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

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

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

SECTION B - WRITTEN RESPONSES**Question 1**

- a Adenosine tri phosphate 1 mark
- b $C_6H_{12}O_6 + 6O_2 + 36 ADP + 36 P \rightarrow 6CO_2 + 6H_2O + 36ATP$ 2 marks
- c In the cytosol of the cell. 1 mark
- d 36 ATP 1 mark
- e CO_2 from aerobic respiration is easy to breathe out, whereas the body needs to breakdown lactic acid that could be toxic. 1 mark
- f A competitive inhibitor is one that binds to the active site of the enzyme in competition with the normal substrate. 1 mark
- g As the cyanide acts as a competitive inhibitor it will bind to the enzyme in the electron transport chain (1) and thus restrict the amount of ATP produced by the cell (1) leading to cell death and then cow death. 2 marks

Total Question 1: 9 marks

Question 2

- a An effector is a muscle or gland that responds to a stimulus (1). The anterior pituitary is an effector as it responds to the stimulus of GHRH by producing GH (1). (Other glands or the liver in the diagram are also examples with the relevant explanation.) 2 marks
- b This is a control mechanism in homeostasis whereby a change in the stimulus is detected that results in a response that brings about a decrease in the stimulus. 1 mark

- c *The hypothalamus releases GHRH that stimulates the anterior pituitary to produce GH. As the level of GH increases above a certain level (1) this has a negative effect on the hypothalamus causing it to stop producing GHRH. The anterior pituitary stops producing GH and the level of GH goes down (1).* 2 marks

Total Question 2: 5 marks

Question 3

- a *Hyperglycaemia is an elevated blood glucose concentration above the norm.* 1 mark
- b *A hormone.* 1 mark
- c *Cell receptor molecules are mainly protein because the receptor molecules have to be of a specific shape in order for the substance eg insulin to attach (1). The amino acids making up protein can be arranged in so many different ways that the proteins can result in a variety of shapes (1).* 2 marks
- d *Patient A would be the most likely diabetic as this person starts off with a higher level of glucose in the blood stream after fasting (1) and the glucose level does not drop down after a couple of hours, indicating insulin is not active (1).* 2 marks
- e *The enzyme glucose oxidase is specific at its active site for the glucose molecule (1). Other sugars as substrates will not be able to fit into the active site of glucose oxidase as they do not have the same shape (1).* 2 marks

Total Question 3: 8 marks

Question 4

- a *Because the total salt concentration of sea water is greater than that of the cells of the roots (1) water will tend to leave the cells of the root by osmosis making it difficult for the plant to take up water by osmosis (1).* 2 marks
- b *Transpiration* 1 mark
- c *The leaves are small, therefore they will have a smaller surface area and fewer stomata where water can be lost (1). The leaves hang vertically and are not presenting a large surface area to the heat of the sun thus lowering evaporation (1).* 2 marks
- d *These stomata are sunken in and not at the leaf surface (1). The atmosphere in the substomatal space will become saturated with water vapor thus reducing the rate of evaporation (1).* 2 marks
- e *The salt exclusion mechanism must be a physical barrier and not an active process requiring energy (1) as the scientists used metabolic inhibitors preventing the plant producing energy but the plant still excluded the salt (1).* 2 marks
- f (i) *Their function would be to absorb oxygen.* 1 mark
- (ii) *The mangrove roots grow in waterlogged soil. Water contains less oxygen than air (1) therefore the lenticels that are exposed to air are able to absorb the extra oxygen (1).* 2 marks

Total Question 4: 12 marks

Question 5

- a *Prions* 1 mark
- b *Normal proteins are denatured by heat of only about 60 °C whereas these infective proteins are not destroyed by heat treatment as high as 138 °C.* 1 mark
- c *All other infective agents that are capable of reproduction contain nucleic acids in the form of DNA or RNA that is essential for reproduction (1). These infective agents are only made up of protein so some scientists do not believe that as such they are capable of reproduction (1).* 2 marks
- d *Formation of antibodies against the pathogen.* 1 mark
- e *In order to trigger an immune response, the body has to recognize the infective agent as foreign (1). These infective proteins are not recognized as foreign by the body (1).* 2 marks

Total Question 5: 7 marks

Question 6

- a *Eukaryotic cells are cells that contain a membrane bound nucleus (1). Plasmodium is a protozoa and protozoas are eukaryotes (1).* 2 marks
- b
- *The female mosquito acts as a vector for the parasite to go from host to host (1).*
 - *Fertilisation of the gametes only occurs in the body of the female mosquito (1).* 2 marks
- c *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
- d *The plasmodium takes on several different forms, probably with different antigenic surface proteins (1) therefore a vaccine that protects against one form of the parasite may not protect against another form (1).*
- or*
- The parasites are mostly inside cells in the human (1) so they are protected from the immune system and a vaccine would create antibodies that couldn't reach the parasites (1).* 2 marks
- e *The injection of the foreign proteins in the vaccination act as an antigen causing the proliferation of specific B cells that can form plasma cells that produce antibodies (1). Some of these B cells form B memory cells that can survive for many years and will react immediately to form antibodies if the person is infected with the malarial parasite thus giving the person protection (1).* 2 marks

Total Question 6: 9 marks

Total Section B: 50 marks

Total examination: 75 marks

END OF SUGGESTED SOLUTIONS