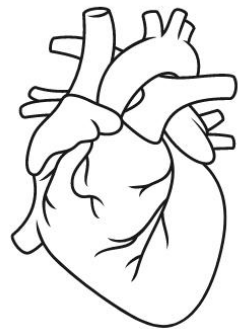
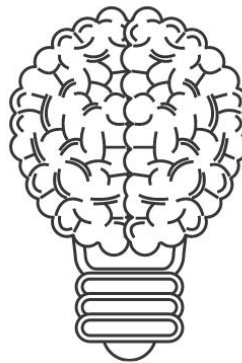
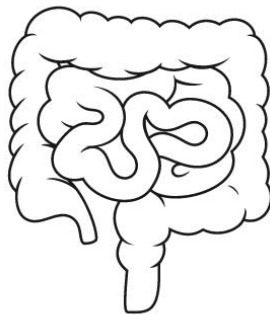
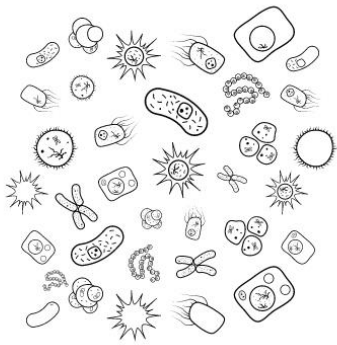


BENGKEL TEKNIK MENJAWAB BIOLOGI KERTAS 2 SPM 2023

BIO SMART A+ WORKSHOP

SEKOLAH SAINS SULTAN HAJI AHMAD SHAH PEKAN.
28 & 29 JULAI 2023 | JUMAAT-SABTU



SECTION A, B & C

CIKGU FAZLIE BIOSENSEI

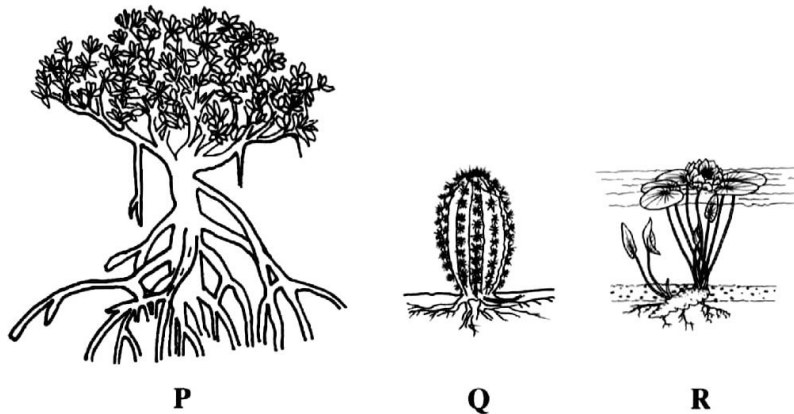
SM SAINS SULTAN MAHMUD (SESMA),
TERENGGANU DARUL IMAN.



BIOLOGY PAPER 2 (4551/2)
SECTION A (STRUCTURE-BASED)

- 1 Tumbuhan boleh dikelaskan berdasarkan habitatnya. Rajah 1 menunjukkan tiga contoh tumbuhan iaitu **P**, **Q** dan **R**.

*Plants can be classified according to their habitat. Diagram 1 shows three examples of plants which are **P**, **Q** and **R**.*



Rajah 1
Diagram 1

- (a) Berdasarkan Rajah 1, nyatakan **satu** contoh habitat untuk tumbuhan **P**.

*Based on Diagram 1, state **one** example of habitat for plant **P**.*

[1 markah]

[1 mark]

- (b) Kelas bagi tumbuhan **P** berdasarkan habitatnya adalah halofit.

Nyatakan kelas bagi tumbuhan **Q** dan tumbuhan **R**, berdasarkan habitatnya.

*Class for plant **P** based on their habitat is halophyte.*

*State the class of plant **Q** and **R** based on their habitat.*

Q :

R :

[2 markah]

[2 marks]

- (c) Tumbuhan memerlukan air untuk pertumbuhan dan metabolisme. Tumbuhan **Q** banyak dijumpai di gurun.

Terangkan bagaimana tumbuhan **Q** beradaptasi untuk mendapatkan air di kawasan tersebut.

*Plants need water for growth and metabolism. Plant **Q** is found mainly in the desert.*

*Explain how plant **Q** is adapted to obtain the water in the area.*

.....

.....

.....

[2 markah]

[2 marks]

- (d) Tumbuhan **R** mempunyai daun yang lebar dan tisu aerenkima yang banyak.

Nyatakan peranan adaptasi ini kepada tumbuhan tersebut.

*Plant **R** has broad leaves and a lot of aerenchyma tissues.*

State the role of this adaptation to the plant.

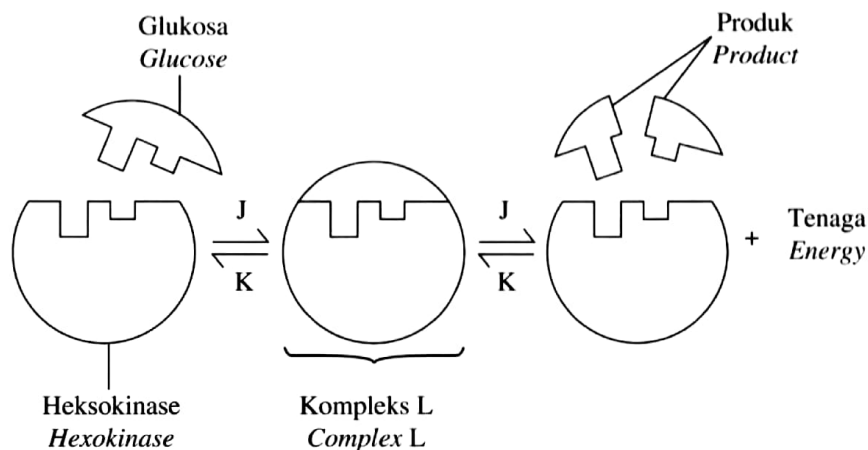
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[1 markah]

[1 mark]

- 2 Rajah 2 menunjukkan metabolisme J dan metabolisme K dalam sel yang dimangkin oleh enzim.

Diagram 2 shows metabolism J and K in a cell that are catalysed by an enzyme.



Rajah 2
Diagram 2

- (a) (i) Nyatakan nama bagi kompleks L.

State the name of complex L.

.....

[1 markah]

[1 mark]

- (ii) Nyatakan jenis enzim heksokinase.

State the type of hexokinase enzyme.

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

- (b) Berdasarkan Rajah 2, nyatakan jenis metabolisme J dan metabolisme K.

Based on Diagram 2, state the types of metabolism J and K.

J :

K :

[2 markah]
[2 marks]

- (c) Pernyataan berikut adalah tentang sifat umum enzim.

The following statement is about the general characteristic of enzyme.

Merkuri adalah logam berat paling toksik yang merencat fungsi enzim.

Mercury is the most toxic heavy metal which inhibits the function of enzyme.

Terangkan kesan merkuri ke atas aktiviti enzim heksokinase.

Explain the effects of mercury on the activity of hexokinase enzyme.

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

[2 markah]
[2 marks]

3.

Rajah 3.1 menunjukkan tumbuhan M di habitatnya.

Diagram 3.1 shows plant M in its habitat.



Rajah 3.1
Diagram 3.1

- (a) Nyatakan organ pada tumbuhan M yang terlibat dalam pengambilan air dan garam mineral.

State the organ of plant M that is involved in the uptake of water and mineral salts.

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

- (b) (i) Nyatakan penyesuaian nutrisi bagi tumbuhan M.

State the nutritional adaptation of plant M.

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

- (ii) Terangkan jawapan anda di 3(b)(i).

Explain your answer in 3(b)(i).

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

- (c) Seorang pekebun telah memindahkan tumbuhan M ke tapak semaian. Rajah 3.2 menunjukkan sejenis baja yang digunakan oleh pekebun tersebut.

A farmer transferred plant M to the nursery. Diagram 3.2 shows a type of fertiliser used by the farmer.



Rajah 3.2
Diagram 3.2

Berdasarkan Rajah 3.2, terangkan kesan makronutrien dalam baja tersebut terhadap pertumbuhan tumbuhan M.

Based on Diagram 3.2, explain the effects of the macronutrients in the fertiliser to the growth of plant M.

.....

.....

.....

.....

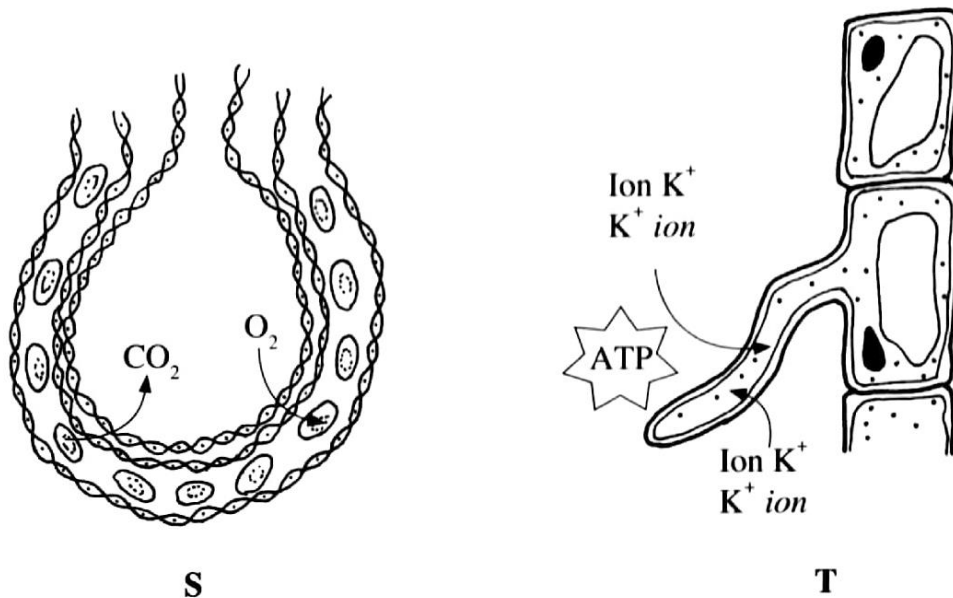
.....

[3 markah]
[3 marks]

4.

Rajah 4.1 menunjukkan dua jenis pergerakan bahan merentas membran plasma.

Diagram 4.1 shows two types of movements of substances across the plasma membrane.



Rajah 4.1
Diagram 4.1

- (a) (i) Nyatakan jenis pergerakan bahan dalam Rajah 4.1.

State the type of movement of substances in Diagram 4.1.

S :

T :

[2 markah]

[2 marks]

- (ii) Nyatakan **satu** ciri bahan yang dapat merentasi membran plasma pada S.

*State **one** characteristic of the substances which can move across the plasma membrane in S.*

.....

[1 markah]

[1 mark]

- (b) Berikan **dua** perbezaan antara proses **S** dengan proses **T**.

*Give **two** differences between process **S** and **T**.*

.....

.....

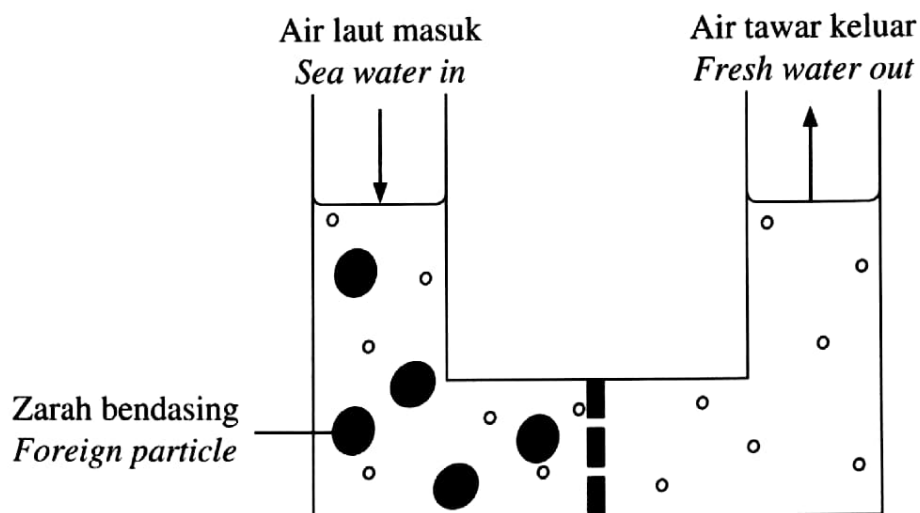
.....

