

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)

Tuesday 13 May 2025

Afternoon (Time: 1 hour 45 minutes)

Paper reference **1BI0/1F**

Biology
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 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 ►

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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 (a) Genes control natural hair colour in humans.

(i) Which term describes the differences in hair colour?

(1)

- ☒ **A** variation
- ☐ **B** tissue culture
- ☐ **C** elongation
- ☐ **D** fertilisation

(ii) Genes are found on chromosomes.

Name the part of the human cell where chromosomes are found.

(1)

(b) The hair colour of 24 students was recorded.

Figure 1 shows the results.

brown	black	blonde	black	blonde	brown
black	black	red	brown	brown	black
blonde	brown	black	brown	brown	blonde
brown	blonde	blonde	black	brown	brown

Figure 1

(i) Complete Figure 2 to show the tally and the total for brown hair.

(2)

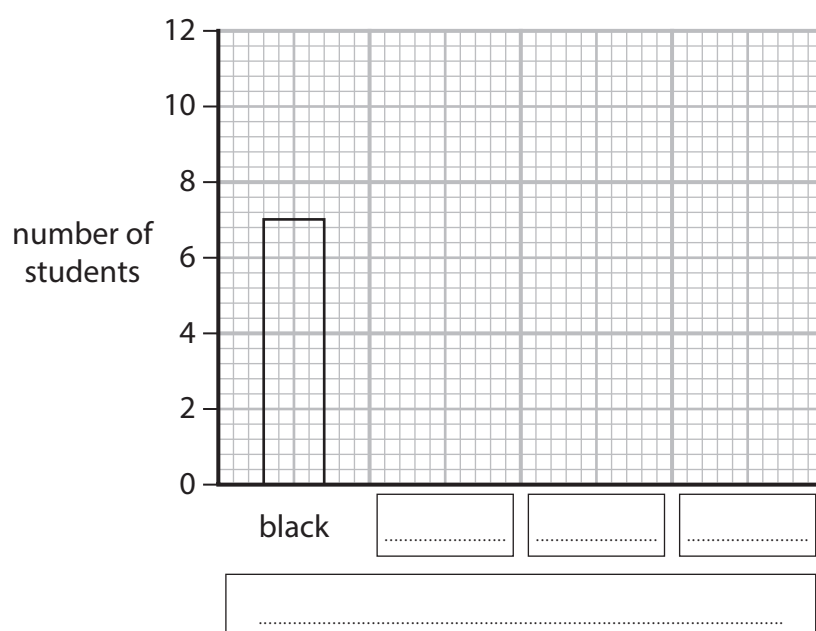
hair colour			
black	blonde	brown	red
total = 7	total = 6	total =	total = 1

Figure 2



(ii) Complete the bar chart to show the totals in Figure 2 and label the x-axis.

(3)



(Total for Question 1 = 7 marks)

2 (a) Figure 3 shows a sperm cell.

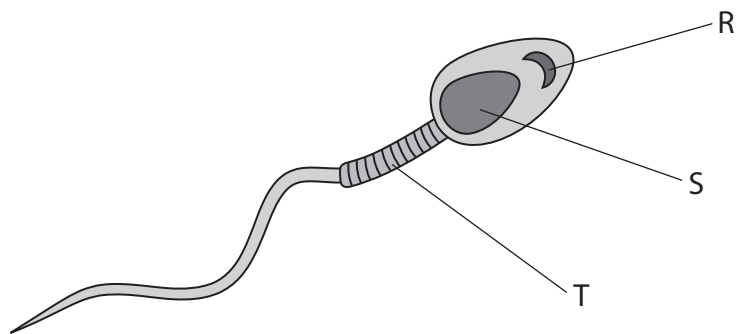


Figure 3

(i) Name the part labelled R.

(1)

(ii) Draw **one** straight line from each part of the sperm cell to its function.

