

SULIT  
4551/2  
Biologi  
Kertas 2  
September  
2 ½ jam

Nama

Tingkatan



JABATAN PELAJARAN MELAKA



Dengan Kerjasama

PERSIDANGAN KEBANGSAAN PENGETUA-PENGETUA  
SEKOLAH MENENGAH MALAYSIA (PKPSM)  
CAWANGAN MELAKA

PEPERIKSAAN PERCUBAAN  
SIJIL PELAJARAN MALAYSIA 2007

BIOLOGI

Kertas 2

Dua jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Kertas soalan ini mengandungi tiga bahagian Bahagian A, Bahagian B dan Bahagian C. Jawab semua soalan dalam Bahagian A, satu soalan daripada Bahagian B dan satu soalan daripada Bahagian C.
2. Jawapan kepada Bahagian A hendaklah ditulis dalam ruang jawapan yang disediakan dalam kertas soalan. Langkah penting dalam kerja mengira hendaklah ditunjukkan.
3. Jawapan kepada Bahagian B dan Bahagian C hendaklah ditulis dalam kertas jawapan yang disediakan. Anda diminta menjawab dengan lebih panjang tetapi jawapan mestilah jelas dan logik. Dalam jawapan anda, persamaan, gambar rajah, jadual, graf dan cara lain yang sesuai untuk menjelaskan jawapan anda boleh digunakan.
4. Jawapan kepada ketiga-tiga bahagian ini hendaklah diserahkan bersama-sama. Anda hendaklah menyerahkan kertas tulis dan kertas graf tambahan, jika digunakan, bersama-sama dengan kertas soalan.
5. Rajah yang mengiringi soalan dimaksudkan untuk memberi maklumat yang berguna bagi menjawab soalan. Rajah tidak dilukiskan mengikut skala kecuali dinyatakan sebaliknya.
6. Penggunaan kalkulator saintifik yang tidak boleh diprogramkan adalah dibenarkan.
7. Masa yang dicadangkan untuk menjawab Bahagian A ialah 90 minit, Bahagian B 30 minit dan Bahagian C 30 minit.

Untuk kegunaan pemeriksa		
Bahagian	No.	Markah
A	1	
	2	
	3	
	4	
	5	
Jumlah		
B	6	
	7	
Jumlah		
C	8	
	9	
Jumlah		
Jumlah Besar		

Kertas soalan ini mengandungi 39 halaman bercetak termasuk kulit  
4551/2 [Lihat sebelah]

For  
Examiner's  
Use

**Section A**

[ 60 marks]

Answer **all** questions

The time suggested to complete this section is 90 minutes.

1. Diagram 1.1 shows a model of plasma membrane.

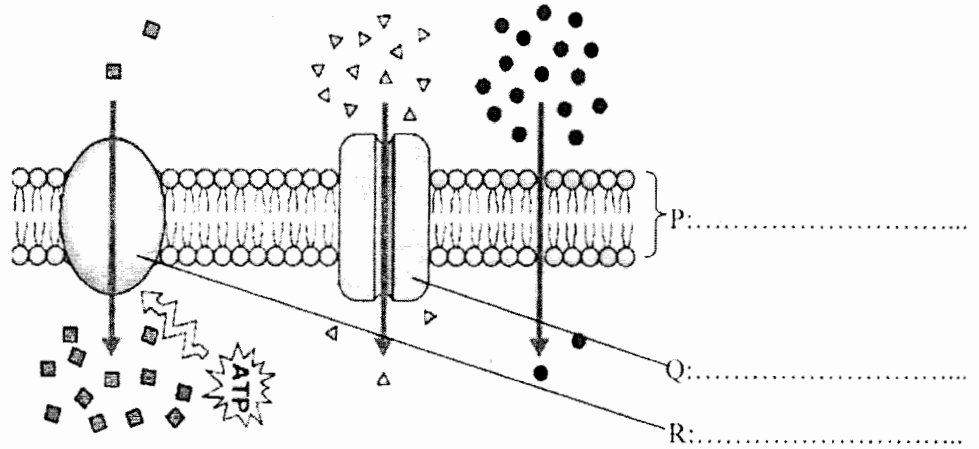


DIAGRAM 1.1

1(a)(i)

(a) (i) Name the structures labelled P, Q and R.

[3 marks]

(ii) Name the process occur at R and explain how?

Process at R:.....

Explanation:.....

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

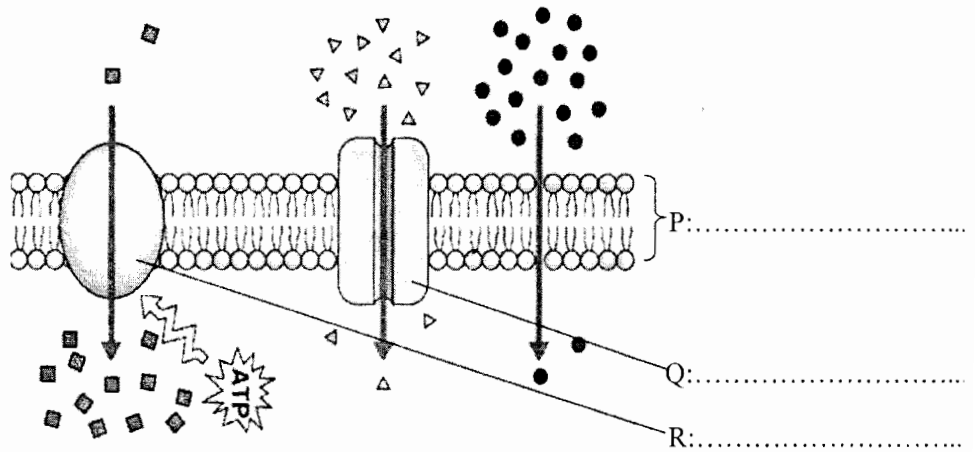
[3 marks]

1(a)(ii)

Jawab **semua** soalan dalam bahagian ini.

Masa yang dicadangkan untuk menjawab bahagian ini ialah 90 minit

1 Rajah 1.1 menunjukkan model membran plasma.



RAJAH 1.1

(a) (i) Namakan struktur berlabel P, Q dan R

[3 markah]

1(a)(i)

(iii) Namakan proses yang berlaku di R dan terangkan bagaimana proses tersebut berlaku?

Proses di R:.....

Penerangan:.....

.....

.....

.....

.....

[3 markah]

1(a)(ii)

For  
Examiner's  
Use

1(b)

(b) How does the process at P differ from the process that occurs at Q?

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

[1 mark]

(c) Diagram 1.2 shows the plasma membrane of a red blood cell which burst after being immersed in a solution J.

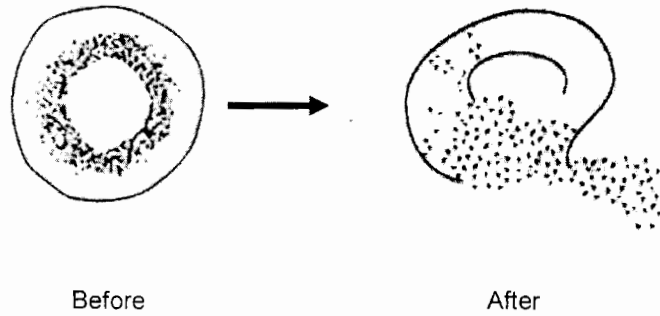


DIAGRAM 1.2

Explain how the red blood cell burst.

