Nama: ..... Kelas: .....

SULIT
4551/3
Biologi
Kertas 3
Ogos
2017

1½ jam

MAKTAB RENDAH SAINS MARA

PEPERIKSAAN AKHIR SIJIL PENDIDIKAN MRSM 2017

BIOLOGI

Kertas 3

Satu jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Tulis **nama** dan **kelas** anda pada ruangan yang disediakan.*
2. *Kertas soalan ini adalah dalam dwibahasa.*
3. *Soalan dalam Bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Melayu.*
4. *Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam Bahasa Inggeris atau Bahasa Melayu.*
5. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

Untuk Kegunaan Pemeriksa		
Kod Pemeriksa :		
Soalan	Markah Penuh	Markah Diperoleh
1	33	
2	17	
Jumlah	**50**	

Kertas soalan ini mengandungi 19 halaman bercetak

Answer **all** questions
*Jawab **semua** soalan*

1. Statement / *Pernyataan :*

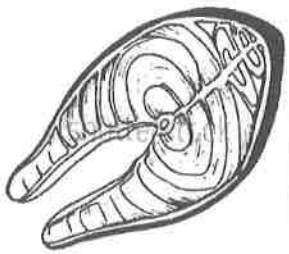
THE Fisherman

SIGN UP FOR OUR FREE eNEWSLETTER

Follow:

Advanced Search

During handling of fresh fish fillet, rinsing it using tap water is to be avoided. This step will make the fillet looks fresh but is easily ruined because of osmosis process.



Translation :
Membilas menggunakan air paip perlu dielakkan semasa mengendalikan kepingan ikan segar. Langkah ini akan menyebabkan kepingan ikan kelihatan segar tetapi ia akan mudah rosak akibat proses osmosis.

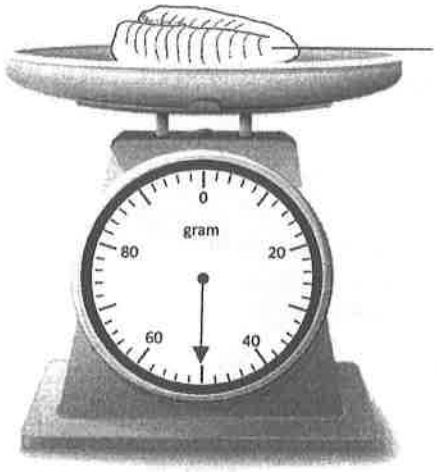
As a member of the company's Research and Development team, you are requested to determine the concentration of solution that is isotonic to the mackerel fillet cells to overcome this problem.

Sebagai seorang ahli kumpulan Penyelidikan dan Pembangunan syarikat, anda diarahkan untuk menentukan kepekatan larutan yang isotonik terhadap sel kepingan isi ikan tenggiri untuk mengatasi masalah ini.

The following steps were carried out.

Langkah-langkah berikut telah dijalankan.

Step 1 : Three mackerel fillets were wiped with tissue paper, weighed and the initial mass was recorded as in Diagram 1.1.
Langkah 1 *Tiga kepingan ikan tenggiri dilap kering dengan kertas tisu, setiap satu ditimbang dan jisim awal direkodkan seperti dalam Rajah* 1.1.



