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

For examiner's use only

Section A

[60 marks]

Answer **all** questions in this section.

1 Diagram 1 shows a section through the human heart.

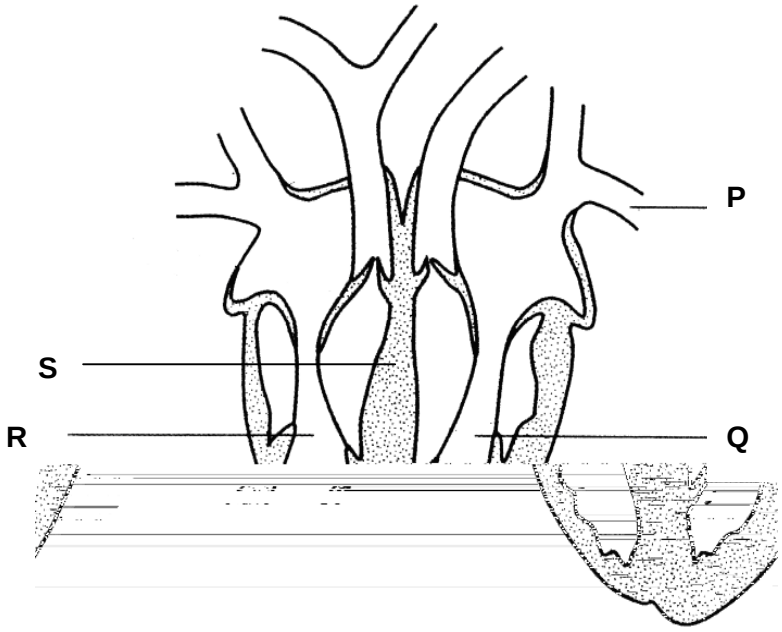

DIAGRAM 1

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]

For examiner's use only

(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)

TOTAL

For examiner's use only

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]

For examiner's use only

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

For examiner's use only

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

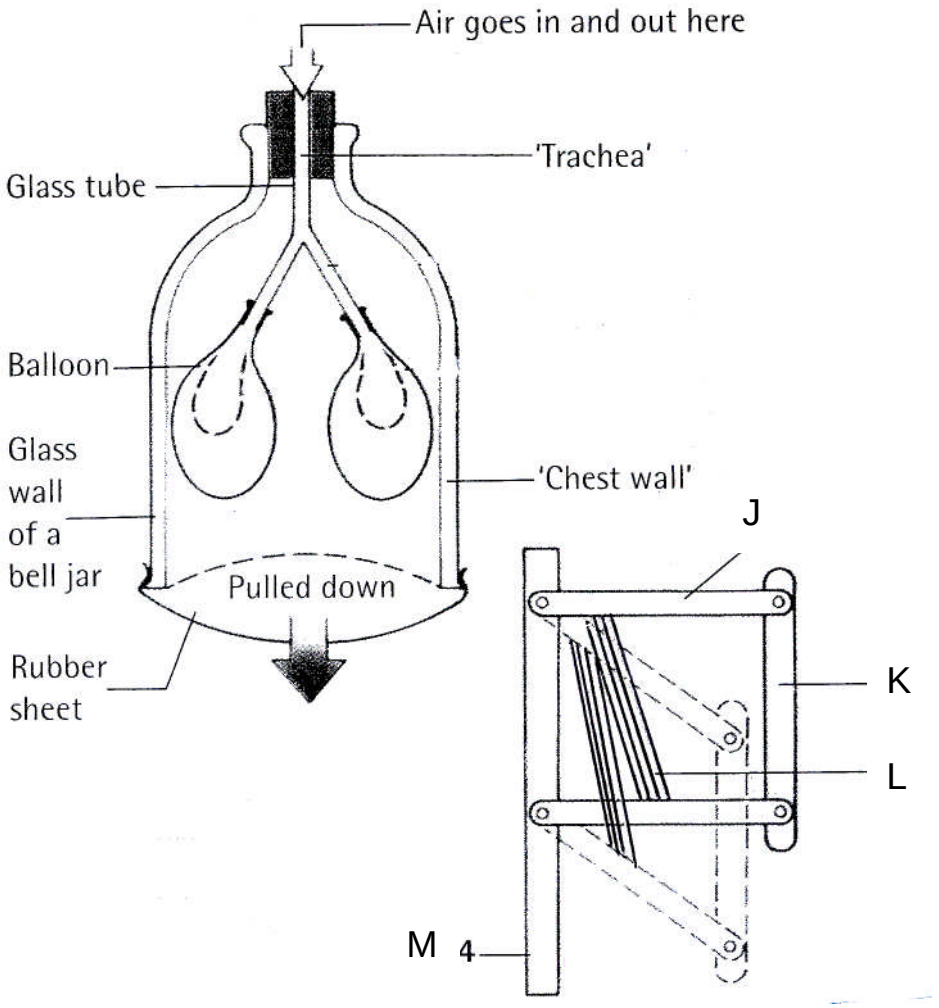

DIAGRAM 3.1

3 (a) (i)

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

……

For examiner's use only

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

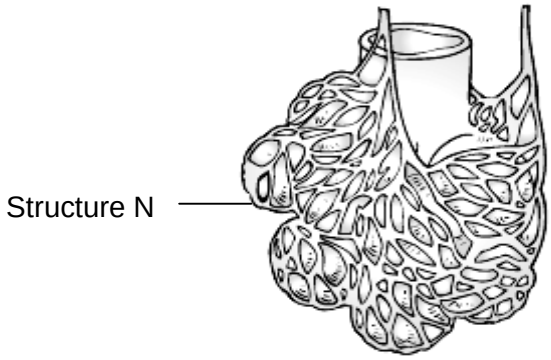

DIAGRAM 3.2

For examiner's use only

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

……

……

……

[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

For examiner's use only

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.

