

GENERAL CERTIFICATE OF SECONDARY EDUCATION

ENVIRONMENTAL AND LAND-BASED SCIENCE

B683/01

Unit B683: Commercial Horticulture, Agriculture and Livestock Husbandry (Foundation Tier)

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

OCR Supplied Materials

None

Duration: 1 hour

Other Materials Required:

- Calculator
- 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, 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.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

INFORMATION FOR CANDIDATES

- Your quality of written communication is assessed in questions marked with a pencil (✎).
- 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 **50**.
- This document consists of **20** pages. Any blank pages are indicated.

For Examiner's		
	Max	Mark
1	1	
2	2	
3	2	
4	1	
5	1	
6	1	
7	5	
8	2	
9	1	
10	4	
11	2	
12	3	
13	2	
14	5	
15	6	
16	6	
17	6	
TOTAL	50	

Answer **all** the questions

1 Which of the following is **not** a sign of loss of condition?

- A dull coat
- B gaining weight
- C poor appetite
- D sunken eyes

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

2 Give **two** uses of glasshouses.

1

2 [2]

3 Breeders have produced a new dwarf narcissus asexually from bulbs.



Give **one** advantage and **one** disadvantage of this method, compared to saving seed from the flowers.

advantage

.....

disadvantage

..... [2]

4 A glasshouse needs to be placed in the correct position. Which **one** of the following would be the best position to put a glasshouse?

- A A north facing slope, away from trees.
- B A north facing slope, under the shade of trees.
- C A south facing slope, away from trees.
- D A south facing slope, under the shade of trees.

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

5 The photograph shows a pig farmer checking his sow.



© OCR

One check he does is to stand behind the sow and press down firmly on her back.

What is his reason for doing this?

- A to check if she is ready for market
- B to check that there is nothing wrong with her rear legs
- C to see if she is on heat
- D to see if she is pregnant

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

6 Growers can use either chemical methods or biological methods to control pests and diseases.

Many supermarkets now require suppliers to use biological methods.

Which of the following is true for **all** biological control methods?

They are

- A harmless to the environment
- B killed by extremely low temperatures
- C naturally occurring organisms controlling the problem
- D quicker at controlling the problem than chemicals

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

7 PCV2 is a virus disease of pigs. Pigs can be vaccinated against this disease.

An investigation was carried out to see what effect vaccination has on the growth of piglets.

Four groups of piglets were used

- A** Both the mother sows and piglets were vaccinated.
- B** The sows were vaccinated but not the piglets.
- C** The piglets were vaccinated but not the sows.
- D** Neither piglets nor sows were vaccinated.

The average weights of the piglets in each group are shown in the table below.

	A	B	C	D
birth weight in kg	1.6	1.7	1.6	1.6
weight at 3 weeks old in kg	6.5	6.5	6.3	6.3
weight at 7 weeks old in kg	14.7	14.6	14.0	13.9
number of piglets in each group	462	467	425	422

<http://www.thepigsite.com/articles/1/pig-health/3123/pcv2-vaccination-strategy-experiment>

(a) Calculate the how much piglets in groups **C** and **D** grew in the first 7 weeks of life.

..... Answer **C**

..... Answer **D**

[2]

(b) Use the information in the table to recommend whether sows and piglets should be vaccinated.

.....

.....

.....

.....

.....

.....

..... [3]

8 It is important that a farmer knows when cows come on heat (are ready to mate).

Explain why it is important that a farmer knows when cows come on heat.

.....

.....

..... [2]

9 The photograph shows a cow with horns and a bull with no horns.



M Wedgwood / © OCR

cow with horns



M Wedgwood / © OCR

bull with no horns

If a bull **with** horns is crossed with a cow with **no** horns (polled), all the calves born have no horns.

What name is given to an inherited characteristic that does not appear in a first generation cross such as this?

..... [1]

10 The photograph shows a flower bed.



K Crafer / © OCR

Heathers are a popular choice for flower beds because they are **evergreen** and **perennial**.

Explain why these features are an advantage to the gardener.

.....

.....

.....

..... [4]

11 Gardeners can raise plants from seed.

Thinning and pricking-out are two stages in growing plants from seed.

Describe what is meant by **thinning** and **pricking-out**.

.....

.....

.....

..... [2]

12 The photograph shows a new animal house.



M Wedgwood / © OCR

Housing for livestock must meet their needs.

