

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										



General Certificate of Secondary Education  
Foundation Tier  
June 2014

## Further Additional Science

### Unit 1 Biology B3

Tuesday 13 May 2014 9.00 am to 10.00 am

#### For this paper you must have:

- a ruler.
- You may use a calculator.

#### Time allowed

- 1 hour

#### Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

#### Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.
- Question 7 should be answered in continuous prose.  
In this question you will be marked on your ability to:
  - use good English
  - organise information clearly
  - use specialist vocabulary where appropriate.

#### Advice

- In all calculations, show clearly how you work out your answer.

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
TOTAL	

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**F**



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**FAS1FP**

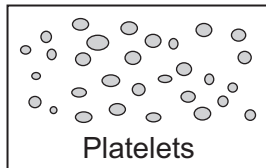
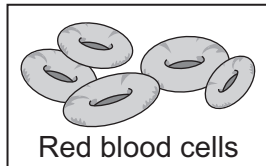
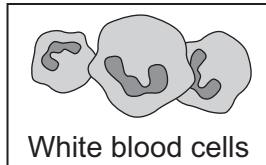
Answer **all** questions in the spaces provided.

**1 (a) (i)** Blood is part of the circulatory system.

Draw **one** line from each part of the blood to its correct function.

**[3 marks]**

**Part of the blood**



**Function**

carry glucose around  
the body

carry oxygen around  
the body

help the blood to clot

destroy  
microorganisms

**1 (a) (ii)** Name **one** waste product that is transported by the blood plasma.

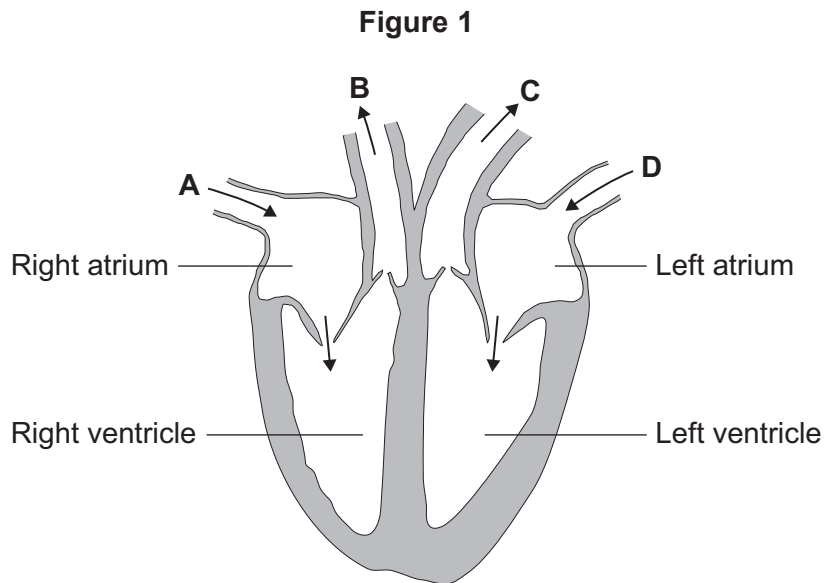
**[1 mark]**

.....



- 1 (b)** The heart is also part of the circulatory system.

**Figure 1** shows a section through the human heart.



- 1 (b) (i)** Which arrow, **A**, **B**, **C** or **D**, shows blood leaving the heart in the pulmonary artery to go to the lungs? ☐

[1 mark]

- 1 (b) (ii)** Which arrow, **A**, **B**, **C** or **D**, shows blood from the lungs entering the heart in the pulmonary vein? ☐

[1 mark]

- 1 (b) (iii)** Valves in the circulatory system make sure blood only travels in one direction.

Name the type of blood vessel that has valves.

[1 mark]

.....

