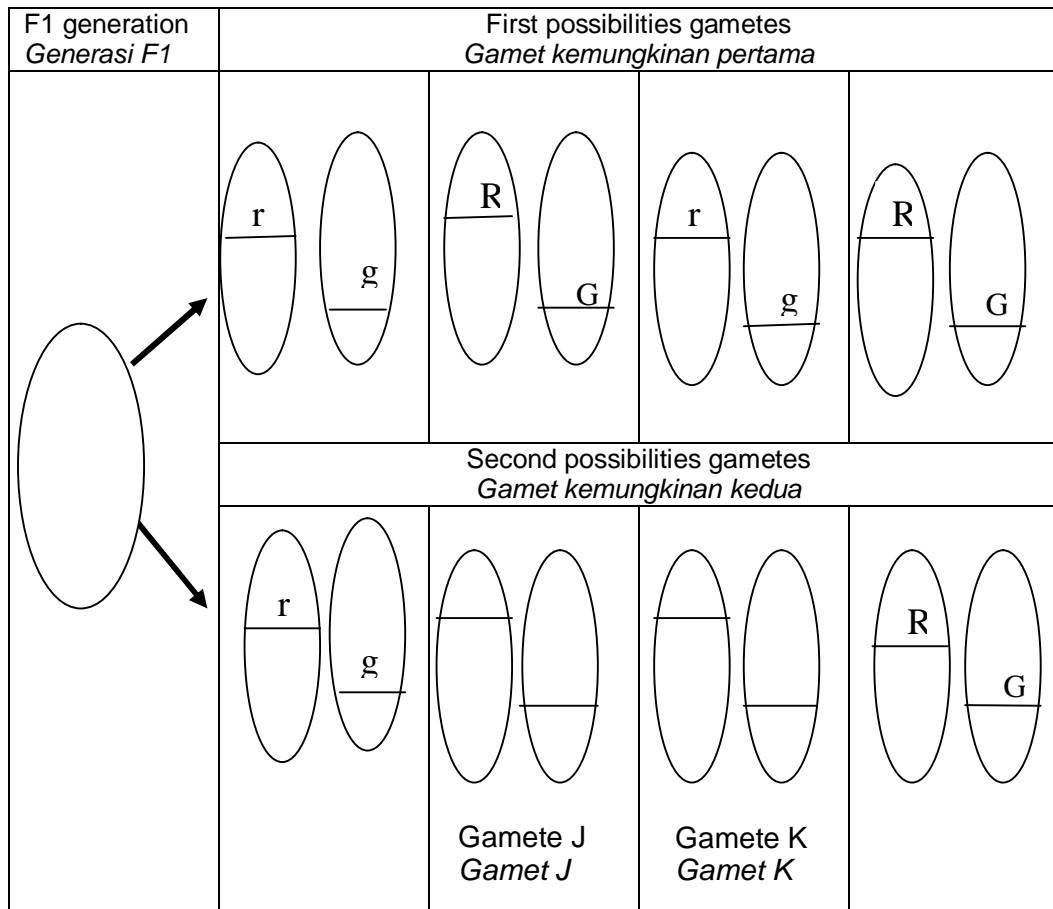


Diagram 5.2
Rajah 5.2

For
Examiner's
Use

- (b) Name the process that occurred during meiosis which produced different gametes in second possibilities.
Namakan proses yang terjadi semasa meiosis yang menghasilkan gamet-gamet berbeza dalam kemungkinan kedua.

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

5 (b)

1

- (c) In diagram 5.2, Complete gamete J and gamete K which are produced in second possibility.
Pada Rajah 5.2, lengkapkan gamet J dan gamet K yang dihasilkan dalam kemungkinan kedua.

[2 marks]
[2 markah]

5 (c)

2

- (d) (i) State which possibilities will cause more variation to the offsprings.
Nyatakan kemungkinan yang mana menyebabkan lebih variasi kepada anaknya.