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

[2 marks]

1(c)

For  
Examiner's  
Use

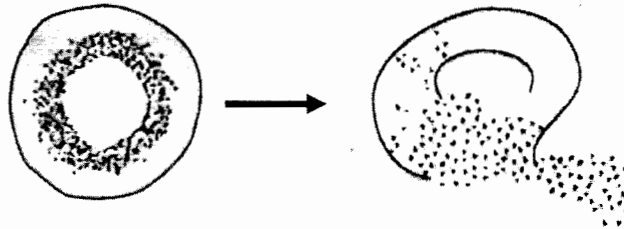
1(b)

(b) Bagaimanakah proses yang berlaku di P berbeza daripada proses yang berlaku di Q?

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

[1 markah]

(c) Rajah 1.2 menunjukkan membran plasma sel darah merah meletus selepas direndam dalam larutan J.



Sebelum

Selepas

RAJAH 1.2

Terangkan bagaimana sel darah merah tersebut meletus.

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

[2 markah]

1(c)

For  
Examiner's  
Use

(d) Diagram 1.3 shows a plant watered with fertiliser.

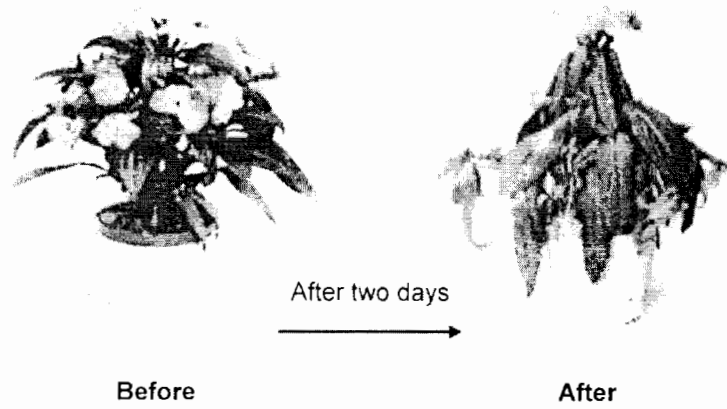


DIAGRAM 1.3

(i) Using your biology knowledge, explain what happens to the plant.

.....

.....

.....

.....

[2 marks]

(ii) Sketch a diagram to show the structure of a plant cell that you have described in (d)(i)

1(d)(i)

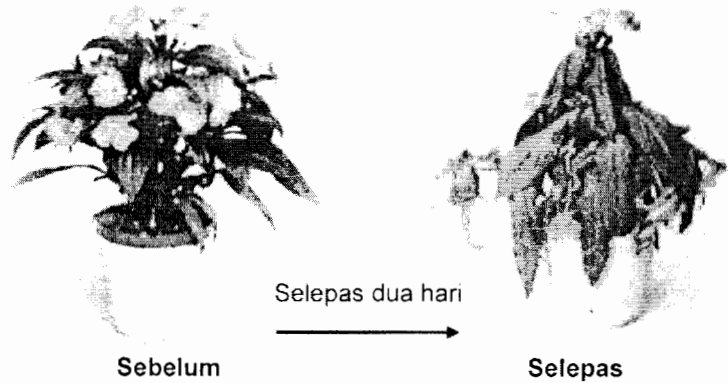
1(d)(ii)

TOTAL

[1 mark]

For  
Examiner's  
Use

- (d) Rajah 1.3. menunjukkan tumbuhan sebelum dan selepas dua hari disiram dengan baja.



RAJAH 1.3

- (i) Melalui pengetahuan anda tentang biologi, terangkan apakah yang telah berlaku terhadap tumbuhan tersebut.

.....

.....

.....

.....

[2 markah]

- (ii) Lakarkan rajah yang menunjukkan keadaan struktur sel tumbuhan yang anda nyatakan di (d)(i).

1(d)(i)

1(d)(ii)

**JUMLAH**

[1 markah]

For  
Examiner's  
Use

2. Diagram 2.1 shows a transverse section through a part of dicotyledon leaf.

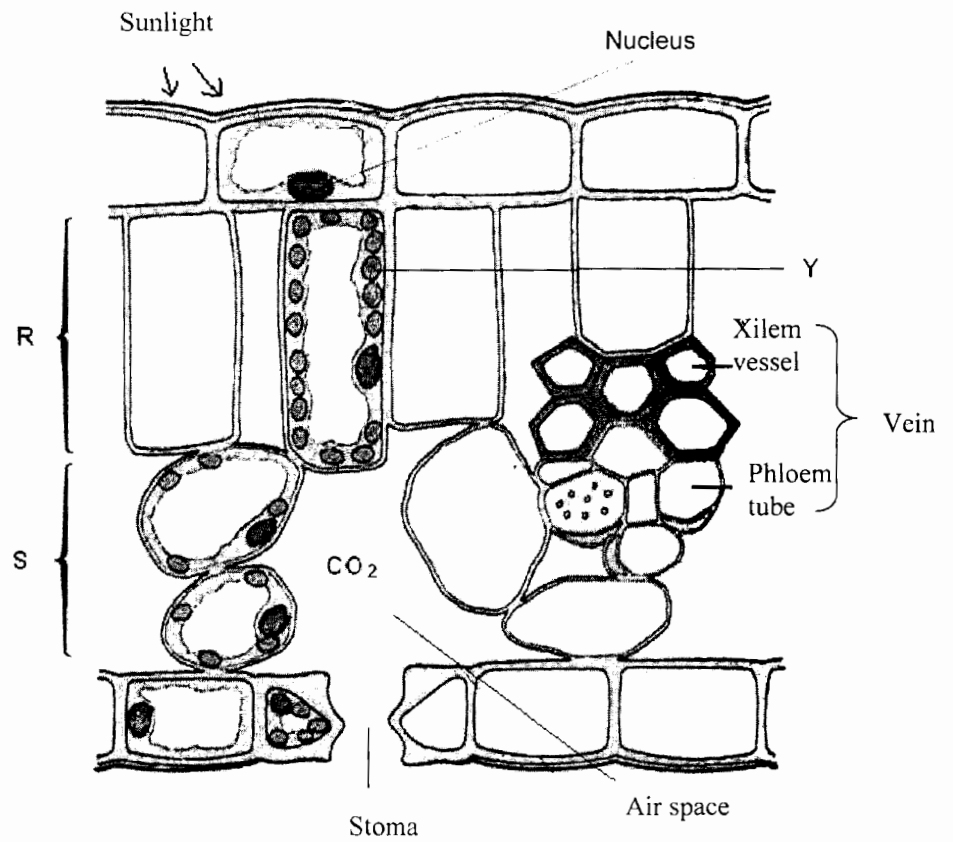


DIAGRAM 2.1

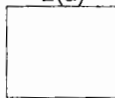
a) Name the structures labelled as R dan Y.

