Please check the examination details below before entering your candidate information

| Candidate surname | Other names |
|---|---|
| | |

Centre Number | Candidate Number

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

**Time** 1 hour 10 minutes

**Paper reference** **1SC0/1BF**

# Combined Science

## PAPER 1

## Foundation tier

**You must have:**
Ruler, calculator

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.*

## 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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Q:1/

P 6 9 4 8 3 A 0 1 2 0

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**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** Some bacteria cause disease.

(a) Which word describes an organism that causes disease?

**(1)**

☒ **A** pathogen

☒ **B** culture

☒ **C** antibiotic

☒ **D** platelet

(b) Draw **one** straight line from each disease to the main way that the disease is spread.

**(2)**

| **disease** | **main way the disease is spread** |
|---|---|
| cholera | in the air |
| | by animal vectors |
| | in body fluids |
| malaria | by a vaccination |
| | in water |

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(c) A scientist investigated the effect of temperature on the growth of bacteria.

The bacteria were grown at 10 °C and 20 °C.

The number of bacteria grown at each temperature were counted every two hours.

Figure 1 shows the result.

| time in hours | number of bacteria at 10 °C in thousands | number of bacteria at 20 °C in thousands |
|---|---|---|
| 0 | 10 | 10 |
| 2 | 20 | 47 |
| 4 | 30 | 74 |
| 6 | 40 | 80 |
| 8 | 50 | 80 |

**Figure 1**

Figure 2 shows a graph of the results at 20 °C.

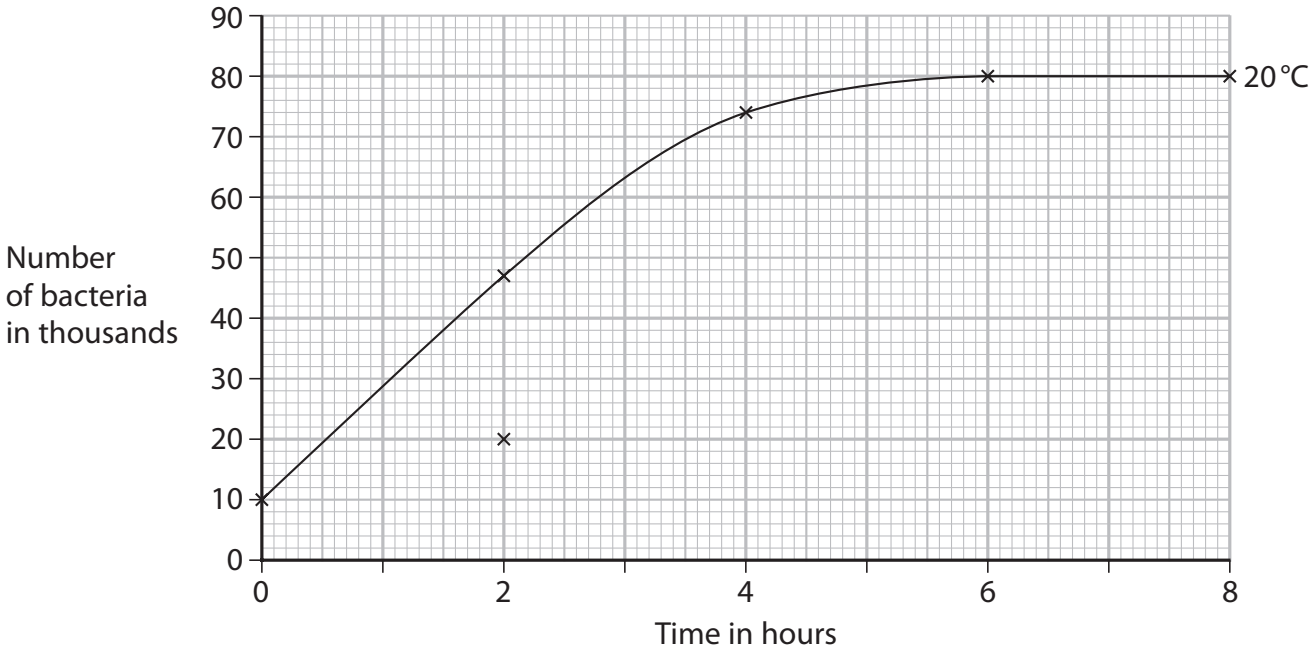



**Figure 2**

(i) Plot the points on the graph for the number of bacteria at 10 °C.

