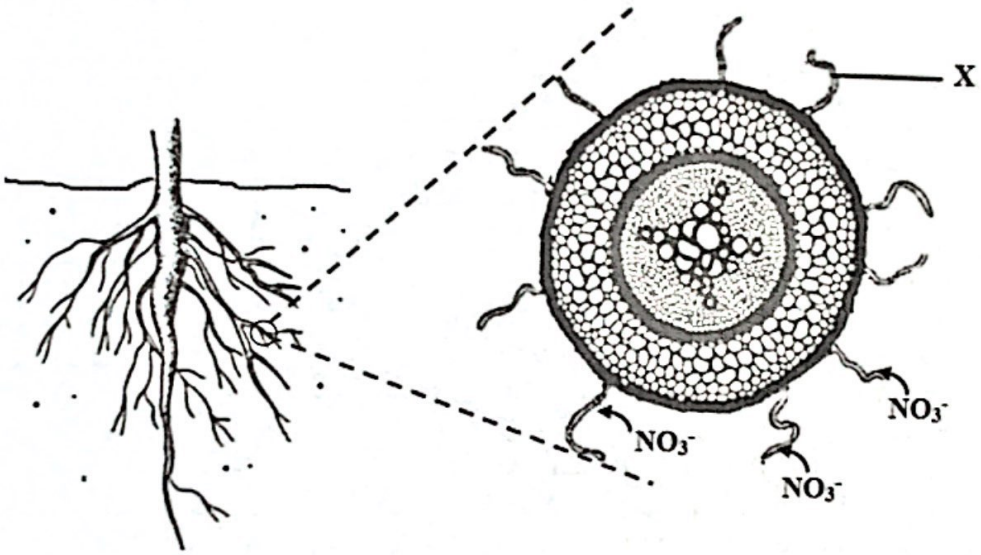
For Examiner's Use

Bahagian A
Section A

[60 markah]
[*60 marks*]

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

1 Rajah 1 menunjukkan penyerapan garam mineral untuk mendapatkan nutrien oleh tumbuhan.
Diagram 1 *shows mineral salt absorption to obtain nutrient by plant.*



Rajah 1/ *Diagram* 1

(a) Berdasarkan Rajah 1
Based on Diagram 1

(i) Nyatakan nutrien yang diserap oleh tumbuhan tersebut.
State the nutrient absorbed by the plant.

.....

[1 markah/*mark*]

1(a)(i) 1

(ii) Kelaskan nutrien yang dinamakan di (a)(i) mengikut kuantiti yang diperlukan oleh tumbuhan.
Classify the nutrient named in (a)(i) according to the quantity required by the plant.

.....

[1 markah/*mark*]

1(a)(ii) 1

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(iii) Terangkan kesan kekurangan nutrien yang dinyatakan di(a)(i) terhadap pertumbuhan tumbuhan tersebut
Explain the effect of nutrient deficiency named in (a)(i) on the growth of plant.

1(a)(iii) 2

.....

.....

.....

[2 markah/*marks*]

(b) (i) Namakan X.
Name X.

1(b)(i) 1

.....

[1 markah/*mark*]

(ii) Nyatakan tisu yang terlibat dalam pengangkutan nutrien yang diserap oleh X.
State the tissue involved in the transport of nutrients absorbed by X.

1(b)(ii) 1

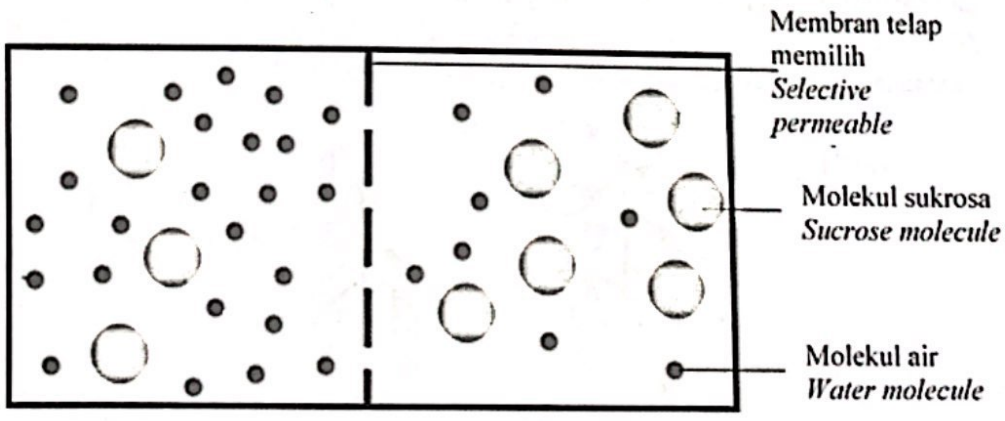
.....

[1 markah/*mark*]

Total 6

2 Rajah 2.1 menunjukkan dua kawasan, P dan Q yang dipisahkan oleh satu membran telap memilih.

Diagram 2.1 *shows two regions,* P *and* Q *which are separated by a selectively permeable membrane.*



Rajah 2.1/ *Diagram* 2.1

For Examiner's Use

(a) Berdasarkan Rajah 2.1;
Based on Diagram 2.1;

(i) Apakah ciri membran telap memilih?
What is the characteristic of selectively permeable membrane?

.....

[1 markah/*mark*]

2(a)(i) 1

(ii) Kawasan manakah yang hipertonik?
Which region is hypertonic?

.....

[1 markah/*mark*]

2(a)(ii) 1

(iii) Nyatakan satu sebab bagi jawapan dalam 2(a)(ii) untuk kawasan yang hipertonik.
State one reason for the answer in 2(a)(i) for hypertonic region.

.....

