4551/3
Biologi
Kertas 3
Ogos 2008
1½ jam

Nama : _____

Tingkatan : _____

SEKOLAH BERASRAMA PENUH
BAHAGIAN PENGURUSAN SEKOLAH BERASRAMA PENUH/ KLUSTER
KEMENTERIAN PELAJARAN MALAYSIA

PEPERIKSAAN PERCUBAAN SETARA
SPM 2008

BIOLOGI

KERTAS 3

Satu jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Tulis **nama** dan **kelas** anda pada ruang yang disediakan
2. Kertas soalan ini adalah dalam bahasa Inggeris.
3. Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.

Soalan	Markah penuh	Markah diperolehi
1	33	
2	17	
Jumlah	50	

Kertas soalan ini mengandungi 9 halaman bercetak

Question 1

Lemna minor is a species of free-floating aquatic plants from the duckweed family Lemnaceae. The plants grow mainly by vegetative reproduction: two daughter plants bud off from the adult plant.

An experiment is carried out to investigate the effect of abiotic factor such as pH on *Lemna* sp. growth. Experiment is done under controlled conditions: 12 hours a day light exposure and using the same Knop's solution.
Petri dish is filled with 20 ml Knop's solution with different pH value and 5 *Lemna* sp. each.
The Knop's solution is treated by adding acid or alkali to achieve the pH value needed.

** **Knop's solution** is a solution which contains essential nutrient for plants growth.

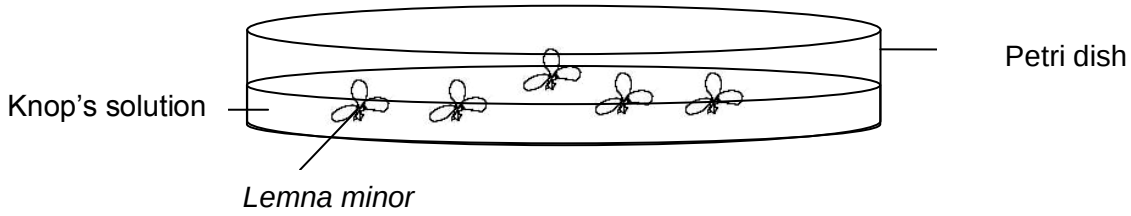

Figure 1

After 7 days, the observation is made and the result shown in Table 1.1
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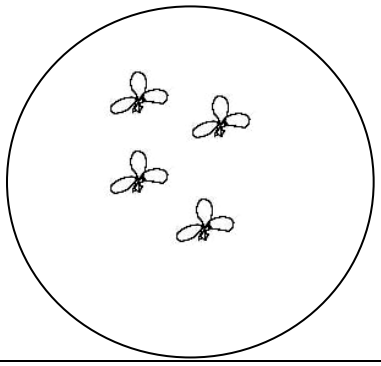
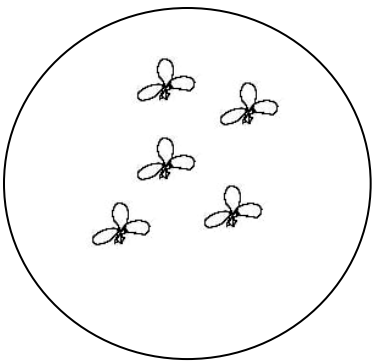
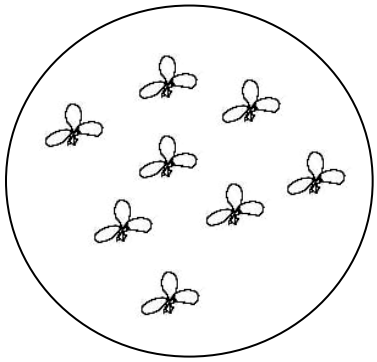
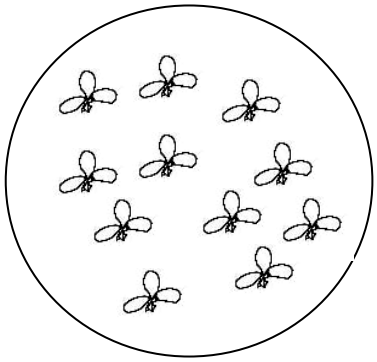
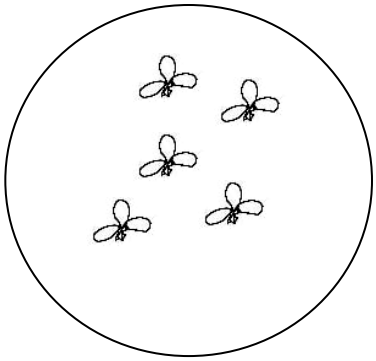
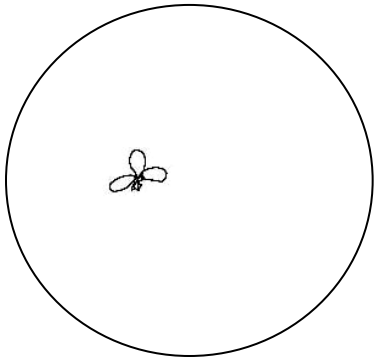
Table 1.1

