Neap:

Trial Examination 2016

VCE Biology Unit 1

Written Examination

Suggested Solutions

SECTION A: MULTIPLE-CHOICE QUESTIONS

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

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

Question 1 C

X has ribosomes on its surface – hence it is the rough endoplasmic reticulum, not smooth. Y is not interconnected so it is not the smooth endoplasmic reticulum and it has a vesicle forming.

Question 2 A

W is a mitochondria and both cells, plant (cell 1) and animal (cell 2), undergo aerobic respiration.

Question 3 C

Proteins are synthesised in the rough endoplasmic reticulum (X).

Question 4 A

V is a chloroplast; this is where light, energy and water are used to fix carbon from carbon dioxide into glucose.

Question 5 D

As the concentration of glucose has reduced to almost 0 in region II and the concentration of glucose in the capillary is 15 mmol, the glucose has been moved against the concentration gradient. Both facilitated diffusion and diffusion move substances with the concentration gradient.

Question 6 B

Osmosis is the movement of water from a region of low-solute concentration to a region of high-solute concentration through a semipermeable membrane.

Question 7 C

Glucose is an energy-rich compound which, in the presence of oxygen, produces ATP.

Question 8 A

Both processes require glucose as the energy source for a reaction which is catalysed by enzymes. Carbon dioxide is a product of aerobic respiration and anaerobic fermentation in yeast, for example.

Question 9 B

Prokaryotes – for example, bacteria – lack membrane-bound organelles and therefore do not have mitochondria or chloroplasts. Ribosomes, which they do have, synthesise proteins.

Question 10 B

Only cell 2, a guard cell, has chloroplasts. The epidermal cells (cell 1) are translucent, allowing light to pass through. Cell 3 (xylem) is dead, and cell 4 (a root hair cell) is underground.

Question 11 D

Root cells have a large surface-area-to-volume ratio and are part of the plant's epidermis.

Question 12 B

The guard cells make up stomata, which open to allow gas exchange and close when water loss is too great. The epidermal cells (cell 1) are unable to regulate water loss, however they are able to reduce water loss.

Question 13 C

Transpiration stream is the movement of water through the plant. Transpiration is the loss of water from a plant's surface.

Question 14 B

The whole pathway illustrates homeostasis. Positive feedback is not a component of homeostasis. A reflex arc is part of the nervous system. Positive feedback is not a component of homeostasis. A reflex arc is part of the nervous system.

Question 15 D

The liver would store glycogen, the pancreas releases insulin and excess glucose would be converted and stored as fat.

Question 16 A

Glucagon is produced to raise blood glucose levels. ADH is produced to increase absorption of water. Adrenalin is released in response to fright.

Question 17 C

The hypothalamus is not involved in this pathway, nor are the kidneys. The liver is not an endocrine gland.

Question 18 B

The binomial nomenclature of scientific names gives the species name, *Banksia prionotes*, where the first word is the genus and the second word is descriptive.

Question 19 C

Both organisms benefit – the banksia has its flowers pollinated and the honeyeater gains nutrition.

Question 20 B

The parasite gains benefit; for example, food (+), and the host is harmed (–).

Question 21 A

There are no producers. No organisms undergo photosynthesis or chemosynthesis.

Question 22 D

The bats are insectivores. The insects eat plants, which gain their energy from the Sun via photosynthesis.

Question 23 B

The guano mites and Uropididae mites compete for the same food source, the fungi.

Question 24 C

The Murray River would separate the populations from New South Wales. The existing populations near Echuca are too far apart for breeding to occur naturally.

Question 25 A

Birth rate and immigration will increase a population. Emigration, death rate and disease will decrease a population.

SECTION B: SHORT-ANSWER QUESTIONS

Question 1 (7 marks)

a. **i.** bacteria (**I**) and cyanobacteria (**II**) 1 mark

ii. *Any two of the following in regards to prokaryotes:*

- They lack membrane-bound organelles.
- They lack specifically named organelles; for example, the nucleus.
- They are smaller.
- They lack internal detail.

