Neap:

Trial Examination 2012

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**

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Question 1 D

Increased metabolism is a physiological adaptation as is the rate of cellular respiration. More body fat would minimise heat loss.

Question 2 B

The kidneys contain millions of nephron, the functional unit of the kidney.

Question 3 C

The regulation, homeostasis is brought about by negative feedback (not positive feedback) to maintain substances/conditions within the tolerance limits.

Question 4 A

ADH antidiuretic hormone, is produced by the hypothalamus, released from the pituitary and acts on the kidney tubule to increase the reabsorption of water.

Question 5 C

The nervous system has neurotransmitters which are chemicals used to convey information across synapses. The responses are fast, of short duration, and messages are not carried by the circulatory system.

Question 6 B

Metabolism is an internal functioning feature of which, in this case, its lowering assists survival of the animal. Hibernation is a behavioural adaptation, an action which assists survival of an organism.

Question 7 D

The electrical action potential triggers the release of the neurotransmitter by exocytosis and it diffuses across the synaptic cleft and opens channels for the movement of sodium ions into the cell.

Question 8 A

The peacocks have associated the blue colour as a threat and therefore perceive anything of that colour as a threat and hence attack it.

Question 9 A

Ethylene causes fruit to ripen and along with abscisic acid promote leaf and fruit fall. Auxin causes cell elongation.

Question 10 B

At 10^{-4} ppm there is the highest stimulation in roots. At 1 ppm the shoots have their highest stimulation.

Question 11 B

At 10^{-2} ppm the roots are inhibited and the action of shoots is stimulatory.

Question 12 D

This is an event which occurs daily. Phototropic responses are growth responses to light and geotropic are responses to gravity. Photoperiodic responses such as leaf fall and flowering are due to a critical continuous period of darkness.

Question 13 C

Three: sea lettuce, sea grass and phytoplankton (photosynthetic plankton). Zooplankton are non-photosynthetic, being microscopic animals.

Question 14 D

Four: producers (as above), first order consumers (herbivores) such as chiton, second order consumers such as bream and third order consumers, like pelicans.

Question 15 A

The common sea star eats other animals, giant barnacle, chiton and blue mussel, all of which are herbivores (first order consumers), hence it is a second order consumer and a first order carnivore.

Question 16 D

The cattle tick, *Boophilus microplus* is a parasite which feeds on cattle, its host.

Question 17 A

The tick carries the disease *Babesia bovis* to new hosts, the cattle, hence it is a vector and the relationship is commensal.

Question 18 A

Photosynthesis produces oxygen whereas all the other processes use oxygen.

Question 19 C

Combustion produces water and carbon dioxide when oxygen combines with the fuel. Both of these contain oxygen. Methane and nitrogen do not contain oxygen. Ozone is O_3, however it is not the product of combustion.

Question 20 D

Oxygen is entering plants and animals and they are producing the same outputs as combustion; hence oxygen is being used by these organisms and water and carbon dioxide are released.

Question 21 A

Bacteria are important in all cycles as they bring about decomposition which will release these chemicals from organisms, their wastes and dead parts. Bacteria also respire and are involved in many chemical reactions such as nitrogen fixation.

Question 22 A

Both species benefit in a mutualistic relationship hence ++.

Question 23 B

In a parasitic relationship the parasite gains benefit, e.g. food (+) and the host which is used as the food source is harmed (–).

Question 24 C

A population increase via immigration and birth and decrease by emigration and death, hence these pairs must be equal if the population size is stable.

Question 25 D

The temperature varies in a random/irregular pattern. All other alternatives occur in a regular pattern.

SECTION B: SHORT-ANSWER QUESTIONS

Question 1

a. neuron 3 1 mark

b. interneurons, neuron 2 1 mark

c. increased speed of transmission 1 mark

d. **i.** *One of:*

- knee jerk
- blinking
- dropping hot objects

Or any other suitable answer.