pH value	Petri dish	Number of *Lemna* sp.
2		
4		

pH value	Petri dish	Number of *Lemna* sp.
6		
8		
10		
12		

For examiner's use

Base on the experiment, answer all questions below.

(a) State the number of *Lemna* sp. in the spaces provided in Table 1.1

[3 marks] 1 (a)

(b) (i) Based on Table 1.1, state two observations that can be made in this experiment.

Observation 1:

……...……..

……

……

Observation 2:

……..……...……...

……..……..……

……

[3 marks] 1 (b) (i)

(ii) State the inference for each observation made in (b) (i).

Inference for observation 1:

……..……..……..

……..

……..

Inference for observation 2:

…..…… ……..……..……..

……

……

[3 marks] 1 (b) (ii)

(c) Complete Table 1.4 to show the variables involved in the experiment and how the variables are operated.

For examiner's use

Variables	Operating the variables
Manipulated variable: ……... …… ……	How to alter the manipulated variable: ……..……. ……..…… ……
Responding variable: ……... …… ……	How to determine the responding variable: ……..……. ……..…… ……
Controlled variable: ……... …… ……	How to maintain the controlled variable: ……..……. ……..……. ……

Table 1.2 [3 marks]

1 (c)

(d) State the hypothesis for this experiment.

……

……

……

[3 marks]

1 (d)

(e) (i) Construct a table and record the results of the experiment.
Your table should contain the following title.

