

BIOLOGY

Unit 3

Trial Examination

SOLUTIONS BOOK

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

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

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

SECTION B - WRITTEN RESPONSES**Question 1**

- a Cell wall – B: Golgi body – E 2 marks
- b Cellulose 1 mark
- c Gives mechanical support to plant tissue. 1 mark
- d Cell Vacuole 1 mark
- e Osmosis 1 mark
- f Because of the movement of water into the vacuole by osmosis, this creates osmotic pressure (1) which is responsible for the rigidity of the plant (1). 2 marks

Total Question 1: 8 marks**Question 2**

- a The rate of photosynthesis decreases with increasing distance of the light source or with decreasing light intensity. 1 mark
- b There are no controls as such but the same plant is used, the water is unchanged, the temperature should remain the same. 1 mark
- c Gaseous oxygen is produced as a result of photosynthesis (1). The greater the rate of photosynthesis, the more oxygen will be produced per unit time (1). 2 marks
- d The plant uses O₂ for respiration (1). If the rate of respiration varies and the plant uses more oxygen, then the amount of oxygen produced will not be a direct measure of the rate of photosynthesis (1). 2 marks

- e Any reasonable answer: Accurately collect the volume of oxygen gas given off per unit time. Insert a beaker of water between the light source and the plant so as to minimize any increase in temperature due to the heating effect of the light. 1 mark
- f $\frac{1}{4}$ the rate seen before the light was moved. 1 mark
- g The experiment needs to equilibrate to a steady rate before accurate measurements can be made. 1 mark
- h Photosynthetic rate increases with increase in temperature within a physiological range, (1) therefore she should expect a faster rate of reaction at the higher temperature (1). 2 marks
- i The production of gas would level off at a particular maximum light intensity (1) because light is no longer a limiting factor (1). 2 marks
- Total Question 2: 13 marks**

Question 3

- a β cells (in the Islets of Langerhans.) 1 mark
- b During digestion of a meal, glucose is produced and is absorbed into the bloodstream. Insulin is needed so that the glucose can be absorbed into cells. 1 mark
- c Glucagon brings about the release of glucose into the bloodstream from liver cells, (1) and this is not required after a meal when glucose is readily available from the intestine (1). 2 marks
- d By slowing down the emptying of the stomach, the concentration of glucose in the bloodstream is more controlled, as the rate of absorption of glucose is lower. 1 mark
- e With exendin-4 injections, insulin will only be produced when glucose levels are high (1), whereas straight insulin injections could bring about hypoglycaemia if injected when glucose levels are low (1). 2 marks
- f Exendin-4 is a polypeptide and could be broken down by proteinases in the digestive system if given orally. 1 mark
- Total Question 3: 8 marks**

Question 4

- a By keeping underground during the day and thus avoiding the heat, (1) the kangaroo rat will not lose as much water trying to keep cool by evaporation (1). 2 marks
- b If a mammal has a water content higher than the relative humidity of their environment, then they will lose water to their environment, the water content of the kangaroo rat at 66% means that the kangaroo rat can minimize its evaporative water losses. 1 mark
- c $C_6H_{12}O_6 + 6O_2 \rightarrow 6H_2O + 6CO_2 + \text{energy}$ 1 mark
- d These nasal passages have a very large surface area (1) thus maximizing the amount of water that can condense on the surface area (1). 2 marks
- Total Question 4: 6 marks**

Question 5

- a A virus is an infectious particle, consisting of genetic material surrounded by a protein coat. 1 mark
- b A fever is a raised body temperature (1) due to the resetting of the body's "thermostat" (1). 2 marks
- c Any two of: increased metabolic rate, constriction of surface blood vessels, shivering. 2 marks
- d The virus is spread by droplets from one person to another (1), by isolating those infected or suspected of infection ie quarantine them, the virus cannot spread to a new host (1). 2 marks
- Total Question 5: 7 marks**

Question 6

- a *Phagocytosis. (Accept endocytosis)* 1 mark
- b *Cell mediated immunity or cellular immunity.* 1 mark
- c *The binding of the T helper cells stimulates B cells to differentiate into plasma cells that form antibodies or T cells differentiate into cytotoxic T cells or T memory cells. (Any one for 1 mark)* 1 mark
- d *Auto immune disease* 1 mark
- e *A vaccine is a suspension of weakened, dead or fragments of microbes that when injected stimulate the immune system to produce specific antibodies.* 1 mark
- f *The fragment of surface peptide when injected into the body acts as an antigen or foreign body (1). This results in antibodies being formed against this peptide (1). As the peptide is present on the errant T cells, these will be attacked by the body's immune system thus preventing them from attacking the myelin sheaths (1).* 3 marks

Total Question6: 8 marks

Total Section B: 50 marks

Total examination: 75 marks