(2)

part of the sperm cell

function

S

• produces glucose

• releases energy

• controls the cell

T

• helps the sperm enter the egg

• helps the egg enter the sperm

(b) Animal and plant cells are both eukaryotic.

State **one** structure found in a plant cell that is **not** found in an animal cell.

(1)

(c) DNA is found in cells.

Figure 4 shows part of a DNA molecule.



Figure 4

(i) Which type of large molecule is DNA?

(1)

- ☐ A monomer
- ☐ B protein
- ☐ C polymer
- ☐ D starch

(ii) Describe how the bases of a DNA molecule are held together.

(2)

(Total for Question 2 = 7 marks)

3 Figure 5 shows a human brain.

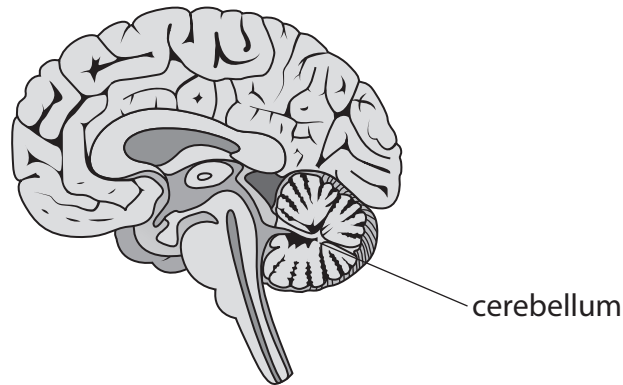


Figure 5

(a) Which is a function of the cerebellum?

(1)

- ☐ **A** to control balance
- ☐ **B** to control breathing rate
- ☐ **C** to control heart rate
- ☐ **D** to control blood pressure

(b) (i) Label the cerebral hemisphere on Figure 5.

(1)

(ii) State **two** functions of the cerebral hemispheres.

(2)

1

.....

2

.....

(c) The brain sends information to the muscles in the iris of the eye.

(i) Name the type of neurone that transmits nerve impulses from the brain to the muscles in the iris of the eye.

(1)

.....

(ii) Figure 6 shows a human eye.

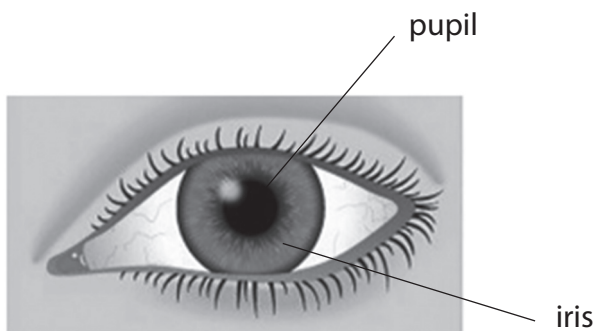


Figure 6

Explain how the pupil changes size.

(2)

(iii) Short-sightedness is a defect of the eye.

State **one** cause of short-sightedness.

(1)

(Total for Question 3 = 8 marks)

- 4 (a) Figure 7 shows the times when *Homo sapiens* (modern humans) and some of their ancestors are thought to have lived.

