NO. KAD PENGENALAN | | | | | | | - | | | - | | | | |

ANGKA GILIRAN | | | | | | | | | |

Nama ..... Tingkatan .....

Sekolah .....

MODUL PINTAS
TINGKATAN 5

4551/3

BIOLOGY
Kertas 3

$1\frac{1}{2}$ jam

Satu jam tiga puluh minit

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

1. *Tulis* **nombor kad pengenalan, angka giliran, nama, tingkatan** *dan* **sekolah** *anda pada petak yang disediakan.*
2. *Kertas peperiksaan 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 peperiksaan ini.*

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

Kertas peperiksaan ini mengandungi 12 halaman bercetak.

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

1 *Cornu aspersum* known by a common name garden snail. The population density is affected by various factors such as the abiotic and biotic factors, birth rate, death rate, immigration and emigration.

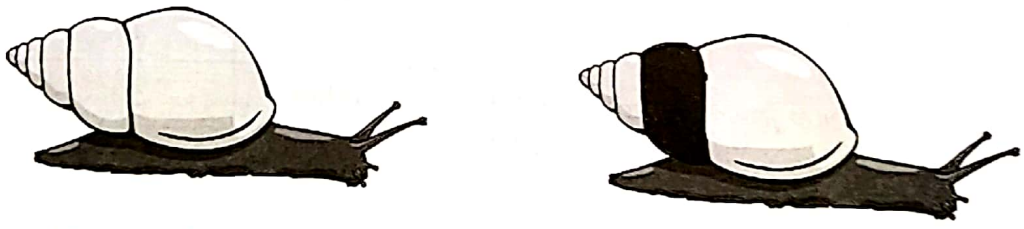
An experiment was carried out to investigate the population size of garden snails in three different areas by using capture, mark, release and recapture technique. A total of 27 garden snails have been found. Each garden snail was marked by using water proof marker pen on the shell. All the garden snails were released back to the place where the garden snails were captured. After 7 days, garden snail at three places were recaptured. The number of garden snail in the second capture was recorded. Also the number of marked garden snail in the second capture was recorded.

The unmarked garden snail and marked garden snail are shown in Diagram 1.

Cornu aspersum dikenali sebagai nama biasanya, siput kebun. Ketumpatan populasi dipengaruhi oleh pelbagai faktor seperti faktor abiotik dan biotik, kadar kelahiran, kadar kematian, penghijrahan masuk dan penghijrahan keluar.

Satu eksperimen telah dijalankan untuk mengkaji saiz populasi siput kebun di tiga kawasan berbeza dengan menggunakan teknik tangkap, tanda, lepas dan tangkap semula. Sebanyak 27 ekor siput kebun telah dijumpai. Setiap siput kebun ditandakan dengan pen penanda yang kalis air pada cangkerangnya. Kesemua siput kebun tersebut dilepaskan semula di tempat siput kebun itu ditangkap. Selepas 7 hari, siput kebun di ketiga-tiga kawasan ditangkap semula. Bilangan siput kebun dalam tangkapan kedua itu direkodkan. Siput kebun bertanda yang ditangkap dalam tangkapan kedua juga direkodkan.

Siput kebun yang tidak bertanda dan siput kebun yang bertanda ditunjukkan dalam Rajah 1.



Unmarked garden snail
Siput kebun yang tidak bertanda

Marked garden snail
Siput kebun yang bertanda

Diagram 1
Rajah 1

Table 1 shows the number of garden snail in second captured and the number of marked garden snail captured in second capture at the lakeside, housing area and paddy field.

Jadual 1 menunjukkan bilangan siput kebun dalam tangkapan kedua dan bilangan siput kebun yang bertanda dalam tangkapan kedua di tepi tasik, kawasan perumahan dan sawah padi.

