

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

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Forename(s)

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Candidate signature

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# GCSE SCIENCE BIOLOGY

# F

Foundation Tier

End of Year 10 test 2018

Time allowed: 1 hour

## Materials

For this paper you must have:

- a ruler
- a scientific calculator.

## Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want to be marked.
- In all calculations, show clearly how you work out your answer.

## Information

- The maximum mark for this paper is 60.
- The marks for questions are shown in brackets.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.

For Examiner's Use	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
<b>TOTAL</b>	

**0 1**

Digestion is where food is broken down into soluble products.

**0 1****. 1**

Different substances help to digest different foods.

Draw **one** line from each substance to the site of production.**[3 marks]****Substance****Site of production**

Bile

Gall bladder

Large intestine

Amylase

Liver

Salivary glands

Protease

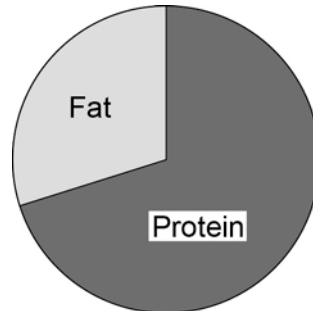
Stomach

0 1 . 2

A man eats a meal.

**Figure 1** shows the proportions of fat and protein in the meal.

**Figure 1**



When the man eats the meal the food is digested.

The percentage of amino acids in the man's bloodstream increases after the food is digested.

Give **one** reason why.

**[1 mark]**

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**Question 1 continues on the next page**

**Turn over ►**

**Table 1** shows the results of food tests on a sample of food.

**Table 1**

Test solution	Positive result	Colour of test solution after testing
Benedict's	Yes	Red
Biuret	No	Blue
Iodine	Yes	

**0 1 . 3** What two types of food are in the sample?

**[2 marks]**

Tick **two** boxes.

Fatty acids

Glucose

Protein

Starch

Vitamins

**0 1 . 4** What colour was the solution after the positive iodine test?

**[1 mark]**

**7**

0 2

Cells are the basic unit of all forms of life.

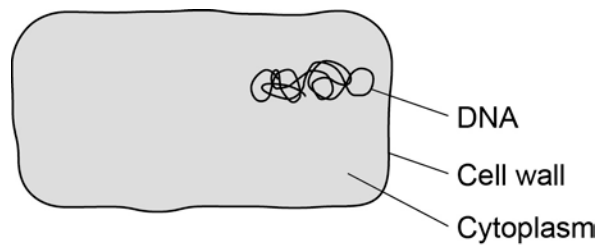
0 2

. 1

Name **two** cell structures that are in a eukaryotic cell but **not** in a prokaryotic cell.**[2 marks]**

1 \_\_\_\_\_

2 \_\_\_\_\_

**Figure 2** shows a prokaryotic cell viewed under a light microscope.**Figure 2**

0 2

. 2

An electron microscope has a higher magnification than a light microscope.

Name **one** other cell structure you would see in a prokaryotic cell if you used an electron microscope to view the cell.**[1 mark]**

\_\_\_\_\_

0 2

. 3

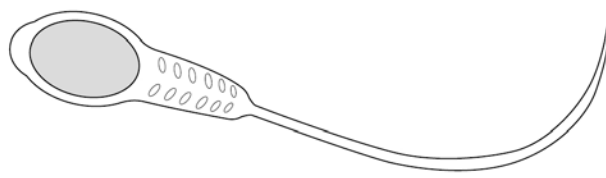
The actual length of the cell in **Figure 2** is 0.006 mm.

What is the length of the cell in standard form?

**[1 mark]**Tick **one** box. $6 \times 10^{-3}$  m  $6 \times 10^{-4}$  m  $6 \times 10^{-5}$  m  $6 \times 10^{-6}$  m **Turn over ►**

0 2 . 4 **Figure 3** shows a sperm cell.

**Figure 3**



Explain **one** way in which a sperm cell is adapted for its function.

**[2 marks]**

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6

**0 3**

Cellulitis is a disease caused by bacteria.

Cellulitis causes a rash on the skin.

**0 3****1**

Complete the sentences.

Choose the answers from the box.

**[2 marks]****antibiotics****antibodies****antigens****antitoxins****painkillers****toxins**

The bacteria that cause cellulitis release \_\_\_\_\_ ,  
which cause a rash on the skin.

Cellulitis can be cured by taking \_\_\_\_\_ .

**0 3****2**

When a person is infected with cellulitis bacteria, their white blood cells engulf and destroy the bacteria.

What is this process called?

