★★

MODUL PINTAS 2020
TINGKATAN 5

4551/3

BIOLOGY
Kertas 3

$1\frac{1}{2}$ jam

Satu jam tiga puluh minit

PERATURAN PEMARKAHAN
BIOLOGY K3
4551/3

Question 1

<table>
<tr><th>No</th><th>Mark Scheme</th><th>Score</th></tr>
<tr><td colspan="3">KB0603 – Measuring Using Number</td></tr>
<tr><td rowspan="4">1 (a)</td><td>Able to record all 6 readings for the number of garden snail in the second captured and the number of garden snails marked in the second capture.

Sample answer:

<table>
<tr><th>Area for garden snail captured
Kawasan siput kebun ditangkap</th><th>Number of garden snail in the second capture / unit
Bilangan siput kebun dalam tangkapan kedua</th><th>Number of garden snail marked in the second capture / unit
Bilangan siput kebun yang bertanda dalam tangkapan kedua</th></tr>
<tr><td>Lakeside
Tepi tasik</td><td>11</td><td>7</td></tr>
<tr><td>Housing area
Kawasan perumahan</td><td>13</td><td>9</td></tr>
<tr><td>Paddy field
Sawah padi</td><td>15</td><td>12</td></tr>
</table>
</td><td>3</td></tr>
<tr><td>Able to list 5 - 3 readings correctly</td><td>2</td></tr>
<tr><td>Able to list 2 - 1 readings correctly</td><td>1</td></tr>
<tr><td>No response or incorrect response</td><td>0</td></tr>
</table>

KB0601 - Observation		
1 (b) (i)	Able to state two different observations based on the following criteria: [Observation must have values / type for MV and RV from Table 1 or comparison between two readings] MV: Area for garden snail capture *Kawasan siput kebun ditangkap* RV: Number of garden snail in second capture / Number of garden snail marked in the second captured *Bilangan siput kebun dalam tangkapan kedua / Bilangan siput kebun yang bertanda dalam tangkapan kedua* Sample answers: 1. If the garden snail caught from lakeslide, the number of garden snail marked in the second captured is 11 units and number of garden snail marked in the second captured is 7 units. *Jika siput kebun ditangkap daripada tepi tasik, bilangan siput kebun dalam tangkapan kedua ialah 11 dan bilangan siput kebun dalam tangkapan kedua yang bertanda ialah 7.* 2. If the garden snail caught from paddy field, the number of garden snail marked in the second captured is 15 units and number of garden snail marked in the second captured is 12 units. *Jika siput kebun ditangkap daripada sawah padi, bilangan siput kebun dalam tangkapan kedua ialah 15 dan bilangan siput kebun dalam tangkapan kedua yang bertanda ialah 12* *compulsory to take **both** reading Wajib memberi **kedua** bacaan	3
	Able to state one observation correctly and one-two inaccurate observations. Sample answers: 1. If the garden snail caught from lakeslide, the number of garden snail marked in the second captured higher // inversely. *Jika siput kebun ditangkap daripada tepi tasik, bilangan siput kebun ditangkap adalah lebih tinggi* 2. The number of garden snail captured in the second capture influenced by the area for garden snail captured / catchment area. *Bilangan siput kebun ditangkap dalam tangkapan kedua dipengaruhi oleh kawasan siput kebun ditangkap.*	2

	Able to state one correct observation Or Able to state two different observations at idea level. Sample answers: 1. The number of garden snail captured in the second capture // marked in second captured is different. *Bilangan siput kebun ditangkap dalam tangkapan kedua adalah berbeza*	1
	No response or wrong response	0