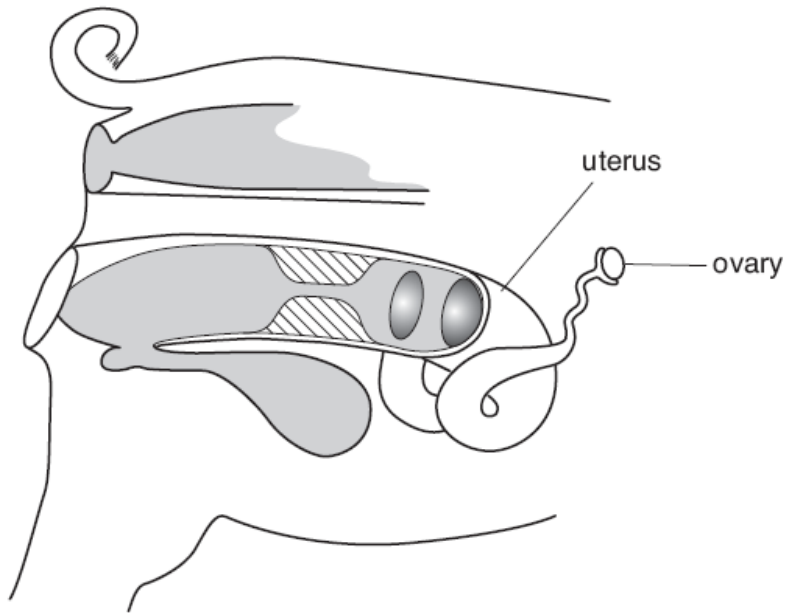
Complete the table to show the way in which the housing shown above is able to provide for the needs of the calves.

The first one has been done for you.

needs of calves	provided by the calf house
food and water	water and food troughs

[3]

13 The diagram shows the reproductive system of a sow (female pig).



What is the function of the following parts of the reproductive system?

ovary

.....

.....

uterus

.....

..... [2]

14 The table shows information about different types of greenhouse glazing.

type of glazing	light transmission	rate of heat loss	expected life	cost
glass	94%	high	long	medium
single-walled polycarbonate	96%	high	medium	medium
twin-walled polycarbonate	85%	medium	medium	high
polythene	80%	high	short	low
fibreglass	85%	medium	medium	high

(a) The table includes information about single-walled and twin-walled polycarbonate glazing.

Manufacturers are interested in evaluating a **triple-walled** polycarbonate material.

Predict its performance under the following headings by putting a tick (✓) in the box against the correct answer in each case.

light transmission

rate of heat loss

expected life

93%	
85%	
78%	

high	
medium	
low	

high	
medium	
low	

[1]

(b) Twin-walled polycarbonate is being increasingly used for greenhouses instead of glass.

Using the information in the table, discuss the choice of twin-walled polycarbonate for greenhouses.

.....

.....

.....

.....

.....

..... [4]

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MARK SCHEME

Duration: 1 hour

MAXIMUM MARK 50

Additional guidance within any mark scheme takes precedence over the following guidance.

1. Mark strictly to the mark scheme.
2. Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise.
3. Accept any clear, unambiguous response which is correct, eg mis-spellings if phonetically correct (but check additional guidance).
4. Abbreviations, annotations and conventions used in the detailed mark scheme:

/ = alternative and acceptable answers for the same marking point
 (1) = separates marking points
not/reject = answers which are not worthy of credit
ignore = statements which are irrelevant - applies to neutral answers
allow/accept = answers that can be accepted
 (words) = words which are not essential to gain credit
words = underlined words must be present in answer to score a mark
 ecf = error carried forward
 AW/owtte = alternative wording
 ORA = or reverse argument

Eg mark scheme shows 'work done in lifting / (change in) gravitational potential energy' (1)

work done = 0 marks
 work done lifting = 1 mark
 change in potential energy = 0 marks
 gravitational potential energy = 1 mark

5. If a candidate alters his/her response, examiners should accept the alteration.
6. Crossed out answers should be considered only if no other response has been made. When marking crossed out responses, accept correct answers which are clear and unambiguous.

Eg

For a one mark question, where ticks in boxes 3 and 4 are required for the mark:

Put ticks (✓) in
the two correct
boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be
worth 0 marks.

Put ticks (✓) in
the two correct
boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be
worth one mark.