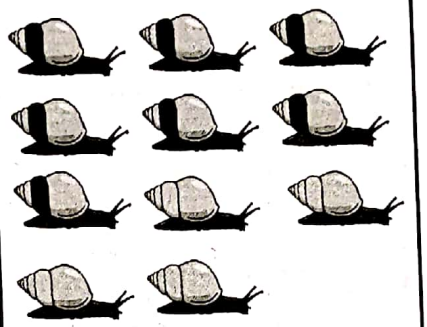
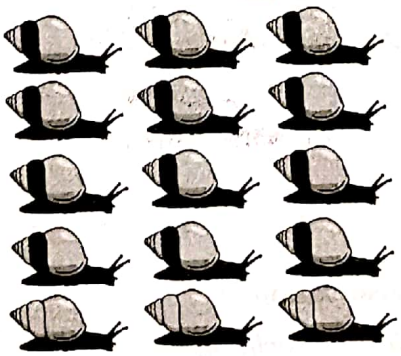
Area of garden snail captured ***Kawasan tangkapan siput kebun***	**Garden snail in the second capture** ***Siput kebun dalam tangkapan kedua***	**Number of garden snail in the second capture** ***Bilangan siput kebun dalam tangkapan kedua***	**Number of marked garden snail in the second capture** ***Bilangan siput kebun yang bertanda dalam tangkapan kedua***
Lakeside *Tepi tasik*			
Housing area *Kawasan perumahan*			
Paddy field *Sawah padi*			

Table 1
Jadual 1

(*a*) Record the number of garden snail in second captured and the number of marked garden snail in second capture in the answer spaces provided in Table 1.

Rekod bilangan siput kebun dalam tangkapan kedua dan bilangan siput kebun bertanda dalam tangkapan kedua di ruang jawapan yang disediakan dalam Jadual 1.

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

1(*a*) 3

(*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 2:

.....

.....

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

1(*b*)(i) 3

(ii) State the inference for **each** observation made in 1(*b*)(i).

Nyatakan inferens bagi setiap pemerhatian yang dibuat dalam 1(*b*)(i).

Inference for observation 1:
Inferens terhadap pemerhatian 1:

.....

.....

Inference for observation 2:
Inferens terhadap pemerhatian 2:

.....

.....

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

1(*b*)(ii) 3

For Examiner's Use

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

Variable ***Pemboleh ubah***	**Method to handle the variable** ***Cara mengendali pemboleh ubah***
Manipulated variable *Pemboleh ubah dimanipulasikan*	....
Responding variable *Pemboleh ubah bergerak balas*	....
Constant variable *Pemboleh ubah dimalarkan*	....

Table 2
Jadual 2

1(*c*) 3

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

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

.....

.....

.....

1(*d*) 3

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

(e) (i) Construct a table and record all the data collected from Table 1. Your table should have the following titles:

Bina satu jadual dan rekodkan semua data yang dikumpul dari Jadual 1.

Jadual anda hendaklah mengandungi tajuk-tajuk berikut:

- Area of garden snail captured
  Kawasan tangkapan siput kebun
- Number of garden snail in the first capture
  Bilangan siput kebun dalam tangkapan pertama
- Number of garden snail in the second capture
  Bilangan siput kebun dalam tangkapan kedua
- Number of marked garden snail in the second capture
  Bilangan siput kebun yang bertanda dalam tangkapan kedua
- Population size of garden snail
  Saiz populasi siput kebun

Use the formula:

Gunakan formula:

$$\text{Population size of garden snail} = \frac{(\text{Number of garden snail in the first capture}) \times (\text{Number of garden snail in the second capture})}{\text{Number of marked garden snail in the second capture}}$$

$$\textit{Saiz populasi siput kebun} = \frac{(\textit{Bilangan siput kebun dalam tangkapan pertama}) \times (\textit{Bilangan siput kebun dalam tangkapan kedua})}{\textit{Bilangan siput kebun yang bertanda dalam tangkapan kedua}}$$

1(e)(i)

3

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

For Examiner's Use

(ii) Use the graph paper provided on page **8** to answer this question.

Using the data in **1**(*e*)(i), draw a bar chart of the population size of garden snail against the area of garden snail captured.

Gunakan kertas graf yang disediakan di halaman **8** *untuk menjawab soalan ini.*

Menggunakan data di **1**(*e*)(i), *lukis sebuah carta bar bagi saiz populasi siput kebun melawan kawasan tangkapan siput kebun.*

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

1(*e*)(ii) 3

(*f*) Based on bar chart in **1**(*e*)(ii), state the relationship between the area of garden snail captured and the population size of garden snail.

Explain your answer.

Berdasarkan carta bar di **1**(*e*)(ii), *nyatakan hubungan di antara kawasan tangkapan dengan saiz populasi siput kebun.*

Terangkan jawapan anda.

.....

.....

.....

.....

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

1(*f*) 3

(*g*) Based on the result of this experiment, state the operational definition for the population size of garden snail.

Berdasarkan keputusan eksperimen ini, nyatakan definisi secara operasi bagi saiz populasi siput kebun.

.....

.....

.....

