

Trial Examination 2011

VCE Biology Unit 2

Written Examination

Question and Answer Booklet

Reading time: 15 minutes
Writing time: 1 hour 30 minutes

Student's Name: _____

Teacher's Name: _____

Structure of Booklet

Section	Number of questions	Number of questions to be answered	Number of marks
A	25	25	25
B	9	9	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

Write your **name** and **teacher's name** 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 unauthorised electronic 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.

The following information relates to Questions 1 and 2.

The Euro is a small wallaby, living in the desert regions of the Pilbara in Western Australia. They shelter in rocky outcrops during the day. These wallabies are able to survive on limited water as they can lose 12% of their body water without being adversely affected. They are unable to sweat, however can pant 300 times per minute. They also lick their relatively hairless forelimbs when hot.

Question 1

A physiological adaptation of the Euro to survive in this hot environment is

- A. relatively hairless forearms.
- B. an inability to sweat.
- C. its ability to survive after losing body water.
- D. its ability to pant at a high rate.

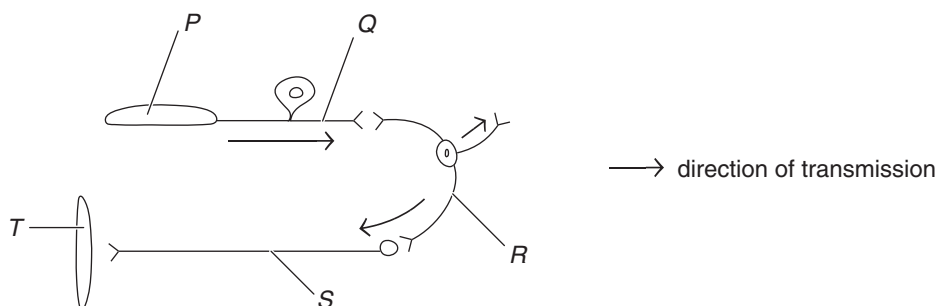
Question 2

A structural adaptation of the Euro to conserve water is

- A. relatively hairless forearms.
- B. a lack of sweat glands.
- C. licking its forearms.
- D. its ability to pant at a high rate.

The following information relates to Questions 3 to 5.

The diagram below represents a simple nerve pathway.



Question 3

A receptor is labelled

- A. *P*
- B. *Q*
- C. *S*
- D. *T*

Question 4

A motor neuron is labelled

- A. *Q*
- B. *R*
- C. *S*
- D. *T*

Question 5

Transmission from *P* to *T* is by messages which are

- A. electrical only.
- B. chemical only.
- C. both electrical and chemical.
- D. controlled by both the nervous and endocrine systems.

Question 6

The adrenal glands release adrenalin. An example of the effect of adrenalin is the dilation of the pupils of the eye, especially during times of fear.

Adrenalin released from the adrenal glands would

- A. reach target cells by diffusion.
- B. react with each cell it comes in contact with.
- C. circulate around the whole body in the circulatory system.
- D. travel directly to target cells.

Question 7

Gibberellins are a group of plant hormones responsible for

- A. the ripening of fruit.
- B. leaf fall.
- C. photo and geotropisms.
- D. cell elongation and hence growth.

