

**GENERAL CERTIFICATE OF SECONDARY EDUCATION**

**TWENTY FIRST CENTURY SCIENCE**

**ADDITIONAL APPLIED SCIENCE A**

Agriculture and Food (Foundation Tier)

**TUESDAY 17 JUNE 2008**

Morning  
 Time: 45 minutes

Candidates answer on the question paper.

**Additional materials (enclosed):**

None

Calculators may be used.

**Additional materials:** Pencil  
 Ruler (cm/mm)



\* C O P / T 4 3 9 6 1 \*

Candidate Forename

Candidate Surname

Centre Number

Candidate Number

**INSTRUCTIONS TO CANDIDATES**

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or 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.

**INFORMATION FOR CANDIDATES**

- The number of marks for each question is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **36**.

**FOR EXAMINER'S USE**

Qu.	Max	Mark
1	3	
2	6	
3	10	
4	7	
5	10	
<b>TOTAL</b>	<b>36</b>	

This document consists of **10** printed pages and **2** blank pages.

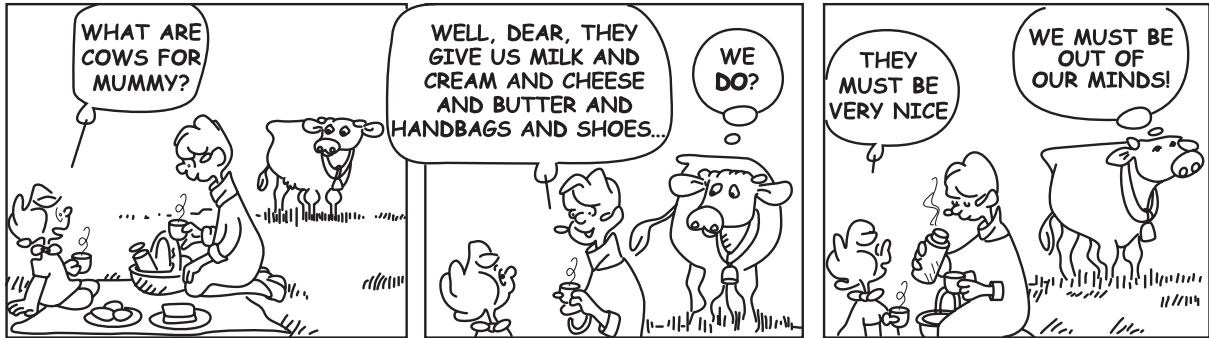
Answer **all** the questions.

1 Products from organisms can be separated into two types.

They can be:

- gathered harvests
- whole organism harvests.

Look at the cartoon about products from cows.



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(a) Complete the table about products from cows.

Put a tick (✓) in the correct box for each product.  
The first row has been done for you.

product	gathered harvest	whole organism harvest
butter	✓	
cheese		
handbag		
milk		
shoes		

[2]

(b) Write down one **other** product from cows.

..... [1]

[Total: 3]

2 Giles is a dairy farmer.

He uses selective breeding to **improve the milk yield** of his cows.

He chooses a cow and a bull with useful characteristics.

