Topica Past Papers IGCSE Edexcel

BIOLOGY

PAPER 2BR

1- (4BI0-S 2015-Paper 2BR-Q6)-*LIFE PROCESSES*

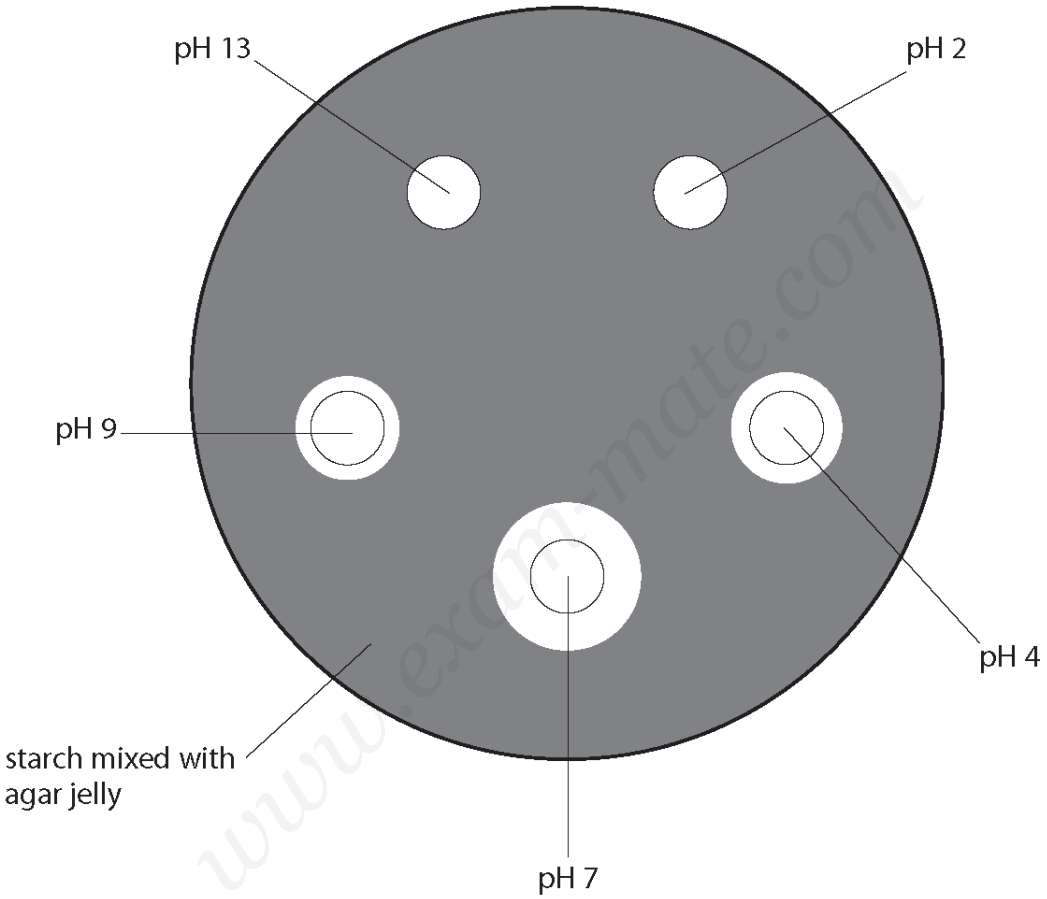
A student is given a Petri dish containing starch mixed with agar jelly.

The student makes five wells each of diameter 10 mm in the agar. She fills the wells with solutions of amylase, each with a different pH.

After 24 hours she pours iodine solution on to the agar jelly.

The iodine solution turns the starch in the agar jelly a dark blue colour.

The diagram shows the appearance of the Petri dish.



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(a) The student measures the clear area around each well using a ruler.

Two have been done for you. Complete the remainder of the table.

(1)

pH of amylase solution	Diameter in mm
2	
4	15
7	
9	
13	10

(b) (i) Explain why there is a clear zone around some of the wells containing amylase.