The first two points have been plotted for you.

**(1)**

(ii) Draw a line of best fit on the graph for 10 °C.

**(1)**

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(iii) Describe how the growth of bacteria at 10 °C was different from the growth of bacteria at 20 °C.

**(2)**

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**(Total for Question 1 = 7 marks)**

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**2** Stone tools can be found at sites used by our human ancestors.

(a) Figure 3 shows tool P.

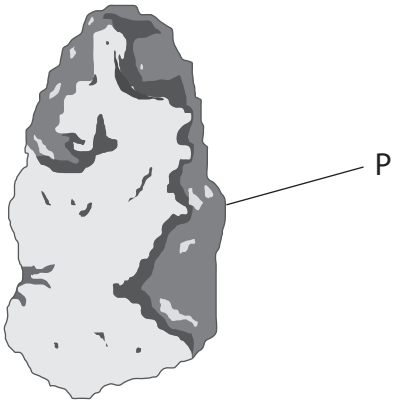



**Figure 3**

(i) Describe how tool P was made.

**(2)**

.....

.....

.....

(ii) Figure 4 shows tool Q which was found at the same site as tool P.

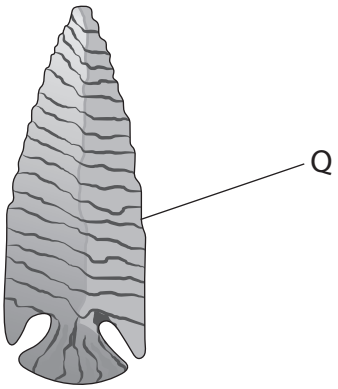



**Figure 4**

A scientist stated that tool Q was made by a more evolved human ancestor than tool P.

Which observation supports this statement?

**(1)**

☒ **A** tool Q is a darker colour than tool P

☒ **B** tool Q is more pointed than tool P

☒ **C** tool Q is a lighter colour than tool P

☒ **D** tool Q is less pointed than tool P

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(iii) Tools provide evidence for human evolution.

Use words from the box to complete the sentences.

**(2)**

| | | |
|---|---|---|
| enlarge | human | migrate |
| mutate | natural | negative |

Evolution is the change of inherited characteristics through

..... selection.

These changes occur because genes ..... .

(b) Fossils were also found in the soil around tool Q.

Describe **two** ways that stone tools and fossils can be dated to find out how old they are.

**(2)**

1 .....

.....

2 .....

.....

**(Total for Question 2 = 7 marks)**

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**3** Alcohol is broken down by liver cells.

(a) Which process moves alcohol from the blood into the liver cells?

**(1)**

- ☒ **A** diffusion
- ☒ **B** respiration
- ☒ **C** osmosis
- ☒ **D** transpiration

(b) If a person drinks too much alcohol, liver cells die and the person can develop cirrhosis of the liver.

The relative risk of developing cirrhosis of the liver is affected by two factors.

1. The volume of alcohol a person drinks in one week.
2. Whether the person drinks the alcohol on its own or with a meal.

Figure 5 shows how these two factors affect the relative risk of people developing cirrhosis of the liver.