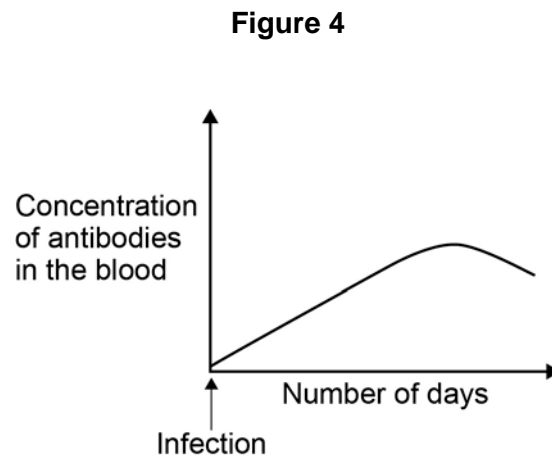
**[1 mark]**

**Question 3 continues on the next page**

**Turn over ►**

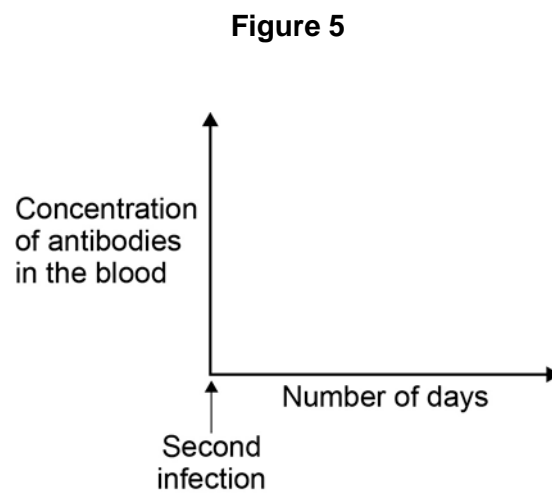
0 3 . 3

**Figure 4** shows how the concentration of antibodies in the blood changes after a person is infected with cellulitis.



The concentration of antibodies in the blood would change after a second infection with cellulitis.

Sketch a line on **Figure 5** to show how the concentration of antibodies would change. **[1 mark]**





Malaria is a disease that kills a million people each year.

Malaria is caused by a protist.

The malaria protist is carried by mosquitos.

The malaria protist is passed from person to person when the mosquito bites them.

**0 3** . **4** What word describes the mosquito in the malaria protist's life cycle?

**[1 mark]**

Tick **one** box.

Antigen

Antibody

Phagocyte

Vector

**0 3** . **5** One way to prevent the spread of malaria is to use mosquito nets around beds when people are sleeping.

How does the mosquito net prevent the spread of malaria?

**[1 mark]**

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**6**

**Turn over for the next question**

**Turn over ►**

0 4

Blood is made of plasma, platelets and different types of blood cell.

0 4

. 1

A man goes to hospital with a cut that is bleeding. The bleeding will not stop.

Which part of the blood does the man not have enough of to stop his cut bleeding?

[1 mark]

Tick **one** box.

Platelets

Red blood cells

White blood cells

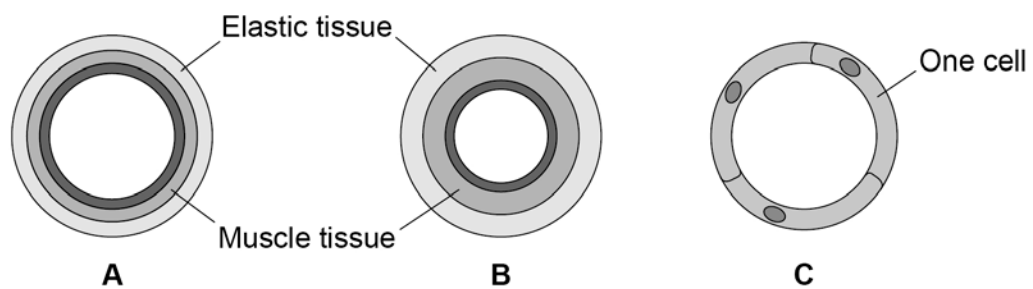
0 4

. 2

A woman needs to have a stent fitted to help prevent her having a heart attack.

**Figure 6** shows three different types of blood vessel in the heart, **A**, **B** and **C**.

**Figure 6**



Not to scale

Which type of blood vessel in the heart, **A**, **B** or **C**, should the stent is placed in?

[1 mark]

**0 4 . 3** There are two types of stent that the woman could have fitted in her heart.

Scientists did medical trials on patients who had been fitted with the different stents.

The trials lasted 5 years.