R: .....

Y: .....

[2 marks]

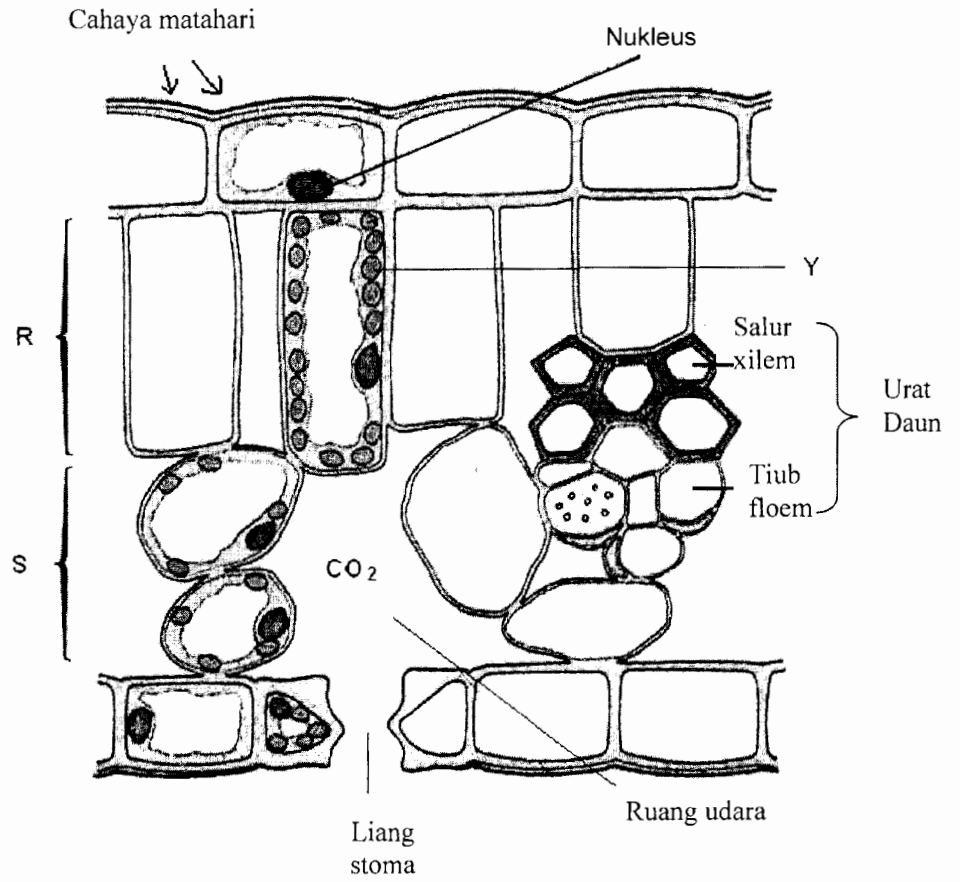
2(a)





Untuk  
Kegunaan  
Pemeriksa

2. Rajah 2.1 menunjukkan rajah skema tindak balas yang berlaku dalam tumbuhan hijau untuk menghasilkan makanan melalui proses fotosintesis.



RAJAH 2.1

(a) Namakan struktur yang berlabel R dan Y.

R:.....

Y:.....

[2 markah]

2(a)



For  
Examiner's  
Use

2. Diagram 2.1 shows a transverse section through a part of dicotyledon leaf.

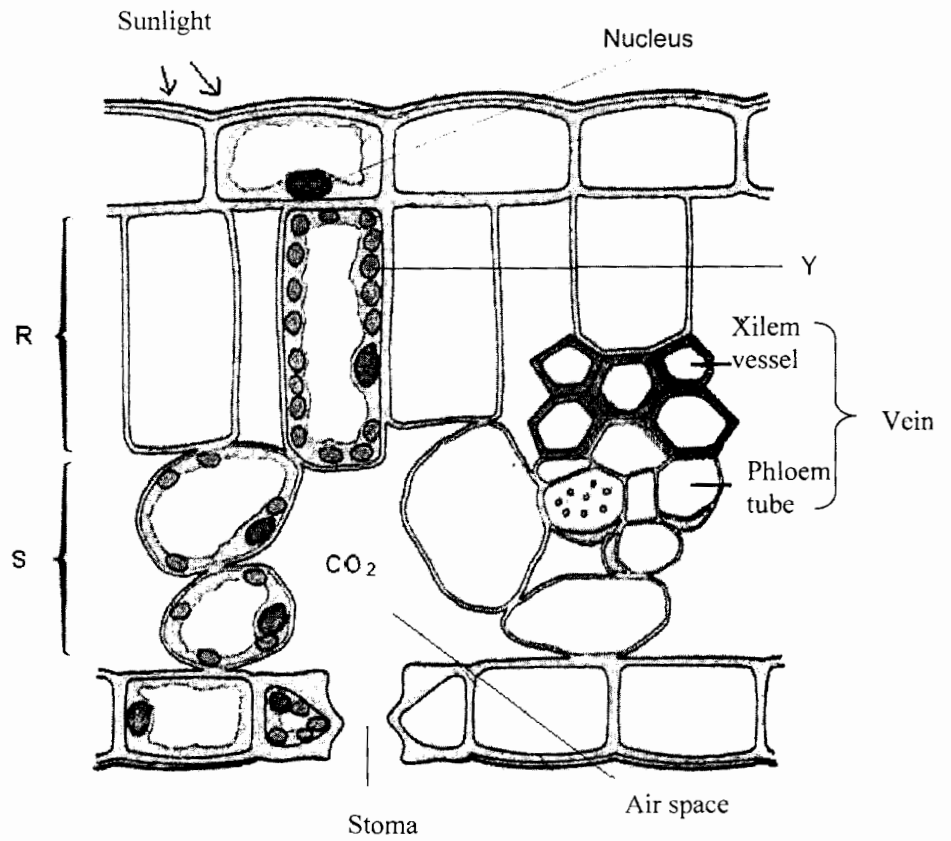


DIAGRAM 2.1

a) Name the structures labelled as R dan Y.

R: .....

Y: .....

