

Wednesday 22 June 2016 – Morning

GCSE ENVIRONMENTAL AND LAND-BASED SCIENCE

B683/02 Commercial Horticulture, Agriculture and Livestock Husbandry
(Higher Tier)

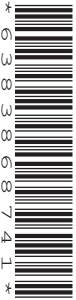
Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:

- Pencil
- Ruler (cm/mm)
- Calculator

Duration: 1 hour



Candidate forename		Candidate surname	
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Centre number						Candidate number				
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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. If additional space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

- The quality of written communication is assessed in questions marked with a pencil (✎).
- 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 **50**.
- This document consists of **16** pages. Any blank pages are indicated.

Answer **all** the questions.

1 A grower wants to plant up a large tub with bedding plants.

The photographs show four suitable plants.

A



B



C



D



(a) Describe how you would plant up a tub for sale using these bedding plants.

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[4]

(b) Keeping plants healthy in a tub is more difficult than in a soil bed.

Name **two** problems of keeping plants healthy in a tub and a method to reduce each of these problems.

Problem 1

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Method to reduce

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Problem 2

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Method to reduce

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[4]

2 The photograph shows plants being raised in a propagator inside a glasshouse.



(a) Plants grow best in a particular temperature range.

(i) Give **one** reason why it is warmer in a propagator than in the rest of the glasshouse.

..... [1]

(ii) Give **one** way the grower could decrease the temperature in the propagator.

..... [1]

(b) The top of the propagator is made of plastic.

Suggest **one** advantage and **one** disadvantage of using plastic rather than glass.

Advantage

Disadvantage

[2]

(c) Explain why plants use more water when the temperature is higher.

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..... [1]

(d) Seedlings raised in a propagator may suffer from a fungal disease called 'damping off'.

Damping off is more likely when the environment in the propagator is:

- A cold and dry
- B warm and dry
- C cold and wet
- D warm and wet

Answer **A, B, C** or **D** [1]

(e) If you grow a crop in the same greenhouse soil for several years, the yield decreases.

Give **two** reasons why.

- 1
-
- 2
- [2]

3 Scientists have provided growers with new techniques.

(a) Genetic engineering is one new technique.

Which **one** of the following can **only** be achieved by genetic engineering?

- A drought resistance
- B increased tolerance to high temperatures
- C increased yield
- D nitrogen fixation in non-legumes

Answer **A, B, C** or **D** [1]

(b) Hydroponics is another new technique.

The photograph shows plants being grown hydroponically.



Compare hydroponics with traditional methods of growing plants in glasshouses **and** suggest the advantages and disadvantages of each method.



The quality of written communication will be assessed in your answer to the question.

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- 4 The table shows some of the economics of producing tomatoes in a glasshouse at different times of the year.

Harvest period	Yield (tonnes/ha)	Gross price (£/tonne)	Gross income (£/ha)
To 31 st March	25	1200	30 000
April	45	1110	49 950
May	52	790	41 080
June	40	-----	28 000
July	67	650	43 550
August	37	390	14 430
September	25	440	11 000
After 1 st October	19	450	8 550
Annual total	310	730	226 560

- (a) Calculate the gross price of tomatoes in June.

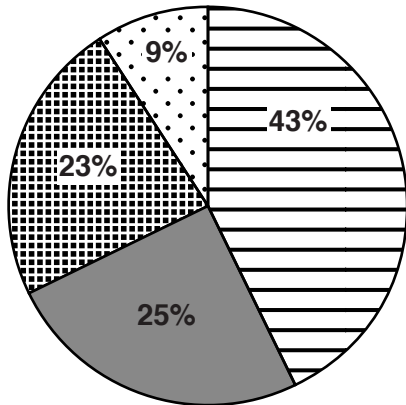
..... £/tonne [1]

- (b) In which month was the gross income the greatest?





..... [1]

(c) The chart shows a summary of the annual costs of production of glasshouse tomatoes.

