Nama :.....

Tingkatan:.....

4551/2
Biologi
Kertas 2
OGOS
2008

$2\frac{1}{2}$ jam

SEKOLAH BERASRAMA PENUH
BAHAGIAN PENGURUSAN SEKOLAH BERASRAMA PENUH/ KLUSTER
KEMENTERIAN PELAJARAN MALAYSIA

PEPERIKSAAN PERCUBAAN SETARA
SPM 2008

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**. Jawab **semua** soalan dalam **Bahagian A** dan **dua** soalan sahaja daripada **Bahagian B** .
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 hendaklah ditulis pada ruang jawapan yang disediakan. Anda diminta menjawab dengan lebih panjang untuk Bahagian B 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 kedua-dua bahagian ini hendaklah diserahkan bersama-sama. Anda hendaklah menyerahkan kertas tulis dan kertas graf tambahan.
5. Penggunaan kalkulator saintifik yang **tidak** boleh diprogramkan adalah dibenarkan.

Untuk Kegunaan Pemeriksa			
Bahagian	Soalan	Markah penuh	Markah dipeolehi
A	1	13	
	2	12	
	3	12	
	4	12	
	5	11	
B	6	20	
	7	20	
	8	20	
	9	20	
Jumlah		100	

Kertas soalan ini mengandungi 20 halaman bercetak

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Section A

[60 marks]

Answer **all** questions in this section.

1 Diagram 1 shows a section through the human heart.

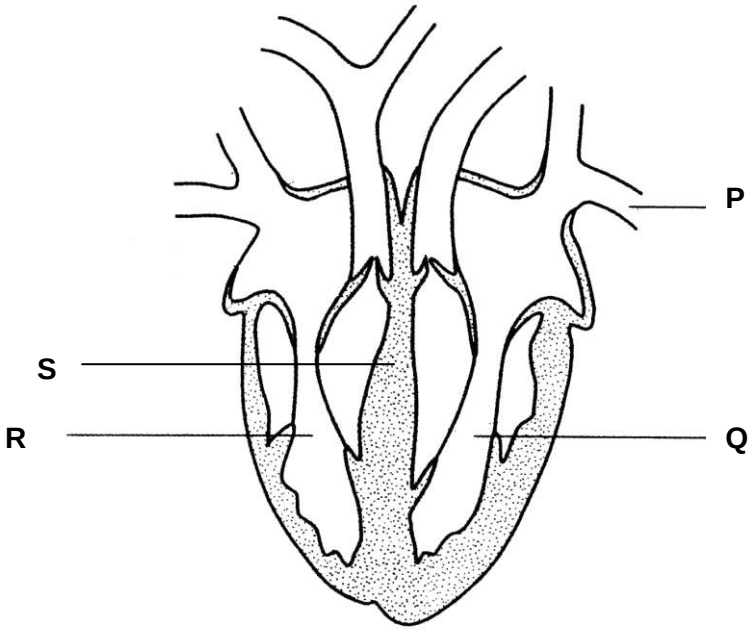

DIAGRAM 1

1 (a) (i)

(a) (i) Name the parts labelled P and S.

P : .....

S : .....

[2 marks]

1 (a) (ii)

(ii) In Diagram 1, shade the cavity of the ventricle which contains oxygenated blood.

[1 mark]

1 (a) (iii)

(iii) What is oxygenated blood?

.....

.....

[1 mark]

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(b) Explain why the wall that around the chamber Q is much thicker than that around chamber R?

……

……

……..

……..

[2 marks]

1 (b)

(c) (i) In Diagram 1, label the bicuspid valve with letter T.

[1 mark]

1 (c) (i)

(ii) Explain the function of bicuspid valve.

……

……

……

……

[2 marks]

1 (c) (ii)

(iii) Why are those valves supported by structure labeled U?

……

……

[1 mark]

1 (c) (iii)

(d) The coronary arteries supply blood to heart muscle.

(i) Suggest **one** activity of human which might cause a blood clot in a coronary artery.

……

[1 mark]

1 (d)

(ii) Explain what might be the result of such a blockage.

……

……

……

[2 marks]

1 (d) (ii)

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2 An experiment was performed to find out how fast a plant photosynthesized as the concentration of carbon dioxide in the air around it was varied. The results are shown in Table 1.

Carbon dioxide concentration / %	*Rate of photosynthesis in arbitrary units*	
	Low light intensity	High light intensity
0.00	0	0
0.02	20	33
0.04	29	53
0.06	35	68
0.08	39	79
0.10	42	86
0.12	45	89
0.14	46	90
0.16	46	90
0.18	46	90
0.20	46	90

TABLE 1

2 (a) (i)

(a) (i) Plot these result on a graph paper provided in page 5.

