PANDUAN PERMARKAHAN
UJIAN DIAGNOSTIK 2
BIOLOGI SPM KERTAS 3
TAHUN 2020

Peraturan pemarkahan

No. 1

<table>
<tr><th>No</th><th>MARK SCHEME</th><th>Score</th></tr>
<tr><td>1(a)</td><td>Able to record the Volume of urine output correctly // All five readings correctly.
Boleh merekodkan isipadu air kencing yang dihasilkan dengan betul //
Semua 5 bacaan dengan betul.

<u>Sample answers:</u>
<table><tr><th>Volume of distilled water drunk (ml)
Isipadu air suling yang diminum (ml)</th><th>Volume of urine output (ml)
Isipadu air kencing yang dihasilkan (ml)</th></tr><tr><td>100</td><td>80</td></tr><tr><td>200</td><td>164</td></tr><tr><td>300</td><td>255</td></tr><tr><td>400</td><td>363</td></tr><tr><td>500</td><td>475</td></tr></table></td><td>3</td></tr>
<tr><td></td><td>Able to record 4-3 data correctly</td><td>2</td></tr>
<tr><td></td><td>Able to record 1-2 data correctly</td><td>1</td></tr>
<tr><td></td><td>Able to record only 0 data <u>or</u> not able to respond / wrong response.</td><td>0</td></tr>
<tr><td>(b) (i)</td><td>Able to state two different observations correctly based on two criteria:
Boleh menyatakan dua pemerhatian dengan betul berdasarkan aspek-aspek yang berikut :

P1- Manipulated variable
(Volume of distilled water drunk) / Isipadu air suling yang diminum
P2 – Responding variable
(Volume of urine output) / Isipadu air kencing yang dihasilkan

<u>Sample answers</u>:
1. When the volume of distilled water drunk is 100 ml / 200 ml / 300 ml / 400 ml/ 500ml, the volume of urine output is 80ml / 164 ml / 255 ml / 363ml/ 475 ml.</td><td>3</td></tr>
</table>

	Apabila 100 ml / 200 ml / 300 ml / 400 ml/ 500ml isipadu air suling yang diminum, isipadu air kencing yang dihasilkan adalah 80ml / 164 ml / 255 ml / 363ml/ 475 ml. 2. When the volume of distilled water drunk is 100 ml // 500ml, the volume of urine output is the least/lowest//most/highest. *Apabila 100 ml // 500ml isipadu air suling yang diminum, isipadu air kencing yang dihasilkan adalah paling sedikit/paling rendah //paling banyak/paling tinggi.*	

	Able to state one correct observation and one inaccurate observation or two inaccurate observations *Boleh menyatakan satu pemerhatian betul **dan** satu kurang tepat atau dua pemerhatian tidak tepat.* Sample answer (inaccurate): 1. When the volume of distilled water drunk is 100 ml / 200 ml / 300 ml / 400ml / 500 ml , the volume of urine output is the less/low//more/ high. *Apabila 100 ml / 200 ml / 300 ml / 400ml / 500 ml isipadu air suling yang diminum, isipadu air kencing yang dihasilkan adalah sedikit / rendah // banyak / tinggi.*	**2**
	Able to state only one correct observation or two observation at idea level. *Boleh menyatakan satu pemerhatian betul **atau** dua pemerhatian pada peringkat idea.* Sample answer (idea level): 1. The volume of urine output is different. *Isipadu air kencing yang dihasilkan adalah berbeza.* 2. The volume of distilled water drunk affects the volume of urine output. *Isipadu air suling yang diminum mempengaruhi isipadu air kencing yang dihasilkan.*	**1**
	No response or incorrect response or one idea only *Tiada respon atau respon salah atau satu idea sahaja*	**0**
(b) (ii)	**Able to state two correct inferences based on the following aspects :** *Boleh menyatakan dua inferens dengan betul berdasarkan aspek berikut:*	**3**

