



STAV Publishing 2009

BIOLOGY

Unit 3

Trial Examination

SOLUTIONS BOOK

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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 checked="" type="checkbox"/> <input checked="" type="checkbox"/>	14	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
2	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	15	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
3	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	16	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
4	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	17	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
5	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	18	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
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9	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	22	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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11	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	24	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
12	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	25	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
13	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input 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	A	16	A
2	B	17	C
3	B	18	A
4	C	19	D
5	B	20	B
6	B	21	C
7	A	22	D
8	D	23	C
9	C	24	A
10	D	25	B
11	D		
12	C		
13	D		
14	B		
15	C		

SECTION B - WRITTEN RESPONSES**Question 1**

- a Isotonic (1) as there are the same number of dissolved particles in solution on both sides of the membrane (1). 2 marks
- b The glucose concentration would have risen on side A and gone down on side B to become equal on both sides (1). 1 mark
- c The sucrose concentration would become less on side A and more on side B (1) because water would have moved by osmosis (1) from areas of low concentration of total solutes (side B) to areas of high concentration (side A). 2 marks

Total Question 1: 5 marks**Question 2**

- a Mouse would increase (1) crayfish would decrease (1). 2 marks
- b With a decrease in temperature the mouse needs to maintain its internal body temperature (1) so it will do this by increasing its metabolic rate and oxygen consumption (1). The crayfish follows the external environmental temperature (1) and as its temperature drops its rate of metabolism drops and hence its oxygen consumption drops (1). 4 marks

Total Question 2: 6 marks

Question 3

- | | | |
|---|---|---------|
| a | A, B and E (any 2 for 2 marks) | 2 marks |
| b | ACT GCC CTG TGG GGC AAG | 1 mark |
| c | Photosynthesis | 1 mark |
| d | Carbon dioxide | 1 mark |
| e | Glucose | 1 mark |
| f | Glucose | 1 mark |
| g | Adenosine triphosphate | 1 mark |
| h | These vaporized molecules could attract insects for pollination (or could deter predators). | 1 mark |

Total Question 3: 9 marks

Question 4

- | | | |
|---|---|---------|
| a | Pheromones | 1 mark |
| b | The molecule once bound could set up a signal transduction pathway that would amplify the response. | 1 mark |
| c | Could release a synthetic pheromone throughout a crop, thus confusing the male moths and preventing them from finding a female to mate with. Or could place the pheromones in traps and trap the insects. This gives an indication of population increases and enables farmers to prepare insect management techniques. (Anything sensible for 2 marks). | 2 marks |

Total Question 4: 4 marks

Question 5

- | | | |
|---|---|---------|
| a | Cytotoxic T cells (1) as these are the cells that are involved in attacking cells recognized as non-self (1). | 2 marks |
| b | Oxygen and nutrients need to pass into the cells (1) and carbon dioxide, waste products and insulin need to pass out of these cells (1). | 2 marks |
| c | As the receptor sites on these foreign cells are not exposed to and in direct contact with the cytotoxic T cells the cytotoxic T cells will not be able to destroy them. | 1 mark |
| d | Ribosomes on the rough endoplasmic reticulum. | 1 mark |
| e | Exocytosis (as the insulin molecule is a large protein molecule.) | 1 mark |
| f | In exocytosis the membrane of the vesicle containing the insulin molecule fuses with the plasma membrane of the cell and the contents can then be released from the cell which requires energy (1). The insulin molecule passes through fixed pores in the alginate coat via diffusion which is passive) (1). | 2 marks |
| g | Paracrine molecules act locally (1), endocrine molecules are released into the blood supply (1). | 2 marks |
| h | The insulin from pigs must have the same structure or be similar enough in structure to human insulin to enable it to bind to receptors on the cell membrane. | 1 mark |
| i | Signal transduction. | 1 mark |

Total Question 5: 13 marks

Question 6

- | | | |
|---|---|---------|
| a | B cells or B lymphocytes. | 1 mark |
| b | Mast cell. | 1 mark |
| c | Once the allergen and the IgE antibodies have bound to the mast cell, the mast cell releases histamine (1). The release of histamine brings about an allergic response such as swelling, itchiness, watering of the eyes (1). | 2 marks |

Total Question 6: 4 marks

Question 7

- a **T Y X W R Z S** 1 mark
- b Synapse 1 mark
- c Acetylcholinase would breakdown the neurotransmitter acetylcholine. 1 mark
- d If the action of acetylcholinesterase was blocked the neurotransmitter acetylcholine would not be broken down. 1 mark

Total Question 7: 4 marks

Question 8

- a Viruses contain nucleic acid; prions are misshapen proteins with no nucleic acid. 1 mark
- b Rational drug design is construction of a drug to fit or alter the active site of a molecule so that the natural action of the molecule cannot occur. 1 mark
- c Take two healthy groups of laboratory mice that are susceptible to malaria (1).
Inject one group with the vaccine and leave the other (1).
After one month inject both groups with the parasite.
If the vaccine is effective the control group without the vaccine should show symptoms of malaria due to GPI and the vaccinated group should not as they will have developed antibodies against GPI (1). 3 marks

Total Question 8: 5 marks

Total Section B: 50 marks

Total examination: 75 marks

END OF SUGGESTED SOLUTIONS