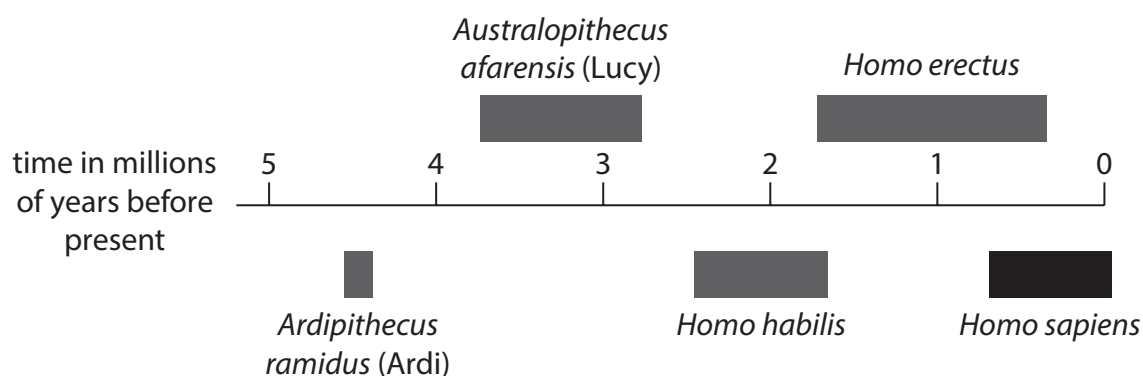


Figure 7

- (i) Which term is used to describe changes in species over time?

(1)

- ☐ A resistance
- ☐ B evolution
- ☐ C mitosis
- ☐ D inheritance

- (ii) Estimate the length of time *Homo habilis* is thought to have lived on Earth.

(1)

..... million years

- (iii) Describe **two** methods scientists used to date the fossils of Ardi or Lucy, as shown in Figure 7.

(2)

1

.....

.....

2

.....

.....

- (b) The ancestors of modern humans used selective breeding to improve the plants they used for food.

- (i) Complete the sentences using words from the box.

(2)

medicine	zygotes	generations
kingdoms	characteristics	domains

Selective breeding involves choosing parents with

desirable

The best offspring are bred together and this process is repeated over

many

- (ii) Suggest **one** feature of a banana that could be improved by selective breeding.

(1)

.....

.....

(c) The DNA of fruit can be modified to produce new varieties.

Figure 8 shows part of a method used to extract DNA from fruit.

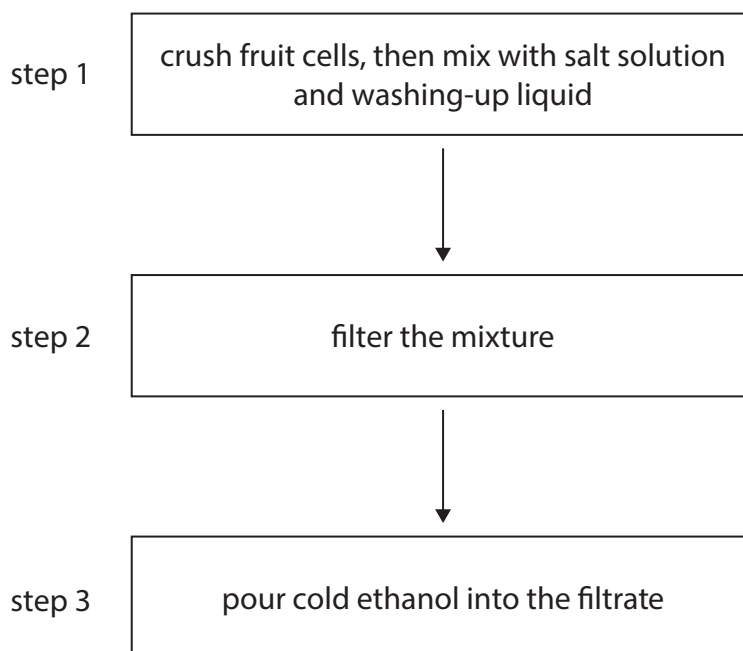


Figure 8

(i) State the purpose of both step 1 and step 2.

(2)

step 1

.....

step 2

.....

(ii) State why the cold ethanol was added in step 3.

(1)

.....

.....

.....

(Total for Question 4 = 10 marks)

- 5 (a) Figure 9 shows how adding fertiliser to the soil affects the yield of a food crop.

The area of a field is measured in hectares.

