

Trial Examination 2014

VCE Biology Unit 2

Written Examination

Question and Answer Booklet

Reading time: 15 minutes

Writing: 1 hour 30 minutes

Student's Name: _____

Teacher's Name: _____

Structure of Booklet

Section	Number of questions	Number of questions to be answered	Marks
A	25	25	25
B	7	7	50
			Total 75

Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners and rulers.

Students are NOT permitted to bring into the examination room: blank sheets of paper and/or white out liquid/tape.

No calculator is allowed in this examination.

Materials supplied

Question and answer booklet of 18 pages.

Answer sheet for multiple-choice questions.

Instructions

Please ensure that you write your name and your teacher's name in the space provided on this booklet and in the space provided on the answer sheet for multiple-choice questions.

All written responses must be in English.

At the end of the examination

Place the answer sheet for multiple-choice questions inside the front cover of this booklet and hand them in.

Students are NOT permitted to bring mobile phones and/or any other electronic communication devices into the examination room.

SECTION A: MULTIPLE-CHOICE QUESTIONS**Instructions for Section A**

Answer **all** questions in pencil on the answer sheet provided for multiple-choice questions.

Choose the response that is **correct** for the question.

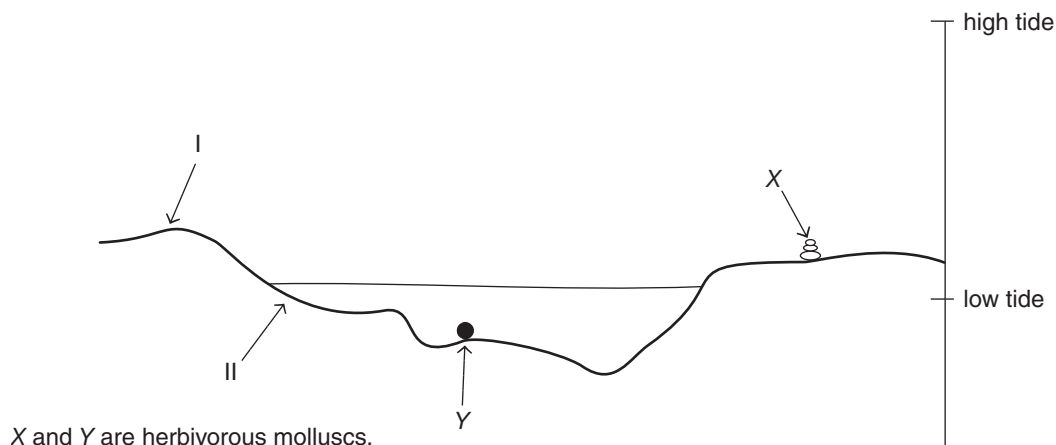
A correct answer scores 1, an incorrect answer scores 0.

Marks will **not** be deducted for incorrect answers.

No marks will be given if more than one answer is completed for any question.

Use the following information to answer Questions 1–5.

The diagram below is of a large rock pool.

**Question 1**

An abiotic factor which would affect both X and Y equally at low tide would be

- A. oxygen.
- B. rocks.
- C. food.
- D. terrestrial predators.

Question 2

The tolerance limits of an organism confined exclusively to location II compared to location I without this restriction would be

- A. greater.
- B. the same.
- C. lower.
- D. impossible to predict.

Question 3

A circadian rhythm experienced by organism X would be

- A. seasons.
- B. tide frequency.
- C. height of tide.
- D. breeding times.

Question 4

When the oxygen level at location II is compared to location I, the oxygen level at location II would

- A. be higher at high tide.
- B. be the same at low tide.
- C. be lower at high tide.
- D. remain relatively constant.

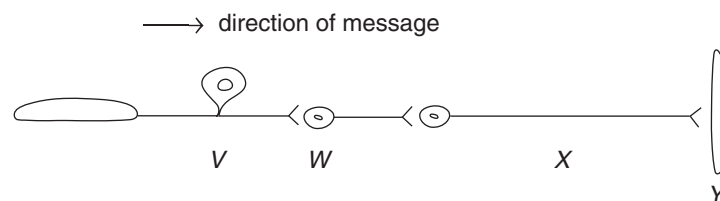
Question 5

Throughout a summer day the temperature at location I compared to location II would be

- A. more varied.
- B. constant.
- C. less varied.
- D. higher at high tide.

Use the following information to answer Questions 6–8.

The diagram below is of a nerve pathway.

