

# **Additional Applied Science A**

General Certificate of Secondary Education

Unit **A334/02**: Agriculture and Food

## **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
<b>not/reject</b>	answers which are not worthy of credit
<b>ignore</b>	statements which are irrelevant - applies to neutral answers
<b>allow/accept</b>	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 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

<b>Edinburgh</b>	
<b>Manchester</b>	
<b>Paris</b>	
<b>Southampton</b>	

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).

<b>Edinburgh</b>			✓			✓	✓	✓	✓	
<b>Manchester</b>	✓	x	✓	✓	✓				✓	
<b>Paris</b>				✓	✓		✓	✓	✓	
<b>Southampton</b>	✓	x		✓		✓	✓		✓	
<b>Score:</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NR</b>

Question			Answer	Mark	Guidance
1	(a)	(i)	3200	1	
		(ii)	easy to harvest; easy to spray/ cover/ look after; if one tree fails , not a big problem; more trees; quicker to start producing fruit; better chance of pollination; more money; less damage from wind	1	two answers required for one mark
	(b)		sugar/glucose = alcohol and carbon dioxide	1	<b>ignore</b> reference to pears and yeast
	(c)	(i)	tissue culture	1	<b>accept</b> micro-propagation/ cloning
		(ii)	plant growth stimulant/rooting powder; plant hormone; auxin	1	<b>reject</b> nutrients
2	(a)		0.5; 1/2	1	
	(b)		crop yield does not vary; flowers/produces seeds/ harvest at same time; regularly produces 3kg seed a year	2	<b>any two</b>
	(c)		artificial insemination <input type="checkbox"/> processing <input type="checkbox"/> selective breeding <input checked="" type="checkbox"/> surrogate parents <input type="checkbox"/>	1	if more than one tick ... no marks

Question		Answer	Mark	Guidance
	(d) (i)	<b>A</b>	1	
	(ii)	<b>C/ B and C</b> but not <b>B</b> on its own	1	
	(iii)	<b>B and C</b>	1	
	(e)	<b>temperature/heat/warmth</b> Heater and control such as automation; <b>ventilation;</b> fans/ windows and control such as automation eg sensor/ thermostat <b>carbon dioxide;</b> sensor plus burn fossil fuel; <b>water/ moisture</b> sprinkler/ watering and control such as automation, timing controlled; <b>light;</b> lighting/ shading and control such as automation	2	one mark for condition one mark for control (must match)
<b>3</b>	(a) (i)	grow faster/quicker ; grow all year round; are bigger	1	<b>two required for one mark</b>  <b>accept</b> not exposed to disease/ predators in the wild
	(ii)	better flavour/ more eggs/keeps longer/ resistant to pests/ disease/live longer/colour/ reproduce more than once/ eats less food	1	<b>reject</b> bigger
	(b)	give optimum levels of food for best growth protect from predators so no losses ensures supply of salmon to markets all year round less energy used for movement so faster growth	1	<b>accept</b> can control conditions for growth can monitor their progress can control size requires less food

Question		Answer	Mark	Guidance	
	(c)	gene cut out/ taken out; of DNA/ chromosome; by enzymes; inserted into DNA/chromosome of different organism	3	any three	
	(d)	proteins (of the introduced gene)/enzymes	1	<b>accept</b> (growth ) hormone	
	(e)	explanation of a subsidy/ Government provides money; afford more fish farms/ so more salmon; so cheaper; so more likely to buy; links marketing/ advertising product to increased sales	2	<b>any two</b>	
	(f)	yeast; chymosin (in cheese)	2	<b>accept</b> other valid examples	
<b>4</b>	(a)	(i)	pathogens	1	
		(ii)	links no/less disease with faster growth/ no deaths/ more money	1	
	(b)	(i)	ovary/brain/pituitary	1	
		(ii)	menstruation/oestrous cycle	1	
		(iii)	controls time of egg release/ bring into mating season/heat	1	<b>allow</b> super-ovulation
		(iv)	control timing of birth/pregnancy; timing of market for sales; booking vet; arrange births at same time	2	any two

Question		Answer	Mark	Guidance
	(c) (i)	select animal/bull; get sperm; freeze it; manually insert; into uterus; at correct time	3	any three
	(ii)	can choose parents/ characteristics/ choose timing for birth/more chance of successful fertilisation/ no need to keep bull/ cows not damaged during fertilisation/ avoids sexually transmitted diseases	1	
		Total	36	

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