

**Tuesday 12 June 2012 – Morning**

**GCSE TWENTY FIRST CENTURY SCIENCE  
ADDITIONAL APPLIED SCIENCE A**

**A334/01** Agriculture and Food (Foundation Tier)

Candidates answer on the Question Paper.  
A calculator may be used for this paper.

**Duration:** 45 minutes

**OCR supplied materials:**  
None

**Other materials required:**

- Pencil
- Ruler (cm/mm)



Candidate forename		Candidate surname	
-----------------------	--	----------------------	--

Centre number						Candidate number				
---------------	--	--	--	--	--	------------------	--	--	--	--

**INSTRUCTIONS TO CANDIDATES**

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

**INFORMATION FOR CANDIDATES**

- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **36**.
- This document consists of **12** pages. Any blank pages are indicated.

Answer **all** the questions.

1 Gill makes some bread.

She uses these ingredients

- flour
- sugar
- water
- yeast.



(a) Which ingredient is ...

a microorganism? .....

food for the microorganism? .....

[1]

(b) Complete the sentences about bread making.

Choose from these words.

**absorbs    carbon dioxide    dies    nitrogen    oxygen    respire    waste**

The ingredients are mixed together to form dough.

The dough is left for a few hours.

The dough rises.

This is because the yeast .....

The name of the gas produced is .....

When the dough is baked, this gas leaves holes in the bread.

[2]

(c) The microorganism involved in bread making uses aerobic respiration.

Look at the four word equations.

**A** sugar  $\rightarrow$  carbon dioxide + alcohol

**B** sugar + carbon dioxide  $\rightarrow$  oxygen + alcohol

**C** sugar + water  $\rightarrow$  oxygen

**D** sugar + oxygen  $\rightarrow$  carbon dioxide + water

Which equation **A**, **B**, **C** or **D** shows aerobic respiration?

Give a reason for your answer.

equation .....

reason..... [2]

(d) Bread can be spoilt by the growth of other microorganisms.

(i) Name **one** type of microorganism that could spoil the bread.

..... [1]

(ii) Describe how microorganisms spoil food such as bread.

.....  
.....  
..... [2]

(iii) Gill wants to store the bread for a few weeks.

Which **one** of the following conditions should she use?

Put a tick (✓) in the box next to the **best** answer.

- chilled in a refrigerator
- in a warm room
- frozen in a deep freezer
- next to an open window
- on a damp surface

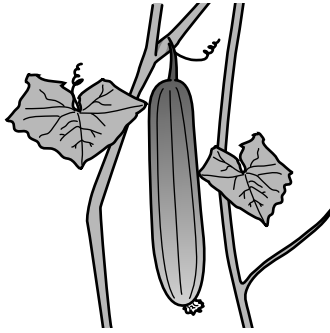
[1]

[Total: 9]

Turn over

2 Elsie grows cucumber plants in polytunnels.

She harvests the cucumbers.



(a) What type of farming is this?

Put a tick (✓) in the box next to the correct answer.

arable

dairy

poultry

horticulture

[1]

(b) Growing the cucumbers is the first stage in a chain of food production.

Look at this list of the stages in a chain of food production.

They are in the wrong order.

**A** transporting to factory

**B** storing

**C** processing

**D** growing

**E** delivering to shops

Use the letters **A**, **B**, **C**, **D** and **E** to put the stages in the correct order.

One stage has been done for you.

			<b>B</b>	
--	--	--	----------	--

[2]

(c) Enforcement officers, such as factory inspectors, monitor food production chains.

Why do they do this?

Put a tick (✓) in the box next to the correct answer.

To prevent ...

... the shop from charging too much for food.

... the farmer from charging too much for his crop.

... customers getting infected food.

... customers buying food they don't like.

[1]

(d) A cucumber is a fruit that contains seeds.

It develops from a flower on a cucumber plant.

Complete the sentences about the life cycle of cucumber plants.

Choose from these words.

**dispersal      fertilisation      germination      leaf      pollination      root**

The transfer of pollen from one flower to another is called .....

The fusion of the pollen nucleus and an egg nucleus is called.....

The process results in the formation of a seed. [2]

- (e) Elsie grows one type of cucumber plant.

Some were grown in a polytunnel **with** extra lighting.

Others were grown in a polytunnel **without** extra lighting.

