

SULIT
4551/3
Biologi
Kertas 3
September
2011
1 ½ jam

Nama :

Tingkatan : No. Kad Pengenalan :



PEPERIKSAAN PERCUBAAN BERSAMA SIJIL PELAJARAN MALAYSIA 2011

ANJURAN
MAJLIS PENGETUA SEKOLAH MALAYSIA (MPSM)
CAWANGAN PERLIS

BIOLOGI

Kertas 3

Satu jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Tulis **nama** anda pada ruang 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 Melayu atau Bahasa Inggeris
5. Calon dikehendaki membaca maklumat di halaman 12.

Kod pemeriksa		
Soalan	Markah Penuh	Markah Diperoleh
1	33	
2	17	
Jumlah	50	

Kertas soalan ini mengandungi 12 halaman bercetak termasuk kulit

Answer **all** questions.

Jawab **semua** soalan.

- An experiment was carried out to determine the concentration of sucrose solution which is isotonic to the cell sap of potato strips.

Satu eksperimen telah dijalankan untuk menentukan kepekatan larutan sukrosa yang isotonik kepada sap sel jalur ubi kentang.

Diagram 1.1 shows the set up of apparatus for this experiment. By using a cork boarer, a cylindrical potato strip was obtained. The potato strip was cut at 5 cm long.

Rajah 1.1 menunjukkan penyediaan radas bagi eksperimen ini. Dengan menggunakan penebuk gabus, jalur ubi kentang diperolehi. Setiap jalur ubi kentang dipotong sepanjang 5 cm.

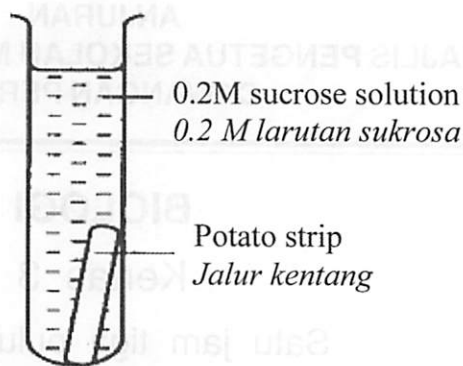
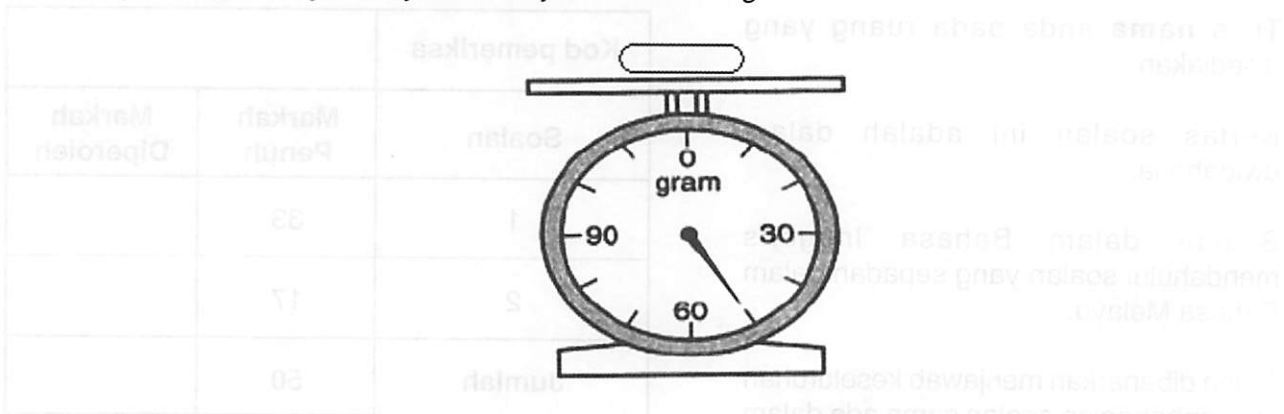


Diagram 1.1 / Rajah 1.1

Diagram 1.2 shows the initial mass for each of the potato strips.

Rajah 1.2 menunjukkan jisim awal jalur ubi kentang.



Initial mass of potato strips : _____ gm

Jisim awal jalur ubi kentang

The experiment in diagram 1.1 was repeated by using different concentrations of sucrose solution.

Eksperimen dalam Rajah 1.1 diulang dengan menggunakan larutan sukrosa yang berbeza kepekatan.

