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 | | | | |

Tuesday 12 May 2020

Afternoon (Time: 1 hour 45 minutes)

Paper Reference **1BI0/1F**

Biology

Paper 1

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 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.

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 ▶

P62069A

1/1/1/1/1/1/1/

P 6 2 0 6 9 A 0 1 3 2

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) Some foods contain starch.

Which chemical is used to test for starch?

(1)

☒ **A** amylase

☒ **B** ethanol

☒ **C** iodine solution

☒ **D** hydrochloric acid

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

Figure 1 shows part of the method for this test.

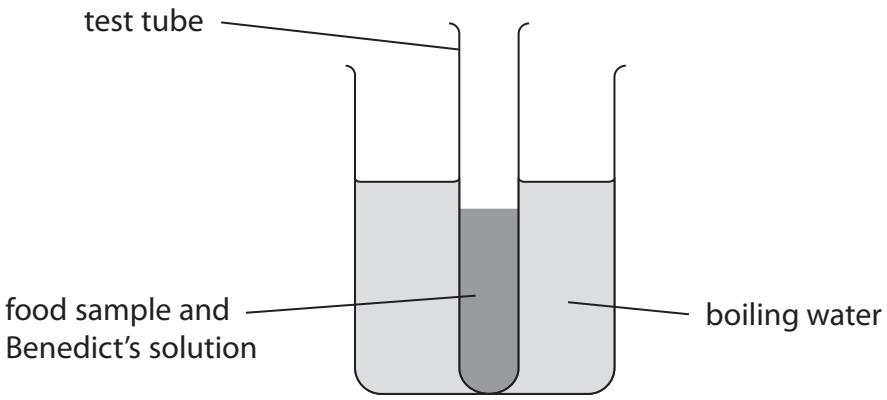

Figure 1

(i) Give **two** safety precautions needed when doing this test.

(2)

1 .....

.....

2 .....

.....

(ii) Give **one** reason for placing the test tube in boiling water.

(1)

.....

.....

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

(c) Figure 2 shows some information about the results of the test for reducing sugar.

colour of Benedict's solution after testing food sample	concentration of reducing sugar
blue	zero
green	low
yellow	↓
orange	
brick red	high

Figure 2

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

(i) Give **one** variable the student should control.

(1)

.....

.....

Figure 3 shows the student's results.

type of biscuit	colour with Benedict's solution
A	green
B	brick red
C	orange

Figure 3

(ii) State **two** conclusions that can be made from the data in Figure 3.

(2)

1 .....

.....

2 .....

.....

(Total for Question 1 = 7 marks)

2 (a) Figure 4 shows three cells.

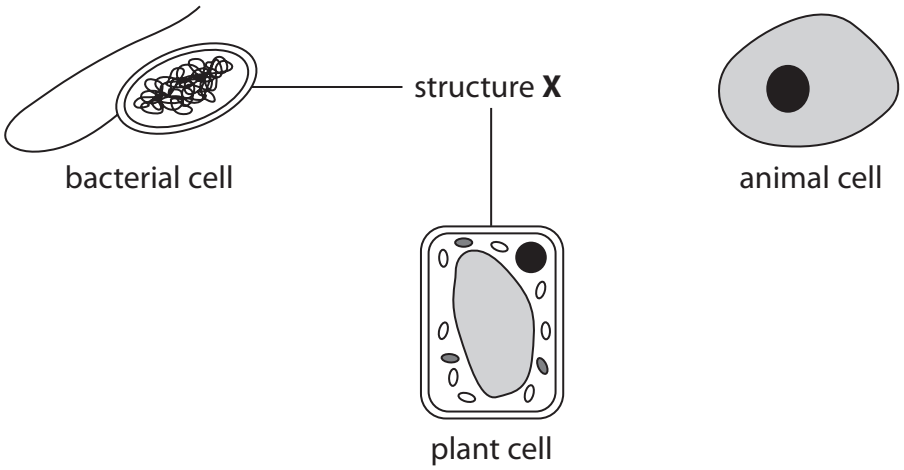

Figure 4

(i) What is structure **X**?