[2 markah]

[2 marks]

- (c) Kebanyakan negara Timur Tengah menggunakan proses penyahgaraman bagi mendapatkan bekalan air tawar daripada air laut. Rajah 4.2 menunjukkan konsep asas proses yang terlibat.

Most of the Middle East countries use desalination process to obtain fresh water supply from the sea water. Diagram 4.2 shows the basic concept of the process involved.



Rajah 4.2
Diagram 4.2

Berdasarkan Rajah 4.2, terangkan proses tersebut.

Based on Diagram 4.2, explain the process.

.....

.....

.....

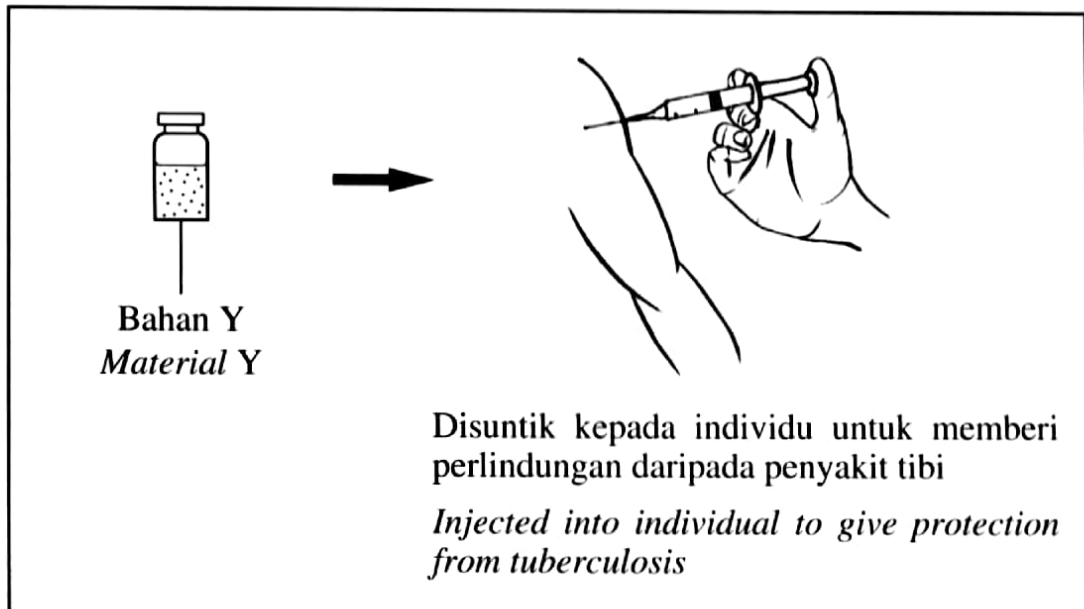
[2 markah]

[2 marks]

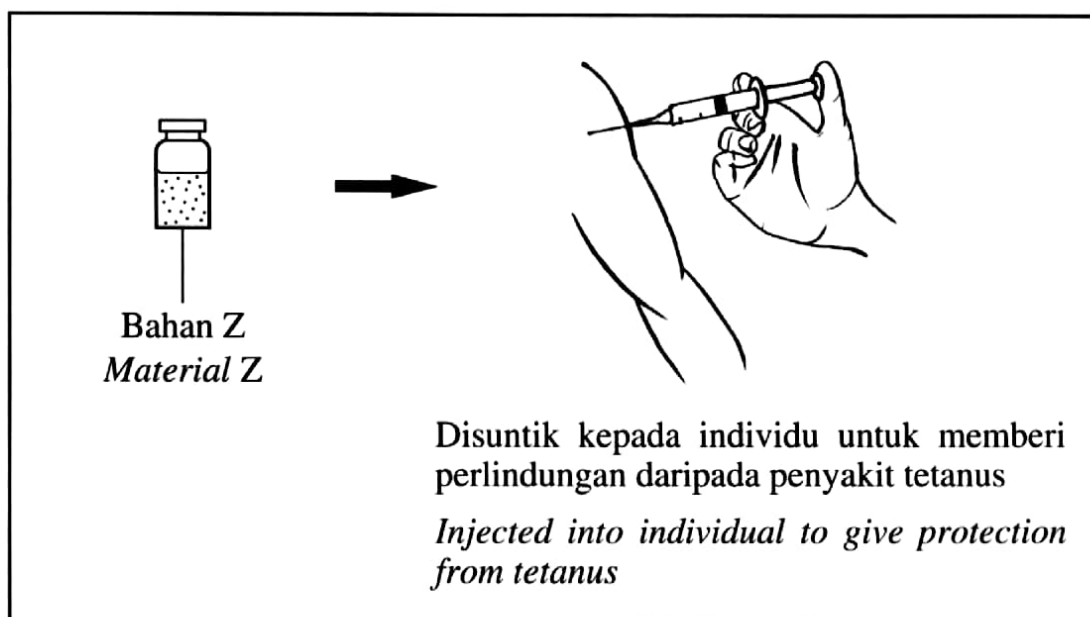
5.

Rajah 5.1 menunjukkan seorang individu disuntik dengan bahan Y. Rajah menunjukkan seorang individu disuntik dengan bahan Z yang diekstrak daripada darah kuda.

Diagram 5.1 shows an individual is injected with material Y. Diagram 5.2 shows individual is injected with material Z that is extracted from the horse blood.



Rajah 5.1
Diagram 5.1



Rajah 5.2
Diagram 5.2

- (a) (i) Nyatakan jenis keimunan yang diperoleh oleh individu dalam Rajah 5.1 dan Rajah 5.2.

State the type of immunity obtained by individual in Diagram 5.1 and Diagram 5.2.

Rajah 5.1 :
Diagram 5.1

Rajah 5.2 :
Diagram 5.2

[2 markah]

[2 marks]

- (ii) Bezakan antara bahan Y dengan bahan Z. Tulis jawapan anda dalam ruang yang disediakan.

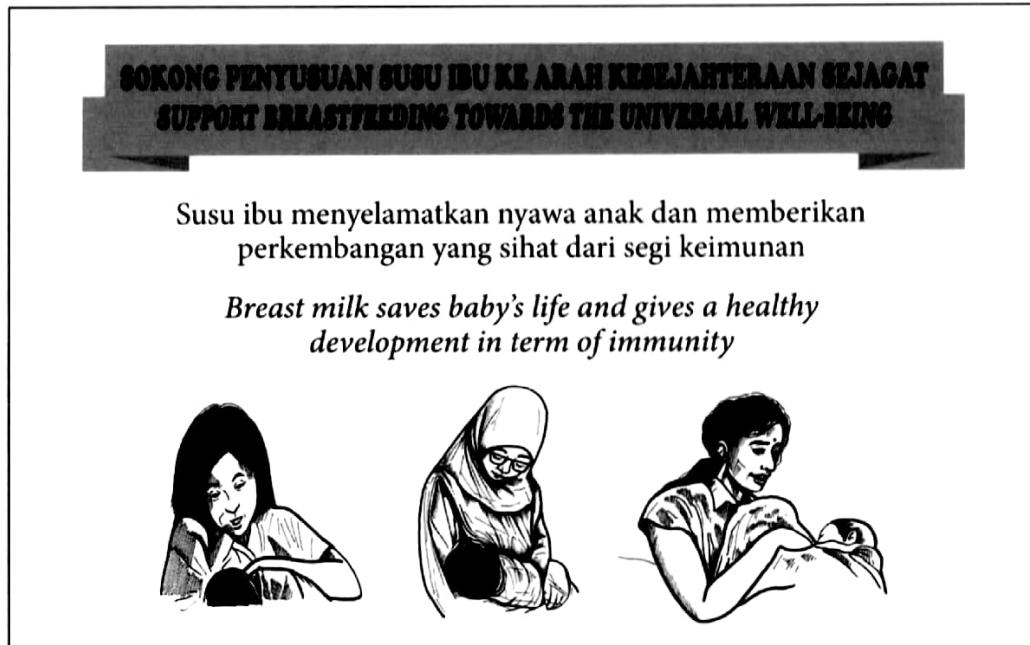
Differentiate between material Y and Z. Write your answer in the space provided.

Bahan Y Material Y	Bahan Z Material Z

[2 markah]

[2 marks]

- (b) Rajah 5.3 menunjukkan poster tentang Kempen Kesedaran Penyusuan Susu Ibu.
Diagram 5.3 shows a poster about Breastfeeding Awareness Campaign.



Rajah 5.3
Diagram 5.3

- (i) Terangkan kebaikan susu ibu dari aspek keimunan.

Explain the advantages of breast milk in term of immunity.

.....

.....

.....

.....

.....

[3 markah]

[3 marks]

- (ii) Cadangkan satu cara lain bagaimana keimunan seperti di 5(b)(i) dapat diperoleh.

Suggest another way on how immunity in 5(b)(i) can be obtained.

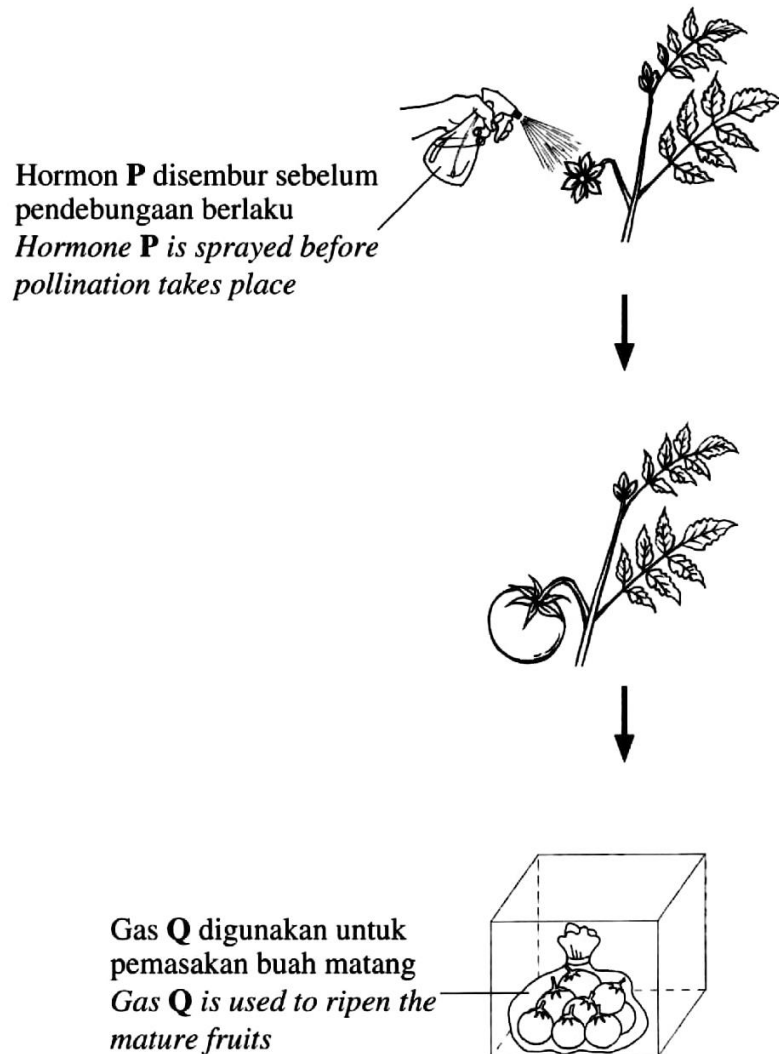
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[1 markah]

[1 mark]

- 6 Rajah 6.1 menunjukkan penghasilan buah tomato untuk tujuan komersial dengan menggunakan fitohormon.

Diagram 6.1 shows production of tomatoes for commercial purpose by using phytohormone.



Rajah 6.1
 Diagram 6.1

- (a) Nyatakan nama hormon **P** dan gas **Q**.

*State the name of hormone **P** and gas **Q**.*

P :

Q :

[2 markah]
 [2 marks]

- (b) Nyatakan peranan hormon **P** yang disembur pada bunga.