Mackerel fillet
Kepingan ikan tenggiri

Initial mass of fish fillet
Jisim awal kepingan ikan

Diagram 1.1
Rajah 1.1

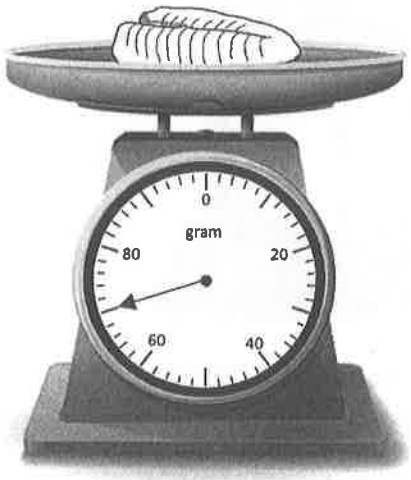
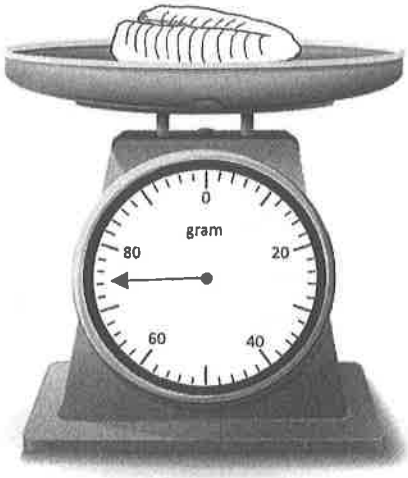
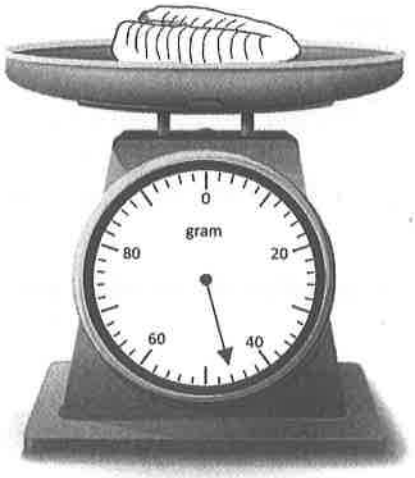
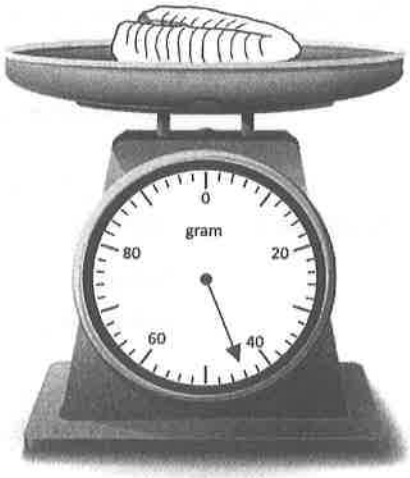
Step 2 : The fish fillet was immersed in a beaker containing 200 ml of 0.1 M of sodium chloride solution.
Langkah 2 *Kepingan ikan direndam di dalam sebuah bikar mengandungi* 200 *ml* 0.1 *M larutan natrium klorida.*

Step 3 : After 30 minutes, the fish fillet was removed from the beaker and wiped dry again.
Langkah 3 *Selepas* 30 *minit, kepingan ikan dikeluarkan dari bikar dan dilap kering sekali lagi.*

Step 4 : The final mass of the each fish fillet was weighed and then recorded.
Langkah 4 *Jisim akhir setiap kepingan ikan ditimbang dan direkodkan.*

Step 5 : Step 1 until 4 is repeated by using different concentration of solution which are 0.4 M sodium chloride solution and 0.6 M sodium chloride solution.
Langkah 1 *hingga* 4 *diulang dengan menggunakan kepekatan larutan Yang berbeza iaitu* 0.4 *M larutan natrium klorida dan* 0.6 *M larutan natrium klorida.*

Table 1 shows the results of this experiment.
Table 1 menunjukkan keputusan eksperimen ini.

Concentration of sodium chloride solution (M) *Kepekatan larutan natrium klorida* (M)	Final mass of mackerel fillet (g) *Jisim akhir kepingan isi ikan tenggiri*	
	First experiment *Eksperimen pertama*	Second experiment *Eksperimen kedua*
0.1		
0.4		

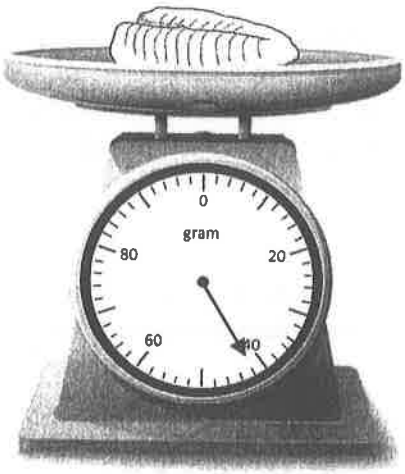
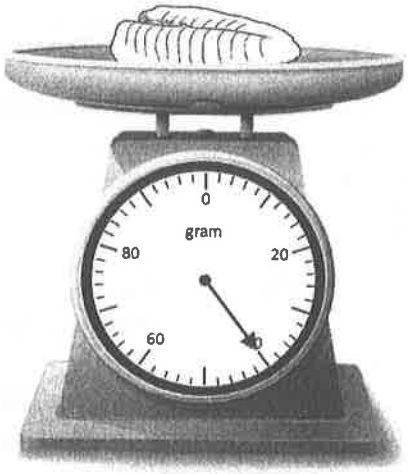
0.6		

Table 1
Jadual 1

For Examiner's use

1 (a)

3

(a) Record the final mass of fish fillet in the boxes provided in Table 1 on pages 4 and 5.
Rekodkan jisim akhir kepingan ikan ke dalam kotak yang disediakan dalam Jadual 1 di halaman 4 dan 5.

