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 2014

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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.

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

NBOD	no benefit of doubt
R	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.	Put ticks (✓) in the two correct boxes.	Put ticks (✓) in the two correct boxes.
☐ ☐	☐ ☒	
☐ ☐	☐ ☒	
☒ ✓	✓ ✓	
☒ ☒	✓ ✓	
☐ ☐	☐ ☐	
This would be worth 1 mark.	This would be worth 0 marks.	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 <u>should be blank</u> (or have indication of choice crossed out).

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	×	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	×		✓		✓	✓		✓	
Score:	**2**	**2**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**NR**

MARK SCHEME:

Question			Answer	Mark	Guidance
1			Dig / spread / add it to the soil; To improve crumb structure / as humus/ as organic matter/adds nutrients/ as a fertiliser	1 1	
2	a		£50	1	
2	b	i	5 (times)	1	
2	b	ii	£3,187.50	1	Allow: ecf (calculation answer to 2a x answer to 2b x 12.75
2	c		Two from: Keep cool; to prevent growth of microbes; Keep dry; to prevent the growth of microbes; Keep airtight/ in a sealed container; to prevent the growth of microbes / prevent entry of pests; High carbon dioxide /nitrogen/low oxygen; to prevent respiration Lack of ethene; to prevent ripening Regular inspection; to remove rotten crops Dark; to prevent sprouting; Genetically modified; for pest resistance;	2	Allow:other correct responses that are specific to named crops Accept: correct reason if the condition is incorrect

Question			Answer	Mark	Guidance
3			**[Level 3]** A detailed description of several of the mechanisms of asexual reproduction together with a balanced explanation of the advantages and disadvantages of these. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** A description of a range of the mechanisms of asexual reproduction together with a limited explanation of the advantages and disadvantages of these. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** A description of some of the mechanisms of asexual reproduction OR a limited explanation of the advantages and disadvantages of these. 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 up to A** **Indicative scientific points may include:** Advantages & Disadvantages: • Asexual reproduction allows genetically identical offspring (clones) to be produced. • Rapid propagation of desired varieties • This allows plant breeders to propagate large numbers of identical plants with known characteristics. • This will be good for profit and provide for consumer demand. • Asexual reproduction does not produce genetic variation in the offspring. • It does not allow plant breeders to develop new varieties of plants for the consumer. • Diseases are more likely to spread through plants that show little genetic variation. • Tissue culture enables production of virus free plants Mechanisms: • Runners are **above ground stems** from which a plantlet grows and develops roots. When the plantlet is large enough it separates from the parent plant producing a clone. • Rhizomes are **below ground stems** from which a new plant grows. • Tubers are **swollen, underground stems or roots** that store food. The stored food is used to produce new growth from buds. • Corms are (vertical) swollen underground plant stems that store food over winter ready for growth in spring. • Bulbs are short underground stems with swollen leaves that store food. • Tissue culture involves removing individual cells from the parent plant and growing plantlets on agar containing nutrients and hormones • Cuttings involves cutting a stem, root or leaf from a plant and putting it in compost Candidates may use diagrams to help illustrate their answers. Named examples are not needed. **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**

Question			Answer	Mark	Guidance
4			351000	1	
5			Stage one is removing the anthers / stamen/ pollen (for cross pollination); Stage two is transferring the pollen to another plant. Stage three is covering the flower to prevent unwanted pollination	1 1	
6			The cost of controlling the pest is the same regardless of the number of pests; (so the farmer knows) how much money he should spend on controlling the pest The cost (of spraying pesticides and crop losses) is the same (so the farmer)doesn't lose money (So the farmer) does not spend too much money on pesticides	2	Accept: General mark for a relevant economic argument for the farmer
7			They suck the virus out of one plant with the sap; Transfer it when they feed on another plant	2	
8	a		Capillary matting	1	
8	b		Any two from: More of the pot/compost is in contact(with the matting); The compost absorbs water (from the matting); The roots absorb water (from the matting)	2	
8	c		£94.80	1	