She measures the length of a sample of cucumbers from each polytunnel.

length of cucumber <b>with</b> extra light in cm	length of cucumber <b>without</b> extra light in cm
40	38
42	36
41	37
41	37
43	36
39	38
average length = 41	

- (i) Calculate the average length of the cucumbers **without** extra light.

Show your working.

average length = ..... cm [2]

- (ii) The average length of the cucumbers grown with extra light is more than those grown without extra light.

Which process is affected by light to cause this increase?

Draw a **(ring)** around the correct answer.

**fertilisation**

**photosynthesis**

**pollination**

**respiration**

[1]

- (iii) Measuring the length of a cucumber is one way to determine yield.

Write down one **other way** to measure yield.

..... [1]

[Total: 10]

**BLANK PAGE**

**Question 3 begins on page 8**

**PLEASE DO NOT WRITE ON THIS PAGE**

## 3 Read the information about Angora goats.

**Are goats better than sheep?**

The Angora Goat Society is encouraging farmers to keep goats.

Mohair, which comes from Angora goats, is now worth £6 per kg, while sheep's wool is only worth £0.70 per kg. Each year an Angora goat will produce mohair worth £24, while a sheep will produce wool worth £1.40.

A goat's carcase (dead body) is worth less than a sheep's carcase. However, more people in the world eat goat meat than any other red meat.

Angora goats are more likely to suffer than sheep in areas of high rainfall because they have fine hair. However, they eat a larger variety of plants than sheep.



Use this information to answer the following questions.

- (a) What mass of mohair does one Angora goat produce each year?

mass = ..... kg

What mass of wool does one sheep produce each year?

mass = ..... kg [1]

- (b) (i) Some people keep Angora goats because their wool is more valuable than sheep's wool.

Suggest **two** other reasons for keeping Angora goats instead of sheep.

1 .....

2 ..... [2]

- (ii) Suggest **one** reason, apart from profit, for keeping sheep rather than Angora goats.

..... [1]

- (c) Write down **three** factors which could affect the growth of animals such as Angora goats and sheep.

1 .....

2 .....

3 ..... [3]



(d) The process of artificial insemination can be used with Angora goats.

(i) Describe the main stages in artificial insemination.

.....  
.....  
.....  
.....  
..... [3]

(ii) One advantage of artificial insemination is that the timing of the animal's birth can be controlled.

Explain why this is an advantage.

.....  
..... [1]

**[Total: 11]**

## 4 Read the information about nettle plants.

**Will it sting?**

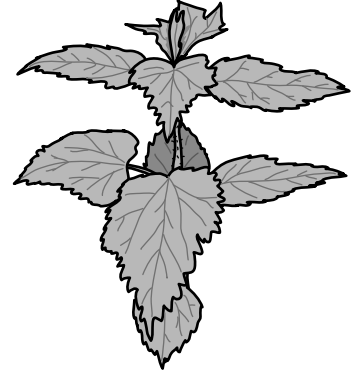
A company has developed a new fabric.

It is made of nettle fibres and wool. The fabric is used instead of polyester to make seat covers.

The company says that crude oil, which is used to make polyester fibres, will become more expensive as supplies run out. Crude oil is a non-renewable resource.

Nettles can be grown on poor land not suitable for food production. Nettles grow very quickly and are easy to harvest. Nettles provide a good habitat for a wide range of wildlife and don't need the use of pesticides or herbicides.

In the World Wars, both German and British soldiers wore uniforms made from plant material such as nettle fibres and cotton.



Use this information to answer the following questions.

(a) **Sustainability** is using resources in such a way that the resources will still be available for future generations.

Choose two ways in which growing nettle plants is an example of **sustainability**.

Put ticks (✓) in the boxes next to the **two** correct answers.

Nettle plants don't need pesticides or herbicides.

Nettle plants are easy to harvest.

Nettle fibres can be mixed with wool.

Nettle fibres can replace polyester fibres.

Nettle plants can sting.

[2]

(b) The company mixes nettle fibres with wool.

Name a plant material that can be mixed with nettle fibres.

..... [1]

(c) Apart from supplying fibres, what makes nettles a good crop for farmers?

.....  
.....  
..... [2]

(d) The company hopes to get a **quality mark** for its new fabric.

Why is this important to the company?

..... [1]

[Total: 6]

**END OF QUESTION PAPER**

**PLEASE DO NOT WRITE ON THIS PAGE**



**Copyright Information**

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website ([www.ocr.org.uk](http://www.ocr.org.uk)) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact the Copyright Team, First Floor, 9 Hills Road, Cambridge CB2 1GE.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.