

# **Environmental and Land Based Science**

General Certificate of Secondary Education

Unit **B682/01/03** Plant Cultivation and Small Animal Care (Foundation 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**

Used in the detailed Mark Scheme:

<b>Annotation</b>	<b>Meaning</b>
/	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
ecf	error carried forward
AW/owtte	alternative wording
ORA	or reverse argument

Available in scoris to annotate scripts

<b>Annotation</b>	<b>Meaning</b>
	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

Annotation	Meaning
	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.

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

This would be worth 1 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 checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth 1 mark.

- c. 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.

Eg 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>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NR</b>

Question			CBT Question Numbers	Answer	Marks	Guidance
1			1	P in second box to label the shoot	1	
2			2	wilted leaves – switch on water sprinklers yellow leaves – add fertiliser holes in leaves – put slug pellets slow growth of leaves – switch on heater	3	3 or 4 correct = 3 marks 2 correct = 2 marks 1 correct = 1 marks
3			3	S in bottom box to label the stigma	1	
4			4	Either: idea of pollination; few insects/little wind in glasshouse. Or: gets too hot; so cannot grow	2	

Question	CBT Question Numbers	Answer	Marks	Guidance
5	5	<p><b>Level 3 (5–6 marks)</b> A detailed description of the features that indicate the carrots are unfit to eat. A comprehensive understanding of the conditions food should be stored in with a full explanation of why they are stored in such conditions. Quality of written communication does not impede communication of the science at this level.</p> <p><b>Level 2 (3–4 marks)</b> A detailed description of the features that indicate the carrots are unfit to eat. Some understanding of the conditions food should be stored in with an explanation of why they are stored in such conditions. Quality of written communication partly impedes communication of the science at this level.</p> <p><b>Level 1 (1–2 marks)</b> Describes at least one feature that indicates the carrots are unfit to eat. Some suggestion of a method of storage. Quality of written communication impedes communication of the science at this level.</p> <p><b>Level 0 (0 marks)</b> Insufficient or irrelevant science. Answer not worthy of credit.</p>	6	<p><b>This question is targeted at grades up to C</b></p> <p><b>Indicative descriptive points may include:</b></p> <ul style="list-style-type: none"> <li>• mouldy/rotten</li> <li>• soft</li> <li>• starting to sprout/roots growing</li> <li>• damage by pests.</li> </ul> <p><b>Indicative scientific points may include:</b></p> <ul style="list-style-type: none"> <li>• store in cool temperatures to prevent the growth of bacteria or fungi or to slow down enzyme activity</li> <li>• warm temperatures cause the carrots to sweat which can encourage growth of micro-organisms</li> <li>• freezing carrots can destroy cell structure and cause carrots to become soft</li> <li>• store in a sealed container to prevent pest attack</li> <li>• removal of oxygen prevents respiration of pests and micro-organisms</li> <li>• store in a dry place to prevent growth of micro-organisms but not too dry or they will lose their texture.</li> </ul>

Question		CBT Question Numbers	Answer	Marks	Guidance
6	(a)	6	the number of whitefly increase initially then decrease; it takes time for the number of <i>Encarsia formosa</i> to breed so whitefly increase; (after 5 weeks) the <i>Encarsia</i> start to kill/eat/remove the whitefly so numbers decrease.	3	
	(b)	7	(yes)there were fewer whitefly when marigolds were present; (no) the number of whitefly still increased even when marigolds were present; no test for a chemical has been made/maybe other factors are important/correlation not causation.	2	
7	(a)	8	<b>any two from:</b> the number of cats/dogs/pets (entering England) has increased since 2000; there was little change in the number of cats (entering England); fewer cats than dogs (entered England)	2	ORA
	(b)	8	3395	1	
	(c)	9	an organism that feeds off/lives off/sucks the blood of another (living) organism	1	
	(d)	9	in this time it will be possible to tell whether the dog has rabies or not/the dog can be destroyed if it has rabies; the rabies virus will not be spread;	2	

