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>1(a)</td><td>Able to record all 6 readings for the diameter of balloon 1 and balloon 2 correctly
Sample answer
<table>
<tr><td>The concentration of sucrose solution, %</td><td>Number of air bubbles release in 5 minutes</td></tr>
<tr><td>0.5</td><td>5</td></tr>
<tr><td>1.0</td><td>13</td></tr>
<tr><td>1.5</td><td>17</td></tr>
</table></td><td>3</td></tr>
<tr><td></td><td>Able to record any 4-5 readings correctly</td><td>2</td></tr>
<tr><td></td><td>Able to record any 2-3 reading correctly</td><td>1</td></tr>
<tr><td></td><td>No response or incorrect response</td><td>0</td></tr>
</table>

Scoring for observation and inference

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

<table>
<tr><th colspan="3">KBO6O1 - Observation</th></tr>
<tr><td>(b) (i)</td><td>Able to state two different observations correctly
P1 - Concentration of sucrose solution
P2 – Number of air bubbles release in 5 minutes
Sample Answers
Horizontal observation:
1.In 0.5% sucrose solution, the tnumber of air bubbles release is 5
2.In 1.5% sucrose solution , the number of air bubbles release is 17
Vertical observation:
1. The number of air bubble release in 5 minutes in 1.5% is the highest compared to in 0.5% and 1.0% of sucrose solution.
2. When the concentration of sucrose solution used increases, the number of air bubbles release in 5 minutes increases.</td><td>3</td></tr>
<tr><td></td><td>Able to state one observation correctly and two inaccurate observations.
Sample answers
1. In 0.5% sucrose solution, the number of air bubbles release is lower
2. The number of air bubbles release in 5 minutes is 17 in higher</td><td>2</td></tr>
</table>

	concentration of sucrose solution	
	Able to state the observations at idea level *Sample answer* 1. In high concentration of sucrose solution, the number of air bubbles release is higher 2. The number of air bubbles release is depends on the concentration of sucrose solution.	1
	No response or incorrect response	0

KB0604 - Making inference		
(b) (ii)	**Able to make two inferences correctly** Criteria: P1 : Infer on concentration of sucrose solution – less sugar/ nutrient P2 : Infer on number of air bubbles release – more/less gas produced P3 : activity in yeast/anaerobic respiration/growth less/more Sample answers 1. In lower concentration of sucrose solution, less sugar/nutrient content, so the number of air bubbles /carbon dioxide release is lower ,activity in yeast/ anaerobic respiration/growth of yeast is lower. 2. In higher concentration of sucrose solution, more sugar/nutrient content, so the number of air bubbles release/ carbon dioxide produced is higher, activity in yeast/anaerobic respiration/ growth of yeast is higher.	3
	Able to make one correct inference and one inaccurate or two inaccurate inferences Sample answers 1. In lower/higher concentration of sucrose solution, lower / more gas produced 2. In lower/higher concentration of sucrose solution , lower / higher activity in yeast	2
	Able to state only one correct inference or two inferences at idea level Sample answers 1. Less / more activity in yeast	1
	No response or incorrect response	0

<table>
<tr><td></td><td></td><td></td></tr>
<tr><td colspan="3">KBO6 10 - Controlling variables</td></tr>
<tr><td>(c)</td><td>Able to state all 3 variables and 3 methods to handle the variable.

Sample answers
<table>
<tr><th>Variable</th><th>Method to handle the variable</th></tr>
<tr><td><u>Manipulated variable</u>

Concentration of sucrose (solution)</td><td>Use different concentration of sucrose (solution)
Change 0.5% sucrose solution with 1.0% and 1.5% of sucrose solution
Use various concentration of sucrose solution</td></tr>
<tr><td><u>Responding variable</u>
The number of air bubbles release <u>in 5 minutes</u>

The rate activity in yeast</td><td>Record the number of air bubbles release by using stopwatch

Calculate the rate of activity in yeast by using formula
= <u>the number of air bubbles release</u>
Time taken</td></tr>
<tr><td><u>Controlled variable</u>

Volume of sucrose solution

Volume of warm water

Temperature

Amount of yeast</td><td>Fix the volume of sucrose solution, 30 ml.