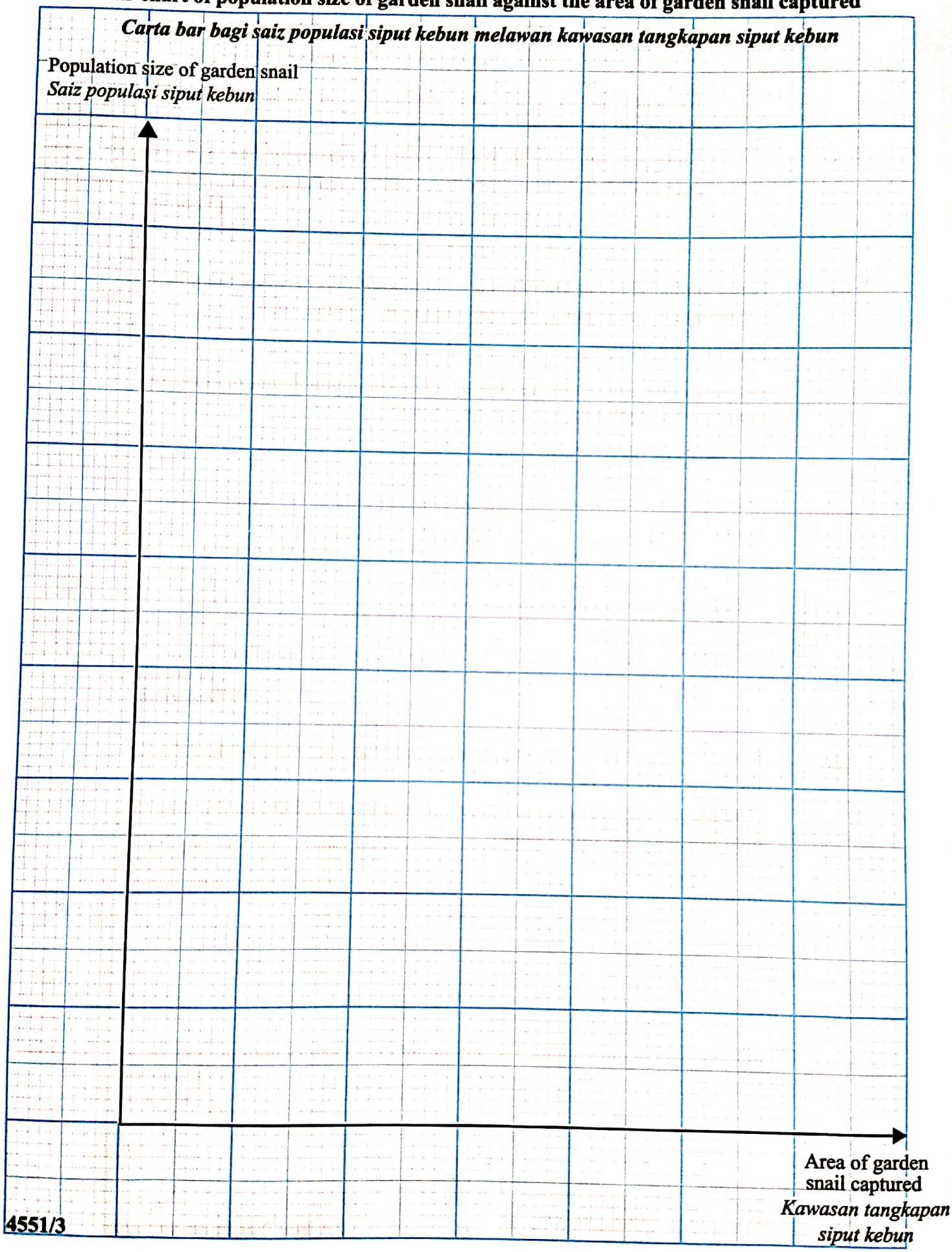
.....

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

1(*g*) 3

Bar chart of population size of garden snail against the area of garden snail captured

Carta bar bagi saiz populasi siput kebun melawan kawasan tangkapan siput kebun



For Examiner's Use

(*h*) Another group of ecologist carried out the same experiment at paddy field but snail garden were captured one week after harvest period.
Predict the population size of snail garden.
Explain your prediction.

Sekumpulan ahli ekologi yang lain menjalankan eksperimen yang sama di sawah padi tetapi siput kebun ditangkap seminggu selepas musim tuai.
Ramalkan saiz populasi siput kebun.
Terangkan ramalan anda.

