

Friday 25 January 2013 – Afternoon

GCSE ENVIRONMENTAL AND LAND-BASED SCIENCE

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

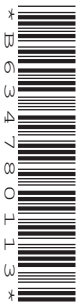
Candidates answer on the Question Paper.
A calculator may be used for this paper.

Duration: 1 hour

OCR supplied materials:
None

Other materials required:

- Pencil
- Ruler (cm/mm)



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. 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

- Your 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 **20** pages. Any blank pages are indicated.

Answer **all** the questions.

- 1 Two different varieties of tomato were crossed to produce a new variety.



variety 1

X



variety 2



new variety

The new variety performs better than either of its parents.

What term is used in genetics to describe the improved performance of the offspring produced by this cross?

..... [1]

2 The photograph shows a plant produced asexually from a tuber.



Describe the **advantages** and **disadvantages** to a grower of propagating plants asexually.

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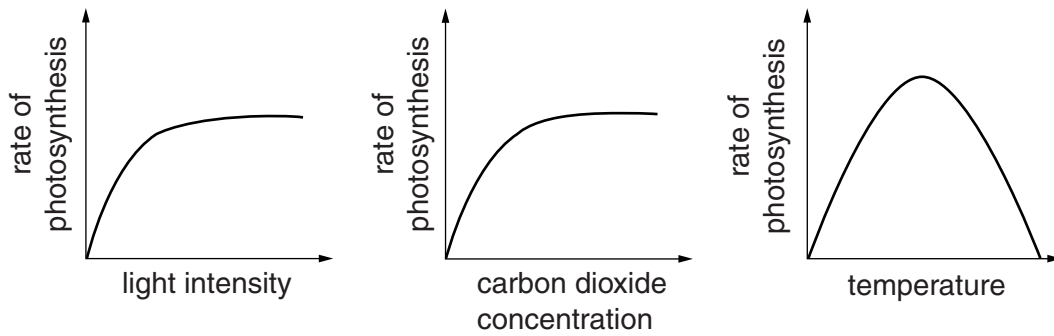
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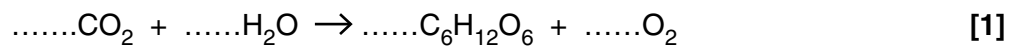
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..... [3]

- 3 The graphs show how light intensity, carbon dioxide concentration and temperature can all change the rate of photosynthesis.



- (a) Balance the equation for photosynthesis.



- (b) Using information from the graphs, explain the principles of limiting factors in photosynthesis.

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..... [2]