**Question 6**

The motor neuron is

- A. V
- B. W
- C. X
- D. Y

Question 7

The correct message type and pathway shown in the diagram above is best represented as

	Message type	Pathway
A.	chemical only	$V \rightarrow X$
B.	electrical only	$V \rightarrow W$
C.	both electrical and chemical	$X \rightarrow Y$
D.	both electrical and chemical	$Y \rightarrow W$

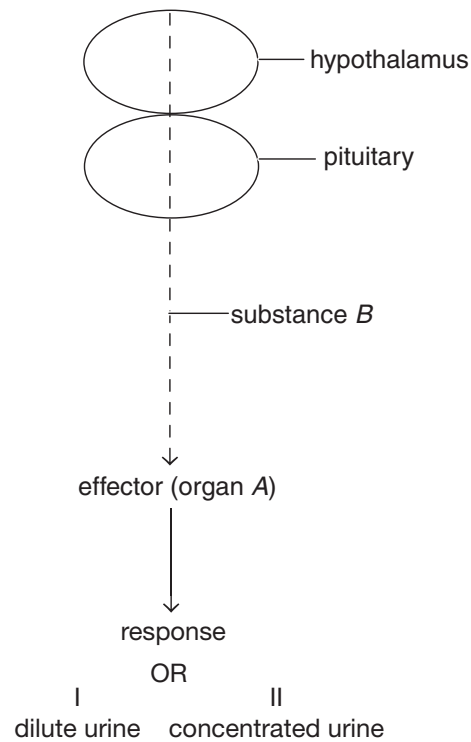
Question 8

In the diagram above the number of synapses is

- A. 1
- B. 2
- C. 3
- D. 4

Use the following information to answer Questions 9–11.

The diagram below shows the regulation of water in the human body.



Question 9

Organ A is the

- A. liver.
- B. kidney.
- C. pancreas.
- D. bladder.

Question 10

Substance B would move to organ A

- A. through the blood.
- B. by a direct pathway.
- C. by diffusion.
- D. in vesicles.

Question 11

Consider the following events:

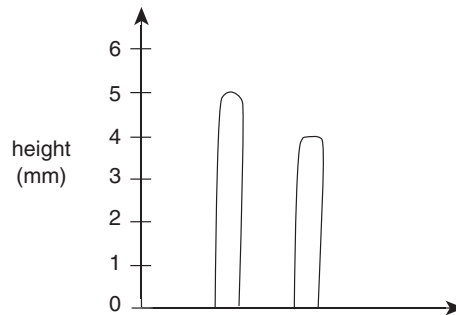
- 1 exercise
- 2 cold weather
- 3 dehydration
- 4 hot weather
- 5 anxiety

The production of response II would be expected after event/s

- A.** 1 only.
- B.** 3 and 4 only.
- C.** 1, 3 and 4.
- D.** 1, 2, 3, 4 and 5.

Use the following information to answer Questions 12 and 13.

The diagram below shows two shoot tips. The left one is intact and the right one has had its tip removed.

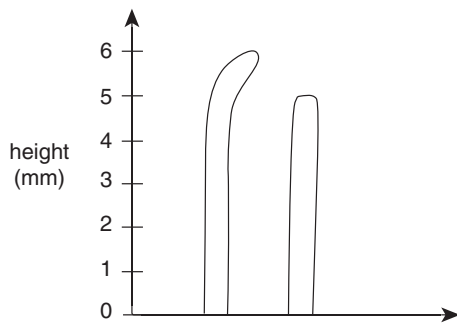


Question 12

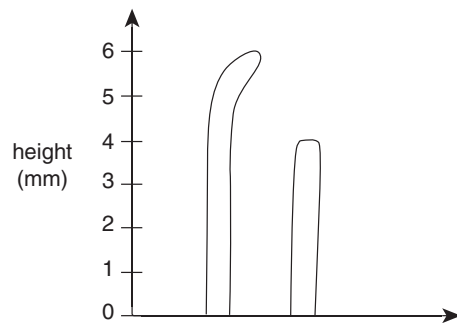
The above shoot tips were illuminated from the left side with respect to the diagram.

The expected results are best represented by

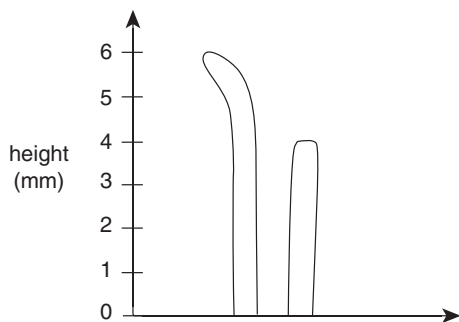
A.



