

Candidate Name	Centre Number	Candidate Number
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**GCSE**

243/01

**SCIENCE BIOLOGY  
FOUNDATION TIER  
BIOLOGY 3**

P.M. THURSDAY, 19 May 2011

45 minutes

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1	5	
2	5	
3	7	
4	7	
5	3	
6	8	
7	5	
8	4	
9	6	
<b>Total</b>	<b>50</b>	

0243  
01/0001

**ADDITIONAL MATERIALS**

In addition to this paper you may require a calculator and a ruler.

**INSTRUCTIONS TO CANDIDATES**

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet.

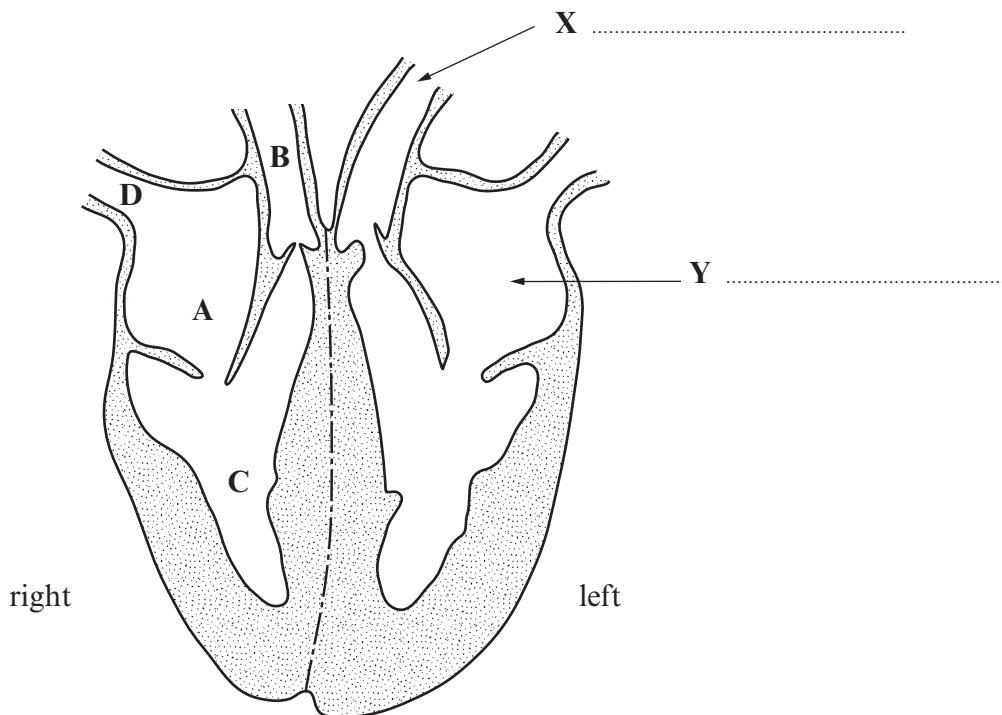
**INFORMATION FOR CANDIDATES**

The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the necessity for good English and orderly presentation in your answers.

Answer **all** questions.

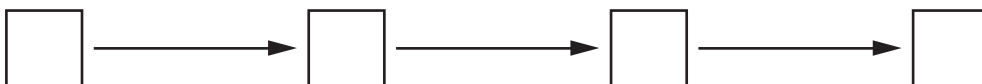
1. (a) The diagram below shows a section through the human heart.



