GCSE

Environmental and Land-Based Science

OCR Report to Centres

January 2013

CONTENTS

General Certificate of Secondary Education

Environmental and Land-based Science (J271)

OCR REPORT TO CENTRES

Overview

This is the first opportunity candidates have had to access the full range of units for this new specification. It is also the last opportunity candidates will have to sit the examination in January.

Candidates seem to have coped well with the new content in the specification, where new topics were tested they performed well. Areas where centres can support candidates in their examination preparation would include practice in:
The range of Mathematical questions used in papers, which account for 10 of the available 50 marks; and
The level of response extended writing questions which account for 18 of the available 50 marks.

Centres are advised to look at the mark schemes for the level of response questions and to use these to give candidates practice in writing responses which meet level 3. Very few candidates achieved level 3 in this examination session.

B681/01 Management of the Natural Environment (Foundation Tier)

The B681 paper of the Environmental and Land Based Science GCSE is the second paper of the new specification. The paper differs from that within the previous specification most notably due to the fact that the paper consists of 50 marks.

The paper is a mixture of short response questions, objective questions, data analysis and longer response questions. The longer response questions typically consist of 6 marks each and assess the level of written communication as well as subject knowledge. The mark scheme accompanying this paper should therefore be evaluated within this context.

As with the previous specification, there are some common questions to both the higher and foundation tier papers allowing for a direct comparison of candidates who are attaining results around the C grade boundary.

This examination was available as either paper or computer based (CBT) versions, the question numbers quoted relate to the paper based version.

General Comments

1) A good introductory question relating to the impact of earthworms, most candidates achieved at least two marks, the increase in activity in soil microbes proving the most difficult answer.

2) Many candidates erroneously chose clay, gravel and silt as being the composites of loam.

3) This question tested the understanding of two familiar terms from the information in a text. This caused some confusion for some, more candidates were able to identify the term 'organic' than 'monoculture'. A common misconception was that outdoor production made something monoculture.

4) Reasons to control weeds was generally well understood by most candidates.

5) The work of the RSPB produced a variable response, although stronger candidates were able to recall the conservation element as being one of their main activities.

6) The nitrogen cycle was generally not well answered, despite the simplification of the diagram. This is a topic that caused problems for many candidates and it is recommended that a greater teaching focus is given. There was little difference in the accuracy of identification of either the point of nitrification or nitrogen fixation.

7) This question was answered enthusiastically by most candidates, but many responses failed to focus upon the damage to the soil, and referred to damage of plants. The most common correct answers related to issues with drainage and lack of air spaces.

8) As with question 7, this was misinterpreted by a number of candidates who failed to relate their answers to the question. Most were able to identify the effect on the food chain or web in the area, fewer identified the effect on pollination. The lack of insects would not mean the immediate death of plants.

9) A poorly answered question overall.

   (a) Reasons for monitoring and recording temperatures focussed upon keeping the temperature in the correct range but often omitted to mention the benefits of reducing waste heat (or associated cost), or the requirement to monitor the closeness of conditions to a growing blueprint, a slightly more complex concept but common in commercial production.

   (b) There were few correct answers given regarding the name of the sensor;a thermostat. Many looked for clues in the question and cited 'apparatus' or the manufacturer's name from the image.

10) This was a longer response question allowing candidates to describe how to test the pH of a soil. Some candidates answered this really well, demonstrating knowledge from carrying out this task as a practical activity, others were very rudimentary. The quality of written communication was also assessed within the answer. The best candidates remembered the need to take multiple samples and to avoid areas such as around feeding troughs which could give anomalous results.

11) (a) A low demand question where most candidates were able to identify that the largest use of water at a golf club would be on the golf course itself.

   (b) A simple calculation question which caused a surprising amount of problems to candidates. The answer is achieved by multiplying the rate of water use per hectare by the number of hectares of the course.

   (c) A follow on calculation which was slightly more complex than in part b. Any errors in the previous calculation were taken into account with the marking of this question. Candidates should be encouraged to give an answer rather than leave a calculation question blank.

   (d) This question was quite specific about the focus on reducing water consumption without affecting the look of the course. Responses which simply said "water less" were not credited unless suitable justification could be given. The mark scheme allowed a number of creative responses some of these included using more drought tolerant grass types and methods of recycling water. Good solutions were seen, such as washing the machines less, checking soil conditions/ weather forecasts to irrigate only when needed, or using improved sprayer nozzles/ application methods to avoid wasteful drift.

12) (a) Most candidates identified that caged production was the lowest cost.

   (b) Interpreting stocking density proved a harder concept for candidates.

   (c) This question tested the understanding of intensive production (as opposed to extensive), both barn and caged birds should have been included in the calculation but this was not commonly seen.

   (d) The average price of eggs, although relatively simple to calculate was not attempted by a number of candidates. A number of candidates did not attempt any calculation based questions.

