

Trial Examination 2016

VCE Biology Unit 1

Written Examination

Question and Answer Booklet

Reading time: 15 minutes

Writing: 1 hour 30 minutes

Student's Name: _____

Teacher's Name: _____

Structure of Booklet

Section	Number of questions	Number of questions to be answered	Number of marks
A	25	25	25
B	8	8	50
			Total 75

Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners and rulers.

Students are NOT permitted to bring into the examination room: blank sheets of paper and/or correction fluid/tape.

No calculator is allowed in this examination.

Materials supplied

Question and answer booklet of 17 pages.

Answer sheet for multiple-choice questions.

Instructions

Please ensure that you write **your name** and your **teacher's name** in the space provided on this booklet and in the space provided on the answer sheet for multiple-choice questions.

All written responses must be in English.

At the end of the examination

Place the answer sheet for multiple-choice questions inside the front cover of this booklet and hand them in.

Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic devices into the examination room.

SECTION A: MULTIPLE-CHOICE QUESTIONS**Instructions for Section A**

Answer **all** questions in pencil on the answer sheet provided for multiple-choice questions.

Choose the response that is **correct** for the question.

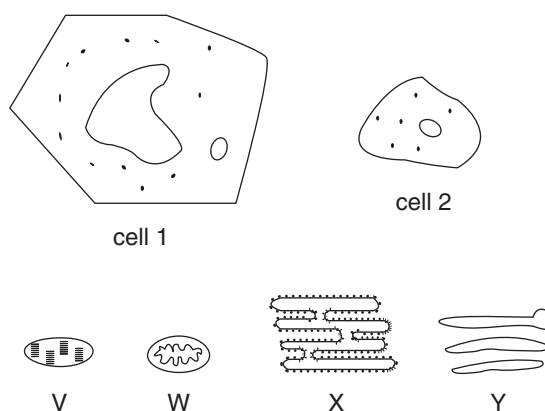
A correct answer scores 1, an incorrect answer scores 0.

Marks will **not** be deducted for incorrect answers.

No marks will be given if more than one answer is completed for any question.

Use the following information to answer Questions 1–4.

The diagrams below indicate cells as viewed with a light microscope and organelles as viewed under an electron microscope.

**Question 1**

Organelles X and Y respectively are the

- A. rough endoplasmic reticulum and smooth endoplasmic reticulum.
- B. Golgi body and rough endoplasmic reticulum.
- C. rough endoplasmic reticulum and Golgi body.
- D. Golgi body and smooth endoplasmic reticulum.

Question 2

W would

- A. be found in both cells 1 and 2.
- B. only be found in cell 1.
- C. only be found in cell 2.
- D. not be found in either cell.

Question 3

Protein synthesis occurs in

- A. V
- B. W
- C. X
- D. Y

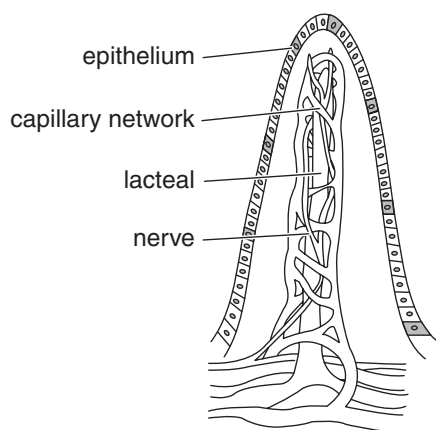
Question 4

Fixing of carbon occurs in

- A. V
- B. W
- C. X
- D. Y

Use the following information to answer Questions 5 and 6.

The diagram below shows a villus, a microscopic projection in the small intestine.



The digested remains of a meal entered the small intestine. Fatty acids and glycerol moved into the villus and then into the lacteal. Glucose, amino acids and other water soluble molecules passed into the capillary. The concentration of glucose in region I when the meal entered was 40 mmol. After 30 minutes the concentration of glucose in region II was 0.001 mmol. The concentration of glucose in the capillary was 15 mmol.

Question 5

The process responsible for the movement of glucose from region I into the capillary was primarily

- A. diffusion.
- B. osmosis.
- C. facilitated diffusion.
- D. active transport.

