



**MAJLIS PENGETUA SEKOLAH MALAYSIA
(CAWANGAN PULAU PINANG)**

**MODUL BERFOKUS KBAT SPM
4551/2(PP)**

BIOLOGI

Kertas 2

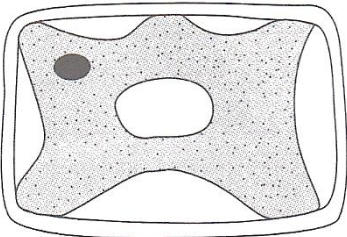
Peraturan Pemarkahan

UNTUK KEGUNAAN PEMERIKSA SAHAJA

AMARAN

Peraturan pemarkahan ini adalah **SULIT** dan **Hak Cipta PKPSM Pulau Pinang**. Kegunaannya khusus untuk pemeriksa yang berkenaan sahaja. Sebarang maklumat dalam peraturan pemarkahan ini tidak boleh dimaklumkan kepada sesiapa. Peraturan pemarkahan ini tidak boleh dikeluarkan dalam apa-apa bentuk media.

Peraturan pemarkahan ini mengandungi 17 halaman bercetak

Question	Marking Scheme	Sub Mark	Total Mark								
1(a)(i)	<p>Able to name the parts label P and Q</p> <p>P : Phospholipid bilayer / <i>dwilapisan fosfolipid</i> Q : Carrier protein / <i>Protein pembawa</i></p>	1 1	2								
(a)(ii)	<p>Able to name the methods of movement of substances A and B through the plasma membrane.</p> <p>Substance A : simple diffusion // facilitated diffusion <i>Bahan A : Resapan ringkas // resapan berbantu</i></p> <p>Substance B : active transport <i>Bahan B : pengangkutan aktif</i></p>	1 1	2								
(a)(iii)	<p>Able to state two differences between the methods of movement shown in Diagram 1.1 and Diagram 1.2.</p> <table border="1" data-bbox="373 831 1273 1312"> <tbody> <tr> <td data-bbox="373 831 823 902">Simple diffusion <i>Resapan ringkas</i></td> <td data-bbox="823 831 1273 902">Active transport <i>Pengangkutan aktif</i></td> </tr> <tr> <td data-bbox="373 902 823 1037">Substance moves down its concentration gradient <i>Bahan bergerak menuruni kecerunan kepekatan</i></td> <td data-bbox="823 902 1273 1037">Substance moves against its concentration gradient <i>Bahan bergerak menentang kecerunan kepekatan</i></td> </tr> <tr> <td data-bbox="373 1037 823 1108">Energy is not required <i>Tenaga tidak diperlukan</i></td> <td data-bbox="823 1037 1273 1108">Energy is required <i>Tenaga diperlukan</i></td> </tr> <tr> <td data-bbox="373 1108 823 1312">This process continues until a dynamic equilibrium is reached <i>Proses ini terus berlaku sehingga satu keseimbangan dinamik tercapai.</i></td> <td data-bbox="823 1108 1273 1312">This process results in either accumulation or elimination of substances. <i>Proses ini mengakibatkan pengumpulan atau penyingkiran bahan</i></td> </tr> </tbody> </table> <p style="text-align: right;"><i>Any 2 / Mana-mana 2</i></p>	Simple diffusion <i>Resapan ringkas</i>	Active transport <i>Pengangkutan aktif</i>	Substance moves down its concentration gradient <i>Bahan bergerak menuruni kecerunan kepekatan</i>	Substance moves against its concentration gradient <i>Bahan bergerak menentang kecerunan kepekatan</i>	Energy is not required <i>Tenaga tidak diperlukan</i>	Energy is required <i>Tenaga diperlukan</i>	This process continues until a dynamic equilibrium is reached <i>Proses ini terus berlaku sehingga satu keseimbangan dinamik tercapai.</i>	This process results in either accumulation or elimination of substances. <i>Proses ini mengakibatkan pengumpulan atau penyingkiran bahan</i>	1 1 1 1	2
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(b)	<p>Able to draw the condition of the plant cell in concentrated salt solution and explain why.</p>  <p>Drawing / <i>Lukisan</i> :</p> <p>L1 : plasma membrane pulls away from the cell wall <i>membran plasma tertarik menjauhi dinding sel</i></p> <p>L2 : Vacuole shrinks <i>Vakuol mengecil</i></p> <p>P1 : water diffuses out of the plant cell by osmosis <i>Air meresap keluar daripada sel tumbuhan secara osmosis</i></p>	1 1 1									

