MARKING SCHEME BIOLOGY 2

Num.	Scoring Criteria	Marks	
1 (a)(i)	Students are able to with types of carbohydrates for each food *Answer:* Bee honey → monosaccharides Potatoes → polysaccharides	 1 1	 2
1(a) (ii)	Students is able to name elements in a food source *Answer:* Element : carbon , hydrogen , oxygen	 1	 1
1(b)(i)	Students can state the observation when reducing sugar is heated with Benedict Solution. *Answer:* Brick Red <u>precipitate</u> is formed	 1	 1
1(b)(ii)	Students is able to describe the process formation of polysaccharides *Answer:* P1: monomers monosaccharides combine through a <u>condensation</u> process to form long molecular chains/complexes P2: this process involves the removal of water molecules	 1 1	 2
	Total	**6**	

Num.	Scoring Criteria	Marks	
2(a)(i)	Able to name type of plant P, Q and R *Answer :* P: Hydrophyte Q: Xerophyte R: Halophyte	 1 1 1	 3
2(a)(ii)	Able to state ONE adaptive characteristic of plant Q for survival at their habitat. *Sample answer :* P1: leaves/stem are succulent // have sunken stomata /thick cuticle P2: root systems are well develop/elongated with root hairs P3: smaller size of leaves // needle like leaves/thorn *Any one*	 1 1 1	 1

2(b)	Able to explain how plant R able to tolerate to sea water to maintain it survival. *Sample Answer:* Root; P1: roots hair cells has higher salt concentration compared to the sea water // hypertonic toward sea water P2: Cell sap does not loose water by osmosis // water molecules able to diffuse into root hair cells by osmosis Leaves; P3: Excess salts are excreted//removed from the leave through (hydathode) P4: Old leaves can store salt and will fall down when the concentration of salt is high *Any 2*	1 1 1 1	2
	Total	**6**	

Num.	**Scoring Criteria**	**Marks**	
3(a)	Able to name X and Y *Answer* X: Plasma membrane Y: Vacuole	1 1	2
3(b)	Able to explain how plasmolysis happen *Sample answer* P1: 30 % sucrose solution is hypertonic to the cell sap of plant cell P2: water (molecules) diffused out of vacuole/cell by osmosis P3: plasma membrane is pulled away from cell wall// cell lost it' s turgidity	1 1 1	2
3(c)	Able to explain the best step which enable to store kimchi long period of time. *Sample Answer:* F: Step 2 P1: (Adding/marinate with more salt cause) cabbage cells are hypotonic to its environment/ salt P2: more water diffused out of cabbage cells/microorganisms by osmosis P3: cabbage cells/ microorganism loss more water// dehydrated// microorganisms killed/unable to survive	1 1 1 1	3
	Total	**7**	

Num.	Scoring Criteria	Marks	
4 (a)(i)	Able to name the process of P and process of Q. *Answer :* P: Glycolysis Q: Oxidation of pyruvate	 1 1	2
4 (a)(ii)	Able to explain the differences between the processes P and Q *Sample Answer:* P1: glycolysis/P is the breakdown of glucose by enzymes while Q/oxidation of pyruvate is a series of reactions to produce carbon dioxide, water and energy. P2: glycolysis that occurs in the cytoplasm while the Q process occurs in the mitochondria *Any one*	 1 1	 1
4(b)(i)	Able to state the importance of molecule R to cells *Answer :* (R is supplied to the cell) to carry out cell division/growth/biochemical reactions / active transport	 1	 1
4(b)(ii)	Able to explain how the number of S organelles in muscle cells is higher than the number of S organelles in their skin cells. *Sample Answer :* P1-number of S/mitochondria is high so that more energy can be supplied to muscle cells. P2-to allow muscle cells to contract and relax rapidly/ stronger P3-to produce movement P4-skin cells do not require much energy, P5-does not produce movement	 1 1 1 1 1	 3
	Total	**7**	

<table>
<tr><th>Num</th><th>Scoring Criteria</th><th colspan="2">Marks</th></tr>
<tr><td>5(a)(i)</td><td>Able to name force X and force Y

Answer:
Force X: Adhesion force
Force Y: Cohesion force
Note: Both must correct</td><td>1</td><td>1</td></tr>
<tr><td>5(a)(ii)</td><td>Able to state the importance of force X and force Y in transport of water in xylem.