Put ticks (✓) in
the two correct
boxes.

<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be
worth one mark.

7. The list principle:

If a list of responses greater than the number requested is given, work through the list from the beginning. Award one mark for each correct response, ignore any neutral response, and deduct one mark for any incorrect response, eg one which has an error of science. If the number of incorrect responses is equal to or greater than the number of correct responses, no marks are awarded. A neutral response is correct but irrelevant to the question.

8. Marking method for tick boxes:

Always check the additional guidance.

If there is a set of boxes, some of which should be ticked and others left empty, then judge the entire set of boxes.

If there is at least one tick, ignore crosses. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses.

Credit should be given for each box correctly ticked. If more boxes are ticked than there are correct answers, then deduct one mark for each additional tick. Candidates cannot score less than zero marks.

eg If a question requires candidates to identify a city in England, then in the boxes

Edinburgh	
Manchester	
Paris	
Southampton	


the second and fourth boxes should have ticks (or other clear indication of choice) and the first and third should be blank (or have indication of choice crossed out).


Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	×	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	×		✓		✓	✓		✓	
Score:	2	2	1	1	1	1	0	0	0	NR


Question		Expected answer	Marks	Additional guidance
1		B gaining weight	[1]	
2		protect plants from cold/frost / idea of growing tender plants / that would not survive outside / grow crops throughout the year start plants off / raise seedlings before planting outside	[2]	
3		<i>advantage:</i> trueness to type/ genetically identical/speed to adult plants <i>disadvantage:</i> slow to produce large numbers/ diseases propagated	[2]	1 advantage and 1 disadvantage needed allow technical difficulty in propagating from seed reject cost
4		C A south facing slope, away from trees	[1]	
5		C to see if she is on heat	[1]	
6		C naturally occurring organisms controlling the problem	[1]	
7	a	C – 12.4 kg; D – 12.3 kg	[2]	units must be given – but only penalise once
	b	idea that piglets grew more in C and D than in A and B and no significant difference between A and B or C and D so it is the vaccination of sows which is significant and vaccination of piglets makes no significant difference / recommendation to vaccinate sows and not piglets	[3]	answers must be linked in order to gain full credit; they must link statements about the data to a recommendation or a statement about the effects of vaccination of sows and piglets

Question		Expected answer	Marks	Additional guidance
8		to know when to put the cow to the bull / use AI and then one from: so that the cow will produce milk following calving to produce replacement calves	[2]	answers must be linked in order to gain full credit; they must link a statement about the timing of mating to a statement about the importance of reproduction for milk production or production of calves
9		dominant	[1]	
10		<i>evergreen because:</i> (two from) colour all year interest all year less leaves to sweep up lower maintenance <i>perennial because:</i> will last for a long time does not need planting every year	[4]	ignore a clear reference to definition if not overtly a benefit answers must be linked in order to gain full credit; they must link the feature to two correct advantages
11		<i>thinning:</i> taking out excess plants to give the other more room OWTTE <i>pricking out:</i> taking seedlings from where they are sown and replacing them in a new tray with more space OWTTE	[2]	one of each method for 2 marks
12		three from: security strong construction / bolt or lock on door exercise space to move around in house dry conditions roof and walls waterproof / good drainage ventilation open front of house / avoid drafts bedding straw for bedding	[3]	one mark for each correct line

Question		Expected answer	Marks	Additional guidance
13		<i>ovary</i> : where eggs are formed; hormone production <i>uterus</i> : where the embryo / baby / piglet develops role in birth	[2]	one function needed for each organ for 2 marks
14	(a)	light transmission: 78% heat loss: low expected life: medium	[1]	3 correct = 1 mark
	(b)	cost is higher than glass / it lasts less well than glass idea that transmission of light is lower, so plants may grow less well less heat is lost than through glass and that: idea that the benefits of reducing heat loss counteracts the other factors	[4]	answers must be linked in order to gain full credit; they must link ideas about the characteristics of the materials to a statement about the importance of reducing heat loss