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

5 (d)(i)

1

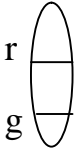
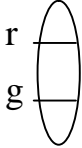
- (ii) Explain **one** reason for your answer in (d)(i).
Terangkan satu sebab bagi jawapan anda di (d)(i).

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

5 (d)(ii)

3

- (e) The pea plant of F1 generation which has undergone second possibility is crossed with the parent which has wrinkled-green seed. Complete Diagram 5.3 by filling in F1 generation gametes drawn in (c), genotype of F2 generation and phenotype of F2 generation which will be produced.
Pokok kacang pea generasi F1 yang telah mengalami proses kemungkinan kedua, dikacukkan semula dengan induk yang mempunyai biji lisut dan berwarna hijau. Lengkapkan Rajah 5.3 dengan mengisikan gamet F1 yang dilukis di (c) , genotip generasi F2 dan fenotip generasi F2 yang akan terhasil.

Gametes from F1 generation. <i>Gamet generasi F1</i>	Gametes from parent <i>Gamet induk</i>	Genotype of F2 generation <i>Genotip generasi F2</i>	Phenotype of F2 generation <i>Fenotip generasi F2</i>
			
			

[3 marks]
[3 markah]

5 (e)

3

**TOTAL
A5**

12

Section B
Bahagian B

[40 marks]
[40 markah]

Answer any **two** questions from this section
*Jawab mana-mana **dua** soalan daripada bahagian ini.*

- 6 (a) Diagram 6.1 shows the human vertebral column. P and R are two types of vertebrae in the human vertebral column.
Rajah 6.1 menunjukkan turus vertebra manusia. P dan R adalah dua jenis vertebra pada turus vertebra manusia.

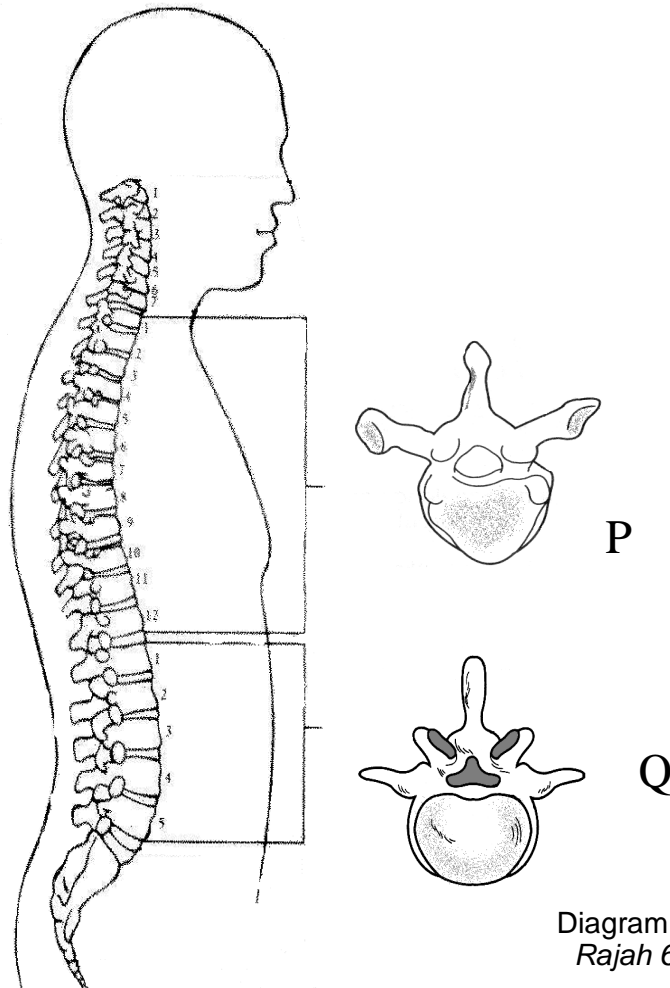


Diagram 6.1
Rajah 6.1

- (i) Explain the adaptation of vertebrae P and vertebrae Q to function efficiently.
Terangkan penyesuaian vertebra P dan vertebra R untuk berfungsi dengan cekap.

