

**SULIT**  
**4551/3**  
**Biologi**  
**Kertas 3**  
**Ogos**  
**2010**  
**1½ jam**

Nama ..... Tingkatan ..... 4551/3



**SEKOLAH BERASRAMA PENUH**  
**BAHAGIAN PENGURUSAN**  
**SEKOLAH BERASRAMA PENUH DAN SEKOLAH KLUSTER**  
**KEMENTERIAN PELAJARAN MALAYSIA**

**PEPERIKSAAN PERCUBAAN SPM**  
**2010**

**BIOLOGI**

**Kertas 3**

**1 Jam 30 Minit**

**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU**

1. Kertas soalan ini adalah dalam dwibahasa; iaitu dalam Bahasa Inggeris dan diikuti dalam Bahasa Melayu yang sepadan.
2. Calon dikehendaki membaca maklumat di bawah.

**INFORMATION FOR CANDIDATES**

1. This question paper consists of two questions. Answer **all** the 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 lined pages at the end of the question paper in detail. You may use equations, diagrams, tables, graph and other suitable methods to explain your answer.
4. Show your working, it may help you to get marks.
5. If you wish to cancel any answer, neatly cross out the answer.
6. The diagrams in the questions are not drawn to scale unless stated.
7. Marks allocated for each question or part question are shown in brackets
8. The time suggested to complete **Question 1** is 45 minutes and **Question 2** is 45 minutes
9. You may use a non-programmable scientific calculator
10. Hand in this question paper at the end of the examination.

Marks awarded:

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

<i>Untuk Kegunaan Pemeriksa</i>		
Soalan	Markah penuh	Markah
1	33	
2	Respons 15	
	Laporan 2	
<b>JUMLAH</b>		

Kertas soalan ini mengandungi 10 halaman bercetak.

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

**Question 1**  
**Soalan 1**

An experiment was carried out to investigate the effect of different concentrations of sucrose solutions on potato tissues.

*Satu eksperimen telah dijalankan untuk mengkaji kesan kepekatan larutan sukrosa yang berbeza ke atas tisu kentang.*

The following steps were carried out:

*Langkah-langkah berikut telah dijalankan:*

Step 1: <i>Langkah 1:</i>	Four pieces of potato disc with thickness of 2 mm each were obtained from a potato. The initial diameter of each disc was 1.5 cm. <i>Empat keping cakera kentang dengan ketebalan 2 mm setiap satu telah diperolehi daripada sebiji kentang. Diameter setiap cakera ialah 1.5 cm.</i>
Step 2: <i>Langkah 2:</i>	Each disc was immersed in a petri dish containing different concentration of sucrose solution. <i>Setiap cakera telah direndam di dalam piring petri yang mengandungi larutan sukrosa yang berbeza-beza kepekatan.</i>
Step 3: <i>Langkah 3:</i>	After 20 minutes, the potato discs were removed and wiped dry with a filter paper. <i>Selepas 20 minit, cakera kentang telah dikeluarkan dan dilap kering menggunakan kertas turas.</i>
Step 4: <i>Langkah 4:</i>	The final diameter of each potato disc was measured and recorded. <i>Diameter akhir setiap cakera kentang itu telah diukur dan direkodkan.</i>

Diagram 1 shows the initial diameter for each potato disc.

*Rajah 1 menunjukkan diameter awal bagi setiap cakera kentang.*

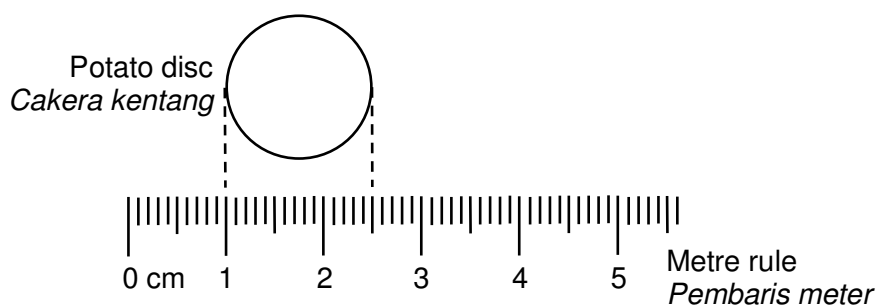


Diagram 1  
*Rajah 1*

Table 1 shows the results of the experiment.