KB0604 - Making inference		
1(b)(ii)	Able to make two inferences correctly. <u>Note:</u> Inference must match observation. P1: Food source from catchment area // Temperature of catchment area // Humidity *Sumber makanan daripada kawasan tangkapan / Suhu kawasan tangkapan // Kelembapan* P2: Population size of garden snail. *Populasi saiz siput kebun* Sample answers: 1. More food source at paddy field // Low temperature // high humidity, more population size of garden snail. *Lebih banyak sumber makanan di sawah padi // suhu rendah // kelembapan tinggi, lebih besar saiz populasi.* 2. Less food source at lakeside, less population size of garden snail. *Kurang sumber makanan di tepi tasik // suhu tinggi, lebih kecil saiz populasi siput kebun.*	3
	Able to make one correct inferences and one inaccurate inference inaccurately. Sample answers: 1. More food source at paddy field. *Lebih makanan di persisiran sawah padi* 2. Less population of garden snail at lakeside. *Kurang populasi siput kebun di tepi tasik.*	2
	Able to state one correct inference and one-two inference at idea level. Sample answers: 1. Different population of garden snail. *Populasi siput kebun berbeza* 2. Population of garden snail depends on catchment area. *Populasi siput kebun bergantung kepada kawasan tangkapan.*	1
	No response OR wrong response	0

Scoring

Score	Correct	Inaccurate	Idea	Wrong
3	2	-	-	-
2	1	1	-	-
	-	2	-	-
1	1	-	1	-
	-	-	2	-
	-	1	1	-
	1	-	-	1
0	-	1	-	1
	-	-	1	1

KB0610 - Controlling variables

1(c) Able to state all 3 variables and the methods to handle the variable correctly. — 3

Sample answers:

Variables	Method to handle the variable correctly
<u>Manipulated variable:</u> Capture area for garden snail *Kawasan tangkapan siput kebun*	Use different area to catch garden snail from lakeside, housing area and paddy field *Menggunkan kawasan tangkapan siput kebun yng berbeza daripada kawasan tepi tasik, kawsan perumahan dan sawah padi*
<u>Responding variable:</u> 1. Number of garden snail in second captured // Number of marked garden snail in second captured *Bilangan dalam tangkapan pertama // Bilangan siput kebun yang bertanda dalam tangkapan pertama* 2. Population (size) of garden snail *Saiz populasi siput kebun*	Count and **record** the number of garden snail in second captured // number of marked garden snail in second captured *Mengira dan **merekod** bilangan siput kebun dalam tangkapan kedua // bilangan siput kebun yang bertanda dalam tangkapan kedua* **Calculate** population size of garden snail using **formula** = <u>No.of garden snail in the 1st capture X</u> <u>No.of garden snail in the 2nd capture</u> Number of marked garden snail in the second captured ***Mengira** saiz populasi siput kebun mengunakan **formula** =* <u>*Bil. siput kebun dlm tangkapan per1 X*</u> <u>*Bil. siput kebun dlm tangkapan ke2*</u> *Bilangan siput kebun yang bertanda dalam tangkapan kedua*

	<u>Constant variable</u> 1. Number of garden snail in the first captured. *Bilangan siput kebun dalam tangkapan pertama* 2. Type of snail. *Jenis siput* 3. Day for recaptured. *Hari untuk tangkap semula*	1. Same number of garden snail catch in the first captured is 25. *Bilangan siput kebun dalam tangkapan pertama ialah 25.* 2. Catch the same type of kura-kura. *Menangkap jenis siput yang sama iaitu siput kebun* 3. The garden snail is recaptured after seven days released. *Tangkap semula siput kebun selepas tujuh hari* 6 ticks	
	4 - 5 ticks		2
	1 - 3 ticks		1
	0 tick		0

