Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel
Level 1/Level 2 GCSE (9–1)

Centre Number | | | | | |

Candidate Number | | | | |

Friday 7 June 2019

Afternoon (Time: 1 hour 10 minutes) | Paper Reference **1SC0/2BF**

Combined Science

Paper 4: Biology 2

Foundation Tier

You must have:
Calculator, ruler

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- Calculators may be used.
- Any diagrams may NOT be accurately drawn, unless otherwise indicated.
- You must **show all your working out** with **your answer clearly identified** at the **end of your solution**.

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- In questions marked with an **asterisk** (*), marks will be awarded for your ability to structure your answer logically showing how the points that you make are related or follow on from each other where appropriate.

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

P60242RA

©2019 Pearson Education Ltd.

1/1/1/1/

P 6 0 2 4 2 R A 0 1 2 0

Pearson

Answer ALL questions. Write your answers in the spaces provided.

Some questions must be answered with a cross in a box ☒.
If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

1 (a) Figure 1 shows the water cycle.

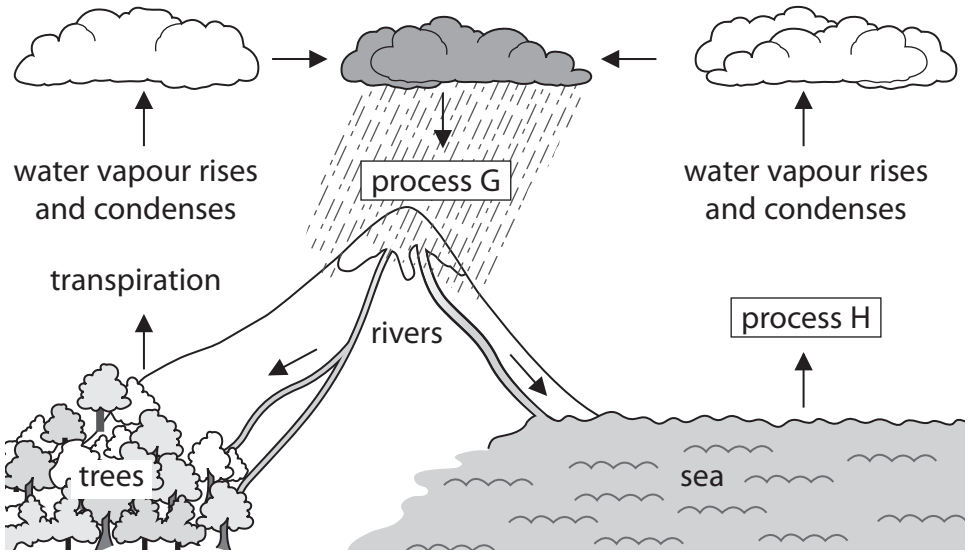


Figure 1

(i) Name process G and process H.

(2)

process G .....

process H .....

(ii) What causes the water vapour to condense and form clouds?

(1)

☒ **A** the water vapour cools down

☒ **B** the water vapour heats up

☒ **C** the temperature of the water vapour stays the same

☒ **D** the trees absorb more water

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

(b) Water from rivers is treated before it is safe to drink.

Use words from the box to complete the sentences.

(2)

filtering	fish	heating
mud	pathogens	stirring

During water treatment, the solids in river water are removed by ..... .

Chlorine is then added to the water to kill ..... .

(c) Figure 2 shows the Canary Islands.

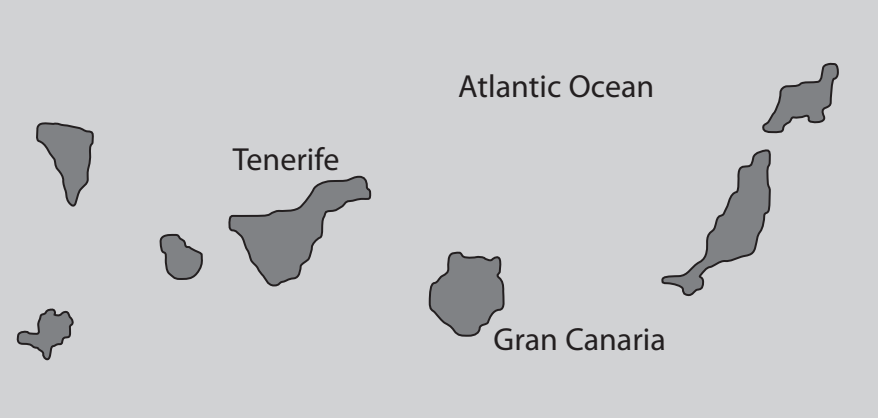


Figure 2

The Canary Islands do not have enough fresh water.