	MV – less/ more amount of water (drunk) *kurang / lebih banyak jumlah air (diminum)* RV – more / less water reabsorbed (in the kidney) *lebih banyak / kurang air diserap semula (di dalam ginjal)* Sample answer: (For observation 1 and 2 in sample answers) 1. The amount of water drunk is **less / more, more / less** water reabsorbed (in the kidney). *Jumlah air yang diminum adalah kurang / lebih banyak, lebih banyak / kurang air diserap semula (di dalam ginjal)*	
	Able to state one correct inference and one inaccurate inference or two inaccurate inferences. *Boleh menyatakan satu inferens dengan betul dan satu inferens tidak tepat atau dua inferens tidak tepat*. Sample answer (inaccurate): **1.** **More /high/ much**/ (amount) of water reabsorbed //inversely. *Lebih banyak / tinggi / banyak (jumlah) air diserap semula // sebaliknya.* **2.** **Higher / high / lower / low** osmotic pressure. *Lebih tinggi / tinggi / lebih rendah / rendah tekanan osmosis* **3.** **Less / more** ADH is secreted to the kidney tubule. *Kurang / lebih banyak ADH dirembes ke dalam tubul ginjal.*	**2**
	Able to state one correct inference and one inference at idea level *Boleh menyatakan satu inferens dengan betul dan satu inferens pada peringkat idea.* Sample answer for idea level: 1. ADH is secreted. *ADH dirembeskan.* 2. Salt reabsorbed. *Garam diserap semula.* 3. Water reabsorbed. *Air diserap semula*	**1**
	No response or inaccurate response *Tiada respon atau respon salah*	**0**

Summary of scoring for 1(b)(i) and 1(b)(ii) :

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

(c) **Able to state all 3 variables and the methods to handle the variables correctly**
*Boleh menyatakan semua **3** pembolehubah dan cara mengendalikan pembolehubah dengan betul*

Sample answer

Variable / *Pembole ubah*	Method to handle the variable / *Cara mengendalikan pemboleh ubah*
Manipulated variable *dimanipulasikan* Volume of distilled water drunk *Isipadu air suling yang diminum*	(The students) drink **different** volume of distilled water // **Change** the volume of distilled water from 100 ml to 200 ml, 300 ml,400 ml and 500 ml. *(Murid-murid) minum isipadu air suling yang berbeza // Tukar isipadu air suling daripada 100 ml kepada 200 ml, 300 ml,400 ml dan 500 ml.*

3

Responding Variable / *bergerakbalas* Volume of urine output // *Isipadu air kencing yang dihasilkan.* Reabsorption of water in the kidney// *Penyerapan semula air dalam ginjal* Percentage volume of urine output *Peratus isipadu air kencing yang dihasilkan.*	Measure and **record** the volume of urine output by using a **measuring cylinder. //** *Ukur dan **rekod** isipadu air kencing yang dihasilkan dengan menggunakan silinder penyukat.* **Calculate** the and record the percentage volume of urine output by using formula : Percentage volume of urine output = Volume of urine output x 100 / Volume of distilled water drunk *Kira dan **rekod** peratus isipadu air kencing yang dihasilkan dengan menggunakan formula :* *Peratus isipadu air kencing yang dihasilkan = Isipadu air kencing yang dihasilkan x 100 / Isipadu air suling yang diminum*	
Constant variable/ *dimalarkan* The student//Time taken to collect/measure/record the urine// type of water drank *Murid // Masa diambil untuk kumpul/ ukur/ rekod air kencing // jenis air yang diminum*	Use the same student to carry out the experiment// *Gunakan murid yang sama untuk menjalankan eksperimen//* **Fix** the time taken to collect/measure/record the urine at **one hour**// *Tetapkan masa diambil untuk kumpul / ukur/ rekod air kencing selama satu jam //* **Use only distilled** water *gunakan hanya air suling*	

	Able to state 3-5 ticks correctly	**2**
	Able to state 1-2 ticks correctly	**1**
	No response <u>or</u> incorrect response	**0**