Question 6

Water also moves into the villus and into the capillary.

Water moves by

- A. diffusion.
- B. osmosis.
- C. facilitated diffusion.
- D. active transport.

Question 7

The energy source for aerobic respiration is

- A. the Sun.
- B. ATP.
- C. glucose.
- D. oxygen.

Question 8

Unlike anaerobic respiration, aerobic respiration requires

- A. oxygen.
- B. enzymes.
- C. glucose.
- D. carbon dioxide.

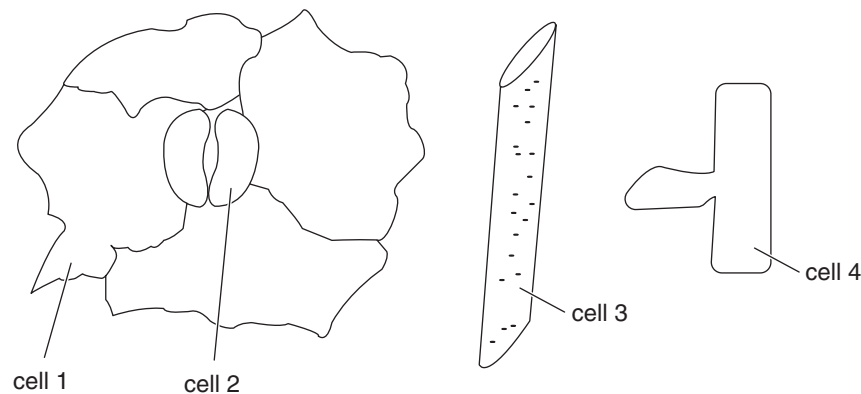
Question 9

In a prokaryotic cell, aerobic respiration occurs in the

- A. mitochondria.
- B. cytoplasm/cytosol.
- C. ribosomes.
- D. chloroplast.

Use the following information to answer Questions 10–13.

The diagrams below illustrate four different cells from the same plant.



Question 10

Photosynthesis occurs in cell

- A. 1
- B. 2
- C. 3
- D. 4

Question 11

Water is absorbed by cell

- A. 1
- B. 2
- C. 3
- D. 4

Question 12

Water loss is regulated by cell

- A. 1
- B. 2
- C. 3
- D. 4

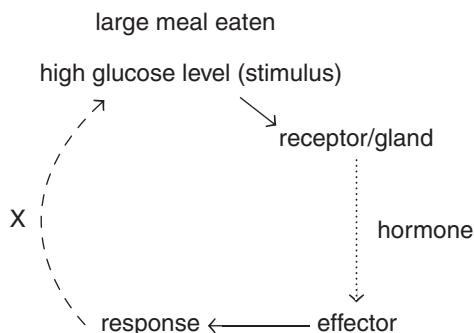
Question 13

The transpiration stream occurs via cell

- A. 1
- B. 2
- C. 3
- D. 4

Use the following information to answer Questions 14–17.

The diagram below illustrates the regulation of blood glucose.



Question 14

X indicates

- A. homeostasis.
- B. negative feedback.
- C. positive feedback.
- D. a reflex arc.

Question 15

An effector for this pathway would be the

- A. liver breaking down glycogen.
- B. pancreas releasing glucagon.
- C. fat tissue breaking down.
- D. skeletal muscles storing glycogen.

Question 16

The hormone involved in this pathway is

- A. insulin.
- B. glucagon.
- C. adrenalin.
- D. ADH.

Question 17

The gland which releases the hormone is the

- A. liver.
- B. kidney.
- C. pancreas.
- D. hypothalamus.

Use the following information to answer Questions 18 and 19.

In the Avon wheatbelt of Western Australia, the acorn banksia, *Banksia prionotes*, flowers in late spring and is the only source of nectar for honeyeaters, which feed on and pollinate the flowers. Honeyeaters are important pollinators of numerous plant species.

Question 18

When considering the scientific name of the acorn banksia, *Banksia* refers to its

- A. species.
- B. genus.
- C. class.
- D. phylum.