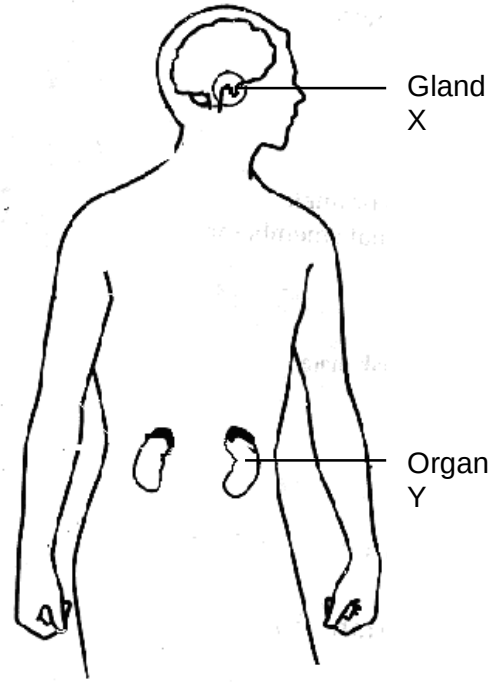

DIAGRAM 4.1

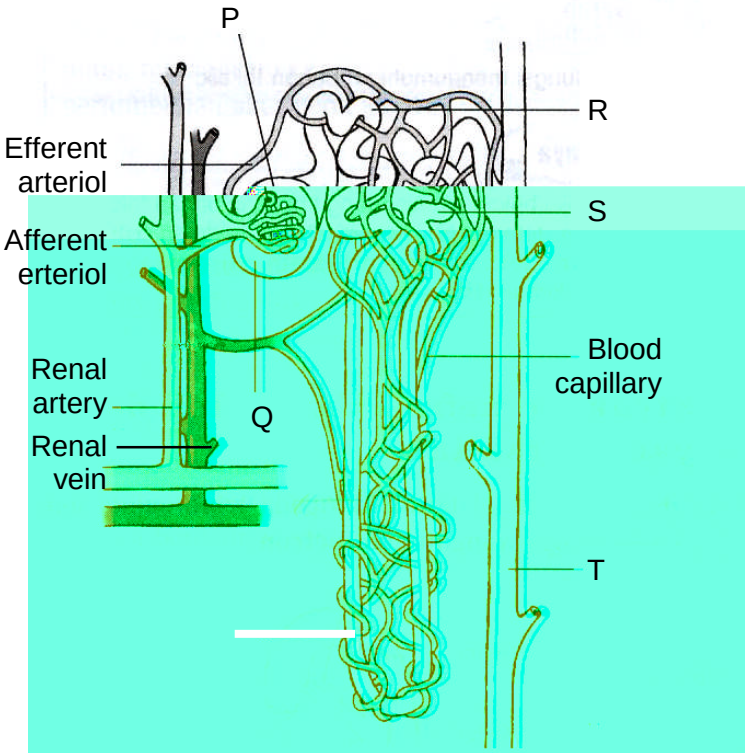

DIAGRAM 4.2

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]

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

……

……

……

[2 *marks*]

For examiner's use only

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

For examiner's use only

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.

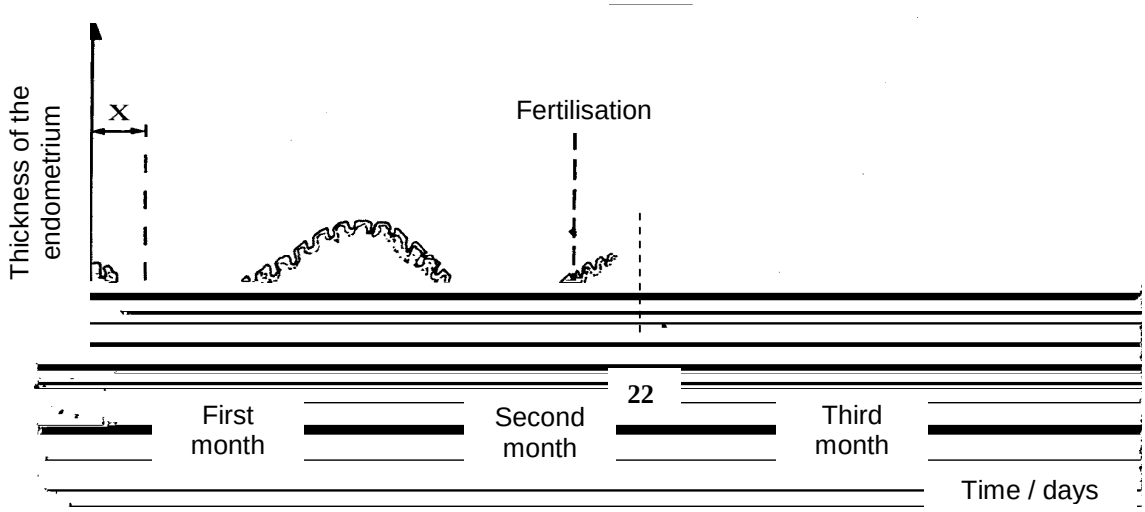

DIAGRAM 5.1

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]

For examiner's use only

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

……

……

[2 marks]