**Table 2** shows the results of the trials.

**Table 2**

<b>Number of patients</b>	<b>Stent P</b>	<b>Stent Q</b>
In the trial	4500	4502
Who had a heart attack and died	103	98
Who had a heart attack but did not die	356	400
Who had to have the stent replaced	630	799
Who had blood clots forming on the stent	32	50
Who had a blood clot in the brain	143	117

Describe the advantages and disadvantages of having Stent **P** fitted rather than Stent **Q**.

**[4 marks]**

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**Turn over for the next question**

**6**

**Turn over ►**

0 5

Starch is digested by the enzyme amylase.

A student did an investigation on amylase activity.

This is the method used.

1. Mix amylase solution and starch suspension at 20 °C in a boiling tube.
2. Remove a drop of the mixture every 30 seconds and test it for starch.
3. Continue testing every 30 seconds until no starch is detected.
4. Repeat the investigation at different temperatures.

0 5

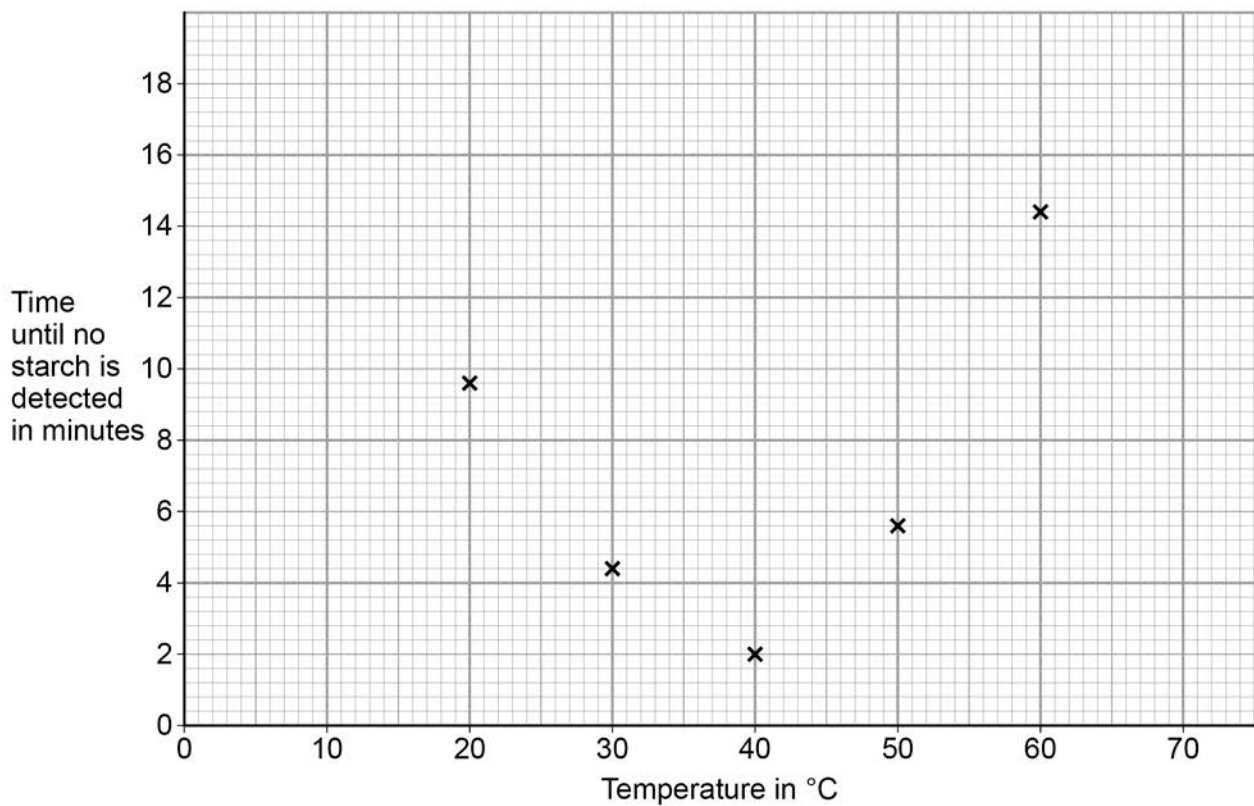
. 1

What apparatus should the student use to control the temperature of the mixture?

[1 mark]

Figure 7 shows the student's results.