Annual costs of production



key:

-  heating and lighting costs
-  materials and services
-  labour for glasshouse work
-  labour for picking and packing

Explain why your answer to part (b) has the greatest gross income, and why it is **not** necessarily the most profitable month.

Use the information in the table and the pie chart in your answer.

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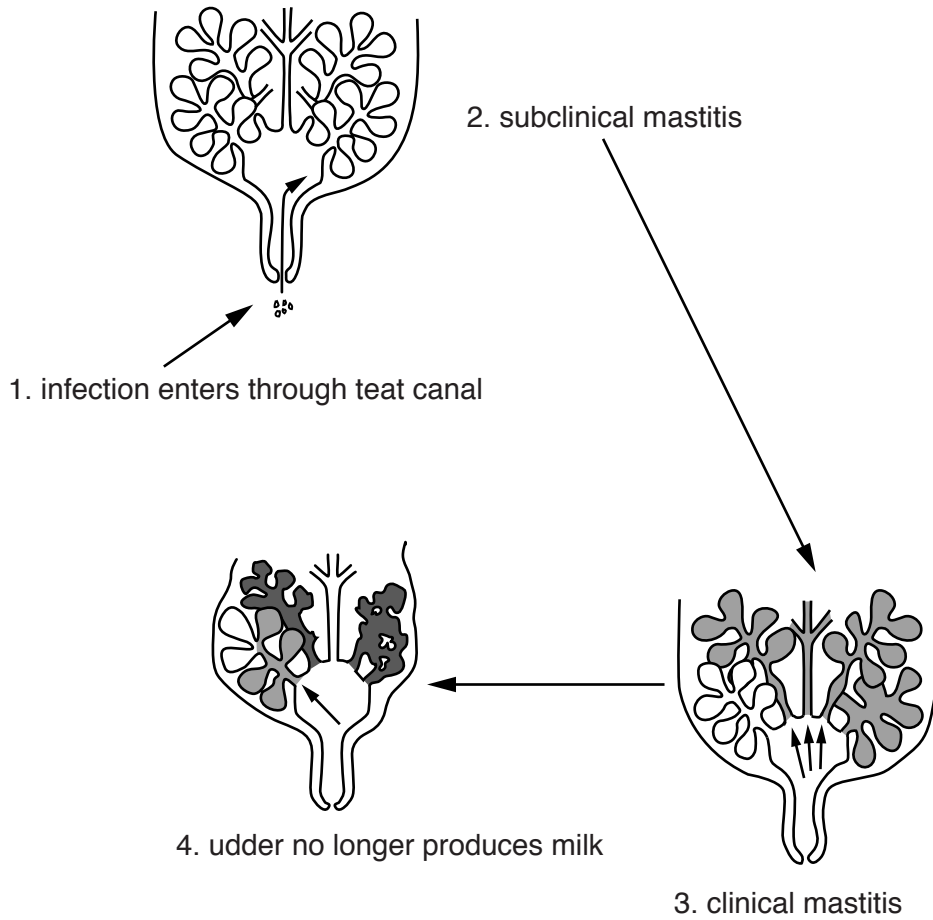
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5 Mastitis is an infection in the udders of cattle.

The diagram shows the stages in mastitis infection.



(a) Which of the following cause mastitis?

- A bacteria
- B fungi
- C parasites
- D viruses

Answer **A, B, C,** or **D** [1]

(b) Describe **two** ways poor housing conditions can lead to increased mastitis in cattle.

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..... [2]

(c) Mastitis can be treated with antibiotics.

Milk from cattle treated with antibiotics cannot be sold for human consumption.

Explain why.

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(d) Disease is often spread from farm to farm when animals are transported.

Legislation has been introduced to regulate the transport of livestock within the UK.

Explain how this legislation helps reduce disease in livestock.



The quality of written communication will be assessed in your answer to the question.

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..... [6]

6 The food conversion ratio is an important calculation to help manage the profitability of livestock production.

(a) Calculate the food conversion ratio for a pig that has gained 110kg of body mass and has eaten 341 kg of food over its lifetime.