Fix the volume of warm water, 20 ml

Fix the temperature

Fix the amount of yeast, 5 ml</td></tr>
</table>
All 6 ticks</td><td>3</td></tr>
<tr><td></td><td>Able to state 4 to 5 ticks</td><td>2</td></tr>
<tr><td></td><td>Able to state 2-3 ticks</td><td>1</td></tr>
<tr><td></td><td>No response or incorrect response or one tick only</td><td>0</td></tr>
</table>

KBO611 - State hypothesis		
(d)	**Able to state a hypothesis relating manipulated variable and responding variable correctly with the following aspect:** P1 — Manipulated variable — Concentration of sucrose solution P2 — Responding variable — The number of air bubble release in 5 minutes // the rate activity in yeast H - relationship Sample answer 1. The higher the concentration of sucrose solution, the higher the number of air bubbles release 2. The higher the concentration of sucrose solution, the higher the rate of activity in yeast 3. As the concentration of sucrose solution increases, the number of air bubbles release increase/ //vice-versa	3
	Able to state a hypothesis relating the manipulated variable and the responding variable inaccurately. Sample answer 1. When the concentration of sucrose solution is different, the number of air bubble release//the rate activity in yeast is different. 2. The number of air bubbles release //the rate of activity in yeast is depends on the concentration of sucrose solution. 3. The number of air bubble release / the rate activity in yeast is directly / linearly proportional to the concentration of sucrose solution.	2
	Able to state one idea of a hypothesis Sample answer 1. The number of air bubble release increases.	1
	No response or incorrect response If no P1 and P2, no mark for H	0

<table>
<tr><th colspan="3">KB0606 - Communicating data</th></tr>
<tr><td>(e)(i)</td><td>Able to construct a table correctly and record all the data correctly
T - Titles with units correctly
D - All data
C - Calculate the rate activity in yeast
Sample answer
<table>
<tr><th>Concentration of sucrose Solution, %</th><th>Number of air bubbles releas in 5 minutes</th><th>Rate of activity in yeast (min $^{-1}$)</th></tr>
<tr><td>0.5</td><td>5</td><td>1.0</td></tr>
<tr><td>1.0</td><td>13</td><td>2.6</td></tr>
<tr><td>1.5</td><td>17</td><td>3.4</td></tr>
</table></td><td>3</td></tr>
<tr><td></td><td>Any two aspects correctly</td><td>2</td></tr>
<tr><td></td><td>Any one aspect correctly</td><td>1</td></tr>
<tr><td></td><td>No response or incorrect response</td><td>0</td></tr>
</table>