[6 marks]
[6 markah]

- (ii) Explain why human requires endoskeleton for efficient daily activities.
Terangkan mengapa manusia memerlukan rangka luar untuk kecekapan aktiviti harian.

[4 marks]
[4 markah]

- (b) Explain why :
- An athlete must do a warming up before the event
 - Elderly people experiences pain at their joint.

Terangkan mengapa :

- *Seorang atlet mesti melakukan senaman memanaskan badan sebelum memulakan acara*
- *Orang-orang tua mengalami kesakitan pada sendi*

[10 marks]
[10 markah]

7 (a) (i)

Movement of substances across the plasma membrane in the cell is important for the continuity in life of organisms. The process helps to maintain a constant internal environment.
Pergerakan bahan merentasi membran plasma di dalam sel adalah penting untuk kemandirian hidup organisma. Proses ini mengekalkan persekitaran dalaman organism.

Explain the importance of plasma membrane for the survival of living organism.
Terangkan kepentingan membran plasma untuk kemandirian organism hidup.

[4 marks]
[4 markah]

- (ii) Diagram 7.1 shows two types of transport of substances through plasma membrane.
Rajah .1 menunjukkan dua jenis pengangkutan bahan melalui membran plasma.

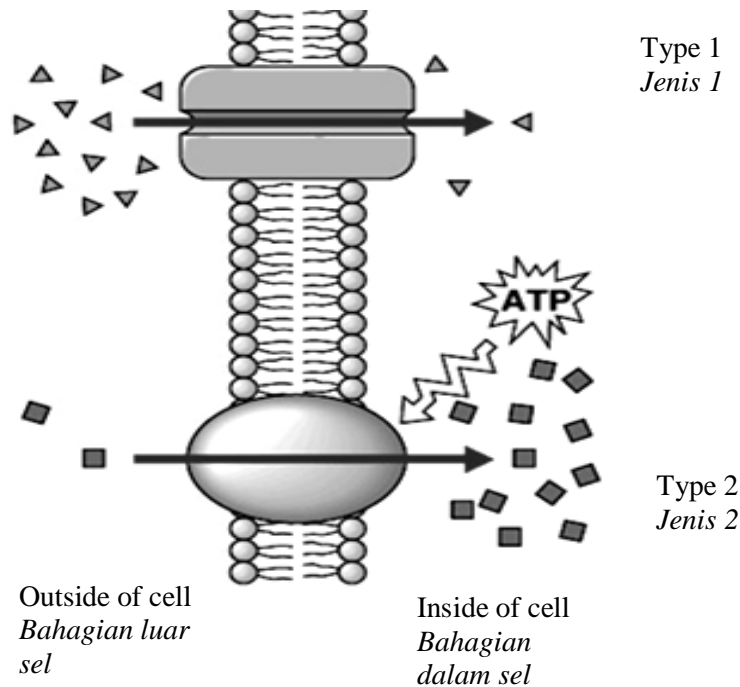


Diagram 7.1
Rajah 7.1

Explain the two types of transport of substances through plasma membrane shown in Diagram 7.

Terangkan kedua-dua jenis pengangkutan bahan melalui membran plasma yang ditunjukkan dalam Rajah 7.

[6 marks]
[6 markah]

- (b) A student carry out the experiment to determine the concentration of an external solution which is isotonic to the cell sap. The student immersed the potato strips in a different concentration of sugar in 30 minutes time. Diagram 7.2 shows graph plotted to show the change in mass against concentration of solution.

Seorang pelajar menjalankan eksperimen untuk mengetahui kepekatan larutan di luar sel yang isotonik dengan kepekatan sap sel. Pelajar itu merendam jalur ubi kentang di dalam kepekatan larutan gula yang berbeza.