[3 *marks*]
[3 *markah*]

(b) (i) Based on Table 1, state **two** different observations.
Berdasarkan Jadual 1, nyatakan **dua** *pemerhatian yang berbeza.*

Observation 1:
Pemerhatian 1:

.....

.....

Observation 2:
Pemerhatian 2:

.....

.....

1 (b)(i)

3

[3 *marks*]
[3 *markah*]

(ii) State **two** inferences which correspond to the observations in **1**(b)(i).
Nyatakan **dua** *inferens yang sepadan dengan pemerhatian di* **1***(b)(i).*

Inference from observation 1:
Inferens daripada pemerhatian 1:

.....

.....

Inference from observation 2:
Inferens daripada pemerhatian 2:

.....

.....

1 (b)(ii)

3

[3 *marks*]
[3 *markah*]

(c) Complete Table 2 based on the experiment.
Lengkapkan Jadual 2 berdasarkan eksperimen itu.

For Examiner's use

Variable ***Pembolehubah***	**Method to handle the variable** ***Cara mengendali pembolehubah***
Manipulated variable *Pembolehubah dimanipulasi*	
.....	.....
.....	.....
.....	.....
Responding variable *Pembolehubah bergerak balas*	
.....	.....
.....	.....
.....	.....
Constant variable *Pembolehubah dimalarkan*	
.....	.....
.....	.....
.....	.....

Table 2
Jadual 2

[3 *marks*]
[3 *markah*]

1 (c) 3

(d) State the hypothesis for the experiment.
Nyatakan hipotesis bagi eksperimen itu.

.....

.....

.....

[3 *marks*]
[3 *markah*]

1 (d) 3

For Examiner's use

(e) (i) Construct a table and record all the data collected from the experiment. Your table should have the following titles:

Bina satu jadual dan rekod semua data yang dikumpulkan dalam ekpserimen itu. Jadual anda hendaklah mengandungi tajuk-tajuk berikut:

- Concentration of sodium chloride solutions
  Kepekatan larutan natrium klorida
- Initial mass
  Jisim awal
- Final mass
  Jisim akhir
- Average of final mass
  Purata jisim akhir
- Difference in mass
  Perbezaan jisim

1 (e)(i)

3

[3 *marks*]
[3 *markah*]

(ii) Use the graph paper provided on page **11** to answer this question.

Using the data in **1**(e)(i), draw a graph to show the difference in mass of fish fillet against the concentration of sodium chloride solution.

Guna kertas graf yang disediakan pada halaman **11** *untuk menjawab soalan ini.*

Menggunakan data di **1***(e)(i), lukis satu graf bagi menunjukkan perubahan jisim kepingan ikan melawan kepekatan larutan natrium klorida.*

[3 *marks*]
[3 *markah*]

For Examiner's use

1 (e)(ii)
3

(f) Based on the graph in **1**(e)(ii), state the concentration of sodium chloride solution which is isotonic to the fish fillet cells.

Explain your answer.

Berdasarkan graf di **1***(e)(ii), nyatakan kepekatan larutan natrium klorida yang isotonik kepada kepekatan sel kepingan ikan.*

Terangkan jawapan anda.

.....

.....

.....

[3 *marks*]
[3 *markah*]

1 (f)
3

For Examiner's use

(g) A group of students carried out another experiment as shown in Diagram 1.2 for 30 minutes.