Describe how seawater can be turned into drinking water.

(2)

.....

.....

.....

.....

(Total for Question 1 = 7 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

2 Figure 3 shows the positions of the endocrine glands in a woman and a man.

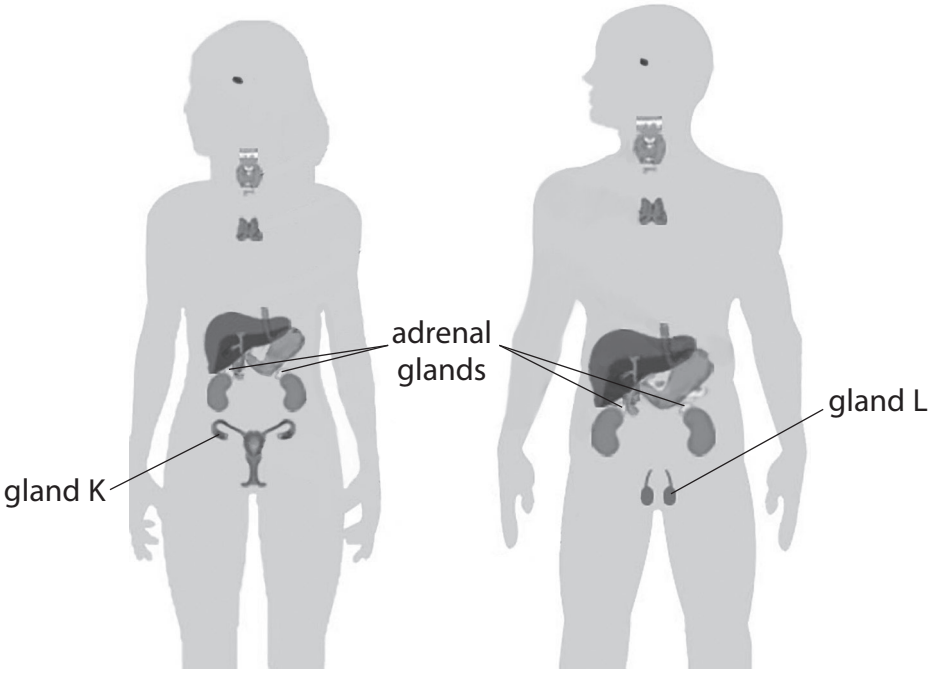


Figure 3

(a) Draw **one** straight line from each hormone to the effect of the hormone on the body.

(2)

hormone	effect of hormone
	increases glucose levels
hormone from gland K in the woman	prepares the uterus lining for a fertilised egg
	causes facial hair to grow
hormone from gland L in the man	controls the water content of the body
	decreases sweating

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

(b) How is adrenalin transported from the adrenal glands to its target organs?

(1)

- ☒ **A** by transpiration
- ☒ **B** by osmosis
- ☒ **C** dissolved in blood plasma
- ☒ **D** carried by red blood cells

(c) What name is given to the process of maintaining the internal body conditions?

(1)

- ☒ **A** respiration
- ☒ **B** diffusion
- ☒ **C** digestion
- ☒ **D** homeostasis

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

(d) Figure 4 shows the concentration of glucose in the blood of a person.