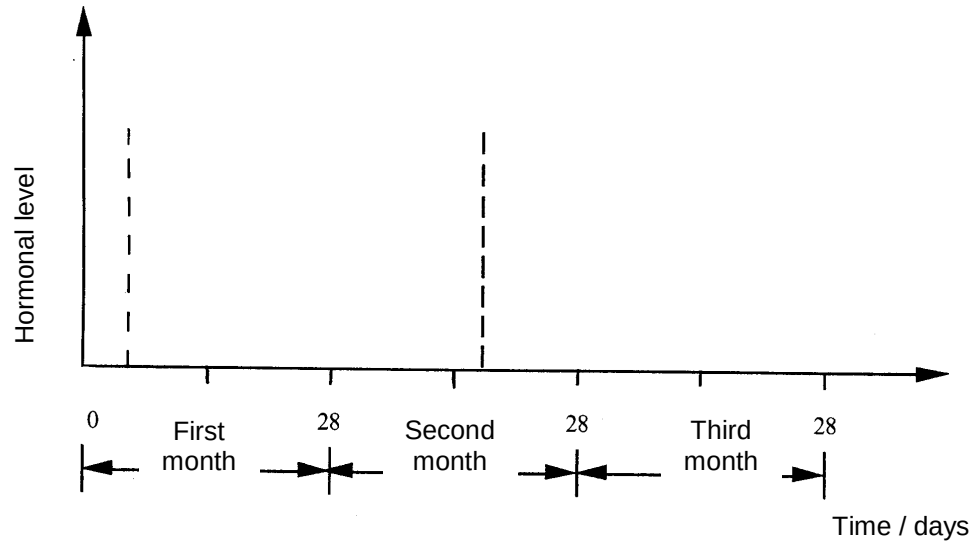

DIAGRAM 5.2

(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)

For examiner's use only

(d)

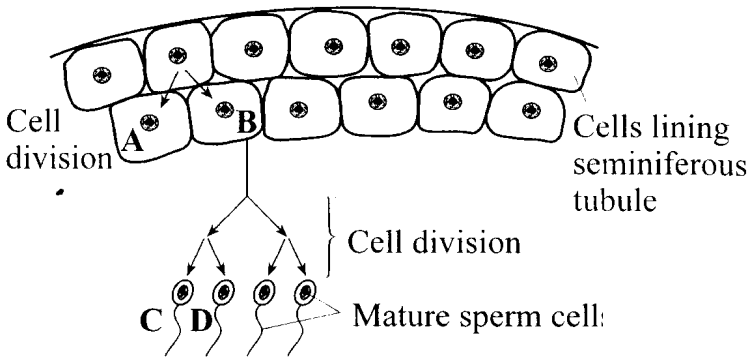

DIAGRAM 5.3

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)

TOTAL

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.

