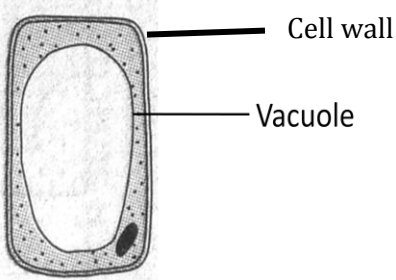


Question 1

No	Mark scheme	Sub Mark	Total Mark
1(a)(i)	Able to name structure labeled O and Q.	1 + 1	
	Answer : R : Mitochondria Q : Golgi apparatus / body		2
(a)(ii)	Able to state the function of structure R and P.	1 + 1	
	Sample answer : R : to generate/ produce/ release energy P : to trap sunlight // to carry out photosynthesis <i>Reject: provide</i> <i>Reject: absorb</i>		2
(b)(i)	Able to state the main component of M.	1	
	Answer : Cellulose		1
(ii)	Able to explain one characteristic of M.	1 + 1	
	Sample answer F1 : Permeable E1 : has tiny pores E2 : to allow substances to move freely into and out of the cell F2: Rigid/though/ E3: give shape to plant cell E4: to provide mechanical support to plant cell E5: to protect the plant cell from rupturing F with any correspond E		2
(c)(i)	Able to explain the condition of the structure N in distilled water.		
	Sample answer F : Vacuole expand / swell up. E1 : Distilled water is hypotonic to the cell (sap) // Cell (sap) is hypertonic to distilled water // the concentration of solute in distilled water is lower than concentration of solute in the cell (sap) E2 : Water (molecules) diffuse into the cell E3: by osmosis Any three	1+1+1+1	3

No	Mark scheme	Sub Mark	Total Mark
(ii)	<p>Able to draw a labeled diagram of the condition of vacuole</p> <p><u>Sample answer</u></p> <p>D- The shape of the cell rectangular. The cell wall is drawn with double line The vacuole must be large/enlarge L - Label vacuole // cell wall</p>  <p><i>Accept any correct shape of plant cell</i></p>	1+1	
	TOTAL		2 12

Question 2

No	Mark scheme	Sub Mark	Total Mark						
2(a)(i)	Able to name respiratory system shown in Diagram 2.1	1							
	Answer: Tracheal System		1						
(ii)	Able to state a difference between the respiratory system of organism X and organism Y.	1							
	Sample answer :								
	<table border="1"> <thead> <tr> <th>Organism X <i>Organisma X</i></th> <th>Organism Y <i>Organisma Y</i></th> </tr> </thead> <tbody> <tr> <td>Oxygen diffuses directly into the body tissue</td> <td>oxygen diffuses directly into the blood capillaries</td> </tr> <tr> <td>Gaseous exchange directly into tissues</td> <td>gaseous exchange occur at specific organ/ lung</td> </tr> </tbody> </table>	Organism X <i>Organisma X</i>	Organism Y <i>Organisma Y</i>	Oxygen diffuses directly into the body tissue	oxygen diffuses directly into the blood capillaries	Gaseous exchange directly into tissues	gaseous exchange occur at specific organ/ lung		1
Organism X <i>Organisma X</i>	Organism Y <i>Organisma Y</i>								
Oxygen diffuses directly into the body tissue	oxygen diffuses directly into the blood capillaries								
Gaseous exchange directly into tissues	gaseous exchange occur at specific organ/ lung								
	<i>Any one</i>								
(b)(i)	Able to name structure P and Q.	1 + 1							
	Sample answer P : trachea Q : bronchus		2						
(b)(ii)	Able to state the common characteristic	1							
	Sample answer : Both have (tracheal) ring/ any explanation		1						
b(iii)	Able to explain why the characteristic is important	1+1							
	Sample answer : F : To prevent deflation/ air passage collapsing E 1: atmospheric pressure is higher than the pressure inside the trachea E2: both ring is to strengthen air tube. <i>Any two</i>		2						