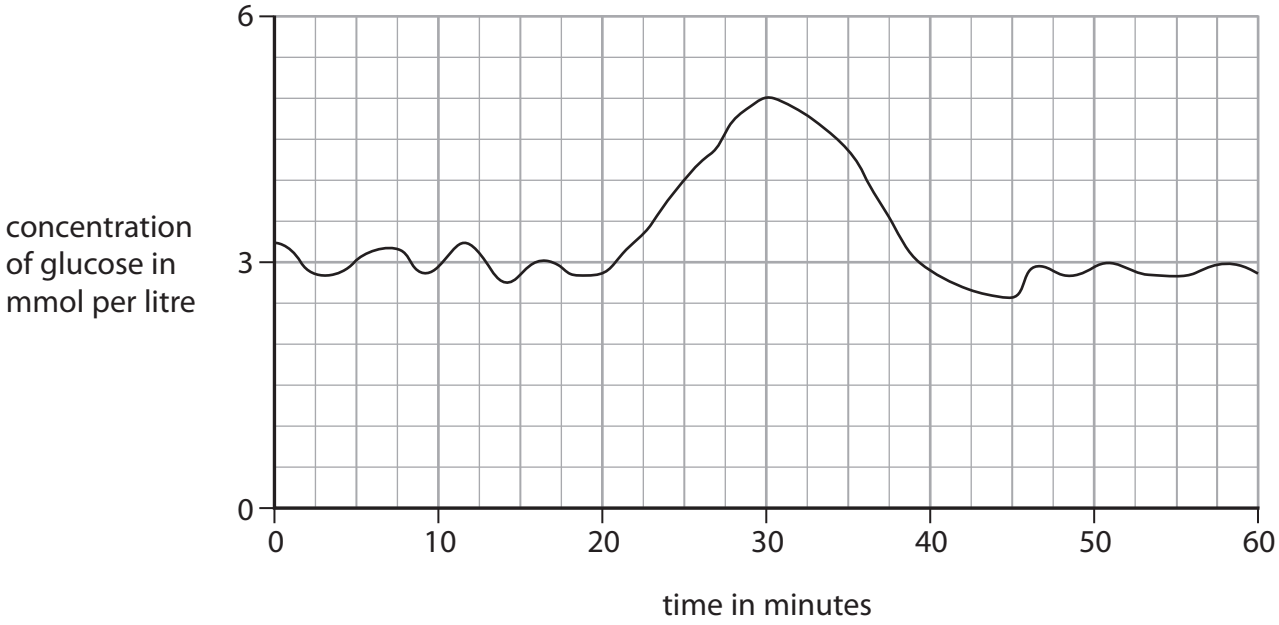


Figure 4

(i) Describe the trends shown in Figure 4 from 0 minutes to 30 minutes.

(2)

.....

.....

.....

.....

.....

(ii) Explain why the concentration of glucose decreases from 30 minutes to 40 minutes.

(2)

.....

.....

.....

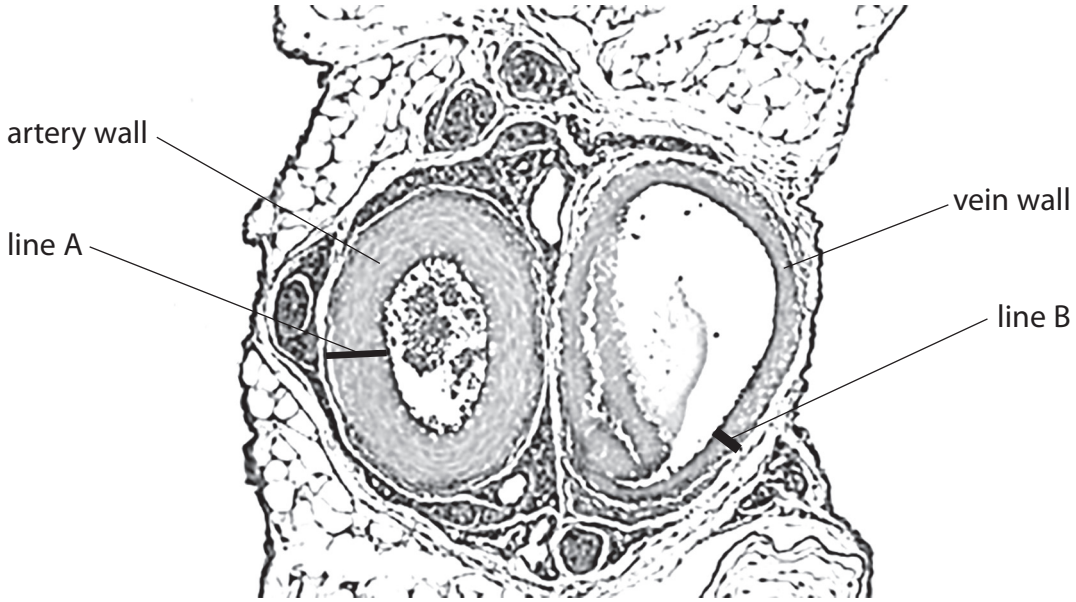
.....

.....

(Total for Question 2 = 8 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

3 (a) Figure 5 shows a cross section of an artery and a vein.