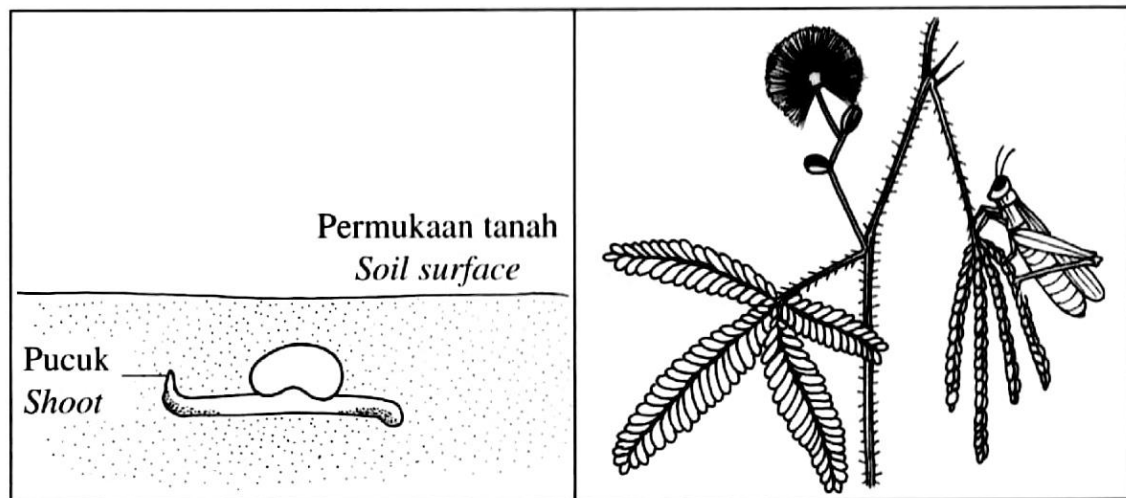
*State the role of hormone **P** that is sprayed onto the flower.*

[1 markah]

[1 mark]

- (c) Rajah 6.2(a) dan Rajah 6.2(b) menunjukkan dua jenis gerak balas pada tumbuhan.

Diagram 6.2(a) and Diagram 6.2(b) show two types of responses in plants.



Rajah 6.2(a)
Diagram 6.2(a)

Rajah 6.2(b)
Diagram 6.2(b)

- (i) Bagaimanakah pucuk dapat bergerak balas seperti yang ditunjukkan dalam Rajah 6.2(a)?

How does the shoot respond as shown in Diagram 6.2(a)?

.....

.....

.....

.....

.....

[3 markah]

[3 marks]

- (ii) Apakah perbezaan antara gerak balas pada Rajah 6.2(a) dengan Rajah 6.2(b)?
What are the differences between the responses in Diagram 6.2(a) and Diagram 6.2(b)?

.....

.....

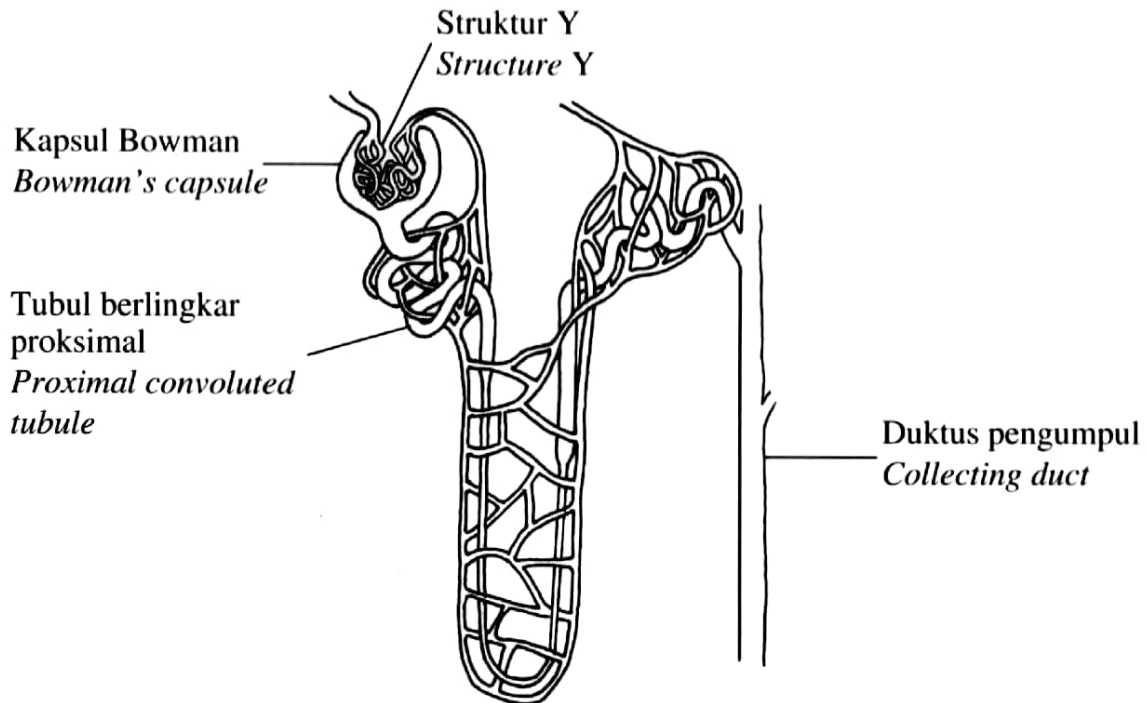
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[2 markah]

[2 marks]

- 7 Rajah 7.1 menunjukkan struktur nefron dalam ginjal manusia.

Diagram 7.1 shows the structure of a nephron in human kidney.



Rajah 7.1
Diagram 7.1

- (a) (i) Nyatakan **dua** bahan yang tidak dapat meresap merentasi dinding struktur Y ke dalam rongga kapsul Bowman.

*State **two** substances that cannot diffuse through the wall of structure Y into the cavity of Bowman's capsule.*

.....

.....

[2 markah]
[2 marks]

- (ii) Berdasarkan jawapan anda di 7(a)(i), berikan **satu** alasan.

*Based on your answer in 7(a)(i), gives **one** reason.*

.....

[1 markah]
[1 mark]

- (b) Encik X telah menghidap penyakit diabetes melitus selama 15 tahun. Penyakit ini akan menyebabkan kerosakan pada struktur Y dalam Rajah 7.1.

Huraikan kesan kerosakan pada struktur Y terhadap sistem urinarinya.

Mr. X was diagnosed with diabetes mellitus for 15 years. This disease will cause damage to structure Y in Diagram 7.1.

Describe the effects of damage to structure Y on his urinary system.

.....

.....

.....

.....

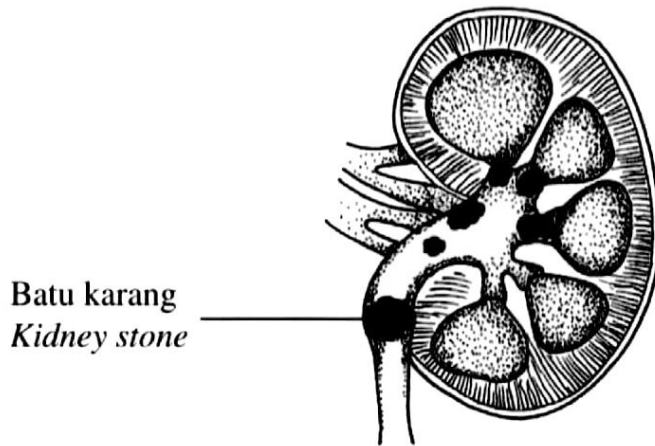
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[3 markah]

[3 marks]

(c) Rajah 7.2 menunjukkan keratan rentas ginjal seorang pesakit.

Diagram 7.2 shows a cross-section of a kidney of a patient.



Rajah 7.2
Diagram 7.2

Doktor telah menasihati pesakit itu agar:

Doctor has advised the patient to:

- Minum banyak air setiap hari
Drink a lot of water daily
- Kurangkan pengambilan daging merah
Reduce intake of red meat

Terangkan kebaikan nasihat tersebut.

Explain the benefits of the advices.

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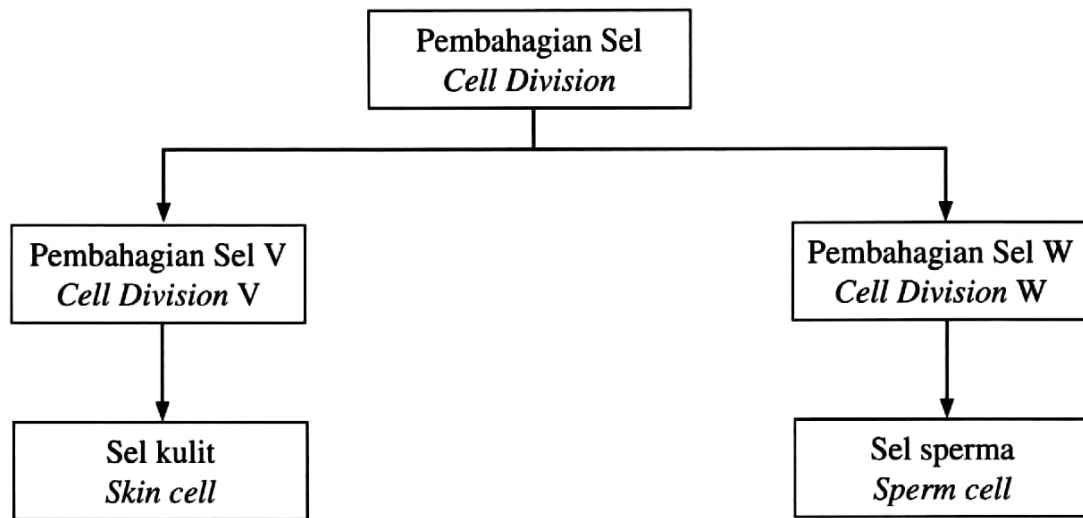
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[3 markah]

[3 marks]

- 8 (a) Rajah 8.1 menunjukkan dua jenis pembahagian sel yang berlaku dalam manusia.
Diagram 8.1 shows two types of cell divisions that occur in human.



Rajah 8.1
 Diagram 8.1

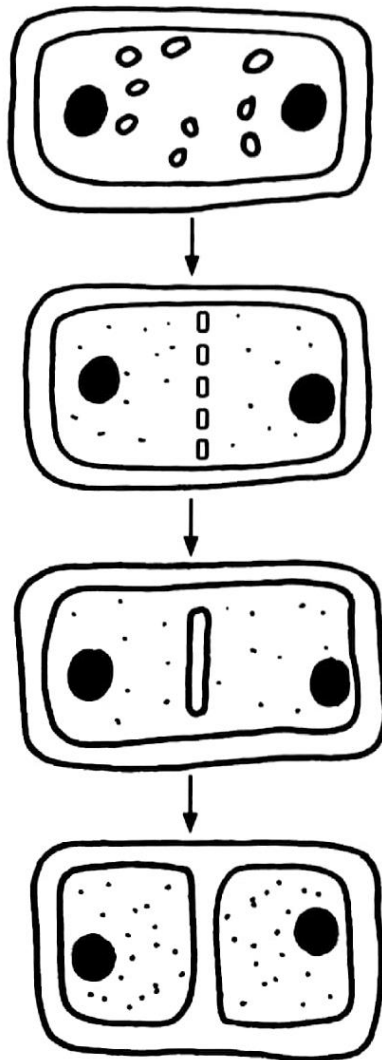
- (i) Lengkapkan jadual tersebut untuk menunjukkan perbezaan bagi jenis pembahagian sel.

Complete the table to show the differences between the types of cell divisions.

Aspek <i>Aspect</i>	Pembahagian sel V <i>Cell division V</i>	Pembahagian sel W <i>Cell division W</i>
Jenis pembahagian <i>Type of division</i>		
Bilangan kromosom dalam sel anak <i>Chromosome number in daughter cell</i>		

[2 markah]
 [2 marks]

- (a) (ii) Rajah 8.2 menunjukkan proses sitokinesis yang berlaku dalam suatu sel.
Diagram 8.2 shows cytokinesis process that takes place in a cell.



Rajah 8.2
Diagram 8.2

Berdasarkan Rajah 8.2, huraikan proses yang berlaku dalam sel tersebut.
Based on Diagram 8.2, describe the process that occurs in the cell.

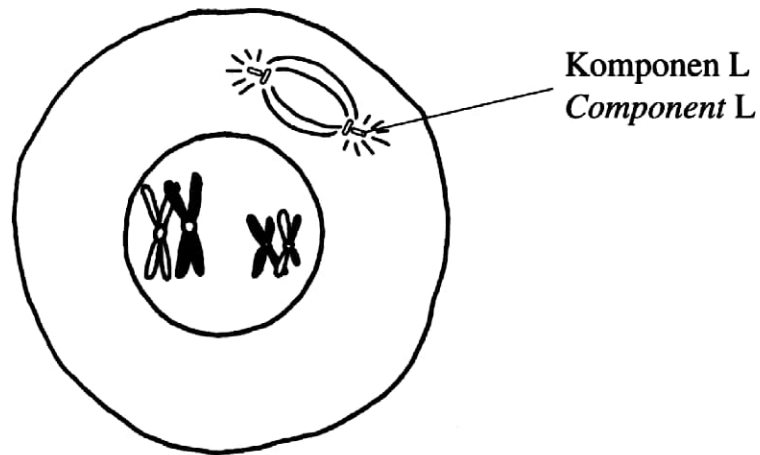
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.....