Jadual 1 menunjukkan keputusan eksperimen ini.

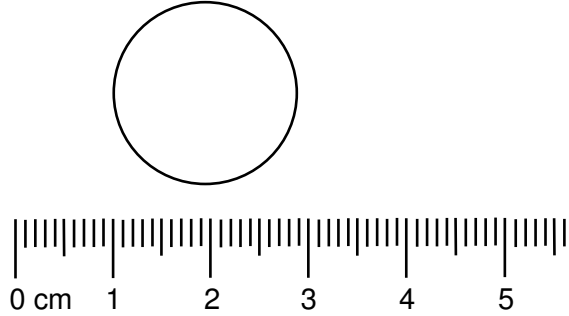
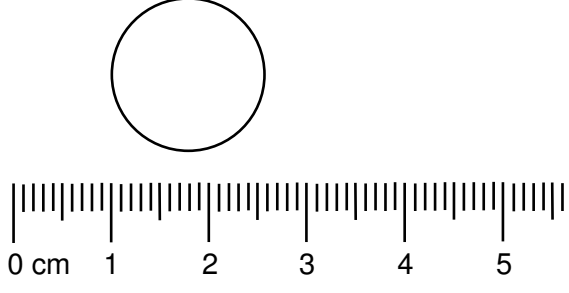
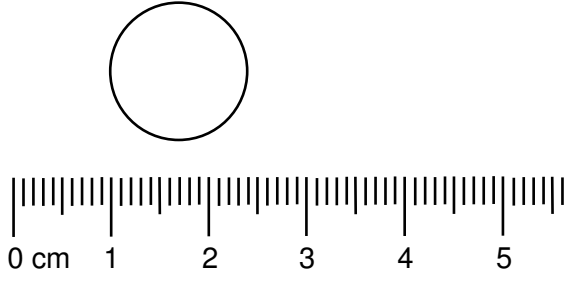
Concentration of sucrose solution, M Kepekatan larutan sukrosa, M	Final diameter of potato disc after 20 minutes, cm Diameter akhir cakera kentang selepas 20 minit, cm	
0.2		.....
0.4		.....
0.6		.....

Table 1  
Jadual 1

For  
Examiner's  
Use

- (a) Record the final diameter of each potato disc in the spaces provided in Table 1.  
*Rekodkan diameter akhir setiap cakera kentang di dalam ruangan yang disediakan di dalam Jadual 1.*

[3 marks]  
[3 markah]

1(a)

- (b) (i) State **two** different observations based on Table 1.  
*Nyatakan dua pemerhatian yang berbeza berdasarkan Jadual 1.*

Observation 1:  
*Pemerhatian 1:*

.....  
.....

Observation 2:  
*Pemerhatian 1:*

.....  
.....

[3 marks]  
[3 markah]

1(b)(i)

- (ii) State the inference which corresponds to each observation in 1(b)(i).  
*Nyatakan inferens yang sepadan dengan setiap pemerhatian di 1(b)(i).*

Inference for observation 1:  
*Inferens untuk pemerhatian 1:*

.....  
.....

Inference for observation 2:  
*Inferens untuk pemerhatian 2:*

.....  
.....

[3 marks]  
[3 markah]

1(b)(ii)

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

For  
 Examiner's  
 Use

Variables <i>Pemboleh ubah</i>	Method to handle the variables <i>Cara mengendali pemboleh ubah</i>
Manipulated variable <i>Pemboleh ubah dimanipulasi</i>	..... ..... .....
Responding variable <i>Pemboleh ubah bergerak balas</i>	..... ..... .....
Controlled variable <i>Pemboleh ubah dimalarkan</i>	..... ..... .....

