

Environmental and Land-Based Science

General Certificate of Secondary Education

Unit **B493/02**: Management of the Natural Environment (Higher Tier)

Mark Scheme for January 2012

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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

- If a candidate alters his/her response, examiners should accept the alteration.
- 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 checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<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

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	(a)	1	clay	1	
	(b)	1	humus	1	
2		2	deposition erosion	2	
3		3	A bird watching C walking	2	
4		4	monitor concentration analyse	2	all three for 2 marks. 2 correct for 1 mark.
5		5	C nutrients are more available E soil microorganisms are encouraged	2	
6		6	1 mark for way and 1 mark for effect from: burrowing – improve drainage; improve air content; egestion / feeding / excretion – improve water holding capacity; mineral / nutrient content; improve crumb structure	2	
7	(a)	7	less use to reduce carbon dioxide / CO ₂ emissions; increased use of other fuels; government policy	1	
	(b)	7	two of: wind; solar; biomass (for one mark)	1	two answers required for one mark.
8	(a)	8	spread weight – less pressure	1	
	(b)	8	large / wide tyres / do not use in wet conditions	1	accept: Lower tyre pressure reject: Drive over same track
9	(a)	9	pasture / amenity / ley / heath	1	accept: Park / cattle grazing land
	(b)	9	deciduous will support many more species of plant and animal than coniferous.	1	accept: Reference to soil quality

Question		CBT Question Numbers	Answer	Mark	Guidance
10		10	two of: build up of toxins in (drinking) water; food chains; loss of diversity	2	reject eutrophication
11		11	two of: timely planting to avoid periods when pests do most damage; companion planting; trapping or picking pests; providing habitats for natural predators	2	accept netting / controlled environment (polytunnel) / biological control / natural pesticides / GM pest resistant crops
12	(a)	12	year 1996 – 2 chicks year 1997 – 8 chicks year 2000 – 25 chicks year 2002 – 44 chicks	1	correct bars filled in on the graph
	(b)	13	8 breeding pairs	1	
	(c)	13	2 128 (number fledged) divided by 64 (number of breeding pairs)	1	ECF the number given for part (b) should be added to 56 to give the number of breeding pairs
13	(a)	14	26 (years)	1	
	(b)	14	1890 (units of electricity)	1	
14		15	12.5 % (10 divided by 80 multiplied by 100)	1	
15		16	three of: nitrogen fixing bacteria in root nodules of legumes convert nitrogen into ammonia (fixation); nitrifying bacteria in soil oxidise ammonia / nitrates to form nitrates (nitrification); energy from lightning breaks nitrogen molecules enabling (combination with oxygen to form) nitrogen oxides which dissolve in rain to form nitrates	3	one mark for each

Question		CBT Question Numbers	Answer	Mark	Guidance
16		17	close supervision, large groups split into small groups each with leader known to pupils; leader of each group understands hazards and control measures; overall leader remains in touch with all groups; pre-visit; risk assessment; dangerous areas to be avoided; farmer is aware of timings	2	accept reference to suitable clothing / foot wear accept descriptions of appropriate ways of minimising specific risks.
17		18	change from spring-sown to autumn-sown cereals and the subsequent loss of winter stubble insecticide use reducing invertebrate populations conversion of pasture to arable land and the resultant decline in soil invertebrate numbers and nest sites land drainage making soil dwelling invertebrates less accessible availability of nest sites due to removal of hedgerows farming has become more specialised [fewer mixed farms] so unable to find all needs (food / nest site) in one area farming has become more intensive – constant use of land use means fewer nest sites habitats such as chalk grassland, meadows, pastures, heath land and river and coastal grasslands have been lost through conversion to other land use	3	one mark (up to a maximum of three) for each valid points with rational
			Total	36	

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