.....

[2 markah]
[2 marks]

- (b) Rajah 8.3 menunjukkan peringkat profasa I dalam suatu sel yang sedang membahagi.
Diagram 8.3 shows prophase I stage in a dividing cell.



Rajah 8.3
 Diagram 8.3

Sel itu telah terdedah kepada sinaran gama dan menyebabkan komponen L gagal berfungsi.

Terangkan kesannya.

The cell was exposed to gamma rays and caused the component L failed to function.

Explain the effects.

.....

.....

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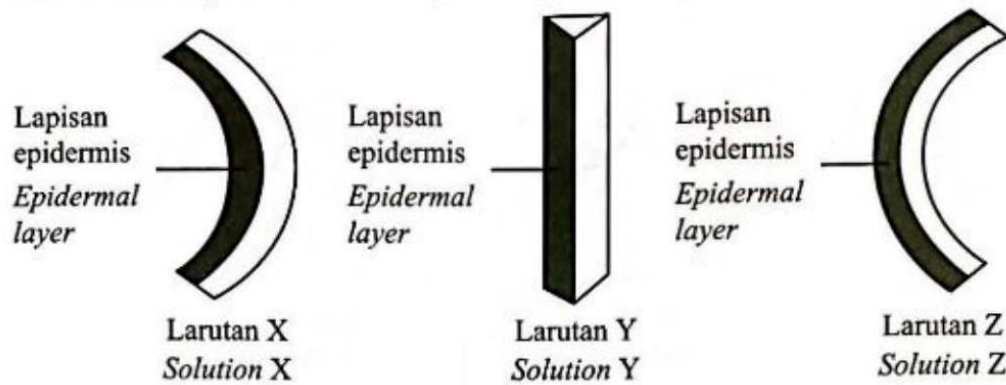
[3 markah]

[3 marks]

9.

Rajah 3.1 menunjukkan pemerhatian jalur sawi yang diletakkan dalam larutan sukrosa yang berlainan kepekatan selepas direndam selama 20 minit.

Diagram 3.1 shows the observation of mustard green strip placed in different concentrations of sucrose solution after being immersed for 20 minutes.



Rajah 3.1
Diagram 3.1

- (a) (i) Berdasarkan Rajah 3.1, nyatakan jenis larutan X dan Z.
Based on Diagram 3.1, state the type of solutions X and Z.

Larutan X :
Solution X

Larutan Z :
Solution Z

[2 markah]
[2 marks]

- (ii) Lukis dan label satu sel sawi yang direndam dalam larutan Z.
Draw and label a mustard green cell that immersed in solution Z.

marks)

- (b) Kimchi merupakan makanan tradisional masyarakat Korea dan menjadi ikon Korea di serata dunia.

Rajah 3.2 menunjukkan tiga langkah penyediaan kimchi daripada kubis.

Kimchi is a traditional food of the Korean and has become a Korean icon around the world.

Diagram 3.2 shows the three steps of preparing kimchi from cabbage.



Kubis direndam dalam
larutan garam pekat
*Cabbage is immersed in
concentrated salt solution*



Kubis diperap
bersama pes cili
*Cabbage is marinated
with chilli paste*



Kimchi disimpan
di dalam
botol bertutup
*Kimchi is kept
in a sealed bottle*

Rajah 3.2

Diagram 3.2

Terangkan bagaimana langkah pertama berkesan dalam pengawetan kubis.

Explain how the first step is effective in preserving the cabbage.

.....

.....

.....

.....

[3 markah]

[3 marks]

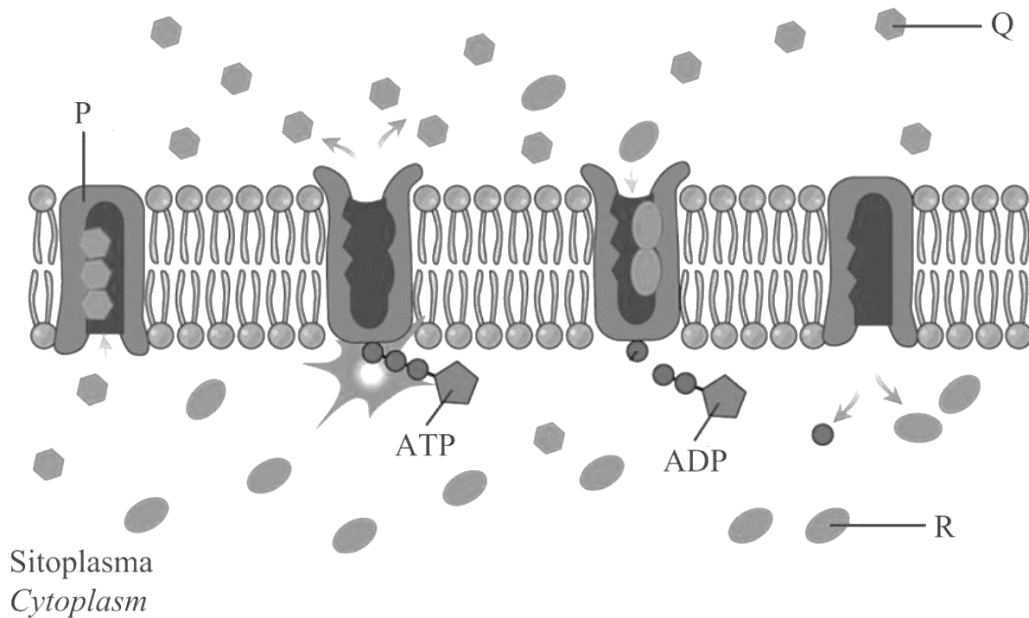
10.

Rajah 3.1 menunjukkan pergerakan bahan merentasi membran plasma.

Diagram 3.1 shows the movement of substances across the plasma membrane.

Bendalir luar sel

Extracellular fluid



Rajah 3.1
Diagram 3.1

(a) (i) Namakan struktur P.

Name structure P.

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

(ii) Namakan jenis pengangkutan yang ditunjukkan dalam Rajah 3.1.

Name the type of transport shown in Diagram 3.1.

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

- (b) Q dan R adalah ion yang terlibat dalam pam natrium-kalium.
 Terangkan pengangkutan ion Q merentasi membran plasma tersebut.
Q and R are ions that involved in the sodium-potassium pump.
Explain the transport of ion Q across the plasma membrane.

.....

.....

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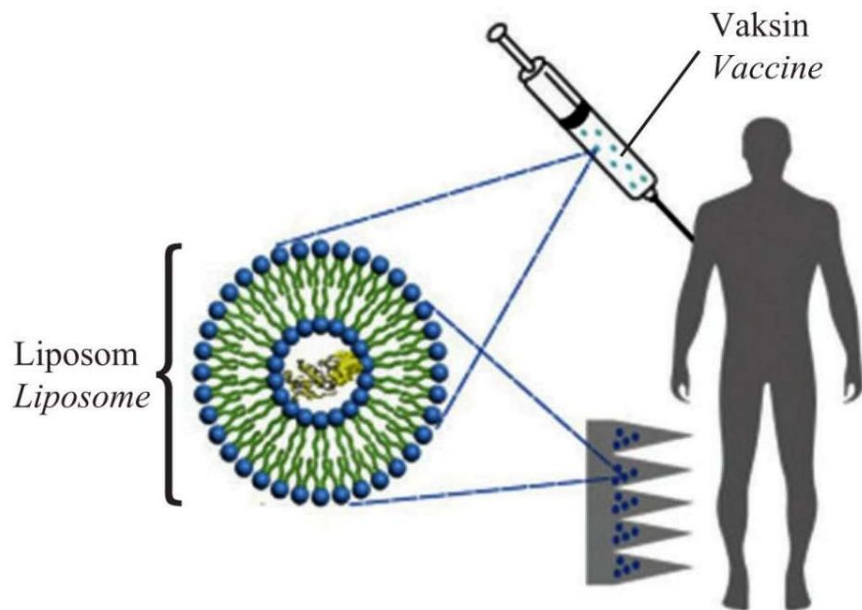
.....

.....

[3 markah]

[3 marks]

- (c) Rajah 3.2 menunjukkan aplikasi liposom dalam bidang farmasi.
Diagram 3.2 shows the application of liposome in the field of pharmacy.



Rajah 3.2
 Diagram 3.2

Terangkan kelebihan menggunakan liposom dalam pemberian vaksin yang berkesan kepada individu tersebut.

Explain the advantage of using liposome in the effective administration of vaccine to the individual.

.....

.....

.....

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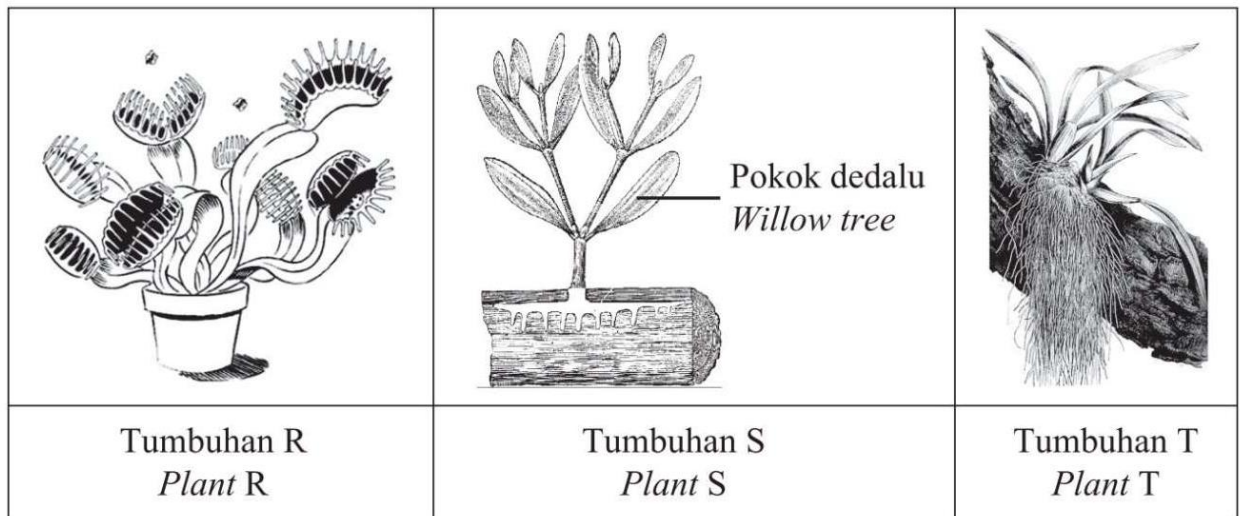
[2 markah]

[2 marks]

11.

Rajah 4.1 menunjukkan tiga jenis tumbuhan R, S dan T.

Diagram 4.1 shows three types of plants R, S and T.



Rajah 4.1
Diagram 4.1

- (a) Namakan jenis nutrisi tumbuhan R dan T.
Name the type of nutrition of plant R and T.

Tumbuhan R :
Plant R

Tumbuhan T :
Plant T

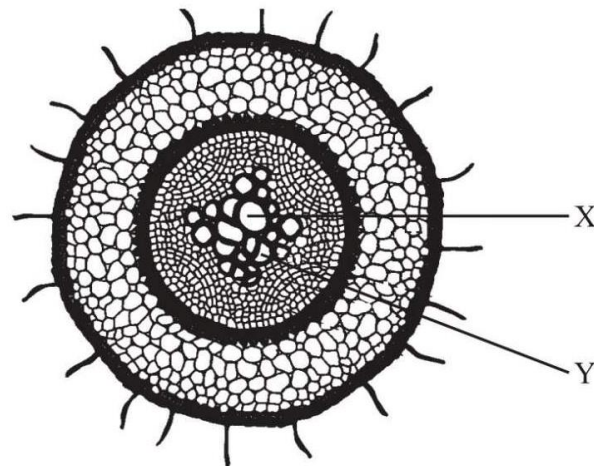
[2 markah]
[2 marks]

- (b) Nyatakan bagaimana tumbuhan S memperoleh air dan garam mineral untuk hidup.
State how plant S obtains water and minerals salt to survive.

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

- (c) Rajah 4.2 menunjukkan keratan rentas bagi struktur akar tumbuhan eudikot.

Diagram 4.2 shows a cross section of an eudicot plant's root structure.



Rajah 4.2
Diagram 4.2

Terangkan ciri penyesuaian struktur X dan struktur Y bagi membolehkan akar menjalankan fungsi secara efisien.