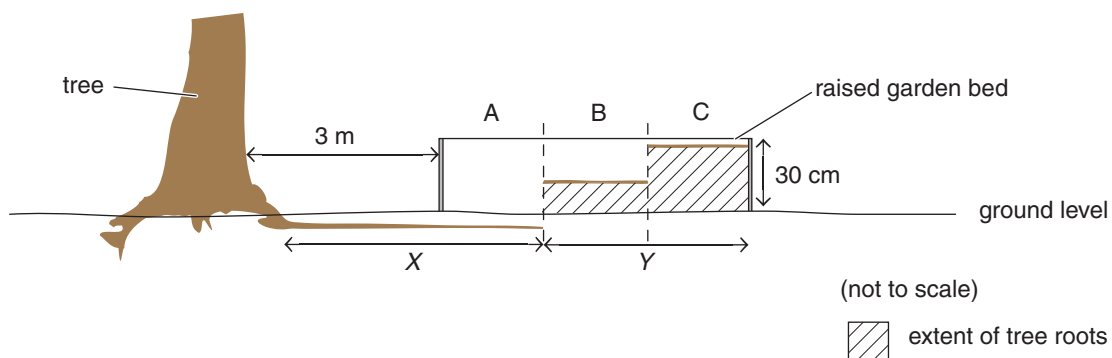
Question 8

The plant hormone responsible for dormancy of seeds and regulation of stomatal opening is

- A. auxin.
- B. ethylene.
- C. abscisic acid.
- D. cytokinins.

Question 9

The diagram below shows a raised garden bed. It illustrates the extent of tree roots in Area Y compared to Area X over three periods of time – initially after the garden bed was introduced (A), after 1 year (B) and after 2 years (C).



When comparing Area Y after 2 years with 1 year, the distribution of roots is due to

- A. negative phototropism and negative geotropism.
- B. positive geotropism and negative phototropism.
- C. positive phototropism and negative geotropism.
- D. positive geotropism and positive phototropism.

Question 10

A spider weaving a web is an example of

- A. innate behaviour.
- B. trial and error.
- C. associative learning.
- D. insight learning.

Question 11

People who live on a busy road, after a time, do not notice the traffic noise while visitors do.

The term used to describe the response of those who permanently live in the house is

- A. trial and error.
- B. associative learning.
- C. habituation.
- D. insight learning.

Question 12

The type of behaviour which is modified by habituation is

- A. innate behaviour.
- B. trial and error.
- C. associative learning.
- D. insight learning.

The following information relates to Questions 13 to 15.

Consider the following relationships: a tapeworm feeding on the intestine of a mammal; a fungus and algae forming a lichen; an anemone shrimp gaining protection by sheltering amongst the tentacles of an anemone.

Question 13

These relationships are all examples of

- A. symbiosis.
- B. mutualism.
- C. parasitism.
- D. commensalism.

Question 14

The relationship evident in the lichen is

- A. competition.
- B. mutualism.
- C. commensalism.
- D. amensalism.

Question 15

Parasitism differs from mutualism because in parasitism

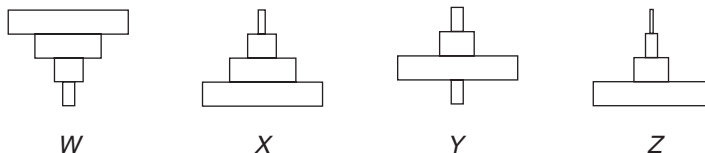
- A. both members are harmed.
- B. neither member is harmed.
- C. neither benefits.
- D. one is harmed and the other benefits.

The following information relates to Questions 16 and 17.

Below are two food chains and four pyramids.

I phytoplankton $\longrightarrow$ daphnia $\longrightarrow$ fish $\longrightarrow$ pelican

II trees $\longrightarrow$ insects $\longrightarrow$ sparrow $\longrightarrow$ hawk



Question 16

Considering food chain I, the number and biomass pyramids would best be represented by

	Number	Biomass
A.	X	X
B.	Y	X
C.	X	W
D.	Y	W

Question 17

Considering food chain II, the number and energy pyramid would best be represented by

	Number	Energy
A.	X	Z
B.	Y	W
C.	Y	Z
D.	X	Y

Question 18

The amount of carbon present in the biogeochemical cycle at present compared to 500 years ago would

- A. have remained constant.
- B. have increased.
- C. have decreased.
- D. be impossible to predict.