Table 1 shows the result of this experiment.

Jadual 1 menunjukkan keputusan eksperimen ini.


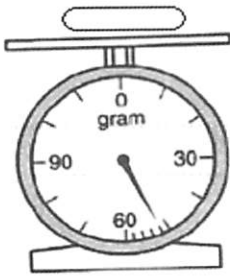

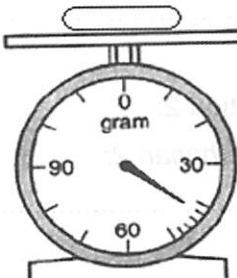
Concentration of sucrose solution / M Kepekatan larutan sukrosa / M	Final mass of potato strip after 30 minutes / g Jisim akhir jalur ubi kentang selepas 30 minit / g
0.2 M	 <input data-bbox="1141 625 1302 732" type="text"/>
0.4 M	 <input data-bbox="1141 931 1302 1037" type="text"/>
0.6 M	 <input data-bbox="1141 1362 1302 1468" type="text"/>
0.8 M	 <input data-bbox="1141 1776 1302 1882" type="text"/>

Table 1 / Jadual 1

(a) (i) Record the initial mass of the potato strip in the space provided in Diagram 1.
Rekodkan jisim awal jalur ubi kentang dalam ruangan yang disediakan pada Rajah 1.2.

(ii) Record the final mass of the potato strip in the space provided in Table 1.
Rekodkan jisim akhir jalur ubi kentang dalam ruangan yang disediakan dalam Jadual 1.

.....
.....

[3 marks / 3 markah]

(b) (i) State **two** different observations made from Table 1.
*Nyatakan **dua** pemerhatian yang berbeza yang dibuat daripada Jadual 1*

Observation 1:

Pemerhatian 1:

.....
.....

Observation 2:

Pemerhatian 2:

.....
.....

[3 marks / 3 markah]

(ii) State the inferences from the observations in 1 (b) (i)
Nyatakan inferens daripada pemerhatian di 1 (b) (i)

Inference from observation 1:

Inferens daripada pemerhatian 1:

.....
.....

Inference from observation 2:

Inferens daripada pemerhatian 2:

.....
.....

[3 marks / 3 markah]

- (c) Complete Table 2 based on this experiment.
 Lengkapkan Jadual 2 berdasarkan eksperimen ini.

Variable <i>Pembolehubah</i>	Method to handle variable <i>Cara mengendali pembolehubah</i>
Manipulated variable: Pembolehubah dimanipulasi
Responding variable: Pembolehubah bergerakbalas
Constant variable: Pembolehubah dimalarkan

Table 2 / Jadual 2

[3 marks / 3 markah]

- (d) State the hypothesis for this experiment.
 Nyatakan hipotesis bagi eksperimen ini.

.....

[3 marks / 3 markah]

- (e) (i) Construct a table and record all the data collected in this experiment.
Bina satu jadual dan rekodkan semua data yang dikumpul dalam eksperimen ini.

Your table should have the following aspects:

Jadual anda hendaklah mengandungi aspek-aspek berikut:

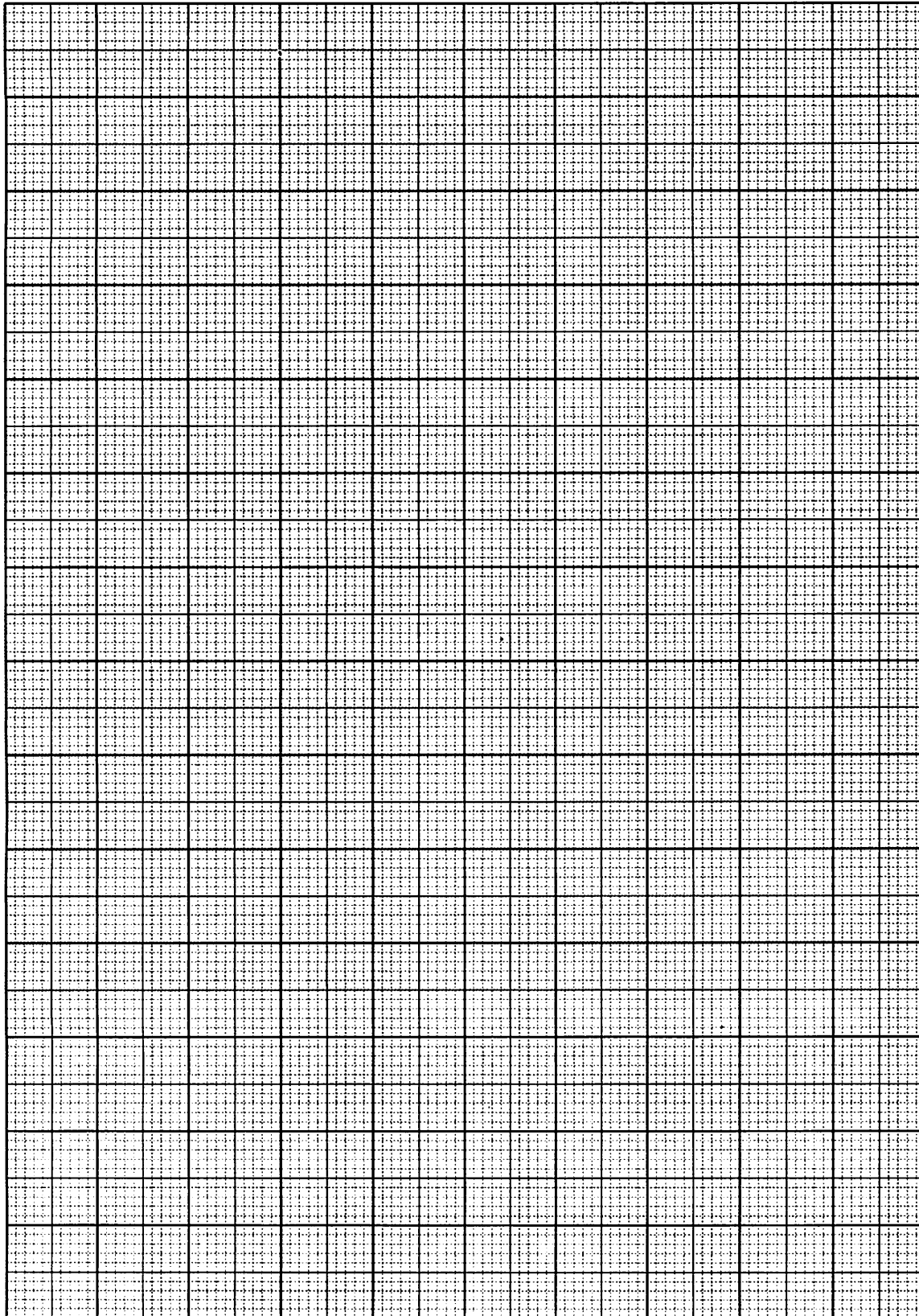
- Concentration of sucrose solutions / *Kepekatan larutan sukrosa*
- Initial mass of potato strips / *Jisim awal jalur ubi kentang*
- Final mass of potato strips / *Jisim akhir jalur ubi kentang*
- Percentage of change in mass of potato strips / *Peratus perubahan jisim jalur ubi kentang*

[3 marks / 3 markah]

- (ii) Use the graph paper provided on page 7 to answer this question. Using the data in 1(e) (i), draw a graph to show the relationships between the percentage of change in mass of potato strips and the concentration of the sucrose solutions.

Guna kertas graf yang disediakan di halaman 7 untuk menjawab soalan ini. Dengan menggunakan data di 1(e) (i), lukis satu graf untuk menunjukkan hubungan antara peratus perubahan jisim jalur ubi kentang dengan kepekatan larutan sukrosa.

[3 marks / 3 markah]



(f) Based on the graph in 1 (e) (ii), state the concentration of the sucrose solution which is isotonic to the concentration of the cell sap of the potatoes.

Explain your answer.

Berdasarkan graf di 1(e) (ii), nyatakan kepekatan larutan sukrosa yang isotonik kepada kepekatan sap sel ubi kentang.

Terangkan jawapan anda.

.....
.....
.....

[3 marks / 3 markah]

(g) The potato strip from 0.6 M sucrose solution was taken out and was dried with tissue paper. Then it was immersed in distilled water for 30 minutes. Based on the result of this experiment, predict the final mass of the potato strip.

Explain your prediction.