[1 markah/*mark*]

2(a)(iii) 1

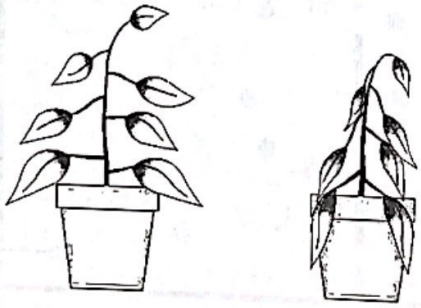
(iv) Selepas 20 minit, keseimbangan antara kawasan P dan kawasan Q tercapai.
Namakan proses yang berlaku.
After 20 minutes, an equilibrium is achieved between region P and Q.
Name the process which occurs.

.....

[1 markah/*mark*]

2(a)(iv) 1

(b) Rajah 2.2 menunjukkan keadaan pokok keembung (*Balsam sp.*) pada hari pertama dan hari kedua selepas ditanam menggunakan tanah paya bakau.
Diagram 2.2 show the condition of a plant (Balsam sp.), on the first day and the second day after being planted with mangrove swamp's soil.



Hari pertama
First day

Hari kedua
Second day

Rajah 2.2/ *Diagram* 2.2

For Examiner's Use

Terangkan perubahan keadaan pokok pada Rajah 2.2.
Explain the change of the plant's condition in Diagram 2.2.

.....

.....

.....

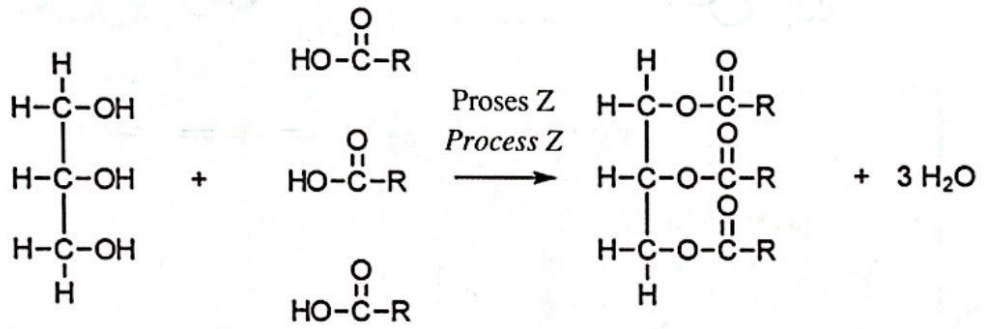
.....

[2 markah/*marks*]

2(b) 2

Total 6

3 Rajah 3.1 menunjukkan pembentukan satu molekul trigliserida.
Diagram 3.1 shows the formation of one molecule triglycerides.



Molekul X	Molekul Y	Molekul trigliserida
Molecule X	*Molecule Y*	*Triglyceride molecule*

Rajah 3.1/ *Diagram* 3.1

(a) Namakan molekul Y.
Name the molecule Y.

.....

[1 markah/*mark*]

3(a) 1

(b) Terangkan proses Z.
Explain process Z.

.....

.....

.....

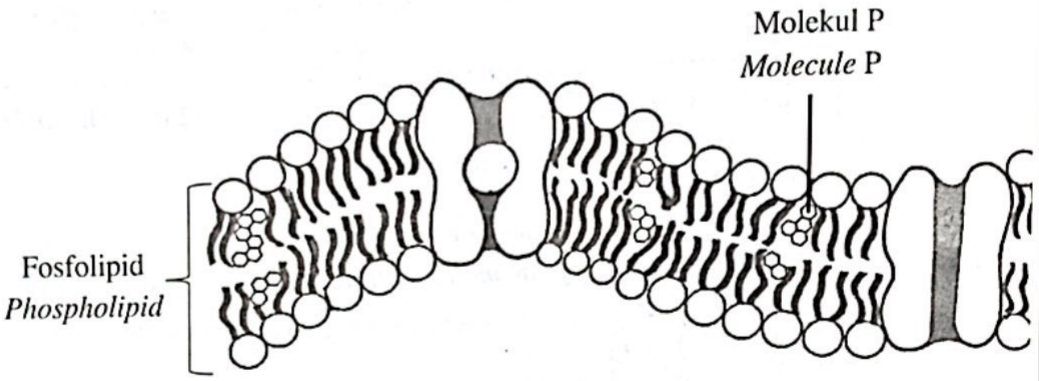
.....

[2 markah/*marks*]

3(b) 2

For Examiner's Use

(c) Fosfolipid dan molekul P adalah antara jenis lipid yang membina struktur membran plasma.
Rajah 3.2 menunjukkan struktur membran plasma.
Phospholipid and molecule P *are types of lipid that build up the structure of plasma membrane.*
Diagram 3.2 *shows the structure of plasma membrane.*



Rajah 3.2 / *Diagram* 3.2

(i) Namakan molekul P.
Name molecule P.

.....

[1 markah/*mark*]

3(c)(i) 1

(ii) Terangkan kesan terhadap sifat membran plasma tersebut jika membran plasma mengandungi kurang molekul Q.

Explain the effect on the characteristics of the plasma membrane if plasma membrane has less molecule Q.

.....

.....

.....

.....

[3 markah/*marks*]

3(c)(ii) 3

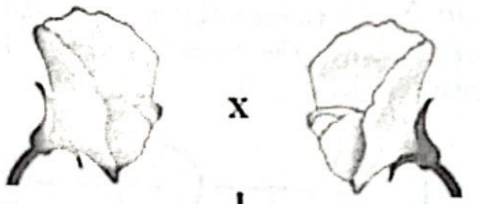
Total 7

For Examiner's Use

4 Rajah 4.1 menunjukkan kacukan antara pokok *Magnolia grandiflora* yang berbunga ungu dengan pokok *Magnolia grandiflora* yang berbunga putih. Separuh daripada anak pokok yang terhasil adalah berbunga ungu manakala separuh lagi berbunga putih.