Rajah 7.2 menunjukkan graf yang diplot untuk menunjukkan perubahan dalam jisim melawan kepekatan larutan

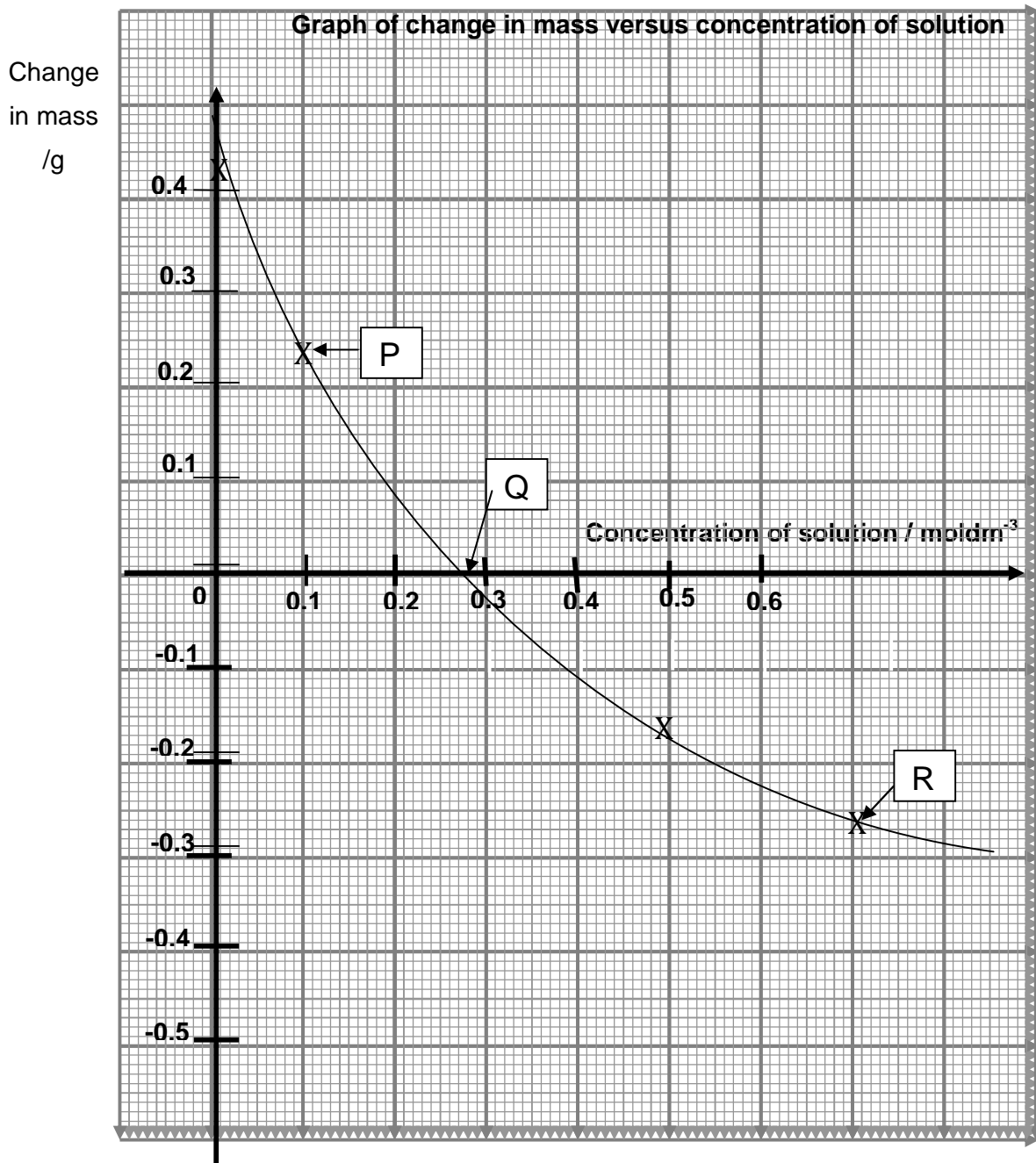


Diagram 7.2
Rajah 7.2

- (i) Based on the graph in Diagram 7.2, state the concentration of the solution that is isotonic to cell sap.
Berdasar graf pada Rajah 7.2, nyatakan kepekatan larutan yang isotonik kepada sel sap.