Explain the adaptive characteristics of structure X and structure Y to enable the root to perform functions efficiently.

.....

.....

.....

.....

.....

.....

[3 markah]

[3 marks]

- (d) Nyatakan kesan kepada fungsi akar jika sel epidermis akar tidak terubah suai membentuk rambut akar.

State the effect on root function if the root epidermal cells are not modified to form root hairs.

.....

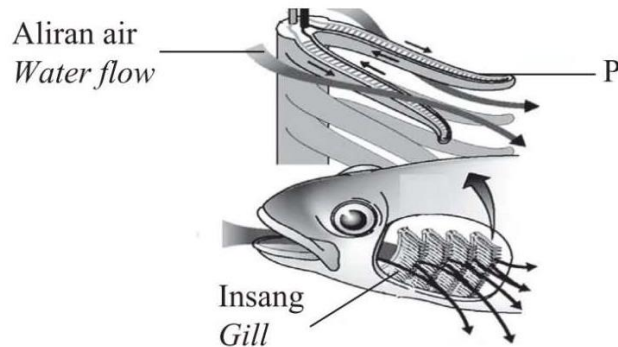
[1 markah]

[1 mark]

12.

Rajah 6.1 menunjukkan struktur respirasi ikan.

Diagram 6.1 shows the respiratory structure of fish.



Rajah 6.1
Diagram 6.1

- (a) (i) Berdasarkan Rajah 6.1, namakan P.

Based on Diagram 6.1, name P.

.....
[1 markah]

[1 mark]

- (ii) Ikan mempunyai bilangan P yang banyak. Apakah tujuannya?

Fish have a large number of P. What is the purpose?

.....
[1 markah]

[1 mark]

- (b) Kepekatan oksigen di udara adalah lebih tinggi berbanding di dalam air. Namun, sekiranya ikan berada di atas darat, ia akan tercungap-cungap kerana kekurangan oksigen.

Dengan menggunakan pengetahuan biologi anda, jelaskan mengapa perkara ini berlaku.

The concentration of oxygen in the air is higher than in water. However, if the fish is on land, it will be gasping due to lack of oxygen.

Using your biological knowledge, explain why this matter occurs.

.....
[3 markah]

[3 marks]

- (c) Rajah 6.2 menunjukkan bronkus individu yang sihat dan bronkus individu yang menghidap bronkitis.

Diagram 6.2 shows bronchi of a healthy individual and bronchi of an individual with bronchitis.



Rajah 6.2
Diagram 6.2

- (i) Nyatakan **satu** faktor yang menyebabkan bronkitis.

*State **one** factor that causes bronchitis.*

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

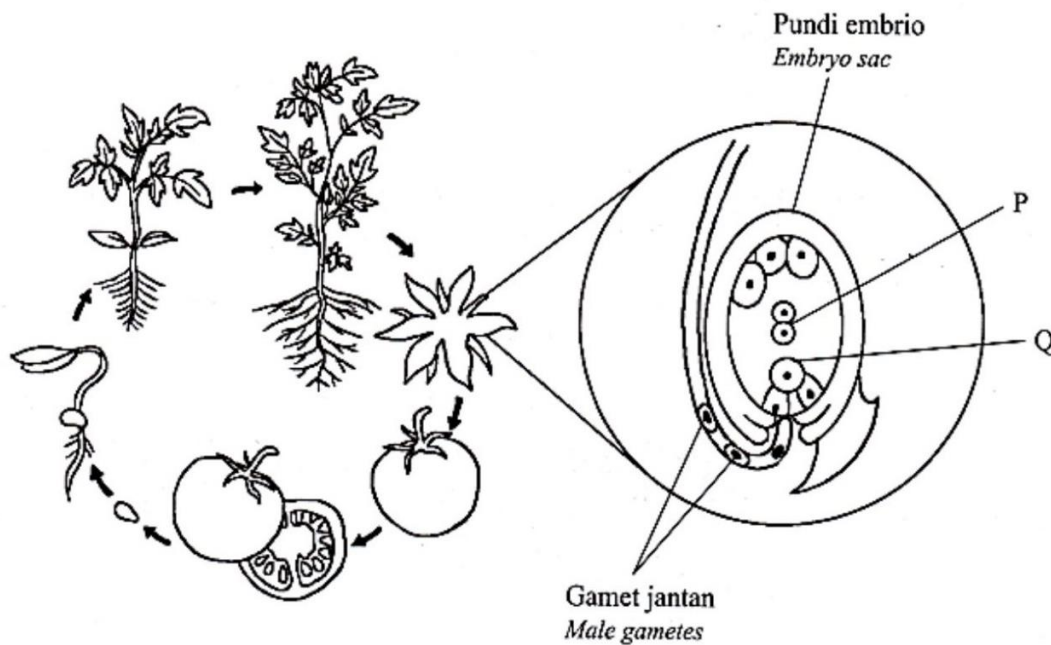
- (ii) Terangkan perbezaan struktur bronkus yang normal dengan bronkus yang menghidap bronkitis.

Explain the differences between the structure of a normal bronchi and bronchi with bronchitis.

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

13. Rajah 4 menunjukkan proses persenyawaan ganda dua yang berlaku di dalam pundi embrio bagi pokok tomato.

Diagram 4 shows double fertilization process that occur in embryo sac of tomato plant.



Rajah 4
Diagram 4

- (a) Berdasarkan Rajah 4, namakan P dan Q.

Based on Diagram 4, name P and Q.

P :

Q :

[2 markah/2 marks]

- (b) Nyatakan bagaimana dua gamet jantan di dalam tiub debunga terbentuk.

State how two male gametes in a pollen tube formed.

.....

.....

[1 markah/1 mark]

- (c) Terangkan kesan ke atas pembentukan buah tomato sekiranya bunga bagi pokok gugur sebelum disenyawakan.

Explain the effect to the formation of tomato if the flower of the tomato plant falls off before being fertilised.

.....

.....

.....

[3 markah/3 marks]

- (d) Nyatakan perbezaan ke atas pembentukan buah tomato sekiranya buah tomato disembur dengan hormon auksin.

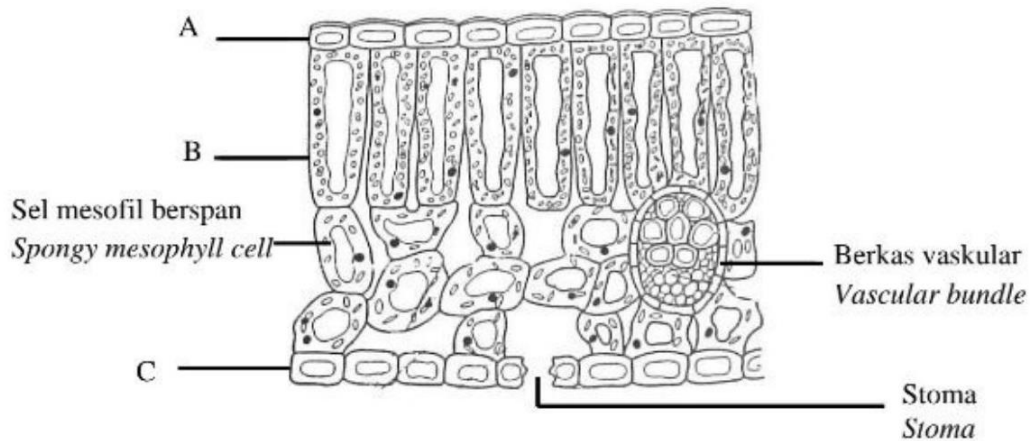
State the difference in formation of tomato if the flower is sprayed with auxin hormone.

.....

.....

[1 markah/1 mark]

14. Rajah 8 menunjukkan keratan rentas sehelai daun tumbuhan.
Diagram 8 shows the cross section of a plant leaf.



Rajah 8 / Diagram 8

- (a) Nyatakan **dua** perbezaan struktur antara sel B dan sel mesofil berspan dalam Rajah 8.
*State **two** structural differences between cell B and spongy mesophyll cell in Diagram 8.*

Sel B <i>Cell B</i>	Sel mesofil berspan <i>Spongy mesophyll cell</i>
1.	1.
2.	2.

[2 markah / marks]

- (b) Permukaan A dan C pada daun ditutupi lumpur selepas berlaku banjir.
Terangkan kesannya terhadap kadar fotosintesis.
Surface A and C of the leaf is covered with mud after the flood.
Explain the effect on the rate of photosynthesis.

.....

.....

.....

[2 markah / marks]

- (c) Tindakan petani menanam tumbuhan di dalam rumah hijau dapat meningkatkan kadar fotosintesis.
Wajarkan tindakan tersebut.
The action of the farmer to plant the plants in the green house increases the rate of photosynthesis.
Justify the action.

.....

.....

.....

[3 markah / marks]

- (d) Pada titik pampasan, kadar fotosintesis dan kadar respirasi sel adalah sama.
Nyatakan kesannya terhadap pertumbuhan tumbuhan. Terangkan.
At the compensation point, the rate of photosynthesis and the rate of cell respiration is equal.
State the effect on the growth of plant. Explain.

.....

.....

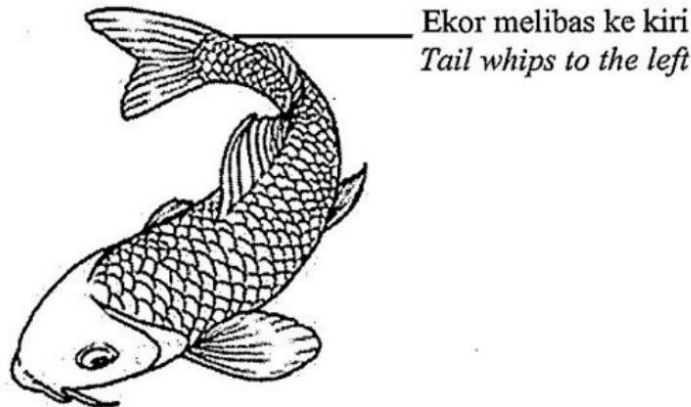
.....

[2 markah / marks]

15.

(a) Rajah 8.1 menunjukkan seekor ikan.

Diagram 8.1 shows a fish.



Rajah 8.1
Diagram 8.1

(i) Namakan otot yang terlibat dalam pergerakan ikan.

Name the muscle involved in movement of fish.

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

(ii) Otot yang dinamakan di 8(a)(i) mengalami kecederaan.

Terangkan kesan kecederaan terhadap libasan ekor ikan berbanding sebelum kecederaan.

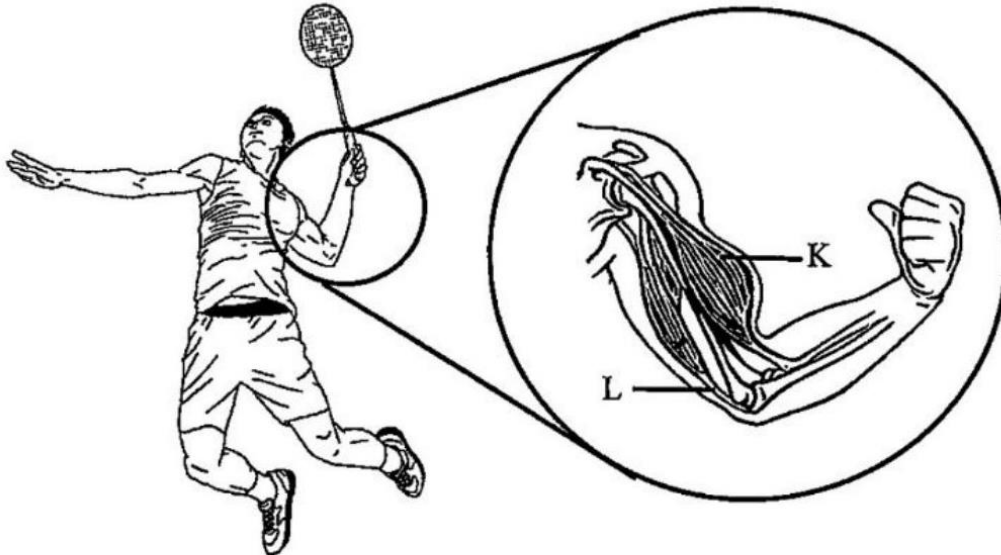
Muscles named in 8(a)(i) are injured.

Explain the effect on injury of whipping fish tail compared to before injury.

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

- (b) Rajah 8.2 menunjukkan struktur lengan seorang atlet yang sedang bermain badminton.

Diagram 8.2 shows the structure of an athlete's arm while playing badminton.



Rajah 8.2
Diagram 8.2

- (i) Namakan struktur L.
Name structure L.