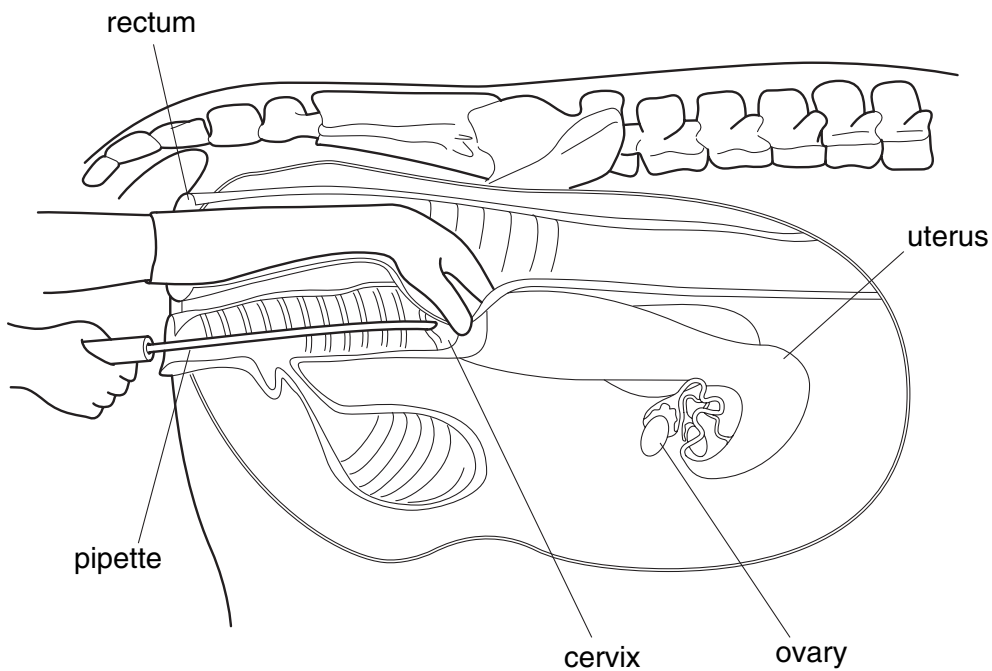
(a) (i) Write down **one** useful characteristic that the **cow** should have.

..... [1]

(ii) Write down **one** useful characteristic that the **bull** must have.

..... [1]

(b) Giles uses **artificial insemination** to fertilise the cows.



(i) Describe the process of artificial insemination.

Use information in the diagram to help you.

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

(ii) Write down **one** advantage of artificial insemination.

..... [1]

[Total: 6]

3 When strawberry plants are grown in **fields**, the fruit is only available for 6 weeks.

Many strawberry growers in the UK use polytunnels.

When strawberry plants are grown in **polytunnels**, the fruit is available for 26 weeks.



(a) How much longer is the fruit available from polytunnels than from growing in fields?

answer ..... weeks [1]

(b) The strawberry crop yield can vary from year to year.

Suggest a suitable method of measuring the strawberry crop yield.

..... [1]

(c) The environmental conditions inside the polytunnel can be controlled.

(i) Write down **two** environmental conditions that can be controlled.

1 .....

2 ..... [2]

(ii) Strawberry plants make their food by photosynthesis.

Complete the word equation for photosynthesis.

water + carbon dioxide → ..... + ..... [2]

(iii) Water and carbon dioxide are needed to produce a good strawberry crop.

What else will the strawberry plants need to grow?

1 .....

2 ..... [2]

(d) The polytunnels are made with plastic sheets.

Write down two **disadvantages** of using polytunnels.

1 .....

2 ..... [2]

[Total: 10]

- 4 Mannie grows vegetables in her garden.
- She makes compost to improve the soil.
- She puts waste such as dead plants, weeds, leaves and grass cuttings into a compost bin.
- She mixes up the compost every few weeks.



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(a) Microorganisms change the waste into compost.

Name **one** type of microorganism.

..... [1]

(b) Complete the sentences describing the production of compost.

Choose words from this list.

Each word may be used once, more than once or not at all.

**aerobic**

**alcohol**

**anaerobic**

**carbon dioxide**

**oxygen**

**water**

Microorganisms change the waste to compost using the process of respiration.

This process is shown by the word equation,

glucose + oxygen → water + .....

This type of respiration is called ..... respiration.

Mannie mixes up the compost to let in ..... [3]

(c) Using compost is an example of sustainable agriculture.

Look at the following statements about sustainable agriculture.

Put ticks (✓) in the boxes next to **three** correct statements about sustainable agriculture.

**Sustainable agriculture ...**

... reduces the need for synthetic fertilisers.

... increases the need for synthetic fertilisers.

... is only used for animal farming.

... reduces water quality in rivers.

... improves water quality in rivers.

... reduces use of pesticides.

... increases use of pesticides.