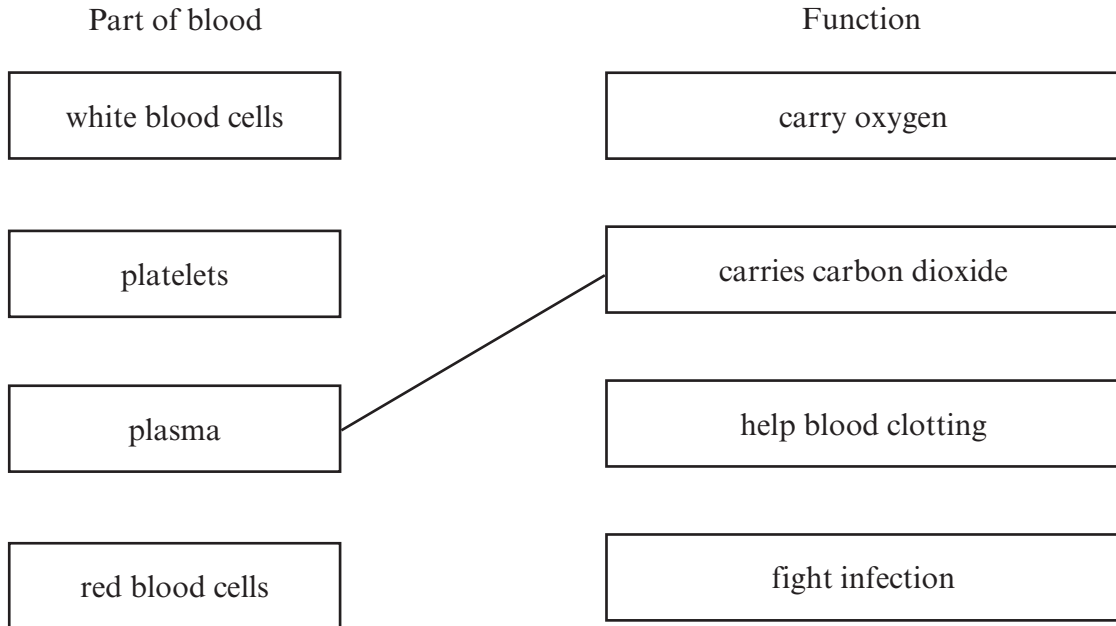
- (i) Label **X** and **Y** on the diagram using some of the words below. [2]

atrium      ventricle      valve      aorta

- (ii) From the diagram, write letters **A**, **B**, **C** and **D** in the boxes below, in the correct order to show the path of the blood as it flows through the right side of the heart. [1]



- (b) Draw lines, using a ruler, to join the parts of the blood with their functions. One has been done for you. [2]



2. Read the following information.

Mycoprotein 'burgers'



- In the 1960s scientists made a food from microbes.
- They grew the fungus *Fusarium* on sugar from cheap corn-starch to make a food called Mycoprotein.
- The fungus was grown in a fermenter with potassium and phosphate added.
- It only took a few days for a very large quantity of Mycoprotein to be made.

(a) Use the information to answer the following questions.

(i) Which type of microbe was used to make Mycoprotein? [1]

.....

(ii) Give **one** reason why the scientists used corn-starch to grow *Fusarium*. [1]

.....

(iii) Name **one** mineral which this microbe needed for growth. [1]

.....

(iv) Suggest **one** advantage of using a fermenter to grow Mycoprotein. [1]

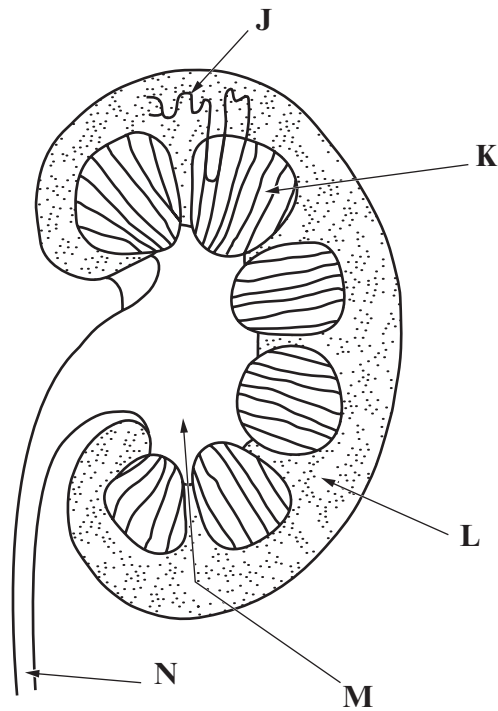
.....

