Candidate A

Question 1

The candidate was awarded **9 out of 10 marks** because they showed a very good understanding of biofuels.

A good definition of a biofuel was provided, something which many candidates struggled with.

The candidate gave a detailed description of the changes in percentage uses of corn between the two years, unfortunately missing the change in 'other' uses and therefore full marks could not be awarded.

The candidate was awarded 2/2 marks for Q1(c). Allowing the second mark was debatable since this response largely mirrored the first response.

Question 2

The candidate was awarded **5 out of 9 marks** because they showed an adequate overall understanding of the impact of global warming on water use in an area that is important for food production, the responses were not always sufficiently developed for the marks to be awarded.

Q2(a)(ii) The mark was awarded for the response about potential overuse of water by farmers and city dwellers. The comment about global warming increasing the evaporation of aquifers is debatable, but a NASA survey suggests that this may occur via boreholes.

Q2(b) The candidate described the changes in water usage for each sector, but explanations for the changes were not developed to a high standard.

Q2(c)(i) The candidate is largely correct in saying that fruit trees need greater volumes of water than vegetables, but it is important to note that they can also survive through periods of drought in the longer term, whereas vegetables need regular irrigation.

Q2(c)(iii) The mark was awarded for 'use of drought resistant crops'.

Question 3

The candidate was awarded **the full 8 marks** for this question because they demonstrated an excellent understanding of population dynamics.

Question 4

The candidate was awarded **5 out of 7 marks** because they showed a good understanding of product obsolescence and waste management.

Q4(a) The candidate correctly indicated the types of obsolescence in the table, but did not justify why these options were selected. This was a common issue and it was felt that candidates may have missed the 'justify your answers'

component and also that too little space had been made available for justification. A 1 mark allowance for this was agreed at the Grade Boundaries meeting.

Q4(c) 'landfill tax' was accepted in place of the full name of the legislation (Landfill Tax Regulations 1996).

Question 5

The candidate was awarded **the full 8 marks** for this question because they clearly had a very good understanding of the human impacts on biodiversity.

Detailed responses were provided for Q5(b) and (c), and this candidate was one of the few candidates able to demonstrate knowledge of the roles of SEPA and SSSIs.

Question 6

The candidate was awarded **7 out of 8 marks** for this question because they demonstrated good knowledge of the structure and composition of the atmosphere.

For Q6(a)(ii), the marks were awarded for the comment about aircraft being able to take advantage of the jet stream and thereby use less fuel and release fewer greenhouse gas emissions.

The candidate made some good points in Q6(b)(ii). However, care should be taken when using chemical formulae in place of full names; in this case CO^2 had been incorrectly used to represent carbon dioxide/CO_2.

Question 7

The candidate was awarded **8 out of 11 marks** because they demonstrated a good understanding of factors affecting urban vs rural populations.

Credit was given in Q7(b) for the comment about better transport routes allowing the rural population access to urban areas.

For Q7(c)(ii), the majority of candidates were unable to suggest an environmental advantage of urban living in terms of domestic energy. At the Grade Boundary meeting it was agreed that there was no requirement for candidates to know about this and that candidates from rural areas especially might have little knowledge about urban living. Consequently, a 1 mark allowance was agreed.

Question 8

The candidate was awarded **5 out of 9 marks** for this question because they demonstrated a basic knowledge of land-based food production.

While cultivation of GMOs is an acceptable way of increasing food production, the second mark for Q8(a) should not be awarded as the UN does not provide subsidies.

1 mark was awarded for Q8(b), for correct plotting of points. The other marks would have been awarded had the candidate included a full label on the *x*-axis (ie

Production (million tonnes)) and drawn lines passing through the plotted points more accurately (ie within a half-box tolerance).

Q8(c) was poorly done by the majority of candidates, with very few achieving the full 2 marks for the definition. This candidate was awarded 0 marks for their explanation of gross productivity.

Question 9

The candidate was awarded **7 out of 10 marks** for this question on factors affecting oceanic and atmospheric circulation.

Q9(a)(i) was a problem solving question, seeking a description of trends shown in the graph. It became evident during marking that different disciplines have differing definitions of ˆtrendˆ, and allowance was made for this providing the interpretation was correct and related to a relationship of some kind. In this instance, it was felt that the candidate did not adequately describe a relationship.

This candidate was one of the few to produce a credible explanation of the impact of the Coriolis effect on atmospheric circulation. Marks were awarded for comments on the cause of the Coriolis effect and the impact at the equator.

Question 10

The candidate was awarded **9 out of 10 marks** for this question because they showed exceptional knowledge and understanding of the benefits and challenges of the hydrogen economy.

Points discussed included: plentiful supply of hydrogen; higher energy to weight ratio than fossil fuels; no/low greenhouse gas emissions; less reliance on fossil fuels; a still developing industry, so expensive; produced through electrolysis of water; energy input required for production; infrastructure challenges; employment opportunities.

Question 11

The candidate was awarded **7 out of 10 marks** for this question because they demonstrated good knowledge and understanding of the qualitative and quantitative techniques used for sampling terrestrial plants and animals.

Points discussed included: the reasons for sampling; named species; threat to the Scottish bluebell from the Spanish bluebell; description of sampling methods (quadrat, transect, Tullgren funnel, Longworth trap, tagging, camera trap, pitfall trap); reliability of results.

Some of the discussion was in-depth but was then fairly low level in other areas. The mark could have been enhanced through more focus on the qualitative and quantitative elements of the question eg providing definitions of these terms and/or stating which applied to each sampling method.