(1)

- ☒ **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)

.....

.....

(iii) Give **one** other difference between the bacterial cell and the animal cell shown in Figure 4.

(1)

.....

.....

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

(b) Substances move into and out of cells.

How does oxygen move into and out of cells?

(1)

☒ **A** transpiration

☒ **B** active transport

☒ **C** diffusion

☒ **D** osmosis

(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)

length of image = ... mm

(Total for Question 2 = 6 marks)

3 (a) Figure 5 shows the area of land used to grow genetically modified (GM) crops worldwide from 2005 to 2014.

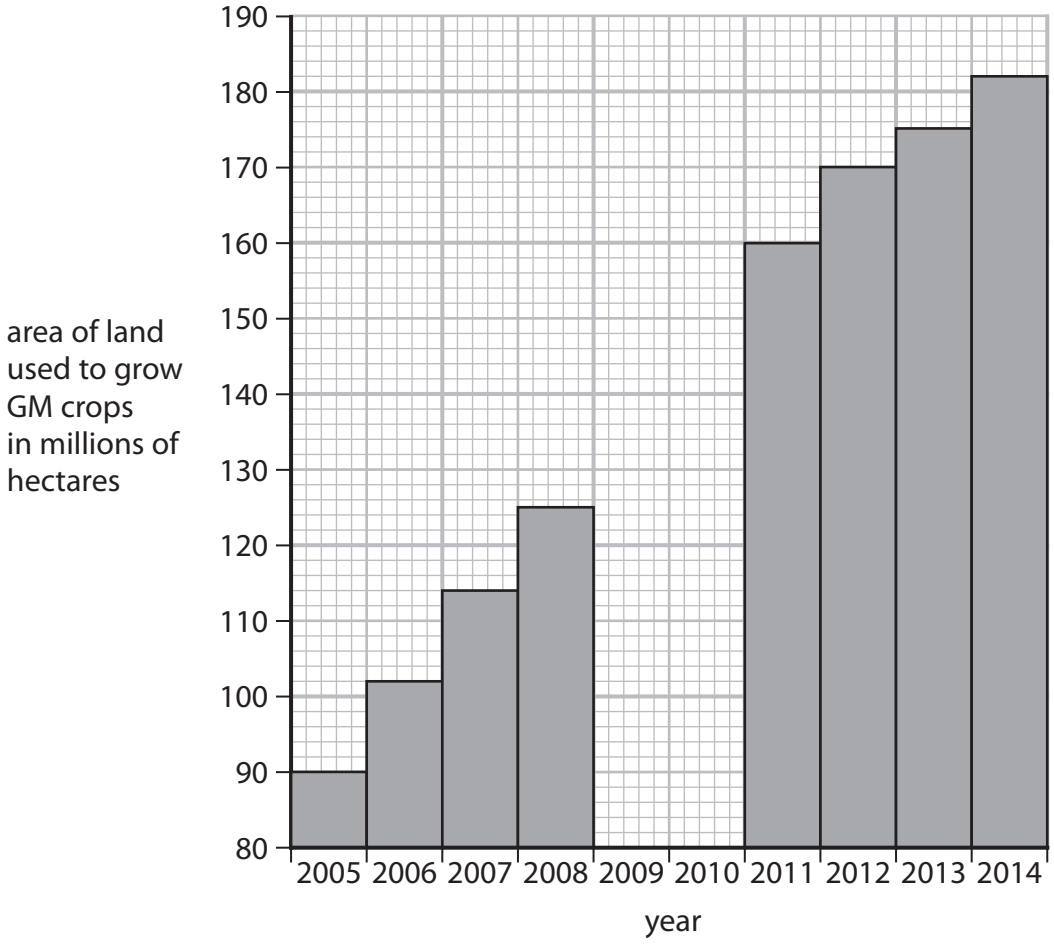

Figure 5

(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)

(ii) Describe the trend shown by the data in Figure 5.

