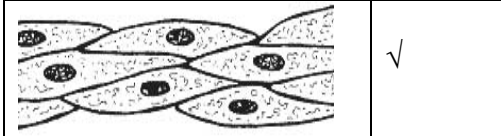


**SCORING CRITERIA PAPER 2**

Question 1

Num.	Scoring Criteria	Marks	
(a)(i)	<p><i>Able to name the level organization of muscle P</i></p> <p>Answer: Tissue</p>	1	1m
(a)(ii)	<p><i>Able to (✓) the correct type of muscle</i></p> <p>Answer:</p> 	1	1m
(b)(i)	<p><i>Able to name organelle abundantly in muscle P</i></p> <p>Answer: mitochondria</p>	1	1m
(b)(ii)	<p><i>Able to justify</i></p> <p>Answer:</p> <p>P1 : to generate energy            P2 : by cellular respiration            P3 : for contraction of muscle            P4 : to enable bird flight</p>	1 1 1 1	2m
(c)(i)	<p><i>Able to name tissue</i></p> <p>Answer: Tendon</p>	1	1m
(c)(ii)	<p><i>Able to state one characteristics</i></p> <p>Answer: Inelastic // strong</p>	1	1m
(d)	<p><i>Able to explain the effect of the locomotion if muscle P is torn</i></p> <p>Answer:</p> <p>F : muscle P cannot contract            P1 : pulling force cannot be create / transfered to the bone            P2 : so bone cannot be pulled upwards / forwards // upstroke            P3 : bird cannot flight</p>	1 1 1 1	max 3m
(e)	<p><i>Able to explain how the stem cell able to becomes tissue P, Q and R.</i></p> <p>Answer:</p> <p>P1 : through differentiation            P2 : the stem cell becomes specialized cells            P3 : such as nerve tissue / muscle tissue / blood tissue / connective tissue</p> <p style="text-align: right;"><i>Any two</i></p>	1 1 1	max 2m
<b>TOTAL</b>		<b>12</b>	

Question 2

Num.	Scoring Criteria	Marks	
(a)(i)	Able to identify the types of polysaccharide <i>Answer:</i> X : starch Y : glycogen Z : Cellulose	1 1 1 1	2m 1m 0m Max 2
(a)(ii)	Able to state the basic unit of polysaccharide  <i>Answer:</i> Glucose	1	1
(a)(iii)	Able to explain the hydrolysis of starch <i>Suggested answer:</i> P1: through enzymatic reaction // by hydrolysis process P2: by using enzyme amylase	1 1	2
(b)(i)	Able to name molecule P  <i>Answer:</i> Sucrose	1	1
(b)(ii)	Able to name process X and Y <i>Answer:</i> X : condensation Y : hydrolysis	1 1	2
(c)	Able to explain the assimilation of glucose  <i>Suggested answer:</i> <u>F1: In the liver</u> P1 : Excess of glucose in the blood is converted to glycogen and stored in the liver P2 : In the liver , if glucose level in blood is low glycogen is converted to glucose P3 : Excess of glycogen is converted to lipids by the liver  <u>F2: In the body cell</u> P4 : Reaching the body cells , glucose is oxidized to release energy in cellular respiration	1 1 1 1 1 1	Max 4
<b>TOTAL</b>		<b>12</b>	

