

Environmental and Land Based Science

General Certificate of Secondary Education

Unit **B491/02/04**: Plant Cultivation (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.

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.

<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, 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

Question		CBT Question Numbers	Answer	Mark	Guidance
1		1	D protects the flower whilst in bud	1	
2		2	C nitrogen for growth	1	
3		3	bulbs – short stem with overlapping leaves rhizomes – underground stem runners – above ground stems	2	one mark for one correct answer two marks for all three correct
4		4	D a fungal infection in humid conditions	1	
5		5	the pollen grain lands on the stamen the ovule develops into the fruit	2	
6		6	B few fruits and flowers	1	
7		7	testa; radicle	2	
8		8	two from: the name/species of plant; germination percentage/percentage yield; treatments/watering/feeding; dates planted/pricked out/potted on/ hardened off; which ones sold the best; how much they sold for; how much profit each plant made; diseases	2	ignore reference to pollination/genetics
9	(a)	9	Gg and gg	1	any letter can be used to represent the allele
	(b)	9	the parent pea plant with the green seeds must be heterozygous so will pass the dominant allele to one half of the F1 generation and the recessive allele to the other half/ Punnett square drawn to explain scenario	1	

Question		CBT Question Numbers	Answer	Mark	Guidance
10	(a)	10	to get an average/ conditions will vary each year/results more reliable	1	
	(b)	11	6.62	1	accept 6.6175/6.6 reject 6.61
	(c)	12	colder so fleece had a greater impact; greater number of pests/disease and fleece acted as a barrier OWTTE	1	
11		13	40 times	1	
12		14	description 1: pollination efficiency/yield was highest when the bees were in a cage; reason 1: the bees had no other food source; description 2: in the open field pollination efficiency was lower; reason 2: the bees could visit other flowers; description 3: when there is a cage and no bees pollination efficiency is lowest; reason 3: there are fewer insects to carry the pollen/bees are the most important pollinator	3	max 2 for descriptions max 2 for reasons
13		15	A there may not be another flower to allow pollination/ lack of insects to carry the pollen/more variation B inbreeding/ lack of variation/ inability to evolve	2	reject less successful allow reference to variation only once reject no variation/cloning
14	(a)	16	0:1:1/ lower nitrate	1	accept 1:1:2/ higher potash
	(b)	16	peas can fix nitrogen so do not need nitrate fertiliser	1	accept K is needed for growth of fruit/ peas
15		17	(Clay) particles stick together/flocculate; increases cation exchange/reduces leaching of nutrients/ makes some nutrients more soluble/ makes some nutrients less soluble/ ions become available	2	

Question		CBT Question Numbers	Answer	Mark	Guidance
16	(a)	18	£2,500	1	
	(b)	18	8	1	
17		19	maintains turgor	1	
18		20	clean/pest and disease free/ sealed; physical protection to prevent bruising; controlled temperature to prevent ripening/decay; controlled humidity to prevent drying out/ decay; low oxygen to prevent ripening/ respiration; low ethene/ethylene to prevent ripening; dark to prevent deterioration of colour/ flavour	3	accept correct responses relevant to specific examples
19		21	wear goggles; pesticide can damage your eyes; read instructions on the pesticide; to determine safe levels of use other PPE eg. suit gloves; pesticides can damage to skin; mask; prevent inhaling fumes open the vents/door of the greenhouse; to prevent inhaling fumes make sure no-one else is around/lock the door/put up a keep out sign; check pesticide has a recommendation for the pest and the crop	3	at least one reason is needed for 3 marks
				Total	36

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