(b) State **one** example, *other than Mycoprotein*, where a microbe is used in making a food. [1]

Food .....

Microbe .....

3. The diagram shows a section through a human kidney.



(a) From the diagram, give the letters which show [3]

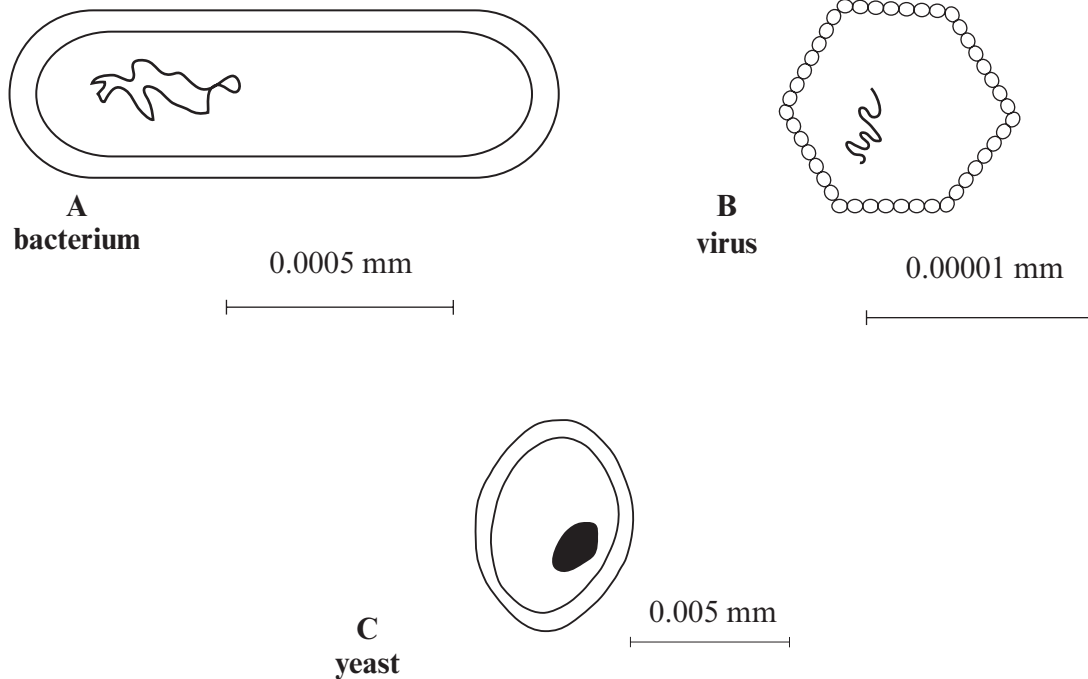
- (i) a nephron; .....
- (ii) the medulla; .....
- (iii) the ureter. ....

(b) Use some of the following words to complete the sentences below. [4]

protein    urea    urine    urethra    bladder

The kidney produces a fluid called ....., which is stored in the ..... before leaving the body through the ..... The fluid contains the waste substance .....