Sekumpulan pelajar menjalankan satu lagi eksperimen seperti ditunjukkan dalam Rajah 1.2 *selama* 30 *minit.*

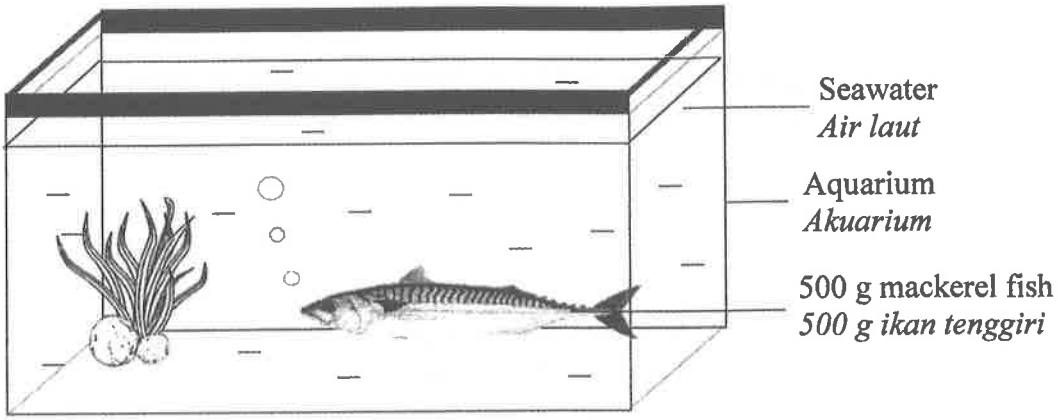


Diagram 1.2
Rajah 1.2

Predict the final mass of the mackerel fish.

Explain your prediction.

Ramalkan jisim akhir ikan tenggiri hidup tersebut.

Terangkan ramalan anda.

.....

.....

.....

[3 *marks*]
[3 *markah*]

1 (g)
3

(h) Based on the result of this experiment, state the operational definition for osmosis.

Berdasarkan keputusan eksperimen ini, nyatakan definisi secara operasi bagi osmosis.

.....

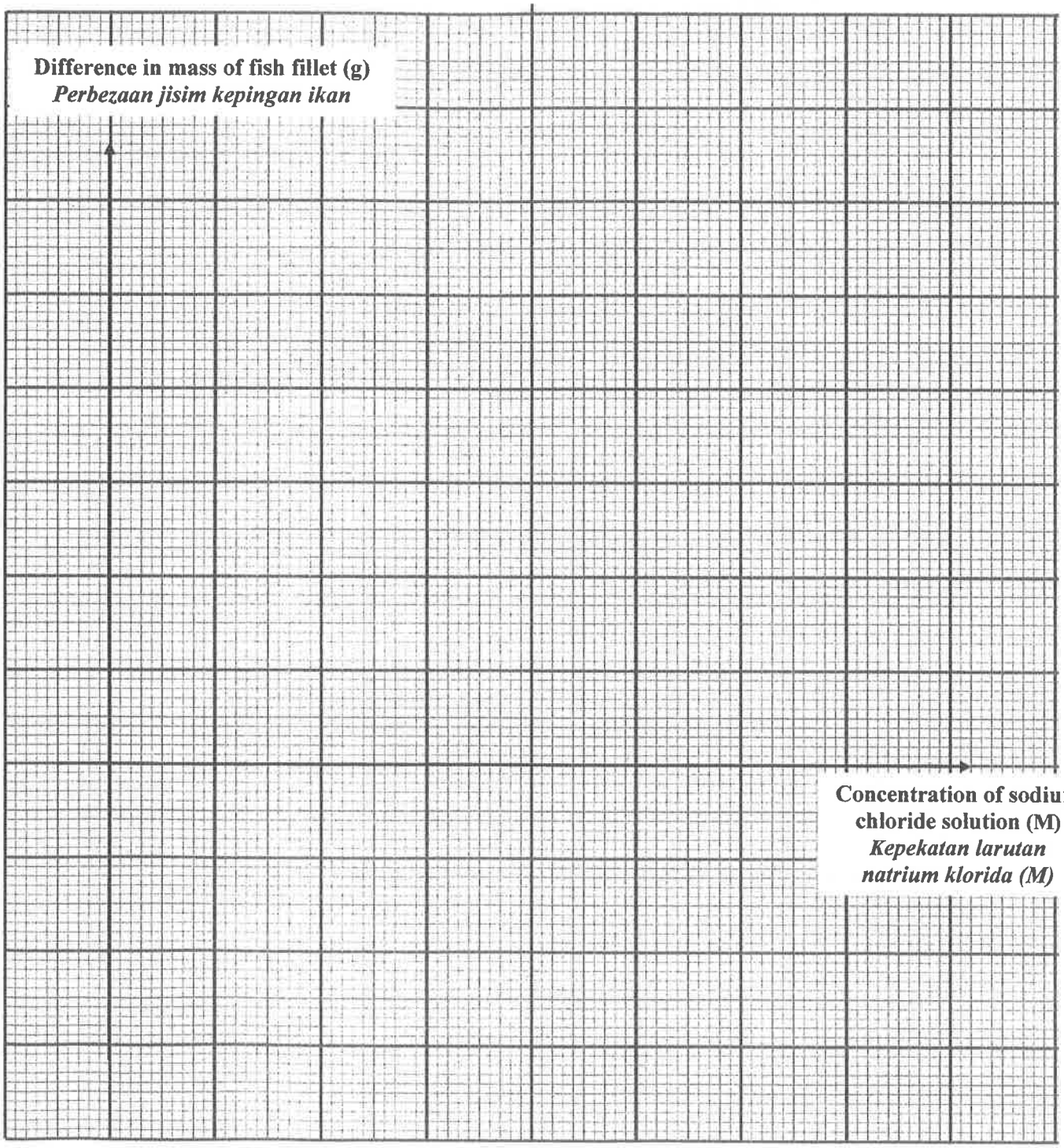
.....