[1 markah]
[1 mark]

Atlet tersebut mengalami koyakan mikro pada otot K disebabkan latihan lasak setiap hari. Sebaik sahaja ini berlaku, aliran darah akan tertumpu ke kawasan tersebut untuk proses pemulihan otot K.

The athlete experiences micro tears on muscle K due to daily intense training. Once this happens, blood flow will be concentrated to the area for recovery process of muscle K.

- (ii) Terangkan bagaimana aliran darah tersebut boleh membantu memulihkan otot K.

Explain how the blood flow can help the recovery of muscle K.

.....

.....

.....

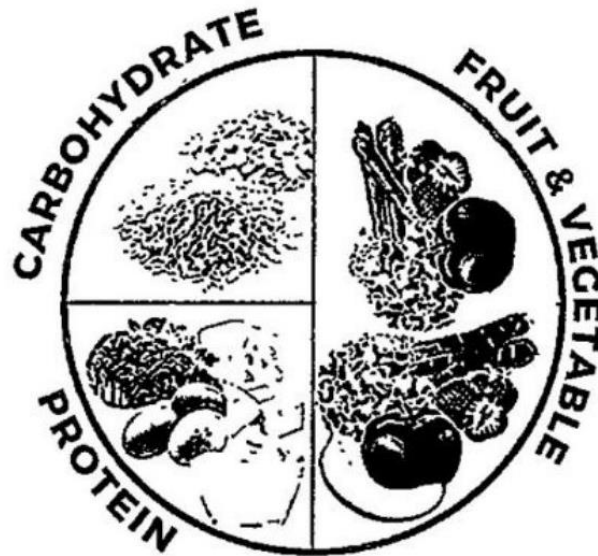
.....

[3 markah]

[3 marks]

- (c) Rajah 8.3 menunjukkan Pinggan Sihat Malaysia seperti yang disarankan oleh Kementerian Kesihatan Malaysia.

Diagram 8.3 shows Pinggan Sihat Malaysia suggested by the Ministry of Health Malaysia.



Rajah 8.3
Diagram 8.3

- (i) Sebagai pakar pemakanan, ubahsuai panduan pemakanan dalam Rajah 8.3 tersebut untuk memenuhi keperluan seorang atlet yang menjalani latihan lasak.

As a nutritionist, modify the nutritional guide in Diagram 8.3 to suit the need of an athlete that undergoes intensive training.

.....

 [1 markah]
 [1 mark]

- (ii) Terangkan jawapan anda dalam 8(c)(i).
Explain your answer in 8(c)(i).

.....

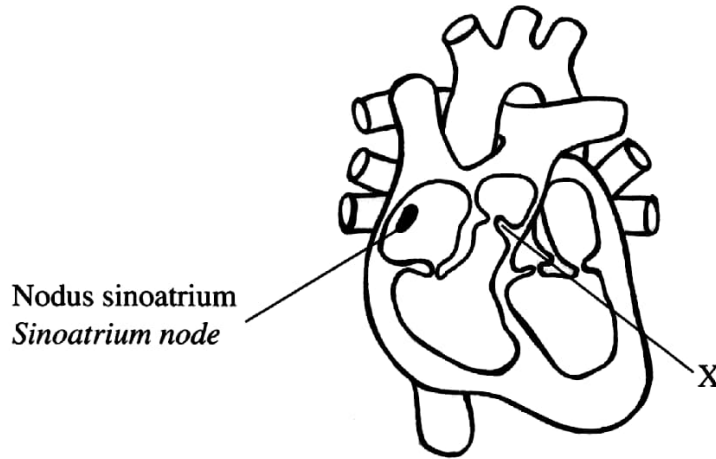
 [1 markah]
 [1 mark]

SECTION B & C:

ESSAYS

SECTION B (CLOSED RESPONSE ESSAY)

16. Rajah 9.1 menunjukkan keratan membujur jantung manusia.
Diagram 9.1 shows a longitudinal section of a human's heart.



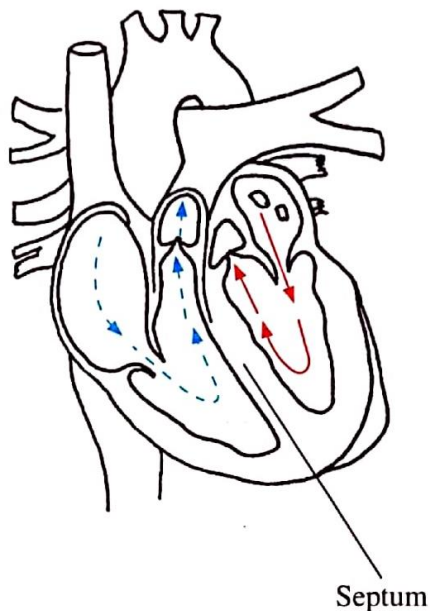
Rajah 9.1
 Diagram 9.1

- (a) (i) Apakah struktur X dan peranannya? [2 markah]
What is structure X and its role? [2 marks]
- (ii) Bagi pesakit yang mengalami kegagalan nodus sinoatrium, doktor akan memasukkan 'Meditronic Micra' pada jantung tanpa menjalani pembedahan. Terangkan bagaimana alat tersebut berfungsi. [3 markah]
For patients with sinoatrium nodes failure, doctor will insert 'Meditronic Micra' to the heart by not undergoing surgery. Explain how the device works. [3 marks]

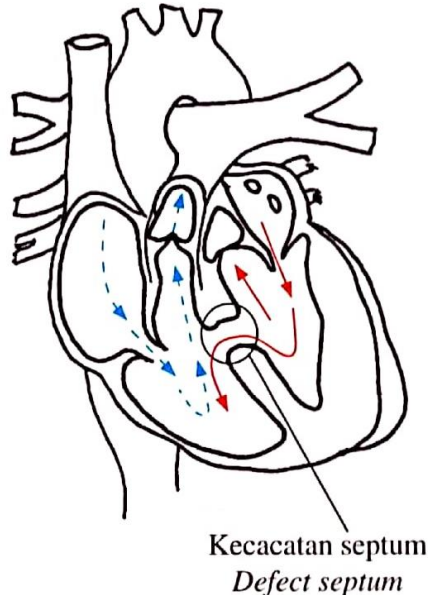
ANSWER:

- (b) Rajah 9.2(a) menunjukkan keratan membujur jantung normal seorang kanak-kanak. Rajah 9.2(b) menunjukkan keratan membujur jantung seorang kanak-kanak yang mengalami kecacatan pada septum ventrikel.

Diagram 9.2(a) shows a longitudinal section of a normal heart of a child. Diagram 9.2(b) shows a longitudinal section of a child's heart with defect at the septum of a ventricle.



Rajah 9.2(a)
Diagram 9.2(a)



Rajah 9.2(b)
Diagram 9.2(b)

Kekunci:
Key

---> Darah terdeoksigen
Deoxygenated blood

—> Darah beroksigen
Oxygenated blood

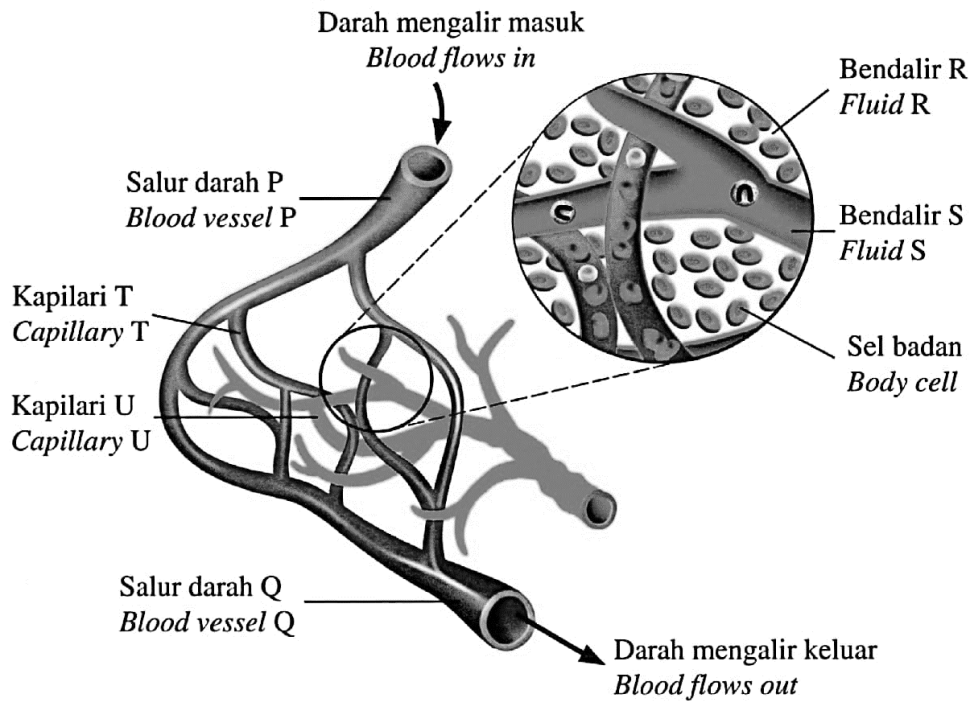
Berdasarkan Rajah 9.2(b), terangkan bagaimana kecacatan septum mempengaruhi sistem peredaran darah kanak-kanak itu. [5 markah]

Based on Diagram 9.2(b), explain how septum defect affects the blood circulatory system of the child. [5 marks]

ANSWER:

- (c) Rajah 9.3 menunjukkan sebahagian daripada sistem peredaran darah dan sistem limfa dalam manusia.

Diagram 9.3 shows a part of blood circulatory system and lymphatic system in human.



Rajah 9.3
Diagram 9.3

Berdasarkan Rajah 9.3, bezakan antara:

Based on Diagram 9.3, differentiate between:

- Salur darah P dengan salur darah Q
Blood vessel P and blood vessel Q
- Bendalir R dengan bendalir S
Fluid R and fluid S
- Kapilari T dengan kapilari U
Capillary T and capillary U

[10 markah]
[10 marks]

ANSWER:

17.

- (a) Hormon adalah bahan kimia yang mengawal atur fungsi khas dalam badan seperti kitar haid. Perubahan aras hormon ini memberi kesan kepada perkembangan folikel dan perubahan ketebalan endometrium sepanjang satu kitar haid.

Hormone is a chemical substance that regulate specific functions in the body such as menstrual cycle. Changes in the hormonal level affects the follicle growth and changes in the endometrial wall thickness throughout one menstrual cycle.

Terangkan peranan hormon-hormon yang terlibat dalam kitar haid.

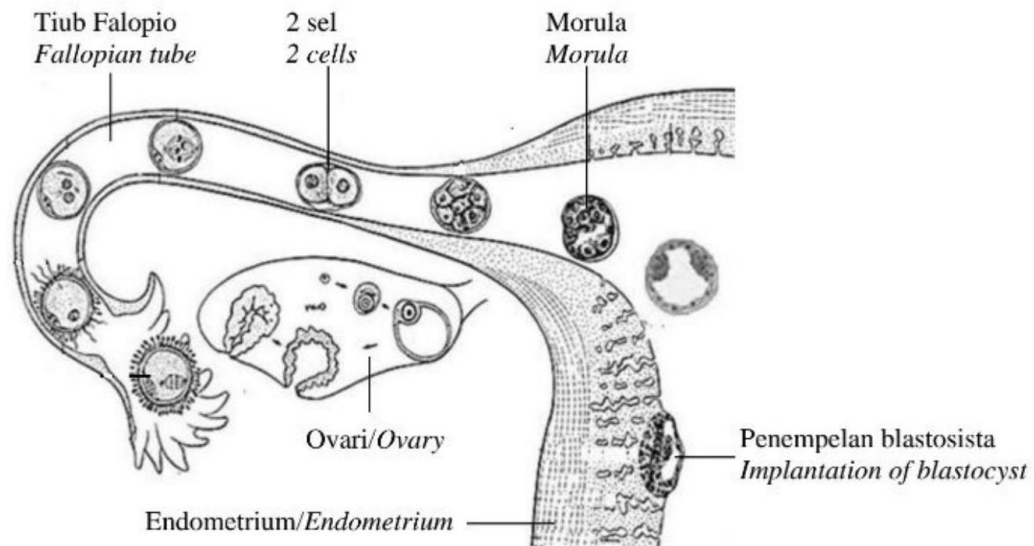
Explain the role of hormones involved in the menstrual cycle.

[4 markah / marks]

ANSWER:

- (b) Rajah 9.1 menunjukkan proses persenyawaan dan perkembangan zigot dalam sistem pembiakan perempuan.

