



**GCSE**

**Environmental and Land Based Science**

Unit **B683/02**: Commercial Horticulture, Agriculture and  
Livestock Husbandry (Higher Tier)

General Certificate of Secondary Education

**Mark Scheme for June 2017**

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, Cambridge Nationals, Cambridge Technicals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support, which keep pace with the changing needs of today's society.

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.

© OCR 2017

**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
—	= underlined words must be present in answer to score a mark
ecf	= error carried forward
AW	= alternative wording
ora	= or reverse argument

**Annotations: the following annotations are available on RM ASSESSOR.**

✓	= correct response
×	= incorrect response
bod	= benefit of the doubt
nbod	= benefit of the doubt <b>not</b> given
ECF	= error carried forward
^	= information omitted
I	= ignore
R	= reject

Highlighting is also available to highlight any particular points on the script.

The following questions should be annotated with ticks to show where marks have been awarded in the body of the text:

Expected Answers			Marks	Additional Guidance
1	(a)(i)	C	1	
1	(a)(ii)	Any <b>two</b> from: Cylinder mowers –  Cut the grass much shorter Cut the grass with less tearing Roll the grass at the same time Pick up the cut grass Rear roller compresses the soil ( smoother surface) No wheel marks	2	<b>ECF</b> – Allow appropriate suggestions for the other mowers  Allow more complex descriptions about sharp blade cutting against a fixed edge ( bottom plate)
1	(b)	Any <b>one</b> from:  <b>Advantages</b> – no need for cables, plugs, power, access to more distant locations  <b>Disadvantages</b> – more maintenance, difficulty starting, need to buy fuel, heavier, noise /atmospheric pollution	1  1	

1	(c)	<b>Grass mixture</b>	<b>Lawn type</b>	2	2/3 correct 2 marks  1 correct 1 mark
		45% - Dwarf Rye Grass 45% - Creeping Fescue 5% - Bent	Family lawn		
		90% - Dwarf Fescue 10% - Bent	Bowling green /fine lawn		
		70% - Perennial Rye Grass 30% - Creeping Fescue	Football pitch		
1	(d)	£142. 40		2	If calculation partially correct – 1 mark (224m <sup>2</sup> and 15.68 kg) or if answer given as £139.55
1	(e)	Temperature Light levels		1 1	Allow reference to winter or summer ( 1 mark max) Reject reference to “growing season”
2	(a)	Any <b>two</b> from:  Pruning Dead heading Watering Feeding Mulching Protection in winter		2	

2	(b)	<p><b>LOR</b>  <b>[Level 3]</b>  A good description of the range of different features of trees at different times of the year together with a named example of each, Quality of written communication does not impede communication of the science at this level.  (5 – 6 marks)</p> <p><b>[Level 2]</b>  A description of the some range of different features of trees at different times of the year with some named examples. Quality of written communication partly impedes communication of the science at this level.  (3 – 4 marks)</p> <p><b>[Level 1]</b>  Names some features of trees at different times of the year. Quality of written communication impedes communication of the science at this level.  (1 – 2 marks)</p> <p><b>[Level 0]</b>  Insufficient or irrelevant science. Answer not worthy of credit.  (0 marks)</p>	6	<p><b>This question is targeted at grades up to C</b></p> <p><b>Indicative scientific points may include:</b></p> <ul style="list-style-type: none"> <li>• Evergreen trees for winter interest</li> <li>• Deciduous trees autumn colour</li> <li>• Trees with fruit / cones for autumn winter interest</li> <li>• Flowering trees</li> <li>• Trees with coloured / variegated leaves</li> <li>• Trees with coloured / textured bark</li> <li>• Trees with structural interest</li> <li>• Food source/ encourage wildlife</li> </ul> <ul style="list-style-type: none"> <li>• Credit given for named examples of the features described</li> </ul>
---	-----	--	---	--

3	(a)	Any <b>two</b> from:  Extends the growing season Grow crops not suitable for UK climate Protection from pests Allows greater environmental control Enables greater levels of automation Production can be planned more closely Uniform crop quality Greater yeild	2	Accept examples
3	(b)	Any <b>two</b> from:  Automatic window opening Thermostatic temperature control Automatic watering Blinds to reduce light levels Hydroponic systems More uniform - crop easier management	2	Answers must refer to <b>how</b> .  A:Reduction in costs associated with working anti-social hours  R: computer controlled without expansion.

4	(a)	<p><b>LOR</b>  <b>[Level 3]</b>  A good explanation of a range of reasons for breeds becoming at risk of extinction and why it is considered important to preserve them. Quality of written communication does not impede communication of the science at this level.  (5 – 6 marks)</p> <p><b>[Level 2]</b>  A description of a range of reasons for breeds becoming at risk of extinction and at least one reason it is considered important to preserve them. Quality of written communication partly impedes communication of the science at this level.  (3 – 4 marks)</p> <p><b>[Level 1]</b>  Identifies at least one reason breeds becoming at risk of extinction and/or one reason to preserve them. Quality of written communication impedes communication of the science at this level.  (1 – 2 marks)</p> <p><b>[Level 0]</b>  Insufficient or irrelevant science. Answer not worthy of credit.  (0 marks)</p>	6	<p><b>This question is targeted at grades up to A*</b></p> <p><b>Indicative scientific points may include:</b></p> <p><b>Reasons for breed being in danger -</b></p> <ul style="list-style-type: none"> <li>• Move to intensive production methods</li> <li>• Fashion</li> <li>• Changing eating habits ie lean meat</li> <li>• Economics</li> <li>• Move away from wool production</li> <li>• Selective breeding</li> <li>• Use of hybrids</li> <li>• Diseases such as Foot and Mouth</li> </ul> <p><b>Reasons to preserve breeds –</b></p> <ul style="list-style-type: none"> <li>• Maintaining gene pool</li> <li>• Future breeding needs (accept examples)</li> <li>• Change to extensive methods</li> <li>• Changing legislation</li> <li>• Future food security</li> <li>• Part of our heritage</li> </ul>
---	-----	--	---	--