[3]

[Total: 7]

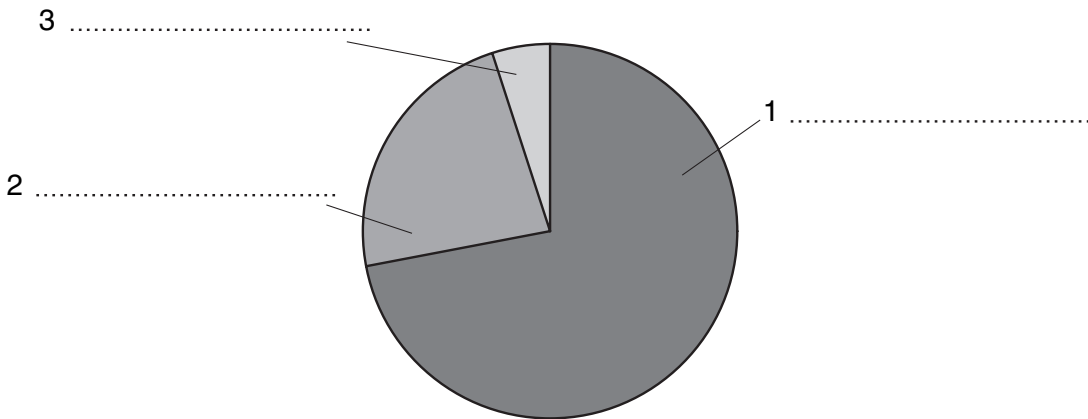
5 Chickens produce eggs. They can be farmed in three different ways:

- cages
- barn
- free range.

(a) The percentage of eggs produced by the UK is:

- 72% by a cage system
- 5% by a barn system
- 23% by a free range system.

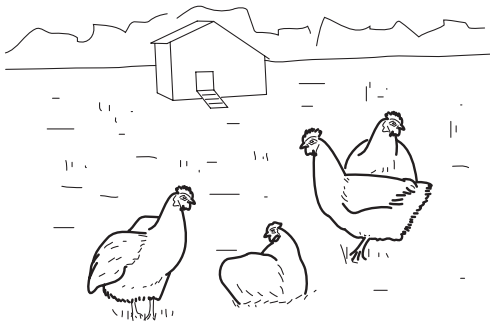
Complete the labels on the pie chart to show this information.



[1]

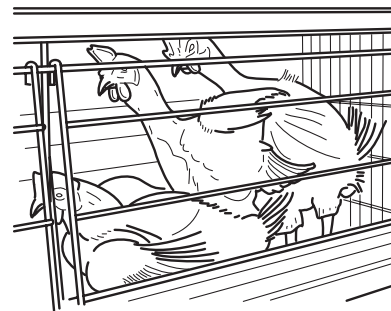
(b) Mannie and Sami are egg farmers.

Mannie uses a free range system.



**Mannie's hens**  
 are kept in a field  
 have plenty of space to move around  
 behave normally  
 have a varied diet

Sami uses a cage system.



**Sami's hens**  
 are kept in cages  
 have a limited area to move around  
 are in a controlled environment  
 have a less varied diet



- (i) Some people think that free range hens have better care than hens kept in cages. State and explain one advantage and one disadvantage of **free range** egg farming. Use **ideas about animal welfare** in your answer.

advantage .....

explanation .....

.....

disadvantage .....

explanation .....

..... [4]

- (ii) Mannie’s free range eggs cost more than Sami’s cage eggs. Suggest why.

.....

.....

..... [2]

- (c) Mannie and Sami put the Lion Quality mark on their hens’ eggs.



What does this mark tell you?

..... [1]

- (d) The British Egg Marketing Board is an organisation that supports egg farmers.

Explain how they do this.

.....

..... [2]

[Total: 10]

**END OF QUESTION PAPER**

**10**  
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*Copyright Acknowledgements:*

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Q.5c logo	The Lion Quality mark is a registered trademark and is reproduced by kind permission of The British Egg Industry Council.

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