KB0611 - Making hypothesis		
1 (d)	Able to state hypothesis following all criteria. P1: Manipulated variable (Catchment area) *Kawasan tangkapan* P2: Responding variable (Number of garden snail marked in second capture // Population size of garden snail) *Bilangan siput kebun yang bertanda dalam tangkapan kedua // Saiz populasi siput kebun* P3: Relationship Sample answers: 1. The number of garden snail marked in the second captured from paddy field is higher than lakeside and housing area / vice versa. *Bilangan siput kebun yang bertanda dalam tangkapan kedua daripada sawah padi adalah lebih tinggi berbanding tepi tasik dan kawasan perumahan / dan sebaliknya* 2. The population size of garden snail at the paddy field is higher than lakeside and housing area / vice versa. *Saiz populasi siput kebun di sawah padi adalah lebih tinggi berbanding tepi tasik dan kawasan perumahan / dan sebaliknya*	3
	Able to make a hypothesis relating the manipulated variable and the responding variable inaccurately. Sample answers: 1. Number of garden snail marked in the second capture depends on the catchment area. *Bilangan siput kebun yang bertanda dalam tangkapan kedua bergantung kepada kawasan tangkapan*	2
	Able to make a hypothesis at idea level. Sample answers: 1. Different area causes different garden snail *Kawasan yang berbeza menyebabkan siput kebun yang berbeza* 2. Area affects / influence number of garden snail *Kawasan mempengaruhi bilangan siput kebun*	1
	No response or incorrect response **P3** is not given if there is no **P1** or **P2**	0

<table>
<tr><th colspan="3">KB0606 – Communication</th></tr>
<tr><td>1 (e)(i)</td><td>Able to construct a table correctly based on the following aspects:

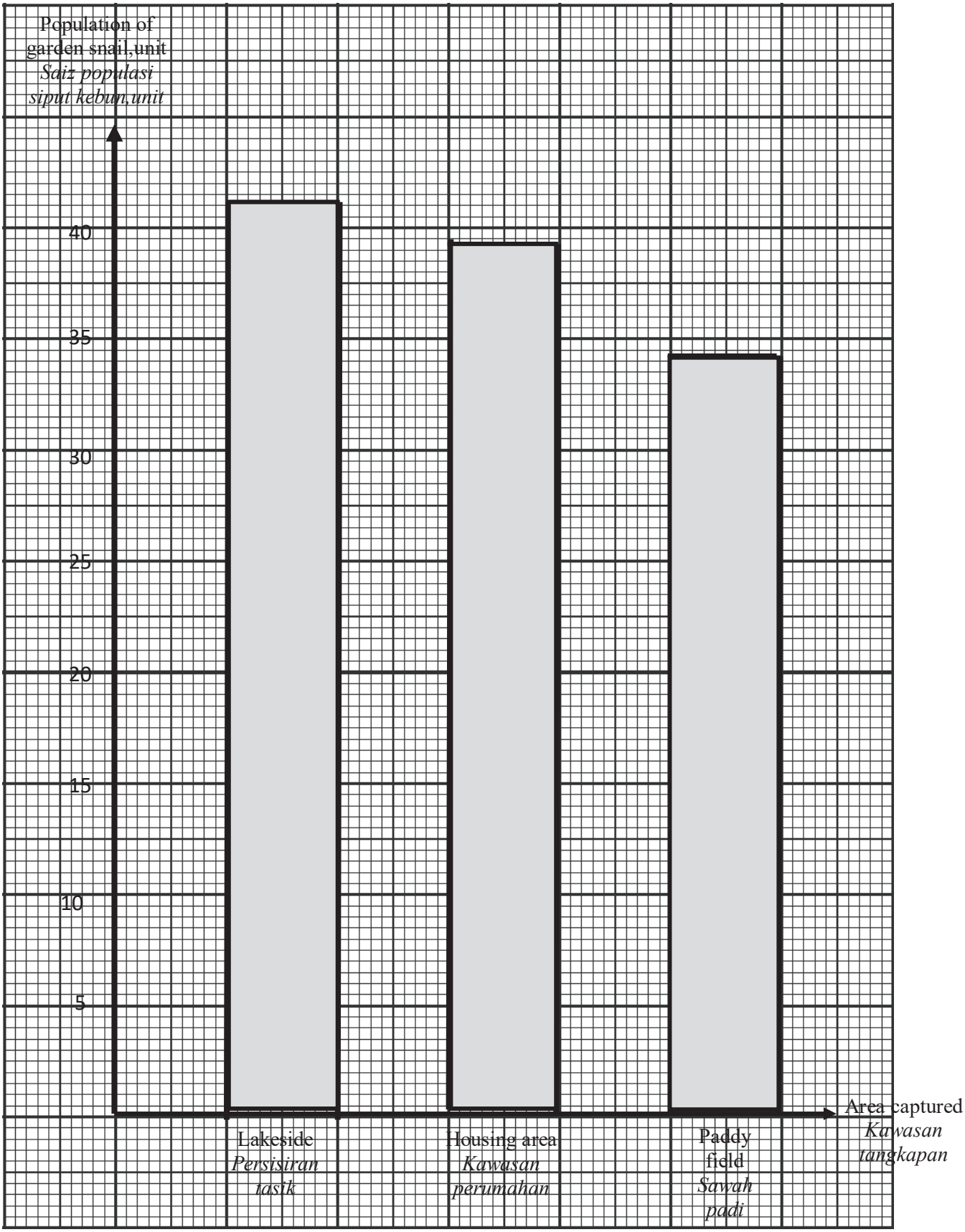
(T): The titles with units correctly.
(D): All the data
Number of garden snail in first, second and mark in the second captured.
Bilangan siput kebun dalam tangkapan pertama, kedua dan bertanda dalam
tangkapan kedua.
(C): Population size of the garden snail.
Saiz populasi siput kebun

