

Paper Reference(s) 1SC0/1BF
Pearson Edexcel Level 1/Level 2 GCSE (9–1)

Combined Science

Paper 1

Foundation Tier

Total Marks

Tuesday 12 May 2020 – Afternoon

Time: 1 hour 10 minutes plus your additional time allowance

In the boxes below, write your name, centre number and candidate number.

Surname					
Other names					
Centre Number					
Candidate Number					

YOU MUST HAVE

Calculator, ruler

YOU WILL BE GIVEN

Diagram Booklet

INSTRUCTIONS

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.

Turn over

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.

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 ☐.

(continued on the next page)

- 1 (a) Look at Figure 1 for Question 1(a) in the Diagram Booklet.**

Figure 1 shows three cells.

- (i) What is structure X?
(1 mark)**

☐ **A cell membrane**

☐ **B cell wall**

☐ **C cytoplasm**

☐ **D nucleus**

(continued on the next page)

1 continued.

(ii) The bacterial cell in Figure 1 has a flagellum.

**State the function of a flagellum.
(1 mark)**

**(iii) Give ONE other difference between the bacterial cell and the animal cell shown in Figure 1.
(1 mark)**

(continued on the next page)

Turn over

1 continued.

(b) Substances move into and out of cells.

**How does oxygen move into and out of cells?
(1 mark)**

- ☐ **A transpiration**
- ☐ **B active transport**
- ☐ **C diffusion**
- ☐ **D osmosis**

(continued on the next page)

1 continued.

(c) A plant leaf cell is 0.04 mm long.

**Calculate the length of the image
after this cell has been magnified
500 times.
(2 marks)**

length of image = _____ mm

(Total for Question 1 = 6 marks)

Turn over

- 2 (a) Look at Figure 2 for Question 2(a) in the Diagram Booklet.**

A student placed three different sized cubes of agar jelly into separate beakers containing the same concentration of hydrochloric acid.

The cubes contained a pink indicator.

This indicator becomes clear when in contact with an acid.

Figure 2 shows the results of the investigation after the cubes had been in the acid for 120 seconds.

(continued on the next page)

2 continued.

- (i) The distance from the outside of cube B to the pink area was 3 mm.**

**Calculate the distance diffused by hydrochloric acid in ONE second.
(2 marks)**

_____ mm

(continued on the next page)

Turn over

2 continued.

(ii) The student wanted to confirm their results.

Give ONE improvement the student should make to this investigation to confirm their results.

(1 mark)

(continued on the next page)

Turn over

2 continued.

**(b) Devise a method, using cubes of agar jelly, to investigate how temperature affects the rate of diffusion.
(3 marks)**

(continued on the next page)

Turn over

2 continued.

(continued on the next page)

2 continued.

(c) Some substances move into and out of cells by active transport.

**Which is the correct description of the movement of a substance by active transport?
(1 mark)**

- ☐ **A against a concentration gradient using energy**
- ☐ **B down a concentration gradient using energy**
- ☐ **C against a concentration gradient without using energy**
- ☐ **D down a concentration gradient without using energy**

(continued on the next page)

Turn over

2 continued.

(d) Look at Figure 3 for Question 2(d) in the Diagram Booklet.

Some drugs used to treat cancer are taken into cells by active transport.

Figure 3 shows some causes of preventable cases of cancer in 2015.

**(i) What is the percentage of preventable cases of cancer that are caused by tobacco?
(1 mark)**

☐ **A 41%**

☐ **B 37%**

☐ **C 34%**

☐ **D 26%**

(continued on the next page)

Turn over

2 continued.

- (ii) In 2015, data from Cancer Research UK suggested that 163 440 cases of cancer could have been prevented.**

Calculate the number of preventable cases of cancer caused by alcohol.

**Give your answer to the nearest whole number.
(2 marks)**

(continued on the next page)

2 continued.

**number of preventable cases of
cancer caused by alcohol**

(Total for Question 2 = 10 marks)

Turn over

- 3 (a) Look at Figure 4 for Question 3(a) in the Diagram Booklet.**

Farmers selectively breed chickens to produce larger chickens.

Figure 4 shows how the size of chickens has changed over time.

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3 continued.

- (i) Explain how farmers have used selective breeding to produce larger chickens.
(3 marks)**

(continued on the next page)

Turn over

3 continued.

**(ii) Describe ONE benefit and
ONE risk of selectively
breeding chickens.
(2 marks)**

benefit _____

(continued on the next page)

3 continued.

risk _____

(continued on the next page)

3 continued.

(b) The body cells of chickens have 78 chromosomes in their nuclei.

**(i) State the number of chromosomes found in each sex cell of a chicken.
(1 mark)**

**(ii) Name the type of cell division which produces sex cells.
(1 mark)**

(continued on the next page)

Turn over

3 continued.