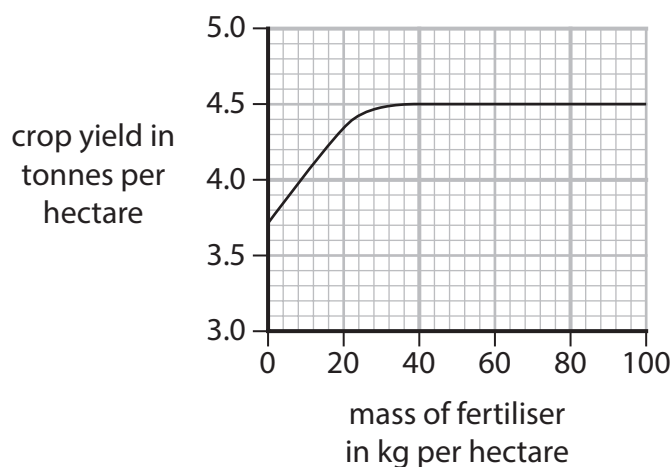


Figure 9

- (i) A farmer added 100 kg per hectare of fertiliser to a field.

Using Figure 9, calculate the increase in crop yield.

(2)

..... kg per hectare

- (ii) Explain why farmers should not add more than 40 kg per hectare of fertiliser to the soil.

(2)

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(b) Figure 10 shows part of a virus life cycle.

This virus infects bacterial cells.

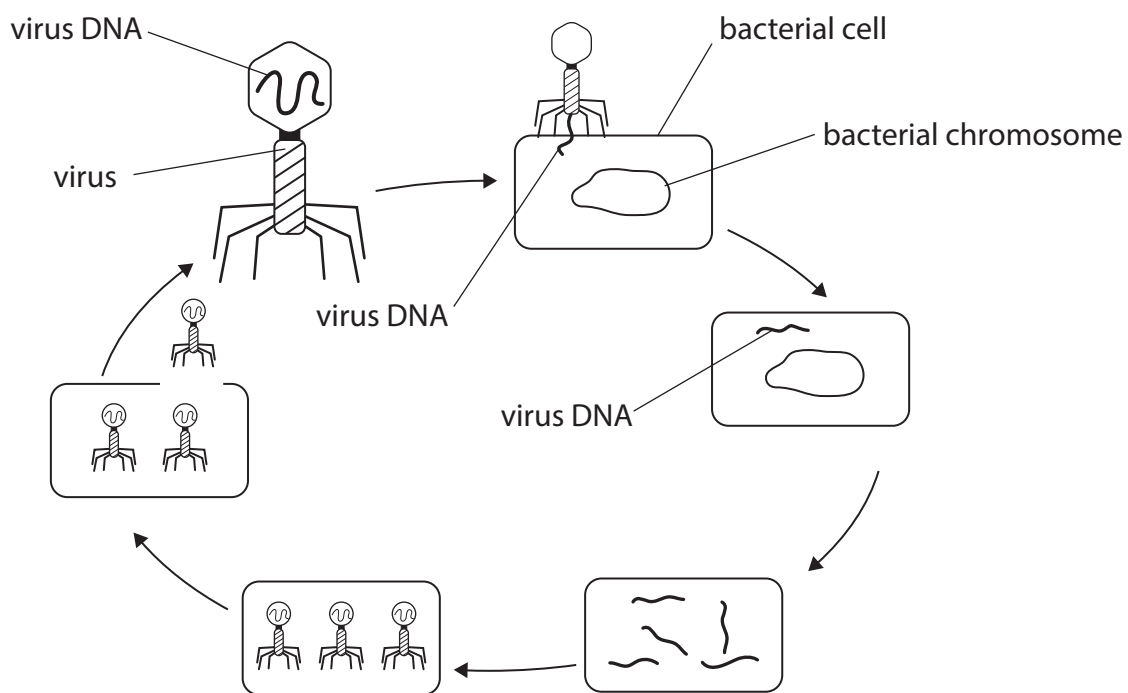


Figure 10

Use Figure 10 to describe how new viruses are made.

(4)



(c) Plants can be affected by pests such as insects.