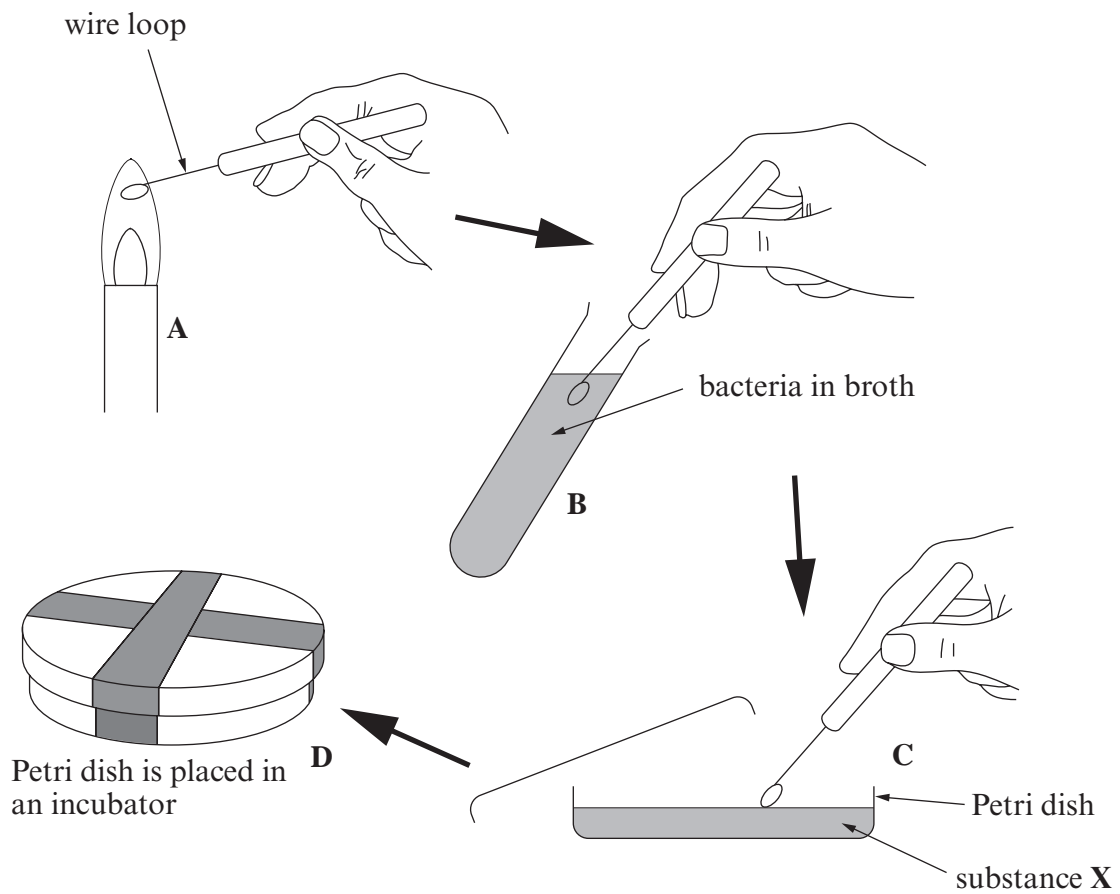
4. (a) The diagrams show three different microorganisms.



Give the correct letter from the diagrams above for each statement below. You may use letters more than once. [4]

- (i) Reproduces by dividing into two. ....
- (ii) Reproduces by budding. ....
- (iii) The smallest microorganism. ....
- (iv) Has a nucleus. ....

(b) The diagrams show how bacteria can be grown in a laboratory.



(i) State why the following actions are necessary. [2]

I. Heating the wire loop in A.

.....

II. Keeping the lid of the dish closed in D.

.....