[3 marks]

2 (a) (ii)

(ii) What is the carbon dioxide concentration of normal air?

.....

[1 mark]

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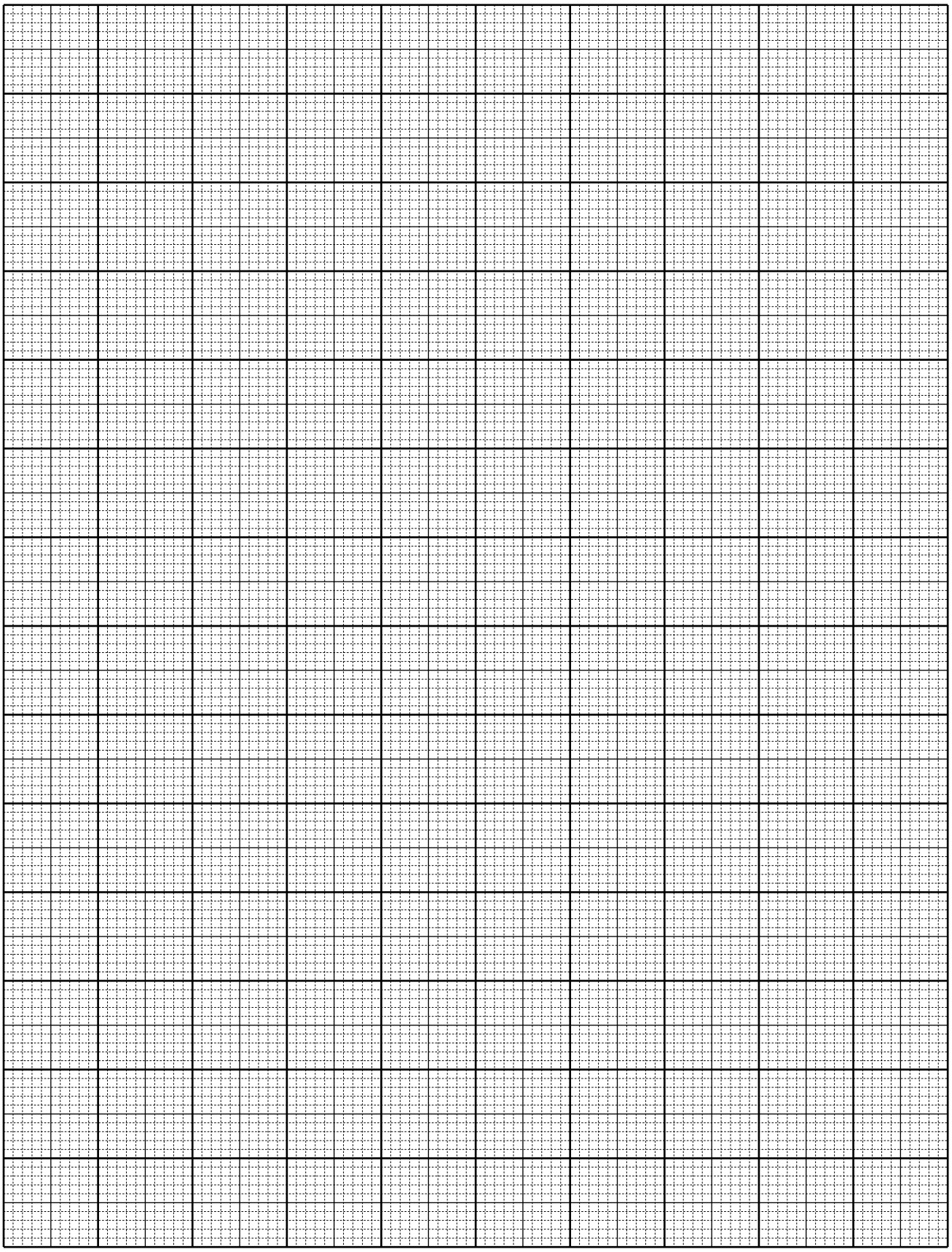

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2 (a) (iii)

(iii) Based on the graph that has been plotted, what is the rate of photosynthesis at this carbon dioxide concentration in a high light intensity?

……
[1 mark]

(b) Market gardeners often add carbon dioxide to the air in greenhouses. What is the advantage of doing this?

2 (b)

……

……..

……..
[2 marks]

2 (c)

(c) Up to what values does carbon dioxide concentration act as a limiting factor at high light intensities? Explain your answer.

……..

……..

2 (d)

……..
[2 marks]

(d) Explain how leaves are adapted to be efficient at absorbing carbon dioxide from the atmosphere.

……...

……..
[2 marks]

TOTAL

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3 Diagram 3.1 show apparatus that can be used to explain the mechanism of breathing.

