Dapatkan Skema di www.banksoalanspm.com

SULIT
4551/3
Biologi
Kertas 3
September
2011
1 jam 30 minit

Nama : .....

Tingkatan : .....

MAJLIS PENGETUA SEKOLAH - SEKOLAH MALAYSIA (MPSM)
CAWANGAN KELANTAN

PEPERIKSAAN PERCUBAAN SPM
TINGKATAN LIMA
2011

BIOLOGI

KERTAS 3

Masa : 1 jam 30 minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Jawab semua soalan.*
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.*
4. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

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

Kertas soalan ini mengandungi 12 halaman bercetak.

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1. A group of student carried out an experiment to investigate the effect of pH on the population growth rate of *Lemna sp*

Sekumpulan pelajar telah menjalankan eksperimen untuk mengkaji kesan pH ke atas kadar pertumbuhan *Lemna sp*

Three beakers A, B and C were filled with 200 ml of pond water. 10 ml of 2M hydrochloric acid was poured into beaker A, 10 ml of 2M sodium hydroxide solution was poured into beaker B and 10 ml of distilled water was poured into beaker C. 30 *Lemna sp* were placed into each beaker and exposed to evenly distribution light. After four days, the number of *Lemna* sp., plants in each beaker are counted.

Tiga bikar, A, B dan C telah diisi dengan 200ml air kolam. 10 ml 2M asid hidroklorik cair dituangkan ke dalam bikar A, 10 ml larutan 2M natrium hidroksida dituangkan ke dalam Bikar B dan 10 ml air suling dituangkan ke dalam Bikar C. Sebanyak 30 tumbuhan Lemna sp. telah dimasukkan ke dalam setiap bikar dan didedahkan kepada cahaya sekata. Selepas empat hari, bilangan Lemna sp. di dalam setiap bikar dikira.

Diagram 1 shows the material and apparatus used in the experiment.

Rajah 1 menunjukkan bahan dan alat digunakan di dalam eksperimen.

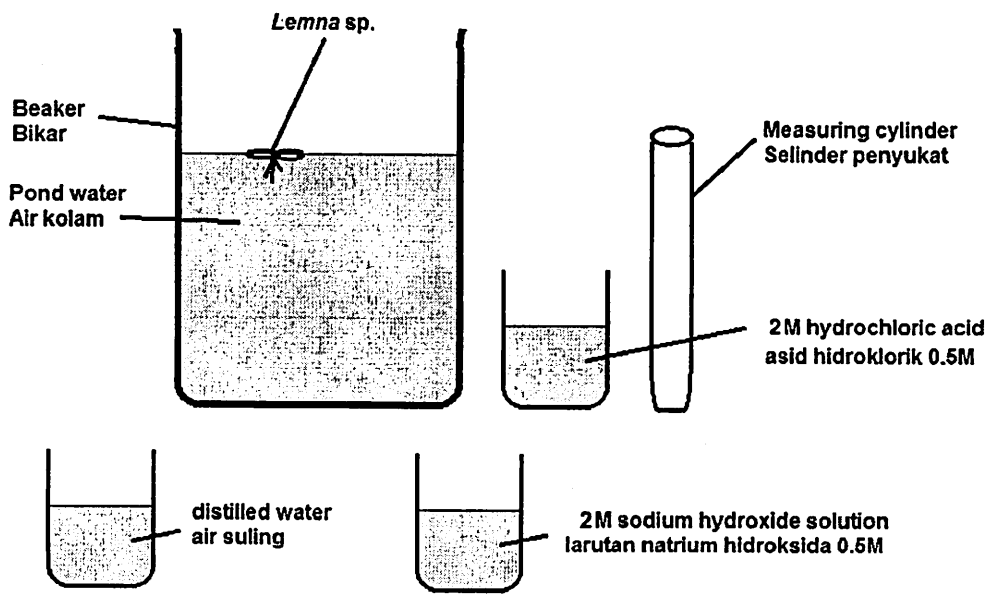

Diagram 1 / *Rajah 1*

Table 1 shows *Lemna* sp. plant in Beaker A, B and C at the beginning and after 4 days of experiment.