(d)	**Able to make a hypothesis based on the following aspects:** *Boleh menyatakan hipotesis berdasarkan aspek berikut* : **P1** : manipulated variable / *Pemboleh ubah dimanipulasikan* : Volume of distilled water drunk / *Isipadu air suling yang diminum* **P2** : responding variable / *Pemboleh ubah bergerakbalas* : Volume of urine output/ *Isipadu air kencing yang dihasilkan.* **R** : Relationship / *Hubungan* <u>Sample answer</u> P1 + P2 + R 1. As the volume of distilled water drunk increases, the volume of urine output increases // vice versa. *Apabila isipadu air suling yang diminum meningkat, isipadu air kencing yang dihasilkan juga meningkat // sebaliknya.*	**3**
	Able to make a hypothesis based on any two aspects. *Boleh menyatakan hipotesis berdasarkan mana-mana dua aspek berikut* : P1 + P2 // P1/P2 + R 1. The volume of urine output depends on the volume of distilled water drunk. *Isipadu air kencing yang dihasilkan bergantung kepada isipadu air suling yang diminum* 2. Different group of students has different volume of urine output. *Kumpulan murid yang berbeza mempunyai isipadu air kencing yang dihasilkan berbeza*	**2**

	Able to make hypothesis based on one aspect. *Boleh menyatakan hipotesis berdasarkan satu aspek berikut* : Sample answer 1. Volume of urine output is different. *Isipadu air kencing yang dihasilkan adalah berbeza*	**1**
	No response or incorrect respons	**0**

(e) (i)	**Able to construct a table correctly with the following aspects:** *Boleh membina jadual dengan betul mengikut aspek-aspek yang berikut :* T : Titles with correct units /*Tajuk dengan unit yg betul* - 1 mark D: Data - 1mark C : Average volume of urine output/*Purata isipadu air kencing yang dihasilkan* - 1mark Sample answer : Title, T	**3**

Volume of distilled water drunk (ml) ***Isipadu air suling yang diminum (ml)***	**Volume of urine output (ml)** ***Isipadu air kencing yang dihasilkan, (ml)***	**Percentage volume of urine output (%)** ***Peratus Isipadu air kencing yang dihasilkan (%)***
100	80	80/80.0
200	164	82/82.0
300	255	85/85.0
400	363	91/90.8
500	475	95/95.0

C –Calculation

Data,D

	Able to state any two correct aspects	**2**
	Able to state any one correct aspect	**1**
	No response <u>or</u> inaccurate response	**0**

(e) (ii)	**Able to draw the graph of average volume of urine output against volume of distilled water drunk based on the following aspects :** *Boleh melukis graf purata isipadu air kencing yang dihasilkan melawan isipadu air kencing yang diminum berdasarkan aspek-aspek berikut:* Axes / *Paksi* (P) : Both axes are labelled in uniform scales – 1 mark Points / *Titik* (T) : All points plotted correctly plotted – 1 mark Shape / *Bentuk (*B*)* : Smooth curve line and join all the points – 1 mark **All three correct aspects**	**3**
	Any two correct aspects	**2**
	Any one aspect correct	**1**
	No response <u>or</u> incorrect response	**0**

(f)	**Able to explain the relationship between the percentage volume of urine output and volume of distilled water drunk based on the following criteria.**
	Boleh menerangkan hubungan antara peratus isipadu air kencing yang dihasilkan dengan isipadu air suling yang diminum berdasarkan kriteria berikut
	
	R1 : Relationship/ hypothesis statement
	The more/less the volume of distilled water drunk, the higher the percentage volume of urine output.
	Lebih banyak / kurang isipadu air suling yang diminum, lebih tinggi peratus isipadu air kencing yang dihasilkan.
	
	E1 : Osmotic pressure decreases.
	Tekanan osmosis berkurang
	
	E2 : Less water reabsorbed (from the kidney) // less/more ADH is produced // Kidney tubules become less/more permeable to water
	Kurang air diserap semula (dari ginjal) // kurang /lebih banyak ADH dihasilkan // Tubul ginjal menjadi kurang / lebih telap terhadap air
	
	<u>Sample answer :</u>
	The more the volume of distilled water drunk, the higher the percentage volume of urine output because the osmotic pressure decreases. Thus, less water reabsorbed from the kidney.
	