Table 2  
 Jadual 2

[3 marks]  
 [3 markah]

1(c)

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

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

[3 marks]  
 [3 markah]

1(d)

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

*Bina satu jadual dan rekod semua data yang dikumpul dalam eksperimen ini.*

*Jadual anda hendaklah mengandungi tajuk-tajuk berikut:*

- Concentration of sucrose solution  
*Kepekatan larutan sukrosa*
- Initial diameter of the potato disc  
*Diameter awal cakera kentang*
- Final diameter of potato disc  
*Diameter akhir cakera kentang*
- Percentage change in diameter of potato disc  
*Peratus perubahan diameter cakera kentang*

*For  
Examiner's  
Use*

[3 marks]  
[3 markah]

1(e)(i)

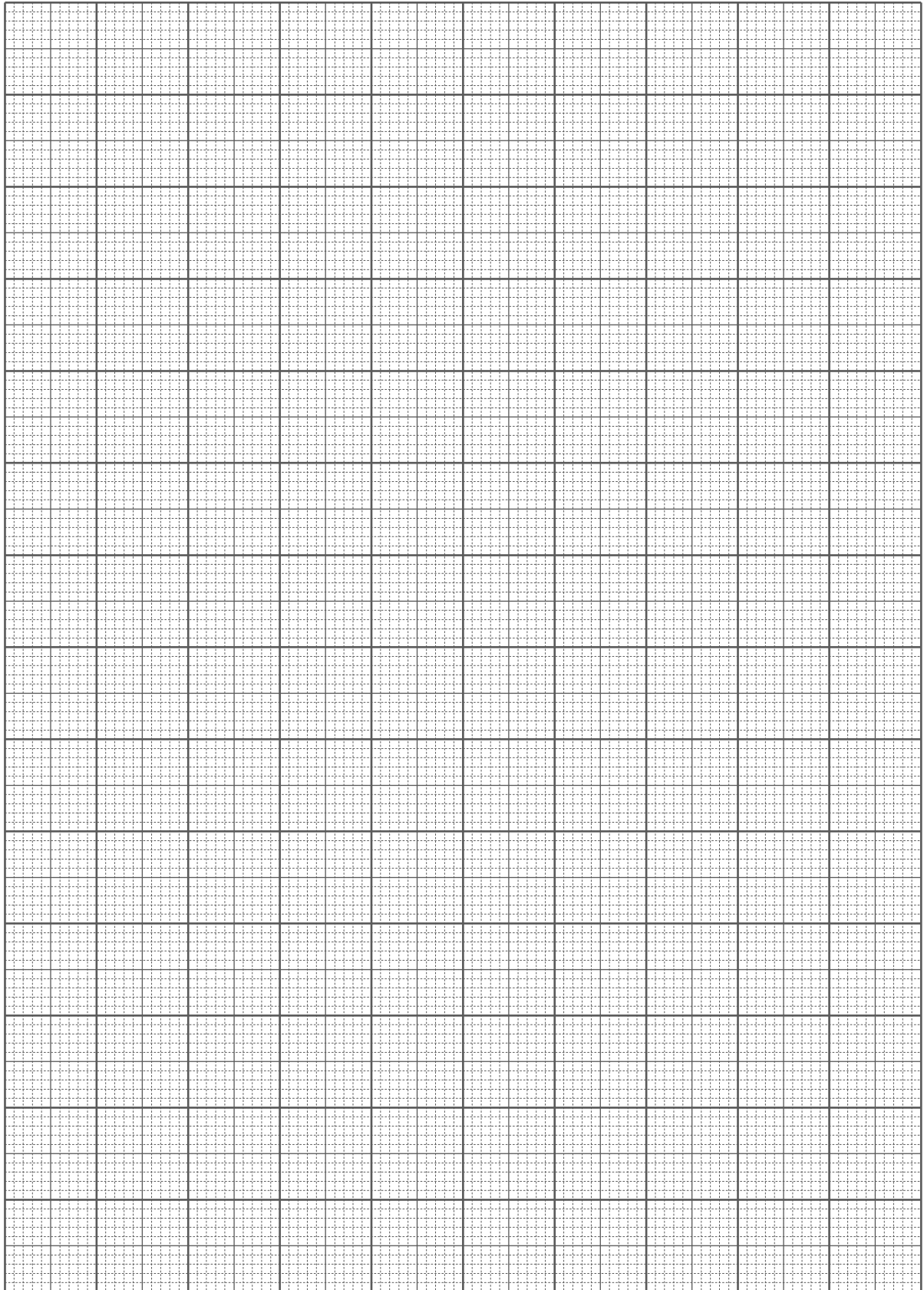
- (ii) Use the graph paper provided on page 7 to answer this question. Using the data in 1(e)(i), draw a graph to show the relationship between the percentage change in diameter of potato disc and the concentration of the sucrose solutions.