.....

.....

.....

.....

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

1(*h*) 3

(*i*) The following list are factors of biotic and abiotic components to population size of garden snail.

Senarai berikut merupakan faktor komponen biotik dan abiotik ke atas saiz populasi siput kebun.

Classify the factors of biotic and abiotic components to population of garden snail in Table 3.
Kelaskan faktor komponen biotik dan abiotik ke atas saiz populasi siput kebun dalam Jadual 3.

Producer *Pengeluar*	Soil texture *Tekstur tanah*	Temperature *Suhu*
Parasite *Parasit*	Topography *Topografi*	Prey *Mangsa*

Biotic factor ***Faktor Biotik***	**Abiotic factor** ***Faktor Abiotik***

Table 3
Jadual 3

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

1(*i*) 3

Total 33

[Lihat halaman sebelah

2 *Lemna* sp. is a floating plant, which lives in fresh water environment. The growth of *Lemna* sp. depend on the abiotic factors such as light intensity, temperature, water pH value and concentration on carbon dioxide.

Lemna sp. *merupakan sejenis tumbuhan terapung, yang hidup dalam persekitaran air tawar. Pertumbuhan Lemna* sp. *bergantung kepada faktor-faktor abiotik seperti keamatan cahaya, suhu, nilai* pH *air dan kepekatan karbon dioksida.*

Diagram 2 shows the *Lemna* sp. in pond.

Rajah 2 *menunjukkan Lemna* sp. *di kolam.*

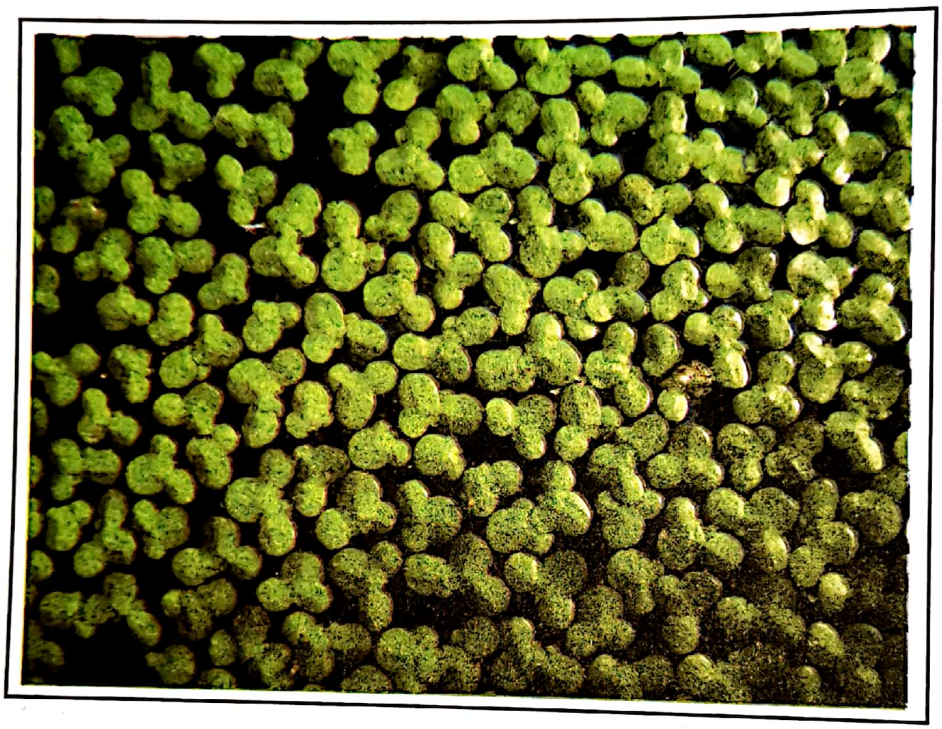


Diagram 2
Rajah 2

Based on the information and Diagram 2, design a laboratory experiment to investigate the effect of light intensity on the population growth rate of *Lemna* sp..

Berdasarkan maklumat dan Rajah 2, rangka satu eksperimen makmal untuk menyiasat kesan keamatan cahaya ke atas kadar pertumbuhan populasi Lemna sp..

The planning of your experiment must include the following aspects:

Perancangan eksperimen anda mesti merangkumi aspek-aspek berikut:

- Problem statement
  Pernyataan masalah
- Hypothesis
  Hipotesis
- Variables
  Pemboleh ubah
- 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 PEPERIKSAAN TAMAT