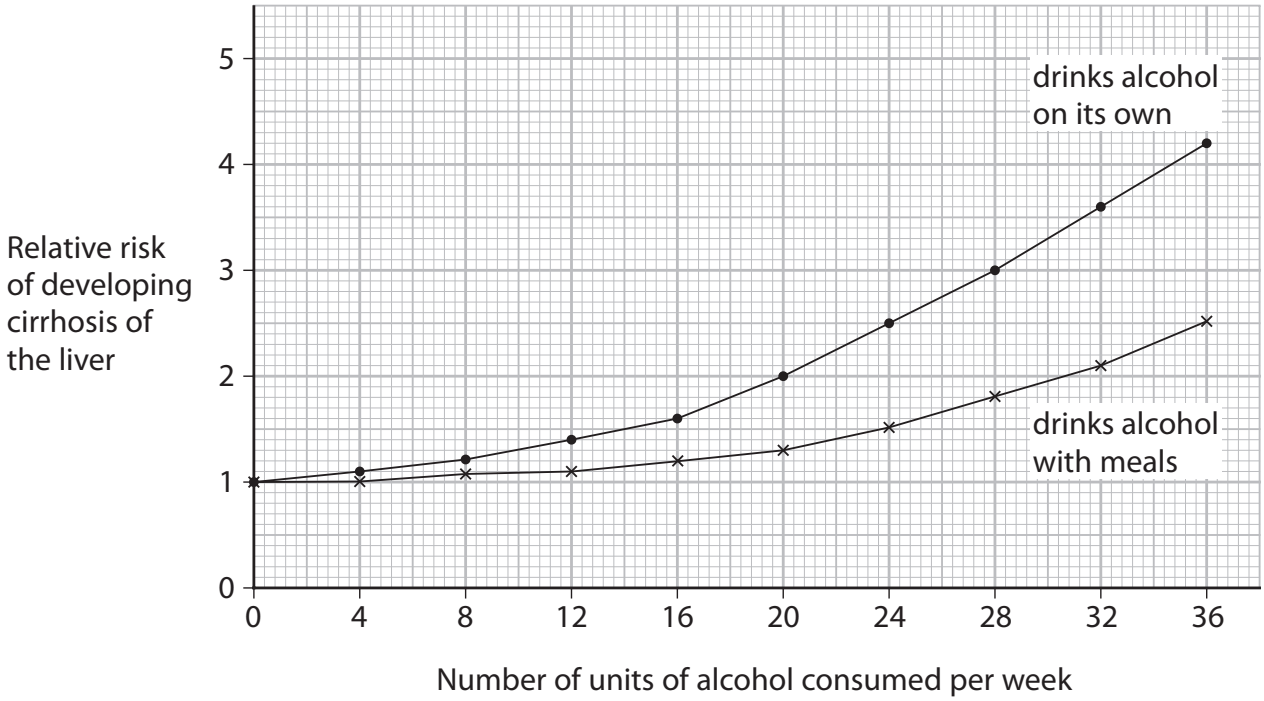



**Figure 5**

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(i) Person A drinks alcohol on its own.

Person B drinks alcohol with their meals.

Calculate the difference in risk for these two people when each one drinks 28 units of alcohol per week.

**(3)**

.....

(ii) Using evidence from Figure 5, state **two** pieces of health advice for people about drinking alcohol.

**(2)**

1 .....

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2 .....

.....

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(c) Cystic fibrosis is a genetic condition that can also cause liver disease.

(i) State where genes are found in cells.

**(1)**

.....

(ii) Figure 6 shows the inheritance of cystic fibrosis in a family.

**F** represents the dominant allele that does not cause cystic fibrosis.

**f** represents the recessive allele that causes cystic fibrosis.

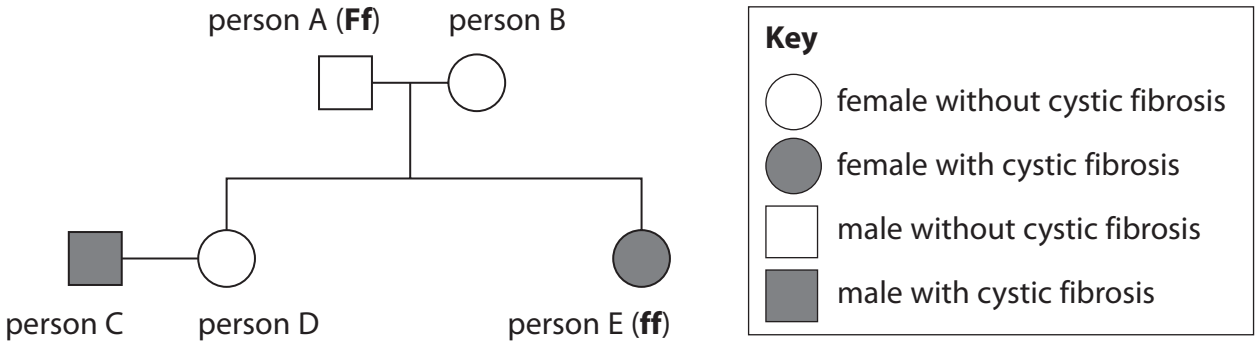



**Figure 6**

A scientist states that the genotype of person B is **Ff**.