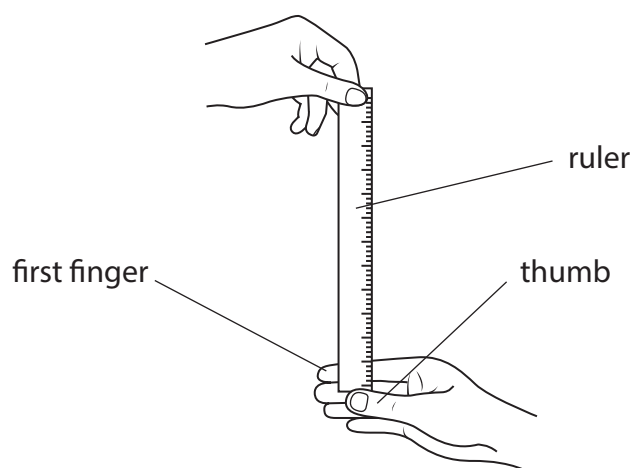
Give **one** way that plant pests can affect the food available for the human population.

(1)

(Total for Question 5 = 9 marks)



- 6 (a) A scientist uses the method shown in Figure 11 to investigate the reaction times of some students.



Method

The scientist

- holds the ruler as shown
- suddenly lets the ruler fall

The student

- catches the ruler between their first finger and thumb
- measures a variable

Figure 11

- (i) Which measurement should be recorded to compare reaction times?

(1)

- ☐ **A** the time taken to complete the investigation
- ☐ **B** the distance the ruler falls
- ☐ **C** the distance between the two hands
- ☐ **D** the temperature of the room

(ii) Figure 12 shows the results of five students.

student	distance measured in cm
J	15
K	12
L	14
M	13
N	13

Figure 12

Which is the mean of the results in Figure 12?

(1)

- ☐ **A** 12.2 cm
- ☐ **B** 12.8 cm
- ☐ **C** 13.4 cm
- ☐ **D** 14.3 cm

(iii) Explain which of the five students had the slowest reaction time.

(2)

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(iv) Give **two** variables that need to be controlled during this investigation.

(2)

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2

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(b) Figure 13 shows a motor neurone.

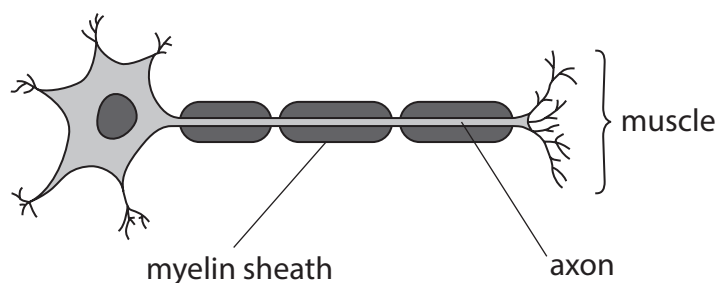


Figure 13

(i) State the role of a motor neurone in a reflex arc.

(1)

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.....

(ii) Explain the function of the myelin sheath.

(2)

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(iii) Describe how a nerve impulse passes across the gap between two neurones.

(3)

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(Total for Question 6 = 12 marks)



7 (a) Bacteria cause many diseases in humans.

(i) Which term describes a pathogen?

(1)

- ☐ **A** a chemical that causes disease
- ☐ **B** an animal that eats another animal
- ☐ **C** a cell that engulfs micro-organisms
- ☐ **D** an organism that causes disease

(ii) In the UK, most children are immunised against serious infections such as measles.

Give **two** advantages of immunising children against measles.

(2)

1

2

(b) Humans have physical barriers to prevent bacterial infections.

(i) Name **two** of these physical barriers.

(2)

1

2

(ii) State the chemical in the stomach that destroys bacteria.

(1)

.....

.....



*(c) Many food crops are damaged by pests.

Some farmers use insects for the biological control of plant pests.

Figure 14 shows a ladybird which can be used for biological control.



(Source: © IanRedding/Shutterstock)

Figure 14

Explain the advantages and disadvantages of biological control.