(2)

.....

.....

.....

.....

.....

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

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

Give **one** reason why this could reduce the destruction of forests.

(1)

.....

.....

.....

(c) The ladybird is a predator.

Aphids are insect pests.

Figure 6 shows a ladybird feeding on aphids.

Figure 6

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

(1)

☒ **A** chemical control

☒ **B** enzyme technology

☒ **C** biological control

☒ **D** tissue culture

(ii) Explain **one** advantage of using predators to control insect pests.

(2)

(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)

(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.

Figure 7 shows the results of the investigation after the cubes had been in the acid for 120 seconds.

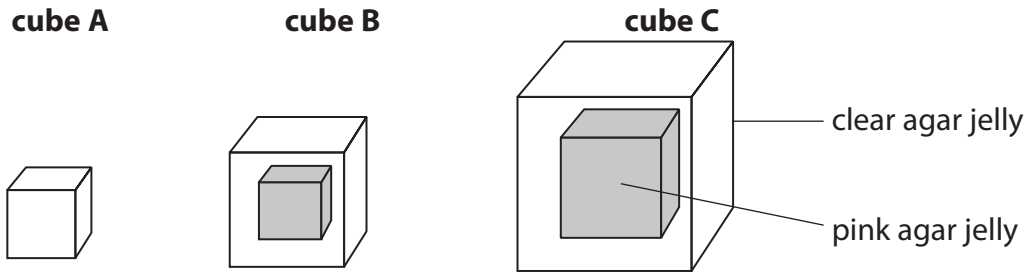

Figure 7

(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)

..... mm

(ii) The student wanted to confirm their results.

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

(1)

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

(3)

(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)

☒ **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

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

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

Figure 8 shows some causes of preventable cases of cancer in 2015.

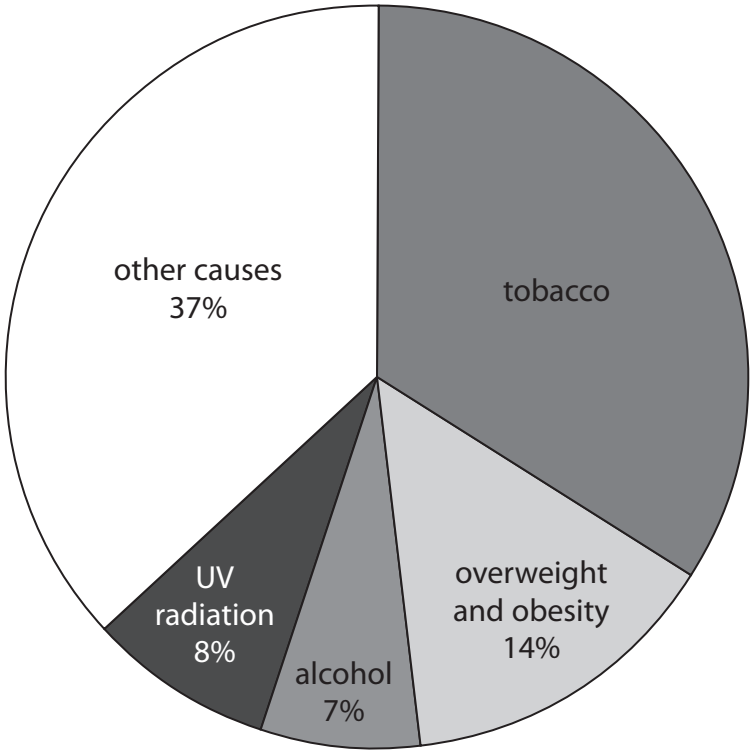

Figure 8

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

(1)

☒ **A** 41%

☒ **B** 37%

☒ **C** 34%

☒ **D** 26%

(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)

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

(Total for Question 4 = 10 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

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

Figure 9 shows how the size of chickens has changed over time.