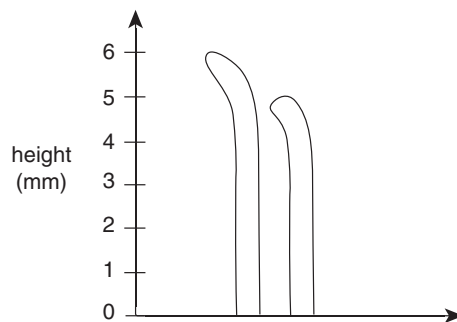
B.



C.



D.



Question 13

The hormone responsible is

- A. auxin.
- B. cytokinin.
- C. gibberellin.
- D. abscisic acid.

Question 14

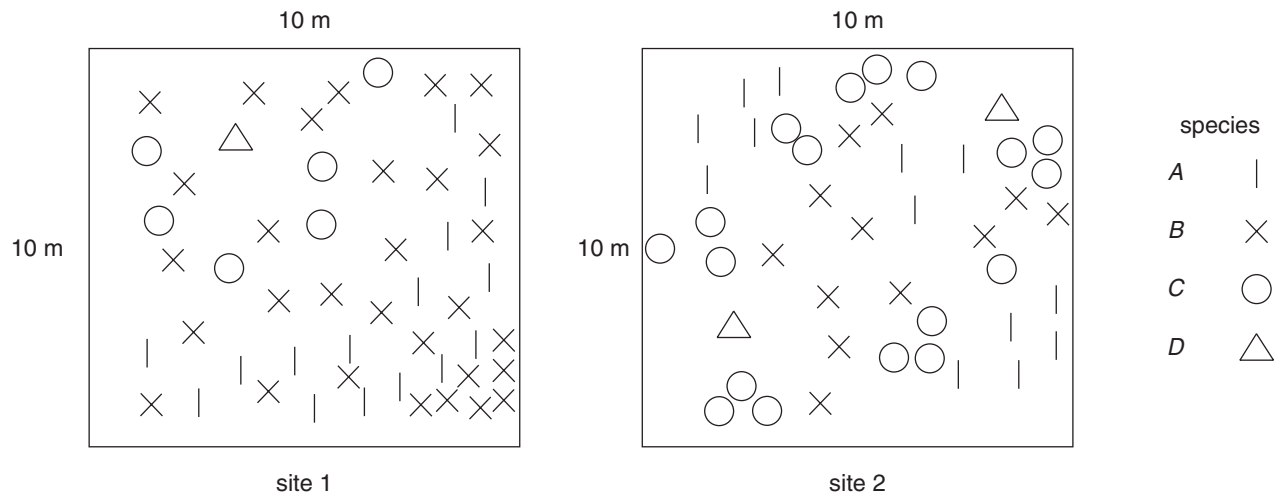
Apples release ethylene, a hormone which causes fruit to ripen. Some refrigerators (model 1) have special filters to remove this hormone.

If apples were kept in a fruit and vegetable drawer of a model 1 refrigerator rather than a non-filtered (model 2) refrigerator, it would be expected that of the food in the model 1 refrigerator, the

- A.** apples would not ripen.
- B.** fruit other than apples would ripen faster.
- C.** fruit other than apples would ripen slower.
- D.** meat would keep for much longer.

Use the following information to answer Questions 15–17.

The diagram below is of two areas sampled in a coastal woodland of the Western Port in Victoria. The distribution of four different species was plotted at the two sites.