(6)

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(Total for Question 7 = 12 marks)



- 8 (a) Figure 15 shows the number of new cases of chlamydia diagnosed in England from 2013 to 2022.

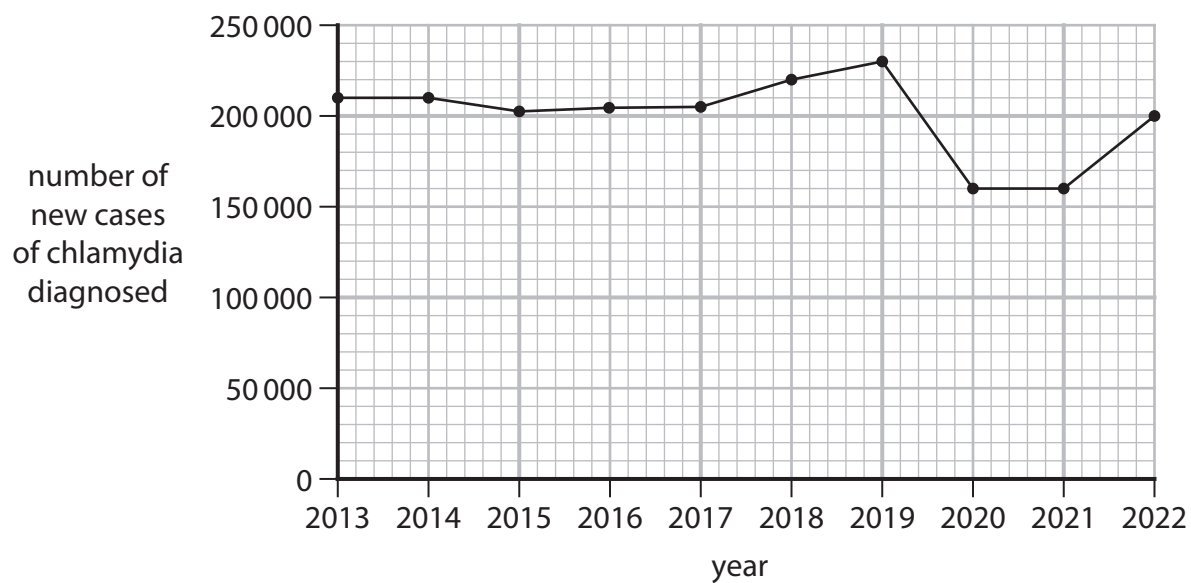


Figure 15

- (i) Which type of organism causes chlamydia?

(1)

- ☐ A bacteria
- ☐ B fungi
- ☐ C protists
- ☐ D viruses

- (ii) Calculate the increase in the number of new cases of chlamydia diagnosed from 2020 to 2022.

(1)

..... cases

(iii) Tuberculosis is a disease that is spread through airborne droplets.

Give **two** ways of reducing or preventing the spread of tuberculosis.

(2)

1

.....

2

.....

(b) Obesity is a risk factor for some non-communicable diseases.

(i) State why liver disease is a non-communicable disease.

(1)

.....

.....

(ii) The waist-to-hip ratio can be used to show if excess weight is a health risk.

An adult has a waist measurement of 80 cm and a hip measurement of 90 cm.

Calculate the waist-to-hip ratio for this adult, using the equation:

$$\text{waist-to-hip ratio} = \frac{\text{waist measurement}}{\text{hip measurement}}$$

Give your answer to **two** decimal places.

(2)

waist-to-hip ratio



(iii) Figure 16 shows the health risk of some waist-to-hip ratios.

health risk	waist-to-hip ratios	
	males	females
low	0.95 or less	0.80 or less
medium	0.96 to 1.0	0.81 to 0.85
high	1.1 or more	0.86 or more

Figure 16

Explain the health risk for a female with a waist-to-hip ratio of 0.75.

(2)

(c) Cancer occurs when cell division by mitosis is uncontrolled.

Describe the properties of cells produced by mitosis.