.....

[3 *marks*]
[3 *markah*]

1 (h)
3

Difference in mass of fish fillet and the concentration of sodium chloride solution
Perbezaan jisim kepingan ikan dan kepekatan larutan natrium klorida



For Examiner's use

(i) In another experiment, a water spinach strip was immersed in 0.8% sucrose solution for one hour.

The results are shown in Diagram 1.3.

Dalam eksperimen lain satu jalur kangkung direndam ke dalam larutan sukrosa 0.8% selama satu jam.

Keputusan ditunjukkan dalam Rajah 1.3.

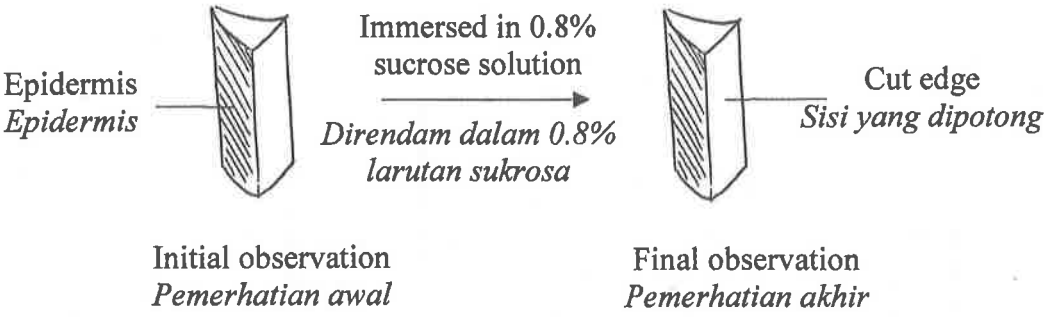


Diagram 1.3
Rajah 1.3

The experiment is repeated by using different concentration of sucrose solution.
Eksperimen diulang menggunakan larutan sukrosa dengan kepekatan berbeza.

0.3%, 0.5%, 1.2%, 0.9%, 3.0%, 2.5%

Classify the above solutions into Table 3.
Klasifikasikan larutan di atas ke dalam Jadual 3.

Types of solution compared to the cell sap of water spinach *Jenis larutan dibandingkan dengan sap sel kangkung*	
Hypotonic / *Hipotonik*	Hypertonic / *Hipertonik*

Table 3
Jadual 3

[3 *marks*]
[3 *markah*]

1 (i)
3

Total
1
33

2. Diagram 2 shows three baby bibs that were stained with plain rice porridge. The bibs were washed with washing powder that contains enzyme Y at three different temperatures, P, Q and R.
Rajah 2 menunjukkan tiga pelapik dada bayi yang mempunyai kesan kotoran bubur nasi. Pelapik-pelapik dada tersebut telah dicuci menggunakan serbuk pencuci mengandungi enzim Y dengan tiga suhu berbeza, P, Q dan R.