	Semakin banyak isipadu air suling yang diminum, semakin tinggi peratus isipadu air kencing yang dihasilkan kerana tekanan osmosis berkurang. Oleh itu, kurang air diserap semula dari ginjal.
	
	Able to state the relationship and two E correctly
		3

	Able to state the relationship based on R and any one E // Able to state an idea of the relationship and two E	**2**
	Able to state an idea of the relationship and any one E / R only	**1**
	No response <u>or</u> incorrect R.	**0**

(g)	**Able to define osmoregulation operationally based on the following criteria.** *Boleh menyatakan definisi secara operasi bagi pengosmokawalaturan berdasarkan kriteria berikut:* P1 : A process that maintain the water content in the blood. *Proses yang mengekalkan kandungan air dalam (darah) tekanan osmosis .* P2 : shown by the volume of urine output by the student after one hour *ditunjukkan oleh isipadu air kencing yang dihasilkan oleh murid selepas satu jam.* P3 : affected by/ depends on the volume of distilled water drunk *dipengaruhi oleh / bergantung kepada isipadu air suling yang diminum.* Hypotesis : the higher the volume of distilled water drunk, the higher the volume of urine output *Hipotesis : Semakin tinggi isipadu air yang diminum, semakin tinggi isipadu air kencing yang dihasilkan* Sample answer : Osmoregulation is the process that will maintain the water content in the body, shown by the volume of urine output of the student after one hour. The volume of urine output depends on the volume of distilled water drunk. *Pengosmokawalaturan adalah proses yang akan mengekalkan tekanan osmosis di dalam badan yang ditunjukkan oleh isipadu air kencing yang dihasilkan oleh murid selepas satu jam dan dipengaruhi oleh isipadu air suling yang diminum.* **Able to state the all Ps correctly.**	**3**
	Able to state any 2 Ps correctly.	**2**
	Able to state 1 P or an idea level only.	**1**
	No response or incorrect response.	**0**

(h)	**Able to predict and explain the volume of urine output based on the following criteria:** *Boleh meramal dan menerangkan isipadu air kencing yang dihasilkan berdasarkan kepada kriteria berikut:* P1 : Prediction – volume of urine output is less than 80ml / decreases /will be less *Ramalan – isipadu air kencing yang dihasilkan adalah kurang daripada 80 ml / berkurang / akan berkurangan* E1 : Explanation – Increase of osmotic pressure *Penerangan – Tekanan osmosis meningkat* E2 : More ADH secreted/ kidney tubule will be more permeable to water *Lebih banyak ADH dirembeskan/ tubul ginjal akan menjadi lebih telap terhadap air* E3 : More water reabsorbed (from the kidney) *Lebih banyak air diserap semula (dari ginjal)* Sample answer Volume of urine output is less than 80 ml/ decreases/ will be less, Because the osmotic pressure increases, more ADH is secreted so that the kidney tubule is more permeable to water, more water reabsorbed (from the kidney). *Isipadu air kencing yang dihasilkan adalah kurang daripada 80 ml / berkurangan / akan berkurang. Ini adalah kerana tekanan osmosis meningkat, lebih banyak ADH dirembes, jadi tubul ginjal adalah lebih telap terhadap air, lebih banyak air diserap semula (dari ginjal)* **Able to predict and state any 2 Es correctly** **(P + any 2 Es)**	**3**
	Able to predict and state any 1E correctly. (P+ 1E) **Able to predict at idea level only and state any 2 Es correctly. (Idea P + 2Es)**	**2**
	Able to predict only or predict at idea level and state 1 E correctly. **(P only @ Idea P + any 1E)**	**1**
	No response or incorrect response.	**0**

<table>
<tr><td>(i)</td><td>Able to classify apparatus and materials into their respective variables.
Boleh mengelaskan radas dan bahan dengan betul.