Question 19

The relationship between the acorn banksia and the honeyeater is

- A. amensalism.
- B. commensalism.
- C. mutualism.
- D. competition.

Question 20

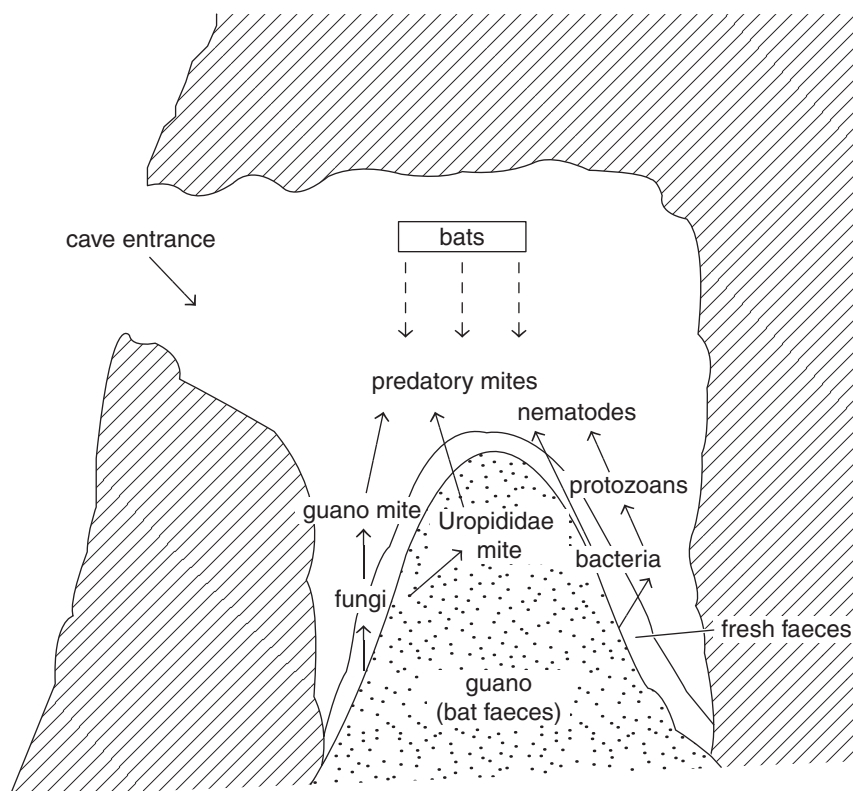
Consider the following symbols: 0 no effect, – harmed and + benefit.

A parasite–host relationship would be represented as

- A. – +
- B. + –
- C. 0 +
- D. + 0

Use the following information to answer Questions 21–23.

The food web below is for a cave community in New South Wales.



Question 21

The number of producer species in the above food web is

- A. 0
- B. 1
- C. 2
- D. 3

Question 22

The original source of energy for the above community is the

- A. guano.
- B. bats.
- C. decomposers.
- D. Sun.

Question 23

Competition for food would occur between

- A. predatory mites and the nematodes.
- B. guano mites and Uropididae mites.
- C. Uropididae mites and predatory mites.
- D. protozoans and guano mites.

Use the following information to answer Questions 24 and 25.

The hooded scaly-foot is a large, legless lizard found across Australia. In Victoria in 2003, it was only known to occur in a very restricted distribution near Terrick Terrick National Park, near Echuca. Smaller populations were found near Mildura in 2008. It is rated as critically endangered, and the locations of populations are illustrated with stars in the diagram below.



Question 24

In order to increase diversity through breeding programs, it would be expected that

- A. breeding could occur naturally with other populations in New South Wales.
- B. populations near Echuca would be more likely to breed than those near Mildura.
- C. human intervention would be required.
- D. human intervention would not be required.