4 The photograph shows a farmer milking a cow.

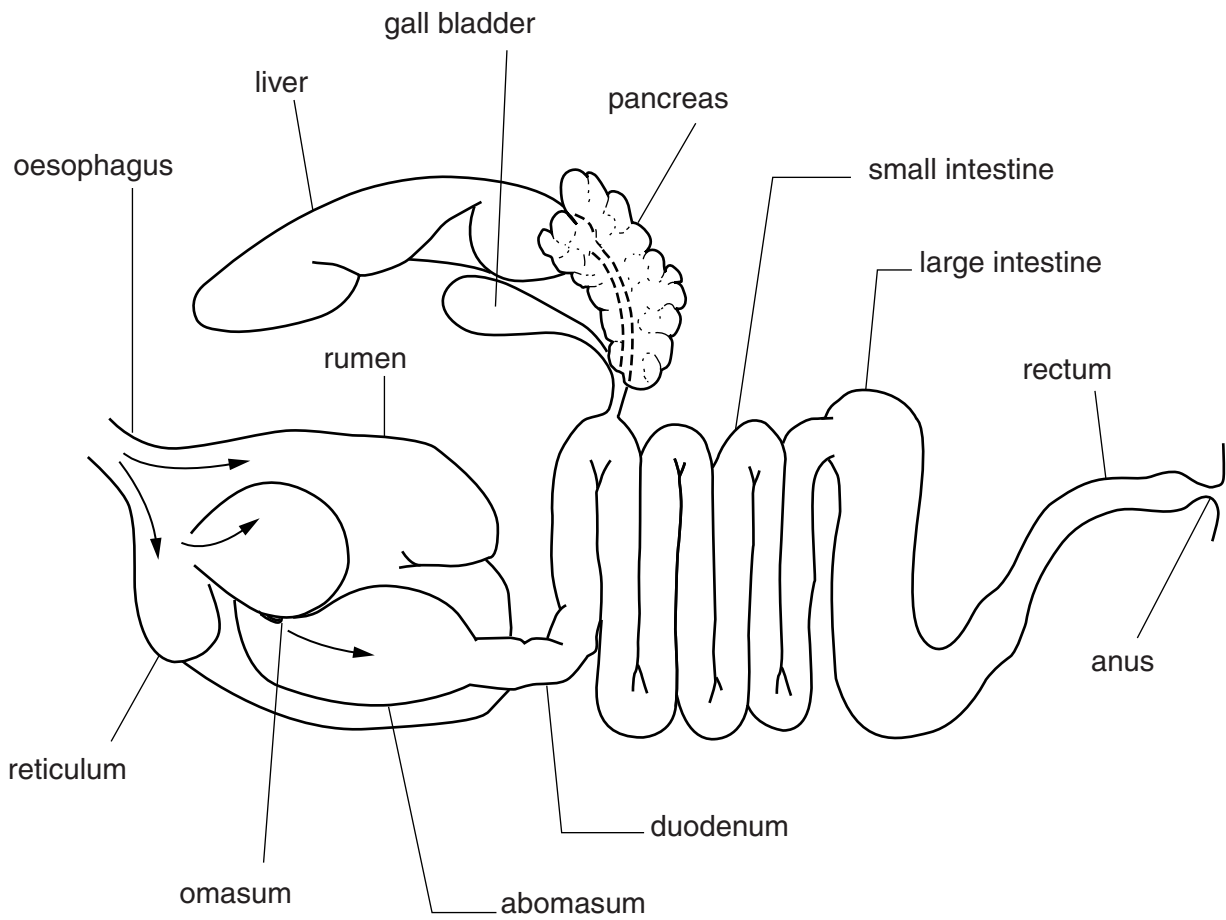


Many farmers do not allow strangers to come into the milking parlour.
Having strangers present during milking can reduce milk production.

Explain why.

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..... [2]

5 The diagram shows the digestive system of a **ruminant**.



Explain how the digestive system of a ruminant enables it to survive on a diet of grass only.



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

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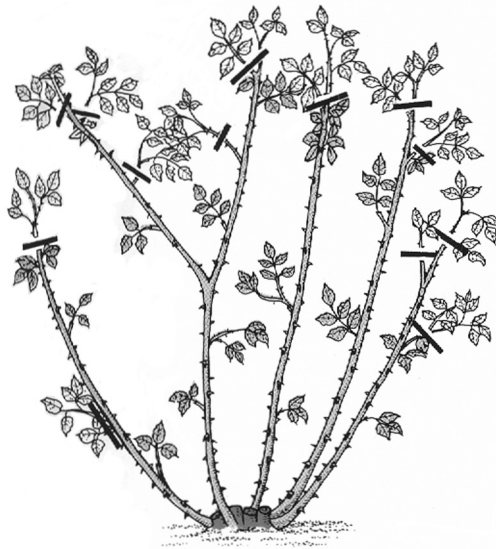
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[6]

- 6 The diagram shows how a rose bush should be pruned.



As part of pruning, a grower removes the growing tips from the rose bush.

Which **one** of the following is the most likely consequence of this action?

- A more roots will grow
- B more shoots will grow
- C the plant will produce more flowers
- D the plant will produce more fruit

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

7 The town council is planting new flower beds around the town.

The council is insisting on the use of organic methods.

A horticulturist has been asked to provide the plants and maintain the flower beds.



Explain how the horticulturist could keep the flower beds weed-free using organic methods.

