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2

90464



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA



National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

Level 2 Biology, 2006

90464 Describe cell structure and function

Credits: Three

2.00 pm Thursday 30 November 2006

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should answer ALL the questions in this booklet.

If you need more space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–10 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

For Assessor's use only		Achievement Criteria		
Achievement	Achievement with Merit		Achievement with Excellence	
Describe cell structure and function.	<input type="checkbox"/>	Explain cell structure and function.	<input type="checkbox"/>	Discuss cell structure and function.
Overall Level of Performance				<input type="checkbox"/>

You are advised to spend 35 minutes answering the questions in this booklet.

QUESTION ONE

The following are components and organelles that may be found in cells. Identify and name each component or organelle **and** describe its function.

(a)

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Name: _____

Function: _____

Adams P, J Baker and G Allen, 1970, *The study of botany*, Addison Wesley, Reading, USA, p 101.

(b)

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Name: _____

Function: _____

In (c) you must name and give the function of the organelle represented by the small dots:

(c)

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Name: _____

Function: _____

Adams P, J Baker and G Allen, 1970, *The study of botany*, Addison Wesley, Reading, USA, p 100.

QUESTION TWO

Bread can be made by mixing flour, water, salt, sugar and a small amount of yeast. Carbon dioxide is produced from the fermentation of simple sugars. Fermentation is controlled by enzymes from the yeast.

(a) Explain why the shape of an enzyme is important for the way it functions. (You may use a diagram to help with your explanation.)

(b) In relation to **enzyme structure**, describe why the enzyme will not function at 45°C.

Researchers have investigated the effect of temperature on yeast activity. The following table is a summary of their results.

Temperature	Fermentation	Temperature	Cell division
-20°C	No fermentation	Less than 20°C Greater than 40°C	Cell division significantly reduced
27°C–38°C	Optimum Fermentation range	20°C–27°C	Most favourable range for yeast to multiply
35°C	Optimum Fermentation temperature	26°C	Optimum temperature for multiplication of yeast
		Greater than 60°C	Nil

Between two and three hours are needed for the yeast to ferment the dough before it is baked in an oven.

(c) Discuss, with respect to the number of yeast cells **and** the fermentation rate, why it is important to have the temperature at:

- 26°C for the first hour and
- 35°C for the next two hours, before the dough is baked.

If the concentration of simple sugars is greater than 6% of the flour, the rate of fermentation is slowed because there is less water inside the yeast cell.

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(d) Explain how the increase in concentration of sugar will slow the rate of fermentation in the yeast cell. (You may use a diagram to help with your explanation.)

Heavy metals, such as mercury and lead, are enzyme inhibitors.

(e) Explain how an enzyme inhibitor affects enzyme activity. (You may use a diagram to help with your explanation.)

QUESTION THREE

Paramecium is a common freshwater Protista, found in ponds or slow-moving streams.

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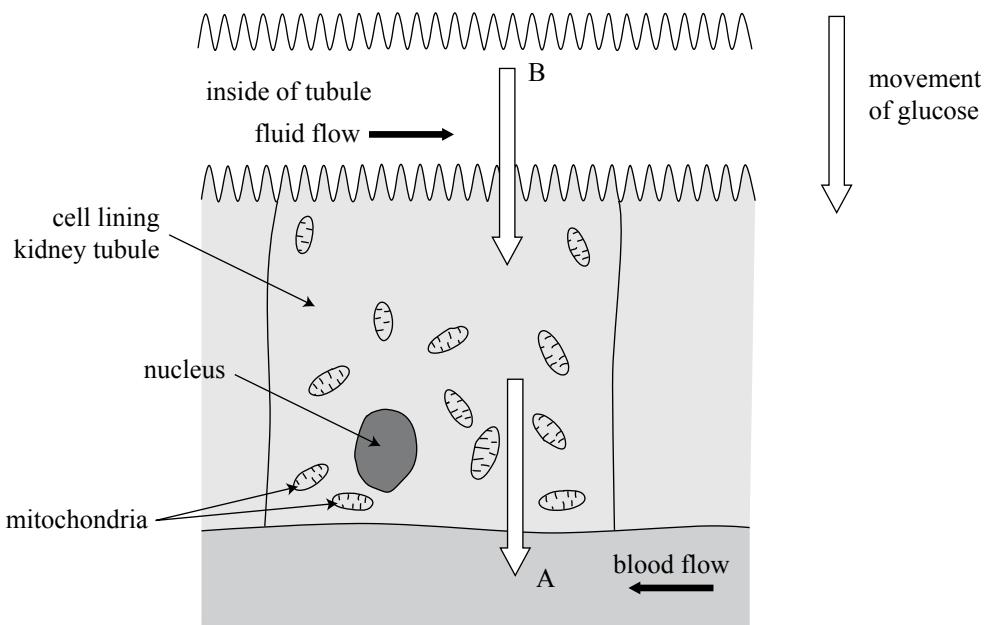
For copyright reasons, this resource cannot be reproduced here.

Adapted from Knox, G A (ed), *Biological Science*, 1969, Government Printer, Wellington, p 319.

Discuss the relationship between osmosis and contractile vacuole activity in a *Paramecium*, in its freshwater environment.

QUESTION FOUR

The diagram below represents a cell from the lining of a human kidney tubule. A major role of the lining of the tubule is to absorb **all** the glucose from the fluid flowing along the tubule and pass it into the blood, as shown by the arrows on the diagram.



The tubule cell contains a large number of mitochondria.

(a) Explain the importance of mitochondria in the movement of **all** the glucose from the tubule to the blood.

The surface membrane of the cell inside the tubule at 'B' is greatly folded.

(b) Explain how this adaptation helps the cell to carry out its function.

QUESTION FIVE

This diagram shows a cell from the palisade layer of a leaf.

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Greenwood T, R Allan and L Shepherd, 2004, *Year 12 Biology*, Biozone International, Hamilton, p 259.

Explain how the role of photosynthesis is affected by the location of the chloroplasts in a palisade layer cell.

**Extra paper for continuation of answers if required.
Clearly number the question.**

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Question
number