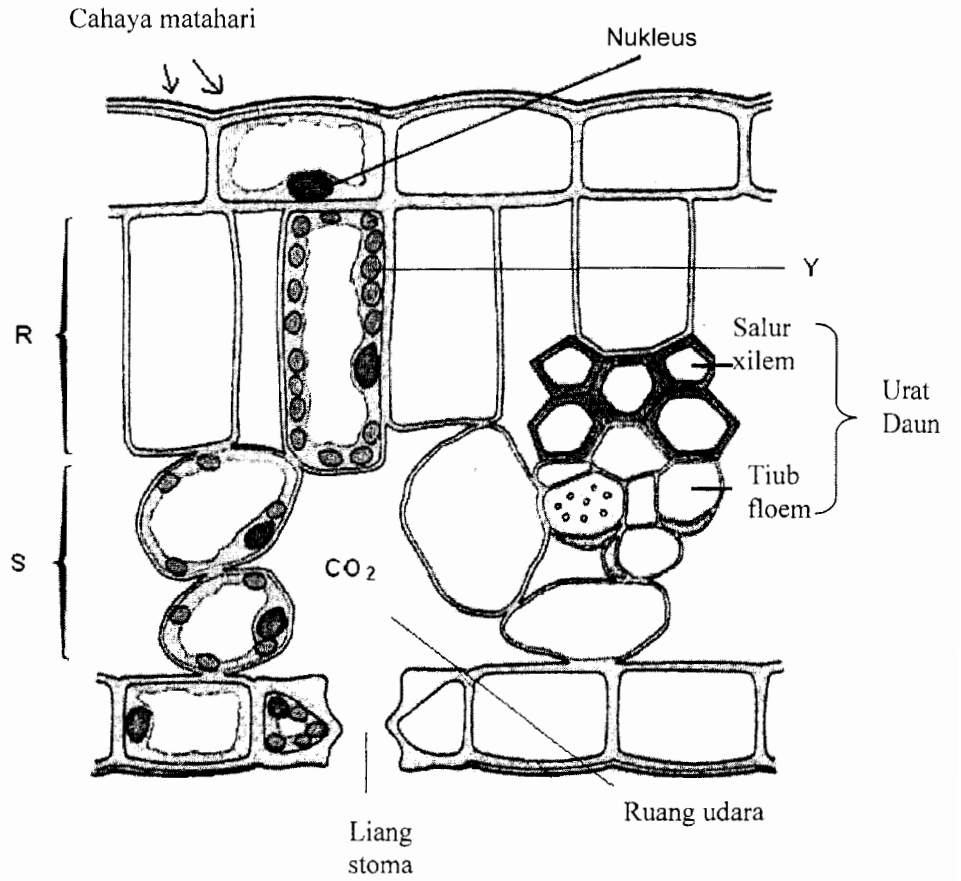
[2 marks]

2(a)



Untuk  
Kegunaan  
Pemeriksa

2. Rajah 2.1 menunjukkan rajah skema tindak balas yang berlaku dalam tumbuhan hijau untuk menghasilkan makanan melalui proses fotosintesis.



RAJAH 2.1

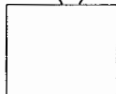
(a) Namakan struktur yang berlabel R dan Y.

R:.....

Y:.....

[2 markah]

2(a)



For  
Examiner's  
Use

(b) Diagram 2.2 shows the structure of Y.

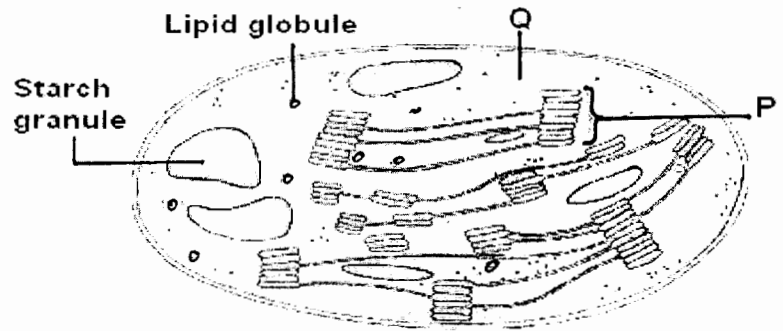


DIAGRAM 2.2

Describe the photosynthesis reactions which occur in structures P and Q.

(i) Structure P :

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

(ii) Structure Q:

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

[4 marks]

c)(i) Write down the full equation for photosynthesis

.....

[1 mark]

(ii) On Diagram 2.2, mark with arrows to show the path of how raw materials for photosynthesis get into Y.

[2 marks]

2(b)(i)

2(b)(ii)

2(c)(i)

2(c)(ii)

(b) Rajah 2.2 menunjukkan struktur Y.

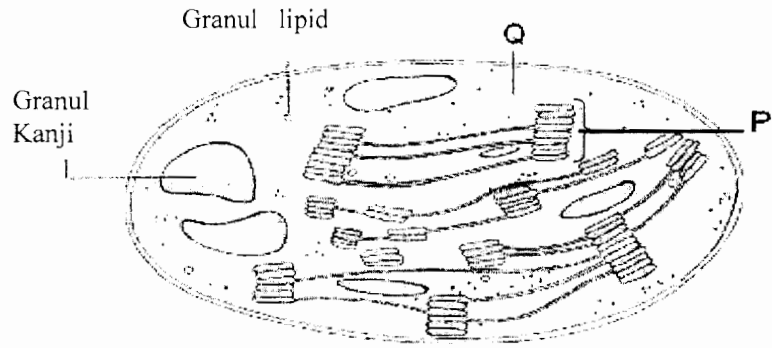


DIAGRAM 2.2

Huraikan tindakbalas fotosintesis yang berlaku dalam struktur P dan Q

(i) Struktur P:

.....

.....

.....

2(b)(i)

(ii) Struktur Q:

.....

.....

.....

2(b)(ii)

[4 markah]

(c)(i) Tuliskan persamaan perkataan untuk tindakbalas fotosintesis.

.....

[1 markah]

2(c)(i)

2(c)(ii)

(ii) Pada rajah 2.2, lukiskan anak panah untuk menunjukkan bagaimana bahan mentah untuk proses fotosintesis masuk ke dalam Y.

*For  
Examiner's  
Use*

(d) The process of photosynthesis contributes to the balance of nature.

(i) State **one** importance of photosynthesis to the balance of nature.

2(d)(i)

..... [1 mark]

(ii) Explain how the problem of air pollution can affect the rate of photosynthesis.

2(d)(ii)

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

**TOTAL**

[2 marks]

*Untuk  
Kegunaan  
Pemeriksa*

2(d)(i)

2(d)(ii)

**JUMLAH**

(d) Proses fotosintesis didapati menyumbang kepada keseimbangan alam sekitar.

(i) Nyatakan satu kepentingan fotosintesis kepada keseimbangan alam sekitar.

.....  
[1 markah]

(ii) Terangkan bagaimana pencemaran udara memberi kesan terhadap kadar fotosintesis.

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

[2 markah]

For  
Examiner's  
Use

3. Diagram 3.1 shows the mechanism of blood clotting.

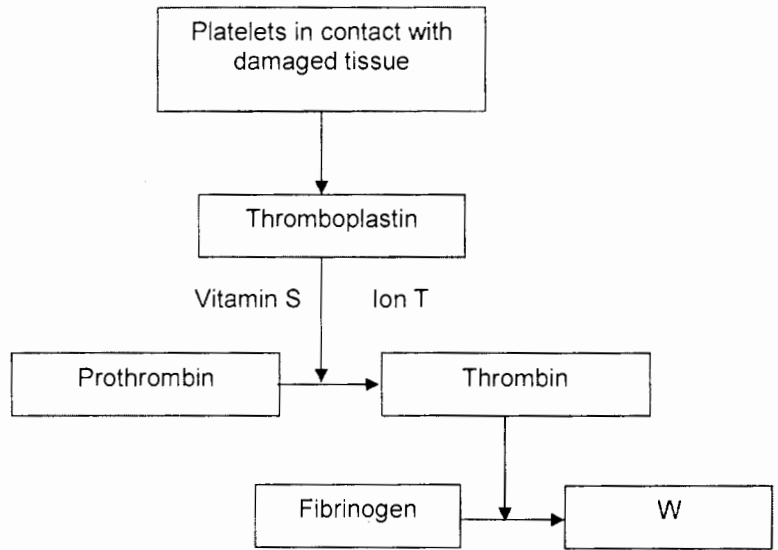


DIAGRAM 3.1

3(a)