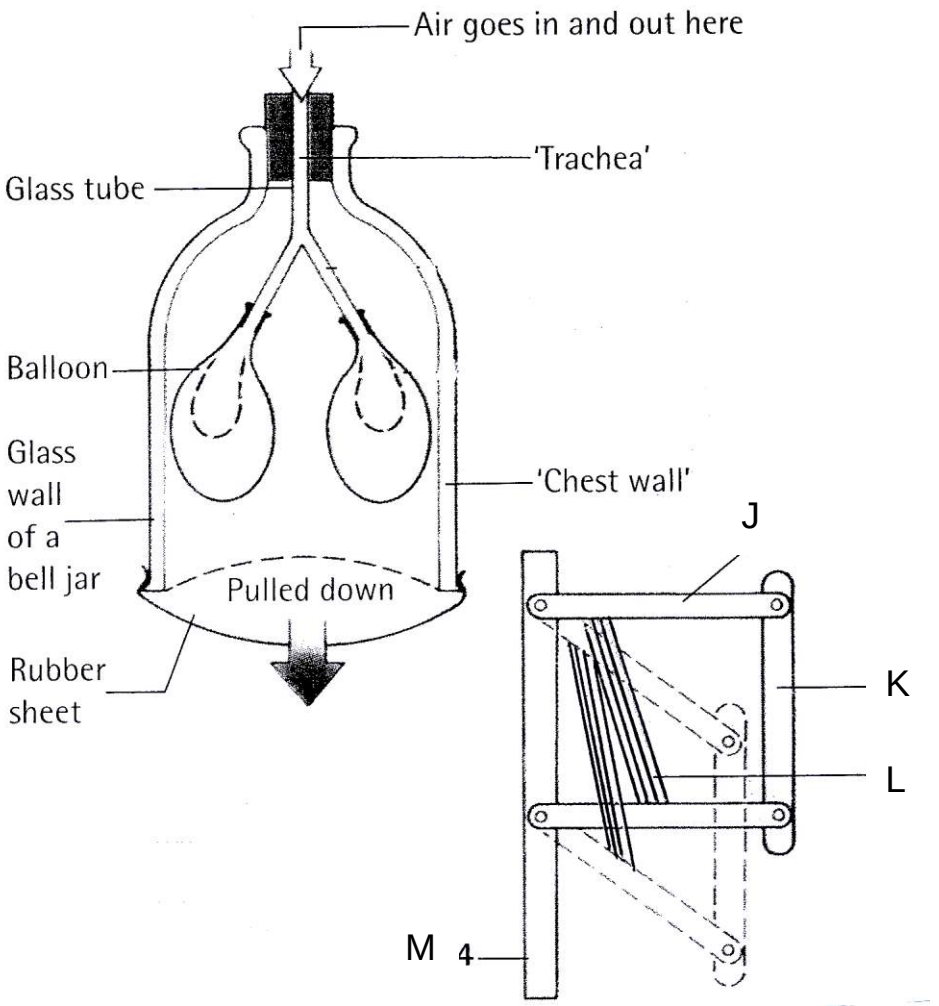

DIAGRAM 3.1

3 (a) (i)

(a) (i) What does the rubber sheet represent ?

.....

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3 (a) (ii)

(ii) What will happen to the ballons when the rubber sheet is pulled downwards?

……..

[1 mark]

3 (a) (iii)

(iii) What phase of the breathing cycle is represented when the rubber sheet is allowed to return to its resting position ?

……

……

[1 mark]

3 (b)

(b) Based on Diagram 3.2, what parts of the human respiratory system do the labels J, K, L and M represent?

J : ……

K : ……..

L : ……..

M : ……

[4 marks]

(c) Diagram 3.2 shows a part of lung of non-smoker

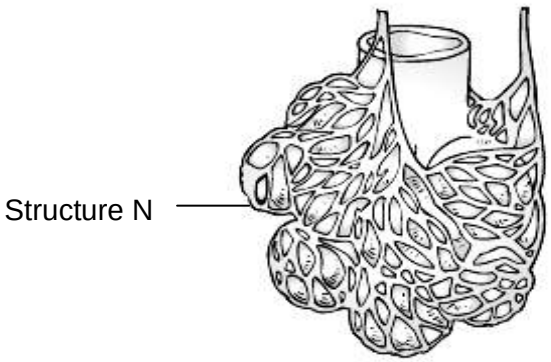

DIAGRAM 3.2

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(i) Explain how smoking would change the structure N.

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……

……

……

[2 marks]

3 (c) (i)

(ii) How would carbon monoxide in the cigarette smoke affect the rate of cellular respiration ?

……..

