Neap

Trial Examination 2022

Question and Response Booklet

QCE Biology Units 1&2

Paper 2

Student's Name: _____

Teacher's Name: _____

Time allowed

- Perusal time – 10 minutes
- Working time – 90 minutes

General instructions

- Answer all questions in this question and response booklet.
- Write using black or blue pen.
- QCAA-approved calculator permitted.
- Planning paper will not be marked.

Section 1 (45 marks)

- 10 short response questions

SECTION 1

Instructions

- If you need more space for a response, use the additional pages at the back of this booklet.
  - On the additional pages, write the question number you are responding to.
  - Cancel any incorrect response by ruling a single diagonal line through your work.
  - Write the page number of your alternative/additional response, i.e. See page …
  - If you do not do this, your original response will be marked.

QUESTION 1 (4 marks)

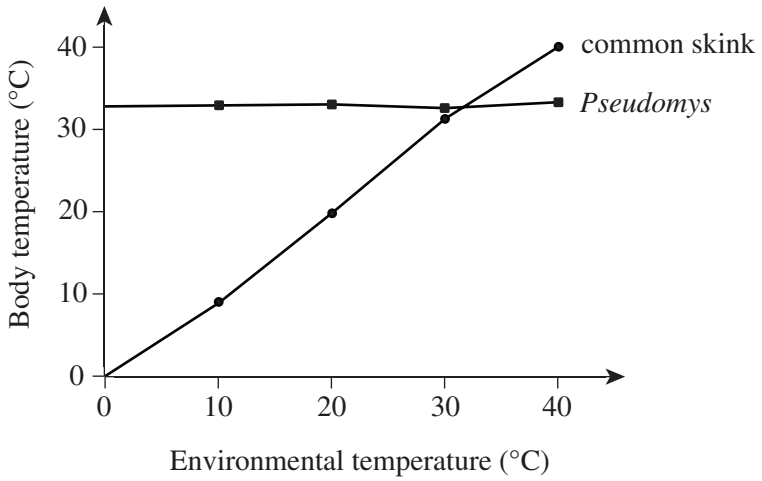
Name and describe two examples of physical and/or chemical defence strategies used by plants in response to the presence of pathogens.

1. _____

2. _____

QUESTION 2 (4 marks)

The graph shows two different mechanisms for temperature control in a rodent (*Pseudomys*) and a lizard (common skink).



a) Determine which organism is the endotherm. Justify your answer with reference to the graph. *[1 mark]*

b) Explain three different behavioural and/or physiological mechanisms used to control heat exchange or metabolic activity. *[3 marks]*

1.

2.

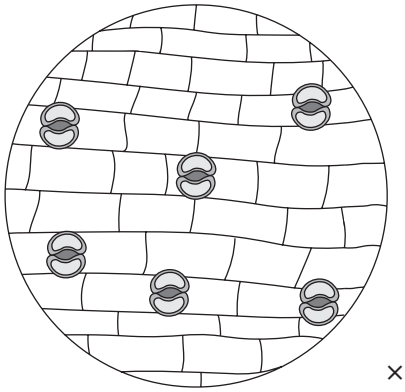
3.

QUESTION 3 (4 marks)

Explain how the relationship between the structural features and functions of gas exchange surfaces enhance the rate of gas exchange.

QUESTION 4 (4 marks)

An investigation was undertaken to study the drought tolerance of genetically altered barley plants. The diagram shows one sample taken during the study. The researcher has forgotten to label the sample and would like to determine which stock it is from, based on the density of stomata.



×100

The formula for the area of a circle is $A = \pi r^2$.

a) If the field of view (FOV) diameter at a magnification of ×100 is 0.8 mm, calculate the FOV area at a magnification of ×100. *[2 marks]*

FOV area at ×100 = _____ mm^2

b) Using the FOV area for a magnification of ×100 calculated in 4a), calculate the stomatal density of the sample. *[2 marks]*

Stomatal density = _____ stomata per mm^2

QUESTION 5 (8 marks)

Three people (X, Y and Z) were exposed to the same dose of a pathogenic virus. Person X became very sick and died after three days. Person Y became very sick, but had recovered by day five. Person Z did not become sick at all.

