FOR OFFICIAL USE

Centre No.	Subject No.	Level	Paper No.	Group No.	Marker's No.

Total

[C007/SQP041]

Intermediate 1 Biology
Specimen Question Paper

Time: 1 hour 30 minutes

NATIONAL QUALIFICATIONS

Fill in these boxes and read what is printed below.

Full name of centre

Town

First name and initials

Surname

Date of birth
Day Month Year

Candidate number

Number of seat

SECTION A

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

SECTION B

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 and rough work 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.

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.

SCOTTISH QUALIFICATIONS AUTHORITY

Read carefully

1 Check that the answer sheet provided is for Intermediate 1 Biology (Section A).

2 Fill in the details required on the answer sheet.

3 In this paper a question is answered by indicating the choice A, B, C or D by a stroke made in **ink** in the appropriate place in the answer sheet—see the sample question below.

4 For each question there is only **one** correct answer.

5 Rough working, if required, should be done only on this question paper—or on the rough working sheet provided—**not** on the answer sheet.

6 At the end of the examination the answer sheet for Section A **must not** be placed inside the answer book, but should be handed separately to the invigilator.

Sample Question

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

A Bread

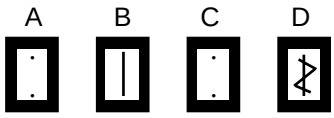
B Butter

C Sugar

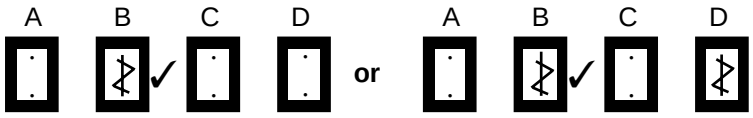
D Apple

The correct answer is **B**—butter. A **heavy** vertical line should be drawn joining the two dots in the appropriate box in the column headed **B** as shown in the example on the answer sheet.

If, after you have recorded your answer, you decide that you have made an error and wish to make a change, you should cancel the original answer and put a vertical stroke in the box you now consider to be correct. Thus, if you want to change an answer D to an answer B, your answer sheet would look like this:



If you want to change back to an answer which has already been scored out, you should enter a tick (✓) to the **right** of the box of your choice, thus:

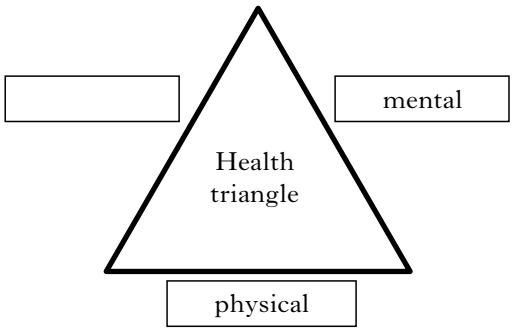


SECTION A

All questions in this Section should be attempted.

Answers should be given on the separate answer sheet provided.

1. This health triangle shows two important aspects of good health.



Which of the following would complete the triangle?

A Technical

B Stamina

C Social

D Intelligence

2. Most adults have a pulse rate in the range

A 55–64 beats/minute

B 65–74 beats/minute

C 75–84 beats/minute

D 85–94 beats/minute.

Questions 3 and 4 refer to the grid below.

The grid contains the names of parts of the circulatory system.

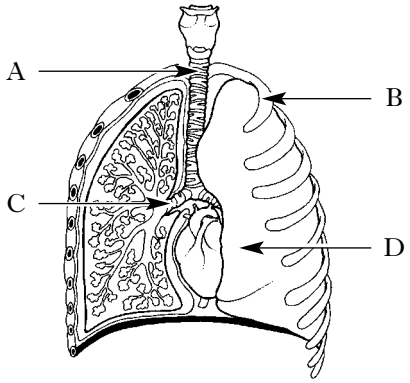
A vein	B heart
C capillary	D artery

Which part matches each of the following descriptions?

3. Blood vessel from which oxygen passes into the tissues.

4. Blood vessel which carries blood towards the heart.

Questions 5 and 6 refer to the diagram of the human breathing system.



5. Which letter points to the windpipe?

6. Which letter points to a bronchus?

Questions 7 and 8 refer to the information below.

The following are steps taken in an investigation to compare the fitness level of two students.

1 Both run on the spot for 3 minutes.

2 The time taken for the pulse rate to return to normal is recorded.

3 Resting pulse rate is measured and recorded.

4 Pulse rate is measured immediately after exercise.

7. Which of the following shows the steps in the correct order?

A $4 \rightarrow 3 \rightarrow 2 \rightarrow 1$

B $3 \rightarrow 1 \rightarrow 4 \rightarrow 2$

C $1 \rightarrow 2 \rightarrow 3 \rightarrow 4$

D $3 \rightarrow 2 \rightarrow 1 \rightarrow 4$

8. Each student carries out the same three minute standard exercise.

Why is this important?

A To make each person equally tired.

B To allow a valid comparison of fitness.

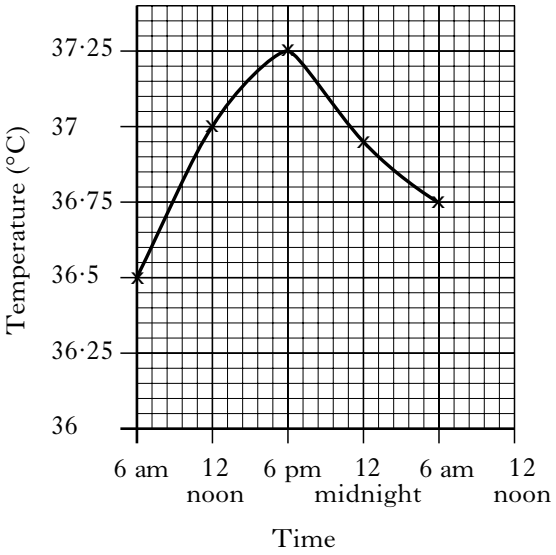
C To make each pulse rate increase at the same rate.

D To stop them having a heart attack.

Questions 9 and 10 refer to the line graph below.

A person's temperature was recorded every six hours over a 24 hour period.

The results are shown in the graph below.



9. The highest recorded temperature was

A 37·25 °C

B 37·3 °C

C 37·35 °C

D 37·5 °C.

10. The rise in temperature from 6 am to 6 pm was

A 0·25 °C

B 0·5 °C

C 0·75 °C

D 1 °C.

11. During cheese making, the liquid left after the clotted protein is removed is called

A whey

B skimmed milk

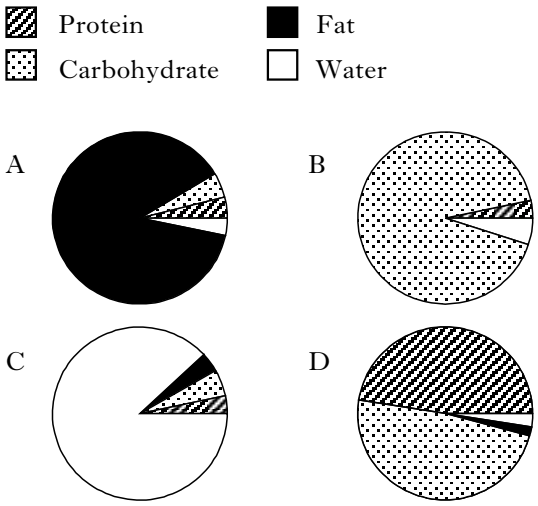
C yoghurt

D rennet.

12. The table below shows the contents of pasteurised milk.

Component	*Pasteurised milk (%)*
protein	3·4
carbohydrate	4·8
fat	3·8
water	88·0

Which pie chart shows this data correctly?



13. What is the most likely outcome of adding large volumes of waste yeast to a river?

A The population of bacteria will decrease.

B Many fish will die due to lack of oxygen.

C The temperature of the river will fall.

D The oxygen content of the river will rise.

14. Biological detergents contain

A antibiotics

B enzymes

C bacteria

D yeast.

15. The table below shows types of micro-organisms and products useful to people.

Which of the following shows the micro-organism correctly matched to its product?

	Micro-organism	*Product*
A	fungus	rennet to clot milk
B	bacteria	enzyme for detergents
C	yeast	antibiotic to treat an infection
D	virus	gas to raise bread dough

16. Antibiotics can only be used to cure a disease caused by a

A virus

B fungus

C yeast

D bacterium.

17. The resazurin test is carried out on milk to detect

A bacteria

B fungi

C protein

D sugar.

18. An investigation was carried out to find out how long it takes a sample of rennet to curdle milk. The investigation was repeated five times and the times taken for the milk to curdle are recorded in the table below.

Procedure number	*Time taken for clots to form (seconds)*
1	37
2	24
3	44
4	31
5	29
Average time (seconds)	

The average time for clotting to occur was

A 33 seconds

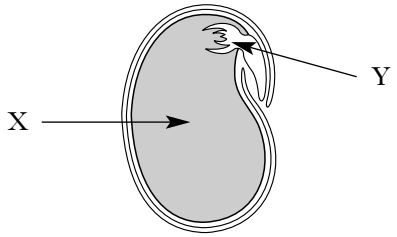
B 35 seconds

C 165 seconds

D 175 seconds.

Questions 19 and 20 refer to the diagram below.

The diagram shows a section through a bean seed.



19. The part labelled X is the

A bulb

B food store

C seed coat

D tuber.

20. The function of part Y is

A to store food

B to make food

C to grow into a new plant

D to protect the seed.

21. The best way to sow very small seeds is to

A plant at least 1cm below the soil surface

B soak overnight before sowing

C place in a freezer for 20 days before sowing

D mix with silver sand before sowing.

22. Which of the following would discourage the growth of grey mould on plants?

A Opening windows to improve ventilation

B Increasing watering

C Increasing the temperature

D Covering with floating fleece

23. The table below shows the cost of heating a greenhouse at a minimum temperature of 7 °C in different parts of Britain.

Energy source	*Annual Cost*		
	Scotland (£)	*Midlands* (£)	*Cornwall* (£)
electricity (full rate)	24	24	17
electricity (white meter)	15	15	10
paraffin	53	55	32
propane gas	23	24	14

Which energy source is the cheapest in all three parts of Britain?

A Electricity (full rate)

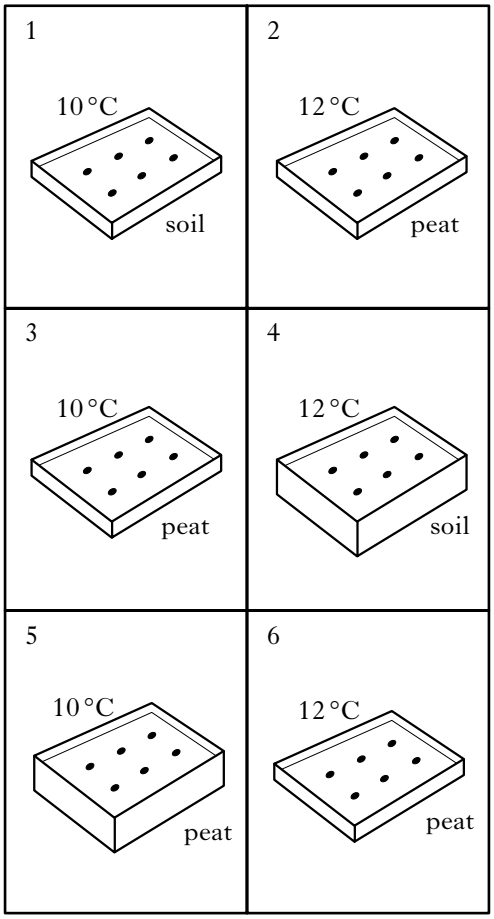
B Electricity (white meter)

C Paraffin

D Propane gas

Questions 24 and 25 refer to the information below.

Six trays of seeds were set up as shown below to investigate the germination of seeds under different conditions.



24. The factor investigated in trays 1 and 3 is

A number of seeds

B type of seed

C depth of growing medium

D type of growing medium.

25. To investigate the effect of **temperature** on seed germination you would compare

A 1 and 2

B 4 and 6

C 2 and 3

D 1 and 6.

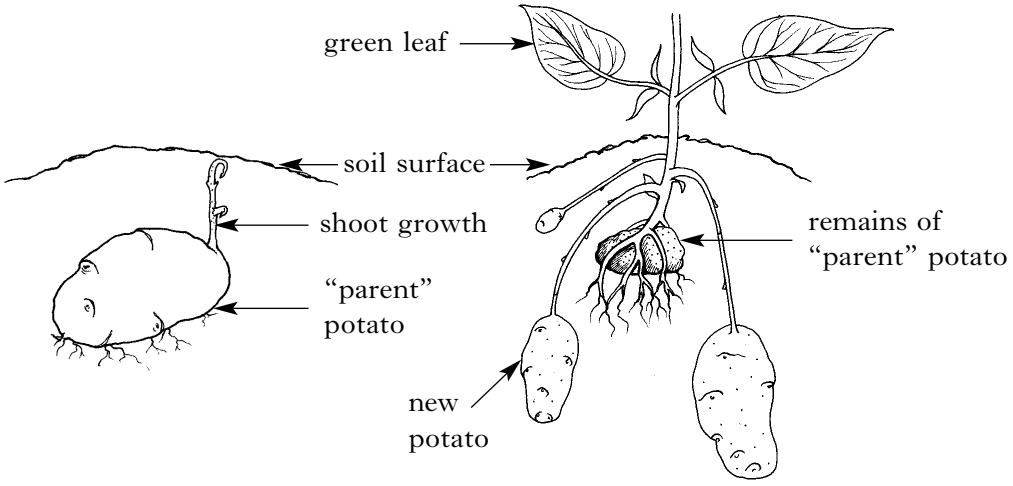
Candidates are reminded that the answer sheet MUST NOT be returned <u>inside</u> this answer book.

Marks

SECTION B

All questions in this Section should be attempted.

1. (*a*) The diagram below shows two stages in the growth of a potato plant.



Stage A—early spring **Stage B—mid summer**

(i) Name the food source used by the shoot for growth during stage A.

_____ **(1)**

(ii) During stage B, which part of the plant is making food?

_____ **(1)**

(iii) Underline the word or phrase in each set of brackets to make the sentence correct.

This method of reproduction is an example of { germination / vegetative propagation / artificial propagation }

and occurs by formation of { runners / tubers / offsets }. **(2)**

Marks

1. (continued)

(*b*) Trees can be grown from cuttings, nuts or seeds.
A student collected the appropriate parts from the trees named in the table below.

Name of tree	*Part of tree collected*	*Month when part collected*
Chestnut	Nuts	October
Aspen	Cuttings	January
Hazel	Nuts	August
White poplar	Cuttings	January
Ash	Winged seeds	August

(i) Name a tree which can be grown from winged seeds.

_____ **(1)**

(ii) Which tree can be grown from nuts collected in August?

_____ **(1)**

(*c*) (i) From the table, name **one** tree which can be propagated artificially.

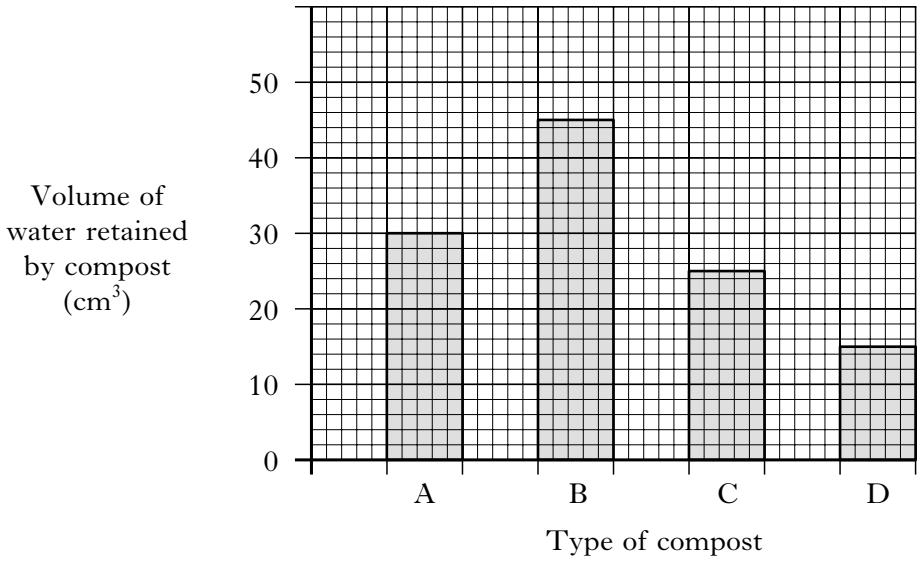
_____ **(1)**

(ii) Name **one** other method of artificial propagation, **not** shown in the table.

_____ **(1)**

Marks

2. (*a*) The bar graph below shows the volume of water retained by 100 g of different composts.



(i) What is the volume of water retained by compost A?

_____ cm^3 **(1)**

(ii) How much more water is retained by compost B than compost D?

_____ cm^3 **(1)**

(iii) Which compost would you use in a hanging basket which will be filled with summer-flowering plants?

Compost _____

Reason _____

_____ **(2)**

Marks

2. (continued)

(*b*) A loamless compost, which can be used for potting on, contains peat and sand in a ratio of 3:1.

Calculate the volume of peat which has to be mixed with 20 litres of sand to make the loamless compost.

Space for calculation

_____ litres **(1)**

(*c*) What would indicate that a plant needs potting on into a larger pot?

_____

_____ **(1)**

Do not write in this margin

Marks

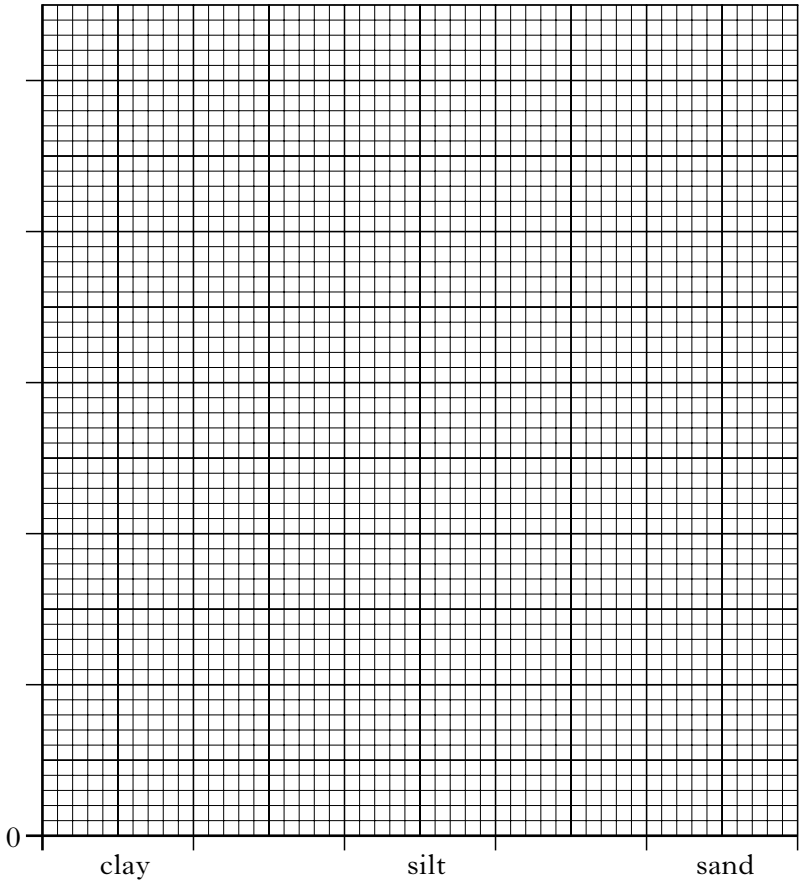
3. The table below shows the results of an investigation in which the percentages of three components in three soils were compared.

Soil	*Clay* *(%)*	*Silt* *(%)*	*Sand* *(%)*
A	50	10	40
B	25	25	50
C	15		55

(*a*) Complete the table by inserting the percentage of silt in soil C. **(1)**

(*b*) (i) Provide the axis label and scale on the bar chart below. **(1)**

(ii) Plot the results for soil A to complete the bar chart below. **(2)**
(Additional graph paper, if required, will be found on page 22.)



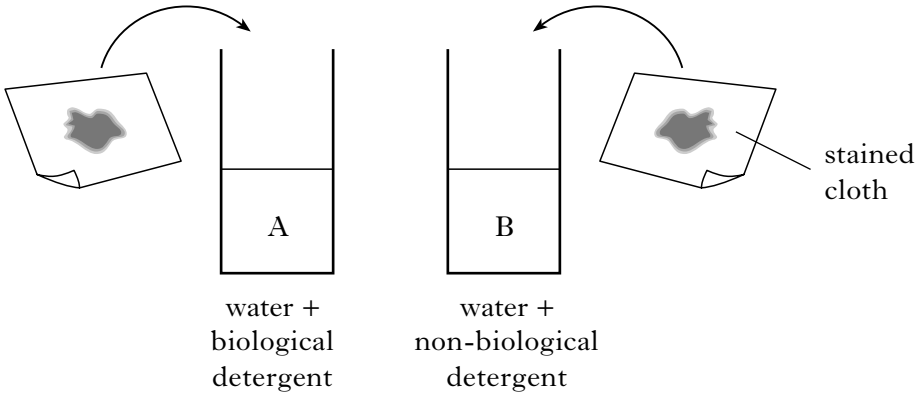
Parts of soil A

Do not write in this margin

Marks

4. (*a*) Students were asked to find out if biological or non-biological detergents were better at removing a curry stain from cloth.

The experimental set-up is shown below.



(i) State **one** variable which should be kept the same for the cloth.

_____ **(1)**

(ii) State **one** variable which should be kept constant for the detergent solution.

_____ **(1)**

(iii) Suggest how the students could have made their results more reliable.

_____ **(1)**

(*b*) The list below contains statements which refer to some benefits and problems of products made by biotechnology.

A Make food more attractive by adding flavour and colour
B Eventually stop working as bacteria become resistant
C Work at moderate temperatures so saves fuel and money
D Can interfere with sewage treatment
E Can be used to treat athlete's foot and thrush infections

(i) Which statements refer to biological detergents?

_____ and _____ **(1)**

(ii) Which statement refers to an antifungal chemical?

_____ **(1)**

Marks

5. (*a*) Yeast is used in bread making.

Name **two** other manufacturing processes that depend on the activities of yeast.

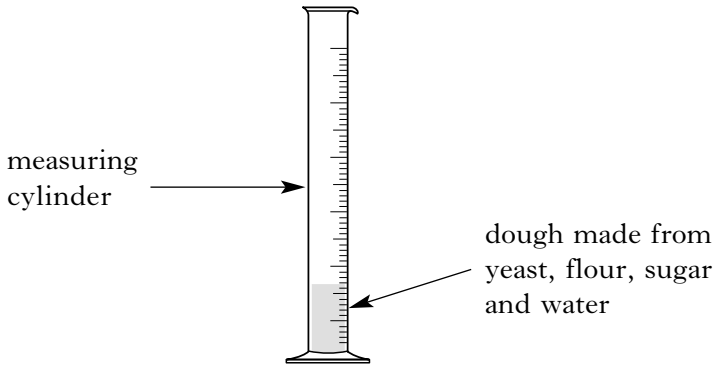
Manufacturing process 1 _____

Manufacturing process 2 _____ **(2)**

(*b*) An investigation into the effect of yeast on bread dough was carried out.

Dried yeast was mixed with flour, sugar and water to make a dough.

The dough was shaped to fit a measuring cylinder as shown in the diagram below.



The volume of dough was measured over a 40 minute period.

The results are shown in the table below.

Time (minutes)	0	10	20	30	40
Volume of dough (cm^3)	25	27	31	37	40

(i) During which 10 minute period was there the greatest increase in the volume of the dough?

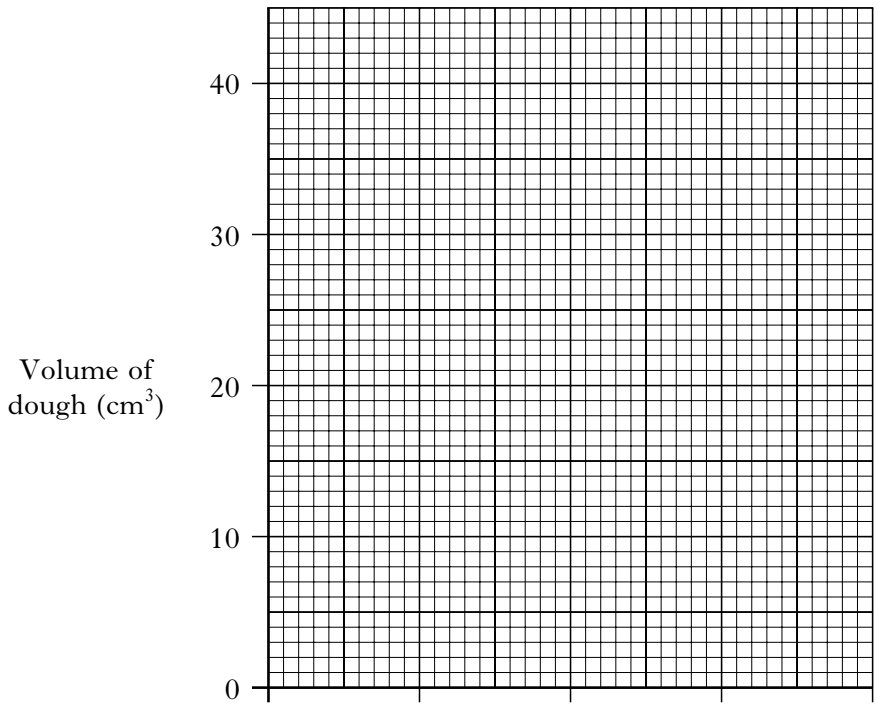
Between _____ and _____ minutes **(1)**

Marks

5. (*b*) (continued)

(ii) Provide the axis label and scale on the grid below. **(1)**

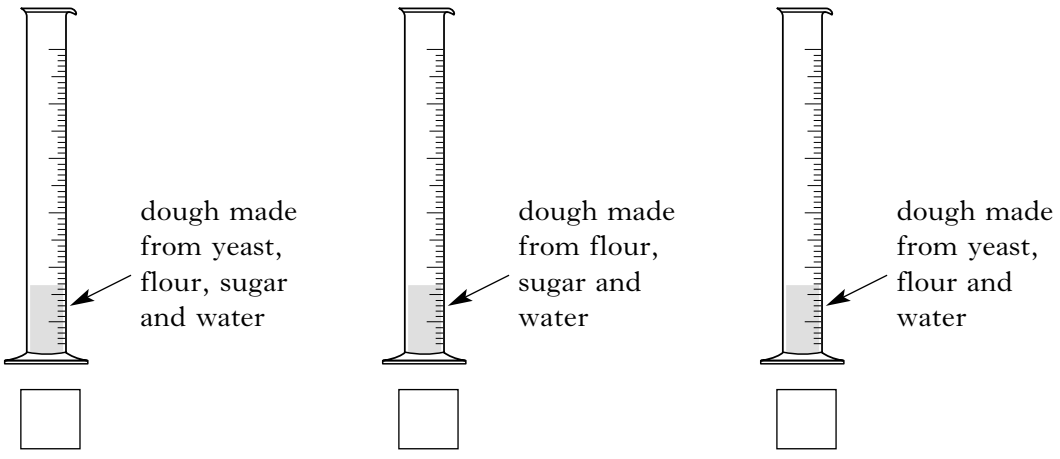
(iii) Use the results in the table to plot a line graph on the grid below.
(Additional graph paper, if required, will be found on page 22.) **(2)**



(iv) What is the effect of the yeast on the dough?

_____ **(1)**

(*c*) Which one of the following would be the best control to ensure that it was the yeast which had caused this effect, and no other factor? Tick (✓) the correct box.



(1)

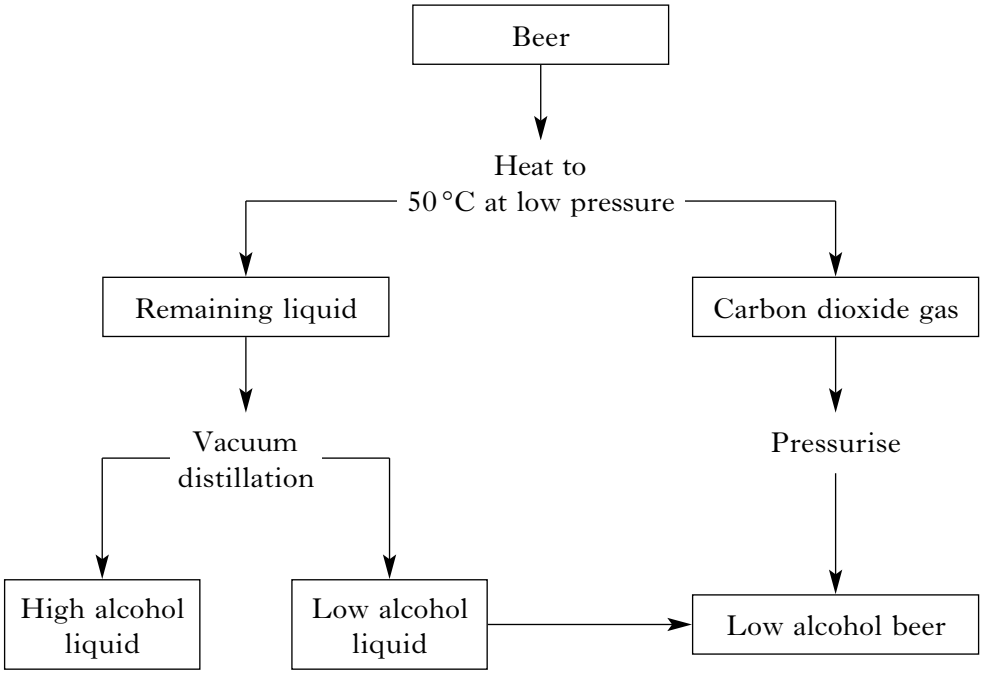
(*d*) Why was it good experimental practice to use a measuring cylinder rather than a beaker?

_____ **(1)**

Do not write in this margin

Marks

6. (*a*) This flow chart shows how low alcohol beer is made.



Use the flow chart to answer the following questions.

(i) What does the process of vacuum distillation do?

_____ **(1)**

(ii) Which **two** substances are combined to make low alcohol beer?

_____ and _____ **(1)**

(*b*) State **one** difference in the production of brewery conditioned beer and cask conditioned beer.

_____

_____ **(1)**

Marks

6. (continued)

(*c*) (i) The table below shows the effect of excitement and drinking alcohol on reaction time.

Use the symbols below to complete the table

↑ if the reaction time would be faster

↓ if the reaction time would be slower

↔ if the reaction time would not change

Factor	*Effect on reaction time*
Excitement	
Drinking 5 units of alcohol	

(2)

(ii) Name a different factor which can slow down reaction time.

_____

(1)

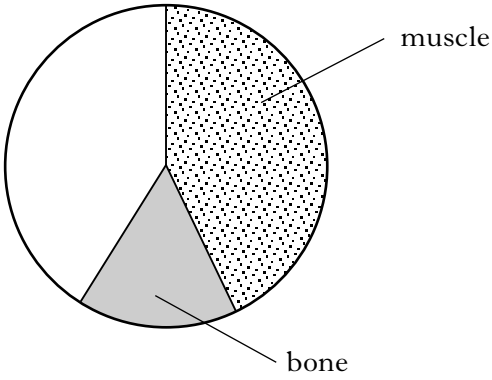
Marks

7. (*a*) The table below gives the percentage of different types of tissue found in the body of a typical male adult.

Body tissues	*Mass (%)*
muscle	45
bone	15
fat	15
other tissue	25

Part of this information is presented in the Pie Chart 1 below.

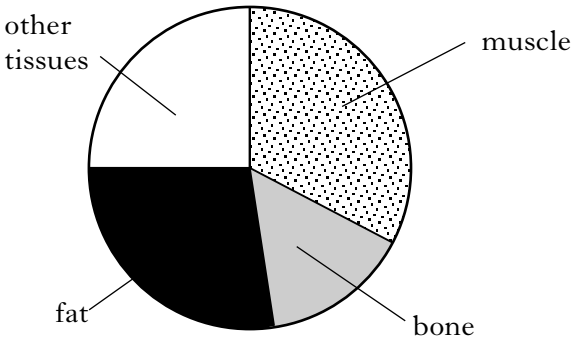
Pie chart 1
typical male adult



(i) Use information from the table to complete and label Pie Chart 1. **(2)**

(ii) Pie Chart 2 shows the percentages of the same tissues found in the body of a typical adult female.

Pie chart 2
typical female adult



Which adult contains more fat?

_____ **(1)**

Do not write in this margin

Marks

7. (continued)

(*b*) (i) A male student weighs 50 kilograms.
15% of his body tissue is fat.
Calculate how much of his body is fat.
Space for calculation

_____ kg **(1)**

(ii) What instrument would you use to measure the thickness of body fat?

_____ **(1)**

Marks

8. (*a*) The table below shows the results of a survey into smoking and pregnancy.

Smoking habit of mothers during pregnancy	*Average weight of babies at birth* (kg)
non-smoker	3·39
light smoker	3·20
heavy smoker	3·18

(i) Describe the relationship between smoking by mothers during pregnancy and the weight of their babies.

_____

_____ **(1)**

(ii) Why are the figures for non-smokers included?

_____

_____ **(1)**

(*b*) A second survey was carried out on mothers who had **given up** smoking before becoming pregnant.

The table below shows the average birth weight of their babies.

Smoking habit of mothers before giving up smoking	*Average weight of babies at birth* (kg)
light smoker	3·36
heavy smoker	3·35

(i) What is the effect of mothers giving up smoking on the birth weight of their babies?

_____ **(1)**

(ii) Name the chemical found in cigarette smoke, which reduces the ability of the blood to carry oxygen.

_____ **(1)**

Marks

9. The list below shows a number of blood tests.

List
Red cell count
White cell count
Blood glucose concentration
Presence of antibodies

Complete the table below to show the blood test used to detect each condition. The first one has been done for you.

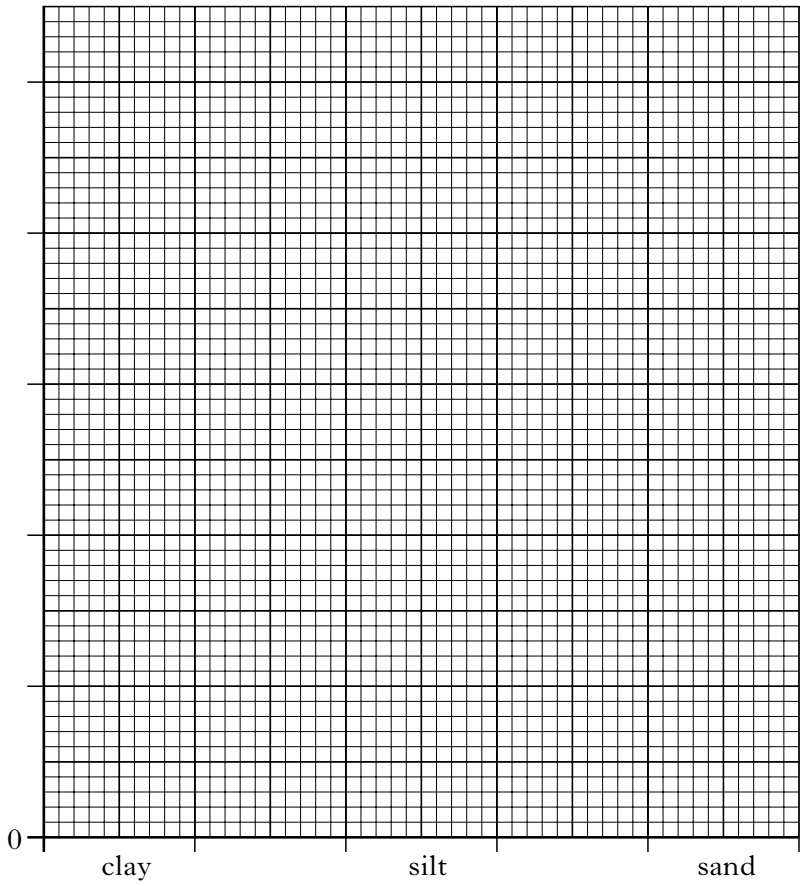
Condition	*Blood test*
Diabetes	Blood glucose concentration
Leukemia	
Anaemia	
Bacterial infection	

(3)

[*END OF QUESTION PAPER*]