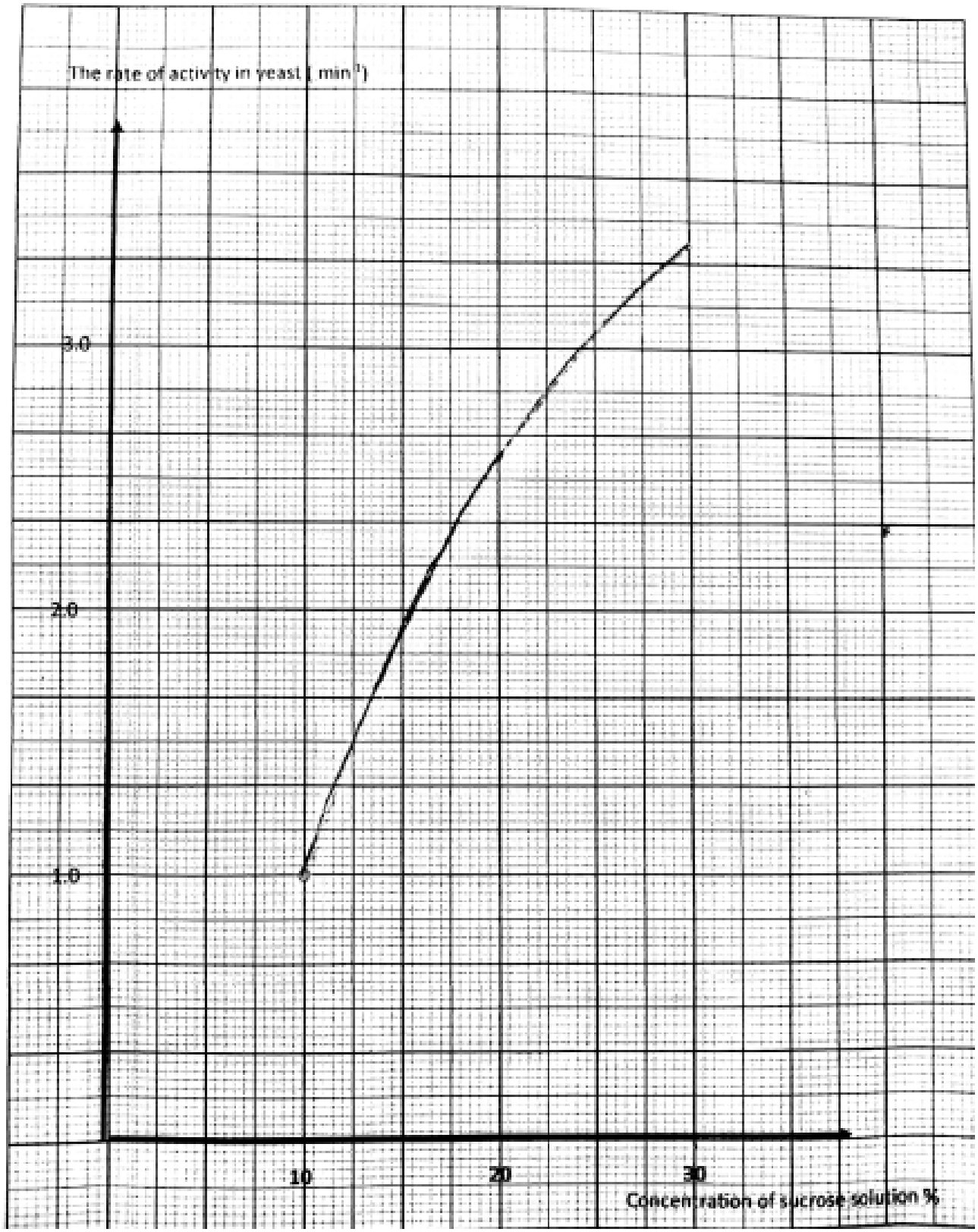
<table>
<tr><td>(e)(ii)</td><td>Able to draw a graph correctly

Axes (P) - both axes are label with correct units and uniform scales - 1 mark
Points (T) - Able to plot 3 points correctly - 1 mark
mark shape (B) - Able to joint all 3 points - 1 mark</td><td>3</td></tr>
<tr><td></td><td>Any two criteria correctly</td><td>2</td></tr>
<tr><td></td><td>Any one criteria correctly</td><td>1</td></tr>
<tr><td></td><td>No response or incorrect response</td><td>0</td></tr>
</table>

<table>
<tr><th colspan="3">KB 0608 - Interpreting data</th></tr>
<tr><td>(f)</td><td>Able to explain the relationship between the concentration of sucrose solution and the activity in yeast correctly

R1 - Able to state the relationship
R2 – more nutrients/ sucrose concentration
R3 - more gas produced
Sample answer
The rate of activity in yeast in 1.5% sucrose solution is the highest compared to the rate activity in yeast in 1.0% and 1.5% of sucrose solution because more nutrient / sucrose concentration is used. So, more gas / carbon dioxide is produced .</td><td>3</td></tr>
<tr><td></td><td>Able to explain the relationship incompletely</td><td>2</td></tr>
<tr><td></td><td>Able to explain the relationship at idea level or only state the relationship.</td><td>1</td></tr>
<tr><td></td><td>No response or incorrect response</td><td>0</td></tr>
</table>

Graph of the rate activity in yeast against the concentration of sucrose solution.
Graf kadar aktiviti yis melawan kepekatan larutan sukrosa.



KB0609 – Defining by operation		
(g)	**Able to state the definition of activity in yeast based on the following criteria:** Pl – An anaerobic respiration which produced gas P2- Shown by the number of bubbles release in 5 minutes P3 – Affected by the concentration of sucrose solution Sample answer Activity in yeast is an anaerobic respiration /growth in yeast that produced gas / carbon dioxide which is shown by the number of bubbles release in 5 minutes. The activity in yeast is affected by the concentration of sucrose solution	3
	Any two correct / 2 P's	2
	An one correct / 1 P	1
	None of the above or no response or incorrect response	0