<u>Sample answer :</u>
All 5 corrects

<table><tr><th>Apparatus
Radas</th><th>Material
Bahan</th></tr><tr><td>Measuring cylinder
Silinder penyukat

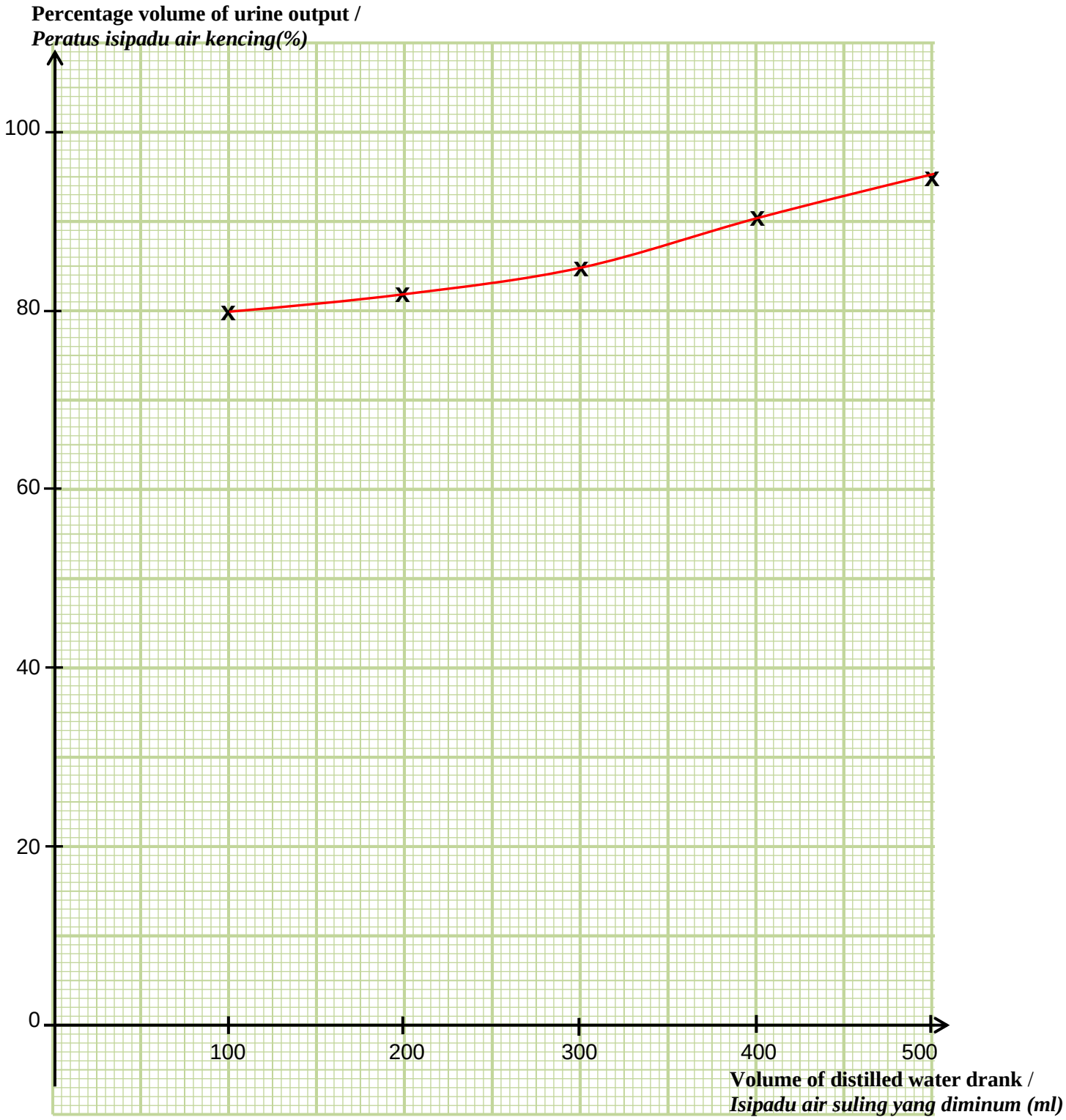
Beaker
Bikar

Stopwatch
Jam randik</td><td>Distilled water
Air suling

Sodium chloride solution
Larutan natrium klorida</td></tr></table></td><td>3</td></tr>
<tr><td></td><td>1 – 2 wrongs</td><td>2</td></tr>
<tr><td></td><td>3 – 4 wrongs</td><td>1</td></tr>
<tr><td></td><td>5 wrongs or no respons</td><td>0</td></tr>
</table>