……

……

[3 marks]

3 (c) (ii)

TOTAL

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4 Diagram 4.1 shows gland X and organ Y which involve in the osmoregulation in human. Diagram 4.2 shows an excretory unit and its associated blood vessels found in organ Y.

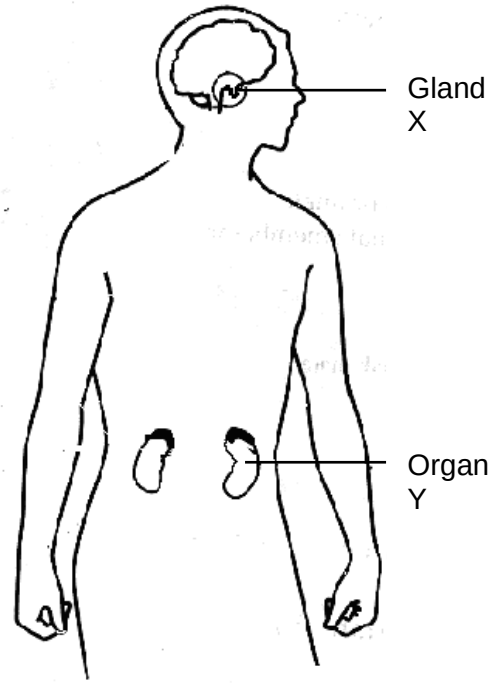

DIAGRAM 4.1

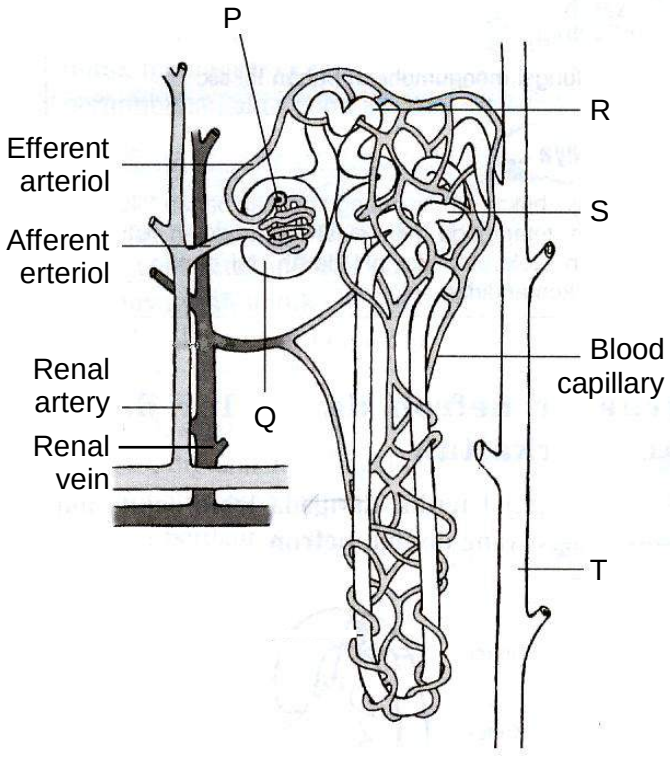

DIAGRAM 4.2

4 (a)

(a) Name gland X and organ Y.

Gland X .....

Organ Y .....

[2marks]

4 (b)

(b) Explain the process which causes the movement of some of the blood components from P into Q.

.....

.....

.....

[2 marks]

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(c) Explain the difference in the solute concentration of the filtrate in R and Q.

……

……

……

[2 *marks*]

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4 (c)

(d) The contents of urine which passes through the collecting duct, T, are influenced by various factors.
Describe how gland X involves in the formation of urine in the body of an athlete running a 10 km race.

……

……

……

……

[3 marks]

4 (d)

(e) In a normal healthy person the concentration of urea in renal artery is higher than in renal vein.

State the changes in urea concentration in the renal vein after eating meat and egg.

……

……

[1mark]

4 (e)

(f) Explain the importance of osmoregulation in human.

……

……

……

[2 *marks*]

4 (f)

TOTAL

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5 Diagram 5.1 shows a graph on how the endometrium in the human uterus varies in thickness with time. Fertilisation took place on the 16th day of the second month.