**Question 1 continues on the next page**

**Turn over ►**

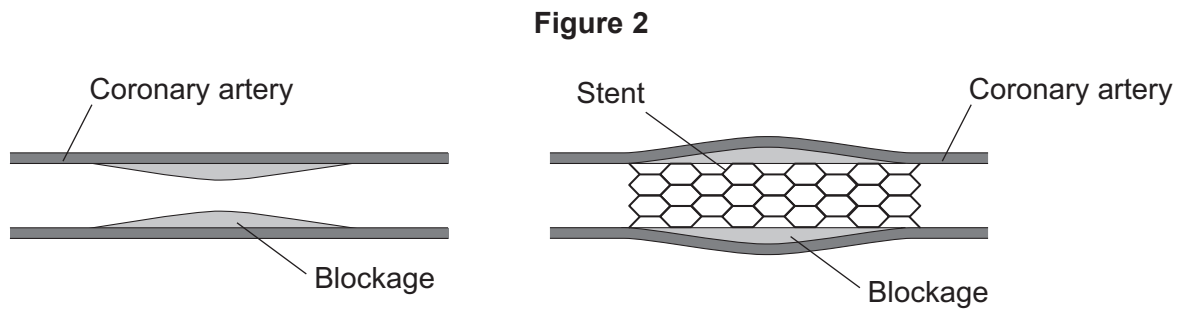


**1 (c)** A person's coronary artery has become narrower.

The person has a heart attack.

A doctor puts a stent into the person's coronary artery.

**Figure 2** shows a stent inside a coronary artery.



**1 (c) (i)** How does the stent help to prevent another heart attack?

Give **one** way.

**[1 mark]**

.....

.....



1 (c) (ii) Figure 3 shows a surgeon putting a stent into a patient.

Figure 3



The surgeon puts the stent into an artery in the leg. He moves the stent through the artery to the coronary artery.

Suggest **two** possible risks of this operation.

[2 marks]

- 1 .....
- .....
- 2 .....
- .....

10

Turn over for the next question

Turn over ►



**2** In the human body, blood glucose levels need to be controlled.

**2 (a) (i)** Draw a ring around the correct answer to complete each sentence.

**[2 marks]**

Blood glucose levels are monitored by the

brain.

liver.

pancreas.

When blood glucose levels increase, the body makes a hormone.

This hormone causes

glucose

oxygen

water

to move from the blood into the cells.

**2 (a) (ii)** Complete the following sentence.

**[1 mark]**

The hormone that controls blood glucose levels is made in the .....



- 2 (b)** In a healthy person, blood glucose levels are between 4.4 and 6.1 mmol per dm<sup>3</sup>.  
Diabetes is a disorder which affects blood glucose levels.  
A doctor measured the blood glucose levels of four people, **A**, **B**, **C** and **D**.  
The results are shown in **Table 1**.

**Table 1**

	Person			
	A	B	C	D
Blood glucose level in mmol per dm <sup>3</sup>	4.6	5.8	10.1	2.4

- 2 (b) (i)** Which person, **A**, **B**, **C** or **D**, has a blood glucose level that is too low?

[1 mark]

- 2 (b) (ii)** Which person, **A**, **B**, **C** or **D**, has diabetes and needs to inject

some insulin?

[1 mark]

- 2 (b) (iii)** Give **one** way, other than using insulin, that diabetes can be controlled.

[1 mark]

.....

.....

6

Turn over for the next question

Turn over ►



**3** Substances can move into cells and out of cells.

**3 (a)** Draw a ring around the correct answer to complete each sentence.

**[2 marks]**

Water moves into cells and out of cells by

active transport.

osmosis.

reabsorption.

The water moves through a

freely permeable

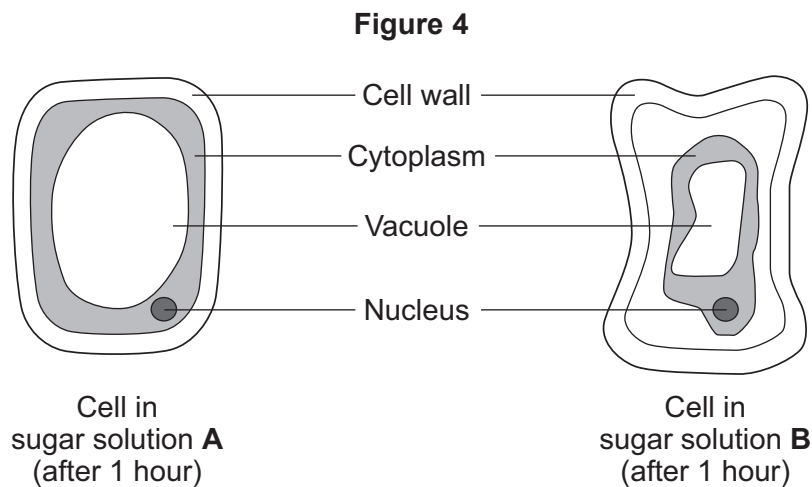
non-permeable

partially permeable

membrane.

**3 (b)** Students put plant cells into two different strengths of sugar solutions, **A** and **B**.

**Figure 4** shows what the cells looked like after 1 hour.



**3 (b) (i)** Describe **two** ways in which the cell in sugar solution **B** is different from the cell in sugar solution **A**.