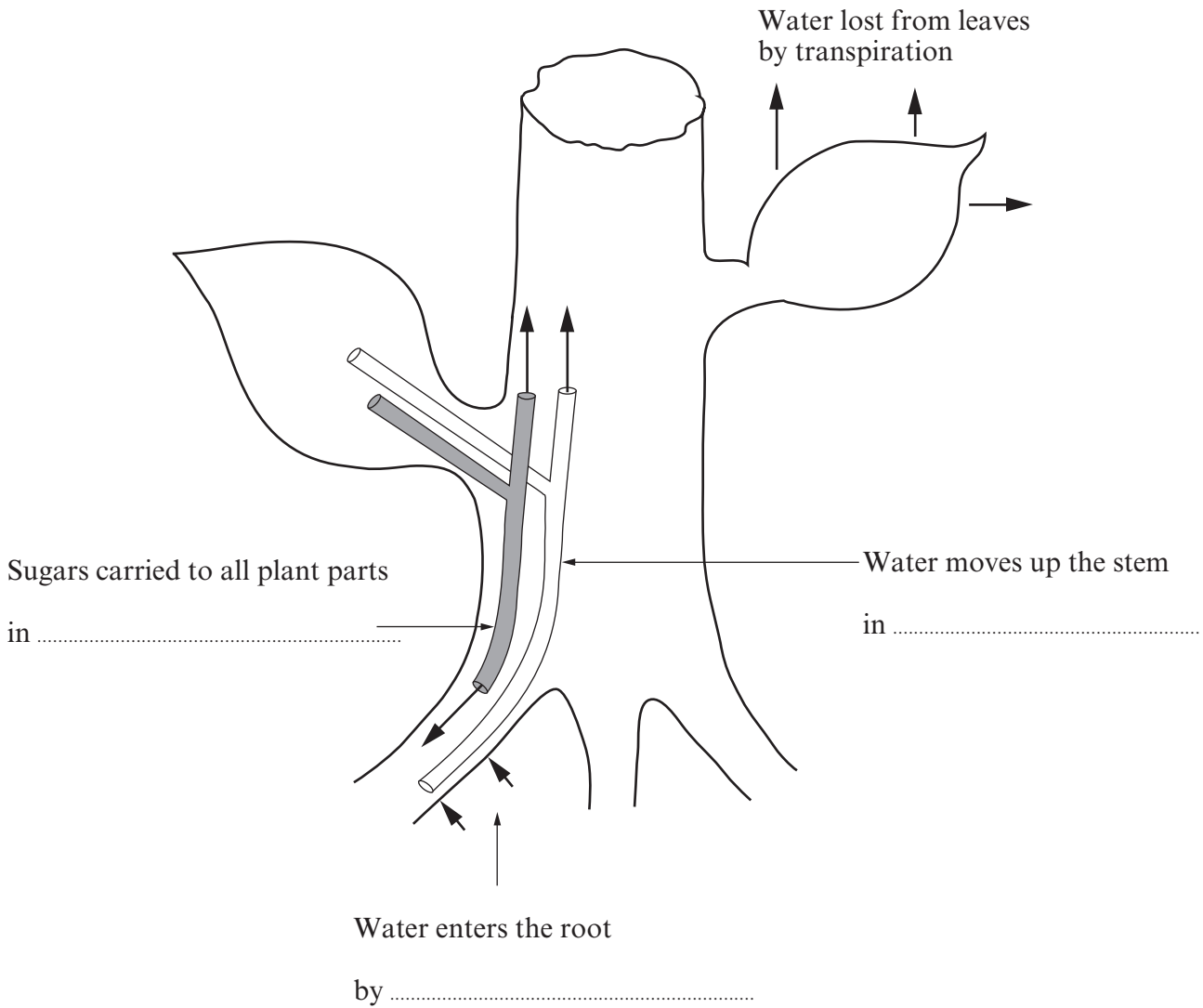
(ii) Name substance X in the dish in C. [1]

.....

5. The diagram shows water passing through a leafy plant. Complete the labels using some of the words below.

[3]