1 mark

ii. Information only travels to the spinal cord. 1 mark

iii. *One of:*

- quicker
- unconscious

Or any other suitable answer.

1 mark

Question 2

a. *Any two of:*

- abundance of food due to increased rainfall has led to more pasture and vegetation growth
- space, the drought limited other species
- high reproduction rate, can breed quickly and out-compete other species

Or any other suitable answer.

2 marks

b. It is the use of a disease or another organism to control a pest. 1 mark

c. *Any two of:*

- can kill other animals
- can kill predators of rabbits
- can harm humans
- costly to farmers with money spent to buy pesticides

Or any other suitable answer.

2 marks

d. A suitable method would be to determine the area occupied by the Reserves in the City of Hume 1 mark

and take random samples of areas such as 100 m^2 and work out the density and hence population 1 mark

Or any other suitable method (such as capture/recapture) described.

Question 3

a. **i.** chemical 1 mark

ii. visual 1 mark

iii. visual 1 mark

b. **i.** *One of:*

- other queens are not produced so as to prevent competition for space in the hive
- to prevent confused instructions

Or any other suitable answer.

1 mark

ii. *One of:*

- the queen is sick or dying
- the hive is too crowded

Or any other suitable answer.

1 mark

c. The chemical could be extracted/artificially produced and used to attract ants. 1 mark

AND

The ants would be lured away from food OR attracted to a trap where they could not escape/be killed by a pesticide. 1 mark

Or any other suitable answer.

d. Innate behaviour is inborn/inherited/not learnt. 1 mark

AND

For example, a spider spinning a web. 1 mark

Question 4

a. *Any two of:*

- possums are able to move between properties
- ringtails feed mainly on sweeter food
- brushtails have a varied diet

Or any other suitable answer.

2 marks

b. The niche of an organism is its role in the ecosystem. 1 mark

Ringtails niche includes: its food, high sugar content; where it nests in roofs/trees; competition, brushtails for food and space. 1 mark

c. Ringtails (or brushtails) could eat the other species' food, nest where the other species breeds, over graze and hence kill vegetation, or any other suitable description. 1 mark

d. competition between brushtail possums 1 mark

possums compete, for example, for mates, breeding area and food (other examples can be accepted) 1 mark

e. Biotic factor, one of: amount of food, availability of mates, or any other suitable suggestion. 1 mark

Abiotic factor, one of: water availability, suitable nesting sites, or any other suitable suggestion. 1 mark

Question 5

a. *Any two of:*

- recycle plastics
- use alternatives to plastic bags
- use a deposit system on plastic items

Or any other suitable answer.

2 marks

b. For example, polystyrene could float on water surfaces and block waterways or plastic could choke an animal if eaten.

Or any other suitable answer. 1 mark

Question 6

a. *Any two of:*

- super high tide
- fierce storm
- earthquake

Or any other suitable answer.

2 marks

b. verbally/through stories 1 mark

c. **i.** The progressive change 1 mark

to stabilise/create a more complex ecosystem. 1 mark

ii. A sandy beach/dune is stabilised by plants which hold the soil together and allows other species to become established. 1 mark

Question 7

a. *One of:*

- mercury
- lead

Or any other suitable answer.

1 mark

b. The substances are non-biodegradable (unable to be broken down) 1 mark
and when an organism that contains them is eaten, the amount increases 1 mark

c. biological magnification/accumulation 1 mark

Question 8

a. *One of:*

- carbon dioxide
- methane
- carbon monoxide

1 mark

b. Greenhouse gases form a layer in the Earth's atmosphere. They reduce the exit of heat from the sun being radiated back to space 1 mark
and the Earth heats up. 1 mark

c. *One of:*

- solar
- hydro
- tidal
- nuclear
- geothermal
- wind

Or any other suitable answer.

1 mark

d. Trees photosynthesise and incorporate carbon from carbon dioxide in them. 1 mark
When this timber is used for buildings the carbon is locked away. 1 mark