

Trial Examination 2011

## VCE Biology Unit 1

Written Examination

### Suggested Solutions

#### SECTION A: MULTIPLE-CHOICE QUESTIONS

1	<input type="checkbox"/> A	<input type="checkbox"/> B	<input checked="" type="checkbox"/> C	<input type="checkbox"/> D
2	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input checked="" type="checkbox"/> D
3	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
4	<input checked="" type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
5	<input type="checkbox"/> A	<input type="checkbox"/> B	<input checked="" type="checkbox"/> C	<input type="checkbox"/> D
6	<input type="checkbox"/> A	<input type="checkbox"/> B	<input checked="" type="checkbox"/> C	<input type="checkbox"/> D
7	<input checked="" type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
8	<input type="checkbox"/> A	<input type="checkbox"/> B	<input checked="" type="checkbox"/> C	<input type="checkbox"/> D
9	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
10	<input checked="" type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
11	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input checked="" type="checkbox"/> D
12	<input type="checkbox"/> A	<input type="checkbox"/> B	<input checked="" type="checkbox"/> C	<input type="checkbox"/> D

13	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input checked="" type="checkbox"/> D
14	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
15	<input checked="" type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
16	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
17	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
18	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
19	<input checked="" type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
20	<input checked="" type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
21	<input type="checkbox"/> A	<input type="checkbox"/> B	<input checked="" type="checkbox"/> C	<input type="checkbox"/> D
22	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input checked="" type="checkbox"/> D
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24	<input type="checkbox"/> A	<input type="checkbox"/> B	<input checked="" type="checkbox"/> C	<input type="checkbox"/> D
25	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D

**Question 1            C**

The protein channel/carrier protein acts as the lock.

**Question 2            D**

The bronchi are muscular tubes, carrying air to the lungs, whilst the trachea is part of the airway (it is unable to dilate due to the cartilaginous rings). The oesophagus is part of the digestive system and the alveoli are air sacs.

**Question 3            B**

Enzymes bind to substrates but neither acts as an agonist/antagonist. Glucose enters by facilitated diffusion/active transport. The inhaler acts as an agonist.

**Question 4            A**

Small molecules such as water and oxygen pass through the pores of the membrane by diffusion. Active transport occurs through the protein channels and both exocytosis and pinocytosis are bulk transport through the membrane.

**Question 5            C**

Plant material has relatively small amounts of cholesterol whereas animal products have larger amounts.

**Question 6            C**

Cholesterol in the form of bile, assists digestion, is also produced by the liver, is removed by the liver and removed from the body via faeces. LDL form steroids, e.g. testosterone.

**Question 7            A**

Starch which is made up of many glucose molecules would yield an enormous amount of ATP and hence energy per molecule.

**Question 8            C**

Chloroplasts contain chlorophyll, which is indicated by the dark banding. This is absent in mitochondria, and ribosomes are not membrane bound or visible under a light microscope.

**Question 9            B**

Photosynthesis, using light and carbon dioxide produces oxygen (W) and glucose. Starch could also be produced, however glycogen is only produced in animal cells.

**Question 10           A**

Cells in an adult's brain do not undergo mitosis, nor do red blood cells. Meiosis occurs in testes.

**Question 11           D**

The cell cycle only represents mitosis. After nuclear division occurs, cytokinesis separates the cytoplasm. The rest of the cycle represents interphase and DNA replication occurs in the S phase.

**Question 12           C**

The cell is undergoing mitosis, as the chromosomes are visible and have been separated (anaphase).

**Question 13      D**

Phospholipids contain phosphorus but not nitrogen. Amino acids contain nitrogen but not phosphorus. Carbohydrates do not contain either.

**Question 14      B**

Gases enter and exit through Z, not light. Oxygen would leave during the day when photosynthesis would be occurring and this process would be influenced by the ability of gases to enter.

**Question 15      A**

Light would be able to pass through the cell and be absorbed by other cells and used in photosynthesis. They would be very different to skin cells, which lack cell walls. The guard cells regulate water loss.

**Question 16      B**

The water is used in photosynthesis and is carried via the xylem by the transpiration stream.

**Question 17      B**

No valves are present in capillaries.