xylem      osmosis      photosynthesis      phloem



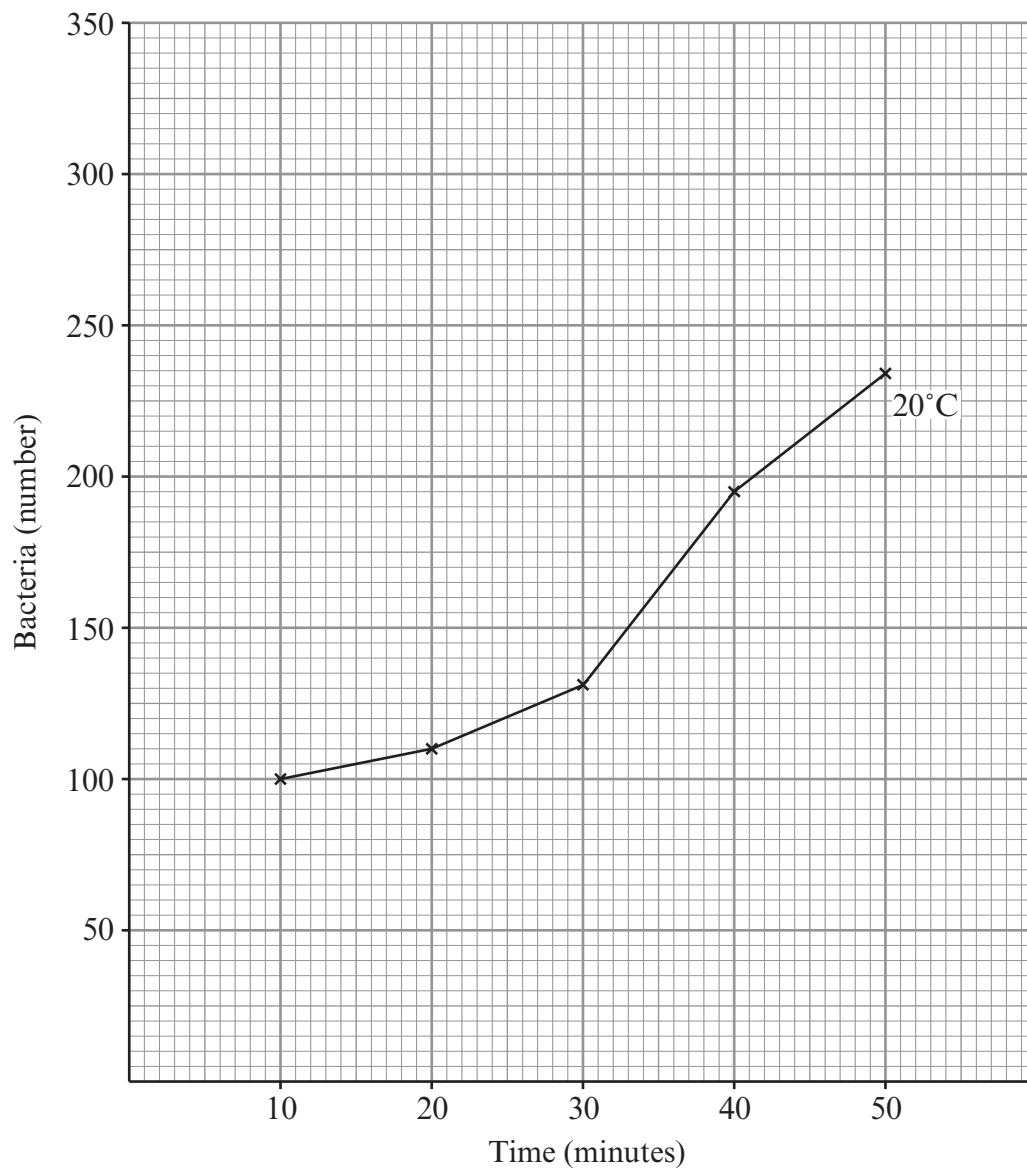


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6. Scientists grew bacteria at 20°C. They counted the number of bacteria every 10 minutes for 50 minutes. They repeated the investigation at 30°C and the results are shown in the table.

Time (minutes)	Number of bacteria in sample	
	20°C	30°C
10	100	110
20	110	125
30	132	185
40	195	273
50	234	335

- (a) Plot the results for 30°C onto the graph. Use a ruler to join the plots. Label your line 30°C. The results for 20°C have been done for you. [3]



(b) From the graphs

- (i) Calculate the increase in the number of bacteria at 20°C between 25 minutes and 35 minutes. Show your working. [2]