(2)

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(ii) Explain why the clear zones have a range of different diameters. The diameters of the wells do not change during the experiment.

(2)

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(c) Name the independent variable in this investigation.

(1)

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(d) (i) The student keeps the Petri dish at 20 °C to control the temperature in order to make a valid comparison between each pH.

Name three other variables that the student needs to control.

(3)

1 .....

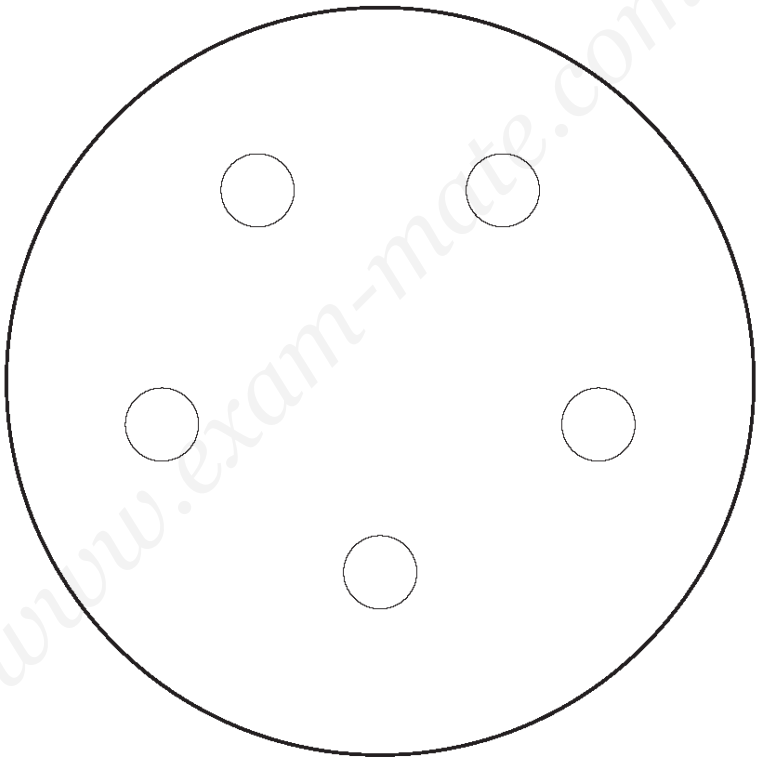
2 .....

3 .....

(ii) The student repeats the experiment, keeping the Petri dish at 37 °C on this occasion.

On the diagram, draw the results you would expect to see.

(2)



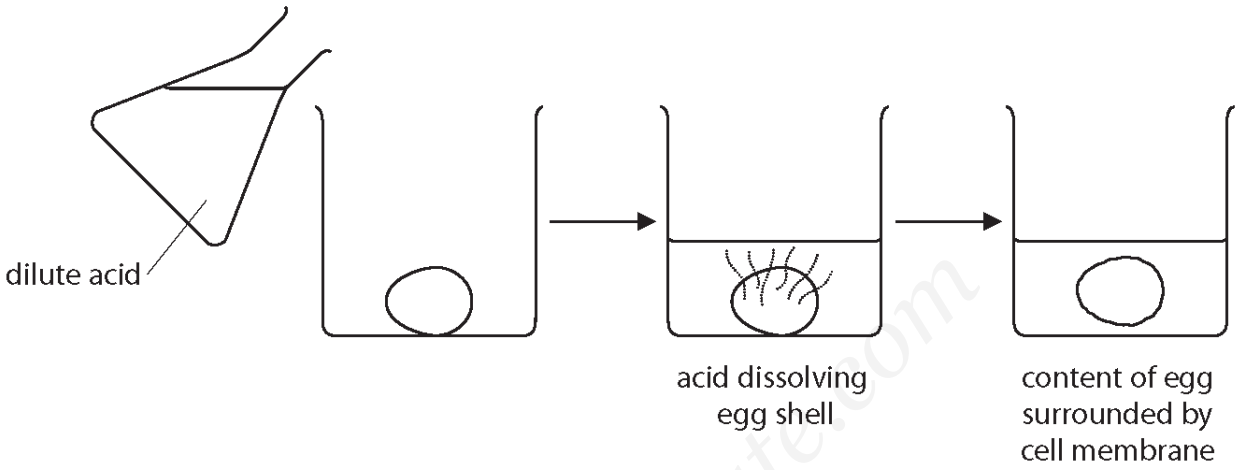
2- (4BI0-S 2015-Paper 2BR-Q4)-*LIFE PROCESSES*