Question	Marking Scheme	Sub Mark	Total Mark	
(c)	P2 : cytoplasm / vacuole shrinks <i>Sitoplasma / vakuol mengecut</i>	1		
	P3 : plasma membrane pulls away from the cell wall <i>Membran plasma tertarik menjauhi dinding sel</i>	1		
	P4 : plasmolysis occurs <i>Plasmosis berlaku</i> <i>Any 2 P / mana-mana 2 P</i>	1	4	
	Able to explain how toxic waste affect the uptake of mineral ions in plant	1		
	P1 : toxic waste inhibits cellular respiration <i>bahan beracun merencat respirasi sel</i>			
	P2 : no energy being produced <i>tiada tenaga dihasilkan</i>	1		
	P3 : active transport cannot occur <i>pengangkutan aktif tidak dapat dijalankan</i>	1		
	P4 : no / less mineral ions will be absorb into the plant <i>tiada / kurang ion mineral diserap ke dalam tumbuhan</i> <i>Any 2 P / mana-mana 2 P</i>	1	2	
				<hr/> 12

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2(a)	Able to name type of nutrition of both animals in diagram 2.1 and 2.2. Heterotroph // holozoic	1	1										
2(b)	Able to name the four digestion chambers of an animal in diagram 2.1 1: Rumen 2: Reticulum 3: Omasum 4: Abomasum 4 / : 2M 1-3 / : 1M	1 1	2										
2(c)(i)	Able to state the part of the chamber or organ <u>that contain</u> an enzyme to digest food rajah 2.1 ; rumen / retikulum rajah 2.2 : mulut / perut / duodenum / usus kecil	1 1											
2©(ii)	Able to explain the function of the enzyme in (b)(i) Mencerna / menghidrolisis / mengurai makanan / molekul kompleks menjadi molekul ringkas // terima contoh enzim, substrat dan produk yang betul	1	2										
2(d)	Explain the adaptation of the digestive system in the animal in Diagram 2.2 to maximize it's function. Adaptation Explanation Example P1 : banyak organ yang merembes enzim yang berlainan / berbeza P2: (supaya) pencernaan lengkap berlaku P3 : amilase dirembes ke dalam mulut dan duodenum untuk mencernakan kanji menjadi maltosa // mana-mana contoh yang sesuai	1 1 1											
2(e)	Able to state two differences between the digestive system in 2.1 and 2.2 for cellulose digestion <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Rajah (2.1)</th> <th style="width: 50%;">Rajah 2.2</th> </tr> </thead> <tbody> <tr> <td>D1 Makanan dicerna dua kali (mengeluar dan mengunyah semula sebelum ditelan semula / proses peruminatan)</td> <td>D1 Makanan di cerna sekali sahaja</td> </tr> <tr> <td>D3 Selulosa dicerna di rumen / retikulum</td> <td>D3 tiada pencernaan selulosa</td> </tr> <tr> <td>D4 Mikroorganisma / bakteria / protozoa dijumpai dalam rumen dan retikulum</td> <td>D4 tiada mikroorganisma / bakteria / protozoa membantu pencernaan</td> </tr> <tr> <td>D5 4 ruang perut</td> <td>D5 1 ruang perut</td> </tr> </tbody> </table>	Rajah (2.1)	Rajah 2.2	D1 Makanan dicerna dua kali (mengeluar dan mengunyah semula sebelum ditelan semula / proses peruminatan)	D1 Makanan di cerna sekali sahaja	D3 Selulosa dicerna di rumen / retikulum	D3 tiada pencernaan selulosa	D4 Mikroorganisma / bakteria / protozoa dijumpai dalam rumen dan retikulum	D4 tiada mikroorganisma / bakteria / protozoa membantu pencernaan	D5 4 ruang perut	D5 1 ruang perut	1	3
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2(f)	<p style="text-align: right;"><i>Any 2P / mana-mana 2P</i></p> <p>Able to explain the effect on animal 2.1 and animal 2.2 if the population of bacteria and protozoa decrease in their digestion system.</p> <p>P1 : Amount of cellulase enzyme decreases <i>Jumlah enzim selulase berkurang.</i></p> <p>P2 : Cellulose (from grasses and plants eaten) cannot be digested completely <i>Selulosa (dari rumput dan tumbuhan yang dimakan) tidak dapat dicerna dengan sempurna.</i></p> <p>P3 : Faeces contains grasses/ undigested food / hard faeces <i>Najis mengandungi rumput/makanan yang tak tercerna / najis keras</i></p> <p>P4 : Animal is deficient in nutrient / thin <i>Haiwan tidak cukup nutris / kurus</i></p> <p style="text-align: right;"><i>Any 2P / mana-mana 2P</i></p>	<p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p>	<p style="text-align: center;">2</p> <p style="text-align: center;">2</p> <hr style="width: 20%; margin-left: auto; margin-right: 0;"/> <p style="text-align: center;">12</p>