Sample answer:

<table>
<tr><th>Catchment area of the garden snail
Kawasan tangkapan siput kebun</th><th>Number of garden snail in the first captured (unit)
Bilangan siput kebun dalam tangkapan pertama (unit)</th><th>Number of garden snail in the second capture (unit)
Bilangan siput kebun dalam tangkapan kedua (unit)</th><th>Number of marked garden snail in the second capture (unit)
Bilangan siput kebun yang bertanda dalam tangkapan kedua (unit)</th><th>Population size of garden snail (unit)
Saiz populasi siput kebun (unit)</th></tr>
<tr><td>Lakeside
Tepi tasik</td><td>27</td><td>11</td><td>7</td><td>42</td></tr>
<tr><td>Housing area
Kawasan perumahan</td><td>27</td><td>13</td><td>9</td><td>39</td></tr>
<tr><td>Paddy field
Sawah padi</td><td>27</td><td>15</td><td>12</td><td>34</td></tr>
</table>

REJECT (C) if reading in decimals.</td><td>3</td></tr>
<tr><td></td><td>Any two correct</td><td>2</td></tr>
<tr><td></td><td>Any one correct</td><td>1</td></tr>
<tr><td></td><td>No response or incorrect response.</td><td>0</td></tr>
</table>

KB0607 – Relationship between space and time		
1 (e)(ii)	Able to draw the bar chart correctly with the following criteria: Criteria: P (paksi) : Uniform scales on both axis, label bar. Y axis, Population size of garden snail X axis, Area captured T (titik) : All 3 points transferred correctly. B (bentuk) : Same size for the bars and bars are separated.	3
	Any two criteria correct	2
	Any one criteria correct	1
	No response or incorrect response	0


Population of garden snail,unit
Saiz populasi siput kebun,unit
40
35
30
25
20
15
10
5
Lakeside
Persisiran tasik
Housing area
Kawasan perumahan
Paddy field
Sawah padi
Area captured
Kawasan tangkapan