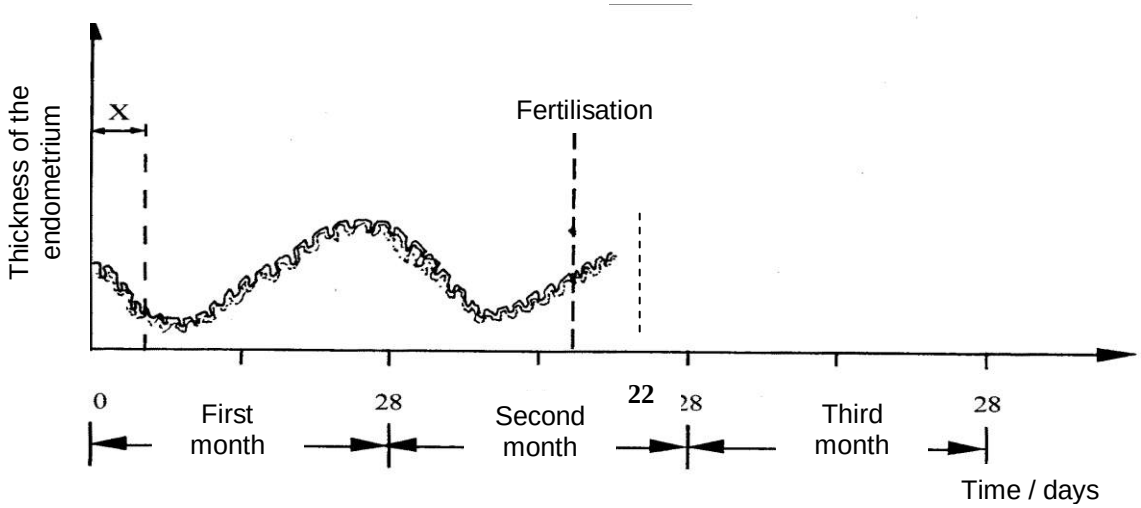

DIAGRAM 5.1

5 (a) (i)

(a) (i) State the process which took place at X.

……

……

[1mark]

5 (a) (ii)

(ii) Based on the Diagram 5.1, state **one** reason to support your answer in (a) (i).

……..

……..

[1 mark]

5 (b)(i)

(b) (i) Complete the graph in Diagram 5.1 to show the changes in the thickness of the endometrium after day 22 in the second month until day 28 of the third month.

[1 mark]

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(ii) Explain why the thickness of the endometrium changes in the way shown in (b)(i).

……..

……..

[2 marks]

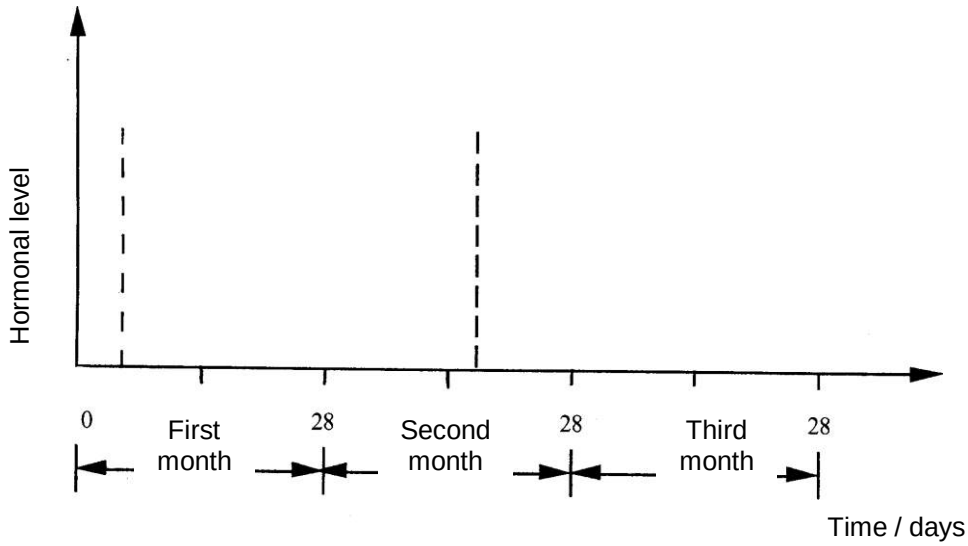

DIAGRAM 5.2

(c) (i) Based on the changes in Diagram 5.1, complete Diagram 5.2 to indicate the level of the hormone progesterone from the first to the third months.

[1 mark]

5 (c) (i)

(ii) Explain the changes in the level of progesterone in the three months as shown in Diagram 5.2.

……

……

……

……

[2 marks]

5 (c)(ii)

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(d)

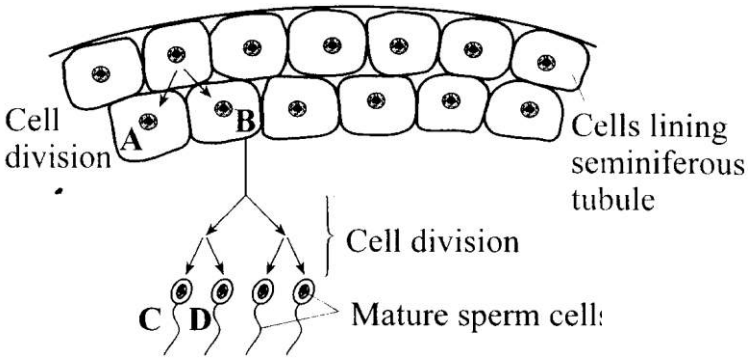

DIAGRAM 5.3

Diagram 5.3 shows the process of sperm formation in the human testis.