   (e) Allowing for any errors created in responses to the previous question, this was only answered correctly by stronger candidates.

(f) This question was enthusiastically answered by many candidates, but often not attempted by those who had not attempted the previous calculation questions either. The question focussed on the economics of production rather than welfare issues. The stronger answers identified the need for extra land, increases in costs of production leading to increase in retail price and the issues of egg shortages which conversion occurred.

13) A longer response question, common with the higher tier paper. The concept of windbreaks was poorly understood by many candidates, particularly the effect not only on wind, but also the general microclimate. They are installed in orchards to help protect blossom and encourage pollination but take up valuable space and may cause competition with the crops. A wide range of valid answers were credited.

14) Another longer response question, some candidates limited their potential mark with the brevity of their answers. Again a wide ranging mark scheme. Many identified the fact that gulls could feed on dropped food in cities and towns- a credit-worthy point, but few expanded their response by including the gulls' ability to out-compete other species, the use of buildings for nesting etc.

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

General Comments:

The paper is a mixture of short response questions, multiple choice, data analysis and longer response questions The longer response questions consist of 6 marks each and assess the level of written communication as well as subject knowledge. The mark scheme accompanying this paper should therefore be evaluated within this context.

As with the previous specification, there are some common questions to both the higher and foundation tier papers allowing for a direct comparison of candidates who are attaining results around the C grade boundary.

This examination was available as either paper or computer based (CBT) versions, the question numbers quoted relate to the paper based version.
It was noted with this higher tier paper that there was a significant number of candidates would have been better able to demonstrate their achievement if entered for the foundation paper. Centres are asked to check that candidates have been entered correctly onto the appropriate level paper.

Comments on Individual Questions:

1) Use of mulches: an accessible first question for the paper, most were able to correctly identify the decorative effect and the retention of water. Some incorrectly suggested that biodiversity would be reduced.

2) Another easily accessible question; intensive farming in this way reduces damage to the sea beds.

3) Crop rotation was poorly understood by many candidates with few demonstrating an understanding that nitrogen fixed by the legumes can be used by leafy crops such as brassicas, or the advantages to future crops of deep cultivation for potatoes.

4) A more demanding question requiring candidates to be able to apply their knowledge of the Environmental Stewardship scheme to this scenario.

5) Risk Assessment: Answered well by higher performing candidates, the focus was on the potential hazard and the action needed. Many lower performing candidates, although filling all the boxes gave very similar situations which did not maximise their marks. The mark scheme allowed for a diverse range of responses and provided they were likely scenarios and good control methods were suggested, marks were awarded.

6) A good discriminator question, better candidates were able to understand the responsibilities of a land owner to a SSSI designation.

7) Biofuels: good answers identified the difference in net carbon emissions, the impact and implications of the use of land, and the issues of profitability for farmers, amongst others. Credit was not given to issues relating to the 'liking' of biofuels by consumers.

8) **(a)** A common question with the lower tier paper, most candidates made a good attempt at calculating the selling price of a dozen eggs, although some incorrect answers could have been avoided if the candidate reviewed their response to see if it looked correct- there were some responses where a dozen eggs cost over £1million.

(b) Allowing for error carried forward from the previous question, success was in line with overall performance on the paper.

(c) A common question with the foundation paper, good responses focussed on the issues of profitability, costs to the consumer and the amount of additional land needed if the production system was to supply sufficient eggs.

9) This series of questions looked at the interpretation of this data.

(a) This question required observing the changes in shapes. If this was done accurately, candidates were successful.

(b) A related question, checking knowledge of the other affects of liming a soil.

(c) Again, the use of the chart to find the maximum availability of minerals- achieved by most candidates.

10) **(a)** Using the data in the table, most candidates were able to find the relationship between salinity and suitability for irrigation.

(b) A more complex question requiring knowledge of the implications of water quality, but answered well by many candidates.

11) An accessible question, most candidates were able to answer this question knowledgeably.

12) A question common with the foundation tier paper and requiring a longer answer where quality of communication was also assessed. While many candidates performed well, understanding the basics of windbreak use, the quality of communication let them down and reduced their mark. More practice here would benefit all questions in this style. Issues of microclimate could have been developed further.

13) Sampling of a population- this proved to be a good discriminator question and it was clear from many responses where a candidate had undertaken sampling as a practical activity as opposed to those where the theory had simply been taught. While many understood the technique to a greater or lesser extent, the ability to actually identify the wild flower species was frequently omitted from the answers.

14) Many candidates wrote enthusiastically on the subject of genetic modification, in particular about the ethics of the process but unfortunately did not focus on the precise question which required a description of the process of genetic modification of a crop. This is an area where additional preparation of candidates would have been useful, although the question did allow those higher performing candidates to demonstrate their knowledge.