e (i) Sample answer

Graph of percentage volume of urine output against volume of distilled water drank
Graf peratus isipadu air kencing yang dihasilkan melawan isipadu air suling yang diminum



No. 2

Question	Mark Scheme	Marks
2(i)	**Able to state a problem statement relating the manipulated variable to the responding variable correctly based on the following aspects:** P1 : Manipulated variable Temperature / *suhu* P2 : Responding variable Rate of anaerobic respiration in yeast / height // increase in the level of coloured liquid in the manometer // time taken for the lime water to turns cloudy. *kadar respirasi anaerobik dalam yis / Ketinggian // kenaikan aras cecair berwarna dalam manometer // masa yang diambil untuk air kapur menjadi keruh.* R : Relationship between the variables in a question. *Pernyataan dalam soalan dan mempunyai hubungan.* <u>Sample answer</u> 1. What is the effect of temperature on rate of anaerobic respiration in yeast / time taken for the lime water to turns cloudy? *Apakah kesan suhu terhadap kadar respirasi anaerobik dalam yis / masa yang diambil untuk air kapur menjadi keruh*?	3
	Able to state a problem statement less accurately <u>Sample answers</u> 1. What is the effect of temperature on yeast? *Apakah kesan suhu ke atas yis?* 2. How yeast activity affects the temperature? *Bagaimana aktiviti yis dipengaruhi oleh suhu?*	**2**
	Able to state an idea of a problem statement <u>Sample answers</u> 1. Yeast affected by temperature *Yis dipengaruhi oleh suhu.* 2. Temperature is the factor of anaerobic respiration. *Suhu adalah faktor kepada respirasi anaerobik.*	**1**
	No response <u>or</u> incorrect response	**0**

Question	Mark Scheme	Marks
2(ii)	**Able to state a hypothesis relating the manipulated variable to the responding variable correctly based on the following aspects:** P1 : Manipulated variable Temperature/*suhu* P2 : Responding variable Rate of anaerobic respiration in yeast / height // increase in the level of coloured liquid in the manometer / time taken for the lime water to turns cloudy *kadar respirasi anaerobik dalam yis / Ketinggian // kenaikan aras cecair berwarna dalam manometer / masa yang diambil untuk air kapur menjadi keruh* R : Relationship between the variables in a question *Pernyataan dalam soalan dan mempunyai hubungan* <u>Sample answer</u> 1. The higher the temperature, the higher the rate of anaerobic respiration in yeast *Semakin tinggi suhu, semakin tinggi kadar respirasi anaerobik dalam yis.* 2. If the temperature increases, then the time taken for the lime water to turns cloudy decreases. *Jika suhu meningkat , masa yang diambil untuk air kapur menjadi keruh berkurang.*	**3**
	Able to state a problem statement less accurately <u>Sample answers</u> 1. How is the effect of glucose concentration on the rate of aerobic respiration *Bagaimanakah kesan kepekatan glukosa ke atas kadar respirasi aerobik* 2. How is the effect of glucose concentration on the rate of respiration *Bagaimanakah kesan kepekatan glukosa ke atas kadar respirasi* 3. Glucose concentration affects the rate of aerobic respiration *Kepekatan glukosa mempengaruhi kadar kadar respirasi aerobic*	**2**

	Able to state an idea of a problem statement Sample answers 1. Glucose concentration affects the rate of respiration *Kepekatan glukosa mempengaruhi kadar respirasi*	**1**
	No response or incorrect response	**0**