Question 3

Num	Scoring criteria	Marks																			
(a)(i)	<b>Able to name structure R</b> R : Grana	1	1																		
(a)(ii)	<b>Able to state one similarity and one differences between the product of light reaction and dark reaction.</b>  Similarity : S1 : Both rection occur in chloroplast Differences: <table border="1" data-bbox="300 629 1230 860"> <thead> <tr> <th data-bbox="300 629 767 674">F:</th> <th data-bbox="767 629 1230 674">Reaction in R</th> <th data-bbox="767 629 1230 674">Reaction in S</th> </tr> </thead> <tbody> <tr> <td data-bbox="300 674 767 707">D1 :</td> <td data-bbox="767 674 1230 707">Occur in grana</td> <td data-bbox="767 674 1230 707">Occur in stroma</td> </tr> <tr> <td data-bbox="300 707 767 741">D2 :</td> <td data-bbox="767 707 1230 741">Needs light</td> <td data-bbox="767 707 1230 741">Does not need light</td> </tr> <tr> <td data-bbox="300 741 767 775">D3 :</td> <td data-bbox="767 741 1230 775">Produce oxygen (and water)</td> <td data-bbox="767 741 1230 775">Produce glucose</td> </tr> <tr> <td data-bbox="300 775 767 808">D4 :</td> <td data-bbox="767 775 1230 808">Not involve enzyme</td> <td data-bbox="767 775 1230 808">Involve enzyme</td> </tr> <tr> <td data-bbox="300 808 767 860">D5 :</td> <td data-bbox="767 808 1230 860">Photolysis of water</td> <td data-bbox="767 808 1230 860">Reduction of carbon dioxide</td> </tr> </tbody> </table> (any 2)	F:	Reaction in R	Reaction in S	D1 :	Occur in grana	Occur in stroma	D2 :	Needs light	Does not need light	D3 :	Produce oxygen (and water)	Produce glucose	D4 :	Not involve enzyme	Involve enzyme	D5 :	Photolysis of water	Reduction of carbon dioxide	1	3
F:	Reaction in R	Reaction in S																			
D1 :	Occur in grana	Occur in stroma																			
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D4 :	Not involve enzyme	Involve enzyme																			
D5 :	Photolysis of water	Reduction of carbon dioxide																			
(b)	<b>Able to explain the effects to the mechanism of dark reaction if the plant is exposed to the light for 24 hours everyday.</b>  P1 : <u>more</u> hydrogen (ions/atoms) are produced during light reaction P2 : <u>more</u> carbon dioxide can be fix by hydrogen atom P3 : <u>more</u> glucose/amino acid/fatty acid are produced P4 : rate of dark reaction increase	1 1 1 1	2																		
(c)	<b>Able to explain how the condition of the environment affects the rate of photosynthesis of the plant.</b>  F1 : dust particle will cover/accumulate on the surface of the leaf P1 : less light energy will be trapped by the chloroplast F2 : dust particle block the stomata P2 : less/no supply of carbon dioxide into the cell P3 : rate of photosynthesis decreases	1 1 1 1 1	3																		
(d)	<b>Able to explain how this method is carried out during winter to ensure the production of crops throughout the year.</b>  F : In winter, the temperature is very low//light intensity is low and the rate of photosynthesis is very low P1 : in the greenhouse, light intensity/concentration of carbon dioxide/temperature are maintained at optimum level (for photosynthesis) throughout the year. P2 : so the rate of photosynthesis is maintain at maximum level throughout the year P3 : this will increase yields of crops production throughout the year	1 1 1 1	3																		
<b>Total</b>		<b>12</b>																			

Question 4

Num	Scoring Criteria	Marks	
(a)	<p>Able to name two systems involve in regulating of respiratory gases</p> <p><i>Answer:</i>            Blood circulatory system // Respiratory system // Nerves system  <i>Any two</i></p>	2	2
(b)(i)	<p>Able to explain why the blood pH decrease</p> <p><i>Answer:</i>            P1: Increase of carbon dioxide in blood            P2: Carbon dioxide reacts with water (in blood plasma)            P3: Formed carbonic acids</p>	1 1 1	Max 2
(b)(ii)	<p>Able to explain how a drop in pH value of the blood can be detected by the body</p> <p><i>Answer:</i>            P1: Detected by the peripheral chemoreceptors            P2: Send nerve impulses to the central chemoreceptors / respiratory centre</p>	1 1	2
(c)	<p>Able to describe how to regulate the concentration of oxygen in the blood</p> <p><i>Suggested answer:</i>            P1: Level of oxygen in blood decrease detected by peripheral chemoreceptors            P2: Nerve impulse send to central chemoreceptors (in medulla oblongata)            P3: Impulse send to diaphragm / and intercostals muscles and cardiac muscles            P4: Breathing rate and heart beat rate increase            P5: Intake more oxygen</p>	1 1 1 1 1	Max 3
(d)	<p>Able to explain the effects of smoking on his heartbeat rate and breathing rate.</p> <p><i>Suggested answer:</i>            F: Higher heartbeat rate and breathing rate            P1: carbon monoxide (in blood) combine with haemoglobin            P2: cause him to breath faster / and deeper            P3: to obtain more oxygen            P4: Nicotine in blood cause release of adrenaline            P5: and make the heart pump faster</p>	1 1 1 1 1 1	Max 3
<b>Total</b>			<b>12</b>