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3(a)	<p>Able to identify the type of respiration for P and Q</p> <p>P : Aerobic respiration Q : Anaerobic respiration <i>Respirasi aerob Respirasi anaerob</i></p>	1 1	2															
3(b)(i)	<p>Able to state two differences between the type of respiration that occurred in P and Q</p> <table border="1"> <thead> <tr> <th></th> <th>P</th> <th>Q</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>Takes place in the mitochondria and cytoplasm <i>Berlaku di dalam mitokondria dan sitoplasma</i></td> <td>Takes place in the cytoplasm <i>Berlaku di dalam sitoplasma</i></td> </tr> <tr> <td>P2</td> <td>Glucose is completely broken down into carbon dioxide and water with the release of energy. <i>Glukosa dioksidakan dengan lengkap kepada karbon dioksida dan air dengan pembebasan tenaga.</i></td> <td>Glucose is partially broken down into lactic acid with the release of energy. <i>Glukosa dioksidakan tetapi tidak lengkap kepada asid laktik dengan pembebasan tenaga.</i></td> </tr> <tr> <td>P3</td> <td>A large amount of energy is released (2898 kJ energy) // produces 38 ATP molecules. <i>Amaun pembebasan tenaga tinggi (2898 kJ) // menghasilkan 38 molekul ATP</i></td> <td>A small amount of energy is released (150 kJ energy) // produces 2 ATP molecules. <i>Amaun pembebasan tenaga rendah (150 kJ)// menghasilkan 2 molekul ATP</i></td> </tr> <tr> <td>P4</td> <td>Occurs in the presence of oxygen <i>Berlaku dalam kehadiran oksigen</i></td> <td>Occurs in the absence of oxygen <i>Berlaku dalam ketiadaan oksigen</i></td> </tr> </tbody> </table> <p style="text-align: right;">Any 2P / mana-mana 2P</p>		P	Q	P1	Takes place in the mitochondria and cytoplasm <i>Berlaku di dalam mitokondria dan sitoplasma</i>	Takes place in the cytoplasm <i>Berlaku di dalam sitoplasma</i>	P2	Glucose is completely broken down into carbon dioxide and water with the release of energy. <i>Glukosa dioksidakan dengan lengkap kepada karbon dioksida dan air dengan pembebasan tenaga.</i>	Glucose is partially broken down into lactic acid with the release of energy. <i>Glukosa dioksidakan tetapi tidak lengkap kepada asid laktik dengan pembebasan tenaga.</i>	P3	A large amount of energy is released (2898 kJ energy) // produces 38 ATP molecules. <i>Amaun pembebasan tenaga tinggi (2898 kJ) // menghasilkan 38 molekul ATP</i>	A small amount of energy is released (150 kJ energy) // produces 2 ATP molecules. <i>Amaun pembebasan tenaga rendah (150 kJ)// menghasilkan 2 molekul ATP</i>	P4	Occurs in the presence of oxygen <i>Berlaku dalam kehadiran oksigen</i>	Occurs in the absence of oxygen <i>Berlaku dalam ketiadaan oksigen</i>	1 1 1 1	2
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3(b)(ii)	<p>Able to write the word equation for the type of respiration that occurred in P.</p> <p>Glucose + Oxygen \longrightarrow Carbon dioxide + Water + Energy <i>Glukosa + Oksigen Karbon dioksida + Air + Tenaga</i></p>	1	1															
3(c)(i)	<p>Able to suggest why muscle fatigue occurs</p> <p>P1: The rate in which muscle cells uses oxygen is higher than the quantity of oxygen supplied by the blood circulatory system. <i>Kadar penggunaan oksigen oleh sel-sel otot melebihi kuantiti oksigen yang dibekalkan oleh sistem peredaran darah</i></p> <p>P2 : Muscles are in a state of oxygen deficiency/ debt</p>	1 1																

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3(c)(ii)	<p><i>Otot mengalami kekurangan oksigen / hutang oksigen</i></p> <p>P3 : Muscles undergo anaerobic respiration <i>otot berespirasi secara anaerob.</i></p> <p>P4 : Glucose is partially broken down into lactic acid. <i>Molekul glukosa diurai secara separa kepada asid laktik</i></p> <p>P5 : The high concentration of lactic acid causes muscular fatigue. <i>Kepekatan asid laktik terkumpul yang tinggi mengakibatkan kelesuan otot.</i></p> <p style="text-align: right;"><i>Any 3P / mana-mana 3P</i></p> <p>Able to explain why the man in situation Q carried out those actions</p> <p>P1 ; Keep warm to maintain body temperature so he is not exposed to cold or virus <i>Mengekalkan suhu badan supaya tidak terdedah kepada demam sejuk atau virus</i></p> <p>P2 : Keep muscles warm to prevent injuries like muscle strains /sprains <i>Mengekalkan kehangatan otot supaya tidak mengalami kecederaan otot.</i></p> <p>P3 : lactic acid accumulated can be removed quickly <i>asid laktik yang terkumpul boleh diuraikan dengan lebih cepat</i></p> <p style="text-align: right;"><i>Any 2P / mana-mana 2P</i></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>3</p> <p>2</p>
3(d)	<p>Able to explain why is there a decrease in the percentage of oxygen in the exhaled air</p> <p>P1 : to oxidise glucose during cellular respiration <i>untuk mengoksidakan glukosa semasa respirasi sel</i></p> <p>P2 : to produce energy and carbon dioxide. <i>untuk menghasilkan tenaga dan karbon dioksida.</i></p>	<p>1</p> <p>1</p>	<p>2</p>
			<hr/> 12