(Source: © The University of Kansas Medical Center)

Figure 5

(i) Measure the length of line A and the length of line B in mm.

(1)

line A ..... mm

line B ..... mm

(ii) State the ratio of the thickness of the artery wall to the thickness of the vein wall.

(1)

.....

(b) (i) Give a reason why veins have valves.

(1)

.....

.....

(ii) Name the artery that transports oxygenated blood from the heart to the body.

(1)

.....

DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA

(c) A scientist investigated the relationship between exercise and the ability to run at 3 metres per second for 20 minutes.

The scientist collected data from six groups of people.
Each group exercised for a different number of hours per week for six months.

There were 100 people in each group.

Figure 6 shows their results.

group	number of hours of exercise per week	number of people who could run at 3 metres per second for 20 minutes
A	0	9
B	2	20
C	4	33
D	6	52
E	8	61
F	10	62

Figure 6

(i) Describe the relationship shown by this data.

(2)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

(ii) Explain why some people's leg muscles tired quickly and developed cramp when they were running.

(3)

.....

.....

.....

.....

.....

.....

.....

(Total for Question 3 = 9 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

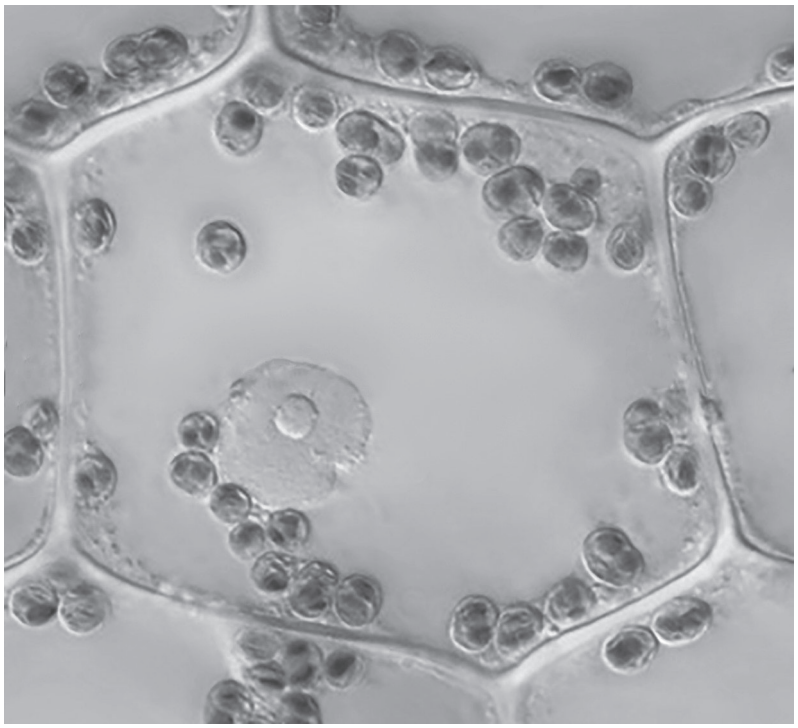
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

BLANK PAGE

4 Figure 7 shows a plant cell as seen under a light microscope.



(Source: © HERVE CONGE, ISM/SCIENCE PHOTO LIBRARY)

Figure 7

(a) Draw this plant cell in the box below.

Label **three** parts of this cell.

(4)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

(b) Mitochondria cannot be seen with a light microscope.

What is the function of mitochondria in a plant cell?

(1)

☒ **A** respiration

☒ **B** make proteins

☒ **C** photosynthesis

☒ **D** store water

(c) A student wanted to investigate the movement of water into and out of cells in potatoes.

The student had the equipment shown in Figure 8.

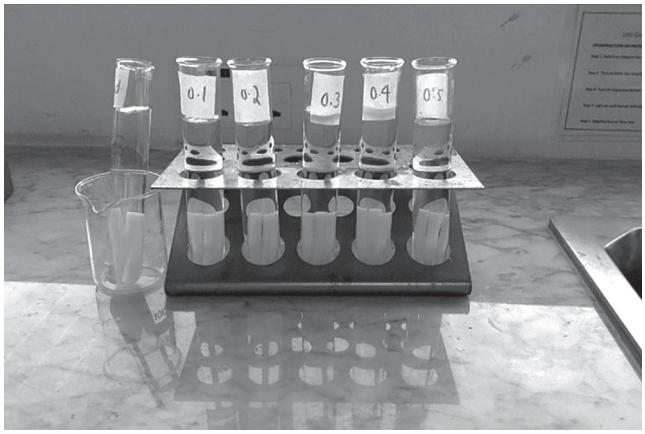


Figure 8

The test tubes in the rack contain different concentrations of sodium chloride solution.