Diagram 9.1 shows the process of fertilisation and development of the zygote in the female reproductive system.



Rajah 9.1 / Diagram 9.1

Berdasarkan rajah di atas, terangkan proses persenyawaan dan perkembangan awal embrio sehingga penempelan berlaku di uterus.

Based on the diagram above, describe the process of fertilisation and the early development of the embryo until implantation occurs in the uterus.

[6 markah / marks]

ANSWER:

- (c) Pertumbuhan organisma merupakan proses kekal serta tidak berbalik yang melibatkan pertambahan bilangan sel, saiz, isi padu dan jisim badan organisma. Pertumbuhan ini dapat dilihat dengan memplotkan parameter pertumbuhan melawan masa. Terdapat enam fasa dalam lengkung sigmoid iaitu:

- Fasa permulaan
- Fasa pertumbuhan pesat
- Fasa pertumbuhan perlahan
- Fasa matang
- Fasa penuaan
- Fasa kematian

Growth in organisms is an irreversible, permanent process that involves the increase in the number of cells, size, volume and weight of the organism's body. The growth can be seen by plotting growth parameters against time. There are six phases in the sigmoid growth curve that is:

- *Lag phase*
- *Exponential phase*
- *Stationary phase*
- *Maturity phase*
- *Senescence phase*
- *Death phase*

Berdasarkan pernyataan di atas, terangkan enam fasa dalam lengkung pertumbuhan sigmoid.

Based on the above statement, explain the six phases in the sigmoid growth curve.

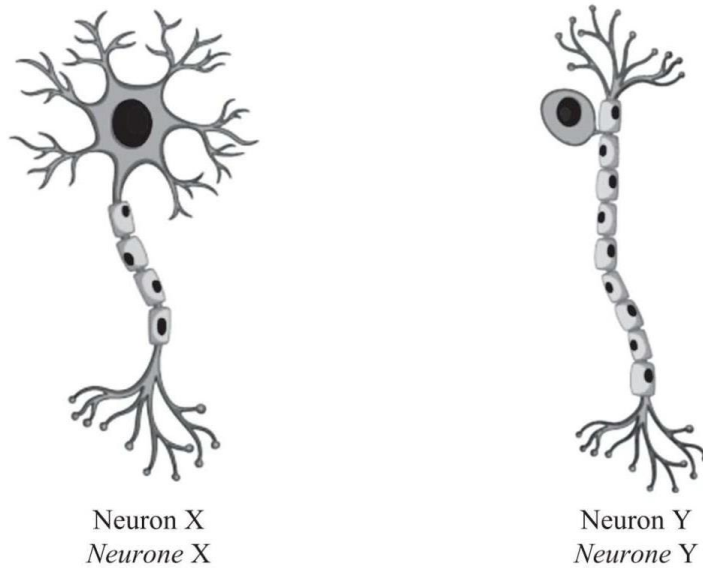
[10 markah / marks]

ANSWER:

18.

Rajah 9.1 menunjukkan dua jenis neuron dalam sistem saraf.

Diagram 9.1 shows two types of neurone in nervous system.



Rajah 9.1
Diagram 9.1

- (a) (i) Namakan neuron X dan neuron Y.

Name neurone X and neurone Y.

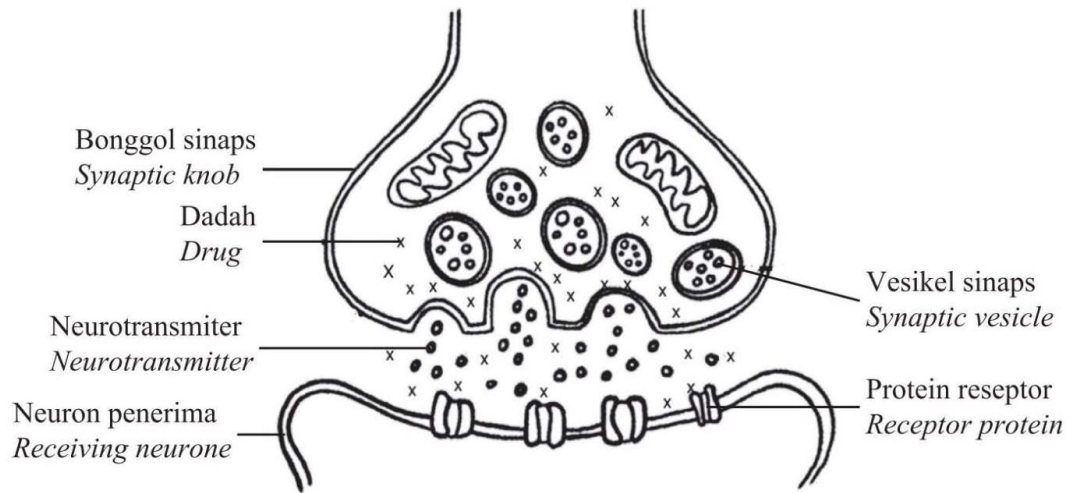
[2 markah]
[2 marks]

- (ii) Nyatakan peranan neuron X dan neuron Y dalam sistem saraf.

State the role of neurone X and neurone Y in nervous system.

[2 markah]
[2 marks]

- (b) Rajah 9.2 menunjukkan pemindahan neurotransmitter dan sejenis dadah merentasi sinaps. *Diagram 9.2 shows the transmission of neurotransmitter and a type of drug across the synapse.*



Rajah 9.2
Diagram 9.2

Seorang pesakit telah disuntik dengan sejenis dadah bagi mengurangkan rasa sakit.
Terangkan bagaimana dadah tersebut dapat mengurangkan kesakitannya.

*A patient was injected with a type of drug to reduce pain.
Explain how the drug can reduce the pain.*

[6 markah]

[6 marks]

- (c) Rajah 9.3 menunjukkan dua gerak balas yang berbeza oleh individu P dan Q.

Diagram 9.3 shows two different responses by individuals P and Q.

Individu P
Individual P



Gerak balas P
Response P

Individu Q
Individual Q



Gerak balas Q
Response Q

Rajah 9.3
Diagram 9.3

Bandingkan gerak balas P dan gerak balas Q.

Compare response P and response Q.

[10 markah]

[10 marks]

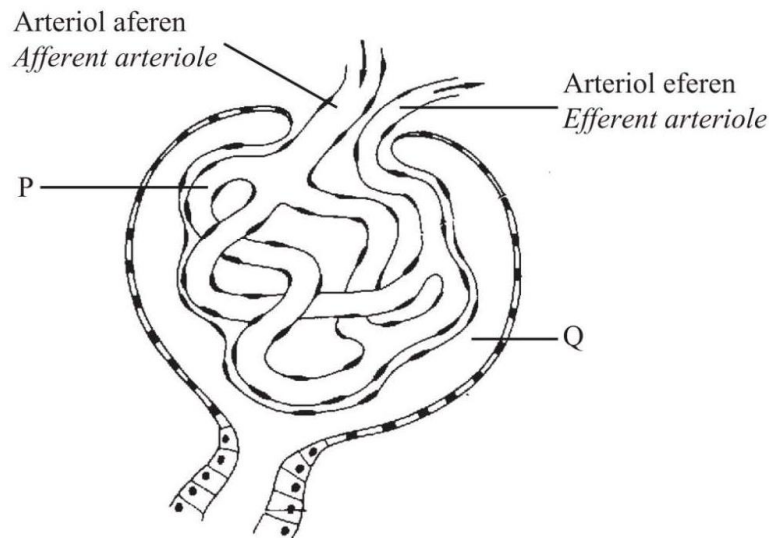
19.

- (a) Ginjal berfungsi sebagai organ perkumuhan dengan menyingkirkan bahan kumuh yang bertoksik seperti urea, asid urik, ammonia dan kreatinina.

Rajah 10.1 menunjukkan sebahagian daripada nefron.

The kidneys function as an excretory organ by getting rid of toxic wastes such as urea, uric acid, ammonia and creatinine.

Diagram 10.1 shows part of the nephron.



Rajah 10.1
Diagram 10.1

- (i) Namakan P dan Q.

Name P and Q.

[2 markah]

[2 marks]

- (ii) Berdasarkan Rajah 10.1, terangkan proses yang berlaku di antara P dan Q.

Based on Diagram 10.1, explain the process that occurs between P and Q.

[2 markah]

[2 marks]

- (b) Rajah 10.2 menunjukkan seorang buruh yang sedang bekerja pada hari yang panas.
Diagram 10.2 shows a labourer working on a hot day.



Rajah 10.2
Diagram 10.2

Apabila buruh tersebut membuang air kecil, air kencing yang dihasilkan sangat pekat dan sedikit kuantitinya.

Terangkan mengapa.

When the labourer urinates, the urine produced is very concentrated and low in volume.

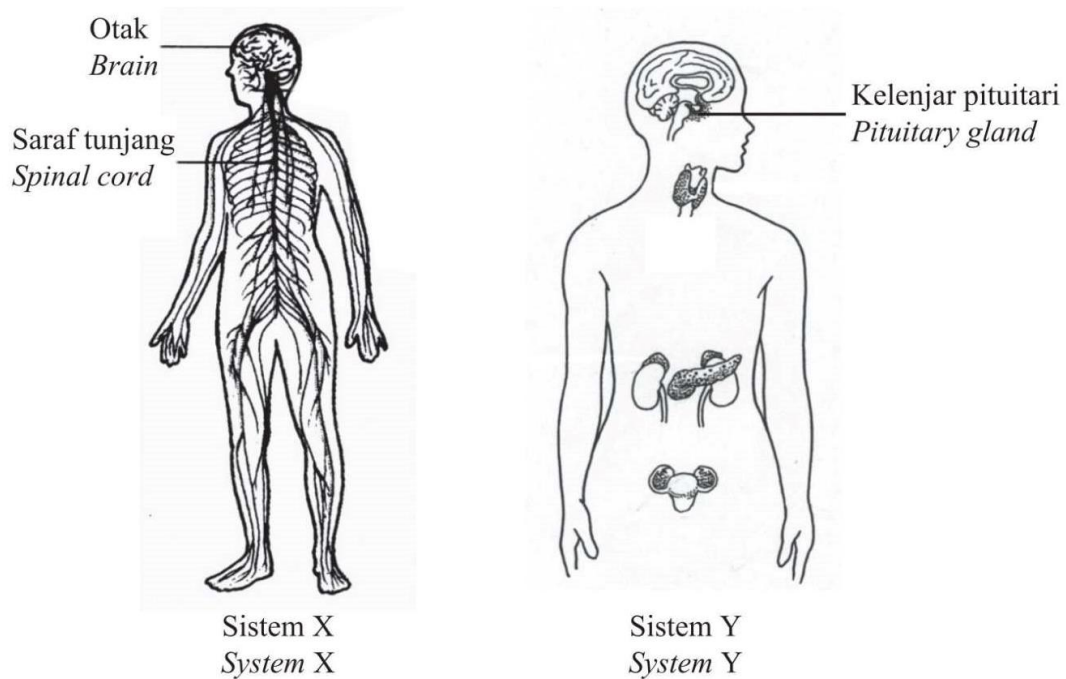
Explain why.

[6 markah]

[6 marks]

(c) Rajah 10.3 menunjukkan dua sistem yang terlibat dalam koordinasi manusia.

Diagram 10.3 shows two systems involved in human coordination.



Rajah 10.3
Diagram 10.3

Nyatakan perbandingan di antara sistem X dan sistem Y.

State the comparison between the system X and system Y.

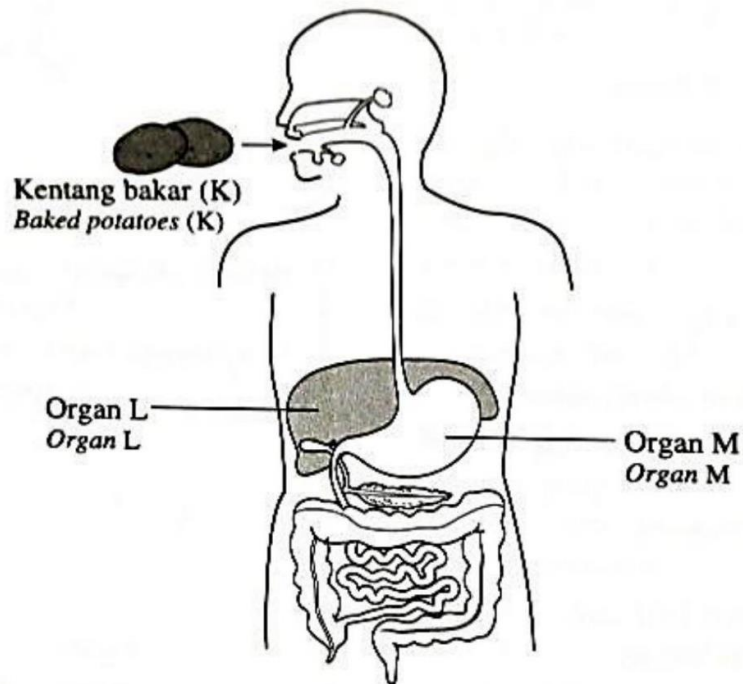
[10 markah]

[10 marks]

SECTION C (OPEN RESPONSE ESSAY)

20. Rajah 11.1 menunjukkan sistem pencernaan dan organ-organ berkaitan yang terlibat dalam pencernaan.

Diagram 11 shows the digestive system and the organs associated with digestion.