Suggested answer:
Enable water to move as a continuous water column (in a narrow xylem vessel)</td><td>1</td><td>1</td></tr>
<tr><td>5(b)(i)</td><td>Able to describe the transport process in Diagram 5.2

Suggested answer:
F: Translocation process occurs
P1: Sucrose / amino acids transport into sieve tube actively
P2: Water potential in sieve tube decrease / low
P3: Water from xylem diffuse into sieve tube via osmosis
P4: Hydrostatic pressure in the sieve tube increase
P5: and pushed content in the phloem along sieve tube to other organs of the plant</td><td>1
1
1
1
1
1</td><td>Max 2</td></tr>
<tr><td>5(b)(ii)</td><td>Able to explain the effect to the transport process in Diagram 5.2 if there is no water from xylem

Suggested answer:
P1: Content of phloem / sucrose / products of photosynthesis unable to be transported to other parts / organs of plant
P2: because the hydrostatic pressure in the sieve tube is low</td><td>1
1</td><td>2</td></tr>
<tr><td>5(c)</td><td>Able to state two differences between the processes in Diagram 5.1 and Diagram 5.2

Suggested answer:
<table>
<tr><th>Diagram 5.1</th><th>Diagram 5.2</th></tr>
<tr><td>P1: transport water and mineral</td><td>P1: transport product of photosynthesis / sucrose</td></tr>
<tr><td>P2: transportation occur from root to leaves</td><td>P2: transportation occur from leaves to other parts of tree</td></tr>
<tr><td>P3: Provide cell turgidity / support to the cell</td><td>P3: Helps in growth / for food storage</td></tr>
</table></td><td>1
1</td><td>2</td></tr>
<tr><td></td><td>Total</td><td colspan="2">8</td></tr>
</table>

<table>
<tr><th>Num.</th><th>Scoring Criteria</th><th colspan="2">Marks</th></tr>
<tr><td>6(a)</td><td>Able to name of the mechanism of action of antibodies:

Answer:
Agglutination
Precipitation</td><td>

1
1</td><td>

2</td></tr>
<tr><td>6(b)(i)</td><td>Able to name type of immunity

Answer:

X: Artificial active immunity
Y: Artificial passive immunity
Both must correct</td><td>

1</td><td>

1</td></tr>
<tr><td>6(b)(ii)</td><td>Able to explain why second injection is required

Suggested answer:
X : To increase the production of antibodies exceed the immunity level // as a booster dose to increase the production of antibodies exceed the immunity level
Y : To supply enough antibodies exceed the immunity level rapidly.</td><td>

1

1</td><td>

2</td></tr>
<tr><td>6(c)</td><td>Able to explain why AIDS patient does not have antibodies

Suggested answer:
Because HIV viruses destroy lymphocyte cells</td><td>

1</td><td>

1</td></tr>
<tr><td>6(d)</td><td>Able to describe two differences between immunity in individual X and Y

Suggested answer:
<table>
<tr><th>X</th><th>Y</th></tr>
<tr><td>P1: Antibodies produced by their own lymphocytes</td><td>Receive antibodies from other sources</td></tr>
<tr><td>P2: Long lasting immunity</td><td>Short-term / temporary immunity</td></tr>
<tr><td>P3: Injection of vaccine</td><td>Injection of antiserum</td></tr>
<tr><td>P4: Slow action</td><td>Fast / immediate action</td></tr>
<tr><td>P5: Prevention from diseases</td><td>Treatment for a disease</td></tr>
</table>
Any two differences</td><td>