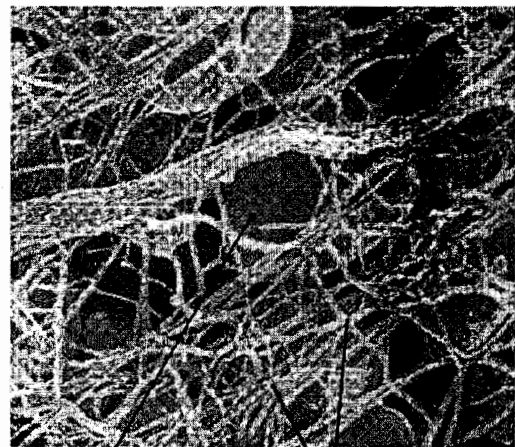
(a) Name Vitamin S and Ion T.

Vitamin S: .....

Ion T : .....

[2 marks]

(b) Diagram 3.2 shows a vertical section through structure W.



Red blood cell

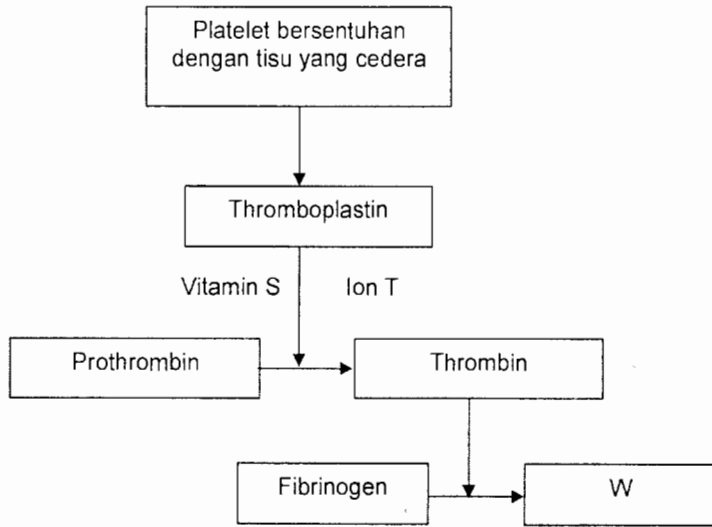
W

DIAGRAM 3.2



Untuk  
Kegunaan  
Pemeriksa

3. Rajah 3.1 menunjukkan mekanisma pembekuan darah.



RAJAH 3.1

(a) Namakan vitamin S dan ion T

2(a)

Vitamin S: .....

Ion T: .....

[2 markah]

(b) Rajah 3.2 menunjukkan keratan secara menegak menerusi struktur W.

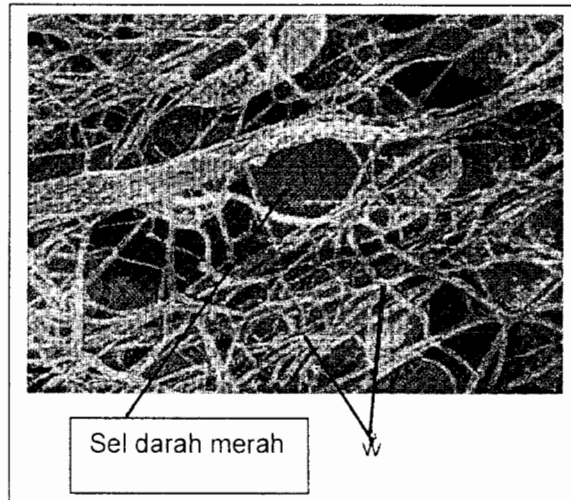


DIAGRAM 3.2

For  
Examiner's  
Use

3(b)(i)

3(b)(ii)

3(b)(iii)

3(b)(iv)

3(c)

3(d)

**TOTAL**

(i) Name structure W.

..... [1 mark]

(ii) Explain how structure W is formed.

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

(iii) State the necessity for the formation of structure W around the wound.

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

(iv) The structure W does not normally formed in intact blood vessels.  
Explain why?

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

(c) What is the consequence if blood clot form within the unbroken blood vessel?

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

(d) Haemophilia is a genetic disease in which the individual cannot produce a clotting factor. Suggest one method to save the afflicted person from dying due to excessive bleeding.

..... [1 mark]

Untuk  
Kegunaan  
Pemeriksa

3(b)(i)

(i) Namakan struktur W

.....  
[1 markah]

3(b)(ii)

(ii) Terangkan bagaimana struktur W terhasil

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

3(b)(iii)

(iii) Nyatakan kepentingan pembentukan struktur W di kawasan yang luka

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

3(b)(iv)

(iv) Struktur W tidak terhasil di dalam salur darah yang tidak cedera. Terangkan kenapa?

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

3(c)

(c) Apakah akibatnya sekiranya terdapat darah beku didalam salur darah?

.....  
[1 markah]

3(d)

(d) Hemofilia adalah penyakit yang menyebabkan individu berkenaan tidak dapat menghasilkan faktor pembeku. Cadangkan satu cara untuk mengelakkan orang yang berpenyakit hemofilia ini mati akibat pendarahan berlebihan.

.....  
[1 markah]

JUMLAH



For  
Examiner's  
Use

4. Diagram 4.1 shows a part of human brain, kidney and a nephron which involve in the process of osmoregulation.

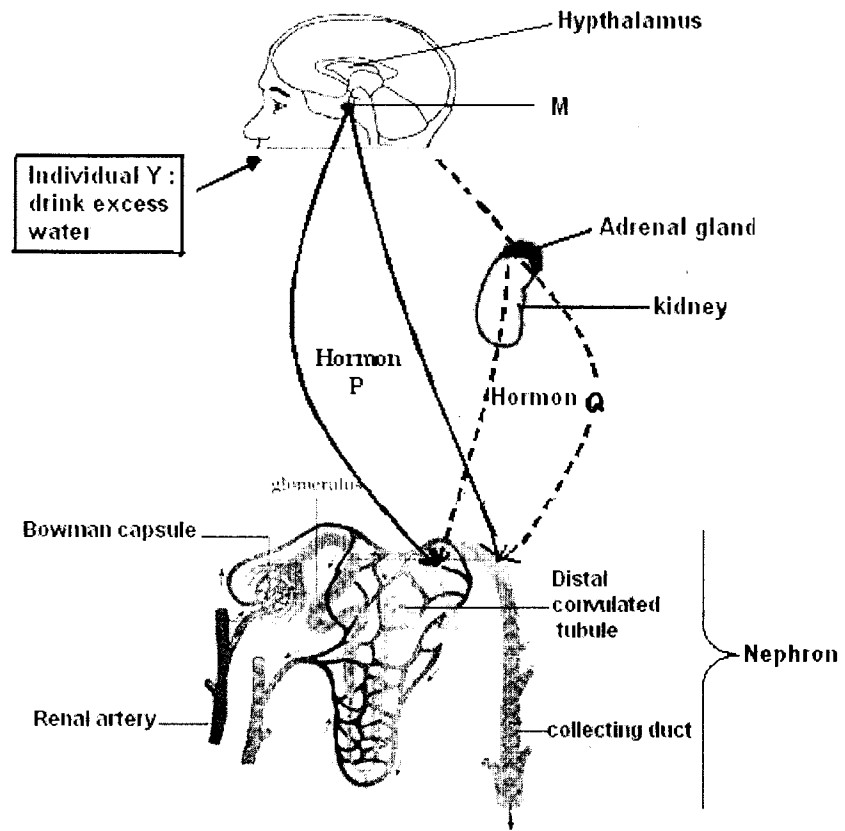


DIAGRAM 4.1

(a) What is the function of kidney in osmoregulation ?