Rajah 11.1
Diagram 11.1

- (a) (i) Namakan organ-organ yang terlibat dalam pencernaan makanan K.
Name the organ that are involved in digestion of food K.

[3 markah / 3 marks]

ANSWER:

- (ii) Terangkan pencernaan yang berlaku pada K di sepanjang salur alimentari sebelum diserap ke vilus.

Explain the digestion which occur in K along the alimentary canal before being absorbed into villus.

[7 markah / 7 marks]

ANSWER:

- (b) Rajah 11.2 menunjukkan dua jenis makanan yang mengandungi karbohidrat
Diagram 11.2 shows two types of foods that contain carbohydrate.



Rajah 11.2
Diagram 11.2

- (i) Terangkan perbezaan jenis karbohidrat yang terkandung dalam kedua-dua jenis makanan dalam Rajah 11.2.

Explain the differences between the type of carbohydrates that contain in both types of food shown in Diagram 11.2.

[6 markah / 6 marks]

ANSWER:

- (ii) Komposisi karbohidrat dalam nasi yang berlebihan di dalam badan manusia akan disimpan dalam bentuk molekul yang berlainan. Dengan contoh yang sesuai, bincangkan kepentingan penyimpanan molekul tersebut dalam badan.

The carbohydrate composition in human body obtained from excess rice intake will be stored in another form of molecule. By giving a suitable example, discuss the importance of storing these molecules in the body.

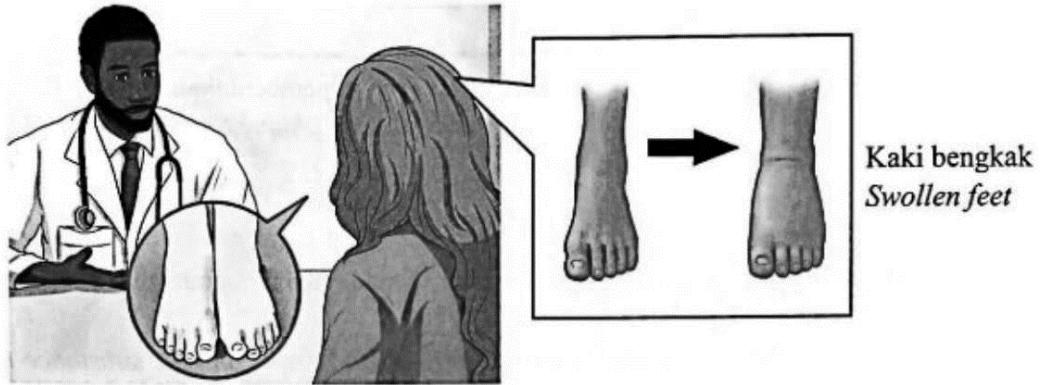
[4 markah / 4 marks]

ANSWER:

21.

- (a) Rajah 11.1 menunjukkan keadaan yang dialami oleh seorang wanita yang hamil. Wanita tersebut mendapatkan nasihat doktor berkaitan simptom yang dialami seperti kaki yang bengkak.

Diagram 11.1 shows the condition experienced by a pregnant woman. The woman gets advice from the doctor regarding her symptoms that is swelling of the feet.



Rajah 11.1
Diagram 11.1

Berdasarkan Rajah 11.1, bincangkan bagaimana kehamilan menyebabkan simptom kaki yang bengkak.

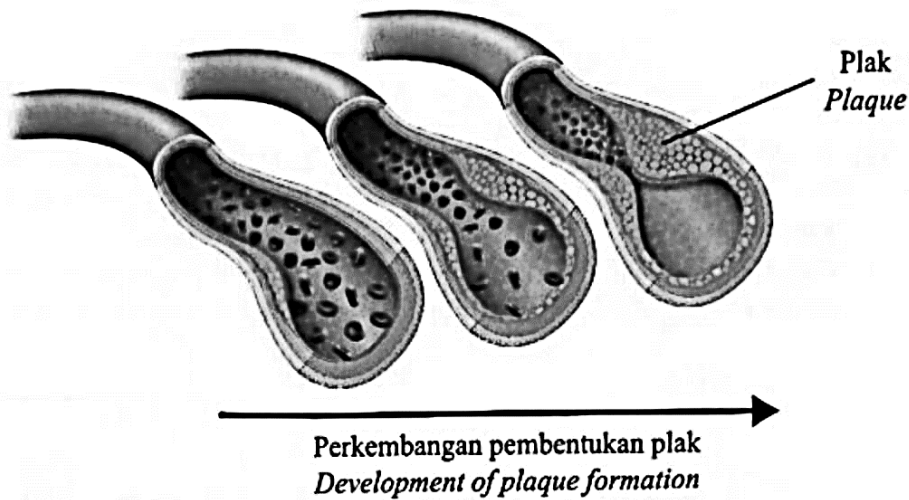
Based on Diagram 11.1, discuss how pregnancy caused the symptom of swollen feet.

[5 markah]

[5 marks]

ANSWER:

- (b) Rajah 11.2 menunjukkan perkembangan pembentukan plak pada dinding dalam arteri.
Diagram 11.2 shows the development of the formation of plaque on the inner wall of artery.



Rajah 11.2
Diagram 11.2

- (i) Namakan penyakit yang berlaku kepada salur darah tersebut dan bahan yang membentuk plak tersebut.

Name the disease that occurred to the blood vessel and the substance that formed the plaque.

[2 markah]

[2 marks]

- (ii) Jika penyakit yang berlaku dalam Rajah 11.2 melibatkan arteri koronari, bincangkan kesan keadaan tersebut kepada sistem kardiovaskular.

If the disease that occurred in Diagram 11.2 involved coronary artery, discuss the effect of the condition to the cardiovascular system.

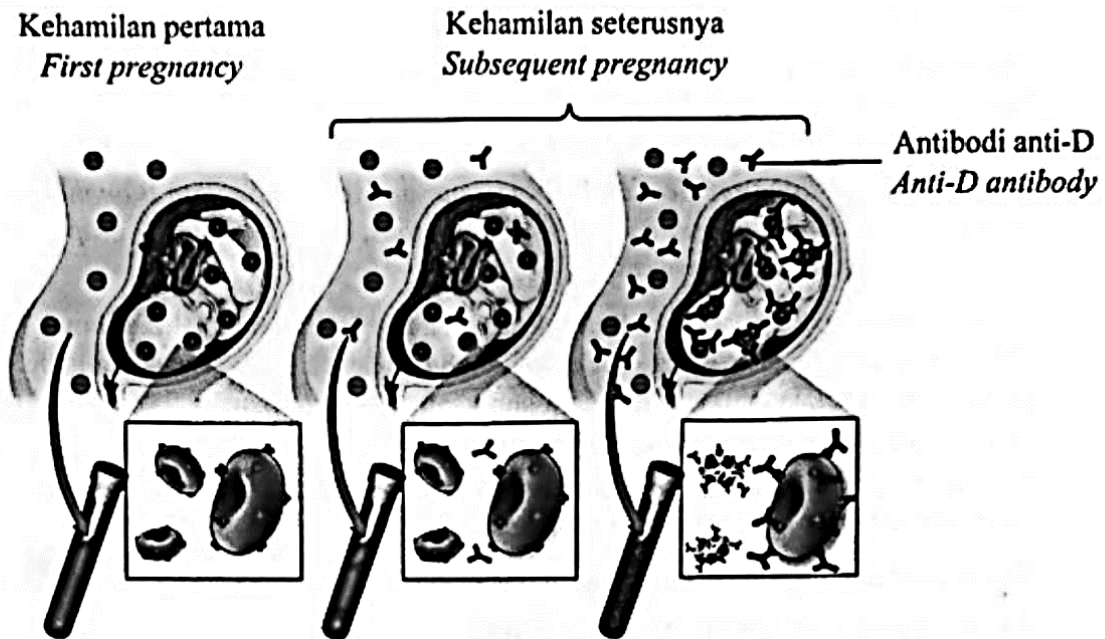
[3 markah]

[3 marks]

ANSWER:

- (c) Rajah 11.3 menunjukkan keadaan yang dialami oleh ibu dan fetus semasa kehamilan. Ibu mempunyai kumpulan darah Rhesus negatif manakala fetus mewarisi kumpulan darah bapa iaitu Rhesus positif.

Diagram 11.3 shows the situation experienced by the mother and foetus during pregnancy. Mother has Rhesus negative blood group while the foetus inherited father's blood group which is Rhesus positive.



Rajah 11.3
Diagram 11.3

- (i) Bincangkan mengapa fetus pada kehamilan seterusnya mengalami komplikasi yang teruk berbanding fetus pada kehamilan pertama.

Discuss why foetus in the subsequent pregnancy undergoes severe complication than foetus in the first pregnancy.

[6 markah]

[6 marks]

- (ii) Cadangkan rawatan yang perlu diambil oleh ibu bagi mengatasi masalah berkaitan faktor Rhesus semasa kehamilan akibat kumpulan darah ibu dan anak yang berbeza.

Suggest the treatment that should be taken by the mother to overcome the problem related to Rhesus factor during pregnancy due to different blood group of mother and child.

[4 markah]

[4 marks]

ANSWER:

21.

- (a) Rajah 11 menunjukkan tiga cara pencegahan penularan virus semasa pandemik COVID-19.

Diagram 11 shows three ways to prevent the spread of virus during COVID-19 pandemic.



Basuh tangan
dengan sabun
*Wash hands
with soap*



Pakai pelitup muka
Wear a face mask



Amalkan penjarakan fizikal
Practise physical distancing

Rajah 11 / *Diagram 11*

- i. Terangkan bagaimana cara pencegahan yang ditunjukkan dalam Rajah 11 dapat menghalang penularan COVID-19.

Explain how the preventive measures shown in Diagram 11 can prevent the spread of COVID-19.

[6 markah / marks]

ANSWER:

- ii. Malaysia telah memasuki fasa peralihan ke endemik Covid-19 bermula pada 1 April, 2022. Mengikut Prosedur Operasi Standard (SOP) semasa fasa peralihan ke endemik ini, pemakaian pelitup muka masih digalakkan kepada semua individu di dalam bangunan yang tertutup manakala penjarakan fizikal tidak lagi diperlukan.

Malaysia has entered the endemic transition phase of Covid-19 starting 1st April, 2022. According to the Standard Operating Procedure (SOP) of the endemic transition phase, the wearing of a face mask is encouraged for all individuals in closed buildings while the physical distancing is no longer required.

Bincangkan pernyataan di atas.

Discuss the statement above.

[4 markah / marks]

- (b) Maklumat di bawah adalah mengenai vaksinasi bagi mereka yang berhasrat untuk mengerjakan haji.

The following information is about the vaccination required for those intending to perform haji.

Setiap tahun, jutaan orang dari serata dunia berhimpun di Mekah bagi mengerjakan haji. Di samping vaksinasi Covid-19, semua jemaah haji diwajibkan untuk mendapat vaksinasi terhadap penyakit meningokokal sekurang-kurangnya 10 hari sebelum tiba di Arab Saudi. Penyakit ini disebabkan oleh bakteria *Neisseria meningitidis* yang menyebabkan keradangan pada membran otak dan septisemia (keracunan darah). Ia boleh menyebabkan maut jika tidak dirawat. Vaksin ini membekalkan keimunan kepada badan selama dua tahun.

*Each year, millions of people from all over the world gather in Mecca to perform Hajj. Apart from Covid-19 vaccination, all pilgrims of hajj are required to get vaccination against meningococcal infection at least 10 days before arrival in Saudi Arabia. This disease is caused by bacteria *Neisseria meningitidis* which affect the brain membrane and cause septicaemia (blood poisoning). It can be fatal if left untreated. This vaccine provides immunity to the body for two years.*

Berdasarkan maklumat di atas, wajarkan keperluan vaksinasi tersebut.

Based on the information above, justify the requirement of the vaccination.

[10 markah / marks]

ANSWER: