

FOR OFFICIAL USE

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Mark

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NATIONAL QUALIFICATIONS 2014

BIOLOGY

INTERMEDIATE 1



* X 0 0 7 1 0 0 2 *

FRIDAY, 16 MAY
9.00 AM – 10.30 AM

X007/10/02

Fill in these boxes and read what is printed below.

Full name of centre

Town

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Forename(s)

Surname

Number of seat

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Date of birth

Day

Month

Year

Scottish candidate number

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SECTION A (25 marks)

Instructions for completion of Section A are given on page two.

For this section of the examination you must use an **HB pencil**.

SECTION B (50 marks)

- 1 All questions should be attempted.
- 2 The questions may be answered in any order but all answers are to be written in the spaces provided in this answer book, **and must be written clearly and legibly in ink**.
- 3 Additional space for answers will be found at the end of the book. If further space is required, supplementary sheets may be obtained from the Invigilator and should be inserted inside the **front** cover of this book.
- 4 The numbers of questions must be clearly inserted with any answers written in the additional space.
- 5 Rough work, if any should be necessary, should be written in this book and then scored through when the fair copy has been written. If further space is required, a supplementary sheet for rough work may be obtained from the Invigilator.
- 6 Before leaving the examination room you must give this book to the Invigilator. If you do not, you may lose all the marks for this paper.

Use **blue** or **black** ink only.



* X 0 0 7 1 0 0 2 0 1 *

Read carefully

- 1 Check that the answer sheet provided is for **Biology Intermediate 1 (Section A)**.
- 2 For this section of the examination you must use an **HB pencil**, and where necessary, an eraser.
- 3 Check that the answer sheet you have been given has **your name, date of birth, SCN** (Scottish Candidate Number) and **Centre Name** printed on it.
Do not change any of these details.
- 4 If any of this information is wrong, tell the Invigilator immediately.
- 5 If this information is correct, **print** your name and seat number in the boxes provided.
- 6 The answer to each question is **either** A, B, C or D. Decide what your answer is, then, using your pencil, put a horizontal line in the space provided (see sample question below).
- 7 There is **only one correct** answer to each question.
- 8 Any rough working should be done on the question paper or the rough working sheet, **not** on your answer sheet.
- 9 At the end of the examination, put the **answer sheet for Section A inside the front cover of this answer book**.

Sample Question

Which of the following foods contains a high proportion of fat?

- A Butter
- B Bread
- C Sugar
- D Apple

The correct answer is **A**—Butter. The answer **A** has been clearly marked in **pencil** with a horizontal line (see below).



Changing an answer

If you decide to change your answer, carefully erase your first answer and, using your pencil, fill in the answer you want. The answer below has been changed to **D**.



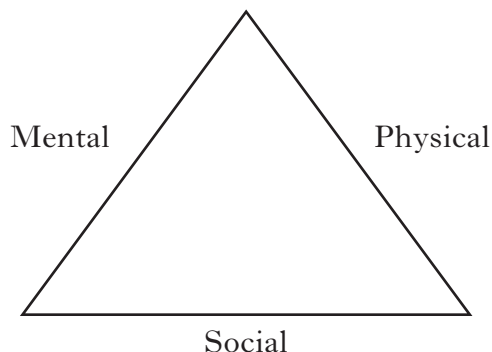
* X 0 0 7 1 0 0 2 0 2 *

SECTION A

All questions in this section should be attempted.

Answers should be given on the separate answer sheet provided.

1. The three aspects of health are shown in the diagram below.



Which one of the following is a physical aspect of health?

- A No stress at school
 - B Eating a balanced diet
 - C Looking forward to the weekend
 - D Enjoying the company of friends
2. Which line in the table below shows the effect of regular exercise on resting pulse rate and recovery time?

	<i>Resting pulse rate</i>	<i>Recovery time</i>
A	increases	decreases
B	increases	increases
C	decreases	increases
D	decreases	decreases

3. Which two food groups in a **balanced diet** both provide energy?

- A Fat and protein
- B Carbohydrate and fat
- C Vitamins and minerals
- D Protein and carbohydrate

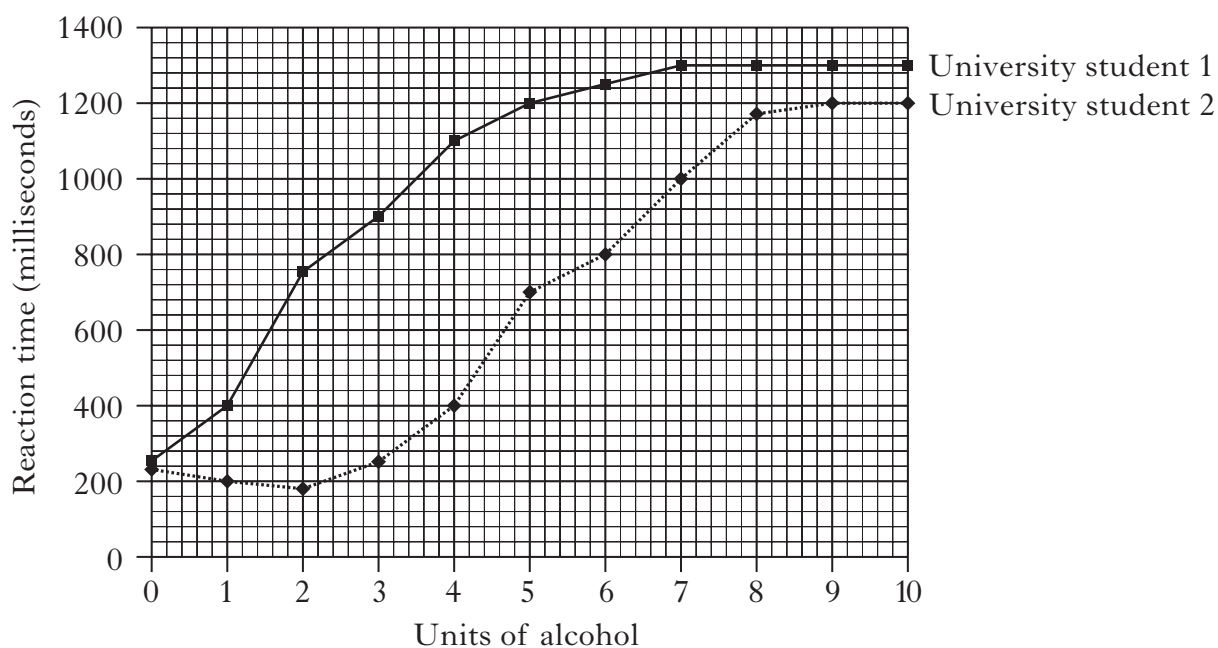


4. The table below shows the blood groups of 200 students.

<i>Blood group</i>	<i>Number of students</i>
O	94
A	84
B	16
AB	6

What percentage of students had blood group AB?

- A 3%
B 6%
C 12%
D 53%
5. The graph below shows the reaction times of two university students after drinking alcohol.



What was the difference in reaction times of university students 1 and 2, after consuming 5 units of alcohol?

- A 100 milliseconds
B 500 milliseconds
C 550 milliseconds
D 700 milliseconds

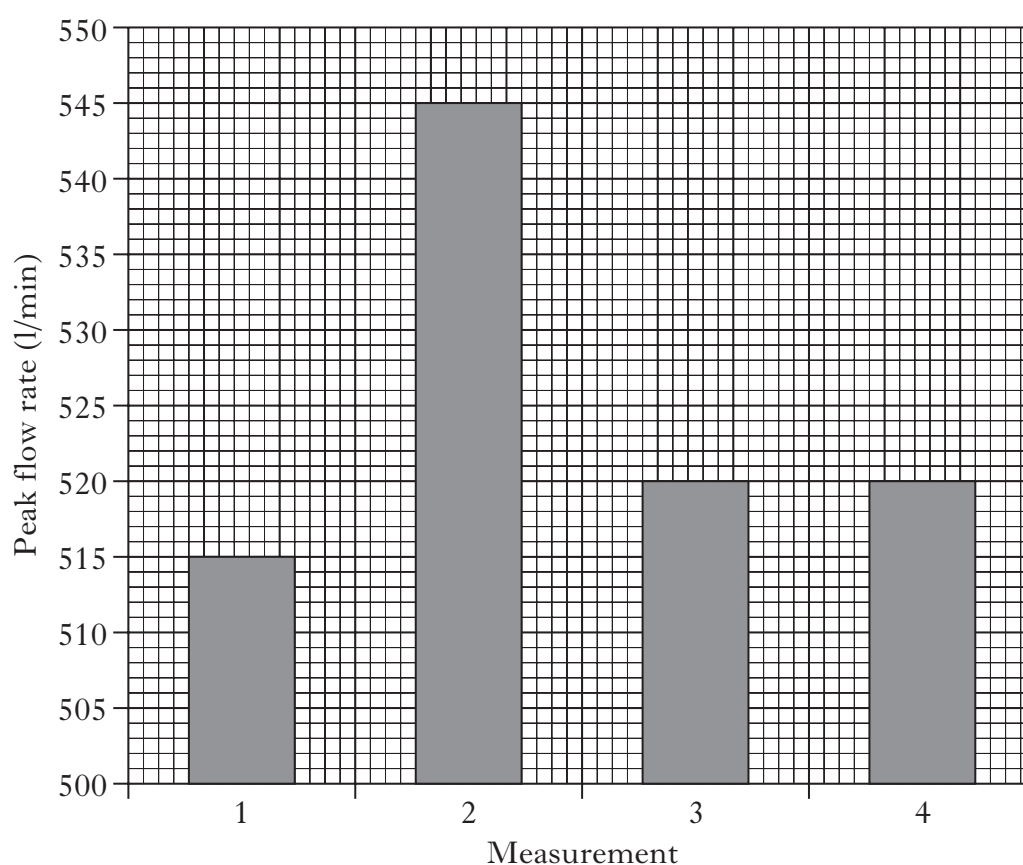


6. Which line in the table below correctly matches the condition to the body temperature indicated?

	<i>Body temperature (°C)</i>	<i>Condition</i>
A	30	fever
B	34	hypothermia
C	37	death
D	40	normal

7. A student measured his peak flow rate four times.

The graph below shows the measurements.



This student's peak flow rate was

- A 515
- B 520
- C 525
- D 545.



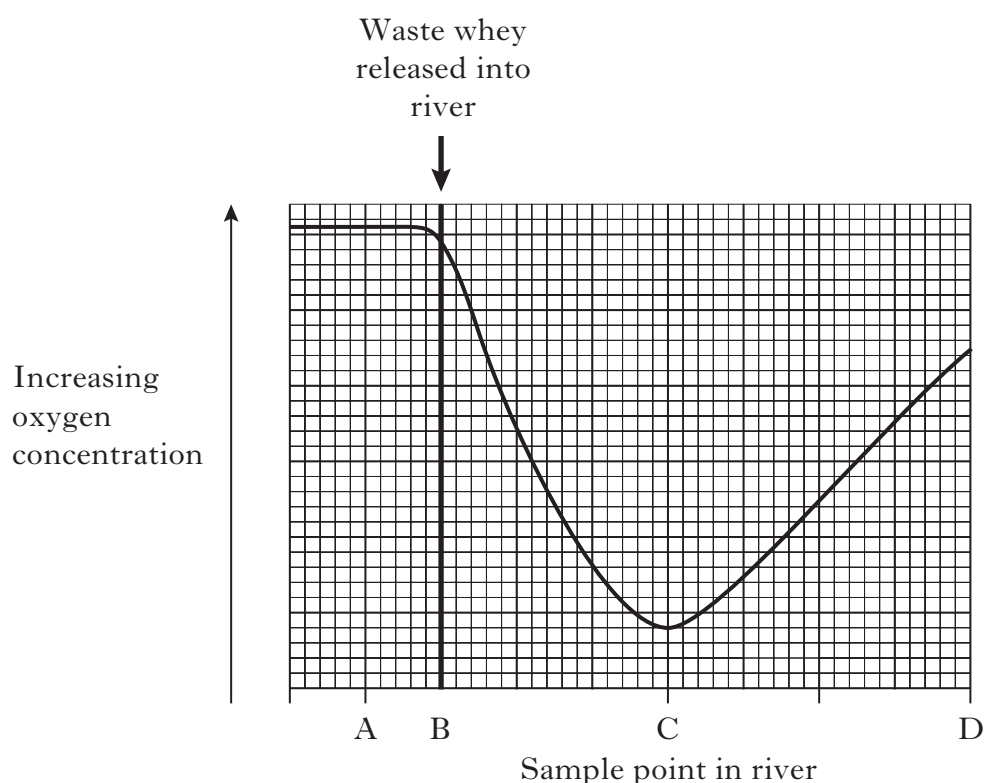
8. Which line in the table below shows the changes which occur in the lungs during exercise?

	<i>Rate of breathing</i>	<i>Depth of breathing</i>	<i>Rate of gas exchange</i>
A	increases	increases	increases
B	increases	increases	decreases
C	decreases	decreases	increases
D	decreases	increases	decreases

9. Which of the following is added to milk to make **yoghurt**?

- A Yeast
- B Rennet
- C Bacteria
- D Enzymes

10. The graph below shows the changes in oxygen concentration before and after waste whey is released into a river.



At which sample point in the river would the range of living organisms, other than bacteria, be greatest?



11. Which of the following is involved in the upgrading of waste whey to make a **creamy alcoholic drink**?

- A Bacteria
- B Curds
- C Rennet
- D Yeast

12. The table below shows the temperature ranges at which different types of yeast can grow.

<i>Type of yeast</i>	<i>Temperature range (°C)</i>
1	14–18
2	12–30
3	18–35
4	8–15

Which two types of yeast will **not** grow at 16 °C?

- A 1 and 3
- B 1 and 4
- C 2 and 3
- D 3 and 4

[Turn over



13. An investigation was carried out to compare the effectiveness of a biological and a non-biological washing powder.

Four test tubes were set up under the conditions shown in the following table.

<i>Test tube</i>	<i>Type of powder</i>	<i>Temperature (°C)</i>	<i>Volume of water (cm³)</i>
1	biological	15	200
2	biological	40	200
3	non-biological	40	300
4	non-biological	40	200

Which two test tubes should be compared to draw a valid conclusion?

- A 1 and 2
B 1 and 4
C 2 and 3
D 2 and 4
14. Which of the following shows the production of a **fermented milk drink**?

- A Sugar in milk $\begin{array}{l} \xrightarrow{\text{enzyme}} \text{lactic acid} \\ \xrightarrow{\text{yeast}} \text{alcohol and carbon dioxide} \end{array}$
- B Sugar in milk $\begin{array}{l} \xrightarrow{\text{yeast}} \text{lactic acid} \\ \xrightarrow{\text{enzyme}} \text{alcohol and carbon dioxide} \end{array}$
- C Lactic acid in milk $\begin{array}{l} \xrightarrow{\text{yeast}} \text{sugar} \\ \xrightarrow{\text{enzyme}} \text{alcohol and carbon dioxide} \end{array}$
- D Lactic acid in milk $\begin{array}{l} \xrightarrow{\text{enzyme}} \text{sugar} \\ \xrightarrow{\text{yeast}} \text{alcohol and carbon dioxide} \end{array}$



15. Fresh milk can be treated to produce different types of milk.

Which line in the table below correctly identifies the treatment used to produce skimmed and evaporated milk?

	<i>Type of milk</i>	
	<i>Skimmed</i>	<i>Evaporated</i>
A	nearly all liquid removed	nearly all fat removed
B	nearly all fat removed	some liquid removed
C	some fat removed	some liquid removed
D	some liquid removed	nearly all fat removed

16. The alcohol content of four types of beer are shown in the following table.

<i>Type of beer</i>	<i>Alcohol content of beer (%)</i>
W (cask conditioned)	4·3
X (brewery conditioned)	4·4
Y (brewery conditioned)	3·8
Z (cask conditioned)	5·5

Which line in the table below correctly shows the average alcohol content of brewery conditioned and cask conditioned beers?

	<i>Average alcohol content</i>	
	<i>Brewery conditioned beer</i>	<i>Cask conditioned beer</i>
A	4·9	4·1
B	4·1	4·9
C	9·8	8·2
D	8·2	9·8

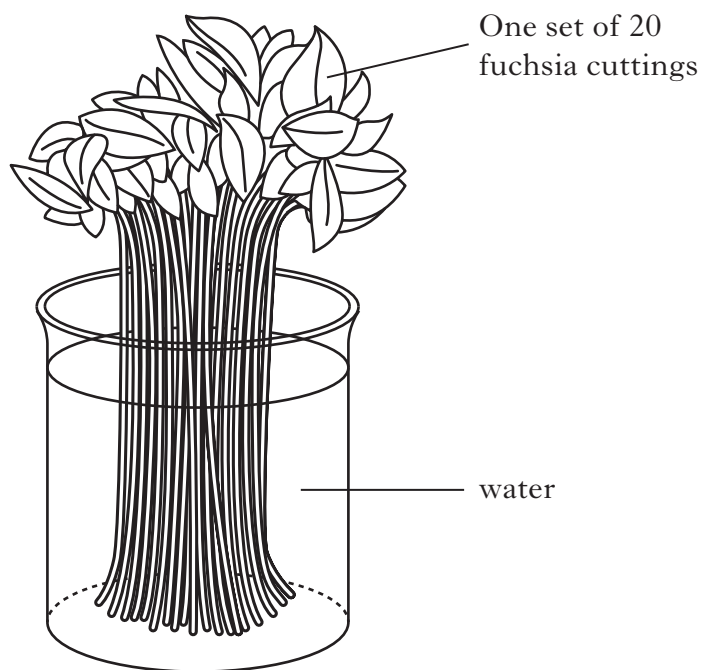
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17. Over-use of antibiotics can lead to

- A antibiotics developing resistance to bacteria
- B viruses developing resistance to bacteria
- C viruses developing resistance to antibiotics
- D bacteria developing resistance to antibiotics.

18. An investigation was carried out into the rooting of fuchsia cuttings. Four sets of 20 cuttings were set up as shown in the diagram below.



The number of cuttings which successfully rooted in each set are shown in the following table.

<i>Set</i>	<i>Number of cuttings which successfully rooted</i>
1	7
2	14
3	9
4	10

What percentage of the total number of all the sets of cuttings rooted successfully?

- A 2%
- B 10%
- C 40%
- D 50%



19. Which line in the table below correctly shows the parts of a plant for which nitrogen, phosphorus and potassium are important for growth?

	<i>Nitrogen</i>	<i>Phosphorus</i>	<i>Potassium</i>
A	leaves	roots	flowers and fruits
B	roots	leaves	flowers and fruits
C	flowers and fruits	roots	leaves
D	leaves	flowers and fruits	roots

20. The picture below shows cuttings growing in a mist propagator.



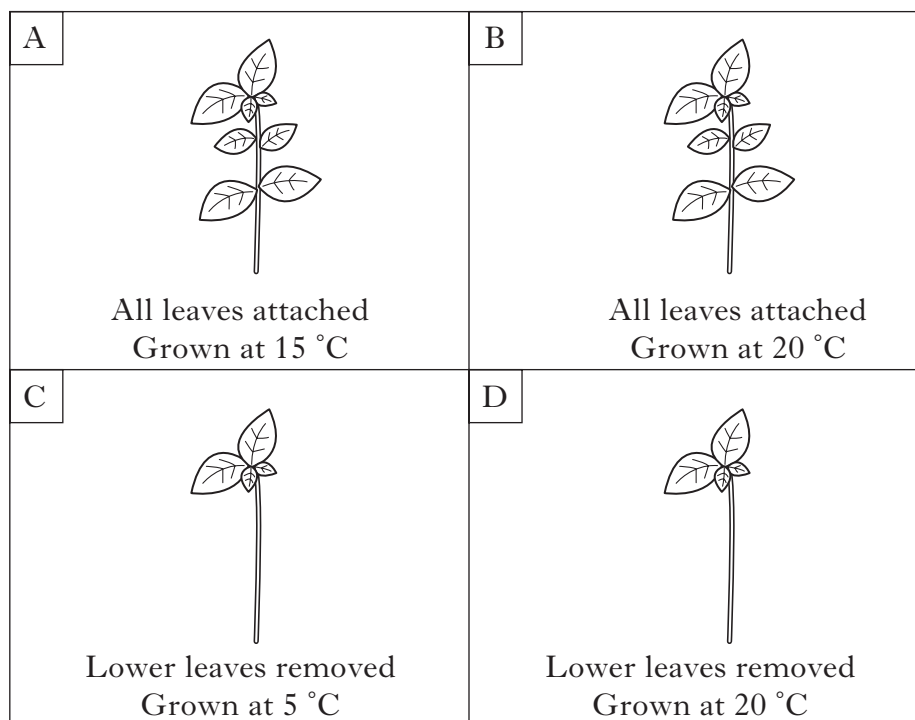
The two main reasons for growing cuttings in this way are to

- A decrease humidity and increase temperature
- B decrease humidity and decrease temperature
- C increase humidity and increase temperature
- D increase humidity and decrease temperature.

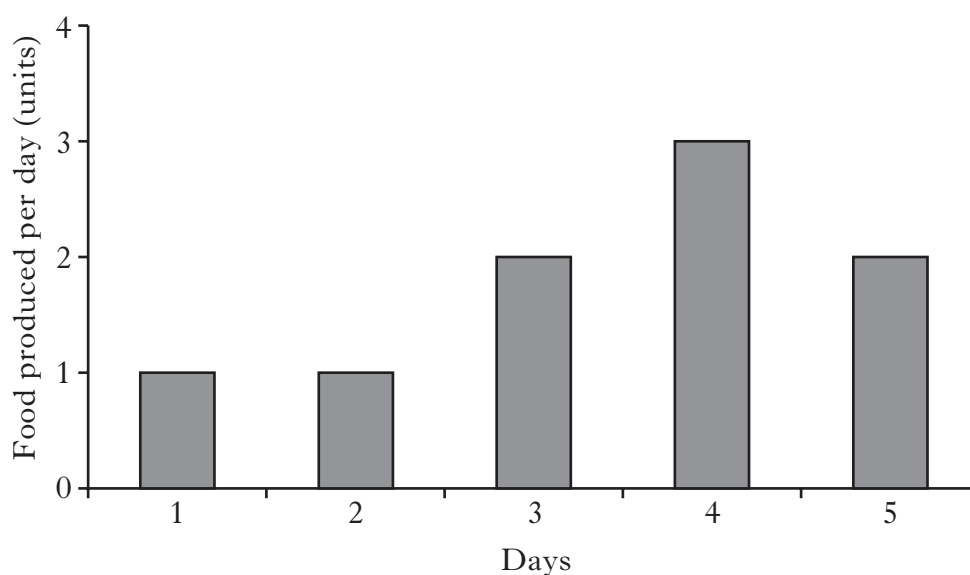
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21. Which of the following stem cuttings would be expected to produce roots first?



22. The graph below shows the food produced per day by a plant over a five day period.



How much food was produced in total from day 2 to day 4?

- A 2 units
- B 4 units
- C 6 units
- D 9 units



23. The process by which green plants make their own food is known as

- A photosynthesis
- B layering
- C propagation
- D germination.

24. Which of the following **both** improve drainage when added to soil?

- A Loam and peat
- B Peat and sand
- C Sand and perlite
- D Loam and perlite

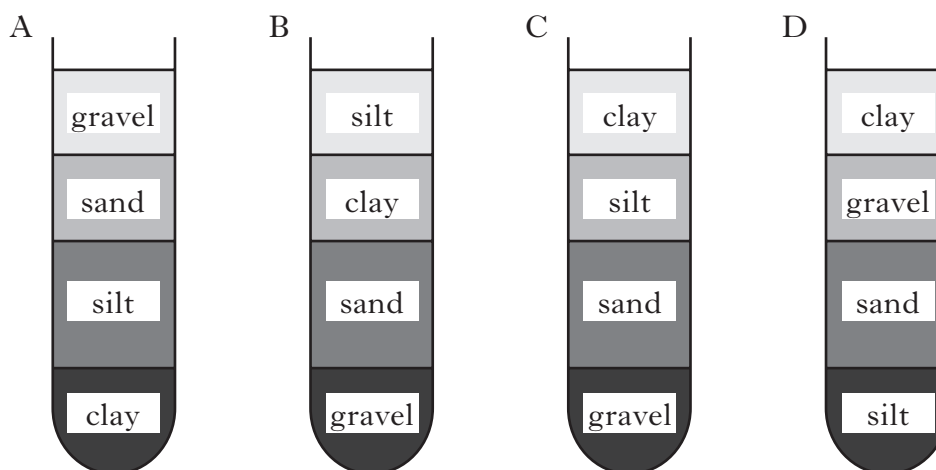
25. After a sample of soil has been shaken with water in a test tube, the particles settle according to their size.

The largest particles sink to the bottom of the tube and smaller particles settle above.

The table below shows the average size of four types of soil particle.

<i>Type of soil particle</i>	<i>Average size of particle (mm)</i>
clay	less than 0.002
gravel	greater than 2.0
sand	between 0.02 and 2.0
silt	between 0.002 and 0.02

Which of the following diagrams correctly shows the settling of a mixture of all four soil particles?



[Turn over for SECTION B on *Page fourteen*]



SECTION B

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Marks

All questions in this Section should be attempted.

All answers must be written clearly and legibly in blue or black ink.

1. (a) The table below shows the high tech instruments used to take physiological measurements.

<i>Physiological measurement</i>	<i>High tech instrument</i>
Blood pressure	Digital sphygmomanometer
Temperature	Y
X	Pulsometer

- (i) Name physiological measurement X.

_____ 1

- (ii) Name high tech instrument Y.

_____ 1

- (b) Blood pressure greater than 160/90 is considered to be high.
What is the average normal blood pressure?

_____ / _____ 1



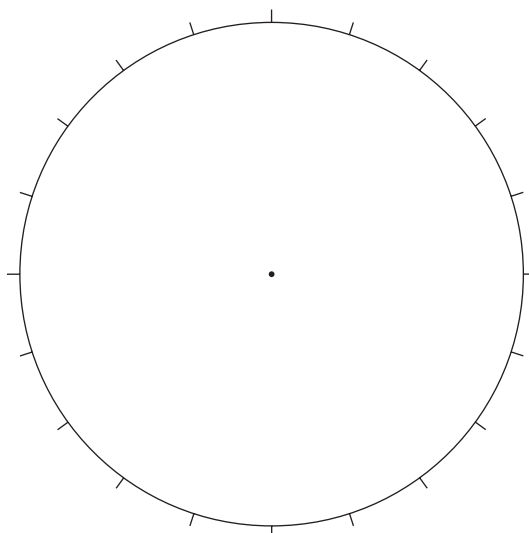
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Marks

2. (a) The table below shows the responses of a group of Scottish 18 year olds when asked how often they drink alcohol.

<i>Response</i>	<i>Percentage of 18 year olds (%)</i>
Never	20
Occasionally	55
Regularly	25

- (i) Present this information in the form of a pie chart.
(An additional pie chart, if required, will be found on *Page thirty-one.*)



2

- (ii) 35% of a group of 21 year olds stated that they regularly drink alcohol.

Calculate the simple whole number ratio of 18 to 21 year olds who stated that they regularly drink alcohol.

Space for calculation

_____ : _____
18 year olds 21 year olds

1



Marks

2. (continued)

- (b) How does the alcohol consumed reach the brain and other parts of the body?

1

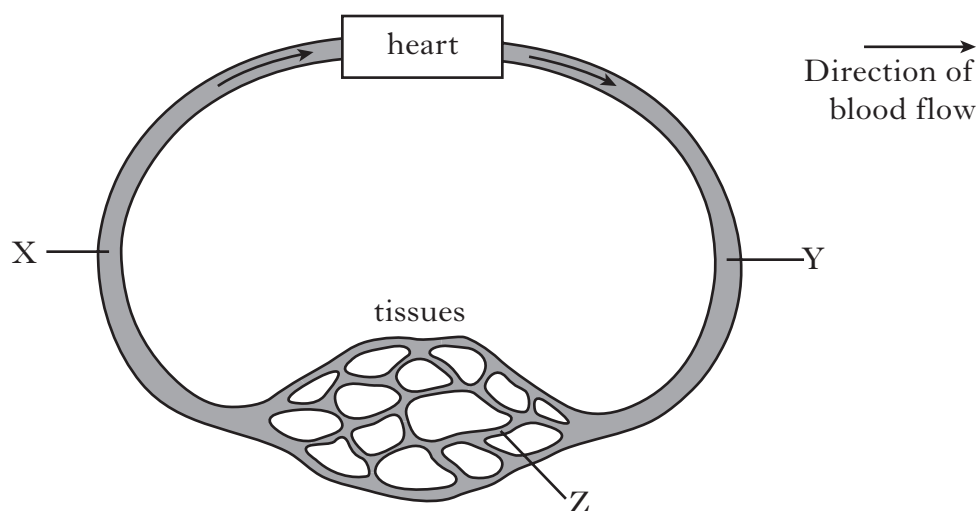
- (c) State one possible **long term** effect of drinking alcohol.

1



Marks

3. (a) The diagram below represents part of the human circulatory system.



- (i) Complete the table below by naming the types of blood vessel labelled X, Y and Z.

<i>Blood vessel</i>	<i>Type of blood vessel</i>
X	
Y	
Z	

2

- (ii) State the function of the heart.

1

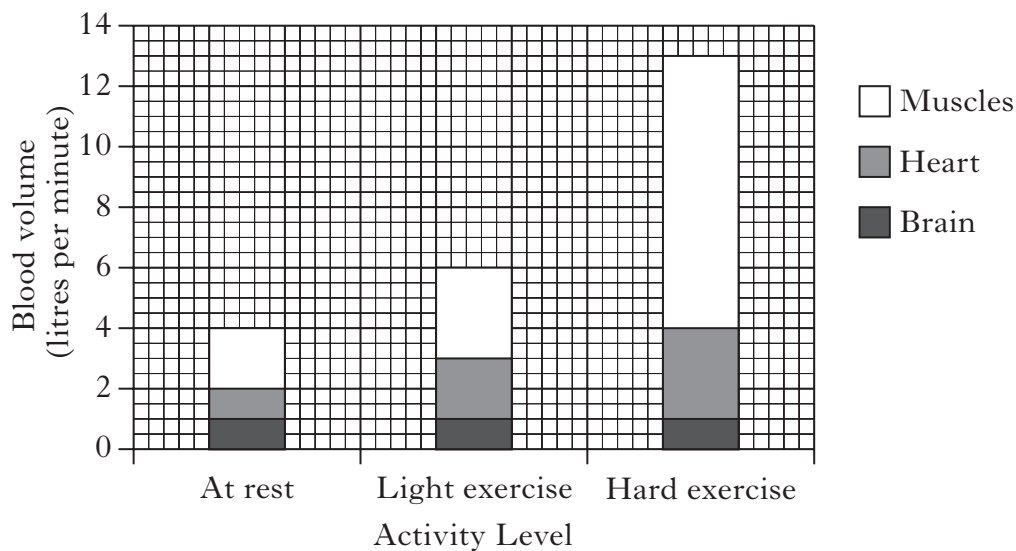
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Marks

3. (continued)

- (b) The bar chart below shows the volume of blood supplied to three parts of the body during different levels of activity.



- (i) What volume of blood is supplied to the **muscles** during light exercise?

_____ litres per minute **1**

- (ii) Describe what happens to the blood supply to the **brain** as the activity level increases.

_____ **1**

- (iii) Calculate how many times greater the blood volume supplied to the **heart** was during light exercise compared to at rest.

Space for calculation

_____ times greater **1**



* X 0 0 7 1 0 0 2 1 8 *

4. The tables below can be used to help assess the risk of developing heart disease. The points for fat in diet and frequency of exercise are added together. The total score indicates the level of risk of developing heart disease.

<i>Fat in diet</i>	<i>Points</i>
None	1
Low	3
Moderate	5
High	7

<i>Frequency of exercise</i>	<i>Points</i>
Every day	1
3–4 days per week	3
3–4 days per month	5
None	7

<i>Total score</i>	<i>Level of risk of developing heart disease</i>
1–4	Low
5–8	Average
9–12	Above average
13–14	High

Use the information in the tables above to answer the following questions.

- (a) State the level of risk of developing heart disease for a person who eats a low fat diet and takes no exercise.

_____ 1

- (b) How frequently would a person exercise if they had an average risk of developing heart disease and a high fat diet?

_____ 1

- (c) How many points for fat in diet and frequency of exercise would a person have if they had a high risk of developing heart disease?

Fat in diet _____

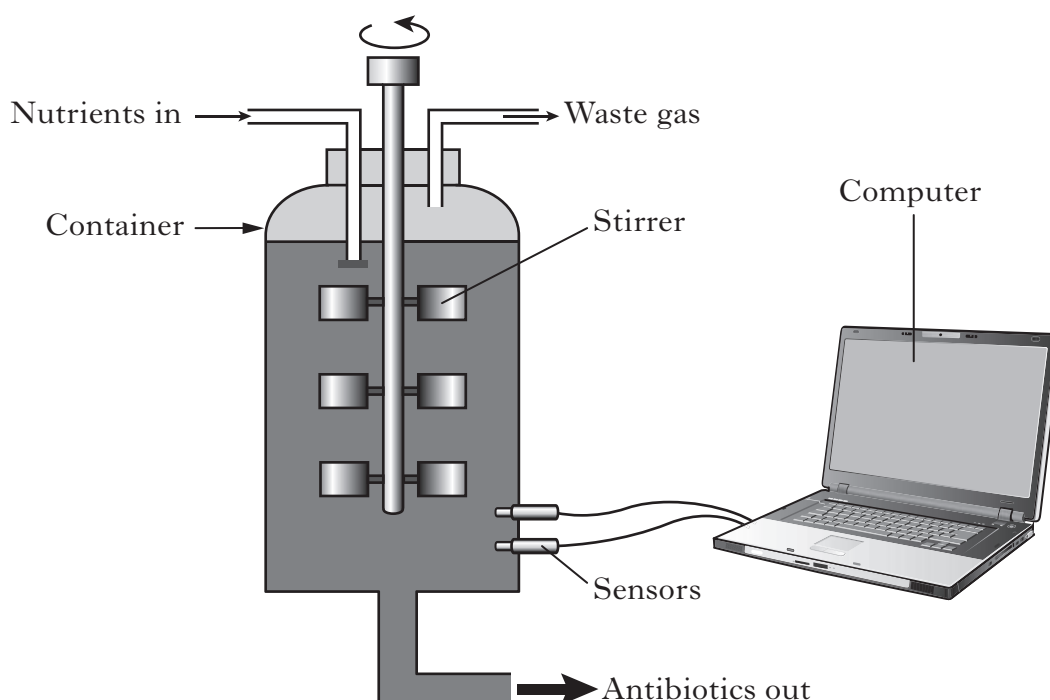
Frequency of exercise _____ 1



* X 0 0 7 1 0 0 2 1 9 *

Marks

5. (a) The diagram below shows equipment used to produce an antibiotic.



- (i) Name the type of container in which the antibiotics are produced.

1

- (ii) Name **one** condition in the container which can be monitored by the sensors.

1

- (b) **Underline** one option in each set of brackets to make the sentences below correct.

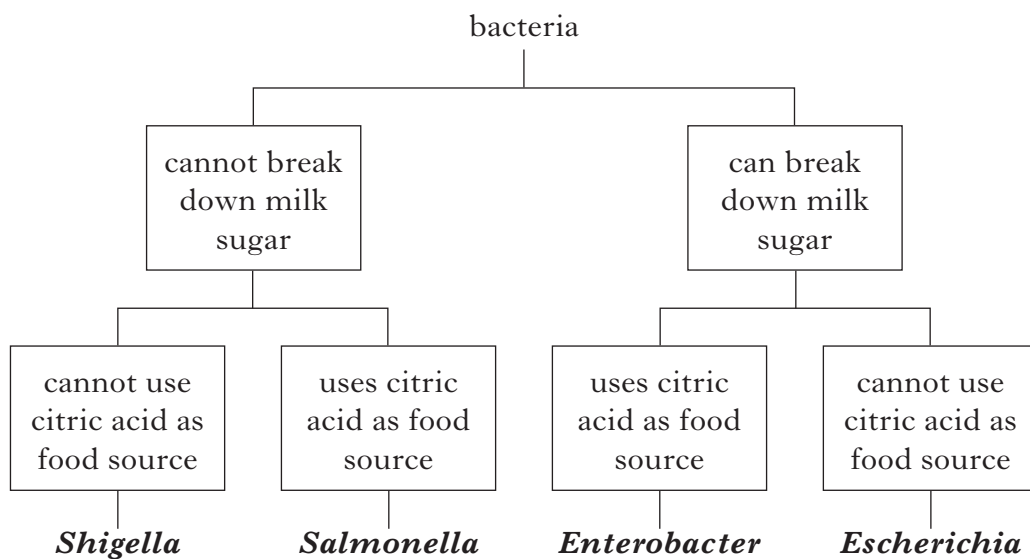
Antibiotics are produced naturally by $\left\{ \begin{array}{l} \text{enzymes} \\ \text{fungi} \\ \text{viruses} \end{array} \right\}$.

Antibiotics destroy and prevent the further growth of $\left\{ \begin{array}{l} \text{bacteria} \\ \text{fungi} \\ \text{viruses} \end{array} \right\}$. 2



Marks

6. The key below can be used to identify the names of four bacteria.



- (a) Complete the table below using the information in the key.

<i>Name of bacteria</i>	<i>Can break down milk sugar</i>	<i>Uses citric acid as food source</i>
<i>Shigella</i>	No	
	No	Yes
	Yes	
<i>Enterobacter</i>		

2

- (b) Using information in the key, compare *Shigella* with *Escherichia*.

1

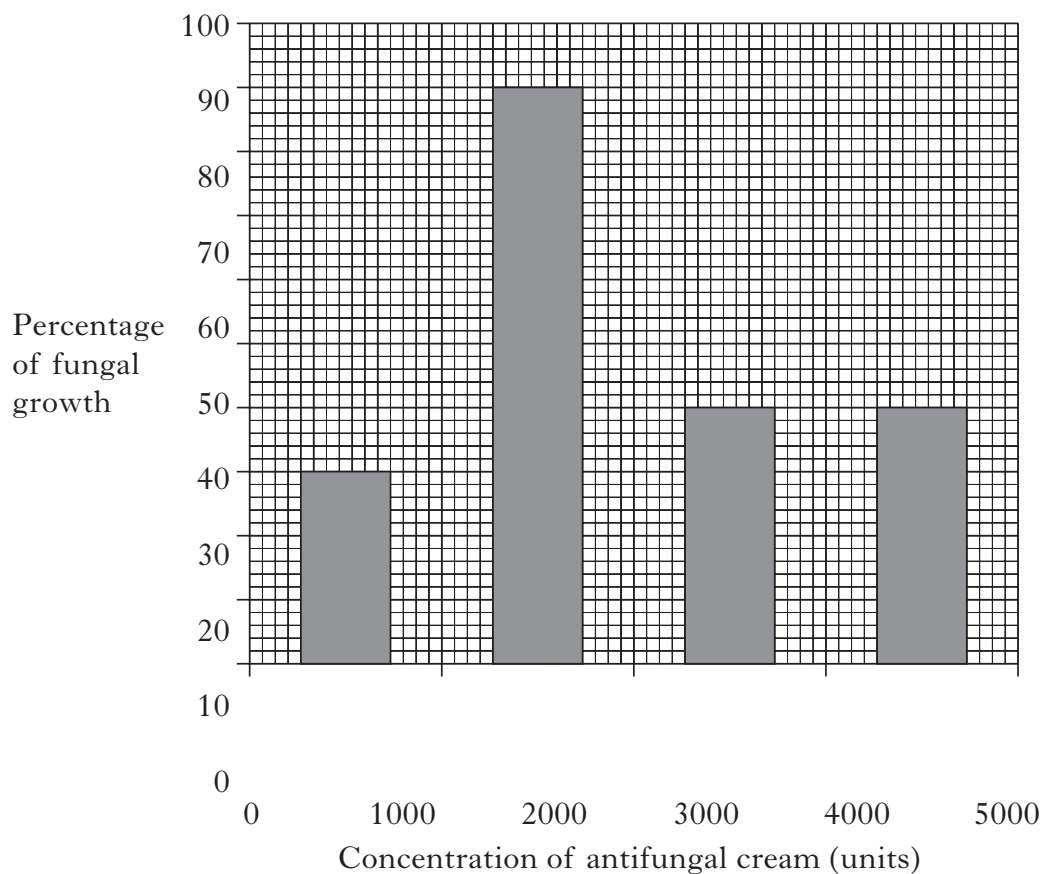
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Marks

7. An investigation was carried out into the effect of concentration of an antifungal cream on fungal growth.

The results are shown in the graph below.



- (a) What was the percentage of fungal growth at an antifungal concentration of 3000 units?

_____ % **1**

- (b) State the concentration of antifungal cream which would be used as a control in this investigation.

_____ units **1**

- (c) State **one** conclusion from these results.

_____ **1**



Marks

8. (a) The table below shows the percentage of four substances found in a type of milk.

<i>Substance</i>	<i>Percentage (%)</i>
fat	3.7
protein	3.3
milk sugar	4.9
minerals	0.7

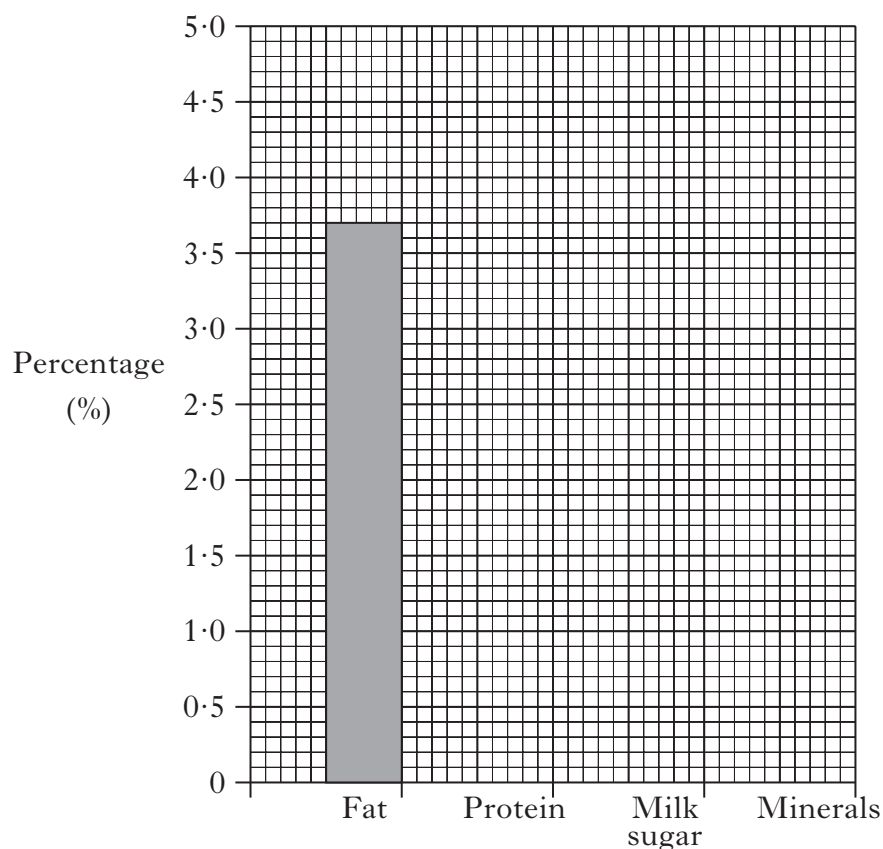
- (i) On the grid below, complete the bar graph by:

- 1 completing the label on the horizontal axis;
- 2 plotting the remaining bars.

1

1

(Additional graph paper, if required, will be found on *Page thirty-one*.)



* X 0 0 7 1 0 0 2 2 3 *

Marks

8. (a) (continued)

- (ii) Milk is made up of the four substances listed in the table and water.

Calculate the percentage of water in this type of milk.

Space for calculation

_____ % **1**

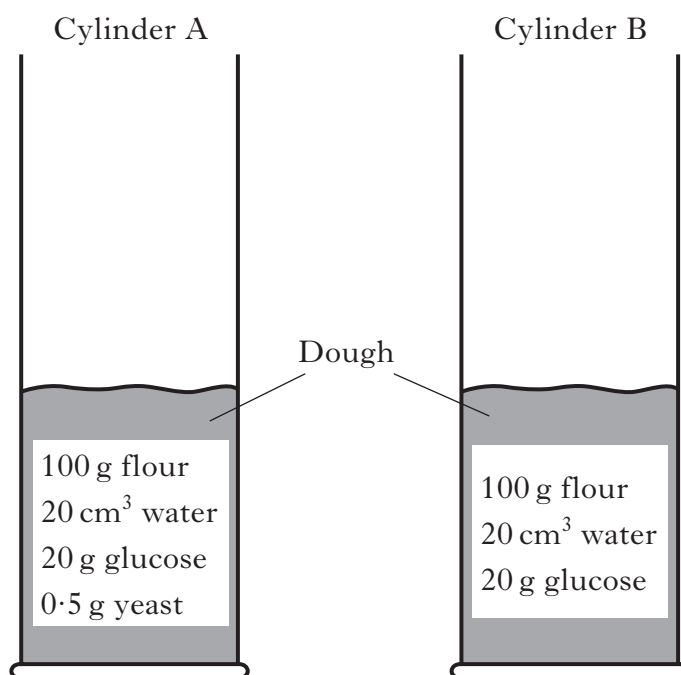
- (b) Name the test carried out on milk samples to ensure that the milk is fit for human consumption.

_____ **1**



Marks

9. Two cylinders were set up to investigate the rising of dough, as shown in the diagram below.



After two hours at 20 °C, the change in height of the dough was measured.

- (a) In which cylinder would there be the greater increase in height of the dough? Explain your answer.

Cylinder _____

Explanation _____

1

- (b) Describe how the **reliability** of this investigation could be improved.

1

- (c) Name the gas produced which makes dough rise.

1



* X 0 0 7 1 0 0 2 2 5 *

10. (a) Read the following passage carefully.

Garden favourite faces fatal threat from mildew



One of Britain's most popular plants is in danger of being wiped out by a new disease. The busy lizzie, a favourite for hanging baskets, is under threat from a new type of fungal disease called downy mildew.

Downy mildew appears as a white powder on the underside of leaves, causing them to turn yellow and then fall off. Amateur gardeners across Britain are seeing their infected plants reduced to bare stems and dying.

This fungal disease was first identified in Britain in 2003 and is thought to have arrived from cuttings imported from abroad.

Until now, its spread has been controlled by commercial growers spraying the plants with fungicide. There are, however, no fungicides available to amateur gardeners for control of the disease. Gardeners are being urged to keep an eye out for the disease. They should destroy any infected plants to stop downy mildew spreading.

Use the information **in the passage** to answer the following questions.

- (i) What effect does downy mildew have on the leaves of busy lizzie plants?

1

- (ii) How is downy mildew thought to have first arrived in Britain?

1



Marks

10. (continued)

(b) Busy lizzies can also be affected by aphids.

Describe **one** method of controlling these pests.

1

[Turn over

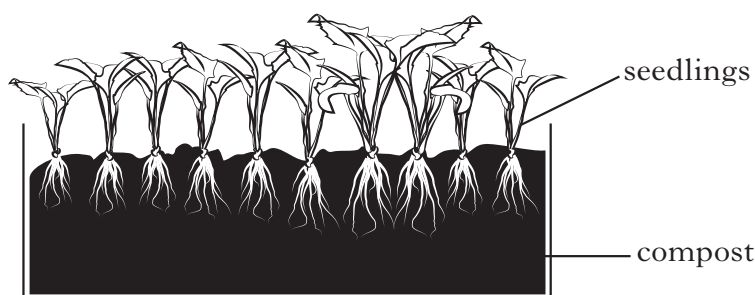


11. (a) An investigation was carried out to compare the effect of temperature on root growth.

Ten seedlings were grown in compost at five different temperatures over a period of 28 days.

Root lengths were measured on the first and last day.

The average root length at each temperature was calculated.



The results are shown below.

<i>Temperature</i> (°C)	<i>Average root length (mm)</i>		<i>Change in average root length (mm)</i>
	<i>First day</i>	<i>Last day</i>	
10	3	11	8
15	3	13	10
20	3		14
25	3	26	23
30	3	15	12

- (i) Complete the table above by calculating the average root length on the last day for seedlings grown at 20 °C.

Space for calculation

11. (a) (continued)

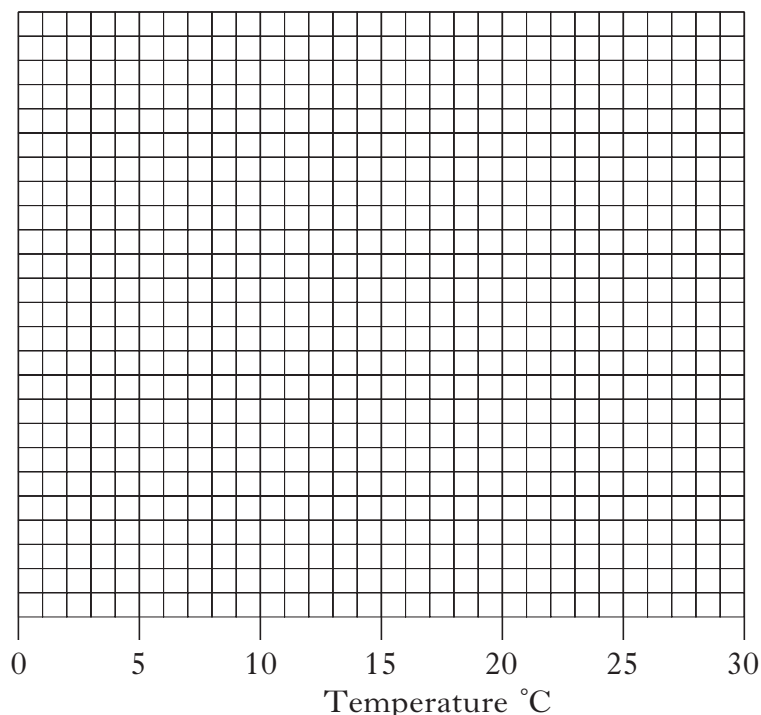
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- (ii) On the grid below, complete the **line graph** to show the change in average root length by:

- | | | |
|---|---|---|
| 1 | providing a label for the vertical axis; | 1 |
| 2 | putting a scale on the vertical axis; | 1 |
| 3 | plotting the change in average root length. | 1 |

(Additional graph paper, if required, will be found on Page thirty-two.)



- (iii) From these results, which was the best temperature for root growth?

_____ °C 1

- (iv) Identify **two** variables, not already mentioned, which should be kept the same when setting up this investigation.

Variable 1 _____

Variable 2 _____ 2

- (b) Name the part of a seed which grows into a new plant.

_____ 1

[Turn over for Question 12 on Page thirty



Marks

12. (a) The grid below contains words to describe seeds and their growth.

chitted	large	dormant
germinating	pre-germinated	fine

Use words from the grid to identify seeds from the following descriptions:

- (i) Seeds mixed with silver sand before sowing.

_____ 1

- (ii) Seeds in which the growth has been delayed.

_____ 1

- (b) **Underline** one option in each set of brackets to make the sentence about pelleted seeds correct.

Pelleted seeds require $\left\{ \begin{array}{c} \text{more} \\ \text{less} \end{array} \right\}$ water than non-pelleted seeds
and take a $\left\{ \begin{array}{c} \text{longer} \\ \text{shorter} \end{array} \right\}$ time to germinate.

1

- (c) Some plants grow using different propagation structures.

Draw a line to connect each of the following plant propagation structures to the correct description.

One example has been completed.

Propagation Structure

Description

bulbs	horizontal stems with young plants growing at the ends
plantlets	food storage organs
offsets	small plants growing as side shoots from the base of large plants
runners	miniature plants attached to larger plants

2

[END OF QUESTION PAPER]

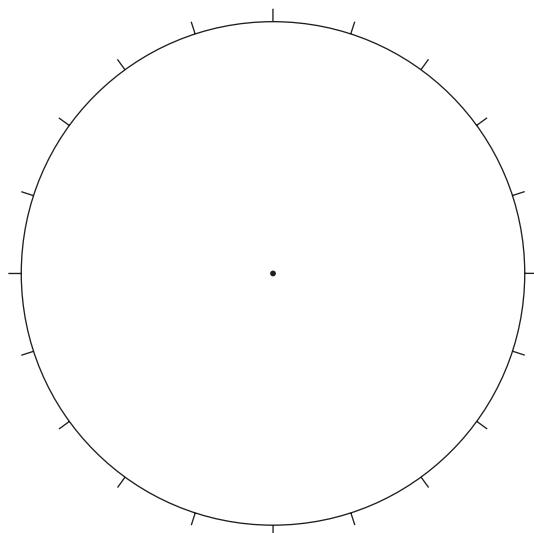


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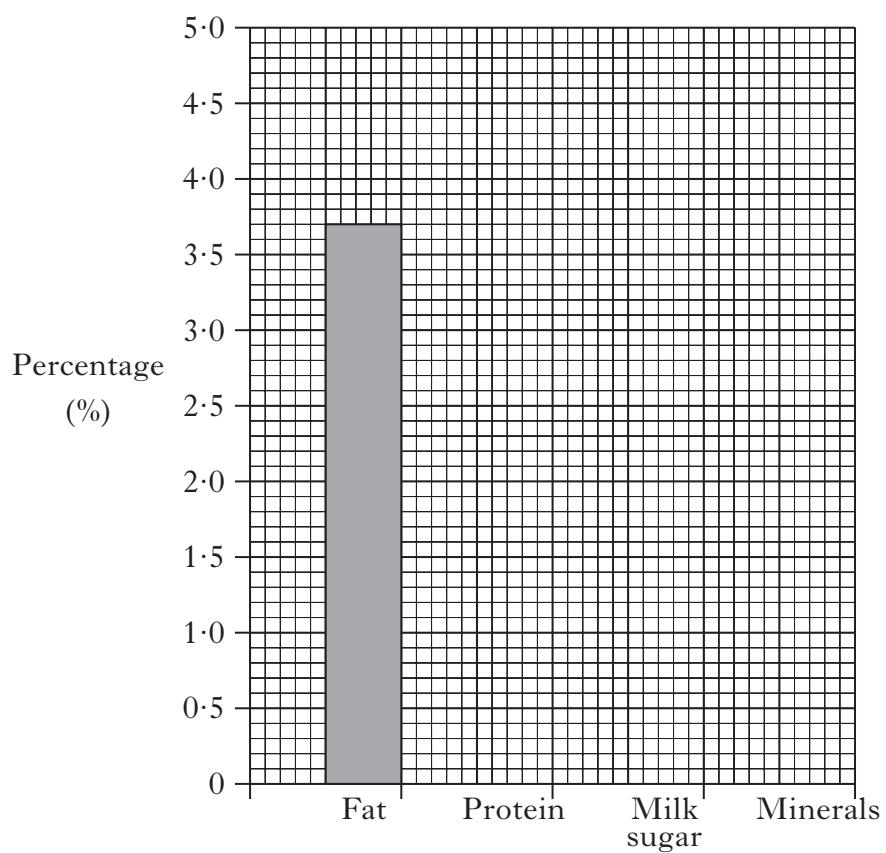
SPACE FOR ANSWERS

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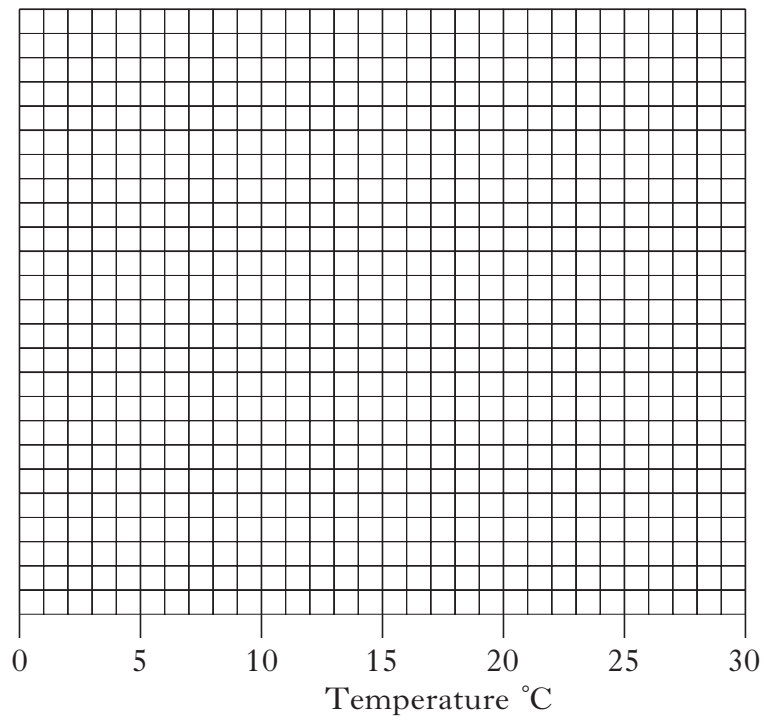
ADDITIONAL PIE CHART FOR QUESTION 2(a)(i)



ADDITIONAL GRAPH FOR QUESTION 8(a)(i)



ADDITIONAL GRAPH FOR QUESTION 11(a)(ii)



ADDITIONAL SPACE FOR ANSWERS

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ADDITIONAL SPACE FOR ANSWERS

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ACKNOWLEDGEMENTS

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