Question 15

In site 1 the species with the highest density is

- A. A
- B. B
- C. C
- D. D

Question 16

The species most likely to be a large-growing tree is

- A. A
- B. B
- C. C
- D. D

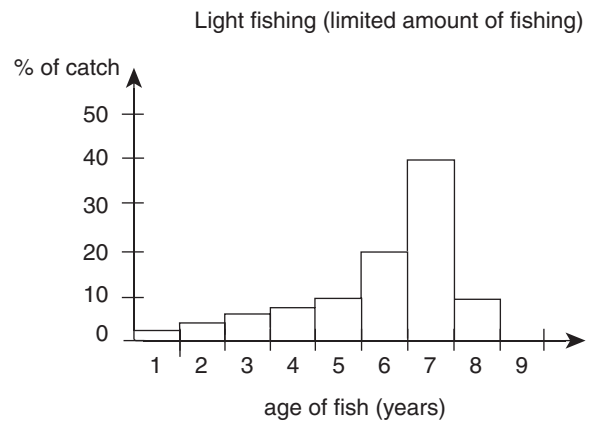
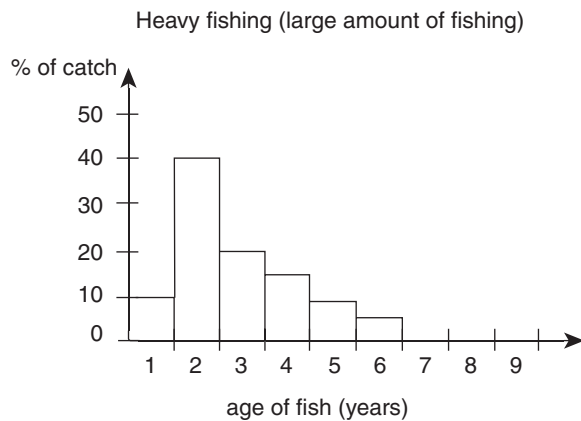
Question 17

When compared, the density of

- A. species A in site 2 is three times the density of species A in site 1.
- B. species B in site 2 is the same as the density of species B as site 1.
- C. species C in site 2 is three times the density of species C in site 1.
- D. species D in site 2 is twice the density of species D in site 1.

Use the following information to answer Questions 18 and 19.

The graphs below illustrate the effects of managed fishing, which limits the amount of fishing in certain areas.



Question 18

Compared to light fishing, a population which is heavily fished has a

- A. greater age range.
- B. lower average age.
- C. similar proportion of the population aged 5 years or older.
- D. higher percentage of fish caught.

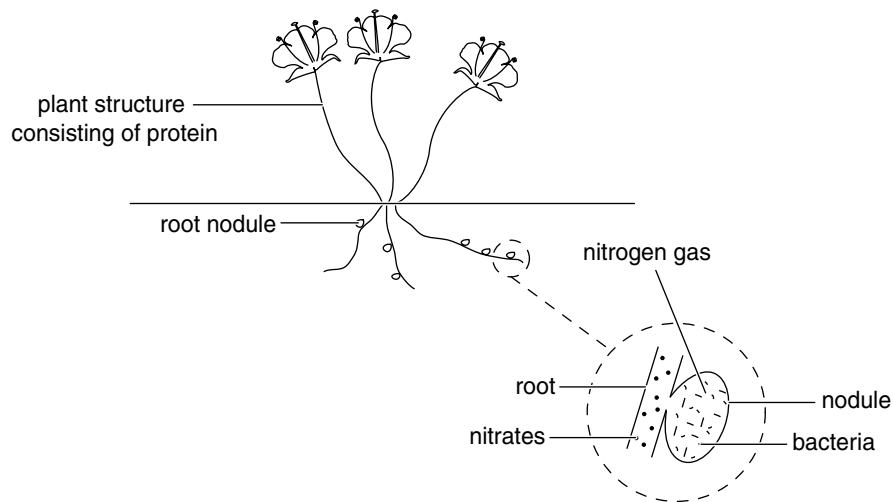
Question 19

The most common average age for the heavily fished group is

- A. 1
- B. 2
- C. 4
- D. 7

Use the following information to answer Questions 20 and 21.

The diagram below illustrates nitrogen fixation.



Question 20

In this process

- A. nitrates are converted to nitrogen.
- B. nitrogen forms amino acids.
- C. proteins release nitrogen.
- D. nitrogen is converted to nitrates.

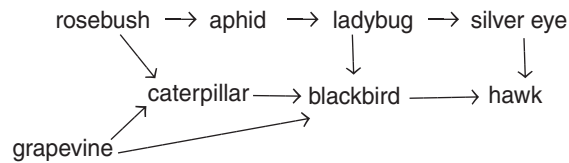
Question 21

The relationship which exists between the bacteria and the clover respectively is

- A. parasite/host.
- B. mutualism.
- C. decomposer/food source.
- D. competitors.

Use the following information to answer Questions 22–25.

The food web below is that of a suburban garden.



Question 22

A third-order consumer is the

- A. ladybug.
- B. blackbird.
- C. aphid.
- D. caterpillar.

Question 23

The organism which is only a first-order carnivore is the

- A. aphid.
- B. blackbird.
- C. ladybug.
- D. hawk.

Question 24

A new predator arrives in the garden and is classed as a second-order carnivore.