**[2 marks]**

- 1 .....
- .....
- 2 .....
- .....





**3 (b) (ii)** A student put red blood cells into water.

Suggest what would happen to the cells.

**[1 mark]**

.....

.....

.....

**3 (c)** In the human body, glucose is absorbed into the blood from the small intestine.

The small intestine contains many villi.

Which **two** of the following help the absorption of glucose in the small intestine?

Tick (✓) **two** boxes.

**[2 marks]**

Villi have a cell wall.

☐

Villi are covered in thick mucus.

☐

Villi give the small intestine a large surface area.

☐

Villi have many blood capillaries.

☐

7

**Turn over for the next question**

**Turn over ►**



**4** Substances are transported through plants.

**4 (a)** Use the correct answer from the box to complete each sentence.

<b>capillary</b>	<b>guard cells</b>	<b>phloem</b>
<b>stomata</b>	<b>transpiration</b>	<b>xylem</b>

**4 (a) (i)** Water is transported from the roots to the stem of a plant  
in the .....

[1 mark]

**4 (a) (ii)** Dissolved sugars are transported through the plant  
in the .....

[1 mark]

**4 (a) (iii)** Movement of water through the plant is called the  
..... stream.

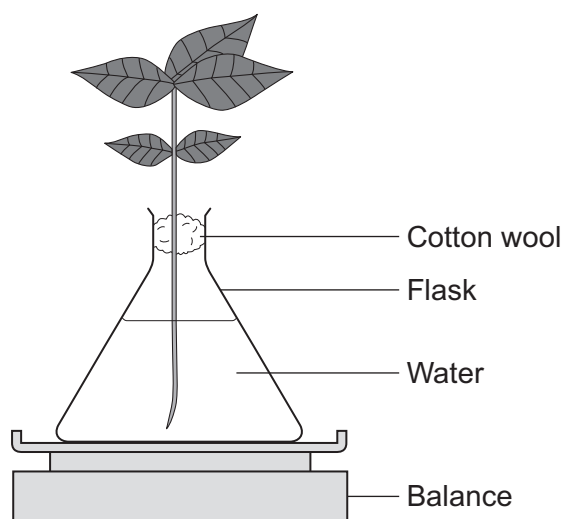
[1 mark]

**4 (a) (iv)** Water vapour moves out of the plant through pores  
called .....

[1 mark]

**4 (b)** Students investigated the effect of different conditions on water loss from leaves.  
The apparatus is shown in **Figure 5**.

**Figure 5**



The students set up four flasks, **A**, **B**, **C** and **D**.

The students:

- used the same size plant shoot in each flask
- recorded the mass of the flask and plant shoot at the start of each experiment
- left each flask and plant shoot in different conditions
- recorded the mass of each flask and plant shoot after 2 hours.

**Table 2** shows the conditions that flasks **A**, **B**, **C** and **D** were left in for 2 hours.

**Table 2**

Flask	Temperature in °C	Fan or no fan
<b>A</b>	20	No fan
<b>B</b>	20	Fan
<b>C</b>	35	No fan
<b>D</b>	35	Fan

**4 (b) (i)** Suggest why the students used cotton wool in each flask.

**[1 mark]**

.....

.....

**4 (b) (ii)** The use of the same size of plant shoot made the investigation a fair test.

Explain why.

**[2 marks]**

.....

.....

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.....

.....

**Question 4 continues on the next page**

**Turn over ►**



4 (b) (iii) Table 3 shows the students' results.

**Table 3**

Flask	Conditions		Mass at the start in grams	Mass after 2 hours in grams	Mass of water lost in 2 hours in grams
	Temperature in °C	Fan or no fan			
<b>A</b>	20	No fan	150.0	148.1	1.9
<b>B</b>	20	Fan	152.0	148.5	3.5
<b>C</b>	35	No fan	149.0	145.9	3.1
<b>D</b>	35	Fan	150.0	145.5	

What mass of water was lost by the plant shoot in flask **D**?

[1 mark]

.....

.....

..... grams

4 (b) (iv) Suggest what conclusion can be made about the effect of temperature on water loss from the plant shoot.

[1 mark]

.....

.....

.....

4 (b) (v) Suggest what conclusion can be made about the effect of the fan on water loss from the plant shoot.

[1 mark]

.....