No	Mark scheme	Sub Mark	Total Mark
(c)(i)	Able to state one characteristics that they have in common to increase the efficiency of gases exchange.	1	
	Sample answer : P1 : Has large surface area/ higher TSA P2: One cell thick P3 : Moist (surface) Any one		1
(c)(ii)	Able to explain the importance of gas exchange in both organisms.	1 + 1	
	Sample answer : P1: To supply oxygen for cellular respiration P2 : oxidized glucose to produce energy P3 :To excrete carbon dioxide produced by cells Any two		2
(d)	Able to explain how smoking habit affect the intake of oxygen intake of oxygen efficiency in human.	1 + 1	
	Sample answer : F1 : less oxygen combine with haemoglobin. E1: Carbon monoxide can bind with haemoglobin E2 : to form carboxyhaemoglobin F2 : reduce diffusion of oxygen E3 : tobacco tar will be deposited/ logged/ accumulated (inside the lungs) // thick // explanation F3 : Oxygen cannot be dissolved E4 : Heat from the smoke E5 : Dry the surface of the alveoli Any F with correspond E		2
	TOTAL		12

Question 3

No	Mark scheme	Sub Mark	Total Mark
(a)	Able to name the organelles X, Y and Z.	1+1+1	Reject RER
	Answer : X : Golgi apparatus Y : rough endoplasmic reticulum Z : secretory vesicle		3
(b)	Able to state two types of nucleic acid inside the nucleus that provide the information to synthesize the protein.	1+1	
	Answer: 1. DNA //deoxyribonucleic acid 2. RNA // ribonucleic acid		2
(c)(i)	Able to state the type of structure shown.	1	
	Answer : Quarternary (structure)		1
(ii)	Able to name one example of the structure.	1	
	Sample answer : Heamoglobin		1
(iii)	Able to describe the structure of molecule P	1 + 1	
	Sample answer : P1 : complex (protein) molecule P2 : combination of two /more tertiary structure (of polypeptide chain) P3 : form large protein molecule <i>Any two</i>		2
(d)	Able to explain how damage to the chromosome structure by radioactive rays can disrupt the synthesis of the extracellular enzyme	1+ 1 + 1	
	Sample answer: F : mutation occur E1 : genetic code/ information / gene of DNA E2 : destroyed / change / E3 : cannot synthesise the enzyme / amylase / lipase / protease / any suitable enzyme. E4 : organism cannot digest food // rate of metabolism become lower // organism die.		

		<i>Any three</i>	3
		TOTAL	12

Question 4

No	Mark scheme	Sub Mark	Total Mark				
(a)(i)	Able to state type of cell division in cell P and cell Q.	1 + 1					
	Answer : Cell P : mitosis / mitotic Cell Q : Meiosis		2				
(ii)	State one importance of the cell division in cell P and cell Q.	1 + 1					
	Sample answer : Cell p : to increase number of cell // to replace damage / dead cell // for asexual reproduction / culture tissue / cloning // to produce new cell // to maintain diploid number of chromosome. Cell Q : to produce variation / gametes // to maintain the chromosomal number of offspring // to ensure haploid number in gametes.		2				
(b)(i)	Able to state one difference between chromosomal behavior at the stage in cell P and cell Q .	1					
	Sample answer : <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Stage in cell P</th> <th style="width: 50%;">Stage in cell Q</th> </tr> </thead> <tbody> <tr> <td>Chromosome / sister chromatid align at metaphase plate / equator</td> <td><u>Homologous</u> chromosome align at metaphase plate / equator.</td> </tr> </tbody> </table>	Stage in cell P	Stage in cell Q	Chromosome / sister chromatid align at metaphase plate / equator	<u>Homologous</u> chromosome align at metaphase plate / equator.		1
Stage in cell P	Stage in cell Q						
Chromosome / sister chromatid align at metaphase plate / equator	<u>Homologous</u> chromosome align at metaphase plate / equator.						
(ii)	Able to explain one importance of the chromosomal behaviour in cell P.	1 + 1					
	Sample answer : F : to ensure equal distribution of chromosome in daughter cell. E : to prevent daughter cell have an abnormal number of chromosome. // any explanation.		2				
No	Mark scheme	Sub	Total				

