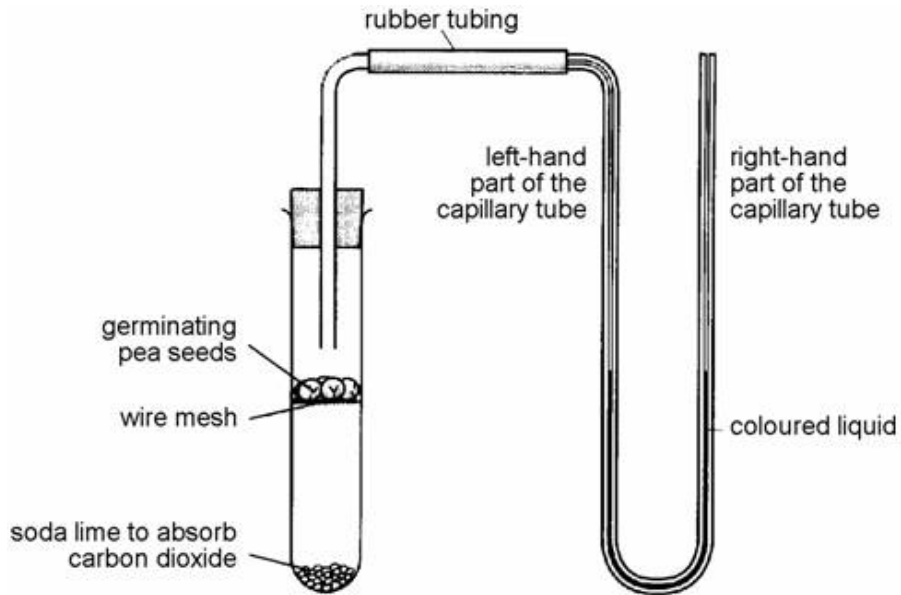


##

The diagram shows an apparatus which can be used to investigate respiration in pea seeds. Pea seeds, which have been soaked in water to begin the process of germination, are put on the wire mesh in the test-tube.



- (a) As the pea seeds respire, the level of the coloured liquid in the left-hand part of the capillary tube rises.

By referring to what is happening in the apparatus, explain why the level of the liquid changes.

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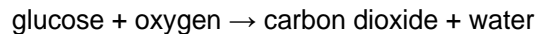
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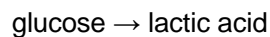
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3 marks

- (b) During aerobic respiration, glucose molecules are broken down into molecules of carbon dioxide and water.



Anaerobic respiration takes place in animals when oxygen is not available. During anaerobic respiration, each glucose molecule is broken down into two molecules of lactic acid.



Less energy is released during anaerobic respiration than during aerobic respiration. Use the information above to suggest why.

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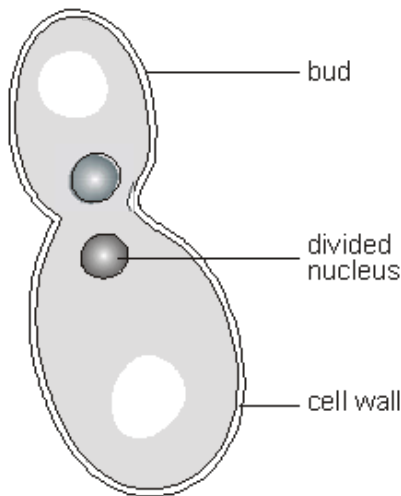
1 mark

- (c) Respiration takes place in parts of the cell called mitochondria. A human sperm contains a greater concentration of mitochondria in its cytoplasm than an ovum does. Suggest a reason for this.

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1 mark
Maximum 5 marks

Q2. The diagram shows a yeast cell reproducing asexually, by budding.



- (a) The nucleus of the yeast cell contained 16 chromosomes before it divided. How many chromosomes will there be in the nucleus of the bud?

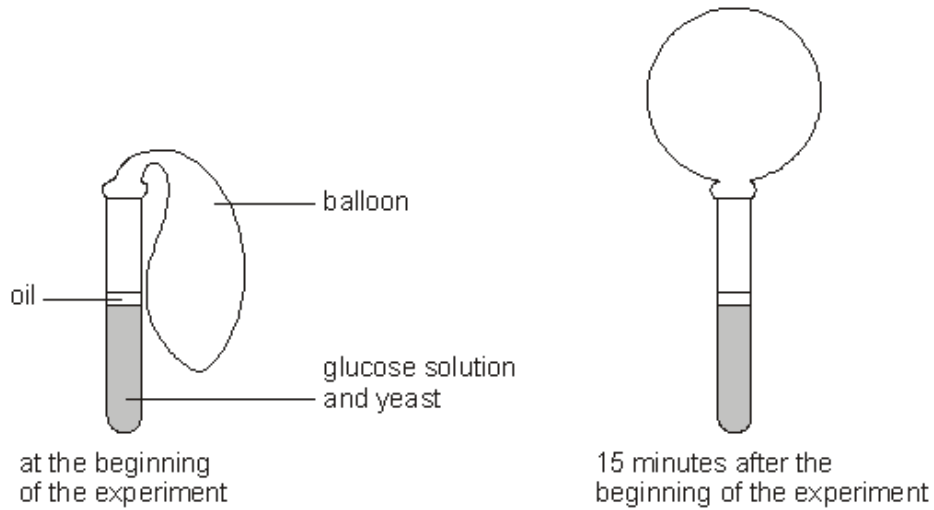
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1 mark

- (b) A solution of glucose was boiled and then cooled to room temperature. Some yeast was added to the glucose solution in a test-tube. A balloon was attached tightly around the mouth of the test-tube, which was kept at room temperature.

A gas was produced which caused the balloon to inflate.

The diagrams below show the apparatus at the beginning of the experiment and 15 minutes later.



(i) Name the process which caused the gas to be given off.

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1 mark

(ii) Write a word equation for this reaction.

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1 mark

(c) In a second experiment, instead of yeast, the liquid from crushed yeast cells was added to glucose solution. The balloon became inflated again

In a third experiment, the liquid from crushed yeast cells was boiled, cooled to room temperature and then added to glucose solution. This time no gas was given off and the balloon did **not** inflate.

Explain why gas was **not** given off in the third experiment.

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1 mark

Maximum 4 marks