Are cells A, cell B and cell C genetically identical? Explain.

……

……

……

[2 marks]

5 (d)

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Section B
[40 marks]

Answer any **two** questions from this section.

6 Diagram 6 shows the eutrophication process that occurs to a lake due to the human activities.

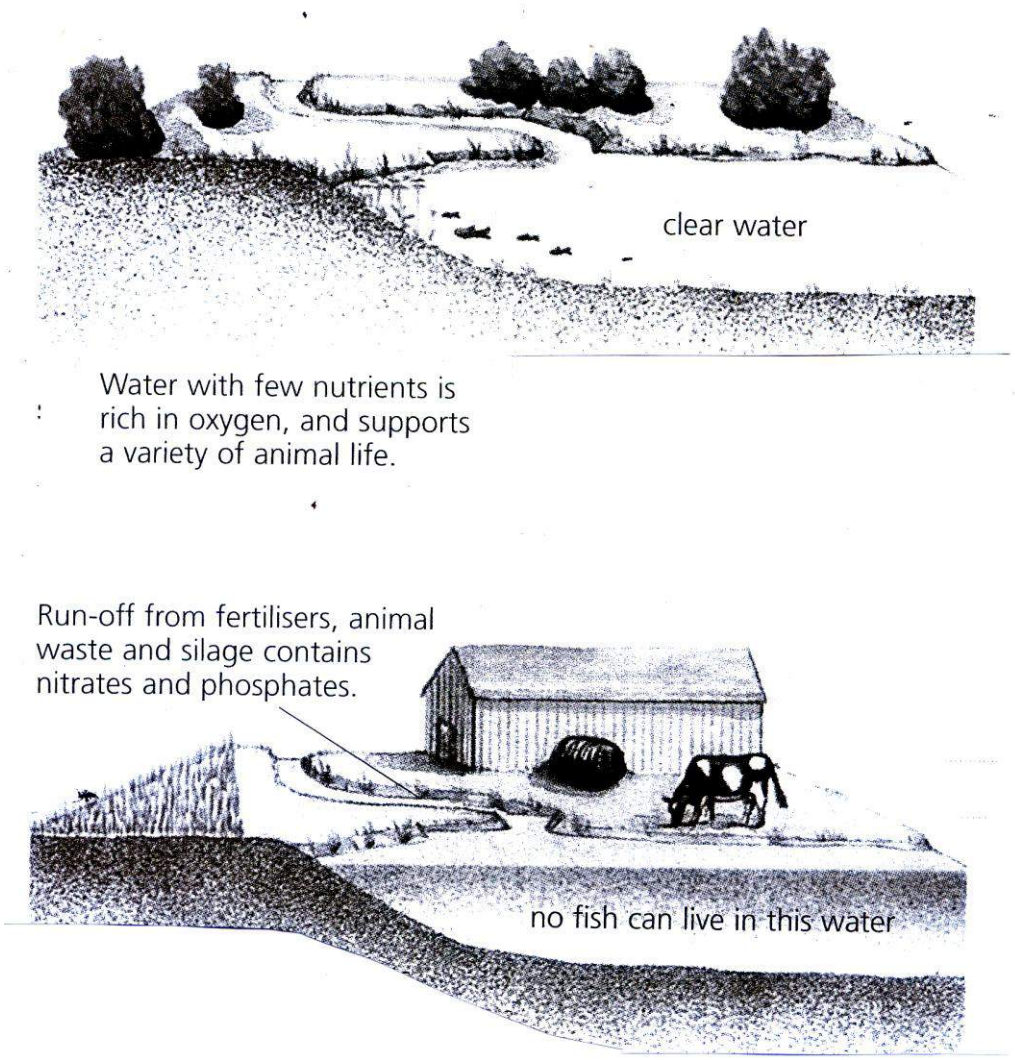

DIAGRAM 6

(a) Based on the Diagram 6, explain what is meant by `eutrophication`

[10 marks]

(b) Explain how each of the following can reduce water pollution:

(i) Treating sewage
(ii) Using organic fertilizers rather than inorganic ones.

[6 marks]

(c) Explain how deforestation of rainforest can cause flash flood.

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[4 marks]

7 (a) An operation has been conducted on a patient to remove part of his stomach as it has became cancerous. As a doctor, explain consequences of his situation to his digestion process.

[4 marks]

(b) How do genetic engineering and tissue culture methods improve the quality and quantity of food production in Malaysia?