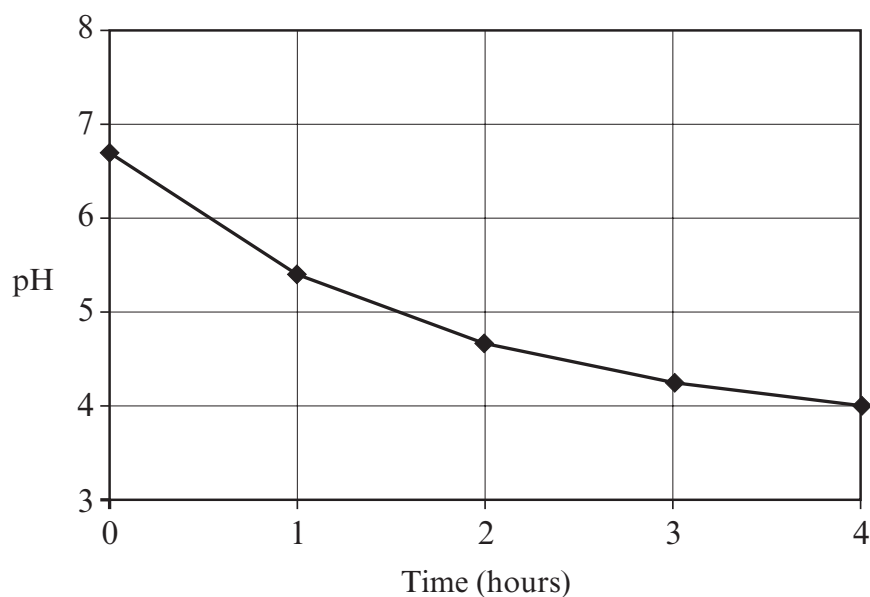
Answer .....

- (ii) How did raising the temperature affect the growth of these bacteria? [1]

- (iii) At what time did the scientists find the greatest difference between the two temperatures? [1]

- (c) Why is it important to keep fresh food in a refrigerator at 4°C? [1]

7. During yoghurt making the pH of the milk used in the process changes. The graph below shows these changes over a 4 hour period.



- (a) **Describe** the change shown in the graph. [1]

.....

.....

- (b) **Explain** how the change in pH is brought about during the yoghurt making process. [3]

.....

.....

.....

.....

- (c) **State one** factor that must remain constant during this phase of the yoghurt making process. [1]

.....

8. Megan was concerned about the high cost of running her washing machine. She washed some of her baby's egg stained clothes in two different washing powders at 30°C and at 80°C. Megan's results are shown in the table below.

Temperature / °C	Washing powder	
	<i>Sudsbright</i> (non biological)	<i>SuperBIO</i> (biological)
30	Egg stains remaining	No egg stains
80	No egg stains	Egg stains remaining

(a) Explain the results for *SuperBIO* at

(i) 30°C;

[2]

.....

.....

.....

(ii) 80°C.

[1]

.....

.....

(b) Which washing powder would you recommend that Megan uses? Explain your answer. [1]

.....

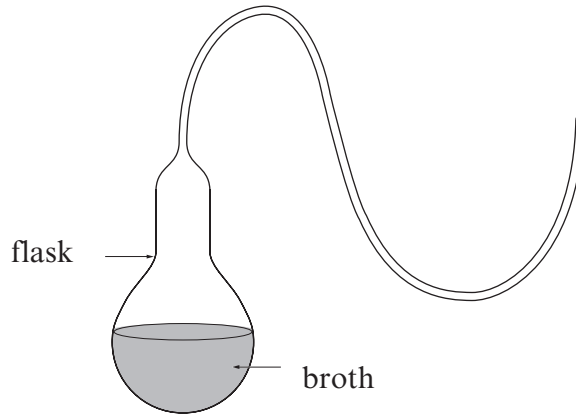
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9. The diagram shows the apparatus used by a famous scientist in the 19<sup>th</sup> Century to disprove the theory of spontaneous generation.

(a) What is meant by the term *spontaneous generation*? [1]

.....

.....



(b) (i) Name the flask shown above. [1]

.....

(ii) Name the famous scientist, who used the apparatus above, to disprove the theory of spontaneous generation. [1]

.....

(c) When the above apparatus was used, the contents of the flask were boiled and the neck of the flask was sealed.

(i) State why the contents of the flask were boiled. [1]

.....

(ii) State why the neck of the flask was sealed. [1]

.....

(d) Some of the sealed flasks were opened in a room full of people and were left there for 8 hours. Other sealed flasks were opened on the top of a mountain and left for the same amount of time. Both sets of flasks were then sealed and returned to the laboratory. After 3 days the contents of the flasks were examined. State **one** difference you would expect to see between the two sets of flasks. [1]

.....

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