Question 25

A population would be likely to increase if

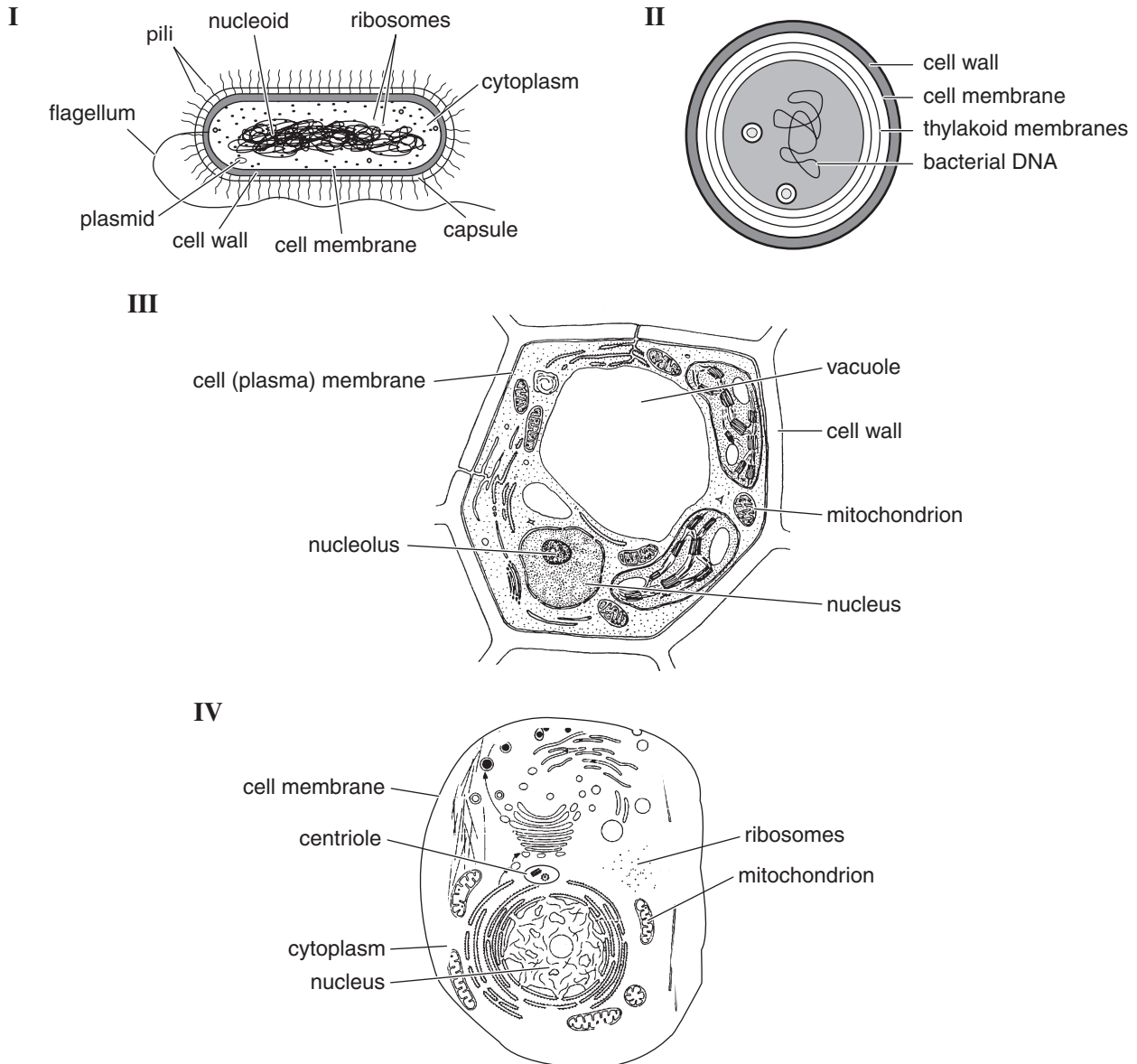
- A. immigration was greater than emigration.
- B. birth rate was less than death rate.
- C. competition increased.
- D. a disease was introduced.

END OF SECTION A

SECTION B: SHORT-ANSWER QUESTIONS

Question 1 (7 marks)

Consider the diagrams below.



