

Environmental and Land Based Science

General Certificate of Secondary Education

Unit **B681/01** Management of the Natural Environment (Foundation Tier)

Mark Scheme for January 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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Annotations

Used in the detailed Mark Scheme:

Annotation	Meaning
/	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

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.

E.g.

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.

- 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, e.g. 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, 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.

E.g. 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	✓	x	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	x		✓		✓	✓		✓	
Score:	2	2	1	1	1	1	0	0	0	NR

MARK SCHEME:

Question		CBT Question Numbers	Answer	Mark	Guidance
1		1	B: help to mix the soil layer D: improve drainage E: increase activity of soli microbes	3	
2		2	C: clay, sand, silt	1	
3		3	Pigs fed on natural materials / no additives; They only rear pigs	2	
4		4	✓: to increase the amount of light getting to the crop ✓: to reduce competition for nutrients and water	2	
5		5	A: conservation	1	
6		6	N between 'ammonia' and 'nitrates' F between 'nitrogen gas in air' and 'absorption by legumes (beans)'	2	
7		7	Any two from: Reduce drainage (OWTTE); Reduce airspaces (OWTTE); Increase run off (OWTTE); Fewer soil organisms (OWTTE)	2	Accept a decrease in fertility
8		8	Any two from: Reduction in pollination / reduction in seeds / reduced flowers; Change in food supply / affects the food chain for birds / animals; Changes to plant diversity	2	Accept other reasoned answers Accept two distinct effects or one effect explained for two marks
9	(a)	9	Any two from: Historical record for next year; Check how close to blueprint; Check growing conditions not too hot / cold; Save energy / costs	2	Accept right growing conditions
	(b)	9	Thermostat / aspirated screen	1	Accept thermometer / thermal sensor

Question		CBT Question Numbers	Answer	Mark	Guidance
10		10	<p>[Level 3] A well structured response, describing a range of relevant points from the list opposite that would lead to a range of valid results. 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] Give a description of sufficient stages to produce a valid result. 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] Gives a description that includes some of the stages necessary to produce a valid result. Answer may be simplistic. There may be limited use of specialist terms. Errors of grammar, punctuation and spelling prevent communication of the Science. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant Science. (0 marks)</p>	6	<p>Relevant points include:</p> <p>the need to take a range of samples in a 'W' shape</p> <p>take samples just below the soil surface</p> <p>do not handle samples with fingers</p> <p>add soil to tube</p> <p>add barium sulphate</p> <p>top up with (de-ionised) distilled water and shake</p> <p>add indicator solution and shake</p> <p>allow to settle</p> <p>compare pH to colour chart</p> <p>alternative references to use of a pH probe / cleaning of probe before use / sampling below surface etc.</p>
11	(a)	11	C: watering the grass on the course	1	

Question		CBT Question Numbers	Answer	Mark	Guidance
11	(b)	12	C: 2400m ³	1	
11	(c)	13	29 days	1	Accept 29.2 days / 30 days Allow ECF from previous question
11	(d)	14	Any three from: Select drought resistant grasses; Improved nozzles / application methods; Apply in morning / evening / don't apply at midday; Don't apply if rain imminent; Recycle water; Check soil conditions	3	Accept watch the weather forecast; Accept build bigger reservoirs / lakes; Accept water saving technology for toilets (OWTTE); Accept use less water for machinery washing
12	(a)	15	Caged	1	
12	(b)	15	Free Range	1	
12	(c)	15	19.8 million	1	Accept 20 million
12	(d)	16	93p	1	Accept £0.93
12	(e)	16	30.7p	1	Accept £0.307 Allow ECF from previous question
12	(f)	16	Any three from: Increase in space needed for same amount of production; Egg prices would rise; Existing buildings / equipment would be redundant; More labour needed; Increase feed costs	3	

Question	CBT Question Numbers	Answer	Mark	Guidance
13	17	<p>[Level 3] A well structured response, explaining a wide range of relevant points including advantages and disadvantages. To include abiotic and biotic 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] Covers a range of environmental impacts, both advantages and disadvantages. 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] Covers a limited range of environmental impacts. May be either advantages or disadvantages, Answer may be simplistic. There may be limited use of specialist terms. Errors of grammar, punctuation and spelling prevent communication of the Science. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant Science. (0 marks)</p>	6	<p>Relevant points include:</p> <p>Advantages: windbreaks will reduce the speed of the wind in the crop / reduce transpiration rate windbreak gives shelter from frosts act as security to the field habitat for beneficial organisms reduces soil erosion aids pollination by insects</p> <p>Disadvantages: competition (for nutrients / water / light) high winds might cause damage (wind funnelling) windbreaks might shade the crop might cause frost pockets might harbour pests or diseases need pruning take up space which could be used for growing a crop</p>

Question	CBT Question Numbers	Answer	Mark	Guidance
14		<p>18</p> <p>[Level 3] A well structured response, explaining a wide range of relevant points with developed explanation. 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] Range of points with some explanation. 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] Some points listed with no or very little explanation. Answer may be simplistic. There may be limited use of specialist terms. Errors of grammar, punctuation and spelling prevent communication of the Science. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant Science. (0 marks)</p>	6	<p>Relevant points include:</p> <p>good eyesight</p> <p>strong flier</p> <p>large size / competes well for food</p> <p>eats a wide range of items</p> <p>not afraid of humans</p> <p>can use buildings as nest sites</p> <p>strong beak for pecking/ tearing open rubbish bags</p> <p>more waste food inland</p> <p>fewer predators inland.</p> <p>has used its intelligence to adapt to new feeding opportunities (OWTTE) / opportunist</p> <p>decline of fish in the sea / fishing industry</p>
		Total	50	

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