

GENERAL CERTIFICATE OF SECONDARY EDUCATION

TWENTY FIRST CENTURY SCIENCE

A334/01

ADDITIONAL APPLIED SCIENCE A

Unit 2: Agriculture and Food (Foundation Tier)

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

OCR Supplied Materials:
None

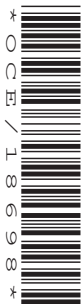
Other Materials Required:

- Pencil
- Ruler (cm/mm)

Wednesday 9 June 2010

Afternoon

Duration: 45 minutes



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- 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**.
- This document consists of **12** pages. Any blank pages are indicated.

Answer **all** the questions.

1 Charlotte grows strawberry plants.

She picks the strawberries from the plants.

This is called a **gathered harvest**.



(a) What is meant by a **gathered harvest**?

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

machines are used to gather the harvest

only the fruits are harvested

the whole plant is harvested

[1]

(b) (i) What would be the best way of finding the strawberry crop **yield**?

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

counting the strawberries

looking at the crop

measuring the size of each strawberry

weighing the strawberries

[1]

(ii) Which of these four methods is a **qualitative** method?

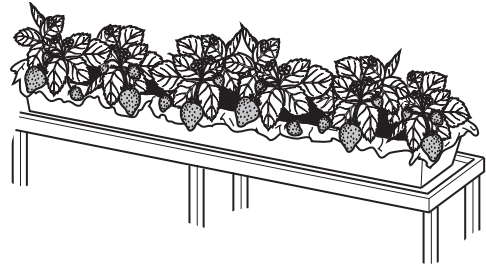
..... [1]

- (c) Charlotte grows the strawberries in a different way.

The strawberry plants are grown in plastic bags.

The plastic bags are placed on a framework above the ground.

The soil in the plastic bags is watered automatically.



This new system of growing strawberry plants produces a better crop.

Suggest **two** reasons why.

- 1
- 2 [2]

- (d) The chain of food production for making strawberry jam includes a number of stages.

The stages are given in the list below. They are in the wrong order.

- A** process
- B** plant
- C** grow
- D** transport to factory
- E** deliver to shops

Put the stages **A, B, C, D** and **E** in the correct order.

The first one has been done for you.

B				
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[2]

- (e) Charlotte finds out that many strawberries are spoilt after a few days.

- (i) Which **type** of microorganism is most likely to cause this damage?

..... [1]

- (ii) Suggest **two** ways that fresh strawberries could be stored to reduce this damage.

.....

 [2]

[Total: 10]

Turn over

2 Ben works in a research laboratory.

He uses microorganisms.

(a) Ben can use different methods to measure the population growth of microorganisms.

Draw a straight line from each **method** to its correct **description**.

method	description
colony counts	how cloudy the liquid is
turbidity	total mass of organisms
biomass	number of bacterial colonies growing on agar

[2]

(b) (i) The microorganisms are grown using aseptic techniques.

What is meant by **aseptic**?

..... [1]

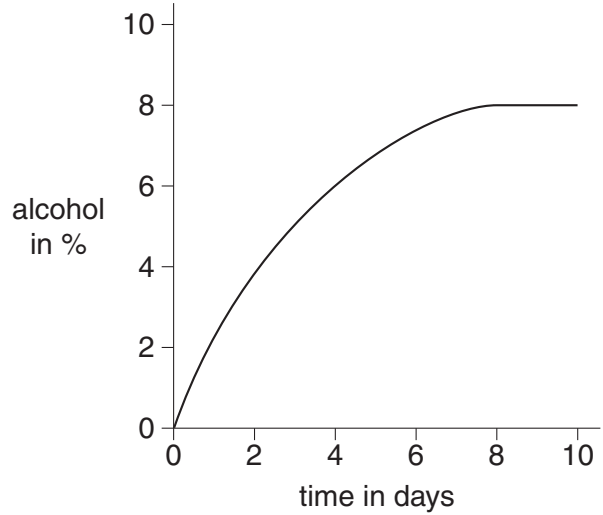
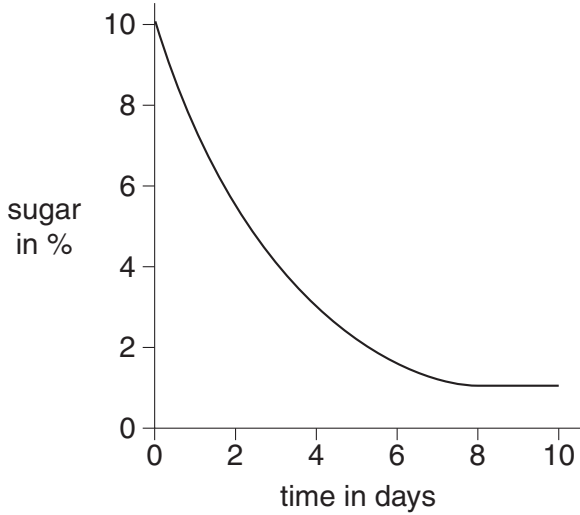
(ii) Why must Ben be very careful when using microorganisms?

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

(c) Ben uses yeast to ferment sugar. Alcohol is produced.

He measures the amount of sugar and alcohol over 10 days.

The graphs show his results.



(i) State what happens to the amount of sugar

from 0 to 8 days

from 8 to 10 days. [2]

(ii) Suggest why the level of alcohol does not increase after 8 days.

