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BIOLOGY
Unit 3
Trial Examination

SOLUTIONS BOOK

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SEMESTER 1

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 marked their answers with a cross. Therefore, any open box with a cross inside it is correct and scores 1 mark.

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

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

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

SECTION B - WRITTEN RESPONSES

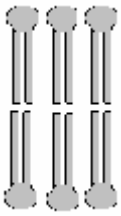
Question 1

a *Carbon, hydrogen and oxygen. (All three correct for one mark)* *1 mark*

b *Phospholipid* *1 mark*

c *They are charged or polar at one end making it hydrophilic at that end (1) and they are non-polar at the other end making them hydrophobic at that end (1).* *2 marks*

d



1 mark

e *The tissue fluid outside the membrane is water-based and therefore polar and the liquid making up the cell cytosol is also water-based and therefore polar (1) so the phospholipid molecules orientate themselves in the bilayer so that their polar ends are in both these polar liquids (1).* *2 marks*

Total Question 1: 7 marks

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Question 2

a	*The receptor will have a specific shape that enables the odorant molecule to bind to it.*	*1 mark*
b	*Signal Transduction.*	*1 mark*
c	*Structure X is a protein channel for sodium ions.*	*1 mark*
d	*Diffusion*	*1 mark*
e	*Each receptor is a specific shape that is genetically determined (1). Odorant molecules will only attach to specific receptors therefore humans can distinguish between different odours (1).*	*2 marks*
f	*cAMP causes the sodium channel to open. If cAMP is not formed then the sodium channel will not open (1). If the sodium ions do not enter the neuron, there is no action potential therefore no message to the brain about the particular odour (1).*	*2 marks*
g	*A negative feedback is described as a feedback that results in a change in the stimulus in the opposite direction (1). As the stimulus (the amount of odour molecules) remains the same this is not a negative feedback (1).*	*2 marks*
	Total Question 2:	***10 marks***

Question 3

a		*Monosaccharides*	*1 mark*
b	*i*	*A competitive inhibitor is one that binds reversibly to the active site of the enzyme and therefore competes with the substrate.*	*1 mark*
	ii	*A non-competitive inhibitor is one that binds irreversibly to a part of the enzyme other than the active site and prevents the enzyme from working effectively.*	*1 mark*
c		*The concentration of the enzyme, the temperature and the amount of inhibitor added.*	*2 marks*
d		*As the concentration of the substrate (ONPG) increases the activity of the enzyme increases (as shown by increased absorbance) (1). This indicates that the inhibitor is competitive as stated in the information (1).*	*2 marks*
e		*This is a control to show the action of the enzyme without the inhibitor and to demonstrate that the enzyme is still active at the end of the experiment.*	*1 mark*
f		*As the enzyme is a biological substance that can cause allergies, care must be taken to avoid skin and eye contact so gloves and eye goggles should be worn.*	*1 mark*
		Total Question 3:	***9 marks***

Question 4

a	*Platelets fibrinogen fibrin*	*3 marks*
b	*Bacteria that have entered the body with the injury are walled off and prevented from penetrating further into the body by the blood clot thus keeping the infection localized.*	*1 mark*
c	*Streptokinase by activating plasminogen to active plasmin will cause the blood clots to break down enabling the bacteria to spread.*	*1 mark*
d	*Streptokinase would be an enzyme (1) as it brings about the chemical reaction of the conversion of plasmin to plasminogen. (1)*	*2 marks*
e	*The action of streptokinase is an enzymatic one with plasminogen as the substrate (1). The enzyme substrate reaction is quite specific so the mouse plasminogen must be different enough from human plasminogen that the streptokinase cannot catalyse the reaction to plasmin in the mouse (1).*	*2 marks*
f	*Streptokinase is a foreign protein (1) and as such will trigger the immune system resulting in the body forming antibodies against it (1).*	*2 marks*
g	*Once the person has been injected with the foreign protein, streptokinase, they will form B memory cells that have the ability to form antistreptokinase antibodies (1). When the person receives a second injection the B memory cells will be activated to produce antistreptokinase antibodies with a greater response destroying the streptokinase before it could work (1).*	*2 marks*
	Total Question 4:	***13 marks***

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Question 5

a	*Protein*	*1 mark*
b	*A type of antibody.*	*1 mark*
c	*Plasma cells.*	*1 mark*
d	*Mast cells are fixed cells found in connective tissue, in the lungs, around blood vessels and near the lining of the intestine. (Any one for one mark)*	*1 mark*
e	*The IgE against the peanut antigen binds to a mast cell (1). When the person takes in the peanut antigen, cross links between the IgE antibody on the mast cell and the antigen form. This causes the mast cell to release histamine (1). The release of histamine brings about the allergic response (1).*	*3 marks*
f	*Not necessarily as the amount of IgE present does not necessarily correlate with the severity of an allergic response. An individual may have a high IgE and yet not have a severe response to the allergen.*	*1 mark*
g	*The formation of specific IgG antibodies as a response to an allergen means that as soon as the allergen is introduced the IgG will react with it (1) and prevent it from binding to the IgE and triggering the allergic response (1).*	*2 marks*
h	*Peanut allergy is potentially fatal even when only small doses are used so doctors are not willing to risk this approach to peanut allergies.*	*1 mark*

Total Question 5: 11 marks
Total Section B: 50 marks
Total examination: 75 marks

END OF SUGGESTED SOLUTIONS

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