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4(a)	<p>Able to name vessel P and Q</p> <p>Vessel P : blood capillary / <i>kapilari darah</i> Vessel Q : lymph capillary / <i>kapilari limfa</i></p>	1 1	2
(b)	<p>Able to explain how fluid R is formed</p> <p>P1 : fluid R is interstitial fluid <i>Cecair R ialah cecair intertis</i></p> <p>P2 : diameter of arteriole end is bigger than the capillaries <i>Diameter hujung arteriol lebih besar dari kapilari darah</i></p> <p>P3 : high hydrostatic pressure occur <i>Tekanan hidrostatik tinggi terbentuk</i></p> <p>P4 : some of the blood plasma / small molecule substances / glucose / amino acids, water, fatty acids are filtered / forced out to the intercellular spaces <i>sebahagian komponen plasma darah / bahan molekul kecil / glukosa / asid amino, air, asid lemak tertapis / dipaksa keluar ke ruangan antara sel</i></p> <p style="text-align: right;"><i>Any 3P / mana-mana 3P</i></p>	1 1 1 1	3
(c)	<p>Able to explain what happen if the excess interstitial fluid failed to return to the vessel P</p> <p>P1 : accumulation of fluid / too much fluid retained in the intercellular spaces <i>Pengumpulan cecair / terlalu banyak cecair terperangkap di ruangan antara sel //</i></p> <p>P2 : cause swollen of body tissue and organ <i>Menyebabkab tisu badan dan organ bengkak</i></p> <p>P3 ; oedema occurs <i>edema berlaku.</i></p>	1 1 1	3
(d)(i)	<p>Able to explain how the narrow section of the coronary artery occurs.</p> <p>P1 : consumption of diet high in fat / cholesterol <i>Pemakanan yang mengandungi lemak / kolesterol yang tinggi</i></p> <p>P2 : deposition of fat / cholesterol on the inner wall of the artery <i>Pengenapan lemak / kolesterol pada dinding dalam arteri</i></p> <p>P3 : which leads to formation of blood clots in the artery <i>Menyebabkan pembentukan darah beku dalam arteri</i></p> <p style="text-align: right;"><i>Any 2P / mana-mana 2P</i></p>	1 1 1	2
(d)(ii)	<p>Able to suggest steps that the patients should do to reduce the risk of</p>		

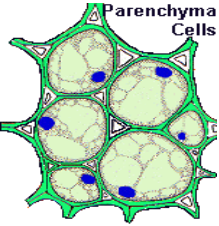
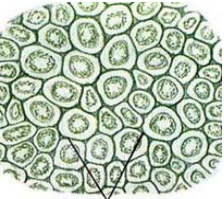
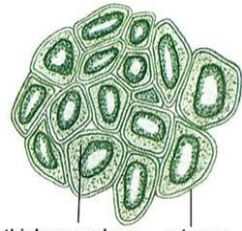
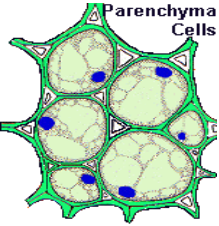
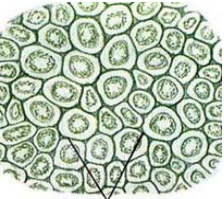
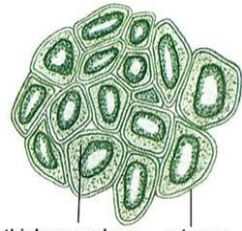
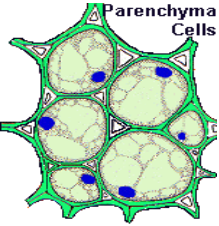
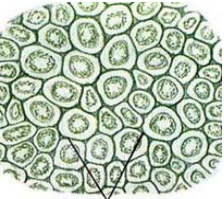
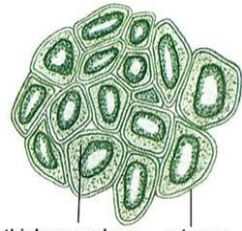
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	<p>heart failure.</p> <p>P1 : take a balance diet // low fat and carbohydrate but rich in fibre diet <i>mengambil diet yang seimbang // diet yang rendah lemak dan karbohidrat tetapi kaya dengan fiber</i></p> <p>P2 : live a healthy lifestyle // free from drugs / cigarettes / alcohol <i>gaya hidup yang sihat // tidak mengambil dadah / rokok / alkohol</i></p> <p>P3 : regular exercise // any explanation on exercising <i>Selalu bersenam // sebarang penerangan yang melibatkan aktiviti bersukan</i></p> <p style="text-align: right;">Any 2P / mana-mana 2P</p>	<p>1</p> <p>1</p> <p>1</p> <hr/> <p>12</p>	<p>2</p>
5(a)(i)	<p>Able to name the process X</p> <p>Mitosis</p>	1	1
5(a)(ii)	<p>Able to explain the important of process X</p> <p>P1 : Produces 8 identical nuclei <i>Menghasilkan 8 nuclei yang sama</i></p> <p>P2 : Haploid nuclei <i>Nuclei haploid</i></p>	1	2
5(b)	<p>Able to identify in which structure</p> <p>Structure Q / <i>Struktur Q</i></p>	1	1
5(c)(i)	<p>Able to describe what happen after a pollen grain stick to stigma</p> <p>P1 : Pollen grain reaches the stigma, sugars in the stigma <i>Debunga melekat pada stigma, gula pada stigma</i></p> <p>P2 : stimulate it to germinate / form the pollen tube <i>merangsangkan debunga bercambah / membentuk tiub debunga</i></p> <p>P3 : end of pollen tube reaches the ovary and release enzyme / <i>hujung tiub debunga yang sampai pada ovari akan merembeskan enzim</i></p> <p>P4 : to penetrates the ovule through the microphyle <i>yang mencerna tisu stil / supaya tiub debunga memanjang ke arah ovul</i></p> <p style="text-align: right;">Any 2P / mana-mana 2P</p>	1	3
5(c)(ii)	<p>Able to explain what happen to structure Q while moving toward ovule to ensure double fertilization occurs</p> <p>P1 : Q is the generative nucleus <i>Q ialah nukleus penjana</i></p>	1	