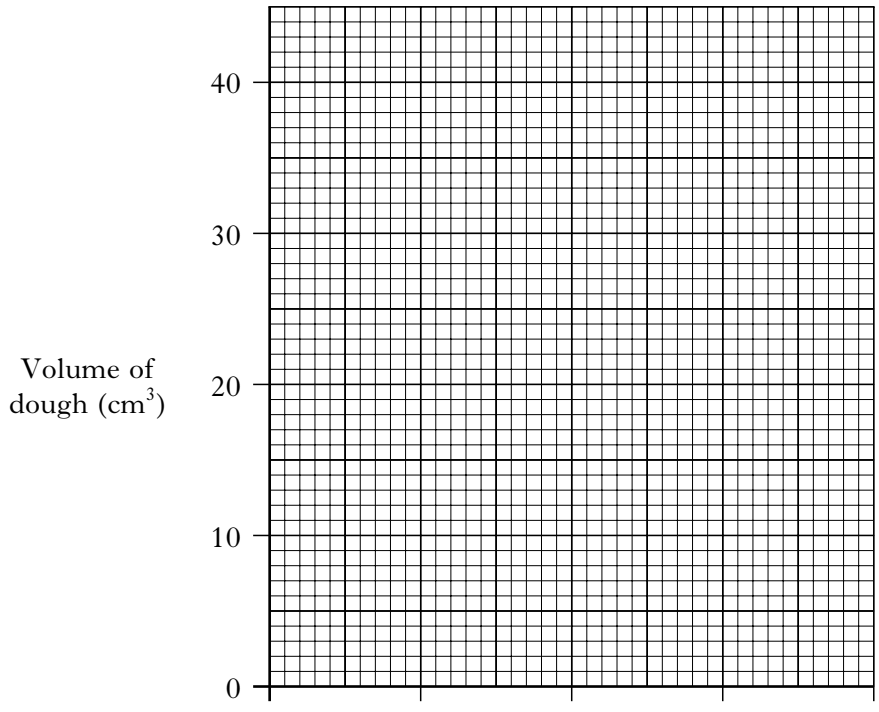
SPACE FOR ANSWERS

ADDITIONAL GRAPH FOR QUESTION 3(*b*)(ii)



Parts of soil A

ADDITIONAL GRAPH FOR QUESTION 5(*b*)(iii)



SPACE FOR ANSWERS

SPACE FOR ANSWERS

[C007/SQP041]

Intermediate 1 Biology

NATIONAL QUALIFICATIONS

Specimen Marking Instructions

SCOTTISH QUALIFICATIONS AUTHORITY

Intermediate 1
Biology Specimen paper

Mark Scheme

Section A

1.	C	2.	B	3.	C	4.	A	5.	A
6.	C	7.	B	8.	B	9.	A	10.	C
11.	A	12.	C	13.	B	14.	B	15.	B
16.	D	17.	A	18.	A	19.	B	20.	C
21.	D	22.	A	23.	B	24.	D	25.	C

Section B

1. (a) (i) Parent potato/starch

(ii) Green leaves

(iii) vegetative propagation tubers

(b) (i) Ash

(ii) Hazel

(c) (i) Aspen/White poplar

(ii) Layering

2. (a) (i) 30

(ii) 30

(iii) B
Because it holds most water.

(b) 60

(c) Roots are growing out of the bottom of the pot.

3. (a) 30

(b) (i) axis and label correct (1)

(ii) bars 3 correct 2 marks
2, 1 correct 1 mark

4. (a) (i) same material/type
same size/area
same thickness

(ii) same type of detergent
same concentration
same temperature

(iii) used several pieces of cloth
repeated the experiment several times

(b) (i) C and D

(ii) E

5. (a) beer/wine making
flavourings eg Marmite

(b) (i) 20 and 30 minutes

(ii) Label and scale correct 1 mark

(iii) all points plotted correctly 1 mark
points joined correctly 1 mark

(iv) It makes it rise/increase in volume

(c) ☐ ☑ ☐

(d) So that the change in volume could be measured more easily/accurately.

6. (a) (i) Separates the high alcohol liquid from the low alcohol liquid.

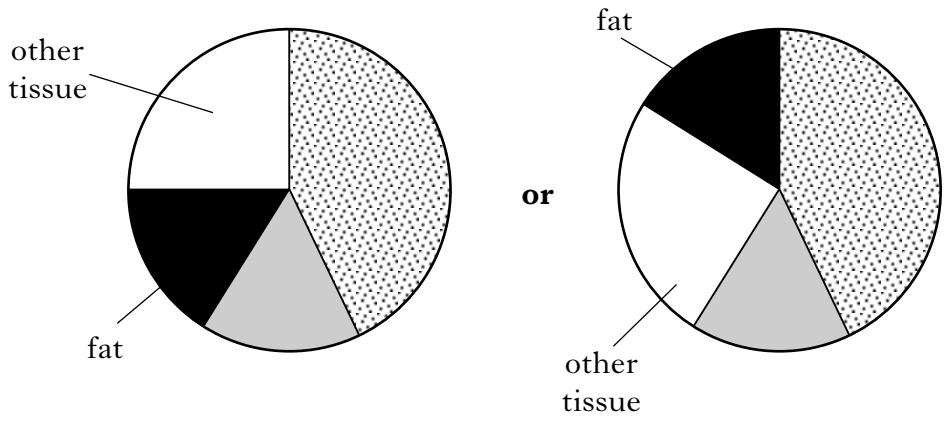
(ii) Low-alcohol liquid and carbon dioxide gas

(b) Brewery conditioned has had the yeast removed/cask conditioned contains yeast. Carbon dioxide in cask conditioned beer comes from fermentation/carbon dioxide is added to brewery conditioned beer.

(c) (i) ↑
↓

(ii) drugs/illness

7. (a) (i)



(ii) female

(b) (i) 7·5

(ii) fat callipers

8. (a) (i) The more the mothers smoke the lighter their babies/the less their babies weigh at birth.

(ii) As a control/so there is a comparison with mothers who smoke.

(b) (i) Their babies are heavier

(ii) carbon monoxide

9.

Diabetes	Blood glucose concentration
Leukemia	White cell count
Anaemia	Red cell count
Bacterial infection	Presence of antibodies

[*END OF MARKING INSTRUCTIONS*]