Question 5

NUM	SCORING CRITERIA	MARK	
(a)	<p>Able to explain how skin and mucous membranes act on the first line of defence mechanism</p> <p><i>Suggested answer</i></p> <p><u>Skin:</u></p> <p>F1: strong layer</p> <p>P1: Hard / cannot be penetrates by microorganisms (as physical barrier)</p> <p>F2: secretes sebum</p> <p>P2: that provides a protective layer on the skin / acidic substances that prevent growth (as chemical barrier) of certain bacteria and fungi</p> <p>F3: Secretes sweat that contain lysozyme</p> <p>P3: used to breakdown bacteria cell wall</p> <p>F4: Blood clotting process occur at fast</p> <p>P4: Able to prevent entering of microorganisms into the blood</p> <p style="text-align: right;"><i>Any IF IP</i></p> <p><u>Mucous membranes:</u></p> <p>F1: Layer on trachea / respiratory tract / digestive tract / urogenital tract</p> <p>P1: secretes mucus that contain lysozymes to breakdown / digest bacteria.</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>Max 2</p> <p>2</p>
(b)	<p>Able to explain the action of blood cell Q against bacteria</p> <p><i>Suggested answer:</i></p> <p>P1: By phagocytosis.</p> <p>P2: Phagocyte /Neutrophil attracted /move towards (chemical / protein produced by) bacteria/phatogen /antigen //extends / form pseudopodia</p> <p>P3: (Phagocytes /neutrophil) engulfs the bacteria /pathogen //(Phagocytes/Neutrophil) surrounds/binds itself to bacteria</p> <p>P4: Forms phagosome /food vacuole /phagocytic vesicle</p> <p>P5: (Lysosome fuse with phagosome and) release/secrete enzyme lysozyme into phagosome / food vacuole /phagocytic vesicle</p> <p>P6: (Enzyme / lysozyme in lysosome) digests /destroy the bacteria /pathogens /antigen</p> <p style="text-align: right;">Accept : kill the bacteria</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>Max 3</p>

(c)(i)	<p>Able to describe type of immunization based on the graph</p> <p><i>Suggested answer</i></p> <p><u>Diagram 5.3 (a):</u></p> <p>P1: Injection P is vaccin // contains a weakened / dead patogens // vaccination</p> <p>P2: to stimulate white blood cells/lymphocyte/B-lymphocyte to produce antibody // the body gain the ability/immunity against the disease/hepatitis B//the antibody able to destroy pathogene/antigen//Artificial (Acquire) Active Immunity <i>Accept: Fight against the pathogene /antigen</i> <i>Reject: Fight against the disease</i></p> <p>P3: Need a booster / second injection of vaccine (after a few years of vaccination) will stimulate the lymphocyte to produce <u>more</u> antibodies quickly</p> <p>P4: stimulates a quicker and longer lasting response // the concentration of antibodies in the body will be able to reach the effective immunity level //and can induce a long lasting immunity // to ensure that the level of antibody (in the body) is enough to give protection against the pathogen</p> <p>F : Hepatitis B / Any suitable example</p>	1 1 1 1 1	Max 3
(c)(ii)	<p><u>Diagram 5.3 (b):</u></p> <p>Q1: Injection Q is serum / antiserum //contains ready-made antibody against a particular disease/tetanus</p> <p>Q2: (The antibody) is injected directly into the blood/body and react <u>immediately</u> against the specific antigens (in the body) /to give <u>immediately</u> protection against the disease / tetanus // Concentration of antibodies increases <u>immediately</u> and exceeds level of immunity</p> <p>Q3: The injection serum (antibody) can only induced a short lived immunity /quick temporary immunity //the level of antibody decrease rapidly // Type of immunity cannot last for several weeks or months (because the foreign antibodies break down in the body and are not replaced )</p> <p>F: Tetanus / Any suitable example</p>	1 1 1 1	Max 3
<b>TOTAL</b>			<b>12</b>



6(c)	<p><b>Able to describe briefly the mechanism of osmoregulation if a person</b></p> <p><b>(i) Drinking too much water</b></p> <p>F1: cause the osmotic pressure of blood is lower 1</p> <p>P1: the osmoreceptor in the hypothalamus are less stimulated/ the pituitary gland is less stimulated 1</p> <p>P2: less ADH is secreted. 1</p> <p>P3: causes distal convoluted tubule and collecting duct become impermeable to water . 1</p> <p>P4: less water is reabsorbed 1</p> <p>P5: the blood osmotic pressure rises to normal 1</p> <p><b>(ii) Eating too much salty foods</b></p> <p>F2: cause the osmotic pressure of blood is higher 1</p> <p>P6: the osmoreceptor cells in the hypothalamus are stimulated /the pituitary gland is stimulated 1</p> <p>P7: more ADH is secreted. 1</p> <p>P8 ; causes the distal convoluted tubule and collecting duct become more permeable to water . 1</p> <p>P9: more water is reabsorbed 1</p> <p>P10: the blood osmotic pressure drops to normal 1</p> <p style="text-align: right;">Maximum</p>		<p>Any 5</p> <p>Any 5</p> <p>10</p>
<b>TOTAL</b>			<b>20</b>