Diagram 4.1 shows the cross of a Magnolia grandiflora plant, *purple flower with Magnolia grandiflora* plant, *white flower. Half of the offspring produced are purple flowers while the other half produced are white flowers.*

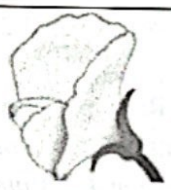
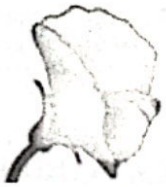
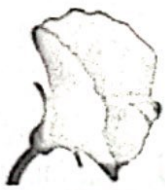
Fenotip induk/ *Parental phenotype* :



Bunga ungu *Purple flower* x Bunga putih *White flower*

Genotip induk *Parental genotype* : ..... bb

Segiempat Punnett untuk anak / *Punnett square of offspring:* :

Gamet *Gamete*	.....	.....
b		
B		

Rajah 4.1 / *Diagram 4.1*

(a) Lengkapkan Rajah 4.1 dengan menyatakan genotip induk bagi pokok berbunga ungu dan gamet-gamet bagi pokok berbunga putih.
Complete Diagram 4.1 by stating the parental genotype for purple flower plant and gametes for white flower plant.

[2 markah/*marks*]

4(a) 2

(b) Berdasarkan Rajah 4.1, nyatakan Hukum Mendel 1.
Based on Diagram 4.1, state Mendel's First Law.

.....

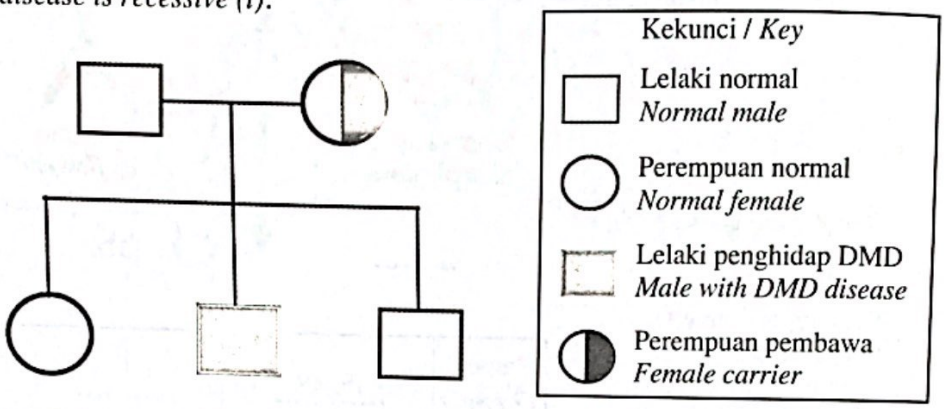
.....

[1 markah/*mark*]

4(b) 1

For Examiner's Use

(c) Rajah 4.2 menunjukkan carta pedigri keluarga bagi dua generasi apabila seorang lelaki normal mengahwini seorang perempuan yang merupakan pembawa penyakit Duchene-muscular dystrophy (DMD). Penyakit DMD adalah kecacatan penyusutan neuro-otot yang disebabkan oleh mutasi resesif pada kromosom-X. Alel normal adalah dominan (T) manakala alel bagi penyakit DMD adalah resesif (t).
Diagram 4.2 shows family pedigree chart for two generation when a normal man marries a carrier woman for Duchene-muscular dystrophy (DMD) disease. DMD disease is a neuromuscular disorder caused by a recessive mutation on the X-chromosome. The normal allele is dominant (T) while the allele for DMD disease is recessive (t).



Rajah 4.2 / *Diagram 4.2*

(i) Berdasarkan Rajah 4.2, nyatakan kebarangkalian bagi pasangan ini mempunyai anak yang normal.
Based on Diagram 4.2, state the probability of the couple to have normal child.

.....

[1 markah/ *1 mark*]

4(c)(i) 1

(ii) Bagaimanakah anak lelaki pasangan ini mewarisi penyakit DMD. Terangkan.
How a son of the couple inherits DMD disease. Explain.

.....

.....

.....

[2 markah/*marks*]

4(c)(ii) 2

(d) Berikan **satu** persamaan antara pewarisan dalam Rajah 4.1 dengan Rajah 4.2.
*Give **one** similarity between inheritance in Diagram* 4.1 *and Diagram* 4.2.

.....

.....

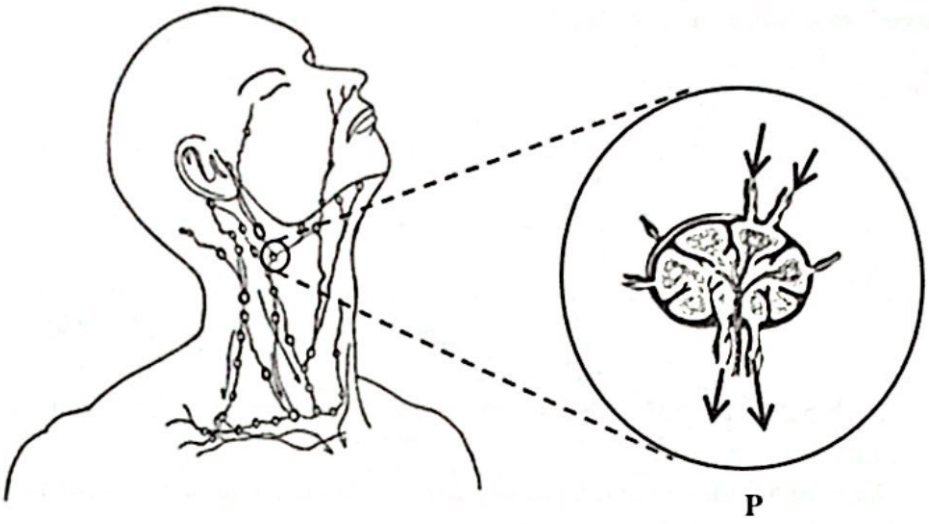
[1 markah/*mark*]

4(d) 1

Total 7

For Examiner's Use

5 Rajah 5.1 menunjukkan sebahagian dari sistem limfa pada leher Encik X.
Diagram 5.1 *shows a part of lymphatic system at* Mr. X's *neck.*



Rajah 5.1 / *Diagram* 5.1

(a) (i) Namakan P.
Name P.