[6 marks]

(c) Diagram 7 shows various processed food on a supermarket shelf.

DIAGRAM 7

Based on Biology knowledge, justify the impact of food processing on human being.

[10 marks]

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8 (a) (i) Diagram 8.1 shows the formation of two pairs of twins.

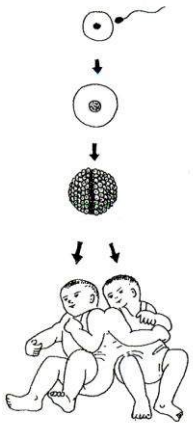

DIAGRAM 8.1

Based on the diagram, explain how the formation of twin X occurs.

[6 marks]

(ii) Diagram 8.2 shows the karyotype of an individual.

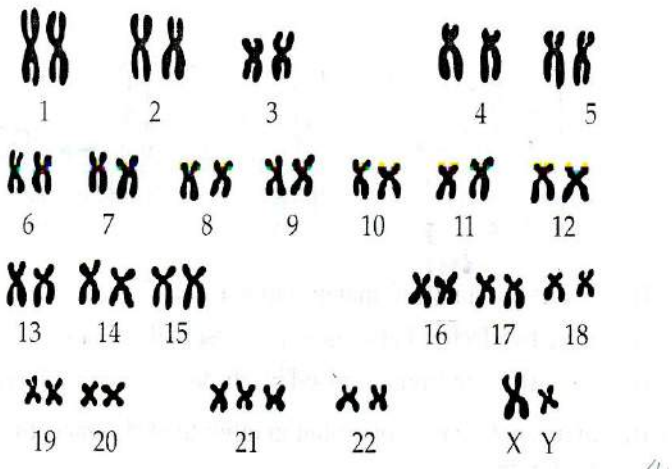

DIAGRAM 8.2

State this syndrome and explain how it happens.

[4 marks]

(b)

An ex-champion runner in 800m has two sons. The first son has a body with well develop muscles built very much like his father. He is also a good athlete, who practices every day. The second son is small in build, choosy in his diet, reluctant to exercise and prefers to spend his time indoors sleeping and reading.

Discuss the factors affecting the variation in the two sons.

[10 marks]

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9 Diagram 7.1 shows the stages of growth X,Y and Z at the tip of plant shoot.
Zone P, Q, R and S shows the changes that occur in the cells during the stages of the growth.

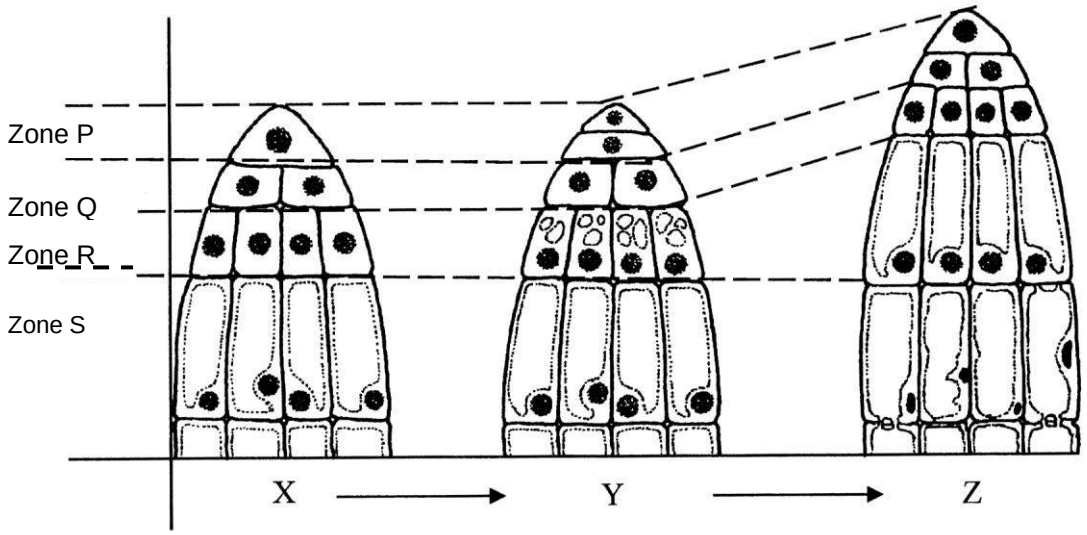

DIAGRAM 9.1

(a) Based on Diagram 9.1, explain the meaning of growth .

[4 marks]

(b) Auxin is a plant hormone which helps in plant growth.
Diagram 9.2 shows the growth of a plant shoot towards light.

