

Additional Applied Science A

General Certificate of Secondary Education **A334/02**

Unit 2: Agriculture and Food

Mark Scheme for June 2010

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Any enquiries about publications should be addressed to:

OCR Publications
PO Box 5050
Annesley
NOTTINGHAM
NG15 0DL

Telephone: 0870 770 6622
Facsimile: 01223 552610
E-mail: publications@ocr.org.uk

Question	Expected Answers	Mks	Additional Guidance
1 a	only the fruit/ seeds/ parts of the plant are picked/ the plant survives owtte , ora	[1]	reject answers based only on examples
b	easy to pick/ harvest; less chance of being damaged by pests; won't get dirty (from the soil)/less contamination; fewer weeds/ easier to remove weeds/less competition watered automatically/ watered regularly/ water controlled/ all get same amount; can put special/ good/ soil or compost in plastic bags; need less water/ no water loss from plastic bags; fertilisers can be given automatically (in water)all get same amount;	[2]	any two treat answers such as better/ bigger crop/ keeps them fresh/organic/ protected/ to get more sunlight/more water/more nutrients/ warmer as neutral
c	growing; (1) processing (1)	[2]	reject examples
d	low/ cool temperature / refrigerated; good ventilation; dry; not squashed together; clean; irradiated;	[2]	any two allow covered/in containers/ pest free ignore references to freezing/ to time/ right temperature/ sealed/plastic bag
e i	don't need clean water for crop/ can use sea water/ fewer bacteria/fewer pests/ cheap source;	[1]	
	ii DNA/ gene; gene for resistance cut out from bacterial DNA; by (ligase) enzymes; put into <u>chromosome/DNA</u> of strawberry plant cell; new gene/gene for resistance produces protein/ enzyme;	[3]	any three points
		[11]	

Question		Expected Answers	Mks	Additional Guidance	
2	a	<p>artificial insemination <input checked="" type="checkbox"/></p> <p>batch culture <input type="checkbox"/></p> <p>organic farming <input type="checkbox"/></p> <p>tissue culture <input type="checkbox"/></p>	[1]	if both a correct and incorrect box is ticked no marks	
	b	<p>temperature;</p> <p>shelter/ exposure/ available space;</p> <p>food;</p> <p>water;</p> <p>pests;</p> <p>disease/health;</p> <p>stress;</p> <p>genetic factors/ size of parents;</p> <p>different metabolic rates;</p> <p>gender;</p> <p>age;</p>	[2]	<p>three correct = 2 marks</p> <p>two correct = 1 marks</p> <p>ignore references to environment/ habitat/ exercise/ weather</p>	
	c	i	<p>vicuna wool (1)</p> <p>only produces 95g per year/same amount as cashmere but takes two years (1)</p>	[2]	<p>reject copied information "gives 190g in 2 years"</p> <p>allow "longer time to make less wool"</p>
		ii	<p>few vicunas;</p> <p>small amount produced;</p> <p>only harvested every two years/ takes a long time to grow;</p> <p>high demand;</p>	[2]	any two
			[7]		

Question		Expected Answers	Mks	Additional Guidance
3	a	prevent contamination;(1) prevent spread of disease/infection/ microorganisms;(1)	[2]	ignore clean/ sterile
	b	turbidity; (1) biomass; (1)	[2]	allow descriptions allow use of colorimeter allow weight/mass
c	i	lag; exponential/log; stationary; decline/death	[2]	3 or 4 correct = 2 marks 2 correct =1 marks reject descriptions
	ii	new cells/ individuals produced balanced by death owtte	[1]	
d		sugar level dropped then levelled; alcohol levels rose then levelled; sugar level decreases as alcohol level increases; sugar converted into alcohol; after 8 days sugar all used/ fermentation stops; after 8 days no more alcohol produced; yeast produces alcohol;	[3]	any three points
e		continuous (culture)	[1]	
			[11]	

Question		Expected Answers	Mks	Additional Guidance	
4	a	i	seeds have supply of food/ photosynthesis does not take place/ no chlorophyll/ seeds don't have (green) leaves	[1]	
		ii	oxygen AND water	[1]	both answers required allow minerals/ nutrients as part of the answer
	b	i	carbon dioxide , water (either order) glucose , oxygen (either order)	[1]	all correct for 1 mark allow correct and balanced symbol equation
ii		a condition that, when it is in short supply, stops/ slows down the rate of photosynthesis increasing	[1]	reject limits/ slows down photosynthesis	
iii		carbon dioxide	[1]	allow water	
c		advantage can control water/ air/ minerals/ minerals not lost/ don't need soil/ no microorganisms or pests <u>in inert material</u> / can be automated/ less manual labour/ water recycled/ minerals recycled/ can grow a lot in a small space (1)	[2]	allow can be grown throughout year	
		disadvantage plants need support/ only good for small plants/needs electric supply/ diseases easily spread (1)			
			[7]		
Total			[36]		

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Customer Contact Centre

14 – 19 Qualifications (General)

Telephone: 01223 553998

Facsimile: 01223 552627

Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

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Telephone: 01223 552552
Facsimile: 01223 552553

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