Question 19

A long-term solution to decrease the amount of carbon dioxide in the atmosphere would be to

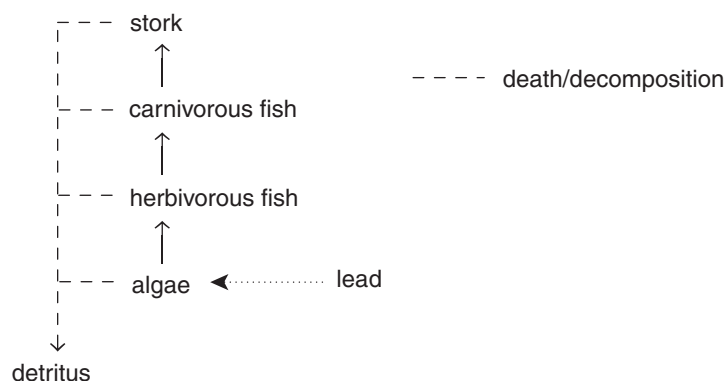
- A. use ethanol to power cars instead of fossil fuels.
- B. plant cereal crops to be used as food.
- C. decompose household waste rather than use landfill.
- D. plant trees to be used for construction of housing.

Question 20

First hand, direct evidence of the existence of an organism, thought to be extinct, would be

- A. photographic evidence.
- B. scats (faeces).
- C. footprints.
- D. capture of an individual.

The following information relates to Questions 21 to 23.

**Question 21**

If lead entered the food chain as indicated above, the highest amount proportionally would be found in the

- A. algae.
- B. stork.
- C. fish.
- D. detritus.

Question 22

If a rat ate the eggs of a stork, the rat would be classed as a

- A. first order consumer.
- B. second order consumer.
- C. third order consumer.
- D. fourth order consumer.

Question 23

Decomposition is brought about by

- A. bacteria.
- B. scavengers.
- C. detritivores.
- D. viruses.

Question 24

After serious bushfires in 2009, all vegetation was destroyed and only seeds of native plants survived. Weeds and exotic plants in affected areas multiplied rapidly and caused a threat to native plant regeneration.

A suitable reason for this is that

- A. more weed seeds survived the fires than native seeds.
- B. seeds of weeds were carried into areas to establish colonies.
- C. there was more competition after the fire.
- D. the weeds required a product of the fire for growth.

Question 25

The Camel, *Camelus dromedaries*, was introduced to Australia between 1860 and 1880. Since then its numbers have greatly increased whereas other introduced species such as zebras, squirrels and musk deers have died out.

It is reasonable to assume that the present day large population of camels is due to

- A. the death rate of camels greatly exceeding the birth rate.
- B. greater competition with native species.
- C. greater numbers of camels being introduced than other species.
- D. the lack of predators of camels.

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

Answer this section in pen.

Answer **all** questions in the spaces provided.

Question 1

The Australian Marsupial Mole *Notoryctes typhlops* is a burrower, generally living a solitary life in the sandy soil of river flats in desert regions. It is approximately 150 mm in length and weighs 60 g. There is no evidence that *Notoryctes typhlops* has an eye, but it does have a well developed chemical sense and good hearing. Horny shields protect the nostrils and both sexes have a rear facing pouch that is more developed in the female. The Australian Marsupial Mole feeds on various insect species and their different life forms, and also on small reptiles. They are eaten by a wide variety of predators, such as dingoes, snakes and birds. They are not actively hunted but caught by opportunistic predators.

- a. Name two abiotic components of the Marsupial Mole's environment.

2 marks

- b. Name a resource which could limit the mole's distribution and describe its effect.

2 marks

- c. Explain the advantage of the arrangement of the pouch.