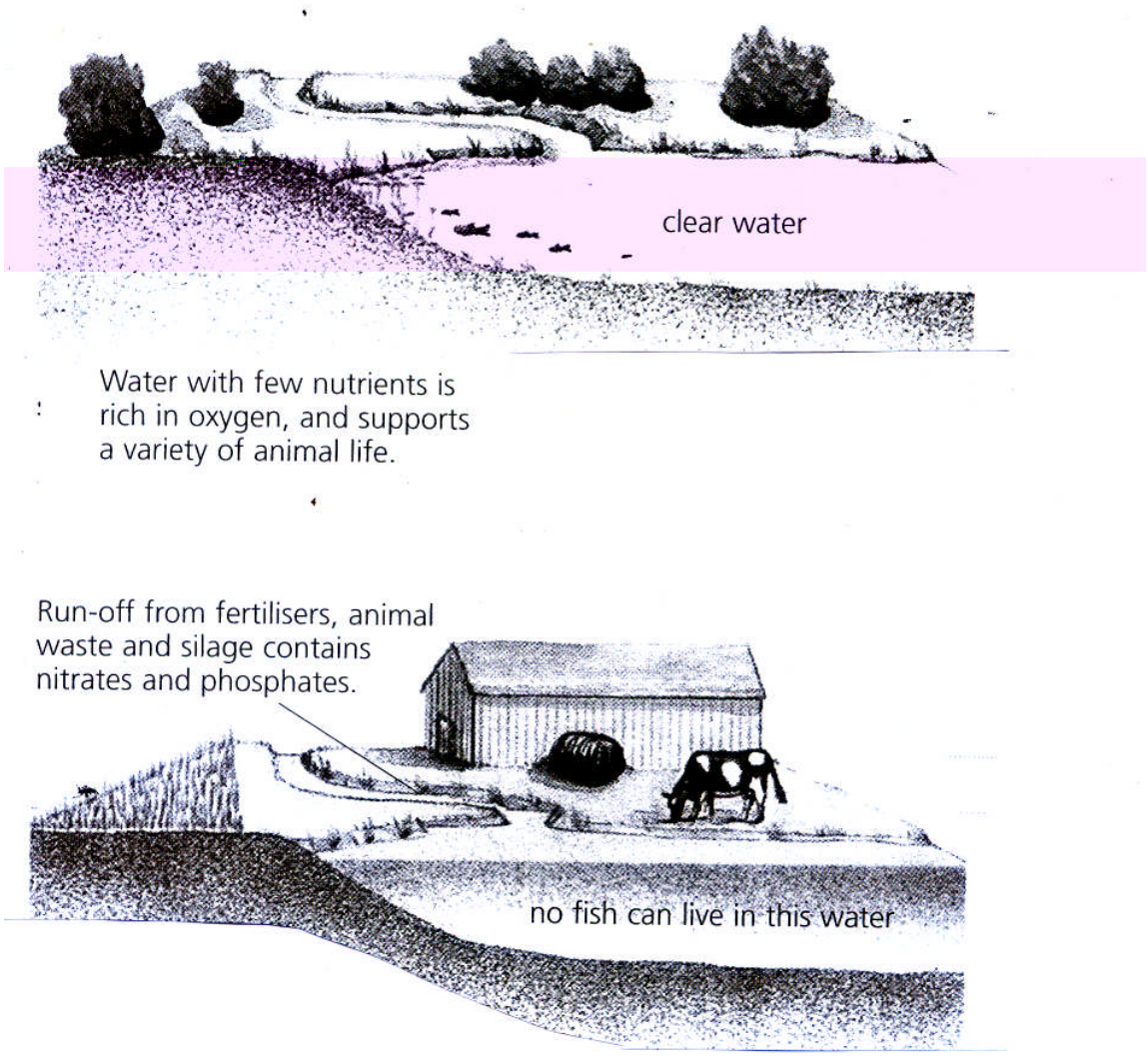

DIAGRAM 6

(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.

[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]

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

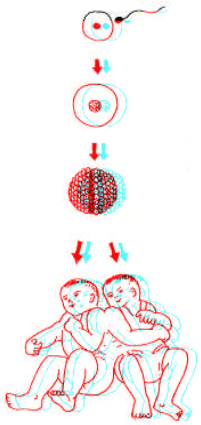

DIAGRAM 8.1

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

[6 marks]

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

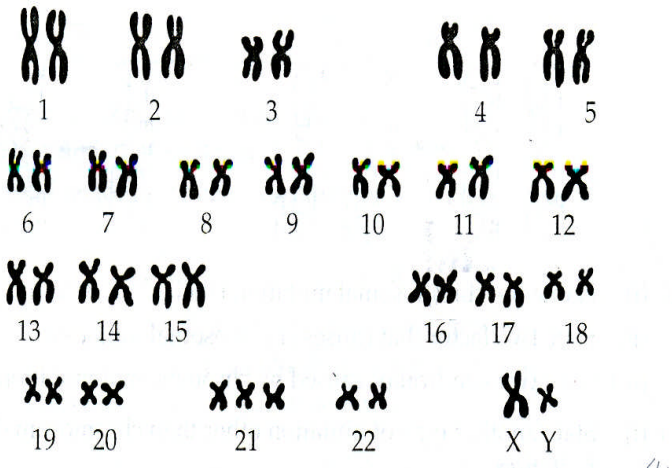

DIAGRAM 8.2

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]

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.

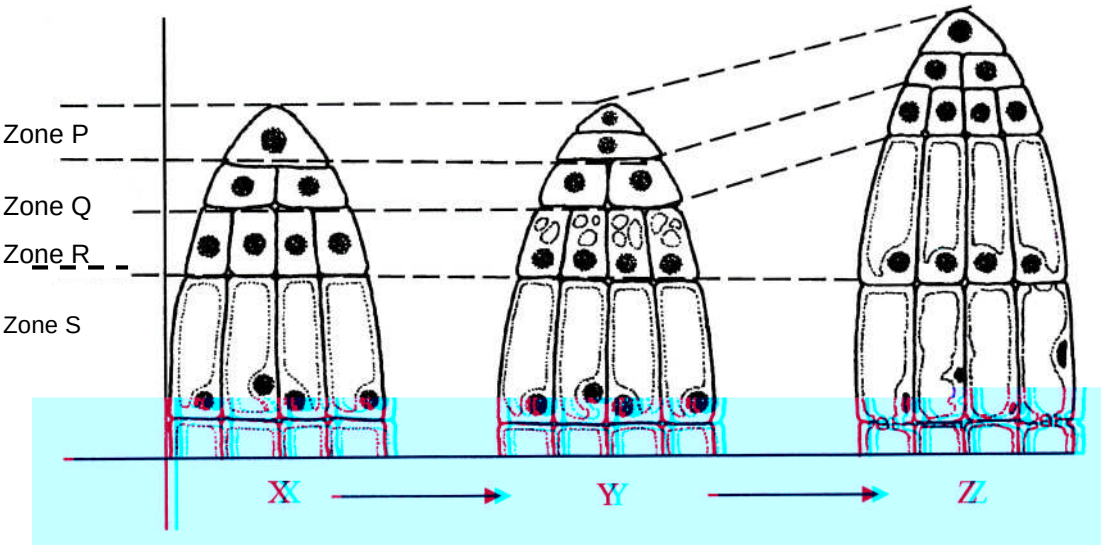

DIAGRAM 9.1

(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.