.....

[1 markah/*mark*]

1(a)(i)

1

(ii) Apa yang akan berlaku kepada patogen dalam P?
What happen to the pathogen in P?

.....

.....

[1 markah/*mark*]

1(a)(ii)

1

(b)

Struktur P dalam Rajah 5.1 mengalami pembengkakan. Hasil keputusan biopsi tisu dari struktur P menunjukkan penghasilan sel limfosit yang tidak terkawal. Sel limfosit yang tidak normal ini telah membahagi secara tidak terkawal dan merebak ke tisu-tisu berdekatan.

Structure P in Diagram 5.1 *undergoes swelling. The results of tissue biopsy of the structure P shows uncontrolled production of lymphocyte. These abnormal lymphocytes have divided uncontrollably and spread to nearby tissues.*

For Examiner's Use

(a) (i) Berdasarkan Rajah 6.1, nyatakan jenis pembahagian sel tersebut.
Based on Diagram 6.1 *state the type of cell divison.*

.....

[1 markah/*mark*]

6(a)(i) 1

(ii) Pada Rajah 6.1, lukiskan perlakuan kromosom pada fasa R
In Diagram 6.1, *draw chromosomal behaviour in phase R.*

[1 markah/*mark*]

6(a)(ii) 1

(iii) Individu S mengalami luka pada tangan dan selepas beberapa hari didapati lukanya sembuh.
Individual S suffered a wound on his hand and after a few days it was found that the wound had healed.
Terangkan bagaimana proses di (a)(i) membantu dalam penyembuhan luka?
Explain how process in (a)(i) helps in wound healing?

.....

.....

.....

[2 markah/*marks*]

6(a)(iii) 2

(b) Rajah 6.2 menunjukkan perlakuan kromosom pada satu fasa semasa gametogenesis.
Diagram 6.2 *shows a chromosomal behaviour at a phase during gametogenesis.*

Rajah 6.2/ *Diagram* 6.2

For Examiner's Use

Nyatakan perbezaan antara fasa Q dalam Rajah 6.1 dengan fasa dalam Rajah 6.2.

State the difference between the phase Q in Diagram 6.1 and the phase in Diagram 6.2.

.....

.....

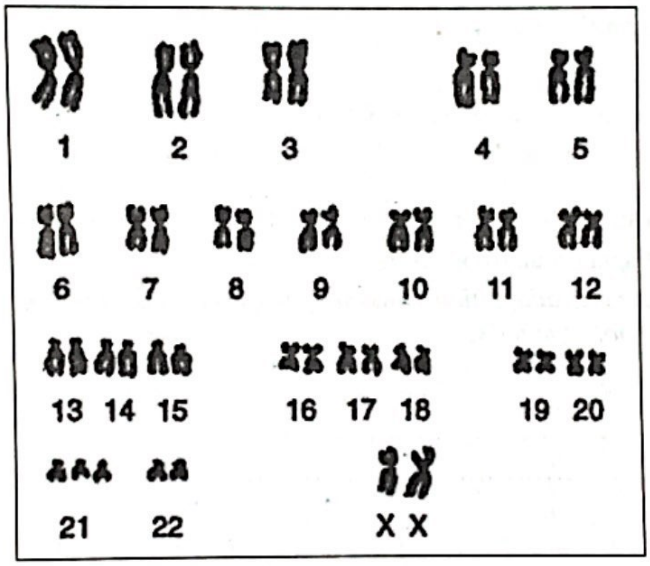
.....

[2 markah/*marks*]

6(b)

2

(c) Rajah 6.3 menunjukkan kariotip bagi individu yang mengalami penyakit genetik.
Diagram 6.3 *shows a karyotype of an individual with genetic disease.*



Rajah 6.3/ *Diagram* 6.3

Terangkan bagaimana penyakit genetik ini berlaku.
Explain how the genetic disease occurs.

.....

.....

.....

[2 markah/*marks*]

6(c)

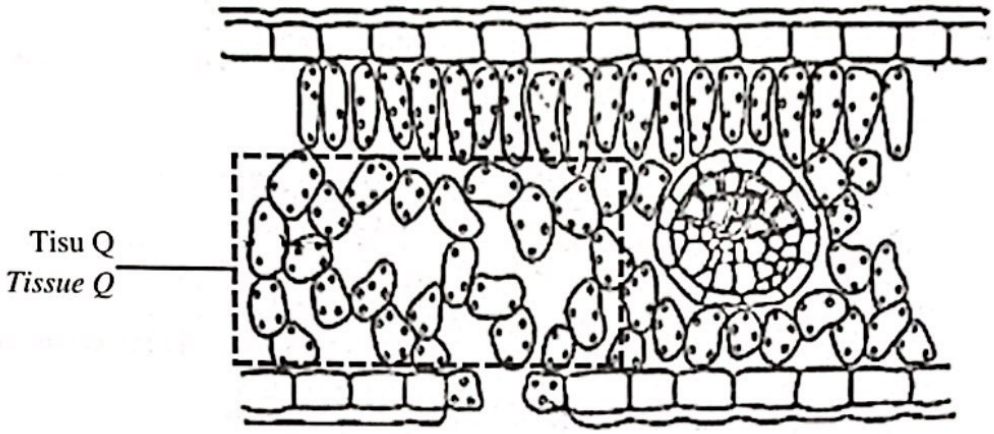
2

Total

8

For Examiner's Use

7. Rajah 7.1 menunjukkan satu keratan rentas daun.
Diagram 7.1 shows a cross section of a leaf.



Rajah 7.1 / *Diagram 7.1*

(a) (i) Namakan tisu Q.
Name tissue Q.