Question	Marking Scheme	Sub Mark	Total Mark
5(c)(iii)	P2 : Q divide through mitosis <i>Q membahagi secara mitosis</i>	1	2
	P3 : to form 2 nucleus / male gametes <i>membentuk dua nukleus / gamet jantan</i> Any 2P / mana-mana 2P	1	
	Able to describe the process of double fertilization in the flowering plant.	1	
	P1 : One of the male nuclei fuses with egg cell nucleus <i>Salah satu gamet jantan bergabung dengan nukleus sel telur</i>	1	
	P2 : to form a diploid zygote (2n) <i>membentuk zigot diploid (2n)</i>	1	
	P3 : The other male nucleus fuses with the two polar nuclei <i>Satu lagi nucleus gamet jantan bergabung dengan 2 nukleus polar</i>	1	
	P4 : to form a triploid nucleus (3n) <i>kutub membentuk nukleus triploid (3n)</i>	1	
	P5 : This triploid nucleus divides to form the endosperm <i>Nukleus triploid akan membahagi membentuk endosperma</i>	1	
	P6 : that will provide food to the embryo <i>yang akan membekalkan makanan kepada embrio</i> Any 3P / mana-mana 3P	1	3

Question	Marking Scheme	Sub Mark	Total Mark
6(a)(i)	<p>Able to define tissue culture</p> <p>P1: Tissue culture</p> <p>P2 : is a technique or process of keeping tissues alive and growing in a culture medium <i>teknik atau proses menyimpan tisu hidup dan membiarkannya tumbuh dalam medium kultur</i></p> <p>Able to outline the processes involved in generating the orchid plants</p> <p>P1: all apparatus and materials used in this technique must be sterilized <i>semua peralatan dan bahan yang digunakan dalam teknik perlu disteril</i></p> <p>P2: the tissue sample is sterilized with ethanol <i>sampel tisu perlu disteril dengan etanol</i></p> <p>P3: the tissue sample then cut into small pieces from the parent plant called explant <i>sampel tisu dipotong dalam kepingan kecil daripada pokok induk, dipanggil explant</i></p> <p>P4: the explants are then placed inside a test tube containing nutrient agar and growth hormone <i>explant dimasukkan ke tabung uji yang mengandungi agar nutrien dan hormon pertumbuhan</i></p> <p>P5: tissue is cultured on a nutrient medium, an unorganized mass of cell appears, is called callus <i>tisu dikulturkan dalam medium nutrien, membentuk kalus</i></p> <p>P6: growth hormones can be added to the media triggering the callus cells to develop roots, shoots <i>hormon pertumbuhan ditambahkan sebagai medium bagi mencetuskan pertumbuhan akar dan pucuk dalam sel kalus</i></p> <p>P7: when the shoots are form then place in a flask containing a new medium that helps roots to develop <i>apabila pucuk terbentuk, ia dirawat dengan nutrien yang menggalakkan pertumbuhan</i></p> <p>P8: the rooted plantlets are then transferred to nursery and kept in a controlled environment</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>2</p> <p>8</p>

Question	Marking Scheme	Sub Mark	Total Mark
	P15: menghalang proses pembiakan semulajadi P16: tiada variasi P17: Akan mengurangkan diversiti/kepelbagaian tumbuhan P18: Jangka hidup yang pendek [5 advantages and 5 disadvantages]	1	10 <hr/> 20
7(a)	<p>Able to state the importance of each of the support in plants.</p> <p>Floating plants / Tumbuhan terapung P2: (Tisu aerenchyma mengandungi udara) menjadikan tumbuhan lebih ringan P2: membolehkan tumbuhan terapung / berada dipermukaan air</p> <p>Submerge plants / Tumbuhan tenggelam P3 : (Kantung udara di bawah permukaan daun.) Membenarkan daun dalam kedudukan yang tepat untuk penyerapan maksima cahaya P4 Membenarkan tumbuhan tumbuh menegak di dalam air</p> <p>Terrestrial Plants / Tumbuhan darat P5: To allow plant to grow towards sunlight in order for photosynthesis <i>Membenarkan tumbuhan tumbuh ke arah cahaya untuk berfotosintesis</i> P6 : memberi sokongan mekanikal (kepada tumbuhan darat)</p>	<p>1</p> <p>1</p> <p>1</p> <p>Any 4</p>	<p>4</p>

