OCR
Oxford Cambridge and RSA

GCSE

Environmental and Land Based Science

Unit **B682/02:** Plant Cultivation and Small Animal Care (Higher Tier)

General Certificate of Secondary Education

Mark Scheme for June 2017

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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.

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 SCORIS.

✓ = correct response
✗ = incorrect response
bod = benefit of the doubt
nbod = benefit of the doubt **not** 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	Any **one** from: Protects embryo; Prevents dessication/drying out; Prevents damage by bacteria/fungi	1	**A** protect seed
1	b	Any **three** from: As temperature increases more seeds germinate OWTTE; Enzymes work better in warmer temperatures; At high temperatures the number of seeds germinating decreases/ no seeds germinate; Enzymes are denatured/destroyed	3	**R** enzymes are killed
1	c	Any **one** from: Water Oxygen Life in the embryo Correct named condition to break dormancy	1	**A** light **I** nutrients
2	a	Rooster Booster; High levels of potassium	2	
2	b	Grow Green; Ratio roughly 2:1:2	2	
2	c	See LOR mark scheme	6	
3	a	Aa	1	
3	b	Correct gametes/ Aa x Aa; Correct cross and genotype of F2; Correct ratio of phenotypes/ 3:1 (purple:white); Correct ratio of genotypes/ 1:2:1 (AA:Aa:aa)	4	**A** ecf if incorrect gametes used **A** ecf if incorrect cross
4		Any **three** from: Cells/sample from parent plant; Placed in agar; containing hormones; Callus formation; Separate cells; Differentiation (into root/shoot); Produce genetically identical/cloned (plantlets)	3	

5		Cloche; Any **one** from: Increases temperature/protects from frost; Protects from adverse weather/wind/rain; Protects from pests/diseases/named pest or disease; Extends growing season	2	
6		Check on the mother and babies regularly (second box)	1	
7	a	More people owned pets in 2012; Dogs/cats are the most popular pets or rabbits/poultry/guinea pigs are the least popular Dog/cat/rabbit/most of pets decrease in number; Poultry stay the same; Guinea pigs increase; Correct data stated	3	
7	b	See LOR mark scheme	6	
8	a	(Diagram A shows) inbreeding because it is breeding between two closely related individuals/ a father with his daughter; (Diagram B shows) line breeding because it is breeding with two related individuals/ an aunt with her nephew	2	
8	b	Dog S1 with any dog except his offspring	1	
8	c	See LOR mark scheme	6	
9	a	Pellets cost £5.00/ Crumble cost £4.50; £0.50 more to feed pellets	2	**A** Cost of crumble: £4.50 - £4.80 **A** £0.20-50 1 mark awarded if correct cost of feeding one feed type calculated
9	b	Any two from: Only used three hens/one hen for each feed type/ should have used more hens; Each feed might contain different levels of nutrients; Each hen might have been kept in different conditions/ should have been kept in the same conditions/ hens should be kept separate; One hen might be healthier/less healthy than the others; Might be different breeds/ size/age; Repeat experiment;	2	

9	c	Crop is where the pellets are stored before digestion; Gizzard contains stones/ grinds up the pellets	1 1	
		Total	50	

Question	Answer	Marks	Guidance
2c	**[Level 3]** A description of a range of sources of organic matter **and** a detailed description of how organic matter improves soil Quality of written communication does not impede communication of the science at this level. (5-6 marks) **[Level 2]** A description of a source of organic matter **and** a description of how organic matter can improve soil Quality of written communication partly impedes communication of the science at this level. (3-4 marks) **[Level 1]** A description of a source of organic matter **or** a description of how organic matter can improve soil Quality of written communication impedes communication of the science at this level. (1-2 marks) **[Level 0]** Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)	6	**This question is an overlap targeted at grades D/C** **Indicative scientific points may include:** Sources of organic matter: • Humus from naturally decaying organisms/example of organism • FYM from a range of livestock • Garden compost from plant material and organic household waste How organic matter improves the soil: • Nutrients • Named nutrients released • Maintenance of crumb structure • Description of crumb structure • Importance of crumb structure to include improved drainage, water retention and aeration • Neutralises alkaline soil • Encourages worms

Question	Answer	Marks	Guidance
7b	**[Level 3]** A correct, detailed description of how an animal could be spayed **and** a biological, ethical and welfare issue about spaying. Quality of written communication does not impede communication of the science at this level. (5-6 marks) **[Level 2]** A description of how an animal could be spayed **and** an issue about spaying. Quality of written communication partly impedes communication of the science at this level. (3-4 marks) **[Level 1]** A description of how an animal could be spayed **or** an issue about spaying. Quality of written communication impedes communication of the science at this level. (1-2 marks) **[Level 0]** Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)	6	**This question is targeted at grades from B to A*** **Indicative scientific points may include:** How to spay an animal: • Removal of ovaries so that the animal cannot produce eggs • Removal of uterus so that the young cannot develop • Cutting the fallopian tube/oviduct to prevent the egg meeting the sperm Biological issues: • Prevents nesting behaviour/bleeding • Can prevent aggressive behaviour • Prevents natural behaviour • Reduced risk of disease/tumours • Remove birthing risks Ethical • Prevents the animals right to reproduce • Prevents unwanted young that need to be rehomed • Animals cannot give consent Welfare • Unwanted young could be poorly treated/ have to live in a shelter • Problem of stray animals • Unnecessary operation/fear/pain post op
Question	**Answer**	**Marks**	**Guidance**
8c	**[Level 3]** A wide range of good scientific	6	**This question is targeted at grades From D to A*** **Indicative scientific points may include:**

	advantages and disadvantages of line, in and cross breeding. Quality of written communication does not impede communication of the science at this level. (5-6 marks) **[Level 2]** A range of advantages and disadvantages of the different types of breeding. Quality of written communication partly impedes communication of the science at this level. (3-4 marks) **[Level 1]** An advantage or disadvantage of breeding techniques. Quality of written communication impedes communication of the science at this level. (1-2 marks) **[Level 0]** Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)		Advantages: • Inbreeding/linebreeding allows desired characteristics to be passed on • Produces pedigree animals • Inbreeding/linebreeding produces a small gene pool allows very similar offspring • Crossbreeding produces healthier puppies/hybrid vigour Disadvantages: • Inbreeding depression/accumulation of harmful recessive characteristics • Inbreeding/line breeding can lead to genetic conditions being inherited • Inbreeding/line breeding can lead to health problems due to reduced gene pool • Crossbreeding cannot guarantee the characteristics of the puppies

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