[1 mark]
[1 markah]

- (ii) Explain what happen to the cell at point P , Q and R.
Terangkan apa yang berlaku terhadap sel di titik P, Q dan R.

[9 marks]
 [9 markah]

- 8 (a) Diagram 8.1 shows the digestive system of a herbivore.
Rajah 8.1 menunjukkan sistem pencernaan sesuatu herbivor.

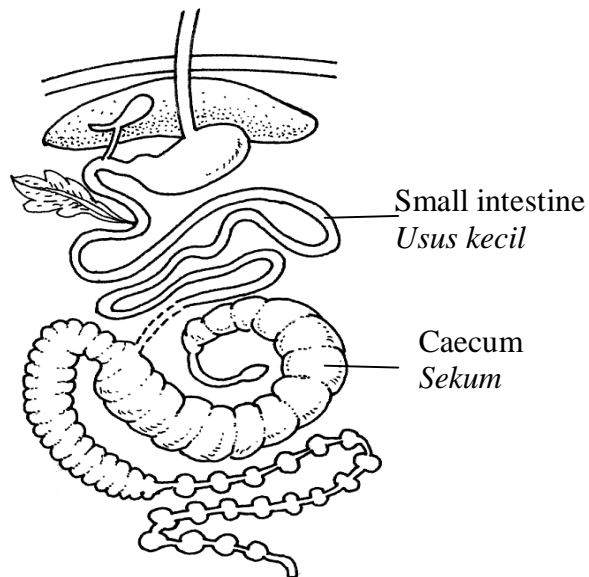


Diagram 8.1
 Rajah 8.1

Describe how cellulose in the plant fibres are digested and how the products of digestion of cellulose are absorbed into the body of the herbivore.

Huraikan bagaimana selulosa dalam serat tumbuhan itu dicernakan dan bagaimana hasil-hasil pencernaan selulosa diserap kedalam badan herbivor itu.

[10 marks]
 [10 markah]

(b) Diagram 8.2 shows a food pyramid.

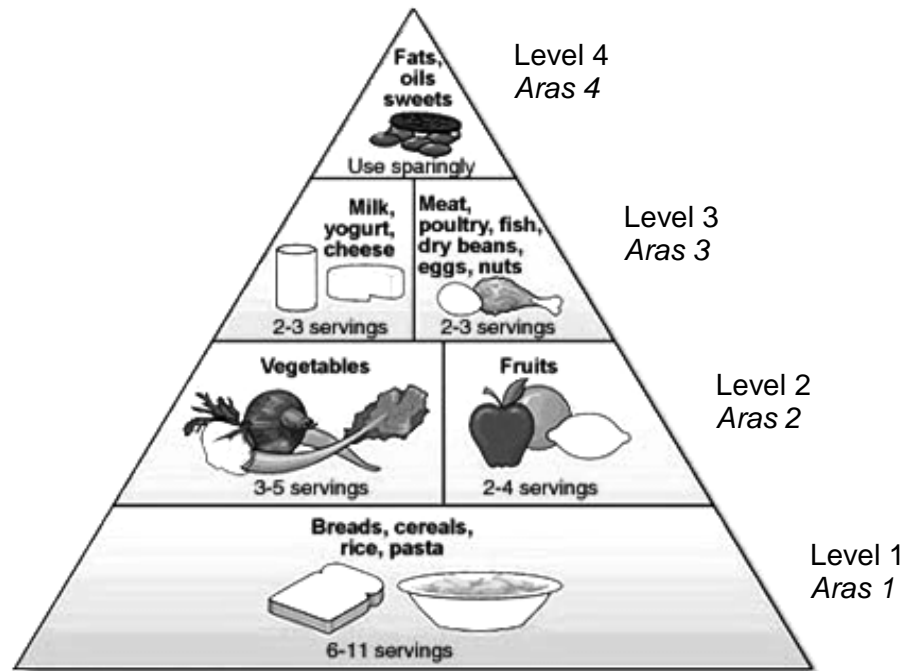


Diagram 8.2
Rajah 8.2

Based on Diagram 8.2, explain how a teenager may be able to plan his daily diet wisely to maintain his normal growth and good health.