		Mark	Mark
(c)(i)	Able to Name the organism produced from scientific technique	1	
	Sample answer : Transgenic plant / organism		1
(ii)	Able to describe how the technique is carried out.	1+1+1	
	Sample answer : P1: shoot/ root/ leaf P2: wash/ sterilize with satirizing agent/ bleaching agent/ hydrogen peroxide P3: tissue/ explants is cultured in sterilize nutrient medium, with suitable temperature and pH value. P4: cell divide to form callus, P5: small pieces of callus than is cultured in nutrient medium P6: callus differentiate to form root/ shoot seedling/ clone Any 3		3
	TOTAL		12

Question 5

No	Mark scheme	Sub Mark	Total Mark
(a)(i)	Able to name P reaction and molecule R.	1 + 1	
	Sample answer : P reaction : dark reaction Molecule R : Starch		2
(ii)	Able to name two raw materials for photosynthesis	1 + 1	
	Sample answer : 1. Carbon dioxide 2. water		2
(b)(i)	Able to explain the importance of sunlight energy during light reaction.	1+ 1	
	Sample answer : F1 : photolysis (of water) E1 : split water into hydrogen ion and hydroxyl ion F2 : to excite electron from chlorophyll		

	<p style="text-align: right;"><i>Reject : Chloroplast</i></p> <p>E2 : to produce ATP E3: electron combine with hydrogen ion to produce atom Q / hydrogen atom</p> <p style="text-align: right;"><i>Any F with correspond E</i></p>		2
(ii)	Able to describe how oxygen and water are produced during photosynthesis.	1 + 1	
	<p>Sample answer :</p> <p>P1 : hydroxyl ion loses an electron P2 : to form hydroxyl group P3 : electron is received by chloropyll P4 : the hydroxyl group combine each other to form water and oxygen</p> <p style="text-align: right;"><i>Any two</i></p>		2
(c)	Able to explain the role of atom Q during P reaction.	1 + 1	
	<p>Sample answer :</p> <p>F : atom Q is hydrogen atom E1 : fix / reduce carbon dioxide E2 : to form (CH₂O)_n / basic unit of glucose/ 6 carbon molecule.</p> <p style="text-align: right;"><i>Any two</i></p>		2
(d)	Explain how air pollution have an effect on rate of photosynthesis .	1 + 1	
	<p>Sample answer :</p> <p>F : rate of photosynthesis decreases / low E1 : pollutant / dust / particle / any suitable example cover the surface of the leaf. E2 : reduce light intensity (received by chloroplast) E3 : lodge / cover the stoma/ reduce gases exchange/ carbon dioxide</p> <p style="text-align: right;"><i>Any two</i></p>		2
	TOTAL		12

