

## VCE Biology Unit 2

### Written Examination

### Suggested Solutions

#### SECTION A: MULTIPLE-CHOICE QUESTIONS

1	<input type="checkbox"/> A	<input type="checkbox"/> B	<input checked="" type="checkbox"/> C	<input type="checkbox"/> D
2	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
3	<input checked="" type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
4	<input type="checkbox"/> A	<input type="checkbox"/> B	<input checked="" type="checkbox"/> C	<input type="checkbox"/> D
5	<input type="checkbox"/> A	<input type="checkbox"/> B	<input checked="" type="checkbox"/> C	<input type="checkbox"/> D
6	<input type="checkbox"/> A	<input type="checkbox"/> B	<input checked="" type="checkbox"/> C	<input type="checkbox"/> D
7	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input checked="" type="checkbox"/> D
8	<input type="checkbox"/> A	<input type="checkbox"/> B	<input checked="" type="checkbox"/> C	<input type="checkbox"/> D
9	<input checked="" type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
10	<input checked="" type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
11	<input type="checkbox"/> A	<input type="checkbox"/> B	<input checked="" type="checkbox"/> C	<input type="checkbox"/> D
12	<input checked="" type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
13	<input checked="" type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D

14	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
15	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input checked="" type="checkbox"/> D
16	<input checked="" type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
17	<input type="checkbox"/> A	<input type="checkbox"/> B	<input checked="" type="checkbox"/> C	<input type="checkbox"/> D
18	<input checked="" type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
19	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input checked="" type="checkbox"/> D
20	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input checked="" type="checkbox"/> D
21	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input checked="" type="checkbox"/> D
22	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input checked="" type="checkbox"/> D
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24	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
25	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input checked="" type="checkbox"/> D

**Question 1**      **C**

Sweating would be an advantage to cool the organism, so an inability to sweat is not an adaptation to a hot environment. Hairless forearms are a structural adaptation, and panting is a behavioural adaptation.

**Question 2**      **B**

Panting and licking will both increase water loss. Relatively hairless forearms are a structural adaptation to cooling the Euro, not conserving water.

**Question 3**      **A**

*Q* is a sensory neuron, *R* an interneuron and *T* an effector.

**Question 4**      **C**

*S* is a motor neuron. See solution to **Question 3**.

**Question 5**      **C**

The action potential is electrical, and transmission across the synapse is chemical. The endocrine system is not involved.

**Question 6**      **C**

Only cells with specific receptors will respond to a particular hormone. They generally travel in the blood and can travel by diffusion; however the distance in this example is too great.

**Question 7**      **D**

Ethylene is responsible for fruit ripening and leaf fall. Auxin is responsible for photo and geotropism.

**Question 8**      **C**

Ethylene is responsible for fruit ripening and leaf fall, auxin is responsible for photo and geotropism, and cytokinins are responsible for cell replication.

**Question 9**      **A**

The roots are growing upwards, away from gravity (negative geotropism) and when they reach the limit, approximately 2 cm, they stop growing upwards as light inhibits the roots (negative phototropism).

**Question 10**      **A**

This behaviour is inborn and therefore not learnt.

**Question 11**      **C**

The loss of a response to conserve time and/or energy is habituation.

**Question 12**      **A**

There is no learning involved, it is the loss of an innate response.

**Question 13**      **A**

All are examples of symbiosis, living together. In mutualism both benefit, so this is the relationship between the fungus and algae. Parasitism is the relationship between the tapeworm and mammal. Commensalism, where one member benefits and the other is unaffected, is the relationship between the anemone shrimp and the anemone.

**Question 14      B**

The relationship evident is mutualism (both members of the relationship benefit). Amensalism is a symbiotic relationship where neither member is affected.

**Question 15      D**

In this relationship, the parasite benefits and the host is harmed.

**Question 16      A**

The number and biomass would be similar and be a typical pyramid shape.

**Question 17      C**

The number pyramid is unusual as the box would be small as there are very few trees. The amount of energy would decrease with each step of the food chain.

**Question 18      A**

The amount of carbon has not changed, however, the amount of carbon dioxide for example, would have proportionally increased from the combustion of fossil fuels.