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Jadùal 1 menunjukkan tumbuhan *Lemna* sp di dalam Bikar A, B dan C pada awal dan selepas 4 hari eksperimen.

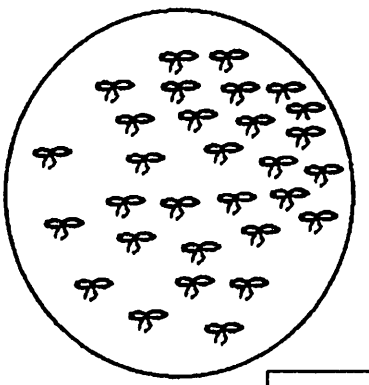
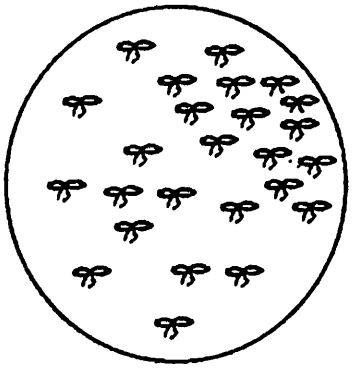
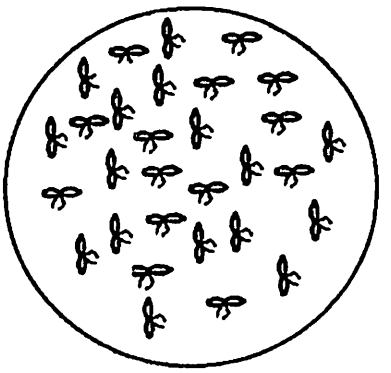
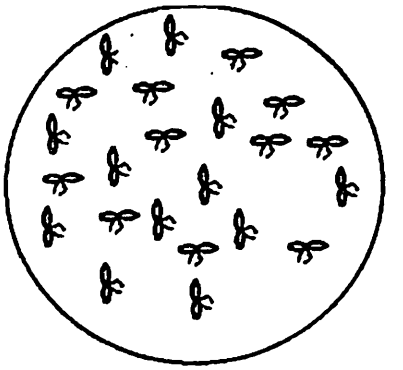
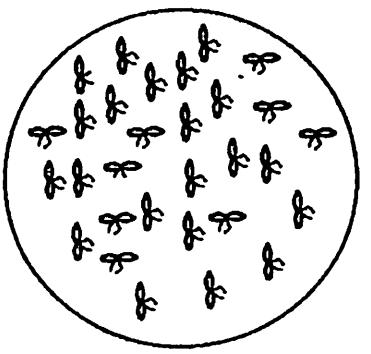
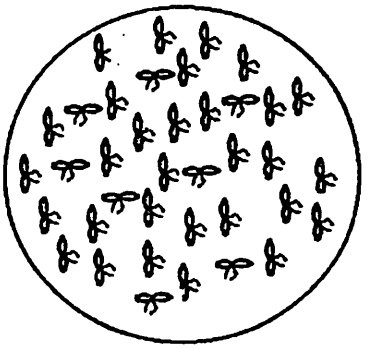
Beaker *Bikar*	Medium Acidity *Keasidan Medium*	Number of plants *Bilangan tumbuhan*	
		Beginning of experiment *Awal eksperimen*	After 4 days *Selepas 4 hari*
A	Acidic *Berasid*	 30	
B	Alkaline *Beralkali*	 30	
C	Neutral *Neutral*	 30	

Table 1 / *Jadual 1*

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(a) Record the number of *Lemna* sp. plants in the three boxes in Table 1.
Rekodkan bilangan Lemna sp. di dalam kotak di dalam Jadual 1.

[3 marks / 3 markah]

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

1. .....

.....

2. .....

.....

(ii) State the inferences from the observation in 1(b)(i).
Nyatakan inferens daripada pemerhatian dalam 1(b)(i).

1. .....

.....

2. .....

.....

[3 marks / 3 markah]

(c) Complete Table 3 based on this experiment.
Lengkap Jadual 3 berdasarkan eksperimen ini.

