Write your name here

Surname	Other names

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

Centre Number | | | | | |

Candidate Number | | | | |

Combined Science

Paper 1: Biology

Foundation Tier

Additional Sample Assessment Material for first teaching September 2016

Time: 1 hour 10 minutes

Paper Reference
1SC0/1BF

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 ▶

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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 The human immune system helps defend the body against disease.

Figure 1 shows a bacterial cell that can cause disease.

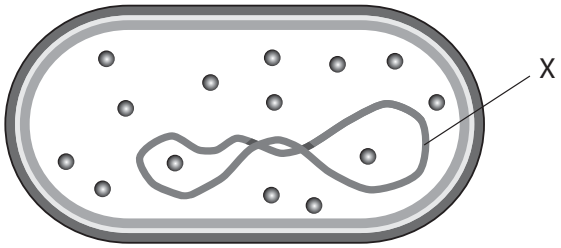

Figure 1

(a) What is the part of the cell labelled X?

(1)

☒ **A** cytoplasm

☒ **B** nucleus

☒ **C** chromosome

☒ **D** plasmid

(b) Bacteria and other microorganisms can cause infectious diseases.

Use the words in the box to complete the passage about treating infectious diseases.

(3)

antigens	painkillers	toxins	viruses
antibiotics	stimulants	pathogens	

Bacteria and other microorganisms that cause infectious diseases are called

..... .

Drugs called ..... can be used to treat infectious diseases caused by bacteria. These drugs do not work against infectious diseases caused by

..... .

(c) In 1796, the work of Edward Jenner led to the development of a vaccine used to immunise people against a disease called smallpox.

Describe how the body responds to immunisation.

(3)

(Total for Question 1 = 7 marks)

2 Some students investigated the effect of pH on the action of the enzyme trypsin.

Trypsin breaks down a protein found in milk. This turns the milk into a clear, colourless solution.

The students set up five test tubes. Each test tube contained trypsin and milk at either pH 5, 6, 7, 8 or 9.

The students then timed how many minutes it took for the milk in each test tube to turn colourless.

(a) Design a table that could be used to record the results for this investigation.

(3)

(b) Trypsin works best at pH 7.8.
Predict the results of this investigation.

(2)

(c) Which of these changes to the investigation would improve the accuracy of the results?

(1)

- ☒ **A** using different volumes of trypsin
- ☒ **B** measuring the time in seconds
- ☒ **C** using a wider range of pH in milk
- ☒ **D** leaving the test tubes for a longer length of time

(d) Trypsin is an enzyme found in the human body.
This investigation was carried out at the optimum temperature for the action of trypsin.

(i) State the optimum temperature for the action of trypsin.

(1)

(ii) Describe how the temperature could be controlled in this investigation.

(1)

(Total for Question 2 = 8 marks)

3 Red blood cells can be stored for use in blood transfusions. They are stored in a solution that has the same concentration of solutes as the blood cells.

(a) What name is given to the movement of solutes, such as glucose, into and out of cells?

(1)

☒ **A** osmosis

☒ **B** diffusion

☒ **C** absorption

☒ **D** transmission

(b) (i) Explain why the storage solution must have the same concentration of solutes as the red blood cells.

(3)

(ii) Describe how scientists could determine the concentration of solutes needed for the storage of red blood cells.

(2)

(iii) State why the scientists should repeat their investigation.

(1)

(iv) Give a potential risk associated with handling blood samples.

(1)

.....

.....

(v) Suggest **one** way to minimise this risk.

(1)

.....

.....

(Total for Question 3 = 9 marks)

4 (a) The part of an onion plant that is used as a vegetable grows underground.

Figure 2 shows an onion plant.

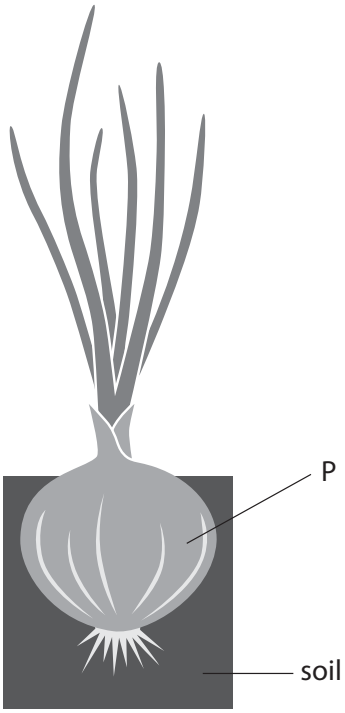

Figure 2

Explain why onion cells from part P are not able to carry out photosynthesis.