Question	Marking Scheme	Sub Mark	Total Mark
7(b)	<p>Able to explain each type of support given and give the adaptation involved.</p> <p>Submerged plants</p> <p>P1 : Contoh : <i>Hydrilla sp</i> P2 ; have thin / narrow / flexible leaves. P3 : Provide (little) resistance to water flow P4 : contain air spaces (air sacs) inside the leaves and stem P5 : Keep the floating plant close to the water surface to obtain maximum sunlight. P5 : no woody tissue, P6 : (because) water have buoyancy to provide support for these plants.</p> <p>Floating plants</p> <p>P7 : Example Water Lily (<i>Eirchorniacrassipes</i>) P8 : have broad / firm but flexible leaves P9 : to resist tearing by wave action P10 : have aerenchyma tissue in the stem / leaves // spongy tissue P11 : provide buoyancy / the plants can float (on the surface of the water)</p> <p>Terrestrial plants</p> <p>Herbaceous plants P12 ;Example: any herbaceous plant P13 : turgidity of the parenchyma and collenchyma cells P15 : for support P16 : thickening of the cell wall (with cellulose and pectin) in collenchyma cells P17 : provide additional mechanical strength for herbaceous plants.</p> <p>Atau</p> <p>Woody plants Example: any woody plant P18 : (has) Secondary Xylem P19 : (Sclerenchyma) composed of cells with the secondary cell walls // lignified cell walls P20 : the (Sclerenchyma) cells have thick / rigid / non-stretchable cell walls. P21 : support non-growing parts of plants</p> <p>Any suitable answers explaining the adaptation</p> <p style="text-align: right;">Mana-mana 10</p>		10

