OCR
Oxford Cambridge and RSA

GCSE

Environmental and Land Based Science

Unit **B681/02:** Management of the Natural Environment (Higher Tier)

General Certificate of Secondary Education

Mark Scheme for June 2015

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.

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.

This would be worth 1 mark.

Put ticks (✓) in the two correct boxes.

This would be worth 0 marks.

Put ticks (✓) in the two correct boxes.

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			Buttercup-meadow Heather-moorland Oak-deciduous woodland Pine- coniferous woodland	3	All correct- 3 marks 2 or 3 correct- 2 marks 1 correct- 1 mark
2			Colder in spring – later sowing of crops; Becomes hard in dry weather – avoid ploughing at these times; Keep vehicles off soil when waterlogged to retain soil structure owtte; Use vehicles with low compression tyres owtte	2	Allow other valid answers. Accept methods to improve clay soil, e.g. drainage, liming. One mark for relevant property of clay soil One mark for the implications and or activity as a result of the property
3	a		A No output until wind speed is 4m/s because wind insufficient to turn blades B increase in output because output increases with wind speed C output maximised because maximum output of the generator reached D output stops to prevent damage to the equipment because the wind speed is too high	4	A: Low output(as power needed to rotate the turbine) A: Low wind speed
3	b		At this mean wind speed, the turbine is only at 50% at output Will produce 1000 kW of power This is not a high output so not very effective/ large numbers needed Small change in wind speed can vary power output a lot	2	A: design not fully effective at this mean speed. A: low wind speed reduces efficiency
4			A ensures the optimum growing conditions	1	

Question			Answer	Mark	Guidance
5			**[Level 3]** A well-structured response giving an in-depth response to demonstrate understanding of the problem and potential solutions. Solutions are well thought out and articulated. All information in answer is relevant, clear, organised and presented in a structured and coherent format. Specialist terms are used appropriately. Few, if any, errors in grammar, punctuation and spelling. (5–6 marks) **[Level 2]** Gives a description of a range of issues and produces some realistic solutions for the management of the area. For the most part, the information is relevant and presented in a structured and coherent format. Specialist terms are used, for the most part, appropriately. There are occasional errors in grammar, punctuation and spelling. (3–4 marks) **[Level 1]** Gives a description that includes some of the issues and/or some methods of managing the situation albeit it in a simplistic way. Answer may be simplistic. There may be limited use of specialist terms. Errors of grammar, punctuation and spelling prevent communication of the science. (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* **Relevant points include:** High footfall will cause Compaction/reduction in air spaces Reduced drainage/waterlogging Wearing away of topsoil and vegetation exposing soil to run-off Effect on the health of larger mature plants close to paths due to the reduction in quality of growing environment Gullying. Management of area Put in steps Make up more robust paths/addition of gravel Fence off areas to be protected Use geotextile fabrics Development of new paths while areas recover Use of mesh to grow plants through to stabilise the soil Use of ‘cushioning’ materials such as bark chippings in areas close to path.

Question			Answer	Mark	Guidance
6	a		Tertiary consumers: hawk (1) Secondary consumers: wren; blue tit; ground beetle (14) Primary consumers: vole; moth larvae (99) Producers: oak tree (1)	4	1 mark for each correct row
6	b		b	1	
6	c		Four from: Initially there could be an increase in insects due to reduced pesticides; larger insect numbers will increase number of secondary consumers; longer term could see an increase in the number of tertiary consumers (hawks); Increase insect larvae feeding on tree many reduce number of acorns –reducing vole numbers. Longer term equilibrium may be similar to initial numbers.	4	There must be at least one short and one long term Allow : in the long-term, if organic control was used there would be no loss of tertiary consumers by accumulation of pesticides up food chain Pests can develop resistance so long-term there might be more insects available than with organic control Allow consequences (ECF) is first assertion is incorrect.
7	a	i	England	1	
7	a	ii	2 from: Different soil/rock types in different locations; effect of acid rain/pollution; sample size was too small; effect of different amounts of rainfall diluting the soil water – changing pH pH can be affected by the biotic activity within the pond	2	
7	b		Northern Ireland: although other countries have lower nitrate or phosphate levels, both values are low.	2	1 mark for country, 1 for justification Allow 1 mark for good justification of incorrect country. I.e. largest range of pH

Question			Answer	Mark	Guidance
7	c		England Restrictions in slurry spreading/ fertiliser application times; rules regarding slurry/waste storage; maximum fertilise application rates; record keeping	3	1 mark for country, 2 for actions.
8			**[Level 3]** A well-structured response, explaining a range of relevant points from the list opposite that are valid. All information in answer is relevant, clear, organised and presented in a structured and coherent format. Specialist terms are used appropriately. Few, if any, errors in grammar, punctuation and spelling. (5–6 marks) **[Level 2]** Give a description of a range of factors affected by the hedge. For the most part the information is relevant and presented in a structured and coherent format. Specialist terms are used for the most part appropriately. There are occasional errors in grammar, punctuation and spelling. (3–4 marks) **[Level 1]** Gives a description that includes some factors. Answer may be simplistic. There may be limited use of specialist terms. Errors of grammar, punctuation and spelling prevent communication of the science. (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:** Physical effects: Shade/ reduced sunlight Reduced wind speed Humidity Reduction in soil water/ nutrients due to hedge Frost pockets/ shelter from frost Temperature change Shelter-affecting water penetration Affect of windbreak on evapotranspiration. Increase in humus nearer to hedge due to leaves etc.

Question			Answer	Mark	Guidance
9			**[Level 3]** A well-structured response explaining a range of relevant points from the list opposite that would lead to reliable results. All information in answer is relevant, clear, organised and presented in a structured and coherent format. Specialist terms are used appropriately. Few, if any, errors in grammar, punctuation and spelling. (5–6 marks) **[Level 2]** Gives a description of sufficient stages to produce a valid result. For the most part, the information is relevant and presented in a structured and coherent format. Specialist terms are used, for the most part, appropriately. There are occasional errors in grammar, punctuation and spelling. (3–4 marks) **[Level 1]** Gives a description that includes some of the stages necessary to produce a valid result. Answer may be simplistic. There may be limited use of specialist terms. Errors of grammar, punctuation and spelling prevent communication of the science. (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 **Relevant points include:** Use of quadrats Choice of sampling technique (random number generation)/ systematic sampling Use of tape measure (for edges or transect) Number of samples taken sufficient to identify anomalies Identification of species % cover of plants/number Risk assessment Allow: Size of quadrat How to identify species Calculate population size

Question			Answer	Mark	Guidance
10	a		Clover uses the nitrogen fixed by the bacteria; The bacteria use the carbohydrates from the plant (photosynthesis)	2	A: sugar A: a suitable habitat for the bacteria, R: a place to stay
10	b		B assists in pest and disease control	1	

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

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