KB0608 – Interpreting data		
1 (f)	Able to explain the relationship between the catchment area and population size of garden snail based on the bar chart and the following aspects: R - able to state the relationship (<u>Population size</u> & area) E1 - amount of food sources E2 - temperature // humidity Sample answers: 1. The population size of garden snail at paddy field increase / higher than population size of garden snail at lakeside and housing area because more amount of food sources and low temperature // more / high humidity / wet area. *Saiz populasi siput kebun di sawah padi meningkat / lebih tinggi saiz populasi berbanding persisiran tepi tasik dan kawasan perumahan kerana lebih banyak sumber makanan dan suhu rendah // kelembapan tinggi.* **(1R + Any 2E)** **Note: If R1 wrong, reject E1 & E2**	3
	Able to interpret the relationship incompletely Sample answers: 1. The population of garden snail at paddy field <u>increase / higher than</u> population of garden snail at lakeside and housing area because more amount of food sources. *Populasi siput kebun di persisiran sawah padi meningkat / lebih tinggi berbanding populasi siput kebun di persisiran paya bakau dan tepi tasik kerana jumlah makanan banyak.* Two aspects including **<u>R1</u>** Example: R1 + E1 / R1 + E2 Note: Relationship at idea level is <u>not accepted</u>. e.g: The population of garden snail influenced by the catchment area BUT Explanation can be accepted.	2
	Able to interpret the relationship at idea level. Sample answer: 1. The population size of garden snail at paddy field <u>increase / higher than</u> population size of garden snail at lakeside and housing area. *Saiz populasi siput kebun di sawah padi meningkat / lebih tinggi berbanding saiz populasi di persisiran tepi tasik dan kawasan perumahan.* Only **<u>R1</u>** stated	1

KB0609 – Defining by operation		
1 (g)	Able to define operationally the population size of garden snail based on the result of this experiment. P1 : Number or garden snail in lakeside, housing area and paddy field P2 : Number of garden snail marked in second captured P3 : The population of garden snail depends on the catchment area // hypothesis statement Sample answer: Population size of garden snail is number of garden snail in lakeside, housing area and paddy field shown by the number of garden snail marked in second captured depends on the catchment area. *Saiz populasi siput kebun ialah bilangan siput kebun di tepi tasik, kawasan perumahan dan sawah padi ditunjukkan melalui bilangan siput kebun yang bertanda dalam tangkapan kedua dipengaruhi oleh kawasan tangkap*	3
	Any two correct	2
	Any one correct	1
	No response or incorrect response Theoretical explanation.	0
	No response or incorrect response or wrong relationship.	0

KB0605 - Predicting		
1(h)	Able to predict and explain the outcome of the experiment correctly with the following aspects: P : Population size of garden snail decrease / any suitable value less than 34 E1: Decrease food source/nutrition E2: High temperature Sample answer: 1. The population size of garden snail will decrease because less than 34 / decrease of food sources and high temperature after harvest time. *Saiz populasi siput kebun akan berkurang kerana sumber makanan berkurang dan suhu meningkat selepas musim menuai.* **Must Correct <u>Prediction</u>** **P + 2E's**	3
	P + Any 1 E	2
	P only	1
	No response or incorrect response	0

<table>
<tr><th colspan="3">KB0602 – Classifying</th></tr>
<tr><td>1 (i)</td><td>Able to classify all factors into two groups correctly in table:

<table><tr><th>Biotic factor
Faktor biotik</th><th>Abiotic factor
Faktor abiotik</th></tr><tr><td>Producer
Pengeluar

Prey
Mangsa

Parasite
Parasit</td><td>Humidity
Kelembapan

Temperature
Suhu

Soil texture
Struktur tanah</td></tr></table>6 ticks</td><td>3</td></tr>
<tr><td></td><td>3-5 ticks</td><td>2</td></tr>
<tr><td></td><td>1-2 ticks</td><td>1</td></tr>
<tr><td></td><td>0 tick</td><td>0</td></tr>
</table>

