

Paper Reference(s) 1BI0/1F
Pearson Edexcel Level 1/Level 2 GCSE (9–1)

Biology
Paper 1
Foundation Tier

Total Marks

Tuesday 12 May 2020 – Afternoon

Time: 1 hour 45 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.

INFORMATION

The total mark for this paper is 100.

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.

Turn over

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 ☒.

1 (a) Some foods contain starch.

**Which chemical is used to test for starch?
(1 mark)**

- ☐ **A amylase**
- ☐ **B ethanol**
- ☐ **C iodine solution**
- ☐ **D hydrochloric acid**

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1 continued.

(b) Benedict's solution is used to test for reducing sugars in food.

Look at Figure 1 for Question 1(b) in the Diagram Booklet. It shows part of the method for this test.

(i) Give TWO safety precautions needed when doing this test. (2 marks)

1 _____

2 _____

(continued on the next page)

1 continued.

- (ii) Give ONE reason for placing the test tube in boiling water. (1 mark)**

- (c) Look at Figure 2 for Question 1(c) in the Diagram Booklet. It shows some information about the results of the test for reducing sugar.**

A student wanted to compare the amount of reducing sugar in three types of biscuit.

- (i) Give ONE variable the student should control. (1 mark)**

(continued on the next page)

1 continued.

Look at Figure 3 for Question 1(c) in the Diagram Booklet. It shows the student's results.

(ii) State TWO conclusions that can be made from the data in Figure 3. (2 marks)

1 _____

2 _____

(TOTAL FOR QUESTION 1 = 7 MARKS)

2 (a) Look at Figure 4 for Question 2(a) in the Diagram Booklet. It shows three cells.

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

☐ **A cell membrane**

☐ **B cell wall**

☐ **C cytoplasm**

☐ **D nucleus**

(ii) The bacterial cell in Figure 4 has a flagellum.

State the function of a flagellum. (1 mark)

(continued on the next page)

2 continued.

(iii) Look at Figure 4 for Question 2(a) in the Diagram Booklet. Give ONE other difference between the bacterial cell and the animal cell. (1 mark)

(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**

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2 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 2 = 6 MARKS)

- 3 (a) Look at Figure 5 for Question 3(a) in the Diagram Booklet. It shows the area of land used to grow genetically modified (GM) crops worldwide from 2005 to 2014.**

- (i) In 2009, the area of land used was 134 million hectares and in 2010 the area of land was 147 million hectares.**

Complete Figure 5 by drawing bars to show the area of land used in 2009 and 2010. (2 marks)

- (ii) Describe the trend shown by the data in Figure 5. (2 marks)**

3 continued.

(b) GM crops often produce a larger yield than non-GM crops.

Give ONE reason why this could reduce the destruction of forests. (1 mark)

(continued on the next page)

3 continued.

(c) The ladybird is a predator.

Aphids are insect pests.

Look at Figure 6 for Question 3(c) in the Diagram Booklet. It shows a ladybird feeding on aphids.

(i) Using ladybirds to control insect pests is an example of (1 mark)

- ☐ **A chemical control**
- ☐ **B enzyme technology**
- ☐ **C biological control**
- ☐ **D tissue culture**

(continued on the next page)

3 continued.

(ii) Explain ONE advantage of using predators to control insect pests. (2 marks)

(continued on the next page)

3 continued.

- (d) Some crop plants are genetically modified to make them resistant to attack by insect pests.**

State ONE disadvantage of genetically modified crop plants. (1 mark)

(TOTAL FOR QUESTION 3 = 9 MARKS)

- 4 (a) 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.

Look at Figure 7 for Question 4(a) in the Diagram Booklet. It shows the results of the investigation after the cubes had been in the acid for 120 seconds.

- (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

4 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)

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4 continued.

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

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4 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**

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4 continued.

- (d) Some drugs used to treat cancer are taken into cells by active transport.**

Look at Figure 8 for Question 4(d) in the Diagram Booklet. It 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%**

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4 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)

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

(TOTAL FOR QUESTION 4 = 10 MARKS)

Turn over

- 5 (a) Farmers selectively breed chickens to produce larger chickens.**

Look at Figure 9 for Question 5(a) in the Diagram Booklet. It shows how the size of chickens has changed over time.