*Gunakan kertas graf yang disediakan di halaman 7 untuk menjawab soalan ini.*

*Dengan menggunakan data dalam 1(e)(i), lukiskan graf untuk menunjukkan hubungan antara peratus perubahan diameter cakera kentang dan kepekatan larutan sukrosa.*

[3 marks]  
[3 markah]

1(e)(ii)



(f) Based on the graph in 1(e)(ii), state the concentration of sucrose solution which is isotonic to the concentration of the cell sap of the potato. Explain your answer.  
*Berdasarkan graf dalam 1(e)(ii), nyatakan kepekatan larutan sukrosa yang isotonik kepada kepekatan sap sel kentang tersebut. Terangkan jawapan anda.*

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

[3 marks]  
[3 markah]

For  
Examiner's  
Use

1(f)

(g) The experiment is repeated by using another potato disc of the same initial size. The disc is immersed in distilled water for 20 minutes. Predict the result of this experiment. Explain your prediction.  
*Eksperimen ini diulang dengan menggunakan satu cakera kentang lain yang mempunyai saiz awal yang sama. Cakera ini direndam di dalam air suling selama 20 minit. Ramalkan keputusan eksperimen ini. Terangkan ramalan anda.*

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

[3 marks]  
[3 markah]

1(g)

(h) Based on this experiment, define osmosis.  
*Berdasarkan eksperimen ini, takrifkan osmosis.*

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

[3 marks]  
[3 markah]

1(h)

- (i) Another experiment is carried out to study the effect of different concentrations of sucrose solutions on the tissue of spinach strips. The observation of the experiment is shown in Diagram 2.

*Satu lagi eksperimen telah dijalankan untuk mengkaji kesan kepekatan larutan sukrosa yang berlainan terhadap tisu jalur bayam. Pemerhatian eksperimen ditunjukkan dalam Rajah 2.*

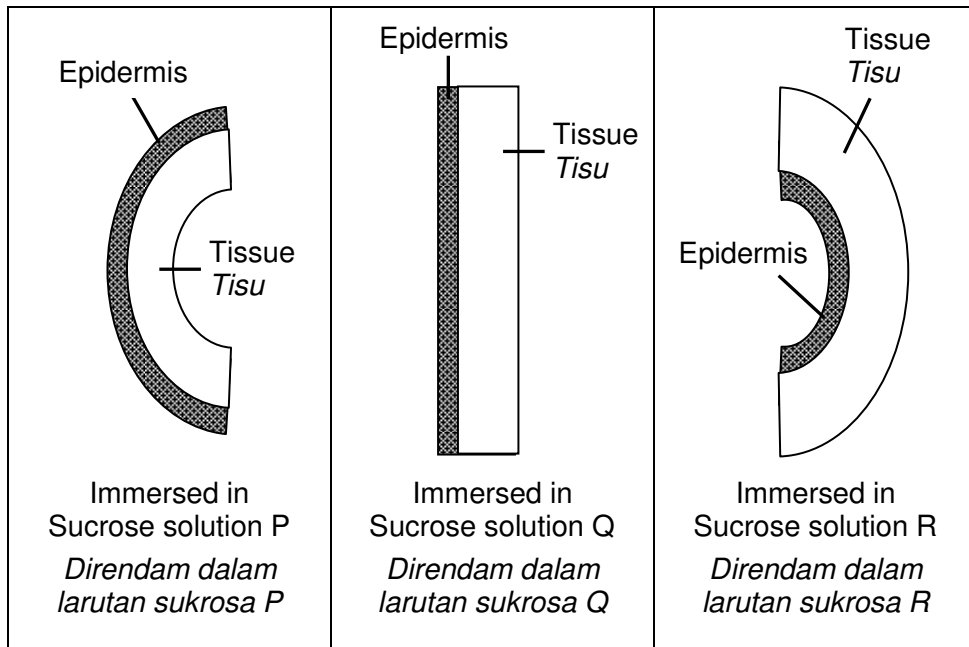


Diagram 2  
Rajah 2

Classify the sucrose solutions P, Q and R.  
*Kelaskan larutan-larutan sukrosa P, Q dan R.*

