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Level 2 Biology, 2019

91156 Demonstrate understanding of life processes at the cellular level

9.30 a.m. Tuesday 19 November 2019
Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of life processes at the cellular level.	Demonstrate in-depth understanding of life processes at the cellular level.	Demonstrate comprehensive understanding of life processes at the cellular level.

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 attempt 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 2–12 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.

TOTAL

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QUESTION ONE: PHOTOSYNTHESIS

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www.tigtagworld.co.uk/film/parts-of-a-plant-PRM00096/

(a) Complete the photosynthesis word equation below:

carbon dioxide + water $\xrightarrow{\text{light}}$ _____ + _____

(b) Describe how AND where water and carbon dioxide enter the plant.

Water: _____

Carbon dioxide: _____

(c) Photosynthesis consists of two phases: the light-dependent phase, and the light-independent phase.

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Discuss the factors that affect each phase AND why both phases are required to form the glucose molecule.

In your answer include:

- an explanation of the light-dependent phase, including where it occurs in the cell
- an explanation of the light-independent phase, including where it occurs in the cell
- a discussion of the factors that affect each phase.

QUESTION TWO: CELLULAR RESPIRATION

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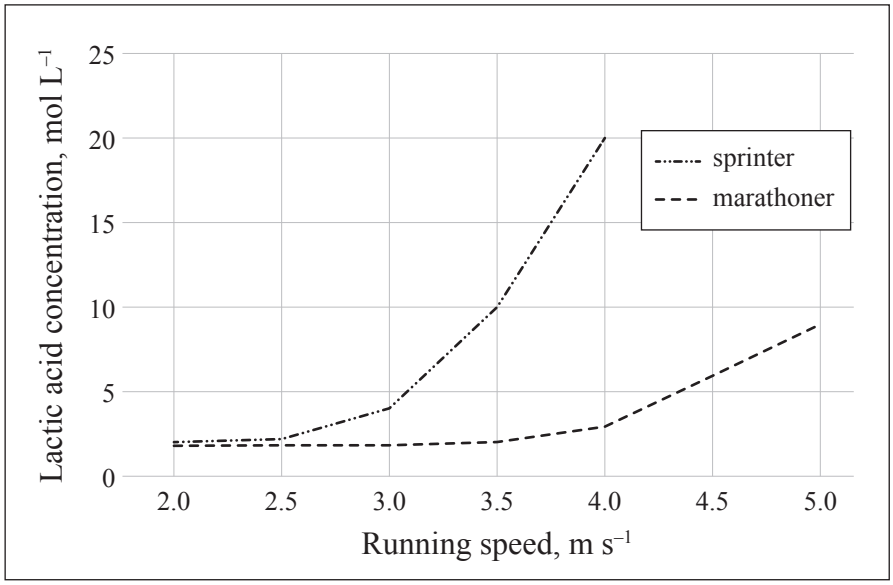
(a) Describe where anaerobic AND aerobic respiration occur in a cell.

(b) Anaerobic and aerobic cell respiration are carried out by all runners.

Lactic acid performance curve



Adapted from http://www.lactate.com/pitesbas.html

Analyse the graph above and discuss why different types of running produce different concentrations of lactic acid.

In your answer include:

- an explanation of anaerobic AND aerobic respiration
- a discussion of the advantages AND disadvantages of anaerobic and aerobic respiration
- a discussion of why sprinters and marathon runners produce different concentrations of lactic acid. Use the graph above to support your discussion.

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QUESTION THREE: MOVEMENT OF MATERIALS AND ENZYME FUNCTION

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Source: http://mis.wlgsh.tp.edu.tw/bio/?p=117

(a) Explain how materials cross cell membranes by diffusion AND facilitated diffusion.

You may draw diagrams to support your answer.

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(b) Some specific enzymes move magnesium ions (Mg^{2+}) across the cell membrane. Mg^{2+} ions are transported using active transport.

Describe an enzyme's structure and purpose, AND explain the process of active transport.

Question Three continues on the following page.

(c) Once inside the cell, the magnesium ion (Mg^{2+}) is used as a co-factor by the other enzymes involved in DNA replication.

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Discuss the consequences to the cell if the enzymes involved in DNA replication become denatured.

In your answer include:

- a description of what is meant by denature
- an explanation of why some enzymes require a co-factor
- a discussion of how enzymes become denatured AND the consequences to the cell if this occurs.

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Extra space if required.
Write the question number(s) if applicable.

QUESTION NUMBER

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