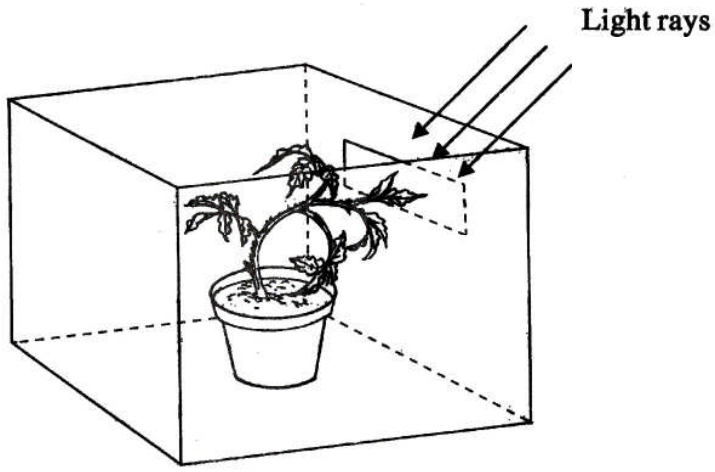

DIAGRAM 9.2

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

[6 marks]

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

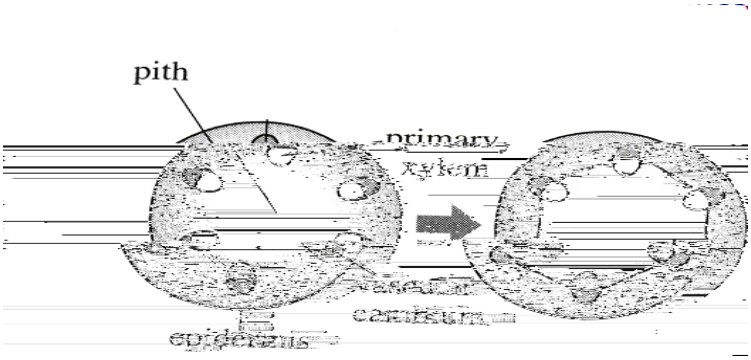

Diagram 9.3

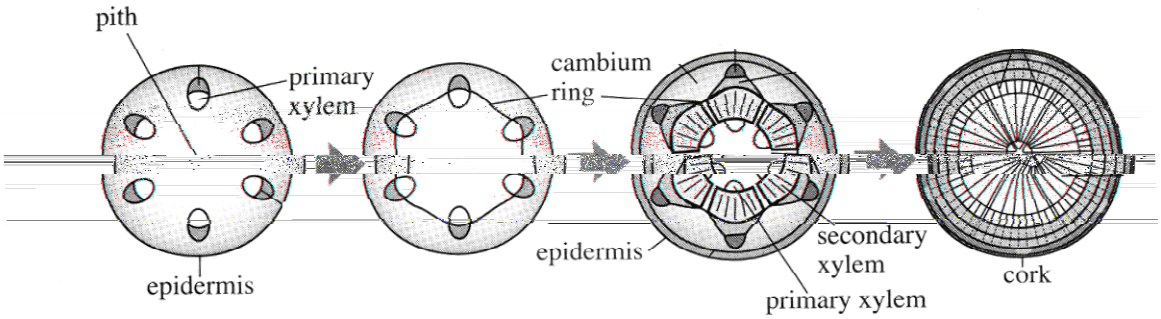

DIAGRAM 9.4

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

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.

4551/2
Biology
Kertas 2
Ogos 2008
2½ jam

SEKOLAH BERASRAMA PENUH
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KEMENTERIAN PELAJARAN MALAYSIA

PEPERIKSAAN PERCUBAAN SETARA
SPM 2008

BIOLOGI

KERTAS 2

PERATURAN PEMARKAHAN

UNTUK KEGUNAAN PEMERIKSA SAHAJA

Peraturan pemarkahan ini mengandungi 17 halaman bercetak

PERATURAN PEMARKAHAN

QUESTION 1

No	Marking Criteria	Marks	
1(a)(i)	Able to name the part labeled P and S **Sample answer** P: Pulmonary vein S: Septum	 1 1	
(ii)	Able to shade the cavity of ventricle Q	1	
(iii)	Able to state the meaning of oxygenated blood. **Sample answer** It contains oxygen which was picked up by the capillaries surrounding the alveoli	 1	4
(b)	Able to explain the different thickness of Q and R. Criteria: F: blood flow P: function **Sample answer** F: The Q pump blood out from heart to all round the body P: To withstand the high pressure of blood flowing through them	 1 1	 2
(c)(i)	Able to label the bicuspid valve with letter T.	1	
(ii)	Able to explain the function of bicuspid valve. **Sample answer** F: to stop/prevent blood flowing from the ventricles back to the atria P: (so that when the ventricles contract) the blood is pushed up into the arteries not back into the atria.	 1 1	
(iii)	Able to state the function of corda tendinae. **Sample answer** P: to stop the valve from going up too far/to hold the location of valve (during ventricular systole)	 1	4

No	Marking Criteria	Marks	
(d))(i)	Able to state one activities of human which cause a clot **Sample answer** High fat diet//smoking//lack of exercise//stressful life//diet which rich in saturated fat	1	
(ii)	Able to explain the result of a blockage **Sample answer** F: cardiac muscles run short of oxygen P: so they cannot contract/stop beating/heart attack/cardiac arrest.	1 1	3
	TOTAL		**13**

QUESTION 2

Item	Scoring Criteria	Marks	
2(a)(i)	Able to plot the graph **Sample answer** P : axis with title and correct units. B : smooth curve(free hand drawing) - connect all point. - label the graph to show graph light intensity and light high light intensity. T : transfer all points correctly	1 1 1	
(ii)	Able to state normal concentration of carbon dioxide with correct unit. **Answer** 0.03%	1	
(iii)	Able to state the rate photosynthesis at 0.03% of carbon dioxide	1	5

<table>
<tr><td></td><td>with correct unit.
Answer
45 unit</td><td></td><td></td></tr>
<tr><td>(b)</td><td>Able to label the advantage of adding carbon dioxide to the green house
Sample answer
P1: to increase the rate of photosynthesis
P2: so the crop/fruits/flowers production will be increased.</td><td>