Question 2

KB061201 – (KB061203 – Statement of Identified Problem)		
No	**Mark Scheme**	**Score**
2(i)	Able to state the problem statement of the experiment correctly that include criteria: Manipulated variable : light intensity Responding variable : population growth rate of *Lemna sp.* Relationship in question form and question symbol [?] Sample answers: 1. Does the light intensity affect the population rate of *Lemna sp.* plants? *Adakah keamatan cahaya mempengaruhi kadar populasi tumbuhan Lemna sp.?* 2. What is the effect the light intensity on the population rate of *Lemna sp.* plants? *Apakah kesan keamatan cahaya ke atas kadar populasi tumbuhan Lemna sp.?*	3
	Able to state the problem statement of the experiment with **any 2** criteria Sample answer 1. Does the light intensity affect the population rate of plant? *Adakah keamatan cahaya mempengaruhi kadar populasi tumbuhan?* 1. What is the effect the light intensity on the population rate of *Lemna sp.* plants *Apakah kesan keamatan cahaya ke atas kadar populasi tumbuhan Lemna sp.*	2
	Able to state the problem statement of the experiment with **any 1** criteria Sample answer 1. What is the effect of light intensity on population? *Apakah kesan keamatan cahaya ke atas populasi?* 2. Does the light intensity affect the growth of plant *Adakah keamatan cahaya mempengaruhi pertumbuhan tumbuhan*	1

KB061202 (KB061203 – Making Hypothesis)		
No.	**Mark Scheme**	**Score**
2 (ii)	Able to state the hypothesis correctly based on **3** criteria: P1 : Manipulated variable (Light intensity) P2 : Responding variable (Population growth rate of *Lemna sp.*) P3 : Relationship of variable <u>Sample answers:</u> 1. The higher the light intensity, the higher the population growth rate of Lemna sp. *Semakin tinggi keamatan cahaya, semakin tinggi kadar pertumbuhan populasi Lemna sp.*	3
	Able to state the hypothesis correctly based on **2** criteria: <u>Sample answers:</u> 1. The population growth rate of Lemna sp. depends on light intensity. *Kadar populasi pertumbuhan bergantung kepada keamatan cahaya.*	2
	Able to state the hypothesis correctly based on **1** criteria: <u>Sample answers:</u> 1. The population growth rate of *Lemna sp*. is the highest in low light intensity. *Kadar pertumbuhan populasi Lemna sp. adalah paling pada keamatan cahaya yang rendah.*	1

(KB061203-Controlling variable)		
No.	**Mark Scheme**	**Score**
2 (iii)	Able to state all three variables correctly. Sample answers: 1. <u>Manipulated variable:</u> Light intensity *Keamatan cahaya* 2. <u>Responding variable:</u> Population growth rate of *Lemna sp.* *Kadar pertumbuhan populasi Lemna sp.* 3. <u>Controlled variable:</u> Species of plant (*Lemna sp.*), volume of water, concentration of nutrients, temperature, pH value, time *Spesis tumbuhan* (*Lemna sp.*), *isipadu air, kepekatan nutrisi, suhu, nilai pH, masa*	3
	Able to state any **two** variables correctly	2
	Able to state any **one** variables correctly	1
	No response <u>or</u> incorrect response	0

<table>
<tr><th colspan="3">KB061205 (KB061203 - Listing of Materials and Apparatus)</th></tr>
<tr><th>No.</th><th>Mark Scheme</th><th>Score</th></tr>
<tr><td>2 (iv)</td><td>Sample answers:

<table><tr><th>Apparatus</th><th>Materials</th></tr><tr><td>• Beakers // petri dish // container(√)
• Measuring cylinder (√)
• Meter (√)

(√) compulsory for 3A</td><td>• Lemna sp. (√)
• Distilled water (√)
• Culture // pond solution (√)

(√) compulsory for 3M</td></tr></table>3A + 3M</td><td>3</td></tr>
<tr><td></td><td>Able to list 2 materials and any 2 apparatus related to the experiment

2M + 2A</td><td>2</td></tr>
<tr><td></td><td>Able to list 1 materials and any 1 apparatus related to the experiment