Berdasarkan Rajah 8.2, terangkan bagaimana seorang remaja lelaki akan mengatur gizi hariannya secara bijak untuk mengekalkan proses pertumbuhan yang normal dan kesihatan yang baik.

[10 marks]
[10 markah]

- 9 (a) Diagram 9.1 and 9.2 shows the stages in blood clotting.
Rajah 9.1 dan 9.2 menunjukkan peringkat pembekuan darah.

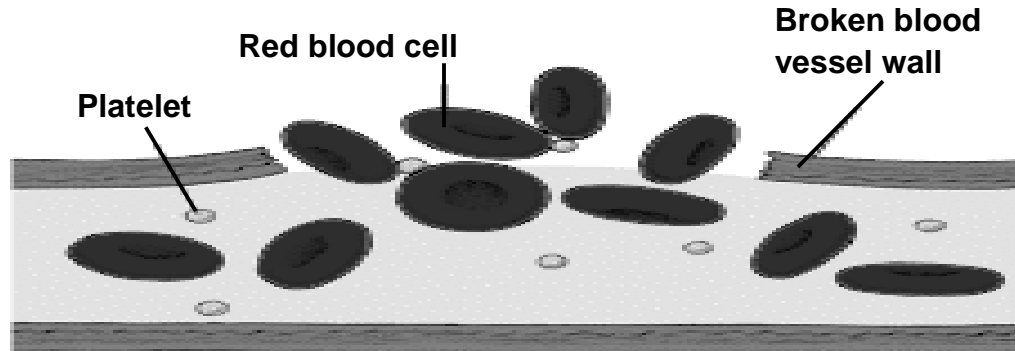


Diagram 9.1
Rajah 9.1

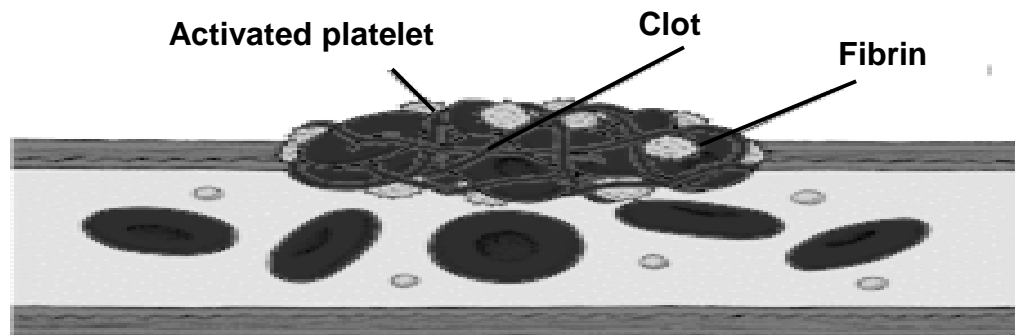


Diagram 9.2
Rajah 9.2

Based on the diagram and on your biological knowledge, describe how the mechanism of blood clotting help to prevent infection when a wound occurs.
Berdasarkan rajah dan pengetahuan biologi anda, huraikan bagaimana mekanism pembekuan darah.membantu untuk mengelakkan jangkitan apabila berlakunya luka.

[10 marks]
 [10 markah]

- (b) The statement below describe the lymphatic system
Pernyataan di bawah menerangkan sistem limfa.

- Lacteals in interstinal villi transport products of lipids
Lacteal di vilus mengangkut produk lipid
- About 10% of interstitial fluid returns to the circulatory system via the lymphatic system.
10 % cecair interstitial akan kembali ke sistem peredaran darah melalui sistem limfa.

Based on these statements, explain why the lymphatic system is considered complementary to the blood circulatory system.
Berdasarkan pernyataan ini, terangkan kenapa sistem limfa dikatakan pelengkap kepada sistem peredaran darah.

[10 marks]
[10 markah]

**END OF QUESTION PAPER
KERTAS SOALAN TAMAT**