1
1</td><td>

2</td></tr>
<tr><td>(c)</td><td>Able to state the valve and explain the answer.
Sample answer
F: 0.14 unit
P: because the rate of photosynthesis is at the constant level even if carbon dioxide is increased.</td><td>

1
1</td><td>

2</td></tr>
<tr><td>(d)</td><td>Able to explain how leaves are adapted, criteria:
F: leaves structure.
P: explanation.
Sample answer
<table>
<tr><td>F1</td><td>Has many stomata</td><td>P1</td><td>Allowing the exchange of gases between the Internal part of leaf and the environment.</td></tr>
<tr><td>F2</td><td>Spongy mesophyll are loosely arranged between each cell are air space</td><td>P2</td><td>Allow easy diffusion of carbon dioxide through leaf</td></tr>
<tr><td>F3</td><td>Irregular shapes of mesophyll</td><td>P3</td><td>To increase the internal surface area for gaseous exchange.</td></tr>
</table>
Any F with respective P

TOTAL</td><td>

1,1

1,1

1,1</td><td>

2

12</td></tr>
</table>

QUESTION 3

<table>
<tr><th>No</th><th>Marking Criteria</th><th colspan="2">Marks</th></tr>
<tr><td>3(a)(i)</td><td>Able to state the part that represented by rubber sheet.
Sample answer
Diaphragm</td><td>1</td><td></td></tr>
<tr><td>(ii)</td><td>Able to state the balloons condition.
Sample answer
Balloon expand</td><td>1</td><td></td></tr>
<tr><td>(iii)</td><td>Able to state the breathing cycle
Sample answer
exhalation</td><td>1</td><td>3</td></tr>
<tr><td>(b)</td><td>Able to label J,K,L,M criteria.
Sample answer
J: Rib
K: sternum
L: intercostals muscle
M: back bone/vertebrae column</td><td>1
1
1
1</td><td>4</td></tr>
<tr><td>(c)(i)</td><td>Able explain how smoking would change alveoli structure.
Criteria
F: name of the chemical in smoke
P: effect of smoking
Sample answer
<table>
<tr><td>F1</td><td>Damage the alveoli wall</td><td>P1</td><td>Reduces total surface area</td></tr>
<tr><td>F2</td><td>Heat (release by burning cigarette)</td><td>P2</td><td>(increase body temperature) damage the tissue lining of alveoli</td></tr>
<tr><td>F3</td><td>Tar</td><td>P3</td><td>Deposits on the alveolus, reduce the efficiency for gases exchange</td></tr>
<tr><td>F4</td><td>Acidic condition</td><td>P4</td><td>Corrodes/damages the alveolus</td></tr>
</table>
Any F with respective P

Able to state how the smoke affects the rate of cellular respiration.
Sample answer</td><td>1,1

1,1

1,1</td><td></td></tr>
</table>

	P1: Carbon monoxide competes with oxygen to bind with Haemoglobin to form carboxyhaemoglobin	1,1	
	P2: It reduced the supply oxygen to cell		2
	P3: thus reduce anaerobic respiration		
(ii)	**TOTAL**	1	
		1	
		1	3
			12