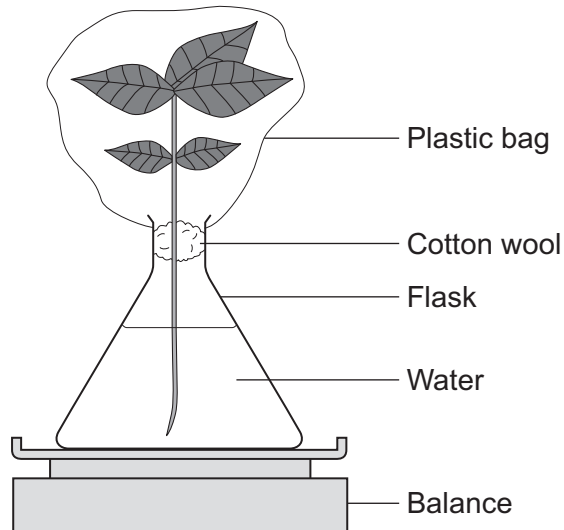
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- 4 (c)** The students carried out another experiment at 20 °C, with no fan.  
The students used the apparatus in **Figure 6**.

**Figure 6**



In this experiment, the students:

- recorded the mass of the flask and plant shoot before tying the plastic bag around the plant shoot
- removed the bag after 2 hours and recorded the mass again.

- 4 (c) (i)** What mass of water would be lost from the plant shoot in 2 hours?

Draw a ring around the correct answer.

[1 mark]

**0.3 g**

**1.9 g**

**3.9 g**

- 4 (c) (ii)** Give a reason for your answer to part (c)(i).

[1 mark]

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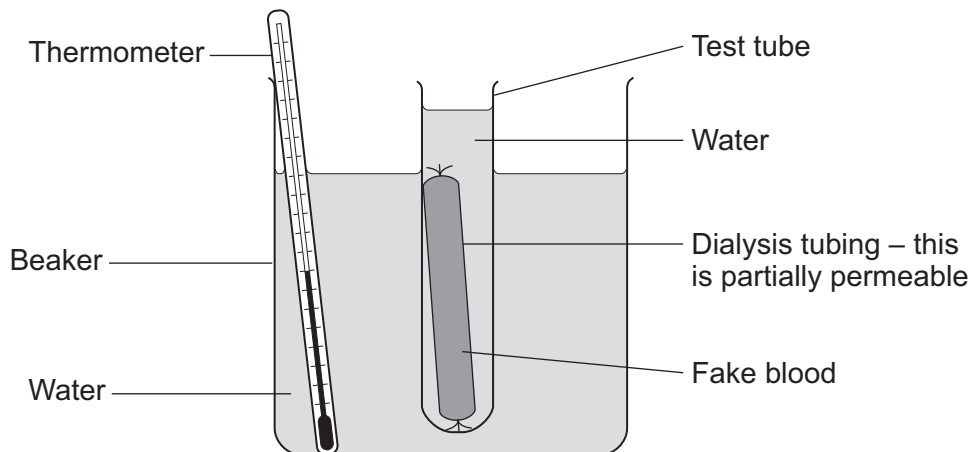
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- 5 A person's kidneys stop working. The person may be treated using a dialysis machine. Some students made a model of a dialysis machine.

**Figure 7** shows the students' model.

**Figure 7**



The fake blood contained:

- water
- sodium ions
- urea
- glucose
- protein.

- 5 (a) (i) Suggest why the students kept the water in the beaker at 37 °C.

[1 mark]

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**Question 5 continues on the next page**