**Question 18      B**

The pulmonary vein carries blood directly from the lung having previously passed through the vena cavae, right atrium (right ventricle) and pulmonary artery.

**Question 19      A**

As fish produce ammonia that is highly soluble, large amounts of water are used to excrete this waste and hence the urine is dilute.

**Question 20      A**

Uric acid is excreted by reptiles and birds. Ammonia is excreted by fish and amino acids are the source of the nitrogenous waste.

**Question 21      C**

Of the responses provided only amino acids contain nitrogen.

**Question 22      D**

The nose contains hairs not cilia. Bronchioles are muscular tubes and alveoli are air spaces, both lacking this feature.

**Question 23      A**

As the blood passes by, it maintains the diffusion gradient by carrying oxygen from, and carbon dioxide to, the alveoli. The other features assist diffusion.

**Question 24      C**

Plasma carries dissolved nutrients such as glucose; platelets are involved in blood clotting; white blood cells are involved in the immune response.

**Question 25      B**

These are both asexual, the exchange of genetic material does not occur and mitosis makes genetically identical copies.

**SECTION B: SHORT-ANSWER QUESTIONS****Question 1**

- a. The cell may have come to the end of its life or may no longer be needed. 1 mark
- b. i. To fight infection. 1 mark
- ii. Red blood cells (*any one of*):
- lack a nucleus
  - are bi-concave in shape 1 mark
- c. i. *Any one of*:
- increased magnification
  - greater resolution 1 mark
- ii. *Any two of*:
- easier to use
  - cheap
  - view images in colour
  - view living material 2 marks
- Total 6 marks

**Question 2**

- a. i. type 2 1 mark
- ii. glucose + oxygen → carbon dioxide + water + energy 2 marks
- 1 mark for reactants, 1 mark for products*
- b. lactic acid 1 mark
- c. *Three of*:
- nucleus
  - cytoplasm
  - ribosomes 3 marks
- d. mitochondria 1 mark
- e. *Any one of*:
- size, it is much larger
  - membrane bound organelles, present in this cell 2 marks
- Total 10 marks

**Question 3**

- a. Active transport, facilitated diffusion and exocytosis. 2 marks  
 These processes require living and functioning plasma membrane. 1 mark
- b. i. osmosis 1 mark  
 ii. The movement of water from a region of low solute concentration to a region of high solute concentration 1 mark  
 through a semipermeable membrane. 1 mark
- Total 6 marks

**Question 4**

- a. valve 1 mark  
 Valves maintain blood flow in one direction. 1 mark
- b. The ventricle 1 mark  
 as it is pumping blood to the lungs and body whereas the atria receives blood. 1 mark
- c. vein 1 mark
- Total 5 marks

**Question 5**

- a. I – mouth  
 III – stomach  
 V – pancreas 2 marks
- b. i. To increase the rate of naturally occurring reactions. 1 mark  
 ii. Different parts of the digestive system have different pH and enzymes are specific for pH. 1 mark
- c. IV – liver 1 mark  
 To produce bile for the emulsification of fat. 1 mark  
 VI – small intestine 1 mark  
 To produce digestive enzymes to complete digestion OR primary place of absorption. 1 mark
- Total 8 marks

**Question 6**

- a. Any two of:  
 • the rim of the pitcher  
 • odours  
 • the liquid in the pitcher 2 marks
- b. To prevent water entering the pitcher and hence slowing digestion. 1 mark
- c. Humans have (*any two of*):  
 • a more constant temperature  
 • specific areas  
 • mechanical digestion. 2 marks
- Total 5 marks

**Question 7**

- a. Three 1 mark
- b. House cat and fishing cat 1 mark  
as they are both in the same genus. 1 mark
- OR
- Wolf and dog 1 mark  
as they are both in the same genus. 1 mark
- c. They would both be in the same class and phylum 1 mark  
as they all have hair (so mammals) and have a nerve tube/backbone (so chordates). 1 mark
- d. Scientific names are
- universal
  - in latin so do not change
  - not open to misinterpretation through translation.

2 marks

*2 marks for any two of the above features*

Total 7 marks

**Question 8**

- a. A hypothesis is a statement which can be tested. 1 mark
- b. A controlled experiment should usually have one variable 1 mark  
and all other factors are controlled. 1 mark

Total 3 marks