

Additional Applied Science A

General Certificate of Secondary Education

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

Mark Scheme for June 2011

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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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1 Abbreviations, annotations and conventions used in the detailed Mark Scheme.

/	= alternative and acceptable answers for the same marking point
(1)	= separates marking points
not	= answers which are not worthy of credit
reject	= answers which are not worthy of credit
ignore	= statements which are irrelevant
allow	= answers that can be accepted
()	= words which are not essential to gain credit
<u> </u>	= underlined words must be present in answer to score a mark
ecf	= error carried forward
AW	= alternative wording
ora	= or reverse argument

Question		Answers	Marks	Guidance
1	a	germination fertilisation dispersal(of seeds and fruits)/germination	2	3 correct = 2 2 correct =1 1 correct =0 must be in correct sequence if germination in second empty box, then no credit for 3 rd empty box more than 2 ticks deduct a mark for each incorrect answer
	b	after 50 years beech between 90 and 100... 90 years at 50 years in the first 25 years	2	
	c	0.3	1	accept values from 0.28 – 0.32
	d	less growth after 50 years/ more growth before 50 years/ optimum growth finished/	1	do not accept the idea that they <u>are</u> fully grown, rather the idea that <u>most</u> or almost all of the growth has occurred
	e	poor soil (1) wrong pH of soil (1) lack of water (1) lack of minerals or nutrients (1) exposure to wind (1) too hot / too cold temperatures (1) pests (1) diseases (1) overcrowding / competition (1) natural disasters (1) pollution (1)	2	any two ignore vague answers referring to weather ignore sunlight ignore “temperature” on its own
		Total	[8]	

Question			Answers	Marks	Guidance
2	a	i	photosynthesis	1	
	a	ii	water and carbon dioxide (1) glucose and oxygen (1)	2	in any order accept food/sugar instead of glucose accept symbols if correct
	b		sugar used (as food)(1) in respiration (1) carbon dioxide given off (1) forming bubbles in the dough(1)	2	any two
	c		less wheat or bread produced / poor harvest/ less available (1) higher demand (1) increased fuel/ transport/equipment costs (1) increased cost of wheat (1) so more expensive (1)	2	supply and demand = 2 marks do not give a mark for 'no wheat grown in winter' accept reverse argument reject cheaper or more expensive if no attempt has been made to give a reason
			Total	[7]	

Question		Answers	Marks	Guidance
3	a	<p><i>advantages, any 2 from.....</i> eat less grass/ less food/ leaner meat /keep more in same space(1)</p> <p><i>disadvantages, any 2 from.....</i> have to alter or buy milking machines/ alter fences/ lower yield of meat or milk</p>	2	give 1 mark for 1 advantage and 1 disadvantage. i.e. any two or three correct = 1 mark
	b	temperature; shelter; food; water; pests; diseases; breed/genes/genetics; space/exercise;	2	any two ignore gender
	c	organic/free range; intensive	1	both required
	d	i	3	ignore 'mini' or 'desirable characteristics'
		select small cattle (1) breed/mate from them (1) repeat for many generations (1) correct reference to inbreeding (1)		
	d	ii	1	accept correct reference to inbreeding/might cause health problems
	e	oestrous/ menstruation cycle/reproductive cycle(1) affects egg release/in season/ on 'heat' (1) farmer can control the time of ovulation/ birth/readiness for market (1)	3	accept idea of super-ovulation accept the idea of the farmer treating the whole/part of the herd at the same time
		Total	[12]	

Question		Answers	Marks	Guidance
4	a	DNA	1	
	b	tomato plants and snapdragon(<i>Antirrhinum</i>)	1	both required accept idea of vector organism ie virus/ bacterium to carry snapdragon DNA into tomato plant
	c	gene(s) (1) for anthocyanins/ purple colour (1) cut from DNA/ genetic material/ chromosome (of snapdragon) (1) use of vector (1) and inserted into DNA/ genetic material/ chromosome (of tomato plant) (1)	3	accept the correct use of enzymes in any part.
	d	<i>any two from</i> gene or DNA codes (1) to make a protein (1) enzyme (to make anthocyanins) (1)	2	
	e	to ensure no escape/ spread of genetic modification to other plants/ quality;	1	accept references to harm to the environment
	f	fermentation/ to mass produce microorganisms/ single celled protein/ IVF/ embryo transplants	1	ignore refs to medicine accept alcohol production (not brewing alone)/yoghurt/cheese/bread making
		Total	[9]	
		Paper total	[36]	

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