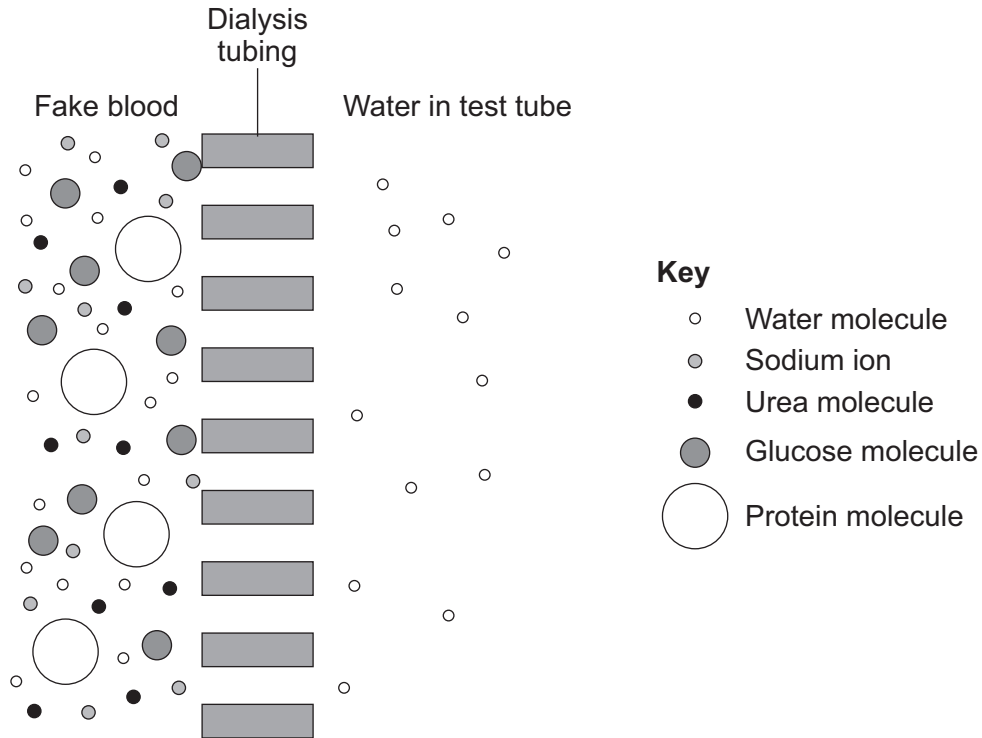
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5 (a) (ii) The dialysis tubing separates the fake blood from the water in the test tube.

**Figure 8** shows the fake blood, the dialysis tubing and the water in the test tube.

**Figure 8**



After 1 hour, the students tested the water in the test tube to see which substances had filtered through from the fake blood.

Name **one** substance that the students would find in the water in the test tube after 1 hour.

[1 mark]

.....

5 (a) (iii) Give a reason for your answer to part (a)(ii).

[1 mark]

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.....

.....





**5 (a) (iv)** In hospitals, dialysis machines use dialysis fluid, not pure water.

Dialysis fluid contains the same concentration of useful substances as the blood.

Which substance is at the same concentration in dialysis fluid as in blood?

Tick (✓) **one** box.

**[1 mark]**

Glucose

☐

Insulin

☐

Oxygen

☐

**5 (b)** When the kidneys stop working, the person can be treated by a continuous process called CPD.

In CPD:

- dialysis fluid is put into the abdomen
- the fluid is changed four times a day at home
- changing the fluid takes about 45 minutes.

Suggest **two** advantages of having CPD instead of treatment on a dialysis machine.

**[2 marks]**

1 .....

.....

2 .....

.....

6

**Turn over for the next question**

**Turn over ►**



**6** The number of fish in the oceans is decreasing.

**Table 4** shows information about the mass of fish caught by UK fishermen between 2002 and 2010.

**Table 4**

Year	Mass of fish caught by UK fishermen from <b>ALL SOURCES</b> in thousands of tonnes	Mass of fish caught by UK fishermen from <b>SUSTAINABLE SOURCES</b> in thousands of tonnes	Percentage of fish caught from sustainable sources
<b>2002</b>	690.0	427.8	62.0
<b>2004</b>	655.0	396.6	60.5
<b>2006</b>	619.0	386.0	62.4
<b>2008</b>	589.0	436.1	74.0
<b>2010</b>	611.5	465.0	

**6 (a) (i)** Calculate the percentage of fish caught from sustainable sources in 2010.

**[2 marks]**

.....

.....

.....

..... %



**6 (a) (ii)** Describe the pattern in **Table 4** for the mass of fish caught from all sources.

Suggest reasons for this pattern.

**[4 marks]**

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**6 (a) (iii)** Suggest why the percentage of fish caught from sustainable sources is increasing.

**[1 mark]**

.....

.....

**6 (b)** Give **two** methods of maintaining fish stocks at a sustainable level.

**[2 marks]**

1 .....

2 .....

**Question 6 continues on the next page**

**Turn over ►**



6 (c) Figure 9 shows a fish farm.

Figure 9



In a fish farm, large numbers of fish are grown in cages in the sea.

Why do fish in the cages grow faster than fish of the same species that are free in the sea?

You should refer to energy in your answer.

[4 marks]

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**In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.**

These waste products cause pollution to water, air and land.

- water
- air
- land.

**[6 marks]**

[illegible]

Extra space .....

**END OF QUESTIONS**

6



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