

Use this page as an overlay for marking the multiple choice answer sheets. Simply photocopy the page onto an overhead projector sheet. The correct answers are open boxes below. Students should have shaded their answers. Therefore, any open box with shading inside it is correct and scores 1 mark.

	ONE ANSWER PER LINE		ONE ANSWER PER LINE
1	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	14	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
2	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	15	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
3	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	16	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
4	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	17	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
5	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	18	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
6	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	19	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
7	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	20	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
8	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	21	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
9	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	22	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
10	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	23	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
11	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	24	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
12	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	25	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
13	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>		

TEACHERS, PLEASE NOTE:

In marking the Exam, teachers should keep in mind that the language used in the suggested answers is sometimes more sophisticated than a student would offer, since these answers are written for teachers' information in their correction of the Exam.

*The answers suggested here might not be the only correct responses possible. Teachers must use their professional judgement in awarding marks for other answers offered. However, in accordance with the VCAA practice, students who give a correct response, and then offer a contradictory incorrect response within the same part of the question, should **not** be awarded any marks for the correct part of the response. Also in accordance with the VCAA practice, no half marks should be given.*

SECTION A - MULTIPLE CHOICE QUESTIONS (1 mark each: 25 marks)

1	C	16	B
2	B	17	B
3	A	18	C
4	A	19	A
5	C	20	D
6	C	21	C
7	D	22	D
8	B	23	D
9	D	24	B
10	B	25	C
11	A		
12	A		
13	C		
14	D		
15	C		

SECTION B - WRITTEN RESPONSES**Question 1**

- a Sensory neuron or afferent neuron. 1 mark
- b The finger tips (1). The number of nerve endings is greater in the finger-tips per unit area. The receptors could be more sensitive in the finger-tips. The receptors may be nearer the surface of the skin. (Anything reasonable for one mark) 2 marks
- c People tend to use their finger-tips to feel their surroundings or feel small objects more than the other areas. 1 mark
- d This is a simple reflex action pathway (1) or reflex arc. Because the pathway does not go to the brain or there is only one synapse in the CNS, the individual is able to respond much faster and this is important for survival (1). 2 marks

Total Question 1: 6 marks**Question 2**

- a A cold environment with snow in the winter because it changes its coat colour to white for camouflage (1) and it has a small surface to volume ratio to reduce heat loss (1). 2 marks
- b Large ears, long legs, long thin body. (Any two for two marks) 2 marks
- c The large ears with veins close to the surface would enable heat to be lost to the surroundings helping to keep the animal cool. **Or** Long skinny legs keeps the animal off the hot ground so lessens heat gain from the hot ground. **Or** Long thin body has a large surface to volume ratio to increase heat loss. 1 mark

Total Question 2: 5 marks

Question 3

- a Submerged in water and out of water .
Temperature cooler when covered by water and higher when out of water.
Light and dark.
The availability of oxygen when covered with water is less than when exposed to air.
(Any two for 2 marks) 2 marks
- b The buoyancy of the water supports the cirri. **Or** The current of the water would bring food to the cirri. 1 mark
- c i Adherence firmly to the rock:
prevents drying out.
makes it more difficult for predators to remove.
makes it more difficult for them to be washed out to sea. (Any two for 2 marks) 2 marks
- ii Not able to move to seek for food if conditions become unfavourable or seek for mates. 1 mark
- d The area higher up the rocks is outside the tolerance range of *Balanus balanoides* (1). The *Chthamalus stellatus* has a wider tolerance range, covering the area occupied by *Balanus balanoides* right up to the high-tide level (1). 2 marks
- e The *Balanus balanoides* cannot grow higher on the rocks because the exposure for longer out of water is outside its tolerance range so it is restricted to the lower levels (1). The *Chthamalus stellatus* is able to grow over the total area but does not grow at the lower level because it is unable to compete with *Balanus balanoides* (1). 2 marks
- f These animals need to mate to exchange sperm one to another and this is only possible by being very close together.
Being close enables them to trap water between them therefore lowering the possibility of drying out when out of water.
Beating of many cirri may create substantial currents, therefore more food and/or oxygen can pass over the barnacles. (Any two for 2 marks) 2 marks

Total Question 3: 12 marks**Question 4**

- a Territorial behaviour. 1 mark
- b Food supply is near to home.
Young are protected and can feed close to home.
Those that are genetically fit will have a territory and breed.
Natural spacing of groups.
Once territories are established there is less conflict between individuals.
(Any three for 3 marks) 3 marks
- c The quolls have no chance to learn to avoid the toads as they are killed on their first eating. 1 mark
- d The ecologists were trying to condition the quolls to avoid eating the cane toads by making them associate eating them with unpleasant consequences. (operant conditioning) 1 mark
- e This behaviour is learned (1). Learned behaviour is behaviour that is modified by experience.
The innate behaviour, to eat the toad, has been changed so that they now avoid the toads and not eat them, i.e. the behaviour is learned (1). 2 marks
- f Once these quolls have had their behaviour modified it is for the whole of their life, therefore scientists can be confident that the quolls would not try and eat the toads and would survive. 1 mark
- g Innate behaviour is genetically determined and can be passed down to offspring (1). This behaviour is learned and so cannot be passed down genetically to offspring (1). 2 marks

Total Question 4: 11 marks**Question 5**

- a i The thorns on the leaf would protect it from possible attack by fish from below. 1 mark
- ii The notch on the leaf would enable rain water to drain away so that the weight of this water does not sink the leaf. 1 mark
- iii The amount of respiratory gases is much less in water than in air, therefore the stomata are on the upper surface in contact with the air so as to maximise the amount of gases entering the leaf. 1 mark
- b Mutualism as both benefit **Or** the beetle is the pollinator of the lily. 1 mark

- c Aerobic respiration. 1 mark
- d The heat attracts the beetles as it provides a warmer environment than the surroundings, enabling them to be more active. 2 marks
The higher temperature would mean that the scent given off by the flower would become more volatile and move further away.
Enzyme activity would increase at higher temperature enabling the petals to close quickly. (Any two for 2 marks)
- e The beetle would not waste time going to purple flowers as there is no food there, but would be directed towards rewarding flowers and so save time and energy when foraging. Or Information for pollinators that there is no food available at the purple flowers will direct the beetles to the white flowers where they can pollinate. 1 mark
- Total Question 5: 8 marks**

Question 6

- a This suggests that the element mercury undergoes bioaccumulation along the food chain. 1 mark
- b *Erythemis simplicicollis* → *Lepomis macrochirus* → *Pomoxis annularis* → *Micropterus salmoides* 1 mark
- c The heavy metals and their compounds are not biodegradable and so remain in the food chain (1). The biomass of the organism decreases along the food chain, therefore, as the concentration of the heavy metals remains their concentration will increase as the chain goes along to higher order consumers (1). 2 marks
- Total Question 6: 4 marks**

Question 7

- a Primary succession. 1 mark
- b The climax community. 1 mark
- c Each organism changes the environment to make it suitable for another community (1) and as a result makes it unsuitable for its own continued existence, and therefore there is a change in species composition over time. 2 marks
- Total Question 7: 4 marks**

Total Section B: 50 marks

Total Exam: 75 marks

marks

END OF SUGGESTED SOLUTIONS