Question 7

Num	Mark Scheme	Mark	
(a)(i)	<p>Able to name 4 types of hormone,</p> <p>P- Hormon Estrogen 1</p> <p>Q- Hormon Progesteron 1</p> <p>X- Hormon FSH 1</p> <p>Y- Hormon LH 1</p>		<b>4 Marks</b>
a(ii)	<p>Able to explain based on the following criteria: <u>Explanation</u> related to <u>hormonal level</u>, <u>follicle development</u> <b>and</b> <u>the endometrial wall</u></p> <p><u>Sample answer:</u></p> <p>F1: The pituitary gland starts to secrete FSH to the ovary. 1</p> <p>E1- The level of FSH in the ovary begins to increase. 1</p> <p>E2-FSH stimulates the development of the follicles 1</p> <p>E3-The follicle starts to develop /becomes bigger/follicle primer and secondary follicle 1</p> <p>E4-FSH also stimulates the ovarian tissues to secrete oestrogen. 1</p>		Any 2





Question 8

Num	MARK SCHEME	MARKS											
(a)(i)	<p><i>Able to define Mendel Second Law</i></p> <p>Sample Answer</p> <p>P1: Each pair of alleles control the trait of organism// alleles TT/Tt/tt control trait tall or dwarf</p> <p>P2: During gamete formation, each member of allele TT/Tt/tt may combine <u>randomly</u> with either member of pair of allele AA/Aa/aa</p>	1											
		1	2										
(a)(ii)	<p><i>Able to write down the genotypes of the parents of each cross and illustrate the inheritance of cross I using schematic diagram.</i></p> <p>Sample answer</p> <table border="1" data-bbox="316 869 1050 1088"> <thead> <tr> <th>Cross</th> <th>Parent's genotypes</th> </tr> </thead> <tbody> <tr> <td>I</td> <td>TtAa x ttaa</td> </tr> <tr> <td>II</td> <td>TtAA x TtAA</td> </tr> <tr> <td>III</td> <td>TtAa x Ttaa</td> </tr> <tr> <td>IV</td> <td>ttAA x TTaa</td> </tr> </tbody> </table> <p>Parent's genotype : TtAa x ttaa</p> <p>meiosis</p> <p>Gametes : TA, Ta, tA, ta, ta</p> <p>random fertilization</p> <p>Offspring's genotype : TtAa, Ttaa, ttAa, ttaa</p> <p>offspring's phenotype : tall, axial; tall, terminal; dwarf, axial; dwarf, terminal</p> <p>phenotypic ratio : 1 : 1 : 1 : 1</p> <p>notes : gametes 1 meiosis and random fertilisation 1 offspring 1 ratio 1</p>	Cross	Parent's genotypes	I	TtAa x ttaa	II	TtAA x TtAA	III	TtAa x Ttaa	IV	ttAA x TTaa	1 1 1 1	
Cross	Parent's genotypes												
I	TtAa x ttaa												
II	TtAA x TtAA												
III	TtAa x Ttaa												
IV	ttAA x TTaa												
		1											
		1											
		1											
		1											
		1											
		1											
		1	8										