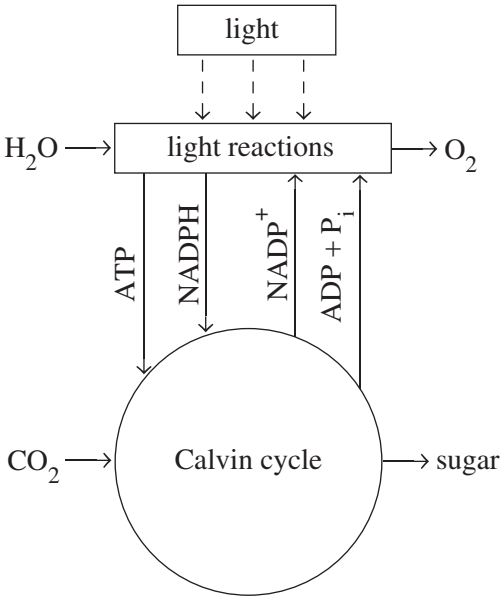
a) Explain why person Y may take less time to recover if they are exposed to the same virus again. *[2 marks]*

b) Explain why person Z could get sick if exposed to a different pathogenic virus. *[2 marks]*

c) Explain why injecting the pathogenic virus into individuals is **not** an effective way to immunise a community. In your response, propose a more effective method. *[4 marks]*

QUESTION 6 (3 marks)

During the light-dependent reaction in photosynthesis, two types of high-energy molecules are produced. A simplified flow chart of photosynthesis is shown.



Identify the two types of high-energy molecules produced during the light-dependent reaction and explain why they are essential for the light-independent reaction.

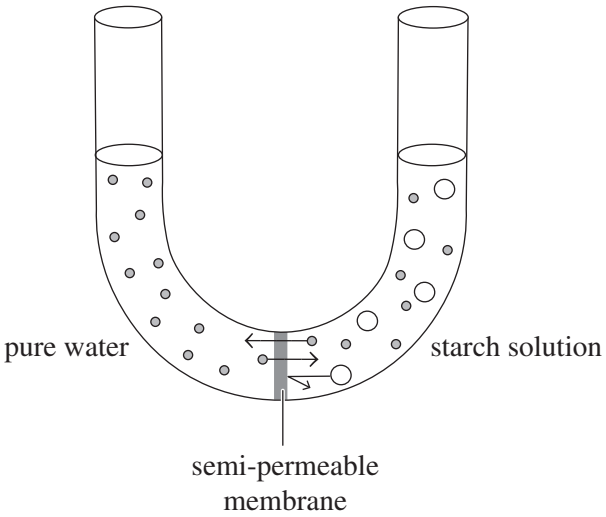
QUESTION 7 (4 marks)

Explain the function of the following sections of the nephron in the production of urine.

	Explanation
Glomerulus	
Bowman's capsule	
Loop of Henle	
Collecting tubule	

QUESTION 8 (3 marks)

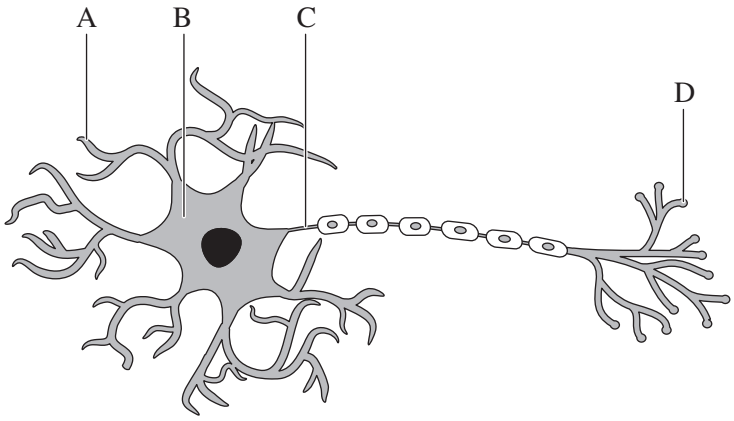
Starch is a large polar molecule. The diagram shows a tube containing pure water and a starch solution that are separated by a semi-permeable membrane.



Explain the direction of movement of the water and starch. In your response, indicate if there are any changes to the volume in each side of the tube.

QUESTION 9 (6 marks)

The diagram shows a neuron.



a) Complete the table by identifying the components labelled on the neuron. *[4 marks]*

	Component name
A	
B	
C	
D	

b) Differentiate between sensory neurons and motor neurons. *[2 marks]*

QUESTION 10 (5 marks)

Identify five differences between the structure of prokaryotic and eukaryotic cells.

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

5. _____

_____

END OF PAPER

ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

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ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

REFERENCES

QUESTION 3

Adapted from OpenStax College, modification of work by Duane Raver, NOAA (2021). Accessed November 2021. https://commons.wikimedia.org/wiki/File:Fish_Respiration_-_Gills_(FR).svg. Licensed under CC BY 4.0 International, https://creativecommons.org/licenses/by/4.0/.

QUESTION 8

Adapted from OpenStax College (2016). Accessed November 2021. https://commons.wikimedia.org/wiki/File:CNX_Chem_11_04_osmosis.png. Licensed under CC BY 4.0 International, https://creativecommons.org/licenses/by/4.0/.