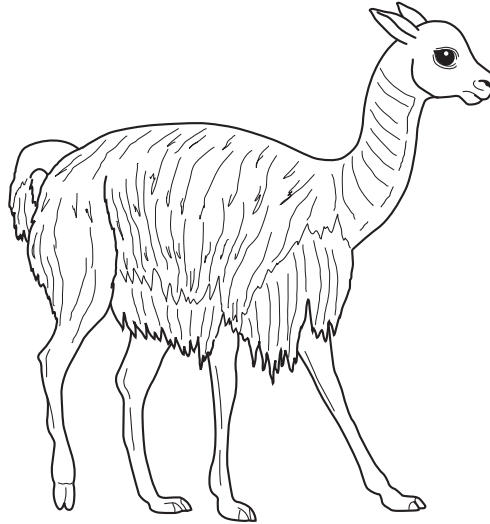
..... [1]

[Total: 7]

3 Vicunas live in the mountains of South America.

In 1960 there were very few vicunas left in the wild.

Vicuna wool produces light but warm clothing.



(a) Suggest **one** useful **non-woollen** product from vicunas.

..... [1]

(b) A special technique is used to increase the numbers of vicunas.

Put a tick (✓) in the box next to this technique.

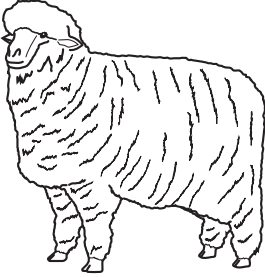
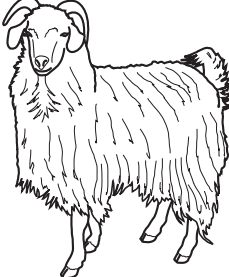
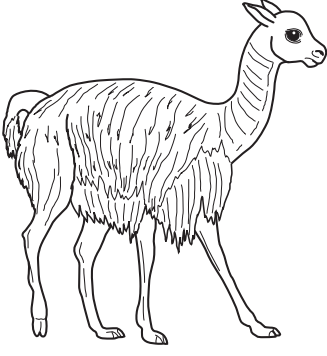
- artificial insemination
- batch culture
- organic farming
- tissue culture

[1]

(c) Suggest **three** factors that could affect the growth of a vicuna.

- 1
- 2
- 3 [2]

(d) Look at the information about three different types of wool.

	merino sheep wool	cashmere goat wool	vicuna wool
			
how often wool is collected	every year	every year	every 2 years
amount of wool from one animal in grams	6800	190	190

(i) Which type of wool shows the **lowest** yield per year?

Explain your answer.

.....
 [2]

(ii) A sweater made from vicuna wool fibres costs about £2600.

Suggest reasons why a sweater made from vicuna wool is very expensive.

.....

 [2]

[Total: 8]

4 Many types of product can be made from plants.

(a) Draw a straight line from each **type of product** to an **example** of the product.

type of product	example
fuel	biodiesel
food for farm animals	flour
food ingredient	silage
fibre	linen

[3]

(b) Complete the sentences about the life cycle of a flowering plant.

Choose from the following words.

dispersal fertilisation germination leaf pollination root seed

Many plants have colourful flowers.

The transfer of pollen from one flower to another is called

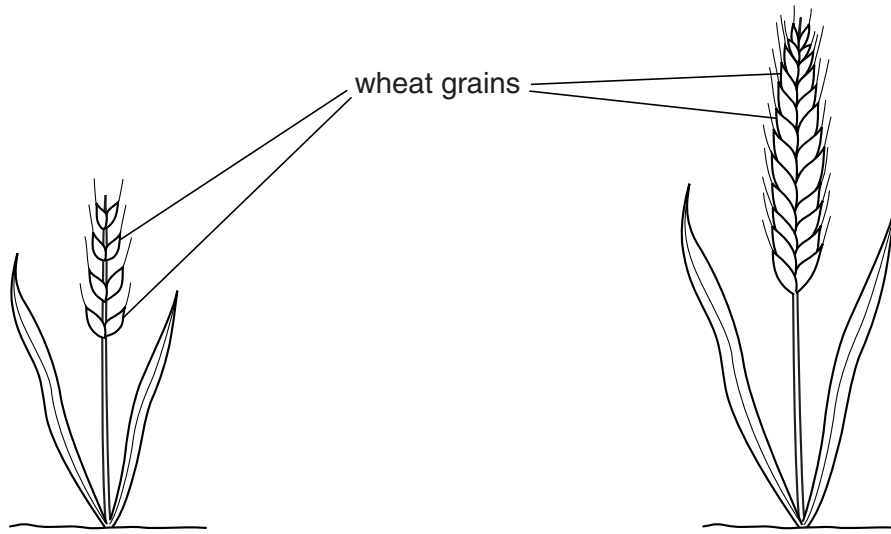
The fusion of a pollen nucleus and an egg cell nucleus is called

This process results in the formation of a

[3]

(c) Wheat plants produce wheat grains which can be ground to make flour.

Wheat plants grown now are very different from those grown hundreds of years ago.



wheat plant hundreds of years ago

wheat plant grown today

(i) Write down **two** reasons why more flour is produced from a plant grown today.

1

2 [1]

(ii) Modern wheat plants have been developed over many generations.

Which technique has been used?

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

artificial insemination

batch culture

organic farming

selective breeding

[1]

(d) Wheat grains can be ground to make flour.

Flour is used to make bread.

Some bread is made using yeast.

Yeast uses both **aerobic** and **anaerobic** respiration.

(i) Look at the four word equations.

A sugar → carbon dioxide + alcohol

B sugar + carbon dioxide → oxygen + alcohol

C sugar + water → oxygen

D sugar + oxygen → carbon dioxide + water

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

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

[2]

(ii) Explain why bread rises when yeast is added.

..... [1]

[Total: 11]

END OF QUESTION PAPER

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