Figure 7



0	5	.	2	Complete <b>Figure 7</b> by drawing a line of best fit.	<b>[1 mark]</b>
0	5	.	3	The starch suspension contained 0.8 g of starch. Calculate the mean rate of starch digested at 33 °C.	<b>[2 marks]</b>
<p style="text-align: center;">Mean rate of starch digested = _____ grams per minute</p>					
0	5	.	4	Describe <b>two</b> ways the student could improve the <b>precision</b> of his data.	<b>[2 marks]</b>
<p>1 _____</p> <p>2 _____</p>					
0	5	.	5	Explain why the rate of starch digested per minute at 60 °C is lower than the rate at 40 °C.	<b>[2 marks]</b>
0	5	.	6	Predict the time taken until no starch is detected at 10 °C. Use information from <b>Figure 7</b> .	<b>[1 mark]</b>
<p style="text-align: center;">Time until no starch is detected = _____ minutes</p>					

0 6

This question is about transport in organisms.

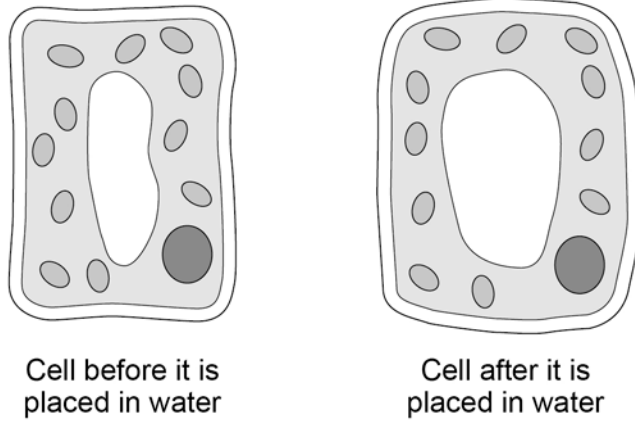
0 6 . 1

A student investigates what happens to a plant cell when it is placed in water.

The student looks at the plant cell through a microscope.

Look at **Figure 8**.

**Figure 8**



Explain why the plant cell swells up when the cell is placed in water.

**[4 marks]**

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0 6 .

2

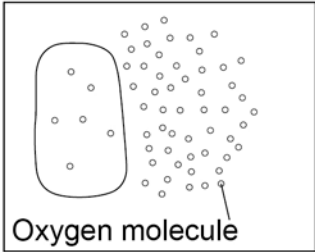
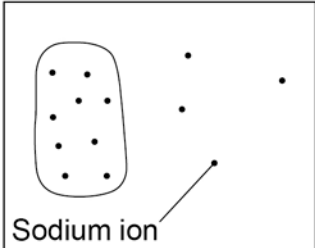
Fish that live in fresh water absorb substances through the epithelial cells in their gills.

**Figure 9** shows the concentration of two different substances inside and outside a gill epithelial cell.

Draw **one** line from each substance to the process used to move it into the gill epithelial cell.

[2 marks]

Figure 9

Substance	Process used
 <p>Oxygen molecule</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">Active transport</div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">Diffusion</div>
 <p>Sodium ion</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">Excretion</div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">Transpiration</div>

Question 6 continues on the next page

Turn over ►





**Turn over for the next question**

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0 7

Yeast is an organism that respire anaerobically.

0 7

. 1 Complete the word equation for anaerobic respiration in yeast.

[1 mark]

Glucose  $\longrightarrow$  \_\_\_\_\_ + \_\_\_\_\_

A student investigated the effect of glucose concentration on the rate of anaerobic respiration in yeast.

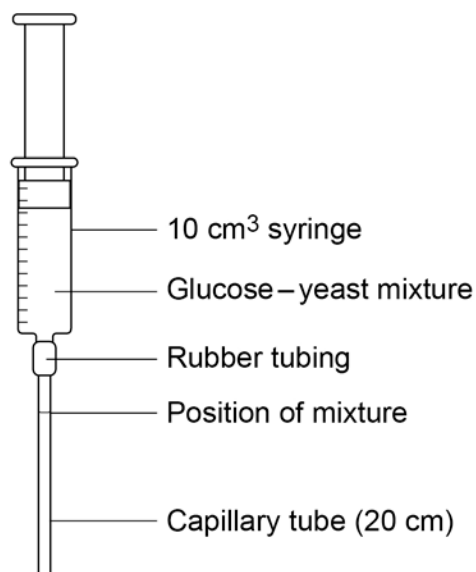
This is the method used.

1. Put 10 cm<sup>3</sup> of yeast suspension in a beaker.
2. Add 10 cm<sup>3</sup> of 0.5 % glucose solution and mix.
3. Put 10cm<sup>3</sup> of the mixture into a syringe.
4. Press the syringe until the mixture is visible at the end of the capillary tubing.
5. Record the starting position of the mixture.
6. Leave the syringe for 10 minutes.
7. Record the end position of the mixture.
8. Repeat steps 1–7 for four different concentrations of glucose solution.