4	(b)	<p>Any <b>two</b> from:</p> <p>Use drugs to encourage rare breed females to produce lots of eggs.</p> <p>Remove eggs from donor mother</p> <p>Insert donor (fertilized) eggs into donor females of a more common breed.</p>	2	
5	(a)	<p>Any <b>three</b> from:</p> <p>Animal needs to be in good condition to support the foetus</p> <p>Developing foetus needs energy from its mother</p> <p>Developing foetus needs protein to support growth</p> <p>Mother needs calcium to support foetal development and produce milk (risk of milk fever)</p> <p>Mother must not be over fed as this can cause the foetus to be too large</p> <p>High fibre diet to prevent constipation and risk of prolapse</p>	3	Accept other nutrients with reasons for

5	(b)	Any <b>one</b> from:  Cost of feeding bulls Danger of bulls Reduced disease transmission Ability to use best bloodlines. Introduce genetic variability onto the farm	1	
5	(c)(i)	Any <b>one</b> from:  Producing an offspring from a single parent (asexual reproduction)  Producing a genetically identical offspring	1	
5	(c)(ii)	Any <b>one</b> from:  Reduced gene pool Ethical worries	1	Allow responses which describe the impact e.g. common susceptibility to diseases.

6	(a)	<p>The more antibiotics are used the greater the occurrence of antibiotic resistance</p> <p>Decrease in anti-biotic use has not resulted in a (significant) decrease in antibiotic resistance.</p>	<p>1</p> <p>1</p>	<p>ALLOW antibiotics increase followed by increase in bacteria a year later, similar time lag when sale of antibiotics decreases</p>
6	(b)	<p>If low levels of antibiotic used not all bacteria die most resistant bacteria survive</p> <p>Resistant bacteria reproduce until a new resistant strain is produced</p>	<p>1</p> <p>1</p>	
6	(c)	22%	1	
6	(d)	<p>Any <b>one</b> from:</p> <p>Stop using antibiotics on healthy animals (prophylactics)</p> <p>May have to find alternatives to using antibiotics</p> <p>May need to find new antibiotics to which the bacteria are not resistant.</p>	2	

7	<p><b>LOR</b>  <b>[Level 3]</b>  A good explanation of how hormones influence the breeding cycle and lactation with reference to actual hormones and their roles.  Quality of written communication does not impede communication of the science at this level.  (5 – 6 marks)</p> <p><b>[Level 2]</b>  A description of the role of hormones in breeding and lactation with some hormones named.  Quality of written communication partly impedes communication of the science at this level.  (3 – 4 marks)</p> <p><b>[Level 1]</b>  A description of the role of hormones in breeding or lactation  Quality of written communication impedes communication of the science at this level.  (1 – 2 marks)</p> <p><b>[Level 0]</b>  Insufficient or irrelevant science. Answer not worthy of credit.  (0 marks)</p>	6	<p><b>This question is targeted at grades up to A*</b></p> <p><b>Indicative scientific points may include:</b></p> <p>General roles of hormones -</p> <ul style="list-style-type: none"> <li>• Hormones trigger oestrus (heat in the female)</li> <li>• Trigger sexual interest in the male</li> <li>• Cause changes in the female and male bodies resulting in sexual maturity</li> <li>• Cause changes in the female body such as egg release and changes in the uterus to accept the foetus</li> <li>• Inhibit milk production when not needed by a young animal</li> <li>• Trigger milk production when needed by the young animal</li> <li>• Hormone use as a tool by farmers eg sponges in sheep to synchronise ovulation.</li> </ul> <p>Specific hormone roles –</p> <ul style="list-style-type: none"> <li>• FSH – stimulates follicle development in the ovary's</li> <li>• Luteinising hormone –triggers ovulation and formation of the corpus luteum</li> <li>• Progesterone – stimulates changes to the uterus wall and inhibits lactation, falling levels stimulate lactation</li> <li>• Oestrogen- Stimulates oestrus (heat) Stimulates growth of reproductive organs in females during puberty</li> <li>• Prolactin – stimulates milk production</li> <li>• Oxytocin – suckling stimulates oxytocin which cause milk let down</li> <li>• Testosterone - Stimulates growth of reproductive organs in males during puberty, causes sperm production, increases libido.</li> </ul>
	<b>Total</b>	<b>50</b>	

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

**OCR Customer Contact Centre**

**Education and Learning**

Telephone: 01223 553998

Facsimile: 01223 552627

Email: [general.qualifications@ocr.org.uk](mailto:general.qualifications@ocr.org.uk)

**[www.ocr.org.uk](http://www.ocr.org.uk)**

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

**Oxford Cambridge and RSA Examinations**  
**is a Company Limited by Guarantee**  
**Registered in England**  
**Registered Office; 1 Hills Road, Cambridge, CB1 2EU**  
**Registered Company Number: 3484466**  
**OCR is an exempt Charity**

**OCR (Oxford Cambridge and RSA Examinations)**  
**Head office**  
**Telephone: 01223 552552**  
**Facsimile: 01223 552553**

© OCR 2017