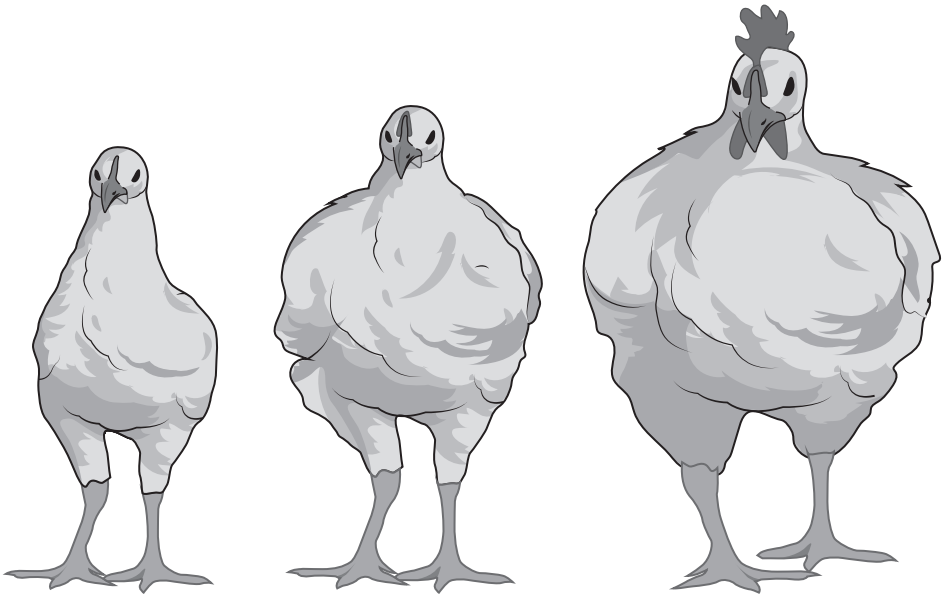

Figure 9

(i) Explain how farmers have used selective breeding to produce larger chickens.

(3)

(ii) Describe **one** benefit and **one** risk of selectively breeding chickens.

(2)

benefit .....

.....

.....

.....

risk .....

.....

.....

.....

(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)

.....

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

(1)

.....

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

(1)

☒ **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

(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)

1 .....

.....

.....

2 .....

.....

.....

(Total for Question 5 = 10 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

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.

Figure 10 shows the results of this investigation.

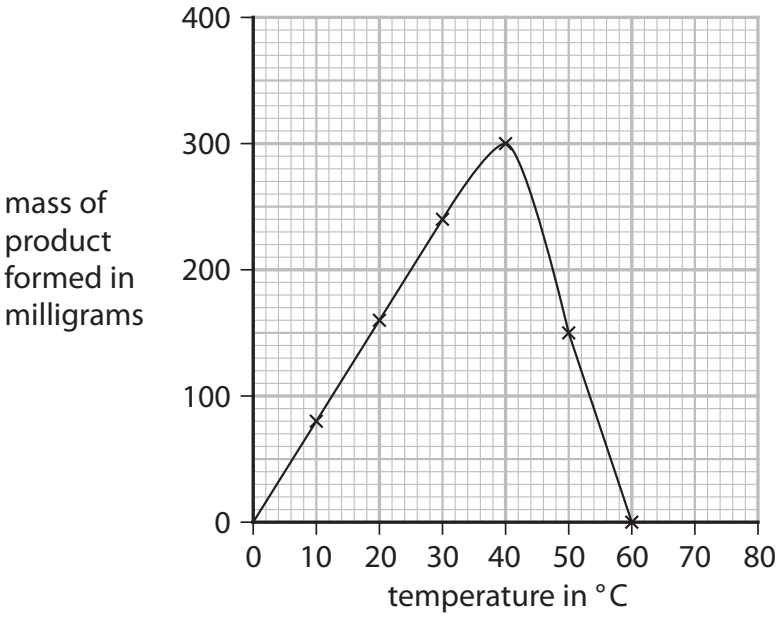

Figure 10

(i) Describe the trends shown in Figure 10.