4(a)

.....  
.....

[ 2 marks ]

Untuk  
Kegunaan  
Pemeriksa

4(b)(i)

(b) Individu Y telah minum air secara berlebihan.

(i) Apakah yang berlaku kepada tekanan osmosis darah?

.....

[1 markah]

(ii) Terangkan bagaimana hipotalamus dan kelenjar M bergerakbalas terhadap keadaan di (b)(i)?

Hipotalamus:.....

.....

.....

Kelenjar M:.....

.....

.....

[4 markah]

(c) Sekiranya individu Y makan makanan yang terlalu masin, kelenjar adrenal akan merembeskan kurang hormon Q.

4(c)(i)

(i) Apakah hormon Q?

.....

[1 markah]

(ii) Terangkan bagaimana hormon Q terlibat di dalam mekanisma mengawalatur tekanan osmosis darah balik ke aras normal.

.....

.....

.....

.....

[3 markah]

4(c)(ii)

- (d) Kidney function may be impaired by excessive blood loss, certain poisons or infectious diseases which can lead to kidney failure. Diagram 4.2 shows a haemodialysis machine which can save a kidney patient's life.

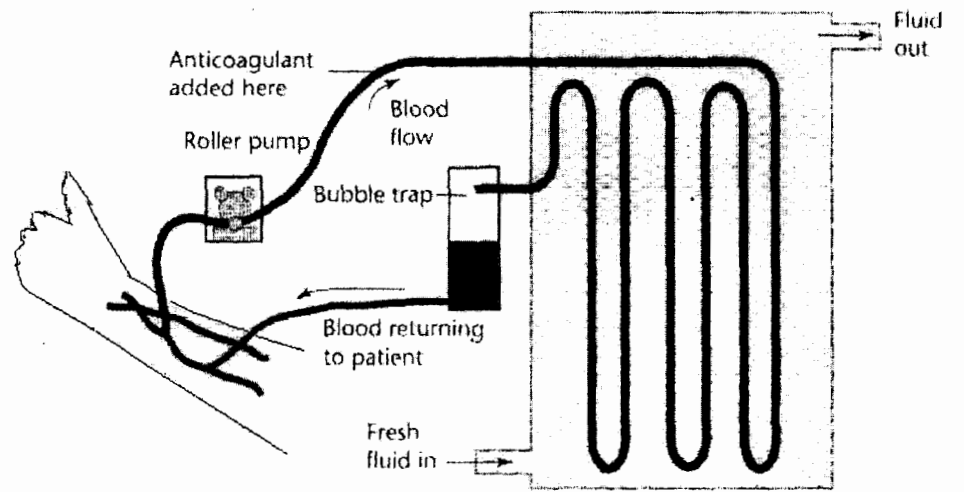


DIAGRAM 4.2

Explain the principle on how the machine operates.

4(d)

.....

.....

.....

.....

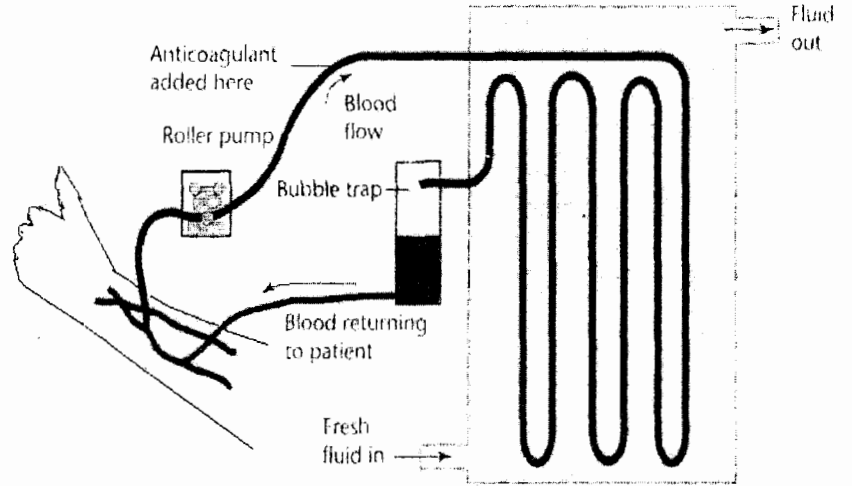
[ 2 marks

TOTAL

Untuk  
Kegunaan  
Pemeriksa

- (d) Buah pinggang boleh dirosakkan oleh masalah kekurangan darah, racun atau jangkitan penyakit yang akhirnya menyebabkan buah pinggang gagal berfungsi.

Rajah 4.2 menunjukkan mesin yang boleh menyelamatkan buah pinggan pesakit.



RAJAH 4.2

Terangkan bagaimana mesin di atas berfungsi.

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

[3 markah]

4(d)

JUMLAH

For  
Examiner's  
Use

5. Diagram 5.1 shows types of wings in fruit flies (*Drosophila* sp.)

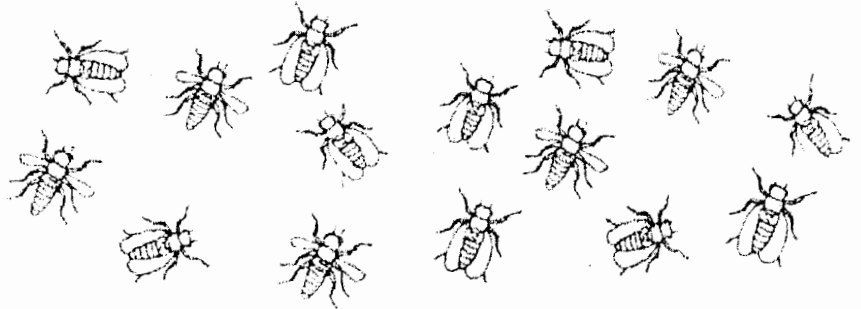
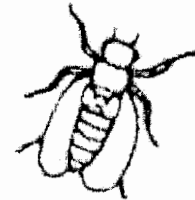


DIAGRAM 5.1

(a) Name the types of wings as shown below.



5(a)

Type of wing:.....

Type of wing:.....