.....

[1 markah/*mark*]

7(a)(i) 1

(ii) Nyatakan satu penyesuaian tisu Q bagi membenarkan daun berfungsi sebagai organ fotosintesis.
State one adaptation of tissue Q to allow the leaf to function as an organ of photosynthesis.

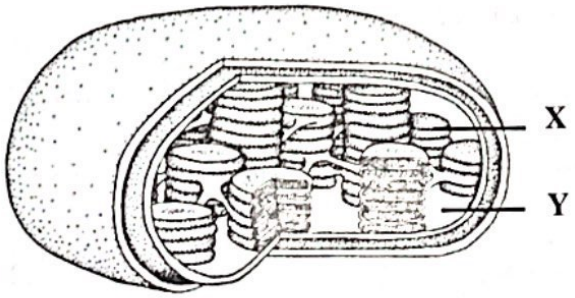
.....

.....

[1 markah/*mark*]

7(a)(ii) 1

(b) Rajah 7.2 menunjukkan satu komponen dalam tisu Q.
Diagram 7.2 shows a component in tissue Q.



Rajah 7.2 / *Diagram 7.2*

For Examiner's Use

Bezakan tindakbalas kimia yang berlaku di X dan Y.
Differentiate chemical reactions that take place at X *and* Y.

Tindakbalas kimia di X *Chemical reaction in X*	Tindakbalas kimia di Y *Chemical reactiom in Y*

[2 markah/*marks*]

7(b)

2

(c) Encik M merupakan seorang pengusaha ladang tomato secara komersial.
Mr. M *is the owner of commercialized tomato's farm.*

(i) Daun pada pokok tomato di ladangnya telah mengalami klorosis.
Terangkan bagaimana keadaan ini mempengaruhi hasil ladang.
Leaves of the tomato plant in his farm had chlorosis.
Explain how this condition affect the crop yields.

.....

.....

.....

.....

[3 markah/*marks*]

7(c)(i)

3

(ii) Encik M telah dinasihatkan oleh pegawai pertanian supaya menggunakan rumah hijau bagi mengatasi masalah di c(i).
Terangkan mengapa saranan ini diberikan.
Mr. M *is advised by an agricultural officer to implement greenhouse to overcome problem faced in c(i).*
Explain why it is suggested.

.....

.....

.....

[2 markah/*marks*]

7(c)(ii)

2

Total

9

For Examiner's Use

8 Pernyataan berikut merupakan isu kelestarian alam sekitar.
The statement is about sustainable environment issue.

Pelan Hala Tuju Malaysia ke arah Sifar Plastik Sekali Guna, 2018 – 2030

Pencemaran sisa plastik akibat daripada pengurusan sisanya yang tidak terkawal pada masa ini merupakan masalah yang perlu ditangani secara holistik dalam keseluruhan rantaian nilai plastik tersebut. Malaysia merancang untuk menangani isu ini menggunakan pendekatan serta perspektif nasional dan seterusnya beralih kepada kaedah, konsep serta material yang lebih mesra alam.

Malaysia's Roadmap towards Zero Disposable Plastics, 2018 - 2030

Pollution of plastic waste as a result of uncontrolled waste management is currently a problem that needs to be addressed holistically throughout the plastic value chain. Malaysia plans to address this issue using a national approach and perspective and subsequently move to more environmentally friendly methods, concepts and materials.

(a) (i) Berdasarkan pernyataan di atas, nyatakan satu amalan yang menyumbang kepada kelestarian alam sekitar.
Based on the statement above, state one practice that contributes to environmental sustainability.

.....

.....

[1markah/*mark*]

8(a)(i) 1

(ii) Bagaimanakah amalan yang dinyatakan di (a)(i) dapat meningkatkan kualiti hidupan dan alam sekitar.
How the practice stated in (a)(i) increases the quality of organism and environment.

.....

.....

.....

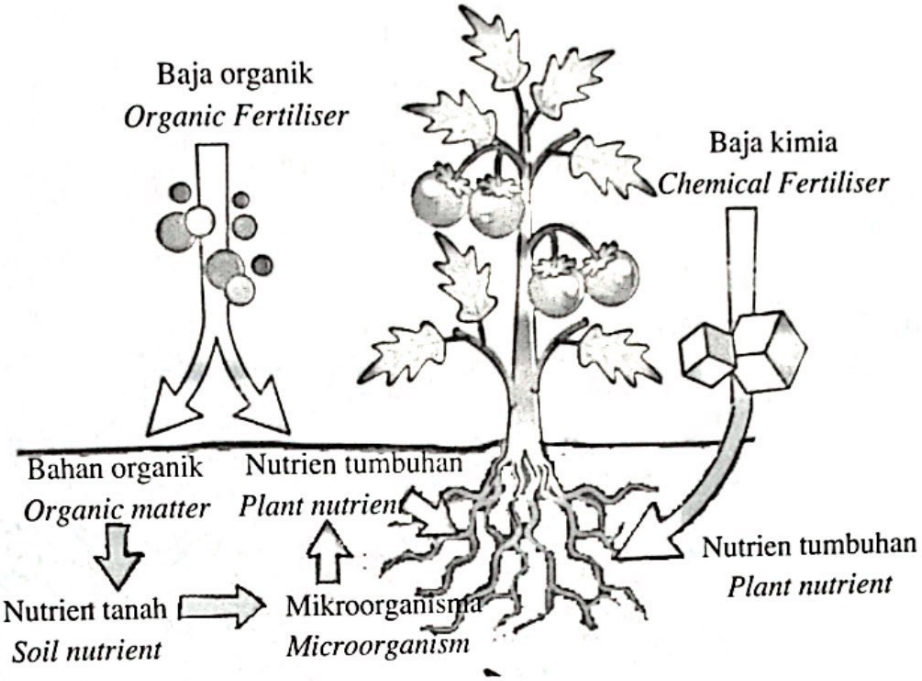
.....