8(b)(i)	<p><i>Able to explain the differences between diagram 8.1 and 8.2</i></p> <p><i>Sample answer</i></p> <table border="1" data-bbox="316 304 1145 640"> <thead> <tr> <th data-bbox="316 304 722 353"><i>Diagram 8.1</i></th> <th data-bbox="730 304 1145 353"><i>Diagram 8.2</i></th> </tr> </thead> <tbody> <tr> <td data-bbox="316 360 722 409"><i>Down's syndrome</i></td> <td data-bbox="730 360 1145 409"><i>Turner's syndrome</i></td> </tr> <tr> <td data-bbox="316 416 722 528"><i>Extra one autosome at chromosome 21</i></td> <td data-bbox="730 416 1145 528"><i>Lack one X chromosome</i></td> </tr> <tr> <td data-bbox="316 535 722 584"><i>Male</i></td> <td data-bbox="730 535 1145 584"><i>Female</i></td> </tr> <tr> <td data-bbox="316 591 722 640"><i>47 chromosome</i></td> <td data-bbox="730 591 1145 640"><i>45 chromosome</i></td> </tr> </tbody> </table>	<i>Diagram 8.1</i>	<i>Diagram 8.2</i>	<i>Down's syndrome</i>	<i>Turner's syndrome</i>	<i>Extra one autosome at chromosome 21</i>	<i>Lack one X chromosome</i>	<i>Male</i>	<i>Female</i>	<i>47 chromosome</i>	<i>45 chromosome</i>	1 1 1 1	4 marks
<i>Diagram 8.1</i>	<i>Diagram 8.2</i>												
<i>Down's syndrome</i>	<i>Turner's syndrome</i>												
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<i>47 chromosome</i>	<i>45 chromosome</i>												
8(b)(ii)	<p><i>Able to explain why color blinds often occur in men as opposed to women and suggest ways to overcome color blindness in a family</i></p> <p><i>Sample Answer;</i></p> <p>P1 ; colour blindness is cause by recessive allele on X chromosome</p> <p>P2 : in male, the presence of one recessive allele on X chromosomes produce colour blindness (due Y does not carry any alleles for colour blindness)</p> <p>P3 : in female, the presence of one recessive allele on X chromosomes do not produce colour blindness but only a carrier</p> <p>P4 ; the presence of both recessive allele on X chromosomes produce colour blindness</p> <p>P5 ; using gene therapy to treat hereditary disease</p> <p>P6 : by insertion of genes into an individual's cells or tissue</p> <p>P7 : by marriage to eliminate recessive in next generation</p> <p>P8 : marry a person those homozygote dominant for normal colour vision</p>	1 1 1 1 1 1 1 1 Any 6	max 6										
<i>TOTAL</i>		20 Marks											

Question 9

Num	Scoring Criteria	Marks	
(a)(i)	<p>Able to explain the function of bacteria X , bacteria Y and bacteria Q in nitrogen cycle</p> <p>suggested answer:</p> <p>F1: Bacteria X is decomposer            P1: When fish eats the plants, the organic nitrogen is transferred into the body of fish            P2: when the fish and plant die,            P3: Bacteria X will decompose / break down dead plant and animals to ammonia            F2: bacteria Y is <i>Nitrosomonas</i> sp. / nitrifying bacteria            P4: converted ammonia /NH<sub>3</sub> into nitrites/ NO<sub>2</sub>            P5: by nitrifying process            F3: bacteria Q is <i>Nitrobacter</i> sp. / nitrifying bacteria            P6: converted nitrites/ NO<sub>2</sub> into nitrates/ NO<sub>3</sub></p>	<p>1 1 1 1 1 1 1 1 1</p>	<p>Max 7</p>
(ii)	<p>Able to explain the effect if there is no bacteria X in the pond ecosystem</p> <p>Suggested answer:</p> <p>F1: decomposition of dead animals, plant and the waste products does not occur            P1: this increases the organics wastes on the pond ecosystem            F2:Natural cycle such as carbon cycle / nitrogen cycle are disrupted            P2: because carbon and nitrogen remains in the death            F3: The soil becomes infertile and photosynthesis will not occur</p>	<p>1 1 1 1</p>	<p>max 3</p>
(b)(i)	<p>Able to explain the causes which contribute to the increasing concentration of carbon dioxide in the atmosphere and the effects to the environment.</p> <p>Suggested answer :</p> <p>Causes :</p> <p>C1: the increasing number of vehicles// factories            C2: ( Vehicles//factories) release a large amount of carbon dioxide            C3: reducing of the area of forest/ jungle// increasing of deforestation            C4: less carbon dioxide is used by plants for photosynthesis            C5:power station used fossil fuel to generate electricity</p> <p style="text-align: right;"><b>( any three)</b></p>	<p>1 1 1 1 1</p>	<p>Max 3</p>

	<p>Effect:</p> <p>E1: Carbon dioxide is a greenhouse gas</p> <p>E2: able to absorb a ( big quantity) of heat // Carbon dioxide reflect heat back to the Earth</p> <p>E3: cause greenhouse effect</p> <p>E4 : lead to global warming</p> <p>E5: melting of ice at the poles// any suitable examples of the effect of global warming</p> <p style="text-align: right;"><b>( any two)</b></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>Max</p> <p>2</p>
(ii)	<p>Able to explain the impact of ozone depletion and global warming to the ecosystem.</p> <p>Suggested answer:</p> <p>Impact of ozone depletion:</p> <p>D1: contribute to global warming</p> <p>D2: climate change</p> <p>D3: decrease in crop yields</p> <p>G1: melting of iceberg/ sea level increase</p> <p>G2: increase the temperature of sea water and can destroy reef coral</p> <p>G3: migration of animals to the new habitat</p> <p>G4 : drought/ flash flood</p> <p style="text-align: right;"><b>( any five)</b></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>Max</p> <p>5</p>
	<b>TOTAL</b>		<b>20</b>