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

[3 marks / 3 markah]

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(d) State the hypothesis for this experiment.

Nyatakan hipotesis eksperimen ini.

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.....

.....

[3 marks / 3 markah]

(e) (i) Construct a table and record all data collected in this experiment.

Bina jadual dan rekodkan semua data dikumpulkan dalam eksperimen ini.

Your table should have the following titles:

Jadual anda mengandungi tajuk-tajuk berikut:

- Beaker
  Bikar
- Medium Acidity
  Keasidan Medium
- Number of *Lemna* sp. plants at the beginning of experiment
  Bilangan tumbuhan Lemna sp.pada awal eksperimen
- Number of *Lemna* sp. after 4 days.
  Bilangan tumbuhan Lemna sp. selepas 4 hari
- The population growth rate of *Lemna* sp.

$$\frac{\text{(Final number of } \textit{Lemna} \text{ sp. – Initial number of } \textit{Lemna} \text{ sp.)}}{\text{4 days}}$$

[3 marks / 3 markah]

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(ii) Use the graph paper provided to answer this question.
Gunakan kertas graf yang disediakan untuk menjawab soalan ini.

Using the data in 1(e)(i), draw a bar chart to show the relationship between the population growth rate of *Lemna* sp. and the acidity of the medium.
Menggunakan data 1(e)(i), lukis carta bar untuk menunjukkan perhubungan di antara kadar pertumbuhan populasi Lemna sp. dan keasidan medium.

[3 marks / 3 markah]

(f) Based on the bar chart in 1(e)(ii), explain the relationship between the population growth rate of *Lemna* sp. and the acidity of the media.

Berdasarkan carta bar dalam 1(e)(i), terangkan hubungan di antara kadar pertumbuhan populasi Lemna sp. dan keasidan medium.

.....

.....

.....

[3 marks / 3 markah]

(g) State the operational definition for population growth rate of *Lemna* sp.

Nyatakan definisi operasi bagi kadar pertumbuhan populasi Lemna sp.

.....

.....

.....

.....

[3 marks / 3 markah]

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(h) After four days, a student added 10 ml of 2M hydrochloric acid into the Beaker B. Predict what will happen to the population growth rate of *Lemna* sp. after another 4 days.

Selepas empat hari, seorang pelajar menambahkan 10 ml 2M asid hidroklorik ke dalam Bikar B. Ramalkan apakah yang berlaku kepada kadar pertumbuhan populasi Lemna sp. selepas empat hari berikutnya.

.....

.....

.....

[3 marks / 3 markah]

(i) The following are list of material and apparatus used in the experiment.

2M hydrochloric acid, 2M sodium hydroxide solution, distilled water, pond water, measuring cylinder, *Lemna* sp., beaker 500ml, beaker 100ml. *2M asid hidroklorik, 2M larutan natrium hidroksida, air suling, air kolam, selinder penyukat, Lemna sp., bikar 500ml, bikar 100ml.*

Classify the material and apparatus in Table 2.

Kelaskan bahan dan alat di dalam Jadual 2.

Material Bahan	Apparatus Alat

[3 marks / 3 markah]

