

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 2015

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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.

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These are the annotations, (including abbreviations), including those used in scoris, which are used when marking

Used in the detailed Mark Scheme:

Annotation	Meaning
/	alternative and acceptable answers for the same marking point
(1)	separates marking points
not/reject	answers which are not worthy of credit
ignore	statements which are irrelevant - applies to neutral answers
allow/accept	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

	Blank Page – this annotation must be used on all blank pages within an answer booklet (structured or unstructured) and on each page of an additional object where there is no candidate response.
	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

- a. If a candidate alters his/her response, examiners should accept the alteration.
- b. 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.

E.g.

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, e.g. 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, e.g. 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.

E.g. If a question requires candidates to identify a city in England, then in the boxes

Edinburgh	
Manchester	
Paris	
Southampton	

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).

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	x	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	x		✓		✓	✓		✓	
Score:	2	2	1	1	1	1	0	0	0	NR

Question		Answer	Mark	Guidance
1	a	Any two from: Through their roots; by active uptake/transport; in solution/dissolved in water;	2	
1	b	2 marks for correct answer i.e. 13%; 1 mark for correct working out of the difference in magnesium content/ 4 in correct context	2	Accept 13.3(%); 13.33(%).
3	b	Any two from: Carried out by a different scientist Used different equipment Plants may be different types/varieties Plants may have been grown in different conditions/places No intermediate results More accurate techniques/ technology improved No current data for comparison	2	A Carried out by a different people; A 50yrs apart OWTTE
2	a	Flask A will stay the same and flask B will increase; Respiration releases heat ;	2	Allow: germination release heat
2	b	No: (no mark) Both flasks are exposed to the same temperatures; The inside of the flask should not be affected by external temperature; Flasks are insulated The thermometer bulbs are inside the flask	1	
2	c	A seed that is not able to germinate/not active; light/cold/high temperature/acid/passage through gut;	2	A not able to grow A Any suitable mechanism for breaking dormancy

Question	Answer	Mark	Guidance
3	<p>[Level 3] A scientific description of the differences between self and cross pollination and a comprehensive explanation of the adaptations plants have evolved to prevent self pollination and encourage cross pollination Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] A description of the difference between self and cross pollination and a description of the adaptations plants have evolved to prevent self pollination and encourage cross pollination. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] An understanding of the differences between self and cross pollination and a relevant adaption that plants have evolved. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to C</p> <p>Indicative scientific points may include:</p> <p>Cross Pollination - description:</p> <ul style="list-style-type: none"> • The transfer of pollen from the anther of one flower to the stigma of another plant of the same species. <p>Cross Pollination - adaptations</p> <ul style="list-style-type: none"> • Insect pollinated flowers have the following adaptations: <ul style="list-style-type: none"> - Bright (petals) - Scented petals - Nectar • Wind pollinated flowers have the following adaptations: <ul style="list-style-type: none"> - Anthers hanging outside the flower so pollen can be blown away by the wind - Feathery stigmas hanging outside the flower to catch the pollen - Large quantities of light pollen - Small flowers - Green/uncoloured flowers <p>Self-pollination - description:</p> <ul style="list-style-type: none"> • The transfer of pollen from the anther of one flower to the stigma of the same plant <p>Self-pollination – adaptations to prevent:</p> <ul style="list-style-type: none"> • (Dioecious) plants have separate male and female flowers • Stamens ripen/pollen is produced at a time when the stigmas of the same flower are not receptive • Different lengths of stamen and stigma

Question		Answer	Mark	Guidance
				Self incompatibility so the pollen does not grow an effective pollen tube AVP: <ul style="list-style-type: none"> Some plants are adapted to allow self-pollination at the end of the flowers life span if cross-pollination has not occurred.
4	a	Gametes of variety B shown as r and r; Gametes of variety A should as R and r; Correct genetic cross shown	3	Ecf if wrong letters but correct cross with 1:1
4	b	A change in DNA/base sequence/genetic material/ gene/change in chromosome structure/number/ random/(copying) errors in DNA; Radiation (named type)/ chemicals (named chemical);	2	A mistake for change or error I pollution
5	a	A	1	
5	b	Day 1 has a higher rate of photosynthesis because of warmer temperature; Less cloud cover/ more light ; More CO ₂ ;	2	Accept reverse argument
6	a	Any two from: Oestrogen levels increase/peak ; Followed by a decrease in oestrogen; LH levels increase/peak; Followed by a decrease; Progesterone levels increase (after ovulation);	2	
6	b	Temperature values plotted correctly; Both points plotted between 62 and 63 days;	2	

Question		Answer	Mark	Guidance
6	c	<p>[Level 3] A detailed description of the processes occurring immediately after birth together with a comprehensive scientific explanation. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] A description of the processes occurring immediately after birth together with some explanation. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] A description of some of the processes that occur immediately after birth. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to A.</p> <p>Indicative scientific points may include:</p> <ul style="list-style-type: none"> • Delivery of placenta; • Eat placenta; • To gain nutrients; • Bite off umbilical cord; • Lick/clean offspring; • To remove amniotic membrane/to dry/to stimulate blood supply/ to start them breathing; • (Vaginal/green) discharge; • Increase levels of oxytocin; • To stimulate milk let down/production of milk; • Production of colostrum; • To provide antibodies/ high levels of fat/protein; • Increase appetite to enable production of nutritious milk; • Increase fluid intake to ensure production of enough milk; • Behavioural changes/aggression/protection • Progesterone levels start to fall <p>Use L1, L2, L3 annotations in Scoris; do not use ticks.</p>
7	a	<p>To allow movement of food through the digestive system/improve digestive system ; Prevent constipation ; Reduces the effect of bowel cancer/keeps digestive tract healthy;</p>	2	
7	b	<p>They eat herbivores/variety of animals/small animal; Whose guts contain vegetable matter/are contained within other animals;</p>	2	

Question			Answer	Mark	Guidance
7	c	i	8	1	
7	c	ii	Ration; Correct amount of nutrients/ not over or under feed/ reduces wastage/monitor food intake	2	
8			<p>[Level 3] A comprehensive description of all the relevant aspects involved in transporting small mammals. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] A detailed description of most of the relevant aspects involved in transporting small mammals. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] A description of some of the aspects involved in transporting small mammals. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to A*.</p> <p>Indicative scientific points may include:</p> <ul style="list-style-type: none"> • In a small cage • Secure • Well ventilated/cool • Food and water for the journey (correct context) • In the boot of a car • Under the seat of a plane or train • Frequent stops for exercise, food and water • Clean out the cage frequently to prevent infection • Proof of current vaccinations • Health certificate • Pet passport/legal document • Otherwise put in quarantine • Fitted with a microchip • Only transport healthy animals • Not transport animals towards the end of gestation • Declare in customs • Don't feed dogs and cats morning of transport <p>Use the L1, L2, L3 annotations in Scoris; do not use ticks.</p>
9			Any two from; Rabbit can escape; injury; overweight due to lack of exercise; disease/illness; predators; cold; overheating; wet	2	

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