Question			Answer	Mark	Guidance
9			**[Level 3]** A description of why older pets need more health checks. A range of different health checks described, including those which can be done at home and by the vet, clearly linked to reasons why they're carried out with specific reference to health issues of older pets. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Some reasons why older pets need more health checks. A range of different health checks mentioned, which can be done at home and by the vet, together with reasons of why they are carried out on older pets. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** Different health checks mentioned,or reasons why they are carried out on older pets. 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 up to C** **Indicative scientific points may include:** **Why older pets need more health checks:** - **increased risk of cancer** - **teeth wear / loss** - **eye problems** - **arthritis / bone joints** - **blood pressure rises** - **kidney failure** - **digestive problems** - **hair / feather loss** - **diabetes** **Health checks:** • Blood pressure. High blood pressure can be an indication of heart disease • Mobility checks for arthritis/ joint problems • Urine tests to give indication of kidney damage / diabetes • Blood tests to check for abnormal levels of antibodies that could indicate disease • Physical examination to check for lumps which could indicate cancerous growth • Dental check (teeth, gums, breath) to check that there are no infections • Check eyes for cloudiness / cataracts • Check on the condition of the coat. Loss of fur/feather symptoms of underlying problems • Loss of weight indicates dietary problems/teeth problems / cancer • Loss of appetite due to virus/disease or dental problems • General behaviour. If listless then there might be an underlying cause.

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					Use the L1, L2, L3 annotations in Scoris; do not use ticks.

Question			Answer	Mark	Guidance
10			Jane is concerned because the body mass is outside the guidelines; The vet isn't concerned because: the data shows only guidelines; data could be out of date; Its mass is only just above the guidelines; the puppy is healthy it depends on the breed of small dog; Natural genetic variation between dogs	3	Accept: her dog is overweight
11	a		40 days	1	
11	b		**[Level 3]** A balanced argument of the advantages and disadvantages of each system including quantitative use of relevant information/data from the table. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** A balanced argument of the main advantages and disadvantages of each system. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** An advantage and disadvantage of each system. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)	6	**This question is targeted at grades up to A*** **Indicative scientific points may include:** • The proportions of nutrients given in a ration have been carefully calculated by feed manufacturers to ensure that the animals are getting a balanced diet for their weight • Relevant data e.g. a small cat should be fed a maximum of approximately 20g morning and night • The owner knows how much they should be feeding their pet which gives peace of mind and prevents the pet becoming under or overweight. • Feeding a ration prevents food being wasted and therefore is more economical • Feeding ad lib allows the pet to feed when it is hungry rather than having to wait until it is due its ration. Animal feeding times may not correspond to human feeding times • All animals vary in activity and an under active or over active animal may require more or less food than is recommended e.g. all cats of the same size are recommended a range of food masses: 3kg cat can be fed between 40 and 60g/day • It may not be possible for all owners to feed their pets twice a day as recommended on the cat food packet. • It can be more time consuming to have to weigh the cat and weigh the food and the pet might alter in weight so this might alter its ration e.g. a

			[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)		cat increasing from 2 to 3kg may require an additional 20g • Pregnant pets may require additional feed to support foetuses which would not be available if feeding a ration **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**

Question				Answer	Mark	Guidance
12				Two from: Variety of prey eaten in the wild; birds of prey in the wild frequently eat all the animal; they get calcium/minerals; from bones; fibre/roughage; from fur; (nutrients from)the digestive system/gut	2	
13				Carbohydrates / sugars; Fat	2	
14	a			Any two from: sperm produces enzymes; sperm enters/fertilises/meets/fuses with egg; other sperm prevented from entering egg; nuclei fuse/ chromosomes combine; formation of fertilised egg/ embryo/zygote	2	
14	b			Fallopian Tube / Oviduct	1	
15				Any two from: Mutation/change in DNA; Inbreeding / breeding closely related individuals/line breeding/selective breeding; reduced gene pool	2	

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