Question	Marking Scheme	Sub Mark	Total Mark								
	<p data-bbox="360 309 1299 427">Able to Draw two types of ground tissues and describe the characteristics and its functions of each type of the tissues involved in terrestrial plant support systems</p> <table border="1" data-bbox="344 461 1241 1832"> <thead> <tr> <th data-bbox="344 461 667 499">Ground tissues</th> <th data-bbox="667 461 1241 499">The characteristics and its functions</th> </tr> </thead> <tbody> <tr> <td data-bbox="344 499 667 909">  <p data-bbox="360 801 603 875">Parenchyma tissue <i>Tisu parenkima</i></p> </td> <td data-bbox="667 499 1241 909"> <p data-bbox="679 506 879 533">Characteristics.</p> <p data-bbox="679 546 1177 577">P1 ; turgidity of the cells give support.</p> <p data-bbox="679 629 807 660">Functions</p> <p data-bbox="679 674 1114 705">P2 : Store starch, sugar and water</p> </td> </tr> <tr> <td data-bbox="344 909 667 1384">  <p data-bbox="360 1223 616 1296">Collenchyma tissue <i>Tisu kolenkima</i></p> </td> <td data-bbox="667 909 1241 1384"> <p data-bbox="679 954 871 985">Characteristics</p> <p data-bbox="679 999 1185 1030">P3 ; Slightly thicken walls of cellulose.</p> <p data-bbox="679 1043 1018 1075">P4 ; Irregularly thickened.</p> <p data-bbox="679 1088 962 1120">P5 ; Primary cell wall</p> <p data-bbox="679 1171 807 1202">Functions</p> <p data-bbox="679 1216 1098 1290">P6 ; Supportive tissue for young herbaceous plant.</p> </td> </tr> <tr> <td data-bbox="344 1384 667 1832">  <p data-bbox="360 1727 627 1800">Sclerenchyma tissue <i>Tisu sklerenkima</i></p> </td> <td data-bbox="667 1384 1241 1832"> <p data-bbox="679 1429 855 1460">Characteristics</p> <p data-bbox="679 1473 1166 1547">P7 :thick walls which do not allow water to go through.</p> <p data-bbox="679 1561 858 1592">P8 ; dead cells</p> <p data-bbox="679 1644 807 1675">Functions</p> <p data-bbox="679 1688 927 1720">P9 : Support in plant</p> </td> </tr> </tbody> </table> <p data-bbox="762 1877 1299 1951" style="text-align: right;">Mana-mana 2 jenis tisu Lukisan 1+ nama tisu 1+ penerangan 1</p>	Ground tissues	The characteristics and its functions	 <p data-bbox="360 801 603 875">Parenchyma tissue <i>Tisu parenkima</i></p>	<p data-bbox="679 506 879 533">Characteristics.</p> <p data-bbox="679 546 1177 577">P1 ; turgidity of the cells give support.</p> <p data-bbox="679 629 807 660">Functions</p> <p data-bbox="679 674 1114 705">P2 : Store starch, sugar and water</p>	 <p data-bbox="360 1223 616 1296">Collenchyma tissue <i>Tisu kolenkima</i></p>	<p data-bbox="679 954 871 985">Characteristics</p> <p data-bbox="679 999 1185 1030">P3 ; Slightly thicken walls of cellulose.</p> <p data-bbox="679 1043 1018 1075">P4 ; Irregularly thickened.</p> <p data-bbox="679 1088 962 1120">P5 ; Primary cell wall</p> <p data-bbox="679 1171 807 1202">Functions</p> <p data-bbox="679 1216 1098 1290">P6 ; Supportive tissue for young herbaceous plant.</p>	 <p data-bbox="360 1727 627 1800">Sclerenchyma tissue <i>Tisu sklerenkima</i></p>	<p data-bbox="679 1429 855 1460">Characteristics</p> <p data-bbox="679 1473 1166 1547">P7 :thick walls which do not allow water to go through.</p> <p data-bbox="679 1561 858 1592">P8 ; dead cells</p> <p data-bbox="679 1644 807 1675">Functions</p> <p data-bbox="679 1688 927 1720">P9 : Support in plant</p>		<p data-bbox="1473 1043 1497 1075">6</p> <hr data-bbox="1453 1106 1516 1111"/> <p data-bbox="1465 1115 1505 1146">20</p>
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8(a)	<p>Able to describe how the married couple with different blood groups can produce a child who has blood group O.</p> <p>S1: The human ABO blood group is determined by three alleles, I^A, I^B and I^O <i>Kumpulan darah manusia ABO ditentukan oleh tiga alel, I^A, I^B dan I^O</i></p> <p>S2: Alleles I^A and I^B are codominant to each other <i>Alel I^A and I^B adalah kodominan bagi satu sama lain</i></p> <p>S3: and can be expressed equally in the phenotype of the heterozygous individuals <i>dan boleh menonjolkan diri dalam fenotip individu yang heterozigot</i></p> <p>S4: Allele I^O is recessive <i>Alel I^O adalah resesif</i></p> <p>S5: Since the couple's son is blood group O, the possible genotype for the child is $I^O I^O$ <i>Oleh kerana anak pasangan mempunyai kumpulan darah O, genotip yang mungkin bagi anak ialah $I^O I^O$</i></p> <p>S6: The possible genotype for the mother is $I^A I^O$ <i>Genotip yang mungkin bagi ibu ialah $I^A I^O$</i></p> <p>S7: The possible genotype for the father is $I^B I^O$ <i>Genotip yang mungkin bagi bapa ialah $I^B I^O$</i></p> <p>S8: The mother will produce two types of gametes, I^A and I^O during meiosis <i>Ibu akan menghasilkan dua jenis gamet, I^A and I^O semasa meiosis</i></p> <p>S9: The father will produce two types of gametes, I^B and I^O during meiosis <i>Bapa akan menghasilkan dua jenis gamet, I^B and I^O semasa meiosis</i></p> <p>S10: Random fertilisation / fusion of gametes between the couple will produce a child with genotype $I^O I^O$ at 25 %probability. <i>Persenyawaan secara rawak / gabungan gamet di antara pasangan itu akan menghasilkan seorang anak dengan genotip $I^O I^O$ dengan kebarangkalian 25 %.</i></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>10</p>

Question	Marking Scheme				Sub Mark	Total Mark		
8(b)	Parents / <i>Induk</i>	Mother / <i>Ibu</i>		Father / <i>Bapa</i>		1	10	
	Phenotype / <i>Fenotip</i>	Blood group A / <i>Kumpulan darah A</i>		Blood group B / <i>Kumpulan darah B</i>		1		
	Genotype / <i>Genotip</i>	$I^A I^O$		$I^B I^O$		1		
	is	Meios				1		
	Gametes / <i>Gamet</i>			1				
	Random fertilisation / fusion of gametes / <i>Persenyawaan rawak / gabungan gamet</i>					1		
	Offspring / <i>Anak</i>	$I^A I^B$	$I^A I^O$	$I^B I^O$	$I^O I^O$	1		
	Phenotype / <i>Fenotip</i> (Blood group / <i>Kumpulan darah</i>)	AB	A	B	O	1		
	Probability / <i>Kebarangkalian</i>	25%	25%	25%	25%	1		
	* Must include S1							1
	Wajib ada S1							1
	Able to discuss the factors that can cause variations in the species and the importance of variations in the survival of a species							1
P1 : factor persekitaran						1		
P2 : menyebabkan variasi selanjur						1		
P3: (contoh) : makanan / iklim / suhu / ph / contoh yang sesuai						1		
P4: factor genetic						1		
P5 : menyebabkan variasi tak / tidak selanjur						1		
P6: pindah silang						1		