The student repeated the investigation a further two times.

**Figure 11** shows the apparatus the student used.

**Figure 11**



**0 7 . 2** Give **two** factors the student controlled in the investigation.

**[2 marks]**

1

2

**0 7 . 3** Give **one** other factor the student should have controlled in the investigation.

**[1 mark]**

**Question 7 continues on the next page**

**Turn over ►**

**Table 3** shows the student's results.

**Table 3**

Concentration of glucose in %	Volume of gas collected in 10 minutes in cm <sup>3</sup>			Mean volume of gas collected in 10 minutes in cm <sup>3</sup>
	1	2	3	
0.5	0.12	0.16	0.18	0.16
1.0	0.54	0.48	0.48	0.50
1.5	0.72	0.78	0.44	0.75
2.0	0.90	0.98	0.04	<b>X</b>
2.5	1.00	1.00	0.94	0.98

**0 7 . 4** Calculate **X** in **Table 3**.

**[1 mark]**

**X** = \_\_\_\_\_ cm<sup>3</sup>

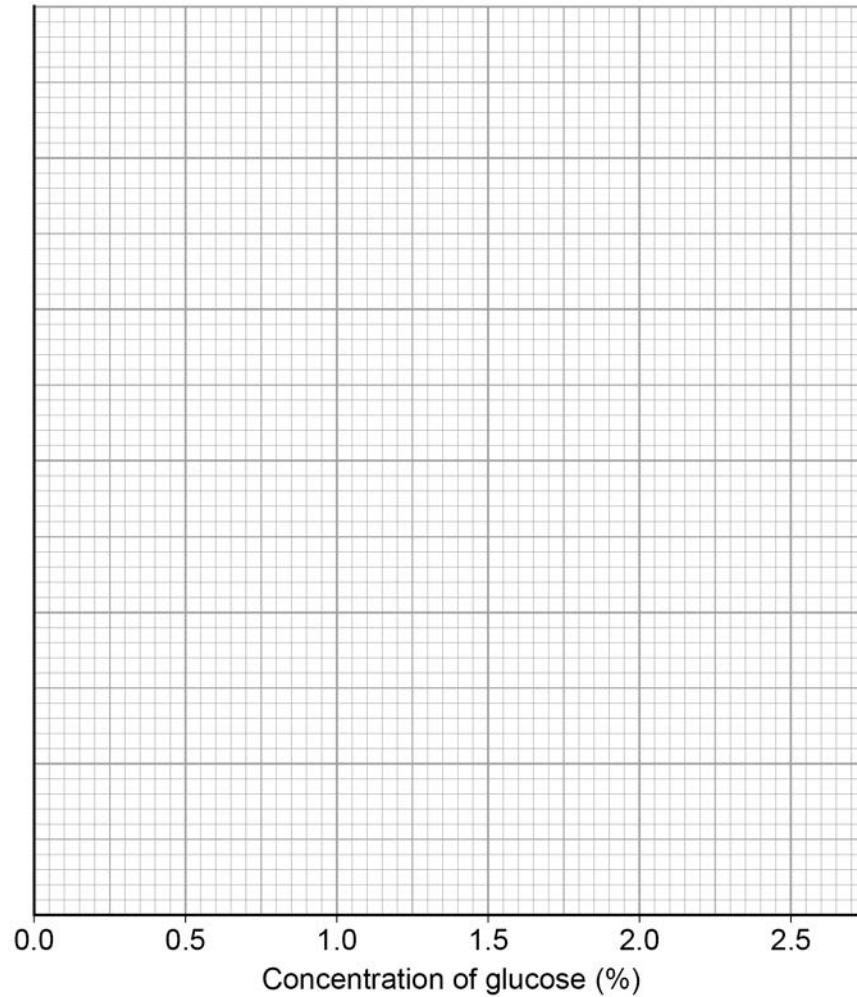
**0 7 . 5** Plot the data from **Table 3** on **Figure 12**.

You should:

- label the y-axis
- use a suitable scale
- draw a line of best fit.

**[4 marks]**

**Figure 12**



**0 7 . 6** Describe the patterns shown in the student's data.

**[2 marks]**

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Turn over ►

**0 8** Environmental factors affect the rate of water loss from plants.

**0 8** . **1** Explain why increasing temperature increases the rate of water loss from plants. **[2 marks]**

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**0 8** . **2** Give **three** other environmental factors that would increase the rate of water loss from plants. **[3 marks]**

1

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2

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3

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**0 8** . **3** The movement of water through a plant is called transpiration.  
What is **translocation**? **[1 mark]**

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**END OF QUESTIONS**

**6**

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