**(c) (i) What is the correct definition of a genome?
(1 mark)**

☐ **A all the cells of an organism**

☐ **B all the enzymes of an organism**

☐ **C all the genetic material of an organism**

☐ **D all the cytoplasm of an organism**

(continued on the next page)

3 continued.

- (ii) A new project called the Earth BioGenome Project aims to discover the sequence of bases in the DNA for all plants and animals.**

**State TWO benefits of discovering the sequence of bases for all plants and animals.
(2 marks)**

1 _____

(continued on the next page)

Turn over

3 continued.

2 _____

(Total for Question 3 = 10 marks)

- 4 (a) Look at Figure 5 for Question 4(a) in the Diagram Booklet.**

A student investigated the activity of a human enzyme at different temperatures.

The student measured the mass of product formed after 10 minutes at different temperatures.

Figure 5 shows the results of this investigation.

(continued on the next page)

4 continued.

- (i) Describe the trends shown
in Figure 5.
(2 marks)**

(continued on the next page)

Turn over

4 continued.

- (ii) Explain the results obtained for temperatures from 40 °C to 60 °C. (2 marks)**

(continued on the next page)

Turn over

4 continued.

(continued on the next page)

4 continued.

(b) Look at the diagram for Question 4(b)(i) in the Diagram Booklet.

Some enzymes are involved in the breakdown of food substances.

**(i) Draw ONE straight line from each food group to the products of digestion for that food group.
(2 marks)**

**(ii) Which enzyme breaks down fat?
(1 mark)**

☐ **A carbohydrase**

☐ **B amylase**

☐ **C protease**

☐ **D lipase**

(continued on the next page)

Turn over

4 continued.

(c) Look at Figure 6 for Question 4(c) in the Diagram Booklet.

Figure 6 shows an enzyme and two substrates, P and Q.

**Explain the reason why no product will be formed if the enzyme is mixed with substrate Q.
(3 marks)**

(continued on the next page)

Turn over

4 continued.

(Total for Question 4 = 10 marks)

5 (a) Measles is a communicable disease caused by a virus.

**(i) What can a virus also be classified as?
(1 mark)**

☐ **A a bacterium**

☐ **B a fungus**

☐ **C a pathogen**

☐ **D a protist**

(continued on the next page)

5 continued.

**(ii) Give ONE reason why
measles is described as a
communicable disease.
(1 mark)**

(continued on the next page)

5 continued.

(b) The human immunodeficiency virus (HIV) can cause AIDS.

**Which type of cell is destroyed by the HIV virus?
(1 mark)**

☐ **A red blood cell**

☐ **B nerve cell**

☐ **C white blood cell**

☐ **D sperm cell**

(continued on the next page)

5 continued.

**(c) Describe how the specific
immune system defends the body
against disease.
(3 marks)**

(continued on the next page)

Turn over

5 continued.

(d) Look at Figure 7 for Question 5(d) in the Diagram Booklet.

Figure 7 shows the number of people per million OF THE POPULATION in five European countries who were diagnosed with measles in one year.

(continued on the next page)

5 continued.

- (i) The population of Belgium in that year was 11·18 million.**

Calculate the number of people in Belgium diagnosed with measles.

**Give your answer to three significant figures.
(3 marks)**

_____ people

(continued on the next page)

Turn over

5 continued.

- (ii) Countries do not report the total number of people diagnosed with measles. Countries report the number of people diagnosed with measles per million of the population.**

**Give ONE reason why this is better.
(1 mark)**

(continued on the next page)

5 continued.

**(iii) Give ONE reason why the number of people per million diagnosed with measles is different in these countries.
(1 mark)**

(Total for Question 5 = 11 marks)

Turn over

- 6 Look at Figure 8 for Question 6 in the Diagram Booklet.**

Figure 8 shows a banana plantation.

After the bananas have been harvested, the old plants are cut down.

The suckers then develop into mature plants producing the next crop of bananas.

The tip of each sucker contains a group of cells called a meristem.

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6 continued.

- (a) (i) Describe the function of a meristem in the growth of a plant. (2 marks)**

(continued on the next page)

6 continued.

- (ii) A student took a sample of cells from a meristem to view under a light microscope.**

Describe how the student would prepare a microscope slide using these cells.

(3 marks)

(continued on the next page)

Turn over

6 continued.

(continued on the next page)

6 continued.

(b) Look at Figure 9 for Question 6(b) in the Diagram Booklet.

Figure 9 is a drawing of a eukaryotic cell.

Structure Z is found in plant leaf cells.

**(i) Name structure Z.
(1 mark)**

(continued on the next page)

6 continued.

**(ii) Give ONE function of
the mitochondrion.
(1 mark)**

(continued on the next page)

6 continued.

***(c) DNA is found in the nucleus of cells.**

**Describe the structure of DNA
and how it can be extracted from
plant cells.
(6 marks)**

(continued on the next page)

Turn over

6 continued.

(continued on the next page)

Turn over

6 continued.

(Total for Question 6 = 13 marks)

TOTAL FOR PAPER = 60 MARKS
END OF PAPER