(2)

(Total for Question 8 = 11 marks)

- 9 (a) Figure 17 shows a beaker containing a potato cylinder in distilled water.

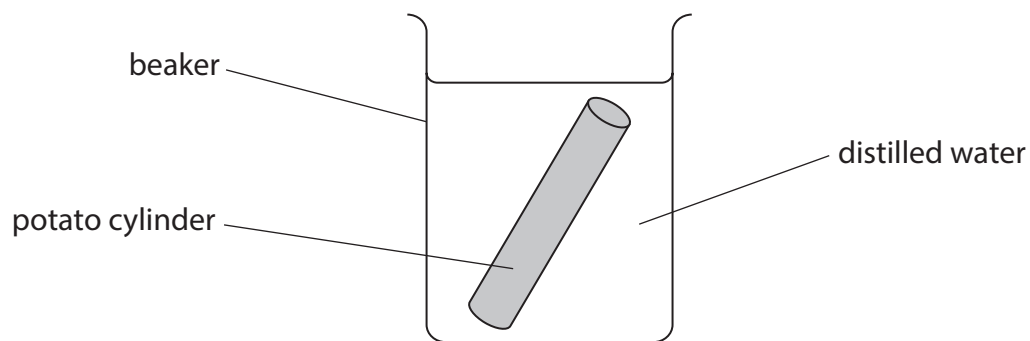


Figure 17

Explain why the mass of this potato cylinder will change when it is placed in distilled water.

(3)

(b) A scientist investigated the rate of diffusion using three agar cubes of different sizes.

Each cube contained a pH indicator that changed from pink to colourless when placed in acid.

The cubes were placed in a beaker containing an acid.

Figure 18 shows some information about each cube.

cube	length of each side of cube in cm	surface area in cm ²	volume in cm ³	surface area to volume ratio	time taken for the cube to become colourless in seconds
A	1.0	6	1	6 : 1	170
B	2.0	24	8	3 : 1	260
C	3.0	54	?	2 : 1	500

Figure 18

(i) Calculate the volume of cube C.

(2)

.....cm³

(ii) Explain the difference in the times taken for cubes A and B to become colourless.

(2)

.....

.....

.....

.....

.....

* (c) Liquid agar was poured into a Petri dish and allowed to set.

A well was cut in the centre of the set agar.

Kiwi fruit juice was poured into the well.

Kiwi fruit juice contains an enzyme that causes set agar to break down into a liquid.

Figure 19 shows the results after 30 minutes.

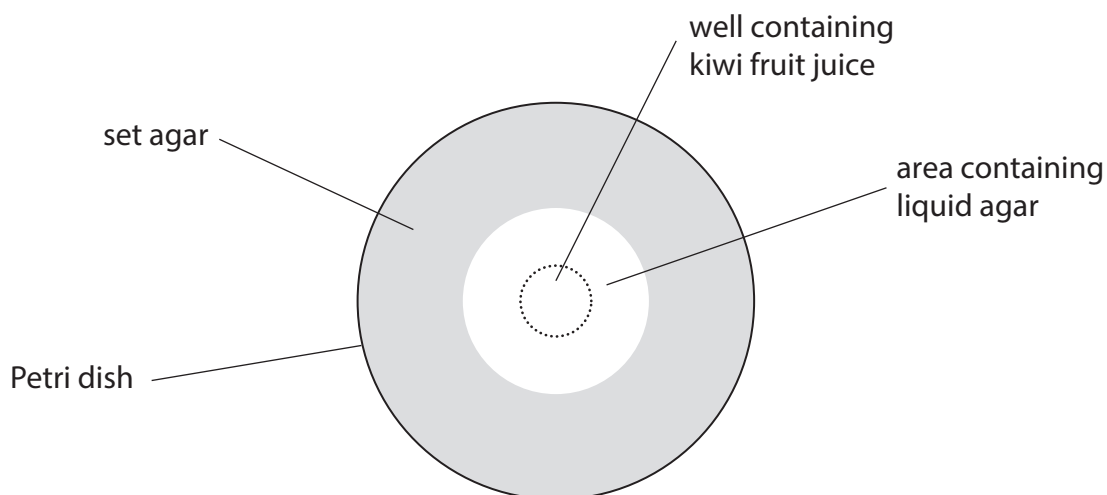


Figure 19

Devise a plan to investigate the effect of different concentrations of kiwi fruit juice on the breakdown of set agar, using the equipment shown in Figure 19.