KB0605 - Predicting		
(h)	Able to predict correctly and explain the prediction based on the following criteria: El - predict the rate of activity in yeast E2 – reason – carbon dioxide is acidic medium E3 - more growth / activity in yeast //anaerobic respiration Sample answer The rate of activity in yeast is more than 3.4min^{-1} because the activity in yeast is suitable in acidic medium . So more growth / activity in yeast // anaerobic respiration	3
	Any two correct	2
	Any one correct	1
	No response or incorrect response	0

KB0602 - Classifying		
(i)	**Able to list all substances in Table 3 correctly** Sample Answers High activity in yeast: Acidic medium, Low light intensity Low activity in yeast: Alkaline medium, Distilled water, High temperature	3
	Able to list 4 substances correctly	2
	Able to list 2-3 substances correctly	1
	No response or wrong response or *only one* correct	0

Question 2

Item no	Explanation	Score
2(i)	**Able to state problem statement correctly based on three aspects** C1: colour camouflage C2: survival of a species H : Relationship in question form. Sample answer: 1. How does colour camouflage help in the survival of a species? *Bagaimanakah penyamaran warna dapat membantu kemandirian spesies?* 2. What is the effect of colour camouflage in the survival of a species? *Apakah kesan penyamaran warna kepada kemandirian spesies?*	3
	Able to state problem statement inaccurately based on any two aspects Sample answer: 1. How does colour camouflage help in the survival of a species 2. What is the effect of colour camouflage to the species? 3. What factor affects the survival of a species?	2
	Able to state the problem statement correctly based on any one aspect or at idea level Sample answer: 1. Colour camouflage affect a species 2. How does the survival of a species occurs?	1
	No response or wrong answer	0

2(ii)	**Able to state hypothesis correctly based on the following aspect:** C1: colour camouflage / the difference in colours between the cloth and button C2: survival of a species / the number of contrasting button choosen H : Relationship Sample answer: 1. The greater the difference in colours between the cloth and button, the greater the number of contrasting button choosen *Semakin ketara perbezaan warna antara kain dengan butang, semakin banyak butang berkontras yang dipilih*	3
	Able to state the hypothesis correctly based on any two aspects / two inaccurate aspects Sample answer: 1. The difference in colours between the cloth and button cause the greater the number of contrasting button choosen 2. The number of contrasting button choosen is affected by the cloth	2
	Able to state the hypothesis correctly based on any one aspect or at idea level Sample answer: 1. Colour camouflage occur in a species?	1
	No response or wrong answer	0
2(iii)	**Able to state all the 3 variables correctly** Manipulated variable: Colour camouflage / the difference in colours between the cloth and button Responding variable: survival of a species / the number of contrasting button choosen Constant variable: Type of button / number of button /	3
	Able to state any 2 variables correctly	2
	Able to state any 1 variables correctly	1
	No response or wrong answer	0

2(iv)	**Able to list out all the apparatus and materials /** **8 Materials and 1 Apparatus correctly** Materials: *Bahan* Piece of black, white and multicoloured floral cloth measuring 50cm X 50cm, 20 black buttons, 20 white buttons, 20 yellow buttons, 20 red buttons and 20 blue buttons *Kain berwarna hitam, putih, dan berwarna-warni yang berukuran 50cm X 50cm, 20 butang hitam, 20 butang putih, 20 butang kuning, 20 butang merah dan 20 butang biru* Apparatus: *Radas* Tile *Jubin*	3
	Able to list out 5-7 Materials and 1 Apparatus correctly	2
	Able to list out 2-4 Materials and 1 Apparatus correctly	1
	No response or wrong answer	0
2(v)	**Able to write the procedures of experiment based on the following aspects:** K1 : Setting apparatus (at least 4 steps / 4K1) K2 : Operating constant variable (1 K2) K3 : Operating responding variable (1 K3) K4 : Operating manipulated variable (1 K4) K5 : Precaution or procedure to get accurate result (1 K5)	
	Able to state all the 5 K 1. Students work in pairs. *Murid bekerja secara berpasangan* 2. Students X turns and faces the wall of the laboratory *Murid X berdiri mengadap dinding makmal* 3. Students Y scatters various coloured buttons randomly on a piece of white cloth *Murid Y menabur butang yang berlainan warna secara rawak di atas kain berwarna putih*	K1 K1 K1 K1

<table>
<tr><td></td><td>4. Students X turns quickly and picks a button to put on a tile
Murid X berpusing dengan cepat dan memilih satu butang lalu meletakkannya di atas jubin