1

1
1
1

1</td><td>

2</td></tr>
<tr><td></td><td>Total</td><td colspan="2">8</td></tr>
</table>

Num.	Scoring Criteria	Marks	
7(a)(i)	Able to name ecosystem in Diagram 7.1 *Answer*: Mangrove ecosystem	1	1
7(a)(ii)	Able to state the characteristic of tree in Diagram 7.1 *Answer*: P1- have prop root/ cable root/ pneumatophore P2- Have succulent leaves / leaves with thick cuticle / sunken stomata P3- Have viviparity seedling *Any one*	 1 1 1	 1
7(b)	Able to explain the technique to estimate population size of P *Answer*: F - Capture , Mark, Release and Recapture technique P1- P are captures with trap // shoot with anesthetic P2- Organism P in first captured are marked P3 – using Indian ink P4- P then are release back into their habitat P5- After 2 – 3 weeks, second capture of organisms P will be conducted P6- Population size is calculated using formula; Population size = number in first capture x number in second capture / Number of marked in second capture *F + any 2P*	 1 1 1 1 1 1	 Max 3
7(c)	Able to compare between niche of organism P and organism Q *Answer*: Similarity: Both are consumer Difference: P1 – Organism P is primary / secondary consumer while organism Q is secondary / tertiary consumer P2 – Organism P is omnivore while organism Q is a carnivore *1 Similarity + 1 Difference*	 1 1 1	 2

7(d)	Able to justify the construction of bridge as a walkway in the ecosystem 7.1 *Answer* : P1- Yes / Agree P2- able to educate community about the mangrove ecosystem // for research / education purposes P3- create new eco-tourism area / attract the tourists P4 – increase economical of residents **Or** P1- No / Disagree P2- It will cause water / sound pollution // dumping site P3- Destroy the natural habitat // Animal will migrate to new place / decrease animal population P4 – disrupt natural food chain in the ecosystem	 1 1 1 1 1 1 1 1	 max 2
	Total	**9**	

Num.	Scoring Criteria	Marks	
8(a)	Able to state type of variation *Answer*: Continous variation	 1	 1
8(b)	Able to state two differences between variation in Diagram 8.1 and Diagram 8.2 *Answer*:		

	Diagram 8.1	Diagram 8.2	
P1	Have intermediate features	Do not have intermediate features	1
P2:	Influenced by genetic factor and environmental factor	influenced by genetic factor only	1
P3:	Has no distinctive characteristics	Has distinctive characteristics	1
P4:	Cannot be inherited	Can be inherited	1
P5	Controlled by multiple / poly genes	Controlled by single gene	1
P6	Quantitative / can be measured	Qualitative / cannot be measured	1
P7	Normal distribution graph	Discrete distribution graph	1

Any 2

Max 2

8(c)(i)	Able to describe how albinisme occurred *Sample answer:* P1: Cells are exposed to mutagen / radioactive rays / carcinogenic compound P2: causes gene mutation	 1 1	 2
8(c)(ii)	Able to state one step taken by the albinism to carry out an outdoor activities during daytime *Sample answer:* P1:wear a sunglasses / wear a hat / cap P2:use an umbrella / wear a body-covering outfit like a long sleeveless shirt/long pants	 1 1	 1
8(d)	Able to explain a method to produce insulin in large scale *Sample answer:* F: DNA recombinant technique P1:Insulin genes from human DNA are cut using restriction enzymes / DNA ligase P2:Plasmids of bacteria as clone vectors are cut P3:Insulin genes inserted into plasmids to form recombinant plasmids P4:Recombinant plasmids are inserted into bacteria P5: Bacteria clone reproduce more to produce more insulin P6: Insulin is extracted from bacteria and purified *F + any 2 P*	 1 1 1 1 1 1 1	 Max 3
	Total	**9**	