Your plan should include:

- measurements that need to be taken
- variables that need to be controlled.

(6)

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(Total for Question 9 = 13 marks)



10 (a) In the 19th century, Gregor Mendel studied genetic inheritance in pea plants.

Mendel made the conclusion that characteristics in organisms were determined by the inheritance of 'units'.

(i) What are these 'units' of inheritance known as today?

(1)

- ☐ A chloroplasts
- ☐ B enzymes
- ☐ C genes
- ☐ D mitochondria

(ii) Figure 20 shows one of Mendel's experiments on the inheritance of pea shape.

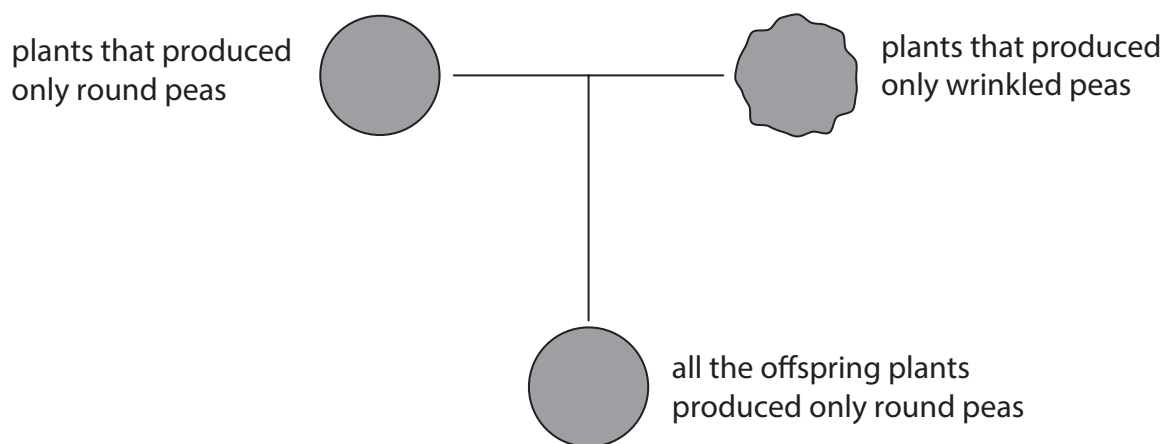


Figure 20

State the conclusion that Mendel was able to make about the wrinkled pea characteristic.

(1)

(b) A scientist crossed two pea plants that were heterozygous for pea shape.

- (i) Complete the Punnett square to show the inheritance of the alleles for pea shape and the percentage probability of producing a plant with wrinkled peas.

Use the letter R for the allele for round shape.

Use the letter r for the allele for wrinkled shape.

(3)

		heterozygous	
heterozygous			

percentage probability of producing a plant with wrinkled peas%

- (ii) Plants used to study inheritance are grown in controlled environmental conditions.

Suggest **two** ways of controlling these environmental conditions.

(2)

1

.....

2

.....

(c) Some plants can reproduce asexually and sexually.

- (i) Complete the table by writing **yes** or **no** in **each** box to show the features of asexual and sexual reproduction.

(3)

feature	asexual reproduction	sexual reproduction
produce genetically identical offspring		
requires male and female gametes		
rapid reproductive cycle		

- (ii) A zygote with a diploid nucleus is formed by sexual reproduction.

State what is meant by a diploid nucleus.

(1)

.....

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(Total for Question 10 = 11 marks)

TOTAL FOR PAPER = 100 MARKS



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