(2)

.....

.....

.....

.....

(b) Figure 3 shows micrographs of the different stages of mitosis in the root tips of an onion. The stages are not in the correct order.

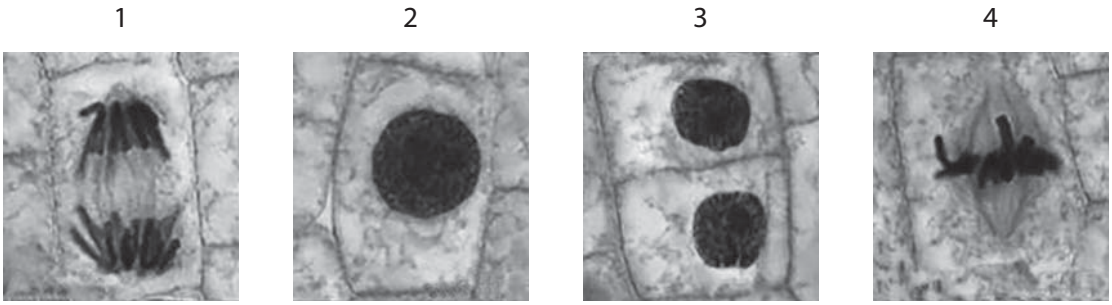

Figure 3

(i) Which order of micrographs shows the correct sequence of stages in mitosis?

(1)

☒ **A** 2, 3, 1, 4

☒ **B** 2, 3, 4, 1

☒ **C** 2, 1, 4, 3

☒ **D** 2, 4, 1, 3

(ii) Figure 4 shows a magnified onion cell.
The actual width of this onion cell is 100 μm.

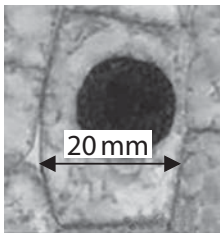

Figure 4

Calculate the magnification of this onion cell.

(2)

magnification = ...

(iii) Describe the importance of mitosis in the root tips of plants.

(2)

.....

.....

.....

.....

(c) (i) One complete cell cycle in an onion cell takes 24 hours. Mitosis takes up 30% of this time. The remainder of the time is spent in interphase.

Calculate the length of time, in minutes, an onion cell spends in interphase.

(3)

interphase ..... minutes

(ii) Describe the events that take place in the onion cell during interphase.

(2)

.....

.....

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.....

(Total for Question 4 = 12 marks)

5 In 2014, nearly 155 000 people died from cardiovascular disease in the UK.

(a) Give the reason why cardiovascular disease is a non-communicable disease.

(1)

(b) Coronary heart disease is a type of cardiovascular disease.

Figure 5 shows the number of deaths worldwide in 2002 for coronary heart disease for different age groups.

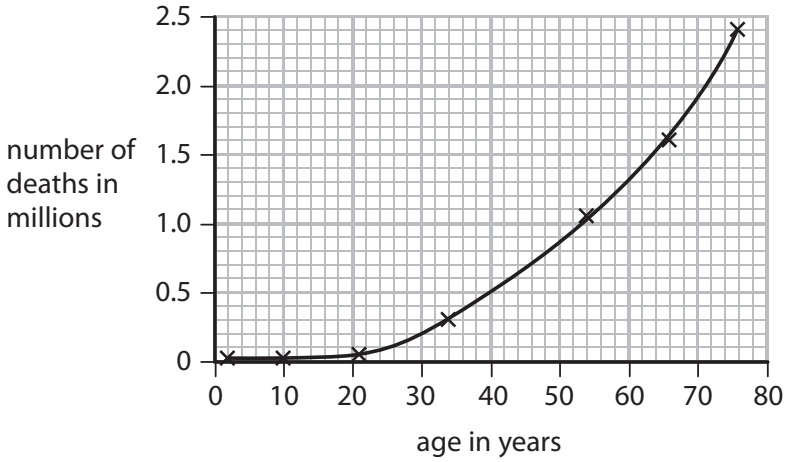

Figure 5

Describe the relationship between coronary heart disease and age.

(2)

(c) Drugs have been developed to treat people with cardiovascular disease.