A chicken egg is a single cell protected by a shell on the outside.

A student puts three chicken eggs into dilute acid and leaves them for three days.

The acid dissolves the egg shells, leaving the contents of the eggs surrounded by the cell membrane.

The diagram shows the student's method.



The student removes the eggs from the dilute acid and uses water to wash the surface acid away.

The student then uses the eggs for this osmosis experiment.

- he measures the mass of each egg
- he then puts one egg into a beaker containing distilled water
- he puts another egg into a beaker containing 5% salt solution
- he puts a third egg into a beaker containing 15% salt solution
- after 15 minutes he removes each egg from its beaker and measures its mass again

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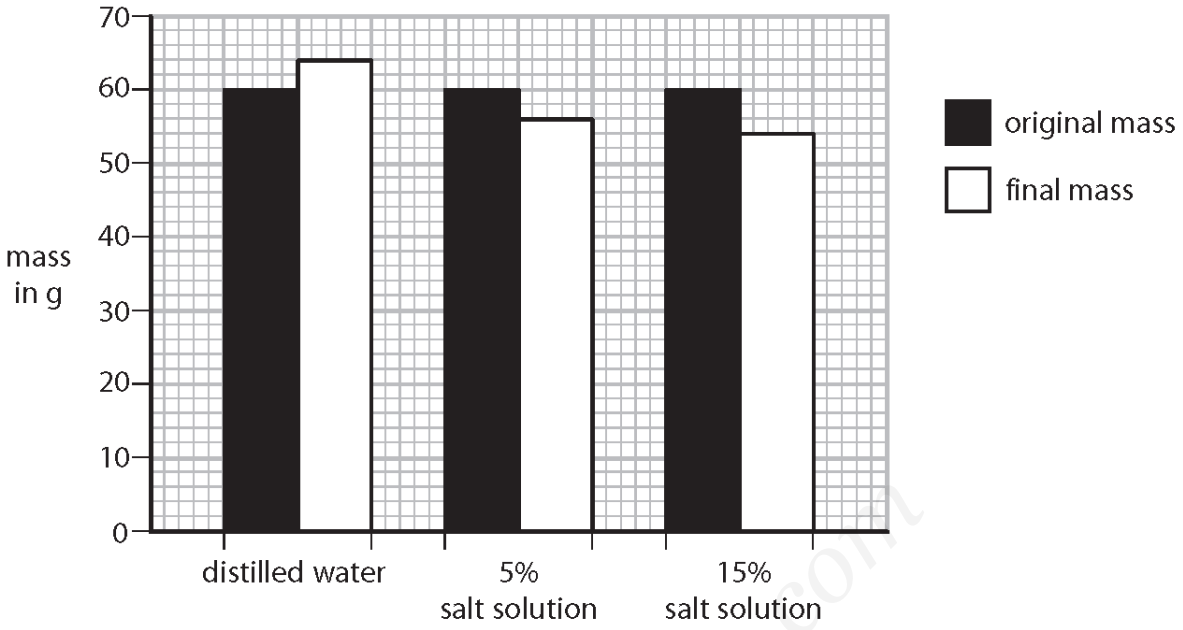
(a) The bar graph shows the results obtained by the student from the osmosis experiment.



Bar graph 1

(i) Name the dependent variable in this experiment.

(1)

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(ii) Explain the result for the egg placed in distilled water.