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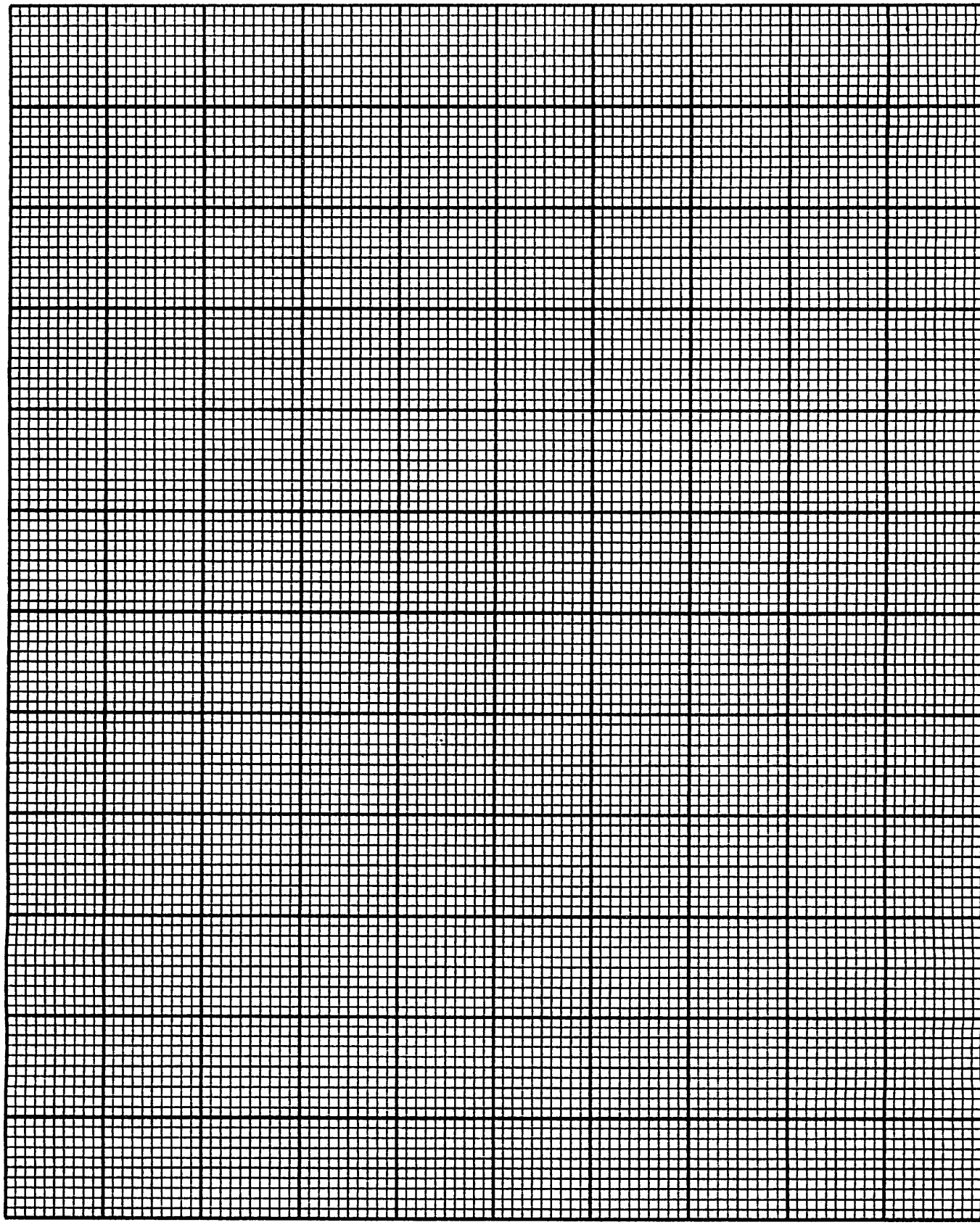

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2. Multicellular organisms are bigger and complex. The cells cannot depend on diffusion alone to obtain its requirements. Multicellular organisms need the transport system to transport respiration gaseous and nutrient the inner part of the body. Whereas, unicellular organisms get their gaseous and nutrients supply by diffusion through their cell membrane because their total surface area *per* volume are big.

Based on the above information, plan a laboratory experiment to study the relationship between the size of organisms and the rate of diffusion.

The planning of your experiment must include the following aspects:

Organisma multisel adalah besar dan kompleks. Sel-sel tidak boleh bergantung kepada proses resapan sahaja untuk mendapatkan keperluannya. Oganisma multisel memerlukan sistem pengangkutan untuk mengangkut gas-gas respirasi dan bahan nutrien ke bahagian dalam seluruh tubuhnya. Manakala, organisma unisel mendapatkan bekalan gas respirasi dan bekalan nutriennya secara resapan menerusi membran sel kerana jumlah luas permukaan per isipadunya yang besar.

Perancangan eksprimen 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

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SPACE FOR ANSWERS / RUANG JAWAPAN

Bahagian / Section : ..... No.Soalan / Question no:.....

Untuk Kegunaan Pemeriksa

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