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Level 2 Biology, 2016

91156 Demonstrate understanding of life processes at the cellular level

9.30 a.m. Friday 18 November 2016
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 2–11 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: DNA REPLICATION

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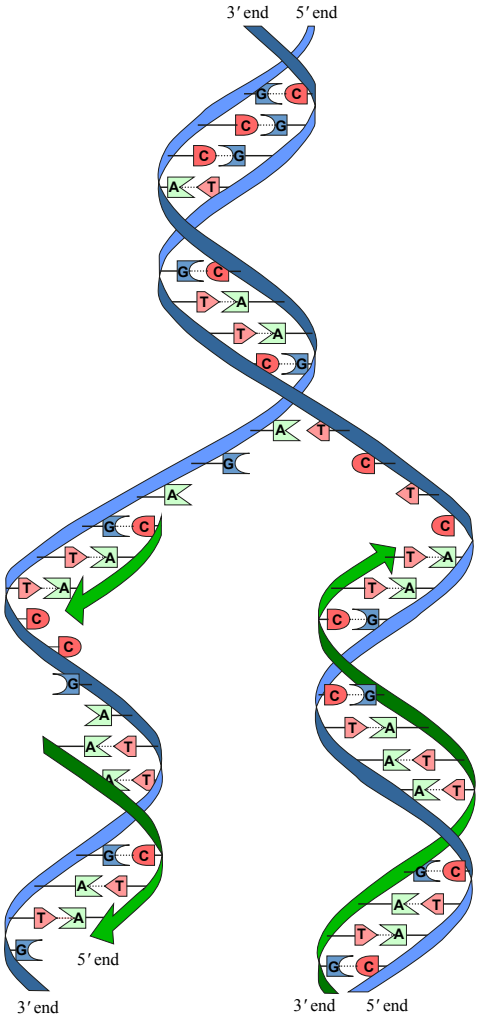
(a) The model below shows DNA replication.

Label the following on the diagram:

- nucleotide
- nitrogen base
- hydrogen bond
- parent strand
- daughter strand
- sugar-phosphate backbone.



(b) Explain the purpose of DNA replication.

(c) Enzymes are needed for DNA replication.

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Discuss the function of enzymes in DNA replication and the factors that affect them.

In your answer include:

- a description of the structure of an enzyme
- an explanation of how enzymes function in DNA replication
- a discussion of at least three factors that affect enzymes during DNA replication.

You may use diagrams in your answer.

There is more space for your answer to this question on the following page.

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QUESTION TWO: MITOSIS AND MOVEMENT OF MATERIALS

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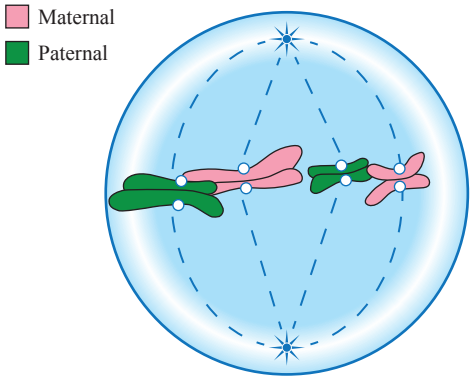

adapted from: https://www.bio.purdue.edu/BCBLab/?p=1093

(a) Describe what is happening in the diagram above during mitosis.

(b) Explain the purpose of mitosis, and how this type of cell division occurs.

(c) Most cells in the human body grow to a limited size then divide. The new cells grow, but also divide when they have reached a certain size.

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Discuss how the surface area to volume ratio affects the process of diffusion, and why the changes in surface area to volume ratio may cause the cell to divide.

In your answer include:

- a description of how the surface area to volume ratio changes as the cell grows
- an explanation of how the surface area to volume ratio affects the movement of materials into and out of a cell
- an explanation of diffusion
- a discussion of how the surface area to volume ratio can affect diffusion and cell division.

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QUESTION THREE: CELL PROCESSES

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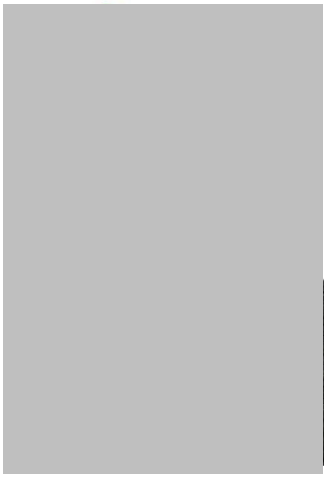
Photosynthesis and cell respiration are cell processes carried out within a plant.

Discuss the similarities and differences between photosynthesis and aerobic cell respiration in a plant.

In your answer include:

- a word equation of photosynthesis and aerobic cell respiration
- an explanation of how both aerobic cell respiration and photosynthesis are required to support the overall survival of the plant
- a discussion of the similarities and differences of the two processes.

Specific details of stages for each process are NOT required.



http://www.ecoagra.com/eA_BPP-HowItWorks.html

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

QUESTION NUMBER

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