

Environmental and Land Based Science

General Certificate of Secondary Education

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

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

Question		Answer	Mark	Guidance
1		P any where on leaf above seed; R anywhere on root below seed;	2	
2		C P;	1	
3		A 14;	1	
4		A improves structure;	1	
5		D more ventilation increases oxygen;	1	
6		Carbon dioxide concentration;humidity	2	
7		A carrot;	1	
8		D decreases pH;	1	
9		any three: humidity – too low dry out, too high rot; temperature – too high disease, too low freeze damage to tissue; sealed containers OWTTE – prevent pests; dark – prevent sprouting; low O ₂ high CO ₂ affects respiration; clean conditions prevents disease; removal of unhealthy potatoes re spread of rot;	3	three conditions with no qualification = 1 mark allow correct temperature/humidity reject goes off reject controlled atmosphere without qualification
10		Two from: pollen unable to land/pollinate; pollen tube unable to grow down the style; eggs or ovule not fertilised; no seeds formed;	2	accept ref. to disease if qualified

Question		Answer	Mark	Guidance
11		any two: improves drainage; improves root growth; aids water retention; increase number of soil organisms; prevents soil erosion; increases soil fertility; improves aeration;	2	
12		Rr and rr;	1	
13		less water wastage/less evaporation; application easier to control; water does not get to leaves so reduces leaf rot/ fungal infection; reduced chance of soil erosion; water gets to roots where it is absorbed; easier to add nutrients in solution;	2	
14		any two: suck nutrients so less for plant growth; pierce leaf so disease enters/loss of water; feed from plant to plant spread disease/virus; sooty mould reduces light entry for photosynthesis; piercing damage causes growth distortion;	2	
15	(a)	5.3 months;	1	need months for mark
	(b)	10	1	
16		any three: (decrease in % peat use 94% to 75%); but more, 15900 m ³ used by gardeners; ditto local auth. 95% to 70%, up 200 m ³ ; private sector % same, use up 6300 m ³ ; private sector not using alternatives; alternatives all up eg but so is peat use eg	3	use relevant data from table

Question		Answer	Mark	Guidance
17		inaccurate temperature; viability of seed; other conditions for germination not met; disease; over/under watering;	1	reject human error unless qualified
18		pollination requires vibration/wind; less insects inside poly tunnel;	2	reject plants closer together
19		by runner/stolon; develops plantlet; roots in soil; runner breaks off/dies; new plant is genetically identical to/clone of parent;	3	
20		pollen tube grows; passes down style; nuclei fuse/fertilisation at ovule; seed formed; ovary develops around seed; fruit formation;	3	reject reference to pollination allow fusion to produce embryo
		Total	36	

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