Question	Marking Scheme	Sub Mark	Total Mark
	<p>P7: semasa profasa I // meiosis 1</p> <p>P8: menghasilkan pelbagai kombinasi gen</p> <p>P9: pengaturan bebas kromosom</p> <p>P10: menghasilkan pelbagai kombinasi gamet</p> <p>P11; persenyawaan rawak</p> <p>P12: menghasilkan variasi genotip dan fenotip</p> <p>P13 : mutasi (kromosom / genetic)</p> <p>P14 : menghasilkan ciri-ciri baru (yang berlainan / tidak dijumpai daripada induk)</p> <p>Importance of variations in the survival of the species <i>Kepentingan variasi dalam kemandirian spesies</i></p> <p>P15: Menyediakan penyesuaian dan ciri-ciri yang perlu untuk individu spesies itu bermandirian dalam persekitaran yang kian berubah</p> <p>P16 : mengelakkan kepupusan</p> <p>P17 : melindungi daripada pemangsa // penyamaran</p> <p>P18: berupaya 1 menjajah / mendiami habitat baru</p> <p>P19: peluang memilih pasangan</p> <p>P20: menghasilkan kepelbagaian dalam spesies yang sama</p> <p>P21: membezakan individu</p> <p style="text-align: right;">7 + 3</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p style="text-align: center;"><u>20</u></p>
9(a)	<p>Able to explain the impacts of the human activities on the environment.</p> <p><u>MEMBAJA</u></p> <p>E1 : excess fertilisers / nitrates / phosphates enter the river <i>baja / nitrat / fosfat berlebihan mengalir ke dalam sungai</i></p> <p>E2 : stimulate rapid growth of algae // cause algal bloom</p>	<p>1</p> <p>1</p> <p>1</p>	

Question	Marking Scheme	Sub Mark	Total Mark
	<i>merangsang pertumbuhan alga yang pesat // menyebabkan algal bloom</i>	1	
	E3 : algae cover surface of the river <i>alga menutupi permukaan sungai</i>	1	
	E4 : less penetration of sunlight to the bottom of the river <i>penembusan cahaya matahari ke dasar sungai berkurangan</i>	1	
	E5 : aquatic plant cannot carry out photosynthesis <i>tumbuhan akuatik tidak dapat menjalankan fotosintesis</i>	1	
	E6 : less dissolved oxygen in the water. <i>kurang oksigen terlarut di dalam air</i>	1	
	E7 : aquatic plants and animal dies <i>tumbuhan dan haiwan akuatik mati</i>	1	6
	E8 : B.O.D level increase <i>aras B.O.D bertambah</i>	1	
	E9 : eutrophication occurs <i>eutrofikasi berlaku // pencemaran air / sungai</i>	1	
	<u>PEMBAKARAN</u>	1	2
	G1 : burning of farm waste releases carbon dioxide / smoke / dirt / soot <i>pembakaran sisa buangan kebun membebaskan karbon dioksida / asap / habuk / jelaga</i>	1	
	G2 : causes greenhouse effect / haze / air pollution <i>menyebabkan kesan rumah hijau/ jerebu / pencemaran udara</i>	1	
	G3 : surrounding temperature increases / global warming / poor vision / example of health problem <i>peningkatan suhu persekitaran / pemanasan global /</i>	1	2
	<u>MERACUN</u>		
	P1 : racun memasuki tanah dan air sungai		
	P2 : pesticide will be accumulated in the animal of higher trophic level <i>racun perosak akan terkumpul pada haiwan yang berada di aras trofik tinggi</i>	1	
	P2 : will cause mutation / death to the animals <i>akan menyebabkan mutase / kematian terhadap haiwan</i>	1	
	P3 : disrupt / destroy the food chain / web <i>mengganggu / memusnahkan rantai / jaringan makanan</i>	1	
		1	

Question	Marking Scheme	Sub Mark	Total Mark
9(b)	<i>Any 6P + 2G + 2P / mana-mana 6P + 2G + 2P</i>	1	
	Able to suggest how we can save the earth from the impact of the phenomenon.	1	
	P1 : avoid cutting down trees / deforestation <i>elakkan menebang pokok / penyahutan</i>	1	
	P2 : (sebab) pokok dapat bebaskan / bekalkan oksigen	1	
	P3 : tanam semula / tanam lebih banyak pokok	1	
	P4 (untuk) menyerap karbon dioksida (berlebihan)dalam atmosfera	1	
	P5 : elak pembakaran terbuka	1	
	P6: (untuk) kurangkan pembebasan haba (/ karbon dioksida)	1	
	P7 : gunakan pengangkutan awam // berkongsi kereta	1	
	P8 : kurang kenderaan yang bebaskan carbon dioxide	1	
	P9 : gunakan sumber tenaga alternative // kurangkan penggunaan bahan api fosil.	1	
	P10: elakkan peningkatan/ pertambahan gas karbon dioksida di atmosfera	1	10
	P11 : kitar semula / mengurangkan, guna semula barangan kertas	1	<hr style="width: 50px; margin: 0 auto;"/> 20
P12 : mengurangkan bilangan pokok yang ditebang	1		
	<i>Any 10P / mana-mana 10P</i>		