1 M + 1A</td><td>1</td></tr>
<tr><td></td><td>Wrong response or no response</td><td>0</td></tr>
</table>

KB061204 (KB061203 - Method / procedure of investigation) - 3m			
No.	**Mark Scheme**	**Score**	
2 (v)	Notes: K1: Preparation of materials and apparatus (all 3) K2: Operating the constant variable (any 1) K3: Operating the responding variable (any 1) K4: Operating the manipulated variable (any 1) K5: Steps to increase reliability of results accurately / precaution (any 1) Able to describe all the 5'K' Sample answer: 1. Choose *Lemna sp.* plant of the same size *Pilih tumbuhan Lemna sp. pada saiz yang sama* 2. Choose // take three petri dishes at same size *Pilih tiga piring petri pada saiz yang sama.* 3. Label the petri dishes as A, B and C. *Label piring petri sebagai A, B dan C.* 4. Pour of 5 ml distilled water into petri dish A B and C *Tuangkan 5ml air suling ke dalam piring petri A, B dan C.* 5. Test the pH value of each solution using pH paper *Uji nilai pH stiap larutan dengan menggunakan kertas pH.* 6. Pour of 5 ml of culture solution / pond water into each petri dish. *Tuangkan 5 ml larutan kultur / air kolam ke dalam setiap piring petri.* 7. Put 5 *Lemna sp*. plants into each of the petri dish *Letak 5 tumbuhan Lemna sp. ke dalam setiap piring petri.* 8. Record in the table *Rekodkan di dalam jadual.* 9. Place petri dish A near the window in the laboratory, petri dish B inside the cupboard and petri dish C on the teacher table. *Letakkan piring petri A di tepi tingkap di dalam makmal, piring petri B di dalam almari dan piring petri C di atas meja guru.* 10. Change the solution in the petri dishes everyday. *Tukar larutan di dalam piring petri setiap hari.* 11. Count the number of Lemna sp. plants after 5 days. *Kira bilangan tumbuhan Lemna sp. selepas 5 hari.*	K1, K2 K1 K1 K1/K2 K1/K5 K1/K2 K1/K2 K1 K1, K3 K5 K2/K4	3

	12. Calculate the population growth rate of *Lemna sp*. plant using the formula; $\frac{\text{Number of } Lemna\ sp.plants}{5 \text{ days}}$ *Mengira kadar pertumbuhan populasi tumbuhan Lemna sp.dengan menggunakan formula;* $\frac{\textit{Bilangan tumbuhan Lemna sp.}}{\textit{5 hari}}$ 13. All the data is recorded in the table / tabulate data. *Semua data direkodkan di dalam jadual.* 14. The experiment is repeated twice to get the average reading. *Eksperimen diulang dua kali untuk mendapatkan bacaan purata*	K4 K1 K5	
	Any 3-4 'K'		2
	Any 1-2 'K'		1
	No response or incorrect response		0

<table>
<tr><th colspan="3">KB061203 – Planning Investigation (KB061203 - Data Presentation) - 2m</th></tr>
<tr><th>No.</th><th>Mark Scheme</th><th>Score</th></tr>
<tr><td>2 (vi)</td><td>Sample answer:

<table>
<tr><td rowspan="2">Light intensity
Keamatan cahaya</td><td colspan="2">Number of Lemna sp. plant (unit)
Bilangan tumbuhan Lemna sp. (unit)</td><td rowspan="2">The population growth rate of Lemna sp.(unit/day)
Kadar pertumbuhan populasi tumbuhan Lemna sp. (unit/hari)</td></tr>
<tr><td>Day 1</td><td>Day 5</td></tr>
<tr><td>Near window
Sebelah tingkap</td><td></td><td></td><td></td></tr>
<tr><td>Inside the cupboard
Di dalam almari</td><td></td><td></td><td></td></tr>
<tr><td>On the teacher table
Di atas meja guru</td><td></td><td></td><td></td></tr>
</table></td><td>2</td></tr>
<tr><td></td><td>Able to construct a table to record data based on one aspect only</td><td>1</td></tr>
<tr><td></td><td>No response or incorrect response</td><td>0</td></tr>
</table>

END OF MARKING SHEME
PERATURAN PEMARKAHAN TAMAT