

Candidate forename						Candidate surname					
Centre number						Candidate number					

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**  
**GCSE**

**A334/01**

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

**Agriculture and Food (Foundation Tier)**

**TUESDAY 12 JUNE 2012: Morning**

**DURATION: 45 minutes**

**plus your additional time allowance**

**MODIFIED ENLARGED**

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

**OCR SUPPLIED MATERIALS:**

**None**

**OTHER MATERIALS REQUIRED:**

**Pencil**

**Ruler (cm/mm)**

**READ INSTRUCTIONS OVERLEAF**

## **INSTRUCTIONS TO CANDIDATES**

- **Write your name, centre number and candidate number in the boxes on the first page. 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).**

## **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.**

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**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**

**respires**

**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 +  $\begin{matrix} \text{carbon} \\ \text{dioxide} \end{matrix} \rightarrow$  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**

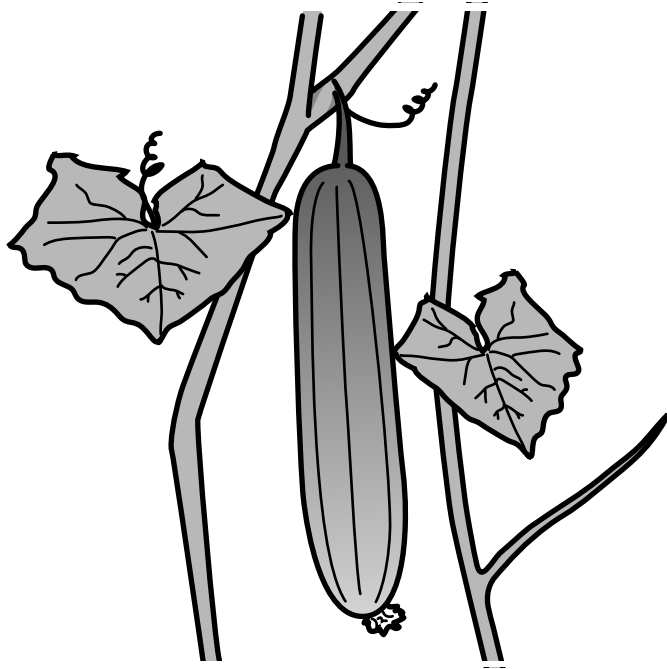
☐

**[1]**

**[Total: 9]**

**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.**

**[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.**

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

- (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]

### **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 carcass (dead body) is worth less than a sheep's carcass. 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.**

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**[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.**

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**[1]**

**[Total: 11]**



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#### **4 Read the information about nettle plants.**

##### **WILL IT STING?**

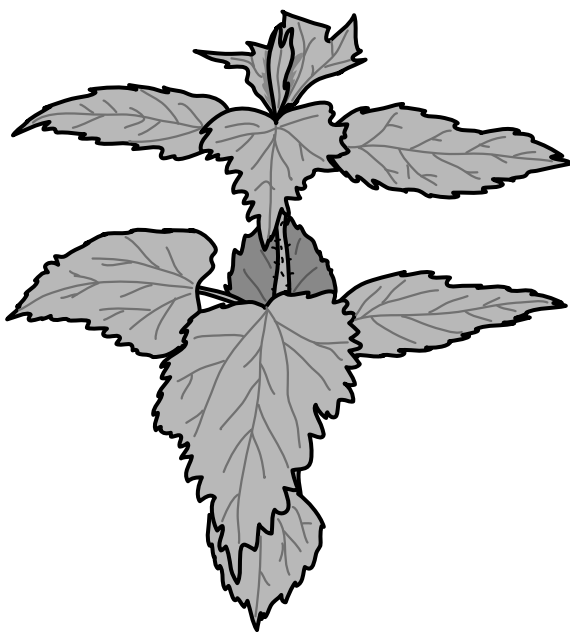
**A company has developed a new fabric.**

**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**

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