2(iii)	**Able to state all three variables correctly** Sample answers 1. Manipulated variable Temperature / *Suhu* 2. Responding variable Rate of anaerobic respiration in yeast / height // increase in the level of coloured liquid in the manometer / time taken for the lime water to turns cloudy *Kadar respirasi anaerobik dalam yis / Ketinggian // kenaikan aras cecair berwarna dalam manometer // masa yang diambil untuk air kapur menjadi keruh* 3. Constant variable Volume / concentration of yeast / glucose / lime water / pH value / temperature of water bath *Isipadu / kepekatan yis / glukosa / air kapur / nilai pH / suhu kukusan air*	**3**
	Able to state any two variables correctly	**2**
	Able to state any one variables correctly	**1**
	No response or incorrect response	**0**

2(iv)	**Able to list all the apparatus and materials correctly** Sample answers **Method 1 : RV** :height // increase in the level of coloured liquid in the manometer *Kaedah 1: RV : Kenaikan aras cecair berwarna dalam manometer*	**3**

	<table><tr><th>**Apparatus (A)** ***Radas (R):***</th><th>**Material (M)** ***Bahan (B):***</th></tr><tr><td>Boiling tube / test tube, manometer / capillary tube / delivery tube, stopwatch, meter rule, rubber tube, retort stand, measuring cylinder *Tabung didih / tabung uji, manometer/ tiub kapilari / salur penghantar, jam randik, pembaris, salur getah, kaki retort, silinder penyukat*</td><td>Yeast suspension, glucose solution, paraffin oil, colored liquid, marker pen / thread *Ampaian yis, larutan glukosa, minyak parafin, cecair berwarna, pen marker / benang*</td></tr></table> **6-7R + 4B** **Method 2 : RV :** time taken for the lime water to turns cloudy *Kaedah 2: RV : masa yang diambil untuk air kapur menjadi keruh* <table><tr><th>**Apparatus (A)** **Radas(R) :**</th><th>**Material (M)** **Bahan (B):**</th></tr><tr><td>Tabung didih / tabung uji, jam randik, tiub penghantar, kaki retort, silinder penyukat</td><td>Ampaian yis, larutan glukosa, minyak parafin, air kapur</td></tr></table> **5A+ 4M // 5R + 4B**	
	Able to list Apparatus and Materials based on the following criteria: Method 1 : **4-5A + 3M** *Kaedah 1 : 4-5R + 3B* **Method 2 : 3-4A + 3M** *Kaedah 2 : 3-4R + 3B*	**2**
	Able to list Apparatus and Materials based on the following criteria: Method 1 : **3A + 2M (yeast suspension and glucose solution)** *Kaedah 1 : 3R + 2B (Ampaian yis & larutan glukosa)* Method 2 : **2A + 2M (yeast suspension and glucose solution)** *Kaedah 2 : 2R + 2B(Ampaian yis & larutan glukosa)*	**1**
	No response <u>or</u> incorrect response Tiada respon	**0**

2(v)	**Able to describe the steps of the experimental procedure or method correctly based on the following aspects:** K1 : Preparation of materials and apparatus *Persediaan bahan dan radas* K2 : Operating the constant variable. *Mengendalikan pembolehubah yang dimalarkan* K3 : Operating the responding variable *Mengendalikan pembolehubah bergerak balas* K4 : Operating the manipulated variable *Mengendalikan pembolehubah dimanipulasikan* K5 : Steps to increase reliability of results accurately / precaution *Langkah meningkatkan keputusan dengan lebih tepat/langkah berjaga-jaga* <u>Sample answers</u> 1. Label the test tube with A, B, C and D (K1) *Label tabung uji dengan A, B, C dan D* 2. Fill 5 test / boiling tubes with 15 cm^{-3} suspension of yeast. (Mixture of 5g yeast and 100cm^{-3} of 10% glucose solution. (K1 / K2) *Isikan 5 tabung uji / didih dengan 15cm^{-3} ampaian yis . (campuran 5g yis dan 100cm^{-3} of 10% larutan glukosa).* 3. Place test tubes A, B, C and D in ice or water bath. (K1) *Letakkan tabung uji A, B, C dan D dalam ais atau kukusan air.* 4. Maintain the water bath temperature at 10°C, 20°C, 30°C, 40°C each. (K4) *Kekalkan suhu kukusan air pada 10°C, 20°C, 30°C, 40°C setiap satu.* 5. Connect the boiling tubes to the capillary tube. In this tube, a coloured liquid dots are trapped. (K1) *Sambung tabung-tabung didih kepada tiub kapilari. Dalam tiub ini, satu titik cecair berwarna diperangkap.* 6. Mark the initial level of the coloured liquid in the manometer. (K1) *Tandakan aras awal cecair berwarna dalam manometer.* 7. Start the stopwatch. (K1) *Mulakan jam randik*	

