OCR
Oxford Cambridge and RSA

GCSE

Environmental and Land Based Science

Unit **B681/01:** Management of the Natural Environment (Foundation 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.

1. 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

2. 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			• to reduce competition for nutrients • to reduce competition for water	2	
2			• plant growth is more rapid than outside • the environment can be closely managed	2	
3			**A** Must use natural methods for pest control.	1	
4			• clay • silt • sand • gravel	2	All in correct places, 2 marks 2 or 3 correct 1 mark
5			**D** the variety of different species living in a habitat	1	
6			Four from: Rapid breeding cycle; able to eat a wide range of vegetation; living in burrows/ under hedges helps protect them from predators (OWTTE); mobile and active/ strong back legs; good eyesight; good hearing; relatively large litter size; colour helps to camouflage them; fur coat keeps warm; good scent detection (OWTTE); claws for burrowing; white tails signal danger to others; whiskers (for use in burrows); small size makes them harder to catch; teeth adapted (continue to grow/ eats a wide range of vegetation).	4	
7	**a**		Decay	1	
	b		Nitrification	1	
8			**E** wheat	1	
9			2 from: Injury to people from animals; injury to animals; escape (causing vehicle accident); spread of pests and disease	2	A: reference to a (significant) hazard in the field they are moved to. R: will get lot or escape without reference to the consequences (which relate to one of the stated hazards)

Question			Answer	Mark	Guidance
10			**[Level 3]** Understanding of the reasons for crop rotation are detailed. Includes a thorough description of an accepted crop rotation system with an understanding of applying the order correctly in future seasons. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Answer demonstrates an understanding of some of the reasons for crop rotation and contains details of an accepted crop rotation system. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** A simple list of reasons for crop rotation with little expansion or a description of basic crop rotation 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)	6	**This question is targeted at grades up to C** **Relevant points include:** Reasons for crop rotation: • Maximisation of nutrition • Maximisation of pH changes • Reduction in pests • Reduction in diseases • Maximisation of soil cultivation activities • Utilisation of all soil profile by crops • Timing of application of organic matter **Application of Technique:** • Description of a widely accepted crop rotation system, most commonly either a 3, 4 or 5 year rotation. • Definition of crops into different crop groups For example (brassicas, roots, others) or (brassicas, roots, legumes). (if 5 year rotation: brassicas, legumes, potatoes, onions, roots) • Concept of fallow land if there is space. Progression of crops into the correct beds the following year e.g. brassicas to follow legumes.

Question			Answer	Mark	Guidance
11	a		Rain levels will help decide how much watering needed/ can see how much water the plant is getting OWTTE	1	Allow other weather related tasks e.g. when to cut the grass
11	b	i	11th (March)	1	
11	b	ii	27th (March)	1	Allow 28th March
11	b	iii	Maximum and minimum temperature divided by two/ use measurements from that day and divide by number of measurements.	1	Response must not relate to the mean across the whole month.
11	b	iv	15 times	1	Allow 14 -16
11	b	v	Monitor temperature until danger of frost is past / until the temperature stays above 4°C	1	Allow don't plant in March/if planting in March plants will need protection/ increase cost OWTTE
	c		Humidity Wind speed/direction Air pressure Snow Mist/fog	2	Reject: soil temperature , storms

Question			Answer	Mark	Guidance
12			**[Level 3]** A thorough description of both the advantages and disadvantages with explanation of the points made. Points raised include complex concepts. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** A description of both the advantages and disadvantages of the production system giving some explanation to demonstrate understanding. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** A simple list of advantages and/or disadvantages with little explanation of the points. 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** **Relevant points include:** Environmental advantages: • Fewer waste management issues dung decays naturally • More room for animals to move means less damage to the land • less energy consumed no heating and lighting of houses • less smell as waste decays • less noise if fed ad lib • less visual impact as houses smaller Environmental disadvantages: • More land use as pigs spread out over wide area • Visual pollution lots of pig arks and if pigs intensive outdoor damage to land • Risk of escape cause damage to neighbouring environment • Noise if not fed ad lib • Pollution from run off into streams of organic waste Ground damage by pigs rooting

Question			Answer	Mark	Guidance
13	a		The trend is for the total population to decrease; Population at conservation site has remained constant/ slight increase	2	Allow both populations fluctuate, but UK population fluctuates more
13	b		Any two from: Loss of habitats/food sources for the population overall; Climate change; pollution; Conservation site has been actively managed to maintain suitable habitats	2	
13	c	i	33%	1	Accept 33.3/33.33
13	c	ii	Species is vulnerable if this site is lost; OWTTE	1	Accept the converse argument i.e. more than half the population are not protected.
13	d		More conservation sites are maintaining their population so invest in these / or buy/ develop more, see what is good about this site and replicate this elsewhere	1	Accept: add in food plants for butterflies elsewhere; references to a captive breeding/ release programme

Question			Answer	Mark	Guidance
14			**[Level 3]** A detailed description of a technique which will give an accurate result of the pH within the garden. Description is written so that the reader could replicate the test. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Description of use of the soil test kit gives sufficient detail to get a result. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** A simple description of soil testing methods using a kit, may miss out a number of stages. Order of the tasks may be incorrect. 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 E** **Relevant points include:** • Taking samples below the soil surface. • Take multiple samples from around the garden (use of a W pattern). • Use finely graded soil (i.e. no large stones/gravel). • Do not touch soil with fingers. • Fill to mark on tube. • Add barium sulfate (not in all kits). • Add water to second line. • Water ideally to be deionised/distilled water. • Add indicator solution. • Put stopper on top. • Shake well. • Allow to settle. • Check against colour chart. Credit detailed answers using a pH meter or Universal Indicator (pH) paper. Ignore litmus paper.

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