Concentration of sucrose solution, M <i>Kepekatan larutan sukrosa, M</i>	Type of solution compared to the concentration of cell sap of spinach <i>Jenis larutan berbanding dengan kepekatan sap sel bayam</i>

[3 marks]  
[3 markah]

1 (i)

**Total**  
**1**

**Question 2****Soalan 2**

Transpiration is the loss of water vapour from plants, especially in leaves. Transpiration occurs mostly through the stomata. The amount of water lost by a plant depends on its size, surrounding light intensity, temperature, humidity and wind speed.

Diagram 3 shows the movement of water in a terrestrial plant.

*Transpirasi ialah kehilangan wap air dari tumbuhan, terutamanya pada daun. Transpirasi berlaku terutamanya melalui stomata. Jumlah air yang hilang dari tumbuhan bergantung kepada saiz tumbuhan, keamatan cahaya, suhu, kelembapan dan kelajuan angin sekitar.*

*Rajah 3 menunjukkan pergerakan air dalam satu tumbuhan darat.*

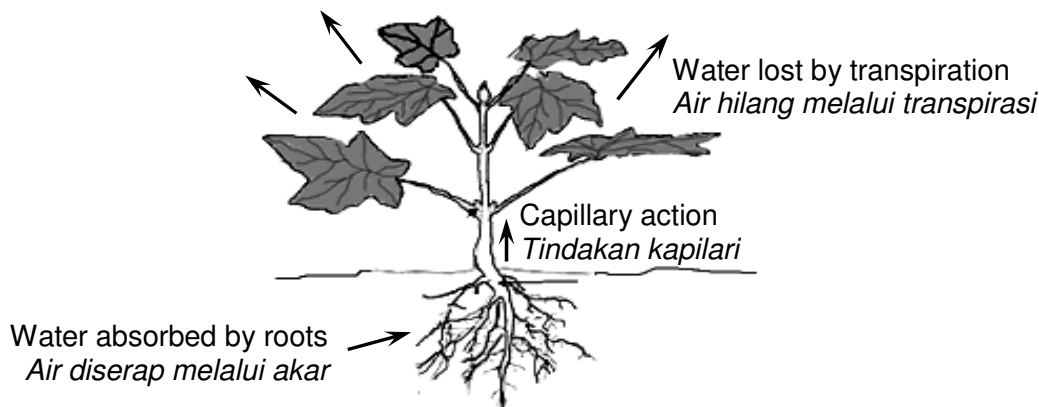


Diagram 3  
Rajah 3

Based on the information, design an experiment to be conducted in the laboratory to investigate the effect of the number of leaves on the rate of transpiration in a hibiscus plant.

*Berdasarkan maklumat ini, rancang satu eksperimen untuk dilaksanakan di dalam makmal untuk mengkaji kesan bilangan daun ke atas kadar transpirasi satu pokok bunga raya.*

The planning of your experiment must include the following aspects:

*Perancangan eksperimen anda hendaklah meliputi aspek-aspek berikut:*

- Problem statement  
*Pernyataan masalah*
- Objective of investigation  
*Objektif kajian*
- Hypothesis  
*Hipotesis*
- Variables  
*Pembolehubah*
- List of materials and apparatus  
*Senarai bahan dan radas*
- Technique used  
*Teknik yang digunakan*
- Experimental procedures  
*Kaedah eksperimen*
- Presentation of data  
*Persembahan data*
- Conclusion  
*Kesimpulan*

[17 marks]  
[17 markah]

**END OF QUESTION PAPER**  
**KERTAS SOALAN TAMAT**