[ 2 marks

(b) (i) State **one** factor that causes variation between the two types of wings in fruit flies.

5(b)(i)

[ 1 mark

(ii) Describe how the factor in (b) (i) causes variation.

5(b)(ii)

[ 2 marks



For  
Examiner's  
Use

5(b)(iii)

(b)(iii) Referring to diagram 5.1, construct a histogram for the number of fruit flies against the types of wings.

[ 3 marks ]

(c) Diagram 5.2 (i) and diagram 5.2(ii) shows the changes occur in structure of chromosomes which causes mutation.

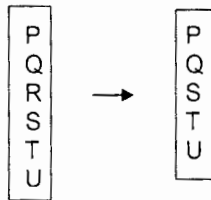


DIAGRAM 5.2 (i)

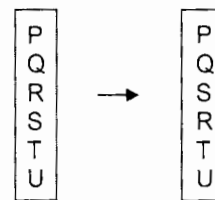


DIAGRAM 5.2 (ii)

5(c)(i)

(i) State **one** factor which causes the mutation.

.....

[ 1 mark ]

(ii) Compare the mutations which occur in diagram 5.2(i) and 5.2(ii)?

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

[ 3 marks ]

5(c)(ii)

**TOTAL**

**Section B**

[ 20 marks]

Answer any one question from this section.

The time suggested to complete this section is 30 minutes.

6. Diagram 6 shows three organisms P, Q and R

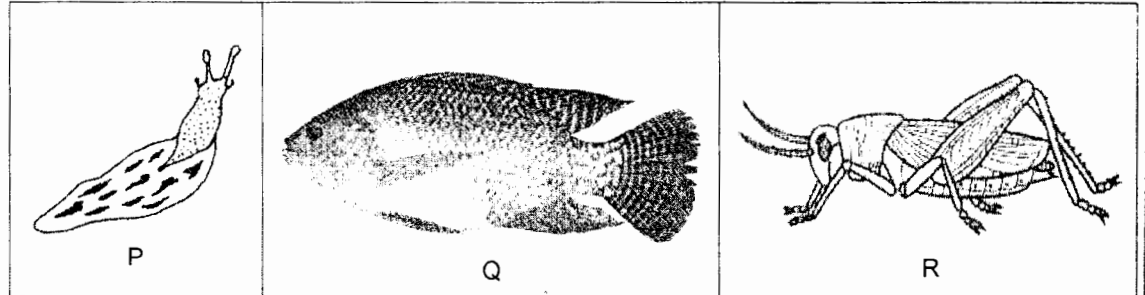


DIAGRAM 6

- (a) (i) Describe the type of skeleton in P and Q [4 marks]
- (ii) Explain one similarity and two differences between the skeleton Q and R. [6 marks]
- (b) Muscle cramp, muscular dystrophy, osteoporosis and arthritis are four health problems related to the musculoskeletal system. State the causes of each problem and suggest ways to overcome these health problems. [10 marks]

7. Diagram 7.1 shows the human life cycle <sup>30</sup>

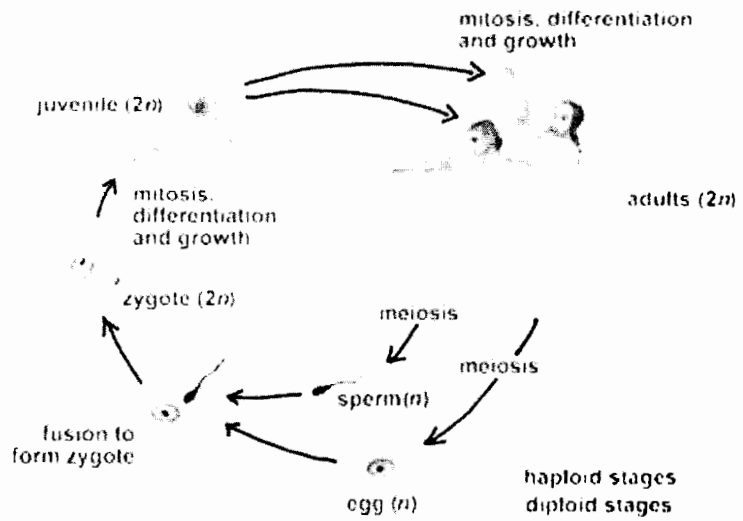


DIAGRAM 7.1

- (a) Explain the importance of meiosis in maintaining the number of chromosomes in human in Diagram 7.1. [4 marks]
- (b) Diagram 7.2 shows the product of cloned plant.



DIAGRAM 7.2

Based on Diagram 7.2, explain how the plant being cloned

[6 marks]

(c) Diagram 7.3 shows the organs found in the mangrove trees.

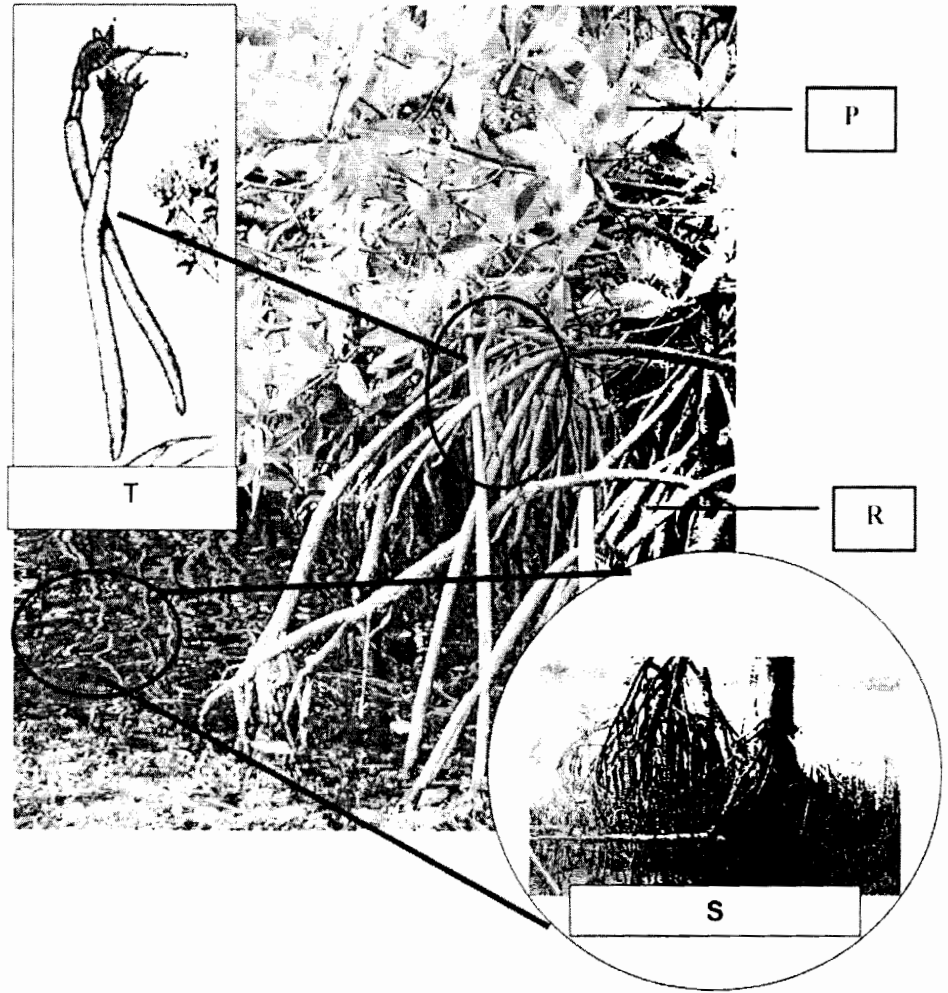


DIAGRAM 7.3

Explain the adaptive characteristics of organ P,R,S and T that enable the mangrove trees to survive at the swampy seashore.