- a. i. Which cells above are prokaryotic? 1 mark

- ii. Give **two** structural differences between eukaryotic and prokaryotic cells. 2 marks

- b.** What are **two** structural features common to all cells illustrated? 2 marks

- c.** Explain why the cell is described as the basic unit of life and not an organelle, such as a nucleus. 2 marks

Question 2 (7 marks)

- a.** Draw a simple labelled diagram showing the main chemical components of a plasma membrane. 2 marks

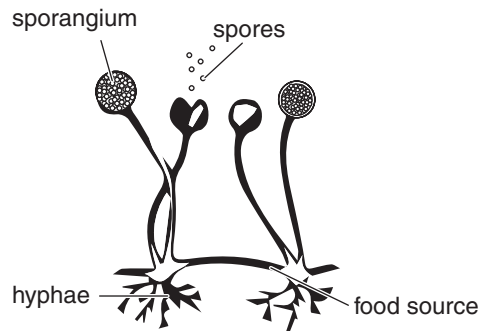
- b.** What are **two** advantages to a cell of having a semipermeable barrier with its environment? 2 marks

- c.** Name the cell's internal environment. 1 mark

- d.** If the plasma membrane is ruptured it no longer functions.
Name a cellular process that would be disrupted and explain why. 2 marks

Question 3 (12 marks)

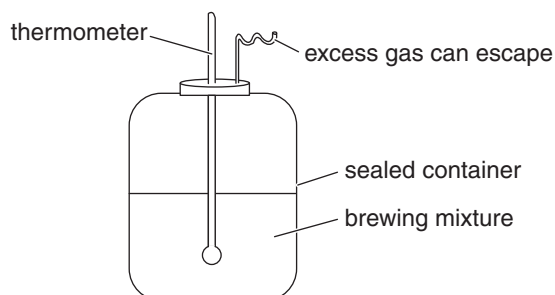
The diagram shows of a fungus which feeds on bread. The hyphae grow into the bread and the bluish-black sporangium appear on the outside of the bread.



- a.** Is the fungus an autotroph or a heterotroph? Explain your answer. 2 marks

- b.** Name **two** possible processes autotrophs use to obtain their energy. 2 marks

A brewing kit was set up as shown below.



Yeast, another type of fungus, was added to a mixture that contained various ingredients, including sugar, which was respired by the fungus to produce alcohol. The brewer designed a controlled experiment to see if the amount of alcohol produced could be increased by adding more sugar to the mixture rather than the 30 g suggested. The brewer used the identical set-up each time, but also used 60 g and 90 g of sugar.

c. By what process is alcohol produced? 1 mark

d. i. Write a suitable hypothesis for the above experiment. 1 mark

ii. Name the dependent and independent variables in the experiment. 2 marks

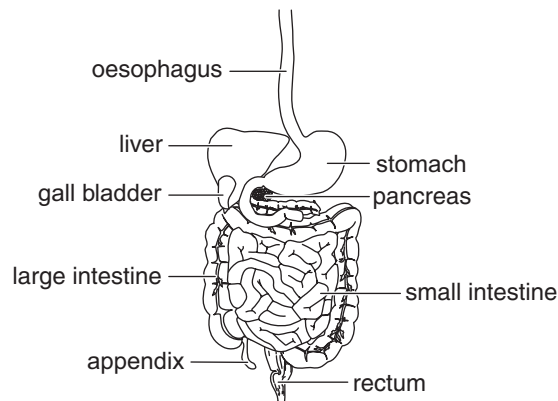
iii. Explain why it is important to undertake a controlled experiment. 1 mark

iv. Name **two** factors which are controlled in this experiment. 2 marks

v. Outline a possible benefit to the experiment of measuring the temperature. 1 mark

Question 4 (8 marks)

The diagram below shows the human digestive system.



Using the system above, or one you have studied in class, answer the following questions.

- a.** What are systems composed of? 1 mark

- b.** Systems do not act in isolation.

Describe an example where one system is interconnected with another system. In your answer, name the **two** systems and describe **two** ways they rely on each other. 3 marks

- c.** For any given system,

- i.** give an example of where diffusion occurs and name the substance diffused. 2 marks

- ii.** name a specialised cell and how its structure assists its function. 2 marks

Question 5 (4 marks)

The echidna is generally nocturnal and eats small insects, such as ants. It has the ability to burrow and make a nesting chamber, or hide when it is threatened. It also has the ability to curl into a ball.

