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91156



Level 2 Biology, 2018

91156 Demonstrate understanding of life processes at the cellular level

9.30 a.m. Friday 23 November 2018 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.

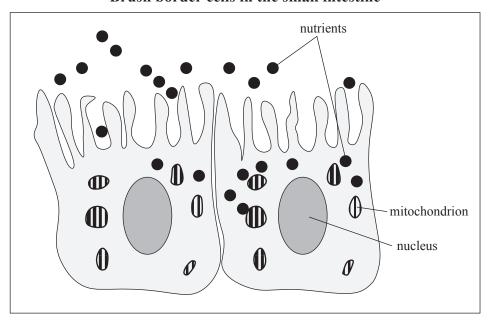
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QUESTION ONE: MOVEMENT OF MATERIALS

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In the small intestine, it is the function of the brush border cells to absorb nutrients. When nutrients first enter the intestines, the nutrients can move into the brush border cells by diffusion. The brush border cells can also absorb these nutrients using active transport.

Brush border cells in the small intestine



Describe the process of diffusion.
Explain the process of active transport.

(c)

	of oxygen can affect both cellular respiration and action of the intestines.	ve transport of nutrients into the	ASSESSOR'S USE ONLY
	uss how oxygen concentration affects the processes of bsorption of nutrients into the brush border cells of the		
In yo	our answer include:		
•	an explanation of aerobic respiration that includes the products made	e raw materials needed AND the	
•	an explanation of anaerobic respiration that includes products made	the raw materials needed AND the	
•	a discussion of how lowered oxygen concentration w AND active transport in the brush border cells.	ould affect cellular respiration	
		There is more space for your answer to this question on the following page.	

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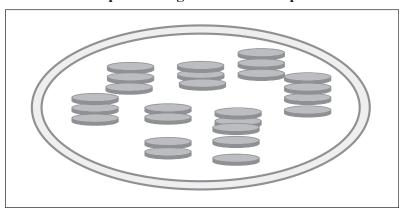
QUESTION TWO: PHOTOSYNTHESIS AND ENZYMES

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Photosynthesis is an important reaction that supports many other life processes in plants.

- (a) Write a complete word equation for photosynthesis.
- (b) Label two parts of a chloroplast on the diagram below AND explain how each of the named parts enables the chloroplast to carry out photosynthesis.

Simplified diagram of a chloroplast



(c)	Enzymes are used in photosynthesis reactions. Environmental factors, such as pH and toxins, can influence enzyme activity. Many toxins act as enzyme inhibitors.	ASSESSOR'S USE ONLY			
	Discuss how enzyme inhibitors influence enzyme activity, and compare this with the effects of pH on enzyme activity.				
	In your answer include:				
	• a description of what an enzyme is				
	• an explanation of how enzyme structure is related to its function				
	• a discussion of how BOTH enzyme inhibitors AND pH affect enzyme activity.				
	You may use diagrams in your answer.				

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QUESTION THREE: DNA REPLICATION AND MITOSIS

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Mitosis and DNA replication occur at different rates, depending on the time of year, the plant part, and the stage of the plant's life cycle.

	Diagram showing seed germination	
Source	: www.dreamstime.com/stock-illustration-bean-seed-germination-isolated-white-image564893	327

	Describe when DNA replication happens, and explain why DNA replication is necessary
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(b) Discuss why the rate of mitosis varies in different parts of a plant, AND why the rate of ASSESSOR'S USE ONLY mitosis changes throughout the year. Your answer should: identify the parts of a plant where mitosis will be greatest AND discuss why the rate of mitosis is greater in these plant parts discuss how factors, such as light, temperature, and/or water availability, and the process of photosynthesis, could affect the rate of mitosis in a plant throughout the year. A detailed discussion of enzyme structure and named plant cells is not required in your answer. There is more space for your answer to this question on the

following page.

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