[10 marks]

34  
**Section C**  
 [ 20 marks ]

Answer any one question from this section.

The time suggested to complete this section is 30 minutes.

8. Diagram 8.1 shows cycle of events in the ovary and the hormonal control of menstrual cycle.

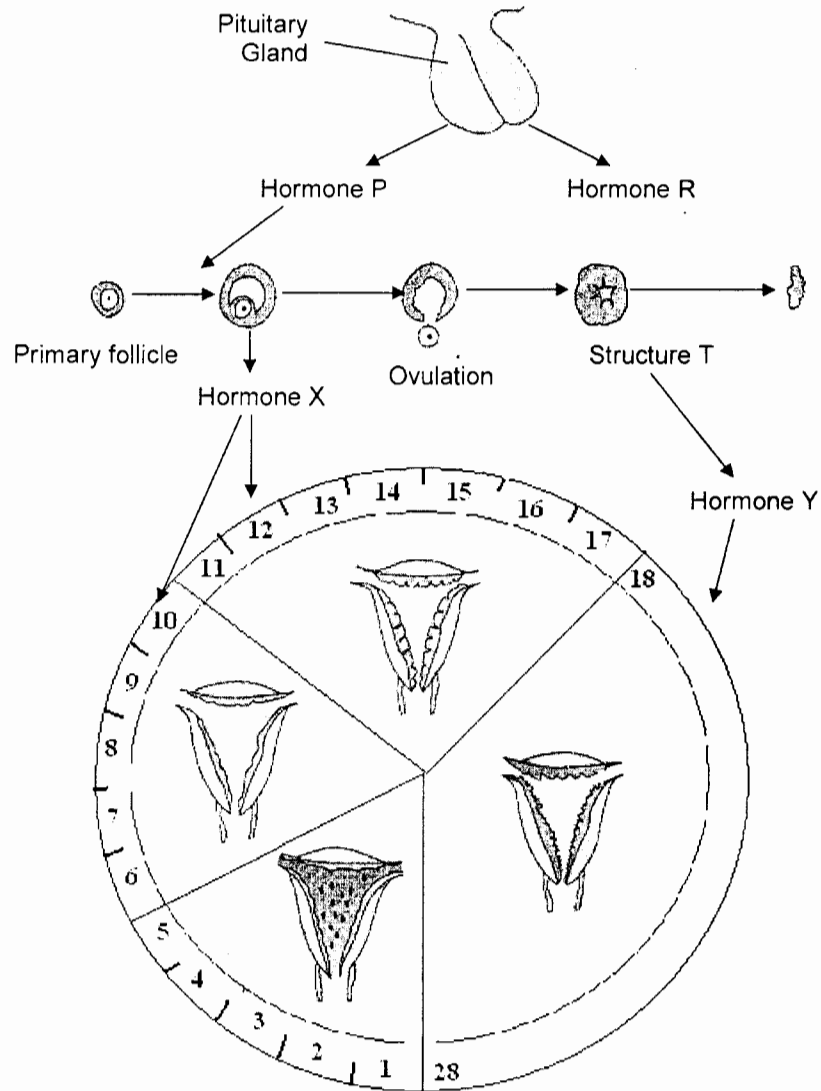


DIAGRAM 8.1

- (a) (i) Based on Diagram 8.1, state the meaning of menstrual cycle? [ 2 marks ]
- (ii) Starting with hormone produced by pituitary gland and ovary, describe how the hormone regulate the menstrual cycle and an ovary produced an ovum? [ 8 marks ]

(b) Diagram 8.2 shows a longitudinal section of shoot tips of a plants.

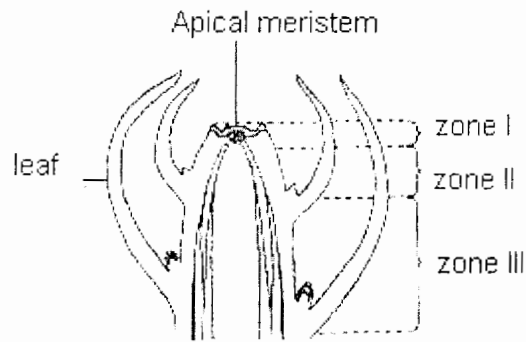


DIAGRAM 8.2

Describe the process of growth in each zone.

[6marks]

(c) Diagram 8.3(i) and Diagram 8.3(ii) show the growth curve for two organisms.

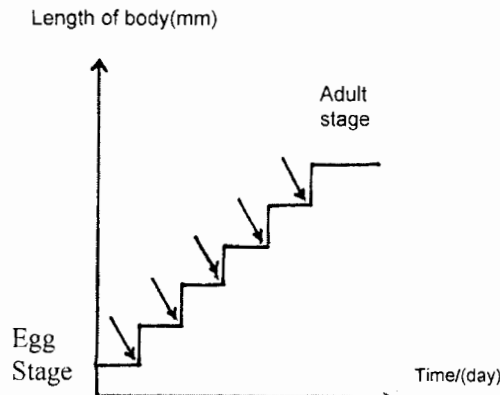


DIAGRAM 8.3 (i)

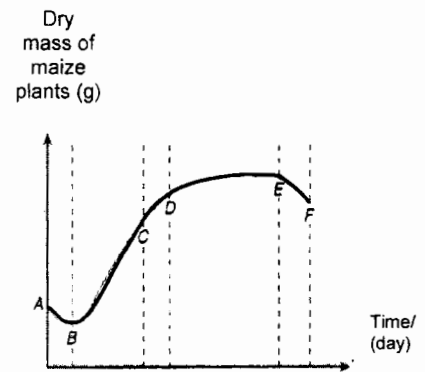


DIAGRAM 8.3 (ii)

Based on Diagram 8.3(i) and Diagram 8.3(ii), explain the differences between the two growth curve of both organisms.

[ 4 marks]

9. Diagram 9 shows a man walking past the <sup>38</sup>**dry lake** bed of Tasik Pedu in Kedah.



DIAGRAM 9

- (a) (i) Name the environmental problem shown in the diagram and how it occurs.  
(ii) Explain ways to overcome the environmental problem that you have stated in (a)(i).

[10 marks]

- (b) 

When sewage is released into the pond gradually, the number and the size of aquatic animals increase but when <b>more</b> sewage is released into the pond, all the aquatic animals die.
--

Explain how this sewage affect the pond ecosystem and the balance of nature.

[ 10 marks]

END OF QUESTION PAPER