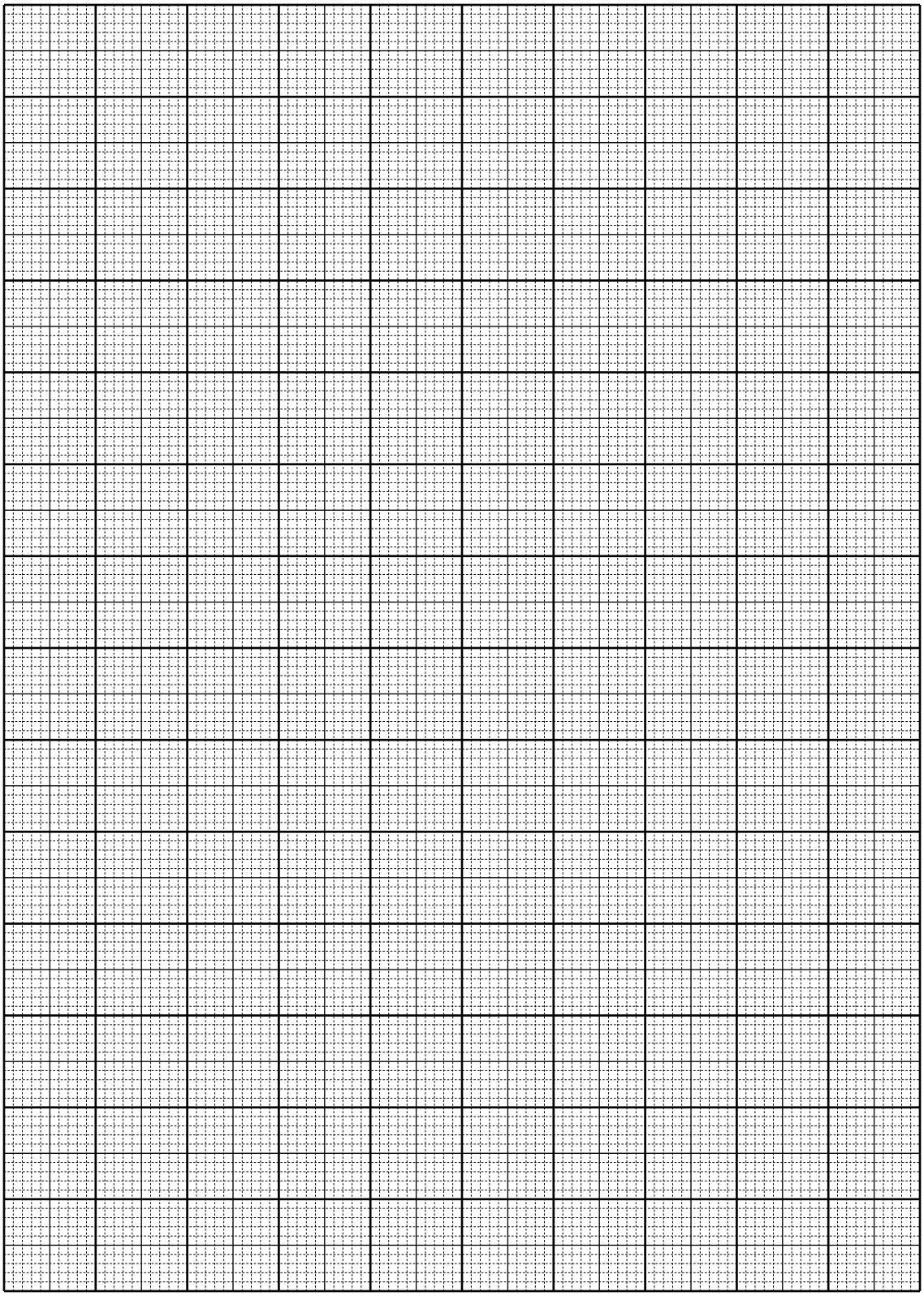
- pH of water
- Number of *Lemna* sp.

[3 marks]

1 (e) (i)

For examiner's use

(ii) Plot a graph showing the number of *Lemna* sp against the pH in the graph below



[3 marks]

1 (e) (ii)

For examiner's use

(iii) Referring to the graph in (e) (ii), describe the relationship between the *Lemna* sp growth and the condition of the medium.

……

……

……

[3 marks]

1 (e) (iii)

(f) Based on the experiment, define operationally the abiotic factor in an ecosystem.

……

……

……

[3 marks]

1 (f)

(g) The effluent from laundry shop flows into a pond nearby, predict the population of *Lemna* sp in the pond. Explain your answer.

……

……

……

[3 marks]

1 (g)

(h) Classify the biotic and abiotic factors from the list provided below.

Humidity, light intensity, decomposer, parasites, symbiotic organism, soil texture, invertebrates, topography

.

[3 marks]

1 (h)

Question 2

When a boy drinks too much water, the osmotic pressure of blood will fall below normal level. Under such condition, the hypothalamus will not be stimulated and less antideuratic hormone (ADH) will be produced. Less water will be reabsorbed and most of the water is allowed to pass out through urine.

Design a laboratory experiment to determine the urine volume released by a student who drinks different volume of mineral water.

The planning of your experimental must include the following aspects:

- Problem statement
- Aim of investigation
- Hypothesis
- Variables
- List of apparatus and materials
- Technique used
- Experimental procedures or methods
- Presentation of data
- Conclusion

[17 marks]

END OF QUESTION PAPER

INFORMATION FOR CANDIDATES

1. This question paper consists of two question: **Question 1** and **Question 2**

2. Answer all questions. Write your answer for **Question 1** in the spaces provided in this question paper.

3. Write your answer 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 answers.

4. Show your working, it may help you to get marks.

5. The diagrams in the questions are not drawn to scale unless stated

6. The marks allocated for each question or sub-part of a question are shown in brackets.

7. If you wish to change your answer, cross out the answer that you have done. Than write down the new answer.

8. You may you a non-programmable scientific calculator.

9. You are advised to spend 45 minutes to answer **Question 1** and 45 minutes for **Question 2**

10. Detach **Question 2** from this question paper. Tie the 'helaian tambahan' together with this question paper and hand in to the invigilator at the end of examination.