	8. Mark and record the final level of the coloured liquid in the manometer after 10 minutes using the meter rule (method 1) (K2/K3) / Measure and record the time taken for the lime water to turns cloudy by using the stopwatch (Method 2). (K3) / Calculate and record rate of anaerobic respiration in yeast by using the formula. (K3) Rate of anaerobic respiration = Increased level of colored liquid in manometer (cm) / Time (min) *Tanda dan rekod aras akhir cecair berwarna dalam manometer selepas 10 minit menggunakan pembaris (kaedah 1) / Ukur dan rekod masa yang diambil untuk air kapur menjadi keruh dengan menggunakan jam randik (Kaedah 2)./* *Kira dan rekod kadar respirasi anaerobik dalam yis dengan menggunakan rumus:* Kadar respirasi anaerobik = Kenaikan aras cecair berwarna dalam manometer(cm) / Masa (min) 9. Record the data in the table. (K1) *Rekod data dalam jadual.* 10. Make sure all apparatus connections are tight and airtight // Repeat the experiment twice to get the average reading. (K5) *Pastikan kesemua sambungan radas adalah ketat dan kedap udara // Ulang eksperimen sebanyak dua kali untuk mendapatkan purata bacaan.* *Reject if the temperature exceeds than 60^{o}C and above **Tolak jika suhu melebihi 60^{o}C dan ke atas.* **Scoring rubric** K1 : Step 1, 2, 3, 5, 6, 7 and 9 (Any 4 steps) K2 : Step 2 and 8 (Any one) K3 : Step 8 K4 : Step 4 K5 : Step 10 **All 5 K**	**3**
	Any 3 - 4 K	**2**
	Any 1 – 2 K	**1**
	No response or incorrect response	**0**

<table>
<tr>
<td>2(vi)</td>
<td>
Able to present all the data with unit based on the following aspects:
Dapat membina jadual untuk merekod data berdasarkan kriteria berikut :

P1 : Correct manipulated variable with unit and data
Pembolehubah dimanipulasikan dengan data dan unit yang betul
P2 : Correct operating RV / Responding variables with units
Pembolehubah bergerak balas dengan unit yang betul

<u>Sample answer</u>

<table>
<tr><th>Temperature
Suhu, ºC</th><th>Increased level of coloured liquid in manometer (cm) / time taken for the lime water to turns cloudy
Kenaikan aras cecair berwarna dalam manometer (cm) / masa yang diambil untuk air kapur menjadi keruh (min)</th><th>Rate of anaerobic respiration(cmmin^{-1}) / (min^{-1})
<i>Kadar respirasi anaerobik yis (cmmin^{-1}) / (min^{-1})</th></tr>
<tr><td>10</td><td></td><td></td></tr>
<tr><td>20</td><td></td><td></td></tr>
<tr><td>30</td><td></td><td></td></tr>
<tr><td>40</td><td></td><td></td></tr>
</table>
</td>
<td>2</td>
</tr>
<tr><td></td><td>Able to construct a table based on one aspect</td><td>1</td></tr>
<tr><td></td><td>No response <u>or</u> incorrect response</td><td>0</td></tr>
</table>