Or any other suitable answer 2 marks

b. *Any two of:*

- plasma/cell membrane
- cytoplasm/cytosol
- ribosomes

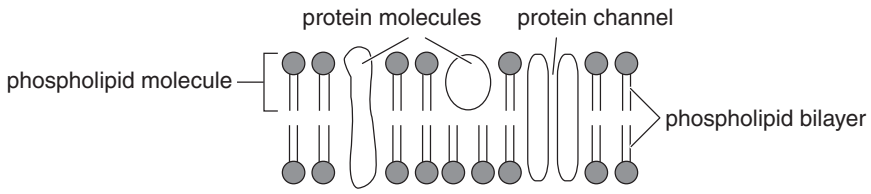
Or any other suitable answer 2 marks

c. A cell is composed of a cell membrane and cytoplasm, also having DNA/a nucleus in order to function. 1 mark

An organelle cannot function/maintain life in isolation; it relies on other components of the cell. 1 mark

Question 2 (7 marks)

a.



2 marks

1 mark for correctly labelling phospholipid/phospholipid bilayer.
1 mark for correctly labelling protein/protein channel.

b. *Any two of:*

- separates internal and external environments to provide concentration differences
- allows for specific processes to occur, such as facilitated diffusion or active transport
- provides for a different environment within the cell
- contains organelles for efficient functioning

Or any other suitable answer

2 marks

c. cytoplasm/cytosol 1 mark

d. *Any one of:*

- osmosis – the semipermeable membrane is required to ensure the solute concentration is different on either side
- cellular respiration – glucose could not move in by facilitated diffusion or active transport

Or any other suitable answer 2 marks

Question 3 (12 marks)

a. heterotroph 1 mark

It is unable to make its own food/is a consumer. 1 mark

b. chemosynthesis and photosynthesis 2 marks

c. anaerobic respiration/fermentation 1 mark

d. **i.** *For example:*

'The more sugar that is added, the higher the alcohol production.' 1 mark

ii. independent variable: amount of sugar added 1 mark

dependent variable: alcohol produced 1 mark

iii. It shows that it is the variable being tested which is responsible for the specific result. 1 mark

iv. *Any two of:*

- size of container
- temperature of fermentation
- ingredients apart from sugar which were added

Or any other suitable answer 2 marks

v. *Any one of:*

- determine variations between set-ups
- determine the progress of the experiment
- determine when reaction has stopped

Or any other suitable answer 1 mark

Question 4 (8 marks)

a. organs 1 mark

b. *For example:*

digestive and circulatory 1 mark

Any two of:

- The digestive system provides the nutrients for the circulatory system to function.
- The respiratory system takes digested food away.
- The respiratory system brings oxygen required for aerobic respiration.

Or any other suitable answer 2 marks

c. **i.** *For example:*

In the alveoli of the respiratory system, 1 mark
diffusion of oxygen into the blood OR diffusion of carbon dioxide out of the blood occurs. 1 mark

ii. *For example:*

Muscle cells 1 mark
are able to contract and move food through the digestive system. 1 mark

Question 5 (4 marks)

a. *Any one of:*

- spines: protection from predators
- long tongue: to catch ants

Or any other suitable answer 2 marks

b. *Any one of:*

- nocturnal: feeds when food available OR to avoid predators
- digs burrow: to escape predators
- rolls into a ball: so predators only exposed to spines

Or any other suitable answer 2 marks

Question 6 (3 marks)

a. biomimicry 1 mark

b. **i.** *Any one of:*

- compact design
- continuous structure

Or any other suitable answer 1 mark

ii. *Any one of:*

- allows for growth to occur in concentric rings
- provides a very solid structure

Or any other suitable answer 1 mark

Question 7 (5 marks)

a. Homeostasis is the maintenance of a relatively stable internal environment/body temperature with a changing external environment 1 mark

b. hypothalamus 1 mark

c. **i.** *Any one of:*

- reduced metabolic activity

Or any other suitable answer 1 mark

ii. *Any one of:*

- seeking a cool environment
- reduced clothing

Or any other suitable answer 1 mark

iii. *Any one of:*

- sweat glands producing sweat
- hair not raised

Or any other suitable answer 1 mark

Question 8 (4 marks)

a. kelp → sea urchin → sea otter 1 mark

b. A keystone species is a plant or animal that plays a unique and crucial role in the way an ecosystem functions. 1 mark

c. sea otter 1 mark

If it was not present the sea urchins would destroy the kelp and all other species would be adversely affected. Without the keystone species, the ecosystem would be dramatically different or cease to exist altogether. 1 mark