Question	Expected answer	Marks	Additional guidance
15 	<p>[level 3] Balanced and detailed comparison of advantages and disadvantages of both systems, including both physical and psychological factors. All information in answer is relevant, clear, organised and presented in a structured and coherent format. Specialist terms are used appropriately. Few, if any, errors in grammar, punctuation and spelling. (5 – 6 marks)</p> <p>[level 2] Answer is balanced including some advantages and disadvantages of the systems. For the most part the information is relevant and presented in a structured and coherent format. Specialist terms are used for the most part appropriately. There are occasional errors in grammar, punctuation and spelling. (3 – 4 marks)</p> <p>[level 1] May be one-sided, focussing on either intensive or extensive systems or a simple comparison of extensive and intensive systems, not particularly related to animal welfare issues. Answer may be simplistic. There may be limited use of specialist terms. Errors of grammar, punctuation and spelling prevent communication of the information. (1 – 2 marks)</p> <p>[level 0] Insufficient or irrelevant information. Answer not worthy of credit. (0 marks)</p>	[6]	<p>relevant points include:</p> <ul style="list-style-type: none"> • physical and psychological factors <p>intensive</p> <ul style="list-style-type: none"> • easier to care for pigs: monitor health, breeding, feeding • not subject to poor weather • disease spreads more quickly <p>extensive</p> <ul style="list-style-type: none"> • pigs able to move about freely, exercise • able to associate – social interaction • more difficult to care for pigs: monitor health, breeding, feeding • disease spreads more slowly • subject to poor weather

Question	Expected answer	Marks	Additional guidance
16 	<p>[level 3] Detailed explanation of the problem and description of what can be done about it, with many examples to support the answer. All information in answer is relevant, clear, organised and presented in a structured and coherent format. Specialist terms are used appropriately. Few, if any, errors in grammar, punctuation and spelling. (5 – 6 marks)</p> <p>[level 2] Some reasons given for the problem and what can be done about it, with some examples used. For the most part the information is relevant and presented in a structured and coherent format. Specialist terms are used for the most part appropriately. There are occasional errors in grammar, punctuation and spelling. (3 – 4 marks)</p> <p>[level 1] Answer may focus on either the problem or the solution, with few examples used or may concentrate on one aspect only. Answer may be simplistic. There may be limited use of specialist terms. Errors of grammar, punctuation and spelling prevent communication of the information. (1 – 2 marks)</p> <p>[level 0] Insufficient or irrelevant information. Answer not worthy of credit. (0 marks)</p>	[6]	<p>relevant points include:</p> <p><i>build up of pests:</i></p> <ul style="list-style-type: none"> • because environment better for pests, including: temperature, humidity; lack of predators; density of food plants for pests <p><i>to reduce pest problems:</i></p> <ul style="list-style-type: none"> • only introduce pest free crops • isolate crops • have a regular spraying regime • introduce biological pest control • rotate crops to break up pest-cycle • avoid re-use of compost (or sterilise)

Question	Expected answer	Marks	Additional guidance
17 	<p>[level 3] Describes the process in detail with all stages correctly sequenced and none omitted; additional points included. All information in answer is relevant, clear, organised and presented in a structured and coherent format. Specialist terms are used appropriately. Few, if any, errors in grammar, punctuation and spelling. (5 – 6 marks)</p> <p>[level 2] Some details given about all the stages but additional points not included. For the most part the information is relevant and presented in a structured and coherent format. Specialist terms are used for the most part appropriately. There are occasional errors in grammar, punctuation and spelling. (3 – 4 marks)</p> <p>[level 1] Not all stages included, or not correctly sequenced, and few details given. Answer may be simplistic. There may be limited use of specialist terms. Errors of grammar, punctuation and spelling prevent communication of the information. (1 – 2 marks)</p> <p>[level 0] Insufficient or irrelevant information. Answer not worthy of credit. (0 marks)</p>	[6]	<p>relevant points include:</p> <ul style="list-style-type: none"> • identification of desired features of plant – flower size, colour and number, compact shape, small size of plant, disease resistance etc. • plants with desired characteristics bred together • offspring selected for these characteristics • continued for many generations <p>also credit for</p> <ul style="list-style-type: none"> • idea of hybrid vigour
Total		[50]	

Assessment Objectives (AO) Grid

(includes quality of written communication )

Question	AO1	AO2	AO3	Total
1	1			1
2	2			2
3	1	1		2
4	1			1
5	1			1
6	1			1
7(a)		2		2
7(b)		1	2	3
8		2		2
9	1			1
10		4		4
11	2			2
12		3		3
13	2			2
14(a)		1		1
14(b)		2	2	4
15 	3	3		6
16 	3	3		6
17 	3	3		6
Totals	21	25	4	50

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