1 mark

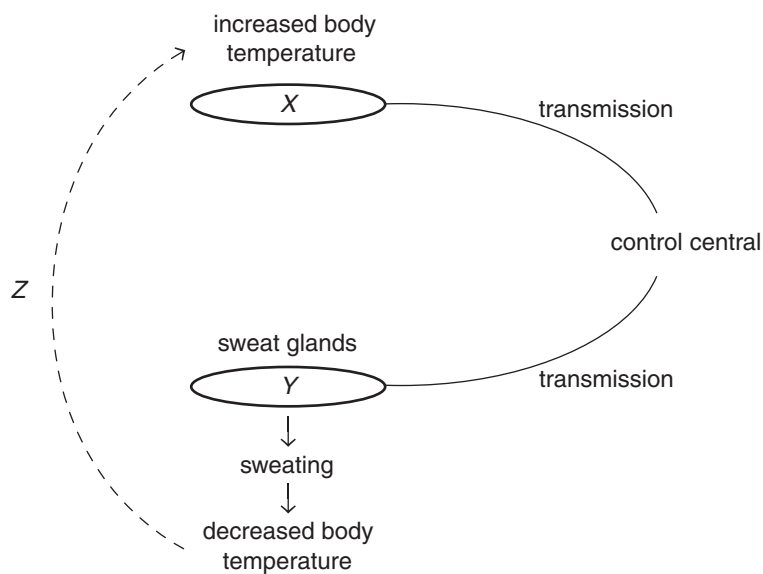
- d. Describe how Marsupial Moles would locate a mate.

1 mark

Total 6 marks

Question 2

The diagram below illustrates the homeostasis of body temperature.



- a. Give the general name of components X, Y and Z.

X _____

Y _____

Z _____

3 marks

- b. Name the control centre for body temperature.

1 mark

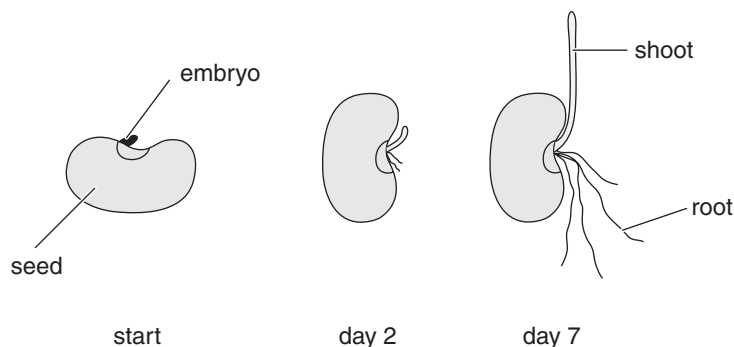
- c. Is transmission brought about by the nervous or endocrine system? Explain your answer.

1 mark

Total 5 marks

Question 3

The diagram below is of a seed pre- and post-germination. The seeds were planted as illustrated in the day 2 diagram in potting mix and the shoot emerged from the soil on day 8.



- a. What type of tropic response is evident in the shoot at day 7? Explain your choice.

2 marks

- b. i. Name the hormone involved in the tropic responses illustrated.

- ii. Where within the seed illustrated is this hormone produced?

1 + 1 = 2 marks

- c. If the seed was planted upside down

- i. what would be the growth response?

- ii. Explain your answer.

1 + 1 = 2 marks

Total 6 marks

Question 4

Codling moth *Cydia pomonella* is the main insect pest of pome fruit – apples and related fruits. Eggs are laid on leaves and fruit, and after a few days the eggs hatch and larvae enter the fruit. The caterpillars bore their way to the core and damage the fruit making it unfit for human consumption. Larva exit the fruit, form cocoons and after two weeks adult moths emerge. These are characterised by their grey wings with brown tips. Multiple generations can occur in a season as long as the temperature is greater than 10°C. Female moths release chemical sex attractants for the male moths and these are used by orchardists as a means of control. Insecticides are available and in other countries various methods are used; for example Russia has a wasp, *Trichogramma*, which is parasitic on moth eggs and a virus also exists overseas which devastates local moth populations. Neither the wasp nor the virus is in Australia.

- a. The Codling moth does not replicate below 10°C.

What is the term given to describe the upper temperature value beyond which the Codling moth does not replicate?

1 mark

- b. i. What name is given to the substance produced by the female moth?

- ii. Describe how this substance could be used to limit the Codling moth population.

1 + 2 = 3 marks

- c. What are two disadvantages of using insecticides to control the Codling moth?