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

(continued on the next page)

5 continued.

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

benefit _____

risk _____

(continued on the next page)

Turn over

5 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)

(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**

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5 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 _____

2 _____

(TOTAL FOR QUESTION 5 = 10 MARKS)

Turn over

- 6 (a) 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.

Look at Figure 10 for Question 6(a) in the Diagram Booklet. It shows the results of this investigation.

- (i) Describe the trends shown in Figure 10.
(2 marks)**

(continued on the next page)

6 continued.

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

(continued on the next page)

6 continued.

(b) Some enzymes are involved in the breakdown of food substances.

(i) Look at the diagram for Question 6(b) in the Diagram Booklet. 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)

6 continued.

- (c) Look at Figure 11 for Question 6(c) in the Diagram Booklet. It 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

6 continued.

(TOTAL FOR QUESTION 6 = 10 MARKS)

7 (a) (i) Which part of the eye carries impulses to the brain? (1 mark)

☐ **A cornea**

☐ **B iris**

☐ **C lens**

☐ **D optic nerve**

(ii) Name the structure within the eye that controls the amount of light entering the eye. (1 mark)

(b) Explain the functions of the two types of cell in the retina that detect light. (4 marks)

(continued on the next page)

Turn over

7 continued.

(c) The eye can be infected by bacteria.

**State the type of drug used to treat infections
caused by bacteria. (1 mark)**

(continued on the next page)

7 continued.

***(d) Look at Figure 12 for Question 7(d) in the Diagram Booklet. It shows two defects of the eye.**

Describe the causes of short-sightedness and long-sightedness.

Use information from Figure 12 to help with your answer. (6 marks)

7 continued.

[illegible]

(TOTAL FOR QUESTION 7 = 13 MARKS)

Turn over

8 (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**

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

(continued on the next page)

8 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**

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

(continued on the next page)

Turn over

8 continued.

(continued on the next page)

8 continued.

(d) Look at Figure 13 for Question 8(d) in the Diagram Booklet. It shows the number of people per million OF THE POPULATION in five European countries who were diagnosed with measles in one year.

(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

8 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)

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

(TOTAL FOR QUESTION 8 = 11 MARKS)

Turn over

- 9 Look at Figure 14 for Question 9(a) in the Diagram Booklet. It 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.

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

(continued on the next page)

9 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)

9 continued.

(b) Look at Figure 15 for Question 9(b) in the Diagram Booklet. It is a drawing of a eukaryotic cell.

Structure Z is found in plant leaf cells.

(i) Name structure Z. (1 mark)

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

(continued on the next page)

9 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)

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9 continued.

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9 continued.

(TOTAL FOR QUESTION 9 = 13 MARKS)

10 Gregor Mendel used pea plants in plant breeding experiments. He discovered the basis of genetic inheritance.

(a) He cross-bred tall pea plants with short pea plants.

Look at Figure 16 for Question 10(a) in the Diagram Booklet. It shows all the offspring were tall.

**(i) Explain why the offspring are all tall.
(2 marks)**

(continued on the next page)

10 continued.

- (ii) In this investigation, the parent pea plants were grown in a warm, closed greenhouse.**

**Give TWO reasons why the parent pea plants were grown in a warm, closed greenhouse.
(2 marks)**

1 _____

2 _____

(continued on the next page)

10 continued.

(b) Pea plants produce different coloured peas.

The allele for yellow-coloured peas (A) is dominant to the allele for green-coloured peas (a).

Two heterozygous parent plants were used in a genetic cross.

- (i) Use the Punnett square for Question 10(b)(i) in the Diagram Booklet. Predict the percentage probability that this cross will have offspring that produce green-coloured peas. (3 marks)**

**percentage probability
of green-coloured peas = _____%**

(continued on the next page)

10 continued.

- (ii) Explain ONE advantage to pea plants of using sexual reproduction to produce offspring.
(2 marks)**

(continued on the next page)

10 continued.

(c) Peas contain small amounts of fat.

Describe a test to identify fat. (2 marks)

(TOTAL FOR QUESTION 10 = 11 MARKS)

TOTAL FOR PAPER = 100 MARKS
END