



# GCSE

## Environmental and Land Based Science

General Certificate of Secondary Education

Unit **B683/02/04**: Commercial Horticulture, Agriculture and Livestock Husbandry  
(Higher Tier)

## Mark Scheme for June 2013

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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For answers marked by levels of response:

- a. **Read through the whole answer from start to finish**
- b. **Decide the level** that **best fits** the answer – match the quality of the answer to the closest level descriptor
- c. **To determine the mark within the level**, consider the following:

Descriptor	Award mark
A good match to the level descriptor	The higher mark in the level
Just matches the level descriptor	The lower mark in the level

- d. Use the **L1**, **L2**, **L3** annotations in Scoris to show your decision; do not use ticks.

Quality of Written Communication skills assessed in 6-mark extended writing questions include:

- appropriate use of correct scientific terms
- spelling, punctuation and grammar
- developing a structured, persuasive argument
- selecting and using evidence to support an argument
- considering different sides of a debate in a balanced way
- logical sequencing.

### Annotations

Annotation	Meaning
/	alternative and acceptable answers for the same marking point
(1)	separates marking points
<b>not/reject</b>	answers which are not worthy of credit
<b>ignore</b>	statements which are irrelevant – applies to neutral answers
<b>allow/accept</b>	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














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ecf	error carried forward
AW/owtte	alternative wording
ORA	or reverse argument

Available in scoris to annotate scripts

	indicate uncertainty or ambiguity
	benefit of doubt
	contradiction
	incorrect response
	error carried forward
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	no benefit of doubt
	reject
	correct response
	draw attention to particular part of candidate's response
	information omitted

**Subject-specific Marking Instructions**

- a. If a candidate alters his/her response, examiners should accept the alteration.
- b. 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.

✗
✗

This would be worth  
1 mark.

Put ticks (✓) in the  
two correct boxes.

✓
✗

This would be worth  
0 marks.

Put ticks (✓) in the  
two correct boxes.

✗
✗
✓
✓

This would be worth  
1 mark.

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.

d. 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, eg 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.

E.g. If a question requires candidates to identify a city in England, then in the boxes

<b>Edinburgh</b>	
<b>Manchester</b>	
<b>Paris</b>	
<b>Southampton</b>	

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).

<b>Edinburgh</b>			✓			✓	✓	✓	✓	
<b>Manchester</b>	✓	x	✓	✓	✓				✓	
<b>Paris</b>				✓	✓		✓	✓	✓	
<b>Southampton</b>	✓	x		✓		✓	✓		✓	
<b>Score:</b>	2	2	1	1	1	1	0	0	0	NR

Question			CBT Question Numbers	Answer	Mark	Guidance
1	(a)		1	B	1	
	(b)		1	Production ration - is additional food given to help an animal produce a crop such as milk eggs meat offspring. Maintenance ration – is the food the animal needs to stay alive and healthy	2	
2			2	Descriptions of - Watering; Feeding; Pruning; Weed Control; Potting on / root pruning; Pest control; frost protection; support Any 4	4	sunlight must be qualified
3			3	rumen; reticulum; abomasum	3	
4			4	cylinder – adjust the front roller hover – spacers under the blade side wheel – alter the height of the wheels rotary – as side wheel or hover	2	1 mark for type of mower named (ignore ride-on) 1 mark for correct method to alter the cutting height.

Question			CBT Question Numbers	Answer	Mark	Guidance
5	(a)		5	<p><b>[Level 3]</b> Explains how growth, equipment, use and season are related to a bowling green. Explains the reasons behind the actions. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p><b>[Level 2]</b> Explains a range of aspects from growth, equipment, use and season related to a bowling green. Some attempt at explanations not necessarily complete. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p><b>[Level 1]</b> Explains <b>some</b> aspects of growth, equipment, use or season not necessarily with full explanations. May be generic. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p><b>[Level 0]</b> Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>		<p><b>This question is targeted at grades up to A/A*</b> <b>Indicative scientific points may include:</b></p> <p><b>Growth</b></p> <ul style="list-style-type: none"> <li>cutting too short prevents the grass recovering</li> <li>regular cutting encourages tillering (side shoots)</li> <li>mowing can change the varieties of grass short cutting encourages fine varieties discourages coarse</li> <li>don't cut before/after adding fertilizer or herbicides</li> </ul> <p><b>Use</b></p> <ul style="list-style-type: none"> <li>hard use needs the grass left long to help protect it</li> <li>bowling grass, very short to ensure the ball runs smoothly</li> </ul> <p><b>Season</b></p> <ul style="list-style-type: none"> <li>only cut when the grass is growing</li> <li>more frequent cutting when the grass is growing rapidly( twice a week)</li> <li>summer use cylinder mower with 6-8 bars for tighter cut</li> <li>cut at right angles to prevent ridging</li> <li>weekly cutting discourages weeds encourages thicker grass growth and visa versa</li> <li>do not cut when the grass is wet or stressed from drought</li> <li>do not mow in winter - it is wet avoids compaction</li> <li>Leave long for frost protection</li> </ul>