Question 6

No	Mark scheme	Sub Mark	Total Mark															
(a)	Able to explain the process shown in Diagram 6.1	Max 4																
	<p>Sample answer :</p> <p>P1 : the process is diffusion.</p> <p>P2 : molecule of sugar move randomly</p> <p>P3 : against concentration gradient // from higher concentration region towards lower concentration region.</p> <p>P4 : concentration of sugar is higher at the bottom of the beaker</p> <p>P5 : (diffusion process continues until) the sugar molecule are evenly dispersed</p> <p>P6 : reach a dynamic equilibrium (at the end of the experiment.)</p> <p style="text-align: right;"><i>Any four</i></p>		4															
(b)	Able to explain the similarities and differences between the movement of molecule across plasma membrane in type 1 and type 2.	Max 2																
	<p>Sample answer :</p> <p><u>Similarities</u></p> <p>S1 : Both need protein</p> <p>E1 : Both transport specific molecules only</p> <p>E2 : Both processes occur in living cell</p> <p style="text-align: right;"><i>Any two</i></p> <p>Differences :</p>	Max 4	2															
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Type 2</th> <th>Type 1</th> </tr> </thead> <tbody> <tr> <td></td> <td>Facilitated diffusion</td> <td>Active transport</td> </tr> <tr> <td>D1</td> <td>Down the concentration gradient</td> <td>Against the concentration gradient</td> </tr> <tr> <td>E1</td> <td>Molecule moves from higher concentration region to lower concentration region</td> <td>Molecule moves from lower concentration region to higher concentration region</td> </tr> <tr> <td>D2</td> <td>Molecules move in both direction across the plasma membrane</td> <td>Molecules move in one direction across the plasma membrane</td> </tr> </tbody> </table>		Type 2	Type 1		Facilitated diffusion	Active transport	D1	Down the concentration gradient	Against the concentration gradient	E1	Molecule moves from higher concentration region to lower concentration region	Molecule moves from lower concentration region to higher concentration region	D2	Molecules move in both direction across the plasma membrane	Molecules move in one direction across the plasma membrane		
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	E2	Molecule move through pore proteins	Molecule can move through carrier proteins		
	D3	No energy used	Energy is used		
	E3	Molecule can move through (pore) protein without binding	Energy is needed for binding / bind with active site		
	D4	Molecule need pore protein to help the movement	Need carrier protein only to help the movement		
	D5	Could achieve equilibrium	Results in accumulation / elimination		
	D6	Not affected by inhibitors	Inhibited by inhibitor		
	E6	Not depended on cellular respiration	Depended on cellular respiration		
	<i>Any 4</i>				4
(c)	Able to explain what happens to the cell in each diagram.				
	<p>Sample answer : (in Diagram 6.3) F : cell under normal condition / protoplasm in normal shape P1 : solution is isotonic to the (plant) cell (sap) P2 : there is a balanced diffusion of water molecules in and out // water molecules entering the cell is equivalent to water molecule leaving the cell P3 : by osmosis</p> <p style="text-align: right;"><i>Any three</i></p>			Max 3	3
	<p>(in solution Y) F : Cell plasmolyses / undergoes plasmolysis // becomes flaccid</p> <p>P1 : because solution Y is hypertonic to (sap) cell</p> <p>P2 : water molecule diffuse out from the cell</p>			Max 4	

	P3 : by osmosis P4: cytoplasm shrinks // cell membrane moves away from the cell wall. <i>Any four</i>		4
	(in solution X) F : cell become turgid P1 : solution Y is hypotonic to the (sap) cell P2 : water molecule diffuse into plant cell P3 : by osmosis. <i>Any three</i>	Max 3	3
	TOTAL		20

Question 7

No	Mark scheme	Sub Mark	Total Mark								
(a)(i)	Able to describe the succession process in zone 1 and zone 2	Max 4									
	Sample answer : P1 : Pneumatophore of pioneer sp / Avicennia sp / Sonneratia sp traps/ collect muds / organic substances/ sediments P2 : Increase the thickness of the soil / land become higher P3 : (As time pass by)the soil becomes more dense/ compact / firm / drier P4 : The condition favours the growth of <i>Rhizophora</i> sp. P5 : The <i>Rhizophora</i> sp. replaces the pioneer species. <i>Any four</i>		4								
(ii)	Able to explain the problems faced by mangrove trees and how they overcome these problems.	Max 6									
	Sample answer : <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">(P)</th> <th style="width: 30%;">Problem faced by mangrove</th> <th style="width: 10%;">E</th> <th style="width: 50%;">How to overcome// adaptation</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>Soft muddy soil, the plant collapse</td> <td>E1</td> <td>have long / branched cable / prop roots to support / anchor the plants to the</td> </tr> </tbody> </table>	(P)	Problem faced by mangrove	E	How to overcome// adaptation	P1	Soft muddy soil, the plant collapse	E1	have long / branched cable / prop roots to support / anchor the plants to the		
(P)	Problem faced by mangrove	E	How to overcome// adaptation								
P1	Soft muddy soil, the plant collapse	E1	have long / branched cable / prop roots to support / anchor the plants to the								