Num	Scoring criteria	Marks	
9(a)	Able to explain the process in W *Sampel answer:* P1 : W is proximal convoluted tubule P2 : Process in W is reabsorption P3 : sodium ion is actively pumped (into the blood capillary) P4 : chloride ions are passively absorbed P5 : glucose / amino acid are reabsorbed by active transport P6 : water diffuse (to the blood capillaries) through osmosis *Any 4*	 1 1 1 1 1 1	 max 4
(b)	Able to explain the formation of kidney stones *Sampel answer:* P1: Caused by diabetes mellitus / high blood pressure / obesity P2: Bacterial infection / correct bacteria name P3: Accident that causes injury on kidney organs P4: Drinking less water / excessive protein intake P5: Excessive intake of mineral salts / supplements which contains high calcium / correct example P6: Kidney failure / damage occurs P7: Causes quantity of uric acid / calcium oxalate / calcium phosphate increases P8: Urine becomes thick P9: (uric acid / calcium oxalate / calcium phosphate) Forming crystals / harden / stick to the kidneys P10: (kidney stone) Clogging the ureter P11: Decreased urine output *Any 6*	 1 1 1 1 1 1 1 1 1 1 1	 max 6

(c)	Able to explain the differences in regulation of water and salt contents in individual X and Y *Sampel answer:*		

	Individual X	Individual Y	
D1:	Blood osmotic pressure increases	Blood osmotic pressure drops	1
D2:	osmoreceptor in the hypothalamus is stimulated	osmoreceptor in the hypothalamus is less stimulated	1
D3:	pituitary gland is stimulated	Pituitary gland is less stimulated	1
D4:	more ADH is secreted	Less ADH is secreted	1
D5:	Distal convoluted tubule / collecting duct more permeable to water	Distal convoluted tubule / collecting duct less permeable to water	1
D6:	more water is reabsorbed	Less water is reabsorbed	1
D7:	Less urine produced	More urine produced	1
D8:	Adrenal gland is less stimulated	Adrenal gland is stimulated	1
D9:	Less aldosterone is secreted	More aldosterone is secreted	1
D10:	Distal convoluted tubule / collecting duct less permeable to salt	Distal convoluted tubule / collecting duct more permeable to salt	1
D11:	Less salt is reabsorbed	More salt is reabsorbed	1
D12:	More salt in urine / urine is concentrated	Less salt in urine / urine is diluted	1
D13:	Blood osmotic pressure decrease back to normal	Blood osmotic pressure increase back to normal	1

Any 10

max 10

	Total	**20**

Num.	Scoring Criteria	Marks	
10 (a)(i)	Able to state the main purpose of the green building concept *Sample answer*: P1- use of natural resources P2- (building) has the characteristics of nature-friendly technology P3- state the suitable example such as use solar panels to convert solar energy into electrical energy / uses a water catchment system to collect rain water / usage of recycle materials *Any 2*	1 1 1	max 2
10 (a)(ii)	Able to state the advantages of development with the concept of green building *Sample answer*: P1- reduces negative effects to human health P2- reduces negative effects to the environment P3- saves the cost of operation / maintenance / construction *Any 2*	1 1 1	max 2
10 (b)	Able to explain the practices that contribute towards environmental sustainability *Sample answer :* P1- use environment-friendly transport / bicycle / hybrid / electric vehicle P2- practice carpooling P3- using public transport / example P4- practise the concept of recycling / 3R / 5R P5- (3R)- reuse, reduce and recycle // (5R)-rethink recycle, repair, reuse and reduce P6- use renewable energy P7- energy generated from natural sources / waves / water / geothermal / biomass P8- (renewable energy) is cleaner / easier / safer *Any 6*	1 1 1 1 1 1 1 1	max 6
10 (c)	Able to explain the relationship between Diagram 10.2 and Diagram 10.3 that contribute to global climate change *Sample answer:* Diagram 10.2 : P1- Deforestation // excessive logging / illegal logging P2- less plants to carry out photosynthesis P3- photosynthesis (rate) will be reduced P4- causes carbon dioxide cannot be absorbed P5- carbon dioxide concentration in atmosphere increases	1 1 1 1 1	