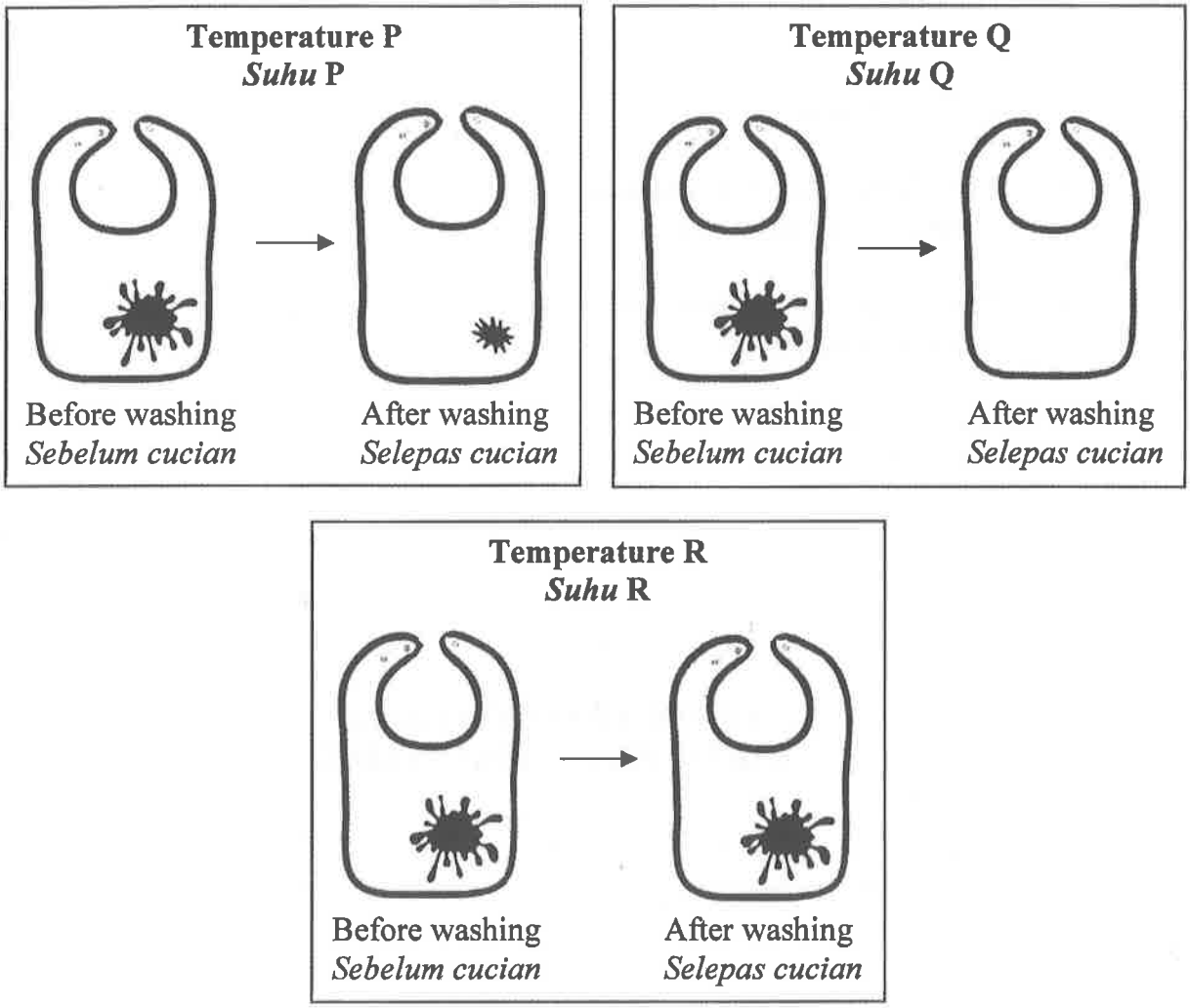


Diagram 2
Rajah 2

By using a suitable named enzyme and temperature, plan an experiment in the laboratory to study the effect of temperature on the rate of enzyme reaction.

Dengan menamakan enzim dan suhu yang sesuai, rancangkan satu eksperimen makmal untuk mengkaji kesan suhu terhadap kadar tindakbalas enzim.

The planning of your experiment should include the following aspects:
Perancangan eksperimen anda hendaklah meliputi aspek-aspek berikut:

- Problem statement
  Pernyataan masalah
- Hypothesis
  Hipotesis
- Variables
  Pembolehubah
- List of apparatus and materials
  Senarai radas dan bahan
- Procedures of the experiment
  Prosedur eksperimen
- Presentation of data
  Persembahan data

[17 *marks*]
[17 *markah*]

END OF QUESTION PAPER
KERTAS PEPERIKSAAN TAMAT