Question		CBT Question Numbers	Answer	Marks	Guidance
8		10	<p><b>Level 3 (5–6 marks)</b> A detailed description of the differences between organic and inorganic fertilisers as shown in the table, with an explanation of their uses. Quality of written communication does not impede communication of the science at this level.</p> <p><b>Level 2 (3–4 marks)</b> A description of most of the differences between organic and inorganic fertilisers as shown in the table, related to their uses. Quality of written communication partly impedes communication of the science at this level.</p> <p><b>Level 1 (1–2 marks)</b> A description of some differences between organic and inorganic fertiliser. Quality of written communication impedes communication of the science at this level.</p> <p><b>Level 0 (0 marks)</b> Insufficient or irrelevant science. Answer not worthy of credit.</p>	6	<p><b>This question is targeted at grades up to E</b></p> <p><b>Indicative scientific points may include:</b></p> <ul style="list-style-type: none"> <li>• Organic fertilisers contain lower levels of NPK</li> <li>• Organic fertilisers do not contain known levels of NPK and these levels cannot be altered to suit different purposes</li> <li>• Organic fertilisers contain trace elements such as Ca and Fe which are needed by plants in small quantities</li> <li>• Organic fertilisers are often slow release because they must rot down to release their nutrients. This means nutrients are available over a longer period of time and are less likely to be leached</li> <li>• Organic fertilisers improve the crumb structure of the soil which results in improved drainage, aeration and reduced erosion</li> <li>• Organic fertilisers are cheap and readily available if you live on a farm but can be bulky and harder to apply in domestic situations</li> <li>• Ideally a mixture of organic and inorganic fertilisers would be used to gain the best results.</li> </ul>

Question		CBT Question Numbers	Answer	Marks	Guidance
9		11	<b>any two from:</b> secure; in a basket/pen/cage; frequent stops; for exercise/food/water;	2	<b>reject</b> no food/ water in the car because it could make the animal sick.
10		12	low P; poor root growth/purple leaves/poor production of DNA/cell membranes	2	<b>accept</b> P is needed for growth for 1 mark.
11		13	<b>any two from:</b> exercise/swimming; able to behave naturally; food; so he can clean out the tank	2	
12	(a)	14	to check they are healthy; to make sure they are not under or overweight/check they are eating properly; to check how much they can be sold for.	1	
	(b)	14	calibrate them using an object of known mass/ weight/bag of sugar etc.	1	<b>accept</b> weigh three times
	(c)	15	grit; needed to grind up pellets for the gizzard	2	
	(d)	(i)	<b>X</b> placed in the third box along; turkeys have reached their maximum mass/waste of money to feed them if they are not getting any bigger	2	
		(ii)	<b>any two from:</b> different turkeys grow at different rates/turkeys are big enough to sell;	2	<b>accept</b> idea of the law of diminishing returns

Question			CBT Question Numbers	Answer	Marks	Guidance
				she needs the money; some people want a small turkey; not enough space; some people want to raise their own turkey		

Question		CBT Question Numbers	Answer	Marks	Guidance
13		17	<p><b>Level 3 (5–6 marks)</b> A comprehensive account of the care of the rabbit during pregnancy and the rabbit and its young after the birth. Quality of written communication does not impede communication of the science at this level.</p> <p><b>Level 2 (3–4 marks)</b> An account, with some technical detail, of the care of the rabbit during pregnancy and the rabbit and its young after the birth. Quality of written communication partly impedes communication of the science at this level.</p> <p><b>Level 1 (1–2 marks)</b> A limited account of the care of a rabbit. Quality of written communication impedes communication of the science at this level.</p> <p><b>Level 0 (0 marks)</b> Insufficient or irrelevant science. Answer not worthy of credit.</p>	6	<p><b>This question is targeted at grades up to C</b></p> <p><b>Indicative scientific points may include:</b> <b>Candidates are not expected to know the terms doe and kit.</b></p> <ul style="list-style-type: none"> <li>• The doe should be in a suitable enclosure. She will need a hutch and a run</li> <li>• The doe should be separated from all other rabbits during her pregnancy and whilst she is weaning her kits</li> <li>• The hutch should be draught free to prevent the kits losing too much heat</li> <li>• The hutch should be dry to stop the kits getting cold</li> <li>• The hutch should be clean to prevent the spread of disease</li> <li>• The run will enable the doe to spend time away from the kits</li> <li>• During pregnancy and whilst she is feeding the kits, the doe should be given access to lots of high quality food such as hay, pellets, grass and vegetables to keep her healthy and provide the extra energy she requires</li> <li>• Extra hay should be provided in case it is needed for a nesting material</li> <li>• After giving birth the doe and kits should be checked regularly but without disturbing them too much</li> <li>• Ensure the doe is not stressed so that she does not reject her kits.</li> </ul>

Question			CBT Question Numbers	Answer	Marks	Guidance
						Use the L1, L2, L3 annotations in Scoris; do not use ticks.
				<b>Paper Total</b>	<b>50</b>	

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