(2)

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

(2)

(b) 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)

food group	**products of digestion**
carbohydrate	amino acids
	glucose
fat	starch
	ethanol
	fatty acids and glycerol

(ii) Which enzyme breaks down fat?

(1)

- ☒ **A** carbohydrase
- ☒ **B** amylase
- ☒ **C** protease
- ☒ **D** lipase

(c) Figure 11 shows an enzyme and two substrates, P and Q.

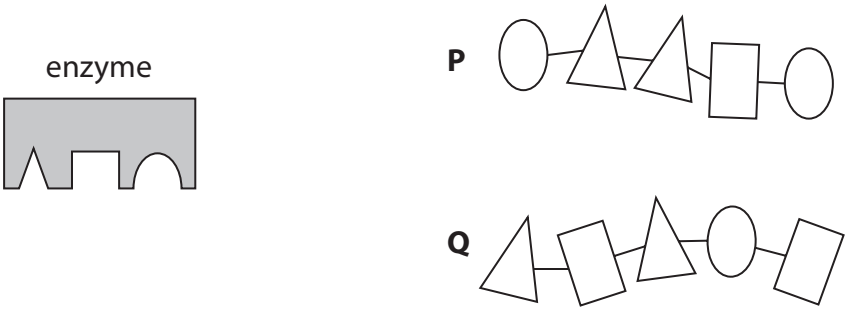

Figure 11

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

(3)

(Total for Question 6 = 10 marks)

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

(1)

- ☒ **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)

.....

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

(4)

.....

.....

.....

.....

.....

.....

.....

.....

(c) The eye can be infected by bacteria.

State the type of drug used to treat infections caused by bacteria.

(1)

.....

*(d) Figure 12 shows two defects of the eye.

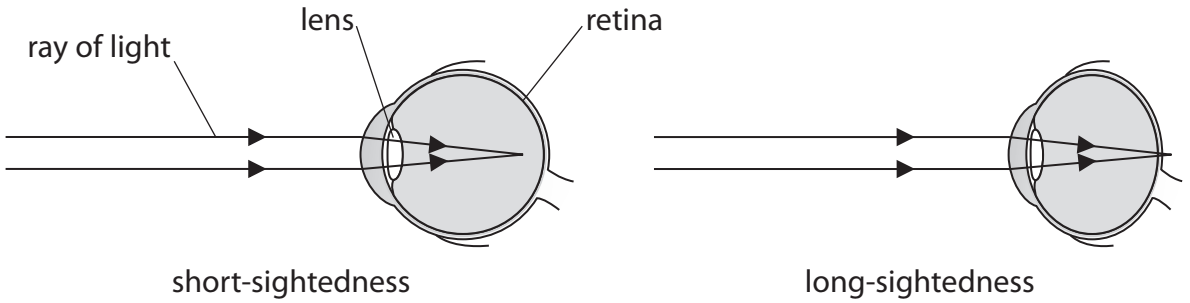

Figure 12

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

Use information from Figure 12 to help with your answer.

(6)

(Total for Question 7 = 13 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

BLANK PAGE

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

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

(1)

☒ **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)

.....

.....

.....

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

Which type of cell is destroyed by the HIV virus?

(1)

☒ **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)

.....

.....

.....

.....

.....

.....

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

(d) Figure 13 shows the number of people per million **of the population** in five European countries who were diagnosed with measles in one year.

country	number of people diagnosed with measles per million of the population
Belgium	21.00
France	15.63
Germany	8.42
Italy	20.06
Norway	0.05

Figure 13

(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)

.....people

(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)

.....

.....

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

(1)

.....

.....

.....

(Total for Question 8 = 11 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

9 Figure 14 shows a banana plantation.

Figure 14

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)

(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)

(b) Figure 15 is a drawing of a eukaryotic cell.