Developing drugs involves many stages.
One stage involves testing a drug on other mammals before testing it on humans.

Give **one** disadvantage of using other mammals for drug testing.

(1)

.....

.....

(d) Figure 6 shows information about the BMI and the lifestyle of two males, P and Q, who have the same height and age.

male	BMI	physical exercise in hours per week	percentage of total daily intake of nutrients		
			carbohydrate	protein	fat
P	24	7	50	20	30
Q	29	2	50	15	35

Figure 6

(i) Which measurements are used to calculate BMI?

(1)

☒ **A** waist and hip

☒ **B** hip and mass

☒ **C** height and mass

☒ **D** waist and height

(ii) Explain which male has a greater risk of developing cardiovascular disease.

(3)

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.....

(e) Figure 7 shows the use of a stent to treat cardiovascular disease.

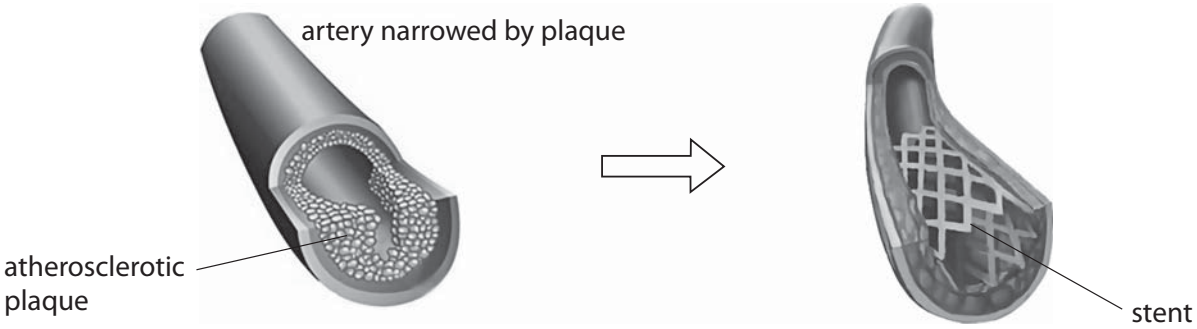

Figure 7

Explain how a stent works to treat cardiovascular disease.

(3)

.....

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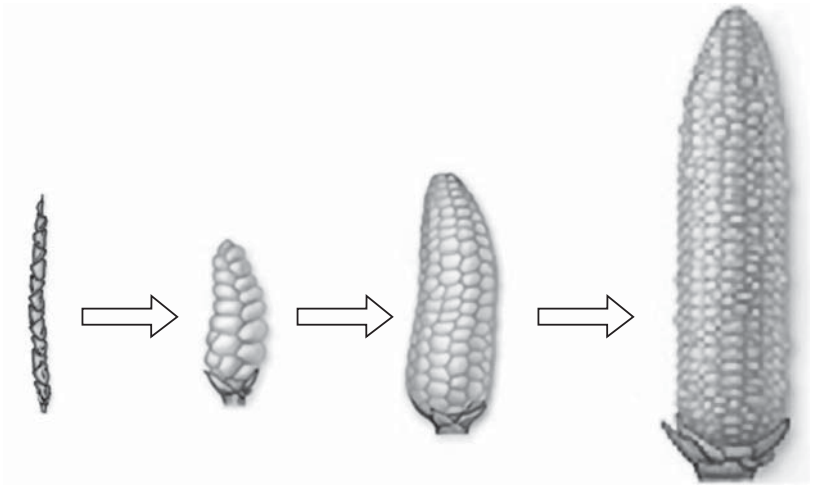
(Total for Question 5 = 11 marks)

6 Corn is one of the world's most important crop plants.

Native Americans grew an early form of corn called teosinte.
Modern corn has been developed by selective breeding of teosinte plants.

Figure 8 shows some stages in the development of modern corn.



teosinte modern corn

Figure 8

(a) Give reasons why native Americans selectively bred teosinte.

(2)

(b) Describe how selective breeding has produced modern corn.

(3)

(c) Genetic engineering can also be used to produce a new variety of modern corn.

Describe how the genome of this new variety of corn is different from the genome of corn that has not been genetically engineered.

(2)

*(d) Compare and contrast the use of selective breeding and genetic engineering to produce modern varieties of corn.

(6)

(Total for Question 6 = 13 marks)

TOTAL FOR PAPER = 60 MARKS

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