

# **Environmental and Land-Based Science**

General Certificate of Secondary Education

Unit **B493/04**: Management of the Natural Environment (Higher Tier)

## **Mark Scheme for June 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.

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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

Annotation	Meaning
	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

Annotation	Meaning
	no benefit of doubt
	reject
	correct response
	draw attention to particular part of candidate's response
	information omitted

Question		CBT	Answer	Mark	Guidance
1		1	leave an unsprayed strip around the field edges  spray when the air is still	2	
2		2	<pre>                     graph LR                         F[fertiliser] --- A1[builds up in food chains, so damaging predators]                         H[herbicide] --- A2[causes excessive plant growth in streams and rivers, so reducing light levels]                         P[pesticide] --- A3[kills some plants needed by animals, so reducing biodiversity]                         P --- A4[prevents sunlight reaching leaves, so reducing photosynthesis]                     </pre>	2	all three correct for two marks  one or two correct for one mark
3		3	crops  solar	2	one mark for each correct answer
4		4	it feels sticky when wet  it retains nutrients	2	one mark for each correct answer
5		5	<b>A</b> denitrifying	1	
6		6	<b>A</b>	1	

Question	CBT	Answer	Mark	Guidance
7		7 quicker to do; can be selective; persistent; can be pre-emergent; less labour intensive; OWTTE  comments on answer: hoeing can be selective	2	<b>reject</b> cost unless qualified in terms of time; easier; more effective; works quicker  <b>accept</b> less labour
8	(a)	8 to ensure all water has been lost OWTTE	1	<b>not</b> it gives an inaccurate result / because mass changes / fair test
	(b)	8 mass at step 2 minus mass at step 5 / mass of soil minus mass of dried soil	1	award mark if calculation of percentage given
9		9 <b>any two of:</b> leisure; buffer zone; habitat	2	<b>accept</b> any correct answers  <b>accept</b> increase biodiversity
10	(a)	10 <b>any two of:</b> change of government policy; change of funding; an increasing world demand for oil / increase in oil price; technological advances; greater efficiency in particular energy source	2	<b>both</b> points need to be <b>qualified</b> by <b>linking</b> to changes in production of renewable energy sources  one mark for two unqualified reasons
	(b)	11 2.1 – 0.2 divided by 0.2 x 100 = 950%	2	two marks for correct answer. One mark for correct formula with wrong answer / 0.95 <b>accept</b> * for times (computer notation) reject ORA
	(c)	12 <b>any one from:</b> lack of suitable sites; cost; environmental impact; construction time; lack of technology	1	<b>accept</b> some European countries are landlocked

Question		CBT	Answer	Mark	Guidance
11		13	<b>any two from:</b> application of fertiliser at wrong time of year; allowing silage / milk to get into stream; excessive fertiliser use; run off from manure / slurry	2	for each practice, one mark for process <b>and</b> explanation one mark for two processes without explanation
12		14	<b>any two of:</b> legislation preventing development; increasing taxes on green field developments; green belts; development of brown field sites; financial penalties / incentives	2	<b>accept</b> income / fund
13	(a)	15	29 584 km [506 584 – 477 000]	1	
	(b)	15	<b>B</b> 5.8%	1	
14	(a)	16	0.08	1	
	(b)	16	0.62	1	<b>allow</b> 0.615 / 0.61 / 0.6
15	(a)	17	oxygen concentration; temperature; pH; conductivity / mineral concentration / nutrients; light intensity; turbidity	1	1 mark for identifying <b>two</b> environmental conditions that could be monitored <b>reject</b> pollution / depth / water level
	(b)	17	<b>probe</b> (monitor) connected to <b>data logger</b> ; download information to <b>computer</b> for analysis	2	1 mark for monitor to data logger 1 mark for computer for analysis <b>reject</b> ref to data base

Question		CBT	Answer	Mark	Guidance
16		18	<p><b>for:</b> crops can be improved; increases growing area; pests and resistance; drug production; reduced fertiliser use; longer storage; shorter growing time; drought resistance</p> <p><b>against:</b> cross-pollination with wild species; long term impact on human health / other species; could result in super organisms / super weeds; monoculture; implications of biotech monopoly on seeds; increased herbicide use</p>	4	<p>maximum 3 for / against</p> <p><b>accept</b> greater yield</p> <p><b>accept</b> unethical / morally wrong</p>
			<b>Paper Total</b>	<b>36</b>	



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