[3 markah/*marks*]

8(a)(ii) 3

For Examiner's Use

(b) Rajah 8 menunjukkan penggunaan dua jenis baja yang berbeza pada tumbuhan.
Diagram 8 *shows the usage of two different fertilisers on plant.*



Rajah 8/ *Diagram* 8

Berdasarkan Rajah 8, bandingkan kesan penggunaan kedua-dua jenis baja.
Based on Diagram 8, *compare the effects of the usage of both types of fertilisers.*

.....

.....

.....

.....

[3 markah/*marks*]

8(b) 3

(c) Antara amalan hijau yang boleh dilakukan dirumah ialah kitar semula.
Cadangkan bagaimana baja semulajadi dapat dihasilkan melalui amalan tersebut.
Nyatakan satu kelebihan amalan ini.
One of the green practices that can be done at home is recycle.
Suggest how natural fertiliser can be produced through this practice.
State one advantage of this practice.

.....

.....

.....

[2 *markah/marks*]

8(c) 2

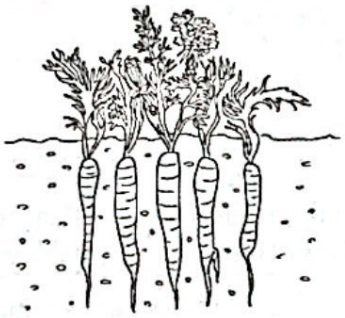
Total 9

Bahagian B
Section B

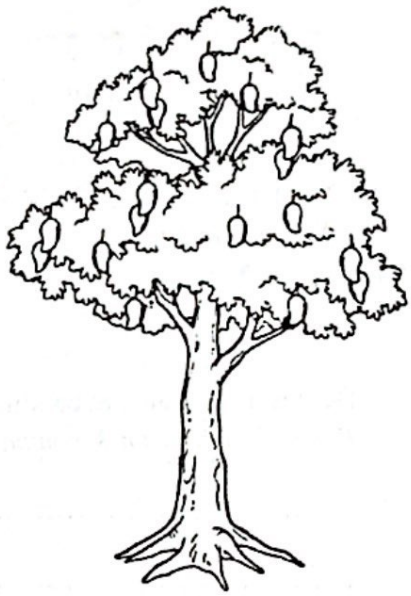
[20 markah]
[20 *marks*]

Jawab **satu** soalan dalam bahagian ini.
Answer ***one*** *the question in this section.*

9 (a) Rajah 9.1 menunjukkan tumbuhan X dan Y.
Diagram 9.1 *shows plant* X *and plant* Y.



Tumbuhan X / *Plant* X



Tumbuhan Y / *Plant* Y

Rajah 9.1/ *Diagram* 9.1

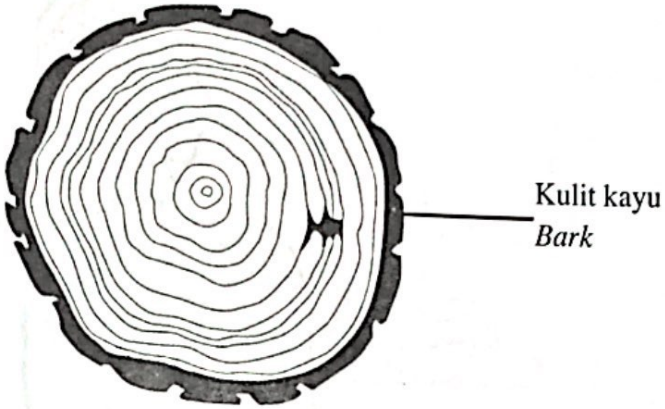
(i) Nyatakan jenis tumbuhan X dan tumbuhan Y berdasarkan kitar hidupnya.
State the types of plant X *and* Y *based on their life cycles.*

[2 markah /*marks*]

(ii) Terangkan ciri-ciri tumbuhan X.
Explain the characteristic of plant X.

[2 markah/*marks*]

(b) Rajah 9.2 menunjukkan keratan rentas batang pokok di kawasan beriklim sederhana.
Diagram 9.2 *shows cross section of tree trunk in a temperate climate region.*

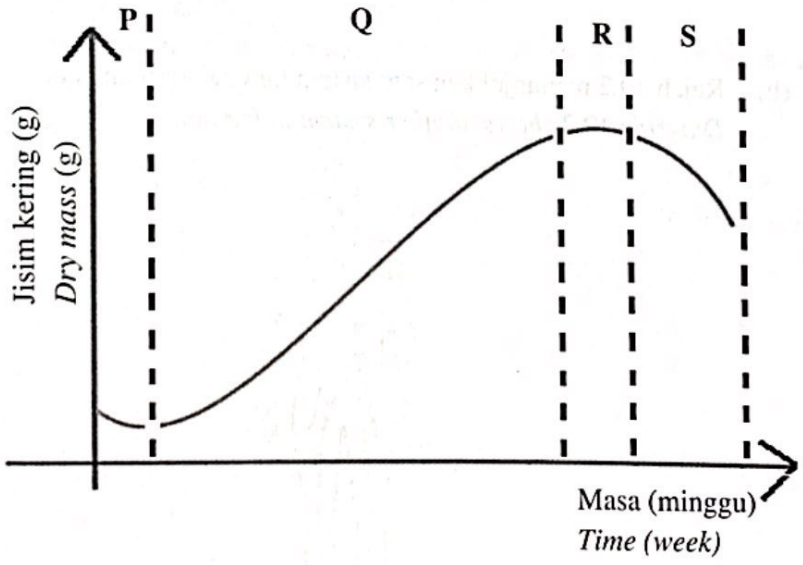


Rajah 9.2 / *Diagram* 9.2

Terangkan bagaimana corak ini terbentuk?
Explain how the pattern is formed?