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[3]

8 Salmonella are bacteria which can cause food poisoning.

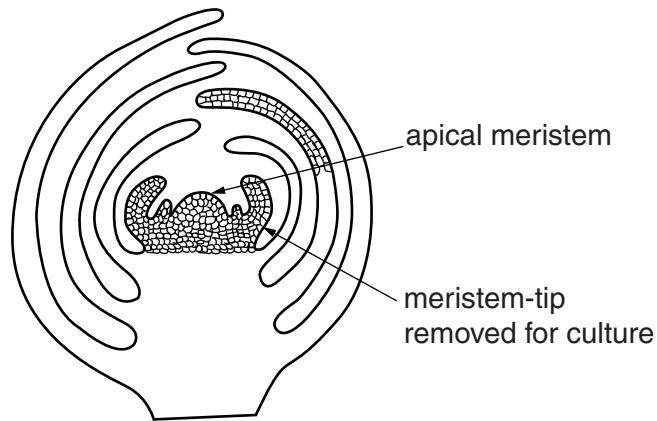
Suggest **two** ways a livestock farmer might reduce the risk of people being infected by salmonella on the farm.

1

2

[2]

9 The diagram shows the tip of a plant stem used for tissue culture.



Which of the following is **not** a reason for growers to use tissue culture?

- A helps produce virus free plants
- B produces new plants quickly
- C produces new varieties of plants
- D propagates plants that cannot be grown from seed

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

10 During reproduction animals sometimes produce mutations.

(a) Explain what is meant by a **mutation**.

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

(b) Why might a mutation be beneficial to an animal breeder?

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

11 New breeds can be produced by cloning.

Suggest why health problems might arise in the offspring of a new breed produced in this way.

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..... [1]

12 The photograph shows an orphan lamb being fed.



(a) The correct feeding of young animals is an important aspect of good livestock husbandry.

Choose a young ruminant animal you have studied.

Describe and explain the changing diet needed by an orphaned ruminant animal from birth to weaning.

animal



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

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[6]

(b) An orphan lamb needs to be bottle-fed.

The lamb drinks a milk replacement food.

The table shows the amounts of milk replacement food needed during the first three weeks.

Feeding period	Feeding frequency	Amount per feed in cm ³	Amount per day in cm ³	Total for the period in cm ³
Day 1–2	every 4 hours	140	840	1 680
Day 3–7	every 6 hours	200	4 000
Day 8–14	every 8 hours	500	1500	10 500
Day 15–21	every 8 hours	700	2100

(i) Calculate and fill in the missing amounts in the table. [1]

(ii) Calculate how much milk is given to the lamb from day 1 to day 21.

Answer cm³ [1]

(iii) It takes 200 g of milk powder to make 1000 cm³ of milk replacement.

What mass of milk powder is needed to bottle feed the lamb from day 1 to day 21?

Answer g [1]

(iv) A 1 kg bag of milk powder costs £2.50.

How much will it cost to feed an orphan lamb from day 1 to day 21?

Answer £ [1]

13 The table shows the U values (a measure of heat loss) for a variety of materials used to glaze glasshouses.

A good insulator has a low U value.

Glazing material	U value
single glass	5.0
double glass	3.0
polythene	1.7
polycarbonate	0.6

(a) Why is it important for growers to be aware of these U values when choosing a material for glasshouse glazing?

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..... [2]

(b) Growers use the following equations to calculate the heating requirements for a glasshouse.

heater size required	=	total heat loss	×	temperature lift
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total heat loss = the amount lost through the walls, floor and roof + the heat lost through ventilation.

temperature lift = the temperature required in the glasshouse – the lowest outside temperature.

(i) A glasshouse loses 2418W through the surfaces of the glasshouse. The other 20% of total heat loss is lost through ventilation.

What is the total heat loss?

Answer W [1]

(ii) If the temperature required in the glasshouse in (i) is 20°C and the lowest outside temperature is –5°C, what heater size is needed for this glasshouse?

Show your working.

Answer W [2]

(iii) How many 20kW heaters would the grower need to heat this glasshouse?

Answer [1]

14 The photograph shows a parasitic wasp used in biological pest control.



A grower introduces the parasitic wasp to control a pest in the glasshouse.

The wasp is very effective and kills all the pests.

Explain why this might be a problem for the grower.

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..... [3]

15 The photograph shows the extraction of peat for horticultural use.



Growers are coming under increasing pressure to reduce their use of peat.

Discuss the horticultural and environmental arguments for and against the use of peat and its alternatives.



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

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[6]

END OF QUESTION PAPER

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