5. Repeat steps 4 nine times
Ulang langkah 4 sebanyak sembilan kali

6. Repeat step 2 to 5 using a black cloth followed by a multicoloured floral cloth
Ulang langkah 2 hingga 5 dengan menggunakan kain berwarna hitam diikuti dengan kain berwarna-warni

7. Record the number of buttons of each colour taken from each piece of cloth in a table
Rekodkan bilangan butang untuk setiap warna yang diambil daripada setiap kain dalam satu jadual</td><td>K1, K2

K4

K1, K3</td></tr>
<tr><td></td><td>Able to state 3K - 4 K</td><td>2</td></tr>
<tr><td></td><td>Able to state 1K - 2 K</td><td>1</td></tr>
<tr><td></td><td>No response or wrong answer</td><td>0</td></tr>
<tr><td>2(vi)</td><td>Able to tabulate a table containing the following aspects:
T : title with correct units
S : value of manipulated variables
Sample data:
<table>
<tr><td>Colour of buttons
Warna butang
Colour of cloth
Warna kain</td><td colspan="5">Number of buttons picked
Bilangan butang yang dipilih</td></tr>
<tr><td></td><td>Black
Hitam</td><td>White
Putih</td><td>Yellow
Kuning</td><td>Red
Merah</td><td>Blue
Biru</td></tr>
<tr><td>White
Putih</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Black
Hitam</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Multicoloured
Berwarna-warni</td><td></td><td></td><td></td><td></td><td></td></tr>
</table></td><td>2</td></tr>
<tr><td></td><td>Able to state any one aspect</td><td>1</td></tr>
<tr><td></td><td>No response or wrong answer</td><td>0</td></tr>
</table>

Sample answer :

Problem Statement
Pernytaan masalah

How does colour camouflage help in the survival of a species?
Bagaimanakah penyamaran warna dapat membantu kemandirian spesies?

Hypothesis
Hipotesis

The greater the difference in colours between the cloth and button, the greater the number of contrasting button choosen
Semakin ketara perbezaan warna antara kain dengan butang, semakin banyak butang berkontras yang dipilih

Variables
Pembolehubah

Manipulated variables : Colour of cloth
Pembolehubah dimanipulasikan: Warna kain

Responding variables:
Pembolehubah bergerakbalas

Number of button chosen
Bilangan butang yang dipilih

Constant Variables:
Pembolehubah dimalarkan

Size of cloth, the same student choosing the buttons
Saiz kain, murid yang memilih butang

Materials:
Bahan

Piece of black, white and multicoloured floral cloth measuring 50cm X 50cm, 20 black buttons, 20 white buttons, 20 yellow buttons, 20 red buttons and 20 blue buttons
Kain berwarna hitam, putih, dan berwarna-warni yang berukuran 50cm X 50cm, 20 butang hitam, 20 butang putih, 20 butang kuning, 20 butang merah dan 20 butang biru

Apparatus:
Radas

Tile
Jubin

Procedur:
Prosedur

1. Students work in pairs.
   Murid bekerja secara berpasangan

2. Students X turns and faces the wall of the laboratory
   Murid X berdiri mengadap dinding makmal

3. Students Y scatters various coloured buttons randomly on a piece of white cloth
   Murid Y menabur butang yang berlainan warna secara rawak di atas kain berwarna putih

4. Students X turns quickly and picks a button to put on a tile
   Murid X berpusing dengan cepat dan memilih satu butang lalu meletakkannya di atas jubin

5. Repeat steps 4 nine times
   Ulang langkah 4 sebanyak sembilan kali

6. Repeat step 2 to 5 using a black cloth followed by a multicoloured floral cloth
   Ulang langkah 2 hingga 5 dengan menggunakan kain berwarna hitam diikuti dengan kain berwarna-warni

7. Record the number of buttons of each colour taken from each piece of cloth in a table
   Rekodkan bilangan butang untuk setiap warna yang diambil daripada setiap kain dalam satu jadual

Presentation of data
Persembahan data

Colour of buttons / *Warna butang* Colour of cloth / *Warna kain*	Number of buttons picked / *Bilangan butang yang dipilih*				
	Black *Hitam*	White *Putih*	Yellow *Kuning*	Red *Merah*	Blue *Biru*
White *Putih*					
Black *Hitam*					
Multicoloured *Berwarna-warni*					