Answer [1]

(b) Growing livestock have different food requirements at different stages of their lives.

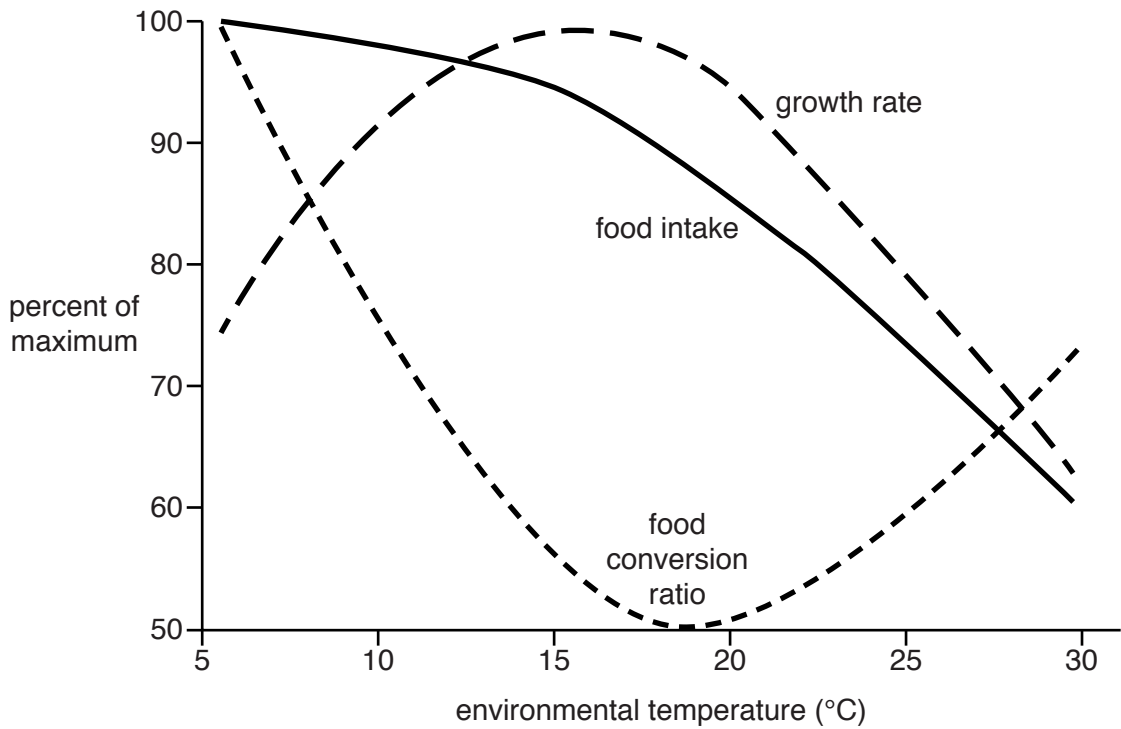
The table shows how the food conversion ratio of pigs changes as they grow.

Stage in growth	Mass of pigs (kg)	Food conversion ratio
A	11–33	1.5
B	34–56	2.1
C	57–78	2.5
D	79–100	3.5

At which stage is a pig's food conversion ratio the best?

Answer **A, B, C, or D** [1]

(c) The graph shows how food intake, growth rate and food conversion ratio vary with the temperature of the pigs' environment.



(i) Use the graph to identify the most efficient temperature for the rearing of pigs.

Answer °C [1]

(ii) Look at the graph.

Explain why the food intake and growth rate change with temperature.

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..... [2]

7 For a mammal you have studied, describe mating and the stages that follow until birth.



The quality of written communication will be assessed in your answer to the question.

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END OF QUESTION PAPER

ADDITIONAL ANSWER SPACE

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).

A large area of lined paper for writing answers. It features a vertical margin line on the left side and horizontal dotted lines for writing. The lines are evenly spaced and extend across the width of the page.

A large area of the page is filled with horizontal dotted lines, providing a space for writing answers. A solid vertical line runs down the left side of this area, creating a margin.



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