[6 markah/*marks*]

(c) Rajah 9. 3 menunjukkan satu graf lengkung pertumbuhan bagi tumbuhan semusim.
Diagram 9.3 *shows a growth curve graph of annual plant.*

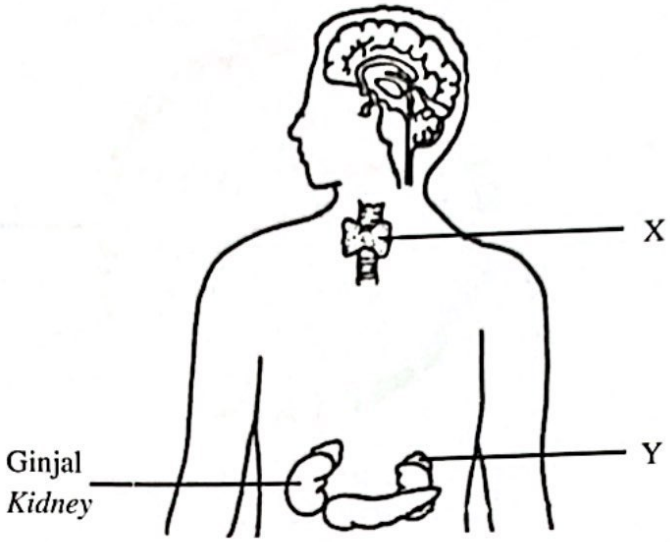


Rajah 9.3/ *Diagram* 9.3

Terangkan peringkat P, Q, R dan S.
Explain stage P, Q, R *and* S.

[10 markah/*marks*]

10 (a) Rajah 10.1 menunjukkan satu sistem pada manusia.
Diagram 10.1 *shows a system in human.*

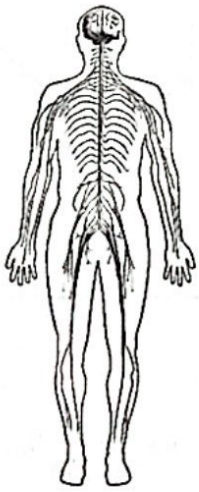


Rajah 10.1/ *Diagram* 10.1

Berdasarkan Rajah 10.1, terangkan fungsi hormon yang dirembeskan oleh struktur X dan struktur Y.
Based on Diagram 10.1, *explain the functions of hormone secreted by structure* X *and structure* Y.

[4 markah/*marks*]

(b) Rajah 10.2 menunjukkan satu sistem lain dalam manusia.
Diagram 10.2 *shows another system in human.*

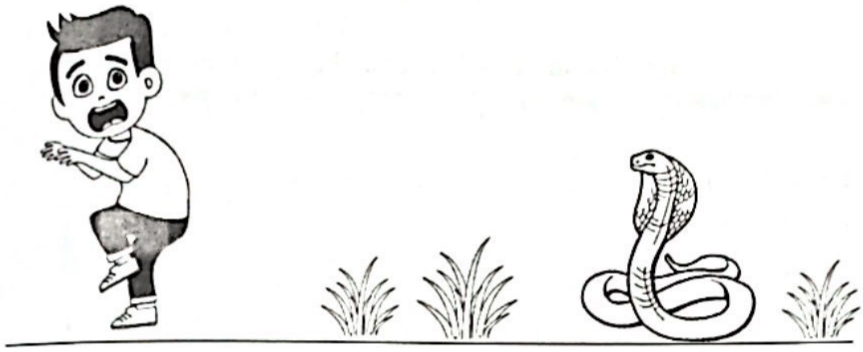


Rajah 10.2/ *Diagram* 10.2

Bandingkan sistem dalam Rajah 10.1 dan Rajah 10.2.
Compare the system in Diagram 10.1 *and Diagram* 10.2.

[10 markah/*marks*]

(c) Rajah 10.3 menunjukkan satu situasi.
Diagram 10.3 *shows a situation.*



Rajah 10.3
Diagram 10.3

Lelaki itu mampu berlari dengan laju.
Huraikan penglibatan sistem saraf dan sistem endokrin dalam situasi tersebut berdasarkan aspek berikut:

- Kadar denyutan jantung
- Kadar pernafasan

The man was able to run quickly.
Describe the involvement of nervous system and endocrine system in the situation based on the following aspects:

- *Heartbeat rate*
- *Respiratory rate*

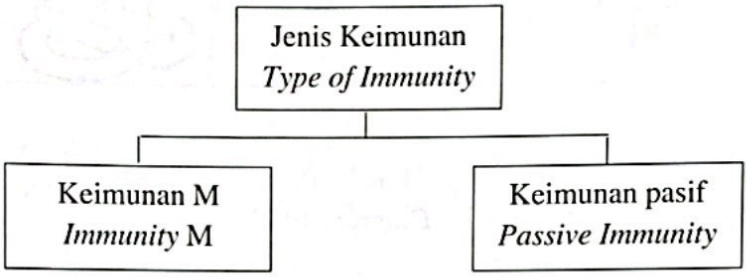
[6 markah/*marks*]

Bahagian C
Section C

[20 marks]
[20 *markah*]

Jawab **semua** soalan dalam bahagian ini.
Answer ***all*** *the question in this section.*

11 (a) Rajah 11.1 menunjukkan jenis-jenis keimunan
Diagram 11.1 *shows types of immunity*



Rajah 11.1/ *Diagram* 11.1

Nyatakan ciri-ciri keimunan M.
State the characteristics of immunity M

[2 markah/*marks*]

(b)

Penyusuan susu ibu secara ekslusif bermaksud bayi hanya diberi susu ibu dalam masa 6 bulan pertama selepas kelahirannya. Tiada makanan atau minuman lain diberikan pada bayi dalam tempoh tersebut. Makanan tambahan hanya dimulakan setelah bayi berumur 6 bulan dan ke atas. Penyusuan hendaklah diteruskan sehingga bayi berumur 2 tahun.

