

Trial Examination 2014

VCE Biology Unit 2

Written Examination

Suggested Solutions

SECTION A: MULTIPLE-CHOICE QUESTIONS

1	☐ A	☒ B	☐ C	☐ D
2	☐ A	☐ B	☒ C	☐ D
3	☐ A	☒ B	☐ C	☐ D
4	☐ A	☐ B	☐ C	☒ D
5	☒ A	☐ B	☐ C	☐ D
6	☐ A	☐ B	☒ C	☐ D
7	☐ A	☐ B	☒ C	☐ D
8	☐ A	☐ B	☒ C	☐ D
9	☐ A	☒ B	☐ C	☐ D
10	☒ A	☐ B	☐ C	☐ D
11	☐ A	☐ B	☒ C	☐ D
12	☐ A	☐ B	☒ C	☐ D

13	☒ A	☐ B	☐ C	☐ D
14	☐ A	☐ B	☒ C	☐ D
15	☐ A	☒ B	☐ C	☐ D
16	☐ A	☐ B	☐ C	☒ D
17	☐ A	☐ B	☒ C	☐ D
18	☐ A	☒ B	☐ C	☐ D
19	☐ A	☒ B	☐ C	☐ D
20	☐ A	☐ B	☐ C	☒ D
21	☐ A	☒ B	☐ C	☐ D
22	☐ A	☒ B	☐ C	☐ D
23	☐ A	☐ B	☒ C	☐ D
24	☒ A	☐ B	☐ C	☐ D
25	☐ A	☐ B	☒ C	☐ D

SECTION A: MULTIPLE-CHOICE QUESTIONS**Question 1 B**

Oxygen would be higher at location I than location II. Food and terrestrial predators are both biotic factors.

Question 2 C

Those organisms confined would experience a more stable environment as they are always submerged. As a consequence their tolerance limits would be narrower.

Question 3 B

Seasons are circaannual. Breeding occurs at specific times throughout the year. The height of the tide increases or decreases throughout the year. Circadian rhythm occurs on a daily basis.

Question 4 D

Location II is always submerged, therefore the oxygen level would remain relatively constant. The oxygen level in location I would vary depending on the tide. The amount of oxygen would be the same in the two locations at high tide. The amount of oxygen at low tide would be much higher at location I as the amount of oxygen in air is 21% and in water is 5%.

Question 5 A

The temperature at location I would be more varied. At high tide the temperature at location I would be higher than at low tide. At high tide both locations would be a similar temperature.

Question 6 C

V is a sensory neuron, *W* is an interneuron and *Y* is an effector – a muscle.

Question 7 C

$V \rightarrow X$ has two synapses (junctions) which are chemical and transmission along neurons is electrical.

$V \rightarrow W$ is electrical and then chemical across the synapse.

$X \rightarrow Y$ is electrical and chemical.

$Y \rightarrow W$ is the wrong direction.

Question 8 C

There are three junctions, between *V* and *W*, *W* and *X* and *X* and *Y*.

Question 9 B

The kidney is responsible for the regulation of water and other substances in the blood. Excess water and wastes form urine which is stored in the bladder.

Question 10 A

Hormones are released into the blood by vesicles and are carried all around the body by the circulatory system.

Question 11 C

Response I would occur for events 2 and 5. More substance *B* would be released to absorb more water and produce concentrated urine for events 1, 3, and 4.

Question 12 C

The intact shoot tip would elongate and grow towards the light. The shoot with the tip removed would not elongate.

Question 13 A

Auxin causes elongation of cells on the side away from the light.

Question 14 C

As ethylene, released by the apples as they ripen, is removed, other fruit will ripen slower. Meat will be unaffected.

Question 15 B

The number of each species respectively is *A*: 15, *B*: 30, *C*: 6, and *D*: 1. Therefore *B* has the highest number for the given area.

Question 16 D

As it is a woodland, trees would be the dominant species, and as they would be the largest in size, they would be the smallest in number.

Question 17 C

A has two-thirds the density, *D* has twice the density and *B* has half the density.

Question 18 B

The heavily fished results are: age range of 5 years versus 8; average age of 2 versus 7; proportion of population greater than 5 years old is approximately 10% versus approximately 80%.

Question 19 B

The greatest proportion is 2 years old – approximately 40%.

Question 20 D

Nitrogen from the air is converted to nitrates which in turn make up amino acids. These are then made into proteins.

Question 21 B

The clover provides the bacteria with organic material and a space to live. The clover gains nitrate for the production of proteins.