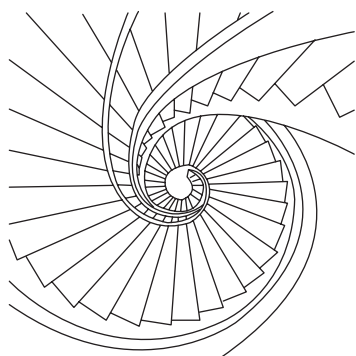
- a.** Name a structural adaptation of the echidna and describe how this feature assists it to survive. 2 marks

- b.** Name a behavioural adaptation of the echidna and describe how this feature assists it to survive. 2 marks

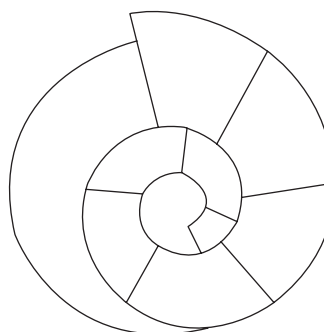
Question 6 (3 marks)

The diagram below indicates that design from nature on the right has influenced its construction.

staircase design – construction



shell design – nature



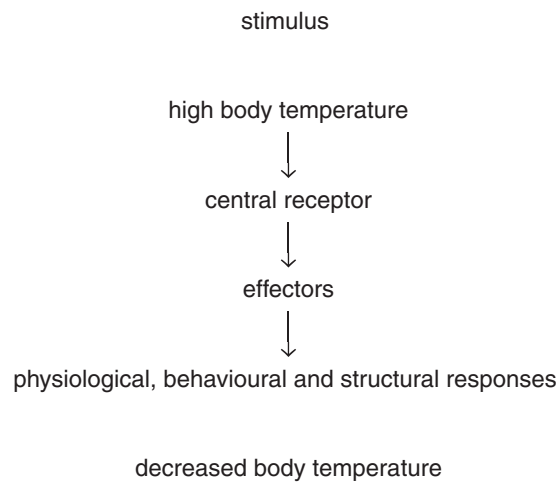
- a.** What is the biological term that describes the above situation? 1 mark

- b. i.** Outline a design benefit to the organism of the shape illustrated. 1 mark

- ii.** What is a possible benefit for the design of the above construction? 1 mark

Question 7 (5 marks)

The diagram below illustrates temperature regulation in a human.



- a.** Define homeostasis. 1 mark

- b.** Where is the control centre for temperature regulation in the above situation? 1 mark

- c.** For each of the following, give an example which will produce the response above.

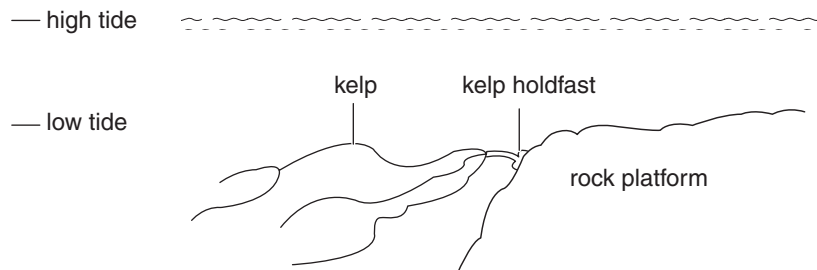
- i.** physiological 1 mark

- ii.** behavioural 1 mark

- iii.** structural 1 mark

Question 8 (4 marks)

The diagram below shows a rock platform with kelp attached to it.



Kelp is a very large, brown algae and can grow to 30 m in length. Its large, leathery leaves are able to withstand wave action at low tide. It provides a habitat for many marine species. It has been found that sea urchins eat the kelp footholds and, as a consequence, the kelp is dislodged, washed into deeper water and dies. Sea otters eat sea urchins and, as a consequence, prevent the destruction of the kelp.

- a. Construct a food chain for the above information. 1 mark

- b. Define keystone species. 1 mark

- c. Name the keystone species in the ecosystem above and justify your choice. 2 marks

END OF QUESTION AND ANSWER BOOKLET