Structure **Z** is found in plant leaf cells.

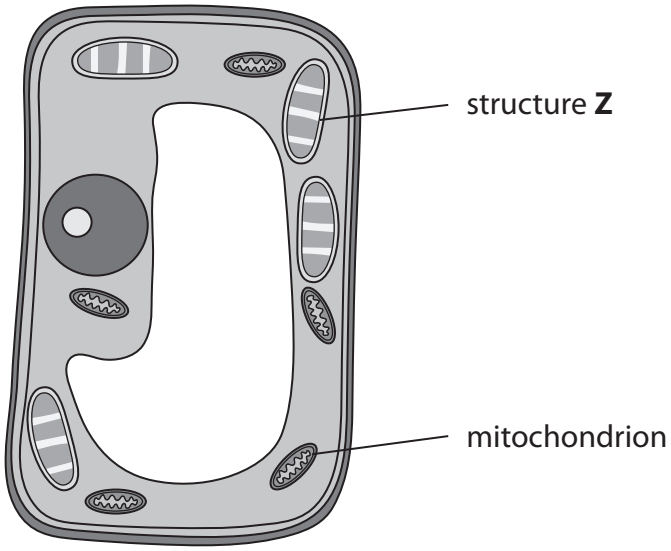

Figure 15

(i) Name structure **Z**.

(1)

.....

(ii) Give **one** function of the mitochondrion.

(1)

.....

.....

.....

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

Describe the structure of DNA and how it can be extracted from plant cells.

(6)

(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.

All the offspring were tall, as shown in Figure 16.

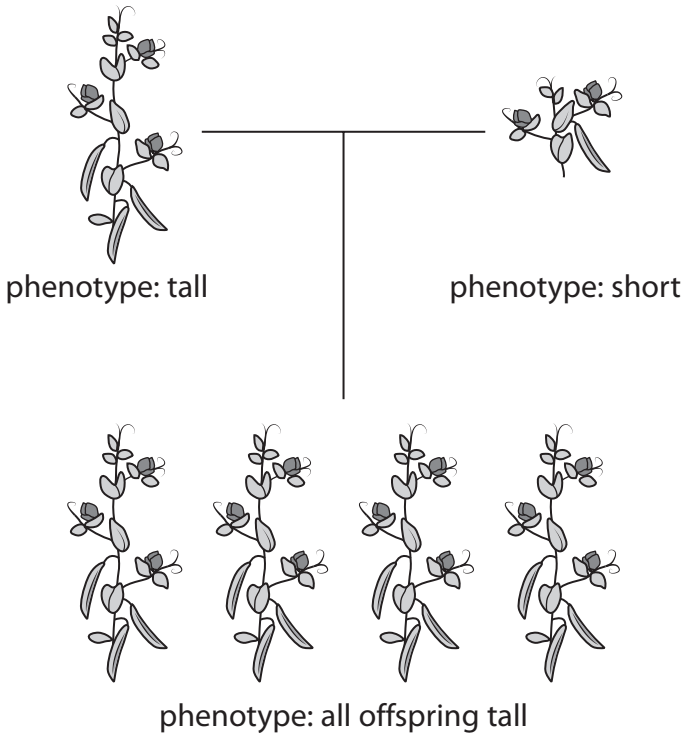

Figure 16

(i) Explain why the offspring are all tall.

(2)

.....

.....

.....

.....

(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)

1 .....

.....

2 .....

.....

(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) Predict, using the Punnett square, the percentage probability that this cross will have offspring that produce green-coloured peas.

(3)

percentage probability of green-coloured peas = ... %

(ii) Explain **one** advantage to pea plants of using sexual reproduction to produce offspring.

(2)

.....

.....

.....

.....

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

(c) Peas contain small amounts of fat.

Describe a test to identify fat.

(2)

.....

.....

.....

.....

.....

(Total for Question 10 = 11 marks)

TOTAL FOR PAPER = 100 MARKS

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

BLANK PAGE