2 marks

- d. i. What term is used to describe the use of a virus or the Russian wasp to limit the codling moth population?

- ii. The Australian Government has not released the Russian wasp or virus into the population. What are two likely reasons this has not occurred?

1 + 2 = 3 marks
Total 9 marks

Question 5

For each of the following scenarios state the type of learning involved.

- a. A chimpanzee placing a chair on a box so it can hit a banana with a stick to dislodge it, without any prior experience.

_____ 1 mark

- b. A group of rats not feeding on an unknown food source until one member has eaten.

_____ 1 mark

- c. A dog eventually being able to catch a ball.

_____ 1 mark

- d. Young ducklings following their mother.

_____ 1 mark

- e. A dog anticipating a walk and getting excited when its owner gets a plastic bag from a cupboard

_____ 1 mark
Total 5 marks

Question 6

The blue ringed octopus *Hapalochlaena lunulata* inhabits shallow waters from Japan to Australia. Its body is about the size of a 50 cent piece, with arms less than 10 cm long. When threatened, the rings on its arms become prominent and produce a bright blue colouration. It produces a powerful toxin, Tetrodotoxin which causes paralysis, finally resulting in paralysis of the diaphragm. The senses and heart are unaffected by this toxin.

- a. What type of neuron is affected by this toxin? Explain your answer.

2 marks

- b. Heart muscle is resistant to this toxin.
What is a possible explanation for this?

1 mark

- c. What is the survival advantage to the blue ringed octopus of having blue rings?

1 mark

Total 4 marks

Question 7

The diagram below is of a cat which predominantly hunts at night.



- a. What biological term describes activities which occur at night?

1 mark

- b. With reference to the diagram above, give two features that would assist the cat to hunt at night.

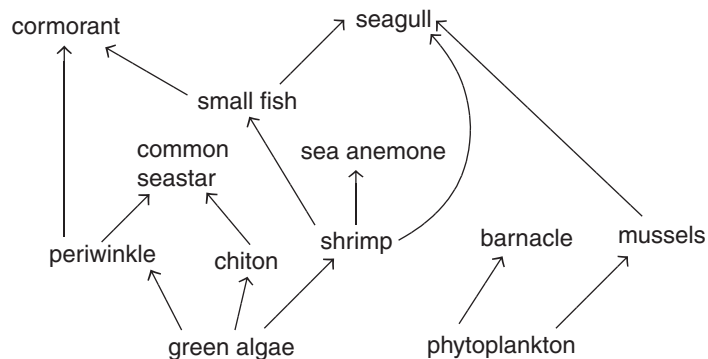
2 marks

- c. What is the name given to describe features of an organism that assist it to survive and reproduce in a particular environment?

1 mark
Total 4 marks

Question 8

The diagram below is of a coastal food web.



Use the diagram above and your knowledge to answer the following questions.

- a. Name the producer(s).

1 mark

- b. What is the original source of energy for this food web? Explain your answer.

2 marks

- c. Name a third order consumer and explain your choice.

2 marks
Total 5 marks

Question 9

The Orange-bellied parrot has a summer habitat in South-West Tasmania, where it reproduces, and a winter habitat in Coastal Victoria and South Australia. The wild population is estimated to be between 30 and 50. Scientists have 40 man-made nesting boxes in a remote area of Tasmania near Port Davey. In January of 2011 12 new chicks were found, which matched the number found in 2010, unfortunately, however, there is an expectation that the species will be extinct in the wild within 3 to 5 years.

Scientists have an intensive breeding program of captive birds with a population of approximately 160 birds

- a. Outline what requirements would be necessary for a successful breeding population.

2 marks

- b. Why might Scientists think the wild population will be extinct within 3 to 5 years? Give two possible reasons.

2 marks

- c. The scientists are not confident that the captive birds can be successfully introduced into the wild population. Give a possible explanation for this.

1 mark

- d. Define the term 'niche'.

1 mark

Total 6 marks

END OF QUESTION AND ANSWER BOOKLET