Explain why the scientist is correct.

**(2)**

.....

.....

.....

.....

(iii) State the genotype of person C.

**(1)**

.....

**(Total for Question 3 = 10 marks)**

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**4** (a) Figure 7 shows a height percentile chart for boys.

The numbers on the right-hand side of the graph show the percentiles of the population for each growth curve.

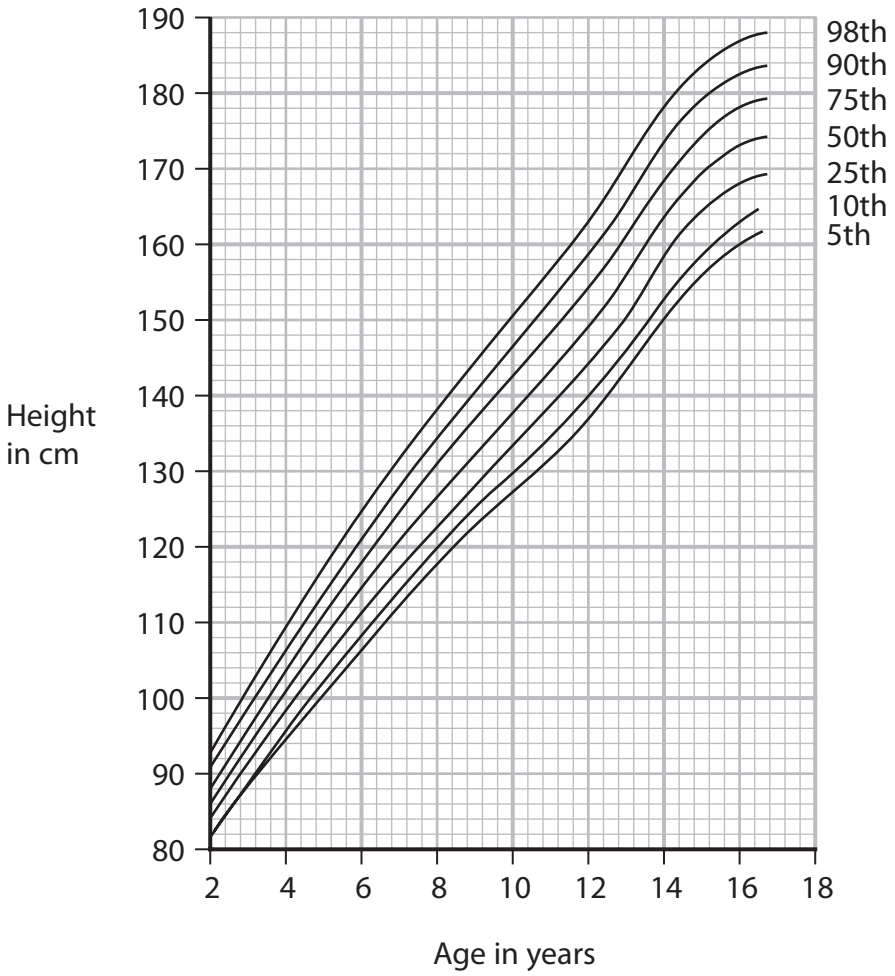



**Figure 7**

(i) A 10-year-old boy has a height of 140 cm.

Which is the percentile range for height for this boy?

**(1)**

☒ **A** 10th to 25th

☒ **B** 25th to 50th

☒ **C** 50th to 75th

☒ **D** 75th to 90th

(ii) State how percentile charts are used.

**(1)**

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(b) As we grow, we make new cells by mitosis and meiosis.

(i) The cells that are made can become specialised.

Figure 8 shows a diagram of a sperm cell.