(2)

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(b) The student calculates the percentage change in mass for the eggs placed in distilled water and in 5% salt solution.

(i) Use the data from graph 1 to calculate the percentage change in mass for the egg placed in 15% salt solution. Show your working.

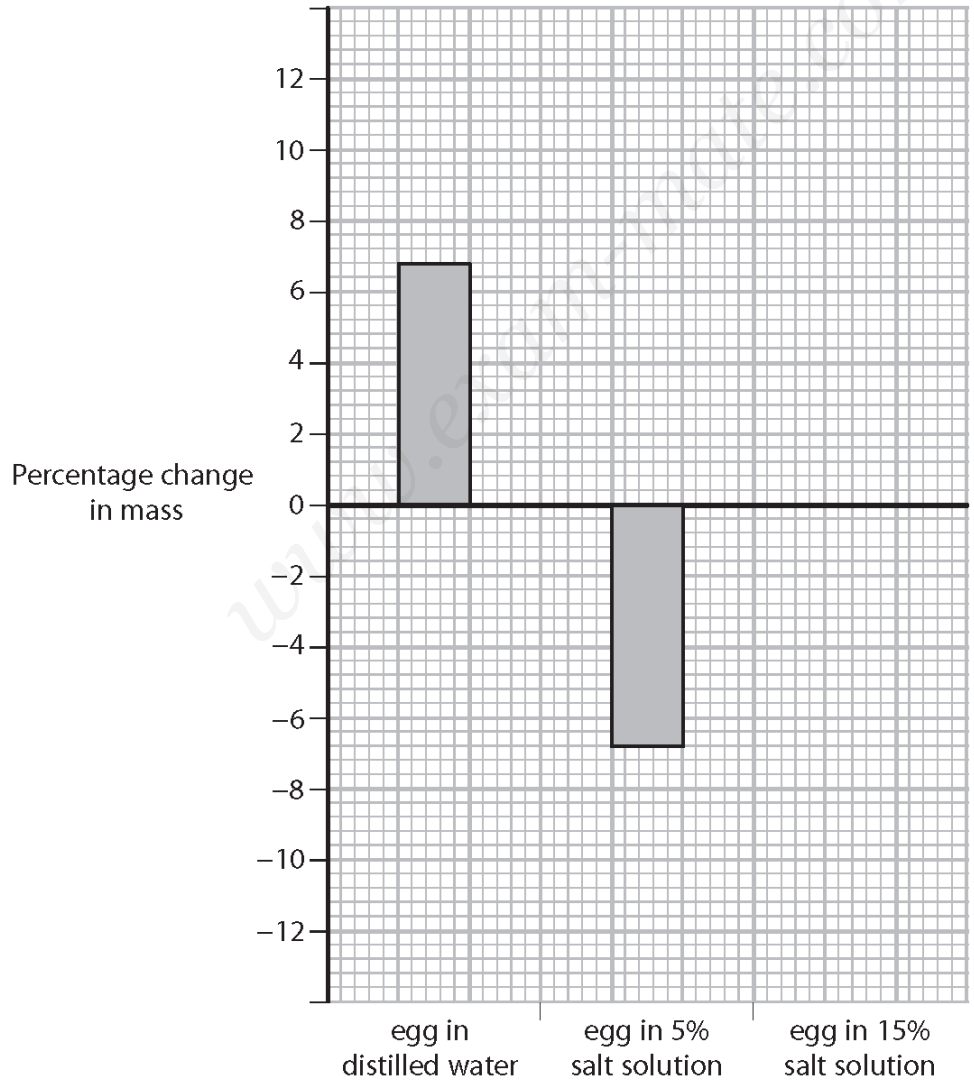
(2)

Percentage change in mass = ... %

(ii) The student plots the percentage change in mass on graph 2.

Complete the bar graph to show the percentage change in mass for the egg placed in 15% salt solution.

(1)



Bar graph 2

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(c) Give one way in which osmosis differs from diffusion.

(1)

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