	Diagram 10.3 : P6- (phenomenon) the greenhouse effect P7- due to the release of carbon dioxide / methane / nitrogen oxide / chlorofluorocarbon P8- (carbon dioxide / methane / nitrogen oxide / chlorofluorocarbon) are greenhouse gases P9- greenhouse gas acts as a heat blanket // greenhouse gas formed a layer P10- (CO_2 / greenhouse gas) absorbs / traps heat P11- heat / infrared radiation radiated / reflected back to the earth P12- this will increase the earth temperature P13- changes in wind direction / changes in distribution of rainfall // storm / drought / El Nino / La Nina phenomenon P14- melting of ice in north / south poles // increase sea level / flooding of low level areas *Any 10*	1 1 1 1 1 1 1 1 1	max 10
	Total	**20**	

Num.	Scoring Criteria	Marks	
11(a)(i)	Able to explain how hormone secreted by X cause the process of glucose assimilation in Y *Sample answers:* P1 : When glucose content is high in blood P2 : (Then) The X gland secretes insulin P3 : (this hormone) converts excess glucose into glycogen P4 : and stored in Y / liver / muscle P5 : When glucose content is low in blood P6 : The X gland secretes glucagon P7 : (this hormone) converts glycogen to glucose *Any 3*	1 1 1 1 1 1 1	max 3
11(a)(ii)	Able to explain the effect of gallstones on food digestion in K. *Sample answers:* P1 : bile cannot flow into the duodenum P2 : fats / lipids cannot be emulsified / or blended into small droplets of fat P3 : hydrolysis of lipids by lipase is reduced P4 : slow lipid digestion rate // Lipids cannot be digested completely P5 : less fatty acid and glycerol formed P6 : alkaline medium in duodenum is not formed // acidic medium in duodenum P7 : acidic chyme (from the stomach) cannot be neutralized P8 : amylase (pancreatic) / trypsin less / can't function P9 : less starch / polypeptide are hydrolysed P10: less glucose / peptide / amino acids are produced *Any 6*	1 1 1 1 1 1 1 1 1 1	Max 6

11(b)	Can suggest the best "burger bread" for the teen's diet. Able to discuss the good and bad effects of the two "burger bread" on his health. *Sample answers:* Choice: Burger B /vegetables is selected F1 : (Both) has protein content that is important for the growth/ synthesis of enzymes/ haemoglobin P1 : (but) high protein content in A can cause kidney failure F2 : (Both) has carbohydrate content that is important in energy production P2 : (but) excess carbohydrates in A can cause high sugar in blood (hyperglycemia) / cause diabetes mellitus F3 : Fats is important for energy production P3 : (but) excess fat in A causes obesity / cardiovascular disease F4 : Sodium content in the blood is important for controlling blood osmotic pressure. P4 : (but) Excess sodium in A can cause high blood pressure disease F5 : Fiber is important to prevent constipation P5 : but decrease of fibre in A causes difficulty in defaecation / constipation *Any 6*	1 1 1 1 1 1 1 1 1 1 1	max 6
11(c)	Able to explain how dietary modification to cardiovascular patients *Sample answers:* F1 : Diet consists of more vegetables and fruits P1 : because it contains (enough) fiber P2 : helps to lower cholesterol level F2 : Diet of more grains / such as wheat/ oats/ brown rice/ peanuts / peas P3 : containing (soluble) fiber P4 : that helps to reduce the absorption of low -density lipoprotein cholesterol / bad cholesterol F3 : Use white meat protein sources / example of white meat/ fish / chicken / vegetables P5 : because contains low fat P6 : Add omega-3 fatty acids / suitable example such as salmon/ mackerel / tuna // Limit the intake of foods rich in saturated fats/ trans fats / Cholesterol // Reduce sodium intake <u>Note:</u> P1 and P3 counted only once *Any 5*	1 1 1 1 1 1 1 1 1 1 1	max 5
	Total	**20**	