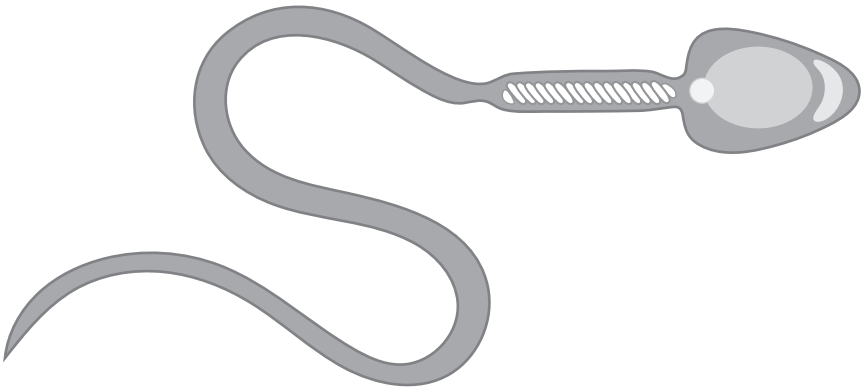


**Figure 8**

Describe **two** ways that the sperm cell is specialised.

**(2)**

1 .....

.....

2 .....

.....

(ii) Complete the table to show the results when a cell divides by mitosis or meiosis in humans.

Human body cells, except gametes, have 23 pairs of chromosomes.

**(4)**

| | **mitosis** | **meiosis** |
|---|---|---|
| number of daughter cells produced | | |
| number of chromosomes in each daughter cell | | |

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(c) The tips of plant roots are where many cells are dividing by mitosis.

(i) Which term describes the area of a root where many cells are dividing by mitosis?

**(1)**

☒ **A** meristem

☒ **B** root hair cell

☒ **C** xylem

☒ **D** phloem

(ii) Plant root cells contain an enzyme that joins glucose molecules together to make starch.

Devise a plan to investigate the effect of pH on the activity of this enzyme.

**(3)**

**(Total for Question 4 = 12 marks)**

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**5** (a) DNA molecules contain base pairs.

Describe how the base pairs are bonded together in a DNA molecule.

**(2)**

.....

.....

.....

.....

(b) Figure 9 shows part of a DNA molecule.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T | T | G | A | T | T | G | C | G | T | A | A |
| | | | | | | | | | | | |

**Figure 9**

(i) Write the code for the complementary DNA strand in Figure 9.

**(2)**

(ii) Three bases code for each amino acid.

Which is the maximum number of amino acids coded for by this strand of DNA?

**(1)**

☒ **A** 3

☒ **B** 4

☒ **C** 6

☒ **D** 12

(iii) What is the shape of a DNA molecule?

**(1)**

☒ **A** triple stranded

☒ **B** single stranded

☒ **C** single helix

☒ **D** double helix

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(c) A student wanted to extract the DNA from fresh peas.

The student crushed the peas and added washing up liquid and water.

The enzyme protease was then added to this mixture.

(i) Explain why the enzyme protease was added to the mixture.

**(2)**

(ii) The mixture was then heated and filtered.

Finally, the student poured the filtrate into a test tube and ice-cold ethanol was poured down the side of the test tube into the filtrate.

State why ice-cold ethanol was poured into the filtrate.

**(1)**

(iii) The student wanted to compare the mass of DNA found in fresh peas with the mass of DNA found in fresh beans.

Give **two** variables the student would need to control to make this a valid comparison.

**(2)**

1 .....

2 .....

**(Total for Question 5 = 11 marks)**

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**6** (a) Figure 10 shows the number of people diagnosed with sexually transmitted infections (STIs) in the UK during 2017.

| sexually transmitted infection (STI) | number of people diagnosed per 1000 of the population |
|---|---|
| chlamydia | 3.7 |
| gonorrhoea | 0.8 |
| genital herpes | 0.6 |
| genital warts | 1.1 |
| syphilis | 0.1 |

**Figure 10**

(i) State the sexually transmitted infection that has the median number of people diagnosed.

**(1)**

.....

(ii) The population of the UK in 2017 was 66 million people.

Calculate the total number of people diagnosed with chlamydia in the UK in 2017.

**(2)**

..... people

(iii) State why chlamydia can be described as a communicable disease.

**(1)**

.....

.....

(iv) Give **one** way the transmission of chlamydia can be prevented.

**(1)**

.....

.....

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(v) Explain why chlamydia can be treated with antibiotics.

**(2)**

*(b) When a person is infected with a disease, the immune system will respond to protect their body.

Explain how the immune system will respond to an infection caused by bacteria.

**(6)**

**(Total for Question 6 = 13 marks)**

**TOTAL FOR PAPER = 60 MARKS**

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