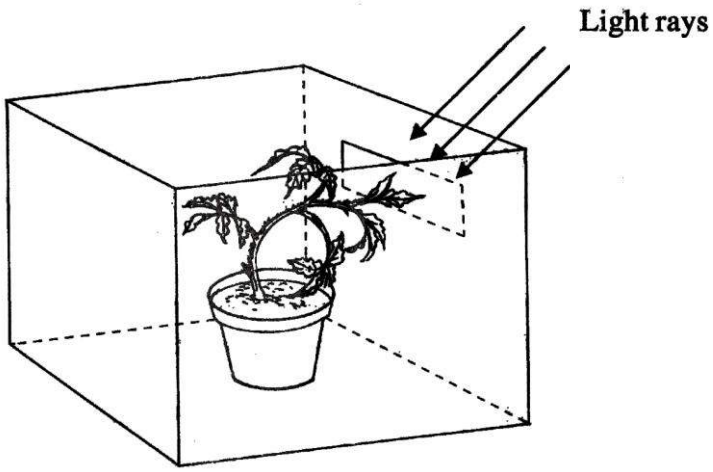

DIAGRAM 9.2

Explain the role of auxin in the growth of plant shoot as in Diagram 9.2

[6 marks]

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(c) Diagram 9.3 and 9.4 show cross section of dicotyledonous stem during process of growth.

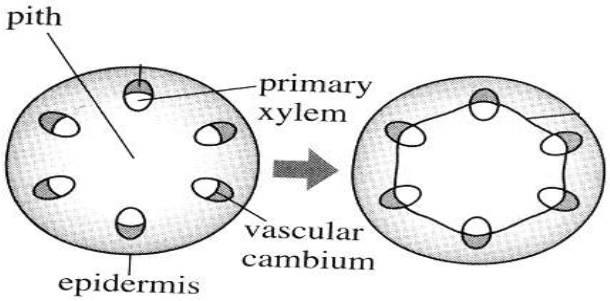

Diagram 9.3

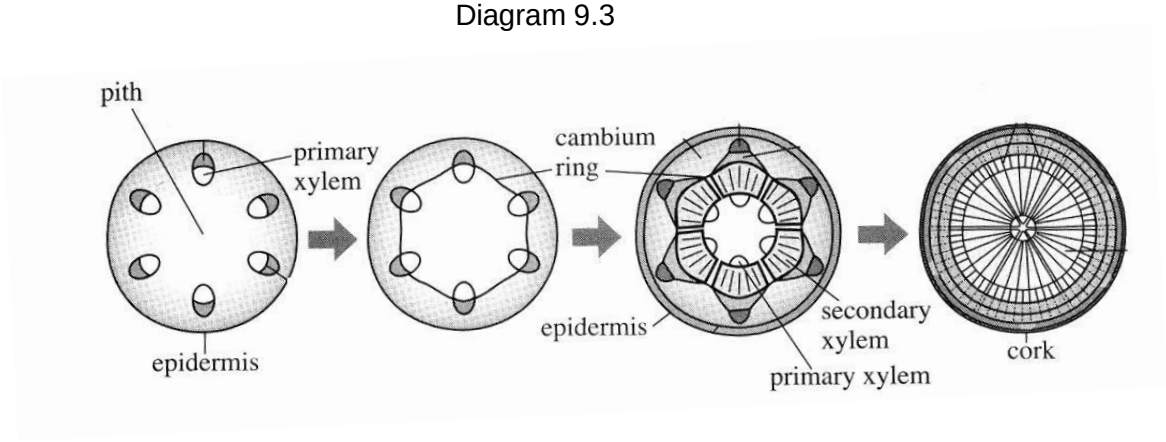

DIAGRAM 9.4

Based on the information given in the diagrams, explain the benefits to plants that undergo growth that shown in Diagram 9.3 as compared to those that undergo growth as shown in Diagram 9.4 .
How does this affect their life span, survival and economic value?

[10 markah]

END OF THE QUESTION

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INFORMATION FOR CANDIDATES

1. This question paper consists of **two** sections: **Section A** and **Section B**.

2. Answer **all** questions in **Section A.** Write your answers for **Section A** in the spaces provided in the question paper.

3. Answer any **two** question from **Section B .** Write your answers for **Section B** on the papers provided by the invigilators. You may use equations, diagrams, tables, graphs and other suitable methods to explain your answers.

4. The diagrams in the questions are not drawn to scale unless stated.

5. The marks allocated for each questions or sub-part of a question are shown in brackets.

6. If you wish to change your answer, cross out the answer that you have done. Then write down the new answer.

7. You may use a non-programmable scientific calculator.

8. You are advised to spend 90 minutes to answer questions in **Section A** and 60 minutes for **Section B**.

9. Detach **Section B** from this question paper. Tie the answers script together with this question paper and hand in to the invigilator at the end of the examination.

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