**Question 19      D**

Ethanol when burnt will still produce carbon dioxide. Food, which undergoes cellular respiration will also produce carbon dioxide, as will decomposition.

**Question 20      D**

Photographs, scats and footprints are indirect evidence of an organism and may be fabricated.

**Question 21      D**

The amount of lead would accumulate with each step of the food chain, however, as lead is not biodegradable after decomposition, a large amount proportionally would be present in the detritus.

**Question 22      D**

As the stork is a third order consumer, the rat eating the eggs makes the rat a fourth order consumer.

**Question 23      A**

Decomposition is brought about by bacteria and fungi.

**Question 24      B**

More native species survived than weed seeds. Seeds of weeds were carried by birds for example, and dispersed by various mechanisms. It is most unlikely that there was a product of fires that was more suitable for weeds to grow rather than native species.

**Question 25      D**

The camels' birth rate would greatly exceed the death rate. The number of camels introduced would have limited the effect on the population and there would have been less competition with native species.

## SECTION B: SHORT-ANSWER QUESTIONS

### Question 1

- a. *Any two of:*
- sandy soil
  - desert region
  - lack of light
  - relatively constant temperature
- Or any other suitable answer.* 2 marks
- b. *Any one of:*
- lack of food
  - inability to survive or inability to raise young (converse also suitable)
  - lack of mates would prevent reproduction (converse also suitable)
- Or any other suitable answer.* 2 marks
- c. The pouch faces backwards so that dirt does not enter. 1 mark
- d. As the moles are blind they would need to rely on sound or 'smell' to detect mates. 1 mark

### Question 2

- a. X – stimulus  
Y – effector  
Z – negative feedback 3 marks
- b. hypothalamus 1 mark
- c. Nervous system  
The response would need to be rapid. 1 mark

### Question 3

- a. Negative geotropism. 1 mark  
The shoot has not emerged from the soil so there is no light stimulus. 1 mark
- b. i. auxin 1 mark  
ii. shoot tip/root tip 1 mark
- c. i. The growth pattern would be the same. 1 mark  
ii. This is because the growth would still be influenced by gravity. 1 mark

**Question 4**

- a. tolerance limit 1 mark
- b. i. pheromone 1 mark  
 ii. The chemical would be used to lure/attract males. 1 mark  
 They could then be killed by being trapped or prevented from mating. 1 mark
- c. *Any two of:*  
 • contaminated fruit  
 • alters taste of fruit  
 • kills other wanted species  
*Or any other suitable answer.* 2 marks
- d. i. biological control 1 mark  
 ii. *Any two of:*  
 • need to conduct tests in order to determine effects on humans/other animals  
 • wasps may become a problem themselves  
 • they may not be effective in the Australian environment  
*Or any other suitable answer.* 2 marks

**Question 5**

- a. insight 1 mark
- b. observation 1 mark
- c. trial and error 1 mark
- d. imprinting 1 mark
- e. associative 1 mark

**Question 6**

- a. motor neuron 1 mark  
 As the toxin leads to paralysis, an inability to move, the motor neuron is affected. 1 mark
- b. The heart muscle does not have receptors where the toxin can bind. 1 mark
- c. The blue colour would warn predators and hence prevent the octopus being eaten. 1 mark

**Question 7**

- a. nocturnal 1 mark
- b. *Any two of:*  
 • large eyes  
 • whiskers  
 • nose/sense of smell 2 marks
- c. adaptations 1 mark

**Question 8**

- a. algae and phytoplankton 1 mark
- b. The Sun 1 mark  
is used by producers for photosynthesis. 1 mark
- c. seagull 1 mark  
It ate a second consumer, the small fish, which ate a first order consumer, the shrimp, which ate a producer. 1 mark

**Question 9**

- a. *Any two of:*
- suitable habitat
  - mimic food
  - control diseases
- Or any other suitable answer.* 2 marks
- b. *Any two of:*
- the decline may be impossible to halt due to habitat destruction
  - presence of predators
  - disease
- Or any other suitable answer.* 2 marks
- c. *Any one of:*
- migration may not be possible
  - competition may occur between the two groups
  - fighting may occur
  - the two groups may not interbreed
- 1 mark
- d. The term 'niche' is used to describe the role of an organism in its environment. 1 mark