It would eat

- A. blackbirds.
- B. caterpillars.
- C. hawks.
- D. silver eyes.

Question 25

The number of trophic levels illustrated above is

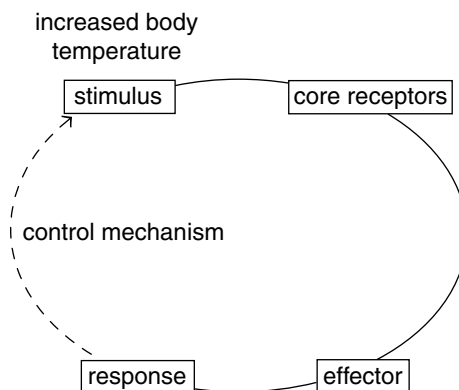
- A. 3
- B. 4
- C. 5
- D. 6

SECTION B: SHORT-ANSWER QUESTIONS**Instructions for Section B**

Answer **all** questions in the spaces provided. Write using black or blue pen.

Question 1 (9 marks)

The diagram below shows the homeostatic regulation of temperature in a human.



- a.** Define homeostasis. 1 mark

- b.** Where are the core receptors? 1 mark

- c.** Name an effector and describe its response for the above pathway. 2 marks

- d.** Name the control mechanism. 1 mark

- e. i.** Is transmission via the endocrine system, nervous system or both?
Explain your answer. 2 marks

- ii.** Outline two differences between the endocrine system and the nervous system. 2 marks

Question 2 (7 marks)

Animals demonstrate many different types of behaviour. Some of these are listed below.

- innate
- trial and error
- habituation
- imprinting
- associative learning
- insight learning
- observational learning

a. Choose one of the types of behaviour listed above which best fits each of the scenarios below and explain your choice.

- i.** people living near a busy road no longer are kept awake by the traffic noise 1 mark

- ii.** students being shown and practicing teeing off at a golf range 1 mark

- iii.** a dog getting excited for a walk when its owner puts on their coat 1 mark

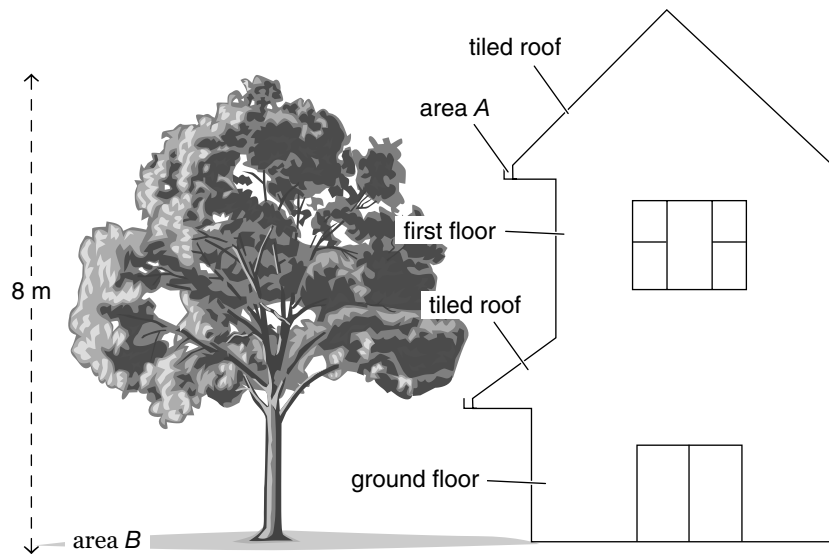
b. Lions eat other animals and whales feed on microscopic organisms such as krill.

Describe the differences in feeding behaviour of these two animals.

4 marks

Question 3 (7 marks)

The diagram above shows the location of different species in areas *A* and *B*.



Small plants of various species growing in area *B* were also found in area *A*, the first floor gutter, as shown in the diagram above.

- a. The plants in area *A* are growing in organic matter.
What are two different sources of this organic matter? 2 marks

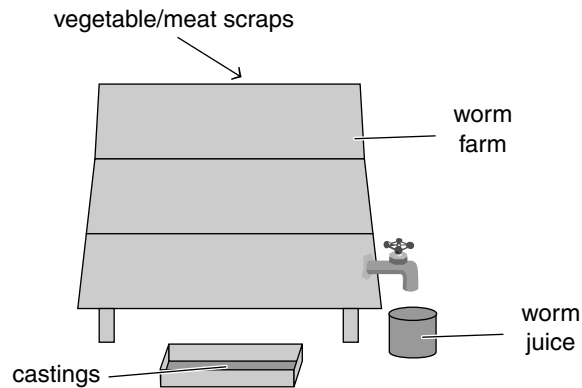
- b. Give two ways in which seeds from area *B* could reach area *A*. 2 marks

- c. Outline two differences in the environment for the plants growing in area *A* compared to area *B*. 2 marks

- d. The occurrence of different species in area *A* is an example of succession.
Define succession. 1 mark

Question 4 (6 marks)

The diagram below shows a worm farm. Food scraps are added as shown and worm 'juice' is taken off and 'castings', the digestive products, are also collected.