Jalur ubi kentang dari 0.6 M larutan sukrosa telah dikeluarkan dan dikeringkan dengan menggunakan kertas tisu. Kemudian ia direndam ke dalam larutan air suling selama 30 minit. Berdasarkan keputusan eksperimen ini, ramalkan apa yang berlaku kepada jalur ubi kentang tersebut.

Terangkan ramalan anda.

.....
.....
.....

[3 marks / 3 markah]

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

Berdasarkan eksperimen ini, nyatakan definisi secara operasi bagi osmosis.

.....
.....
.....

[3 marks / 3 markah]

- (i) In another experiment, it was found that a mustard stem strip that was immersed in 0.8% sodium chloride solution did not undergo a change in mass.
Dalam eksperimen lain didapati bahawa satu jalur batang sawi yang telah direndam dalam larutan natrium klorida 0.8% tidak mengalami perubahan jisim.

The following solutions are used in this experiment.
Larutan berikut telah digunakan dalam eksperimen ini.

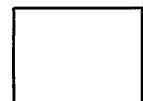
0.25 % sodium chloride solution, 0.65% sodium chloride solution 1.10 % sodium chloride solution.
0.25% larutan natrium klorida, 0.65% larutan natrium klorida, 1.10% larutan natrium klorida.

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

Solution concentration <i>Kepekatan larutan (%)</i>	Types of solution compared to the osmotic concentration of the cell sap. <i>Jenis larutan berbanding kepekatan osmotik sap sel.</i>

Table 3 / *Jadual 3*

[3 marks / 3 markah]



SULIT**10****4551/3**

2. The rate of transpiration can be affected by several factors such as air movement, temperature, relative humidity and light intensity.

A potometer can be used to measure the rate of transpiration. The stem or shoot part of the plant is cut under water to remove air in the xylem vessels. An air bubble is introduced into the capillary tube and its movement is measured.

Based on the above information, plan a laboratory experiment to study the effect of air movement on the rate of transpiration.

The planning of your experiment must include the following aspects :

Kadar transpirasi dipengaruhi oleh beberapa faktor seperti pergerakan udara, suhu, kelembapan bandingan dan keamatan cahaya.

Potometer boleh digunakan untuk mengukur kadar transpirasi. Bahagian batang atau pucuk berdaun tumbuhan dipotong dalam air untuk mengelakkan udara terperangkap dalam salur xylem. Satu gelembung udara dimasukkan ke dalam tiub kapilari dan pergerakannya diukur.

Berdasarkan maklumat di atas, rancang satu eksperimen dalam makmal untuk mengkaji kesan pergerakan udara ke atas mempengaruhi kadar transpirasi.

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
- Experimental procedure
Prosedur eksperimen
- Presentation of data
Persembahan data

[17 marks]

[17 markah]

**END OF QUESTION PAPER
KERTAS SOALAN TAMAT**

1. Perhatikan gambar berikut!

Sebuah kubus ABCD.EFGH memiliki panjang rusuk 10 cm. Sebuah bidang malar memotong kubus tersebut dengan cara memotong rusuk AB pada titik P, rusuk BC pada titik Q, rusuk CD pada titik R, dan rusuk DE pada titik S. Panjang AP = 2 cm, BQ = 3 cm, CR = 4 cm, dan DS = 5 cm. Berapakah luas bidang malar tersebut?

Jawab: ...

Langkah	Penyelesaian
1.	...
2.	...
3.	...
4.	...

INFORMATION FOR CANDIDATES

1. This question paper consists of two questions. Answer **all** questions.
2. Write your answers for **Question 1** in the spaces provided in the question paper.
3. Write your answers for **Question 2** on the 'helaian tambahan' provided by the invigilators. You may use equations, diagrams, tables, graphs and other suitable methods to explain your answer.
4. Show your working, it may help you to get marks.
5. If you wish to change your answer, neatly cross out the answer that you have done. Then write down the new answer.
6. The diagrams in the questions are not drawn to scale unless stated.
7. Marks allocated for each question or part of the question are shown in brackets.
8. The time suggested to answer **Question 1** is 45 minutes and **Question 2** is 45 minutes.
9. You may use a non / programmable scientific calculator.
10. Hand in all your answer sheets at the end of the examination.

Marks awarded:

Score	Description
3	Excellent : The best response
2	Satisfactory : An average response
1	Weak : An inaccurate response
0	No response or wrong response