Exclusive breastfeeding defines that the baby is only given breast milk for the first 6 months after birth. No other food or drink is given to the baby during the period. Supplementary foods are only started after the baby is 6 months old and above. Breastfeeding should be continued until the baby is 2 years old.

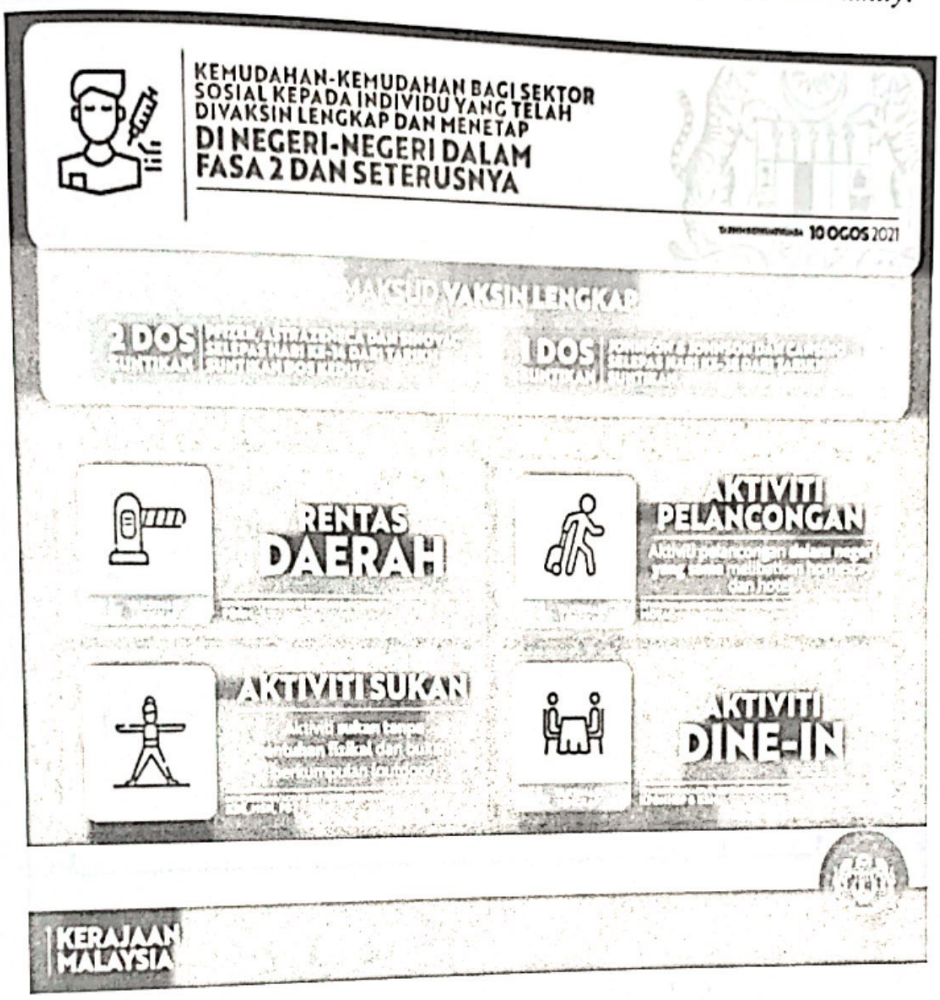
Seorang wanita telah membuat keputusan untuk tidak memberikan susu ibu kepada bayinya yang baru lahir kerana bimbangkan perubahan bentuk fizikal badannya. Justifikasikan tindakan wanita tersebut kepada sistem keimunan bayinya. Bincangkan.

A woman has decided not to breastfeed her newborn baby because she is worried about changes in the physical shape of her body.
Justify the woman's actions to her baby's immune system. Discuss.

[7 markah/*marks*]

(c) (i) Rajah 11.2 menunjukkan kemudahan kepada individu yang telah melengkapkan vaksinasi bagi mencegah penyakit COVID-19 yang menular dalam komuniti.

Diagram 11.2 *shows the facilities for individuals who have completed vaccination to prevent COVID-19 disease from spreading in the community.*



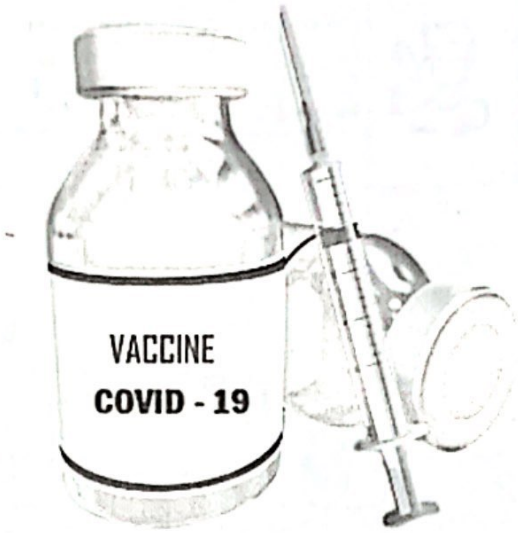
Rajah 11.2/ *Diagram* 11.2

Terangkan bagaimana keimunan diperolehi oleh individu yang telah melengkapkan vaksinasi.

Explain how immunity is acquired by individuals who have completed vaccination.

[7 markah/*marks*]

(ii) Rajah 11.3 menunjukkan produk biologi yang digunakan untuk mencegah penyakit COVID-19.
Diagram 11.3 *shows the biological products used to prevent COVID-19 disease.*



Rajah 11.3
Diagram 11.3

Terangkan bagaimana teknologi genetik dapat menghasilkan produk biologi tersebut yang berasaskan virus dalam skala besar oleh industri biofarmaseutikal.

Explain how genetic technology can produce virus-based biological products on a large scale by the biopharmaceutical industry.

[4 markah/*marks*]

KERTAS SOALAN TAMAT
END OF QUESTION PAPER