Question 22 B

rose bush → aphid → ladybug → **blackbird**
producer first second **third-order consumer**

Question 23 C

The ladybug is a second-order consumer (see answer to **Question 22**). It is therefore also a first-order carnivore.

Question 24 A

grapevine → caterpillar → blackbird.

The blackbird is a second-order consumer/first-order carnivore.

Question 25 C

rosebush → aphid → ladybug → silver eye → hawk

SECTION B: SHORT-ANSWER QUESTIONS**Question 1 (9 marks)**

- a. the maintenance of a relatively stable internal environment with a changing external environment 1 mark
- b. brain or hypothalamus 1 mark
- c. *Any one of:*
- sweat gland: produce sweat which evaporates
 - surface capillaries: blood diverted to skin's surface
- Or any other suitable answer.* 2 marks
- d. negative feedback 1 mark
- e. i. nervous system 1 mark
information travels quickly via nerves from the CNS to the effectors 1 mark
- ii. *Any two of:*
- the nervous system:
- electrical message
 - fast
 - specific pathway
- endocrine system:
- chemical
 - slow
 - via blood
- Or any other suitable example.* 2 marks

Question 2 (7 marks)

- a.**
- i.** type of behaviour: habituation
explanation: Responding to the noise is an innate response and not responding conserves energy 1 mark
- ii.** type of behaviour: observational learning OR trial and error
explanation: The instructor's method is copied by the students OR students learn from their mistakes and improve their action 1 mark
- iii.** type of behaviour: associative learning
explanation: The dog has made the link that the wearing of the coat indicates a walk is to occur. It has linked the two events together. 1 mark
- b.** Lions chase and catch prey 1 mark
which they then kill and eat using powerful claws and sharp teeth. 1 mark
Whales filter feed, 1 mark
taking in large volumes of food to support their large size. 1 mark

Question 3 (7 marks)

- a.** leaves carried by the wind from the nearby tree 1 mark
wastes produced by birds or other animals 1 mark
Or any other suitable answer.
- b.** *Any two of:*
- wind
 - carried by birds
 - washed there from animal wastes
- Or any other suitable answer.* 2 marks
- c.** *Area A, any two of:*
- less shaded
 - hotter
 - periodic inundation of water
- Or any other suitable answer.* 2 marks
- d.** the colonisation of a barren area and the development of varied habitats 1 mark

Question 4 (6 marks)

- a. omnivore 1 mark
- b. i. Food types could include citrus or bones. 1 mark
Citrus is too acidic and may kill worms OR worms cannot physically digest bones.
Or any other suitable answer. 1 mark
- ii. suitable: made of plant material and could be digested
OR
unsuitable: inks may be poisonous
Or any other suitable answer. 1 mark
- c. *Any two of:*
• increased chance of reproduction
• particularly when numbers are limited
• a disproportionate gender balance
Or any other suitable answer. 2 marks

Question 5 (9 marks)

- a. i. the use of an organism to restrict development of another 1 mark
- ii. *Any one of:*
• calicivirus OR myxomatosis to control rabbits
• *cactoblastis cactorum* to control prickly pear
Or any other suitable answer. 1 mark
- b. *Any two of the following advantages of not using herbicides:*
• will kill other plants
• could contaminate crops
• could biologically magnify through the food chain
• are expensive
Or any other suitable answer. 2 marks
- c. The Californian thistle is native to Europe and therefore this beetle would be part of its natural ecosystem. 1 mark
- d. Hypothesis: that the beetle completes its life cycle in other species of thistles 1 mark
Experiment: Have 10 members of 4 different species. All conditions are the same, for example, water availability. Expose to beetles and determine if eggs are laid and if these develop into adult beetles. 1 mark
Results: All species produce adult beetles. 1 mark
- e. The life cycle must be completed so the beetles will continue to eat the thistles and remove the problem. 1 mark

Question 6 (6 marks)

- a. exponential 1 mark
- b. carrying capacity 1 mark
- c. $B + I = D + E$ 1 mark
- d. i. rabbits OR sheep OR any other suitable answer 1 mark
- ii. *Any two of:*
- lack of competition
 - lack of predators
 - abundance of food
 - adequate space
- Or any other suitable answer.* 2 marks

Question 7 (6 marks)

- a. carbon dioxide OR carbon monoxide 1 mark
- b. *Any two of:*
- cellular respiration OR aerobic respiration
 - fermentation
 - decomposition
- 2 marks
- c. photosynthesis 1 mark
- d. total carbon – no change as carbon only changes form 1 mark
- Reserves have depleted due to the use of coal, petrol, gas, etc. 1 mark