- a. In terms of feeding, what are the worms classified as? 1 mark

- b. i. Not all food types should be given to worms.
Suggest an unsuitable food source and why it is inappropriate. 2 marks

- ii. Newspaper can be put in a compost and mixed with food scraps and plant material.
Explain whether newspaper would be suitable for a worm farm. 1 mark

- c. Worms are hermaphrodites. Each worm has both male and female reproductive systems.
Explain the advantage/s of this arrangement. 2 marks

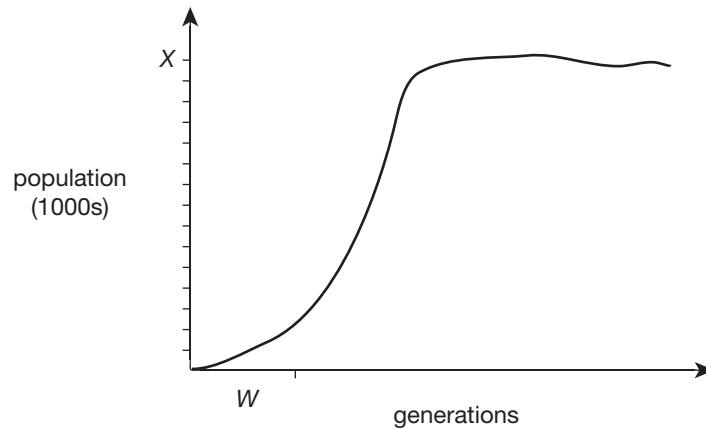
Question 5 (9 marks)

Californian thistles, *Cirsium arvense*, native to Europe are widespread throughout hill country farms in New Zealand's South Island. Landcare has released European-sourced green thistle beetles, also known as *Cassida rubiginosa* or tortoise beetles. Their primary host is the Californian thistle, however they do feed on other thistles as well. It has not been determined if the beetle can complete its life cycle on other species of thistle. Experiments are being conducted to determine this. New Zealand has no native thistles.

- a. i.** The use of this beetle is an example of biological control.
Define this. 1 mark
- _____
- _____
- ii.** Describe another example of successful use of biological control. 1 mark
- _____
- b.** The use of the beetle could reduce the need to use herbicides.
What are two advantages of not using herbicides? 2 marks
- _____
- _____
- c.** Explain why a European beetle is successful against the Californian thistle. 1 mark
- _____
- _____
- d.** Outline an experiment which could be conducted to determine if the beetle completes its life cycle on other species of thistles.
In your answer state the hypothesis being tested, how you would test the hypothesis, and what results would support your hypothesis. 3 marks
- _____
- _____
- _____
- _____
- _____
- _____
- e.** Why is it important that the beetles complete their life cycle? 1 mark
- _____

Question 6 (6 marks)

The graph below indicates the change in a population of an introduced species in a farming area.



- a. What is the growth pattern in period *W*? 1 mark

- b. What term describes *X*? 1 mark

- c. The population fluctuates from year to year. The factors which determine the population are *B*, birth rate; *E*, emigration; *I*, immigration; and *D*, death rate.

Write an equation using these symbols for a population in equilibrium.

1 mark

- d. The graph above illustrates the population growth of an introduced species.

- i. Name an introduced species this could represent. 1 mark

- ii. Give two reasons why the growth pattern shown in *W* was possible. 2 marks

Question 7 (6 marks)

- a.** Name a carbon-based gas produced during bushfires. 1 mark

- b.** Name two other processes, apart from bushfires/combustion, which release carbon-based gases. 2 marks

- c.** Name a process that reduces carbon-based gases in the atmosphere. 1 mark

- d.** Global warming is in part due to the accumulation of carbon-based gases in the atmosphere. Comment on the changes in the world ecosystem of total carbon available, and the amount of fossil fuel reserves now compared to 100 years ago. 2 marks

END OF QUESTION AND ANSWER BOOKLET