			muddy soil.
P2	Waterlogged conditions of the soil decrease the amount of oxygen	E2	has breathing roots / pneumatophores to absorb oxygen from atmosphere // pneumatophores have pores / lenticels exchange gases takes place
P3	Direct exposure to the sun leads to a high rate of transpiration	E3	A thick layer of cuticle covers the leaves to reduce (rate of) transpiration // The leaves are thick and succulent to store water.
P4	The surrounding water in the soil hypertonic as compared to the cell sap of the root cells	E4	The cell sap of the roots cells has a higher osmotic pressure than the soil water that surrounds them to ensure that the roots do not lose water by osmosis. // Have pores on the leaves / hydathodes to excrete the excess salt in the hypertonic water of the soil which enters the roots.
P5	Seeds which fall onto the ground die because they are submerged within the soft and waterlogged soil.	E5	Seeds have vivipary characteristic. // the seeds are able to germinate while still attached to the parent plant.

	<i>Any six</i>		6
(b)	Able to explain the importance of microorganisms in farming.	Max 10	
	<p>Sample answer :</p> <p>P1: Nitrogen fixing bacteria carries out fixation of nitrogen P2 : <i>Rhizobium</i> in root nodules of leguminous plants// Free-living bacteria/ <i>Azotobacter</i>/ <i>Nostoc</i> P3: Use nitrogen in the air to make nitrates/ ammonium compound P4: Nitrates produced by the bacteria are absorbed by plants to make protein</p> <p>P5 : to make protein P6: When animals eat plants the protein is transferred to animals</p> <p>P7: Excretory nitrogenous substances/ urea/ waste material/ faeces from animal</p> <p>P8 : and when plants/ animals die, P9 : are decomposed/ decayed by decaying bacteria/ saprophytic bacteria/ fungi</p> <p>P10 : Breaks them down to ammonia/ ammonium compounds</p> <p>P11: Nitrifying bacteria/ <i>Nitrosomonas</i> converts ammonium compounds/ ammonia to nitrites</p> <p>P12: Nitrifying bacteria/ <i>Nitrobacter</i> converts nitrites to nitrates</p> <p>P13 : Mineral ions /nitrates be released/ returned to the soil P14 : Soil becomes fertile/ more nutrient in the soil</p> <p>P15 : Plants will grow/ photosynthesis take place / crop yield increase</p> <p style="text-align: right;"><i>Any 10</i></p>		10
	TOTAL		20

Question 8

No	Mark scheme	Sub Mark	Total Mark
(a)	Able to explain how the production of these products can endanger ecosystem	Max 5	
	<p>Sample answer :</p> <p>F : Ozone depletion</p> <p>E 1 : Leaf cells and chlorophyll are damaged by ultraviolet rays</p> <p>E2 : lower the rate of photosynthesis</p> <p>E3 : reduce crop yield</p> <p>E4 : Ultraviolet rays kill microorganisms/ phytoplankton// destroy</p> <p>E5 : disrupt the marine food chain</p> <p>E6 : Prolonged exposure to ultraviolet radiation lead to skin cancer/ melanoma/ cataract/ weakened the immune system</p> <p>E7 : Greenhouse effect/ global warming</p> <p>E8 : damage the eggs of certain amphibians// wind patterns change// climatic changes</p> <p style="text-align: right;"><i>Any 6</i></p>		6
	Able to suggest measures to be taken to reduce this problem.		
	<p>Sample answer :</p> <p>P1 : Reduce/ stop/ ban the use of Chlorofluorocarbon/ CFC</p> <p>P2 : Replace CFC with HCFC</p> <p>P3 : Firing ozone missile</p> <p>P4 : the world comply with the Montreal Protocol to reduce the use of CFCs (to cut the use of CFC's in half by the year 1997)</p> <p>P5 : Reduce the usage of Styrofoam / polystyrene container</p> <p style="text-align: right;"><i>Any 4</i></p>		4
(b)	Able to explain the occurrence of these phenomenon's	Max 8	
	Sample answer :		
	F1 : phenomenon : Green house effect / global warming		
	F2 : burning of fuel from transports / factories / forest / excessive deforestation		