The solutions were 0.1 M, 0.2 M, 0.3 M, 0.4 M and 0.5 M sodium chloride solution.

The test tube in the beaker contains distilled water.

There are three potato chips in each of the six test tubes.

(i) State why the test tube in the beaker only contains distilled water and three potato chips.

(1)

.....

.....

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

(ii) State **two** variables that need to be controlled in this investigation.

(2)

1 .....

.....

2 .....

.....

(iii) Explain why the chips in the 0.5 M sodium chloride solution lost mass.

(3)

.....

.....

.....

.....

.....

.....

.....

(Total for Question 4 = 11 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

5 (a) A student was investigating the populations of organisms in a garden.

Figure 9 shows the estimates of the number and biomass of some of the organisms in the garden.

organism	number	mean biomass of each organism in grams	biomass of population in grams
cabbages (plants)	80	70	5600
earthworms	620	3.4	?
slugs	30	4.1	123
hedgehogs	1	620	620
squirrels	2	600	1200

Figure 9

(i) Calculate the biomass of the population of earthworms in the garden.

(1)

.....

(ii) Hedgehogs eat slugs and earthworms.
Slug pellets were used to kill the slugs.

Explain how killing the slugs would affect the population of earthworms in this garden.

(2)

.....

.....

.....

.....

.....

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

(iii) Describe a method that could be used to estimate the population of slugs in the garden.

(3)

(b) Explain how cabbages, earthworms and squirrels contribute to the carbon cycle.

(3)

(c) State **three** ways the concentration of nitrates in soil can be increased.

(3)

1

2

3

(Total for Question 5 = 12 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

6 (a) A student investigated respiration in three different organisms.

Red hydrogencarbonate indicator was placed in each of three test tubes.

Gauze was placed in each test tube to hold the organisms.

In test tube 1 the student placed four germinating peas.

In test tube 2 the student placed four dried peas.

In test tube 3 the student placed four mealworms.

Bungs were added to each of the test tubes.

The three test tubes were left for one hour.

The equipment used is shown in Figure 10.

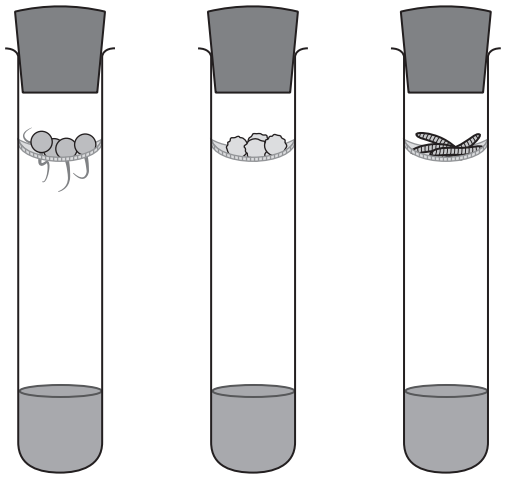


Figure 10

(i) State **two** ways this method could be improved to make the results for these three organisms more comparable.

(2)

1 .....

.....

2 .....

.....

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

(ii) Describe a suitable control for this investigation.

(2)

(b) Hydrogencarbonate indicator changes from red to yellow when more carbon dioxide is present.

The results for this investigation are shown in Figure 11.

organisms	colour of hydrogencarbonate indicator
germinating peas	yellow
dried peas	red
mealworms	yellow

Figure 11

(i) Explain why the result for the germinating peas is different from the result for the dried peas.

(2)

(ii) How was the carbon dioxide produced in this investigation?

(1)

☒ **A** by photosynthesis

☒ **B** when glucose is broken down in the presence of oxygen

☒ **C** when glucose is broken down in the absence of oxygen

☒ **D** by the reaction between oxygen and water

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

*(c) Carbon dioxide is carried in blood plasma.

Human blood also contains red blood cells and white blood cells.

Explain how the structure of red blood cells and white blood cells is related to their function.

(6)

(Total for Question 6 = 13 marks)

TOTAL FOR PAPER = 60 MARKS

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

BLANK PAGE

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

BLANK PAGE