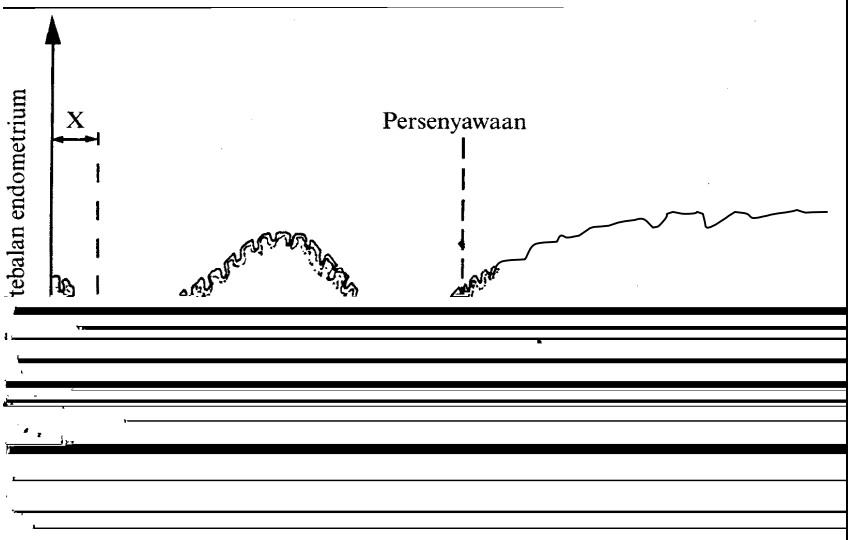
QUESTION 4

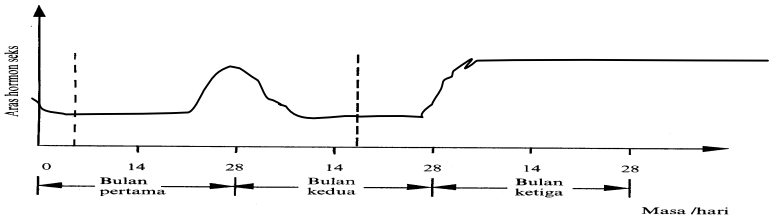
Item	Scoring Criteria	Marks

4	(a)	Able to name of gland X and organ Y. **Answer:** Gland X : Pituitary (gland) Organ Y : Kidney	 1 1	 2
	(b)	Able to explain the process of ultrafiltration, which causes the movement of some of the blood components from P, glomerulus into Q, Bowman's capsule. **Sample answer**: F:Ultrafiltration occurs // Filtration which occurs in bulk due to high force / pressure. P: (Very) high hydrostatic pressure in P / glomerulus // because the diameter of efferent arteriol is smaller than the diameter afferent arteriol.	 1 1	 2
	(c)	Able to explain the difference in the solute concentration of the filtrate in R, proximal convulated tubule and Q, Bowman's capsule. **Sample answer:** F: Filtrate in R has <u>no glucose and proteins</u> *or* <u>less water and salts / vitamins / nutrients / *any one solvent*</u> (than in Q) P: Reabsorption occurs in R.	 1 1	 2
	(d)	Able to explain how gland X, pituitary gland involves in the formation of urine in the body of an athlete running a 10 km race. **Sample answer**: P1: Osmotic pressure in the blood (of the athlete) increases / very high / higher // The water content in the blood decreases. P2 ; Gland X secretes ADH / antidiuretic hormone (into the blood). P3: Part S / distal convulated tubule and T, collecting duct (more) permeable to water. P4: More water is reabsorbed (into the blood capillaries). *Any 3*	 1 1 1 1	 3
	(e)	Able to state the changes in urea concentration in the renal vein of a normal healthy person after eating meat and eggs. **Sample answer**:		

		P: The urea concentration increases / higher because; deamination / conversion of (excess) proteins into urea (in the liver). // secretion / active transport of urea (from blood capillaries) into the nephron / kidney tubule TOTAL	1	1 **12**

QUESTION 5

Item	Scoring Criteria	Marks	
5(a)(i)	Able to state the name **Sample answer** menstruation	1	
(ii)	**Able to** **Sample answer** Thickness of the endometrium is decreasing	1	2
(b)(i)	Able to complete the changes in the thickness of endometrium.  	1	
(ii)	**First month** F1 : level of progesterone increases after ovulation and then decreases P1 : as there is no implantation **Second month**	1	

	F2 : level of progesterone increases after ovulation and continues to increase / is maintained P2 : as implantation has occurred **Third month** F3 : level of progesterone continues to rise / is maintained P3:as the endometrium is further developed to support the growing embryo Any F and respective P	1 1 1 1 1	3
(c)(i)	Able to complete the changes in the level of progesterone in diagram 1.2  	1	
(ii)	Able to explain the changes in the level of progesterone . **Sample answer** F: endometrium getting ready for implantation of embryo P:endometrium vascularises and continues to thicken	 1 1	3
(d)	Able to explain which cells are identical F: Yes P:Because these cells have been formed from mitosis TOTAL	 1 1	2 11

QUESTION 6

Item	Scoring Criteria	Marks

6(a)	Able to explain eutrophication.		
	Sample answer		
	P1 : Farmers use fertilizers that usually contains nitrates/phosphate	1	
	P2: Fertilizer/animal waste/silage which contain nitrate/phosphate may washed out in water when it rains/leaching/run into the lake.	1	
	P3: Algae/green plant in the lake grow faster (when they are supplied with extra nitrate/(phosphate)	1	
	P4: (they may grow so much) that they completely cover the water.	1	
	P5: block out the light for plants growing beneath them.	1	
	P6.Photosynthesis rate reduced	1	
	P7:Dissolve oxygen also reduced	1	
	P8: Plant on the top of water and beneath water eventually die.	1	
	P9: Their remains are good source of food bacteria //bacteria decomposed the dead plant rapidly//bacteria breed rapidly	1	
	P10:The large population of bacteria respires, using up oxygen ,so there is very little oxygen left for other living organism	1	
	P11: BOD increased	1	
	P12: Those fish which need oxygen have to move other areas or die	1	10
	Any 10		
(b)	**Sample answer**		
	(i) Treating sewage		
	P1: The sewage contains harmful bacteria /substance which provide Nitrate/nutrient for microbe.	1	
	P2: Remove harmful bacteria/most of the nutrient which could course eutrophication before it is released into the rivers.	1	
	P3: When sewage has been treated, the water in it can be used again//sewage treatment enables water to be recycled.	1	
	P4: Microorganisms used in sewage treatment.	1	
	Any 3		3
	(ii) Using organic fertilizers rather than inorganic		
	Sample answer		
	1. Example of organic fertilizers : Manure	1	
	2. Example of inorganic fertilizer : *Ammonium nitrate*	1	

	3. Organic fertilizers do not contain many nitrates(which can easily be leached out of the soil. 4. They release their nutrients gradually (over a long period of time) giving crops time to absorb them efficiently**.** Any 3	1 1	3
(c)	Able to explain the relation between deforestation and flash flood **Sample answer** F ; deforestation can cause soil erosion P1 : The leafy canopy trees protect the soil from the impact of falling rain. P2: The roots of the trees hold soil and water P3: (With the trees removed) the soil is exposed directly to the rain//water runoff becomes intense. P4:Topsoil/fertile layer,get washed away during heavy rain. P5: (heavy rainwater flows down hillside to river with) eroded soil deposited blocking the flow of water. P6: The water levels in rivers rise rapidly causing flood to occur. Any 4 **TOTAL**	 1 1 1 1 1 1 1 	 4 **20**

QUESTION 7

Item	Scoring Criteria	Marks	
7(a)	Able to explain the consequences of the situation **Sample answer** F: Production of gastric juice/pepsin/rennin decrease. P1:Digestion of protein become slow/decrease P2:Coagulation of protein by rennin decrease. P3:Unable to provide acidic medium for enzyme reaction//bacteria can not be destroyed.	 1 1 1 1	 4
(b)	Able to state how genetic engineering to improve the quality and quantity.		