	<p>F3 : increase carbon dioxide content in the atmosphere</p> <p>P1 CO₂ trap /absorb more heat in the atmosphere</p> <p>P2 The layer of green house gases / CO₂ acts as an insulator / barrier</p> <p>P3 To prevent the heat from being transmitted to space</p> <p>P4 Causes a rise in temperature of the atmosphere / leads to global warming</p> <p>P5 Thermal expansion of sea water // melting of glaciers / ice sheet</p> <p>P6 Cause sea level to rise / flood / sinking of island</p> <p>P7 Causes changes in wind direction / sea current</p> <p>P8 Cause climatic changes / thyphoon</p> <p>P9 High atmosphere temperature reduces the rate of photosynthesis</p> <p>P10 Productivity of crops / livestock decrease</p> <p>P11 Destruction / disruption of food chains / food webs</p> <p>P12 Cause extinction of species // biodiversity decreases</p>		8
	Able to measures to be taken to reduce this problem.	Max 2	
	Sample answer :		
	<p>P1 : replacing energy of fossil / Energy generated from wind / water</p> <p>P2. Limit open burning</p> <p>P3. Limit deforestation</p> <p>P4. Replanting after deforestation</p> <p>P5. Promotes green word.</p> <p style="text-align: right;"><i>Any two</i></p>		2
	TOTAL		20

Question 9

No	Mark scheme	Sub Mark	Total Mark
(a)	Able to explain the necessity for food processing.	Max 8	
	<p>Sample answer :</p> <p>F1 : prevent food spoilage E1 : (food spoilage) causes by the action of microorganism E2 : decomposing bacteria/fungi on carbohydrate/protein E3 : produced carbon dioxide / water / ammonia hydrogen E4 : make food become toxic</p> <p>F2 : prevent Oxidation of food when cut/expose to air E1 : oxygen react with enzymes/chemicals released by cell Oily food becomes rancid / smells / taste different</p> <p>F3 : To increase it commercial value E1 : food additives is added in preserving the freshness of food E2 : Improve the taste/appearance/texture</p> <p>F4 : to diversify the uses of food E1 : increased the variety of products E2 : more attractive / palatable</p> <p>F5 : to last longer E1 : can withstand long periods of transportation / storage</p> <p style="text-align: right;"><i>Any 8</i></p>		
(b)	Able to describe how the method can preserve food for along period of time.	Max 8	
	<p>Sample answer :</p> <p>(Pasteurisation) P1 : milk is treated to 63°C for 30 minutes // 72°C for 15 seconds P2 : followed by rapid cooling to below 10°C P3 : destroy bacterias but not the spores P4 : retains the natural flavor of milk // nutrients//vitamin B P5 : retains the nutrients // vitamin B</p>		

	P6 : must refrigerated to avoid the germination of microbe`s spore		
		<i>Any 3</i>	
	(Canning) P1 : use heat sterilisation		
	P2 : kill microorganisms and spores		
	P3 : steamed at high temperature / pressure to drive out air		
	P4 : sealed while the food is being cooled		
	P5 : vacuum in the can prevent growth of microorganism		
		<i>Any 3</i>	
	(Refrigeration) P1 : stored at temperature below 0°C		
	P2 : prevent the growth of microorganisms / the germination of spores		
	P3 : remain fresh		
		<i>Any 2</i>	
(c)	Able to describe the aeroponics method to improve the quality and quantity of food production.	Max 4	
	Sample answer :		
	P1 : the plants are suspended in a chamber .		
	P2 : the roots exposed to the air.		
	P3 : nutrient solutions are sprayed onto the root (at suitable time		
	P4 : at suitable time interval // explanation.		
	P5 : the plant roots absorb more oxygen in between the periods of spraying.		
	P6 : light intensity / temperature can be controlled to ensure the environmental factor are at optimum.		
		<i>Any 4</i>	
		TOTAL	20

PERATURAN PERMARKAHAN TAMAT