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						<b>Equipment</b> <ul style="list-style-type: none"> <li>• Mower appropriate to season/grass length eg. Cylinder mower during playing season</li> <li>• Mow in different directions to produce even sward</li> </ul>
	(b)		6	All ryegrass – football pitch; 40% ryegrass 60% creeping red fescue –back lawn; all brown top – bowling green 55% creeping red fescue 40% chewings fescue 5% browntop bent – fine lawn	3	All four lines = 3 marks 2 or 3 lines = 2 marks 1 line = 1 mark

Question			CBT Question Numbers	Answer	Mark	Guidance
6			7	Loss of nutrient; build-up of pests; build-up of disease	2	Max 2 points
7			8	<p><b>[Level 3]</b> Explains fully both practical and environmental reasons for changing to hydroponics. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p><b>[Level 2]</b> Explains with limited detail both practical and environmental reasons for changing to hydroponics. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p><b>[Level 1]</b> Explains some of the advantages of hydroponics compared to peat. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p><b>[Level 0]</b> Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p><b>This question is targeted at grades up to A</b></p> <p><b>Indicative scientific points may include:</b></p> <p><b>Practical reasons</b></p> <ul style="list-style-type: none"> <li>• hydroponics less expensive to run as you don't have to keep buying in peat (ignore cost if not qualified)</li> <li>• less pest/disease as water sterile medium</li> <li>• can use IT to control pH / nutrient levels</li> <li>• easier for the plant to take in nutrients (roots don't have to search them out)</li> <li>• lower labour requirements, no need for potting on etc.</li> <li>• greater crop uniformity, plants have constant access to nutrients and water</li> <li>• less handling of plants therefore less damage.</li> </ul> <p><b>Environmental reasons</b></p> <ul style="list-style-type: none"> <li>• peat a declining resource</li> <li>• use of peat adds to CO<sub>2</sub> levels</li> <li>• peat digging damages valuable wildlife habitats</li> </ul>

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Question			CBT Question Numbers	Answer	Mark	Guidance
8	(a)		9	6.0	1	
	(b)	(i)	10	it lowers pH /more acidic	1	
		(ii)	10	adding nutrients and absorption by plants changes the pH of the solution which can make nutrients <b>insoluble</b> and therefore <b>unavailable</b> to the plants.	2	<b>Allow</b> ecf
		(iii)	10	Have a probe which constantly monitors pH and triggers release of buffering agents (owtte) to maintain correct pH.	1	Needs both monitor and adjust for mark
9	(a)		11	6	1	
	(b)		11	temperature/humidity; the moisture content of the cows food: genetic variation; exercise	2	Max 2 points <b>Allow</b> may drink more if ill
10	(a)		12	£9849.24	1	
	(b)	(i)	13	rainwater collection; streams/rivers on the farm, springs, wells or boreholes any 2.	2	
		(ii)	13	£3784.48	2	<b>Allow</b> 1 mark for correct working
	(c)		14	63mm	2	2 marks correct answer 1 mark for correct working (1.03m <sup>3</sup> per hour)

Question			CBT Question Numbers	Answer	Mark	Guidance
11			15	<p><b>[Level 3]</b> Compares in detail the advantages and disadvantages of both intensive and extensive egg production. The answer is balanced with reference to the photographs. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p><b>[Level 2]</b> Compares both advantages and disadvantages of intensive and extensive egg production but not necessarily a balanced argument or reference to the photographs. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p><b>[Level 1]</b> Describes the features of intensive and extensive with limited comparison. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p><b>[Level 0]</b> Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p><b>This question is targeted at grades up to C</b></p> <p><b>Indicative scientific points may include:</b></p> <p><b>Intensive Advantages</b></p> <ul style="list-style-type: none"> <li>• cheaper food production</li> <li>• less labour needed</li> <li>• easier environmental control</li> <li>• take up less space</li> <li>• predator proof</li> <li>• animals eat less</li> </ul> <p><b>Intensive Disadvantages</b></p> <ul style="list-style-type: none"> <li>• cost to set up</li> <li>• welfare issues</li> <li>• ethical issues</li> <li>• waste production</li> <li>• energy consumption</li> <li>• easier disease transmission</li> </ul> <p><b>Extensive Advantages</b></p> <ul style="list-style-type: none"> <li>• welfare issues</li> <li>• food more valuable</li> <li>• easier to monitor individual health</li> </ul> <p><b>Extensive Disadvantages</b></p> <ul style="list-style-type: none"> <li>• cost of labour</li> <li>• welfare issues</li> <li>• risk of predator</li> <li>• needs a lot of land</li> </ul> <p><b>Do not credit answers which are the same advantages/disadvantages repeated for each system</b></p>

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Question			CBT Question Numbers	Answer	Mark	Guidance
						Ignore cheaper /more profitable without qualification
				Total	50	

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