Sample answer

Genetic engineering

P1: Transfer the beneficial genes from one organism to another organism. 1

P2: Obtain/produces genetic modified organism/transgenic 1

P3:crop yield/animal contain gene that able to enhance growth/nutritional Properties/resistance against disease. 1

Culture tissue

P4: tissue/cell of parent plant are grown in culture medium. 1

P5: daughter plant is called clone. 1

P6;Produce many clone in a a short time/produce large fruit/maintain good characteristic of parent plant. 1 6

(c) Able to explain the good and bad of food processing

Sample answer

Good(G)	Explanation(P)	
G1 ; to preserve food	P1: Avoid wastage of food/prevent food spoilage/can be stored(for future use)	1,1
G2: to increase its commercial value/uses of food additives	P2: improve the taste/appearance/texture of food/to preserve the freshness	1,1
G3:to diversify the uses of food substances	P3: to increase the variety of product//any example	1,1 5

Max 5 marks

Sample answer

Bad(B)	Explanation(P)	
B1 ; uses food additive	P4:give long term side effect/examples//reduce the nutrient/vitamin in the food.	1,1 1,1
B2: too much sugar	P5: increases the risk of diabetes	1,1
B3: foof colouring/yellow dye/tetrazine	P6: causes allergy reaction	1,1

	B4:too much salt	P7:increase the risk of high blood pressure	1,1	5
	B5: Sodium nitrate	P8:causes nausea/athma(to certain people)		
		Any 3B with respective P Max 5 marks		
		TOTAL		**20**

QUESTION 8

Item	Scoring Criteria	Marks	
8(a)(i)	Able to explain the formation of Siamese twin **Sample answer** F: Siamese twin P1:**One** sperm and **one** ovum are involve in fertilization P2:to produce one/single zygote P3:zygote undergoes mitosis repeatedly to form blastocyst P4:blastocyst does not divide completely P5:The two blastocyst implant/embedded into endometrium walland develop to embryo) P6:they are joined at certain part of the body F with any 5P	 1 1 1 1 1 1 1	 6
(ii)	Able to name the syndrome and explain how it happens. **Sample answer** F: Downs's Syndrome P1:due to the failure of the two homologous chromosome number 21 to separate normally P2:during anaphase 1/meiosis 1 P3:produce a gamete with a pair of homologous chromosome number 21//gamete with only 22 chromosomes P4:when above gamete fuse/fertilized with the normal gametes it produce zygote with a three chromosome number 21. F with any 3P	 1 1 1 1 1	 4
(b)	Able to discuss genetic and environment factor affecting variation **Sample answer**		

	separate. P6:resulting in an independent assortment of maternal and paternal chromosomes into daughter cells **F: Random fertilization** P7; sperms and ovum with a variety of combinations of chromosomes/genetically different are randomly fertilized. P8:Thus,variation exists between individuals from the same species//zygote produces wll have a variety of diploid combination. **F:Mutation** P10:mutation causes permanent change in the genetic composition/genotype of an organism **Environmental factor** F1: (can cause variation among individuals at same species)by interacting with genetic factor. P: examples of factor at least 2 type of food/exercise/skill/experience/education/sunlight/climatic Any 9 from genetic factor And any 1 from environment factors	1 1 1 1 1 1	10

Item	Scoring Criteria	Marks	
9(a)	Able to explain the meaning of growth correctly Criteria: P1 Mitosis P2 Increase in the number of cells P3: Elongation of cells P4: Specialisation of cells P5:Increase in shoot length P6: the process is irreversible **Sample answer** F1:Zone P and Zone R is cell division/mitosis zone P1: Produces new cells/Number of cells increases F2: Zone R is elongation region P2:New vacuoles are formed//enlargement of vacuoles//increase in the size of cells, F3:Zone S is differenciation/specialization in zone. P3:differenciation cells are specialized to form specific /permanent of tissue/form specific function/example of tissue F4:length of shoot increases //height of the plants increases. P4:the process is irreversible Any 4	1 1 1 1 1 1 1 1	4
(b)	Able to explain the role of auxin in the growth of plant shoot correctly. **Sample answer:** F: (Tip) shoot bends towards light//positive phototropism P1:Auxin is produced at shoot tip//coleoptile P2:More auxin diffuse/accumulate at the region with low light intensity P3: Auxin difuses to the elongation region P4: Auxin stimulates the cell elongation growth at shoot tip P5:Since the region has more auxin) the rate of cell elongation is higher(than the region with less auxin/higher light intensity)	1 1 1 1 1 1	6
(c)	Able to explain the benefit of secondary growth plant and the affect of their life span,survival and economic value. Sample answer		

	Criteria	Plants with secondary growth		
	Life span	P1:Longer life span P2:Bearing fruits/reproduce many time/producing many offsprings	1 1	
	Survival	P3: The plants are taller/bigger/wider(in size)//large diameter P4:higher opportunity/acess for light(in tropical forest) P5:denser/bigger/more xylems and phloems//additional strength/support to stem/root/stronger P6:better transportation of/for water/nutrient(in plants) P7:presence of cork tissue provides better protective layer for internal tissues	1 1 1 1 1	
	Economic value	P8: Economically cost effective/examples:materials/long lasting P9:needs no replanting P10:many/widely used in wood industry P11:potential as timber	1 1 1 1	
		Any 10		10

END OF MARK SHEME