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## FOREWORD

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This booklet contains reports written by Examiners on the work of candidates in certain papers. **Its contents are primarily for the information of the subject teachers concerned.**

# ENVIRONMENTAL MANAGEMENT

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## GCE Ordinary Level

Paper 5014/01

Paper 1

### General comments

The total mark out of 40 for the answers to **Questions 1 - 4** was usually similar to the mark for **Question 5**, also marked out of a total of 40. However, the mark for **Question 6** was typically four or five marks lower and occasionally lower still. The fact that **Question 6** was taken from the atmosphere part of the syllabus might have been a factor. Another was confusion between different types of pollution shown by some candidates; the presence of CFCs in the table in the first part of **Question 6** seemed to be the trigger for the inclusion later of references to the hole in the ozone layer, which formed no part of this question. Part **(c)** was the least well answered part by some margin. Only in a minority of responses was the Kyoto Protocol mentioned; some attempted to base their answers instead upon the Montreal Protocol. The majority answered at a national rather than international scale, which severely limited the overall effectiveness of their responses. In contrast, **Question 5** was well answered throughout. Many candidates possessed the understanding and supporting case study knowledge that allowed competent responses to the different parts on population, fishing and deforestation. Among the first four shorter questions, **Question 3** was the best answered followed by **Question 2**; answer quality for the other two questions was at a similar level, on average one to two marks inferior.

Most candidates gave full answers to all the questions. A few candidates gave the impression that they were under some time pressure and unable to give answers as full as they would have liked to some of the longer, later parts of **Question 6**. Others gave full answers throughout and had clearly finished their answers in the time allowed. Candidates were welcome to continue their answers into the spaces below the lines and a few took the opportunity to do so from time to time. The number of lines left for an answer can be no more than an indication of length of answer expected, and makes certain assumptions, such as normal size handwriting and not filling up the first two lines by repeating the question before beginning the answer.

The examination performance of some candidates might have been improved by reading ahead to later related parts of question before starting their answers. Not doing this led to repetitive answers to two or more parts of the same question. The questions which suffered most from this were **5 (b)(iii)**, **5 (b)(v)**, **6 (f)(ii)** and **6 (d)**. What distinguished all these questions from their preceding questions was the fact that candidates were asked to explain differences between places (rural and urban areas, developed and developing countries, some parts of the world and some countries more than others). Candidates were no longer being asked for general reasons for reducing populations, falling birth rates, forest losses and effects of global warming. Answers needed to be focused upon why there were differences; this expected type of answer was not always forthcoming. In a question like this, the place named first needed to be given at least equal, and preferably, more detailed treatment than the one named second. Therefore in **5 (b)(iii)** not only was an answer overwhelmingly based upon rural areas inferior, but also it often overlapped with and repeated the answer already given to **5 (b)(ii)**. In order to deliver a fully successful answer, the dominant comment had to be about how and why circumstances in cities were different.

Questions which begin with the command word 'Describe' in association with source materials (whether graphs, tables, diagrams or photographs) tend to be easier than average for candidates to score good marks. In this examination a number of candidates forfeited easy marks either by not describing at all, or by switching to explanation after one descriptive point was made. This was noticed most by Examiners in answers to **6 (b)(ii)**. Virtually all candidates, irrespective of levels of ability, began with the statement that emissions of carbon dioxide were higher in developed than in developing countries, but at least one third of candidates then lost the plot by mentioning large amounts of industry, high car ownership and the like in developed countries to explain high emissions. Similarly in answers to **4 (b)(i)** some candidates quickly deserted description from the photograph in favour of general information about savannas, which was not asked for by the question.

**Comments on specific questions****Question 1**

Sedimentary was the main, although not universal answer, to part **(a)(i)**. Folding, compression and convergence were considered to be acceptable answers in **(a)(ii)**, but among the correct answers candidates offered a variety of incorrect ones as well. This question was not well understood. The majority accurately completed the pie graph in **(b)(i)** and used the shading given the key. The next part, **(b)(ii)**, was the least well answered part of the whole question. Little knowledge about air and water occupying the same pore spaces was shown; nor was there much understanding that, as one increases, the other decreases because it is replaced. Most candidates described correct origins for both mineral particles and organic matter in their answers to **(b)(iii)**. Answers to part **(c)** included plenty of successful references to loam soils as an illustration of what makes a good soil for crop growth.

**Question 2**

Most answers to **(a)(i)** were accurate with values from 121-123 points accepted. In **(a)(ii)** the correct approach to answering was adopted by the majority of candidates as they made parallel statements about both rivers. Part **(b)** was a high scoring question because of the plentiful reasons that could be used in this answer. Although sites A and B were almost invariably marked in acceptable places to the north of the city in **(c)(i)**, candidates did not always make clear exactly how the responsibility or otherwise of the city for the decline in water quality could be determined.

**Question 3**

In part **(a)** the wind rose was completed correctly. Occasionally the anemometer shown in **(b)** was confused with the wind vane. If a mark was lost in **(b)(ii)** it was usually caused by a lack of reference to a meter or dial for recording the wind speed. Most answers to part **(c)** were based upon either weather forecasting or the preparedness for an emergency; use of either of these strategies offered plenty of opportunities to explain its greater success in developed countries. The few who chose strong buildings and cyclone shelters gave answers for the reasons which were less convincing.

**Question 4**

In **(a)(i)** the purpose of protection was the one stated most for making National Parks. 'Wildlife reserve' and 'world biosphere reserve' are the two types of area named in the syllabus which have similar purposes. In part **(a)(ii)** some candidates offered 'zoo' instead, which was not the same. To their credit, in **(b)(i)** a good number of candidates stayed with description of what could be seen in the photograph; they looked for a good number of different points about trees, animals and other vegetation, which were often sufficient to lay claim to all four marks. Others were less successful when they digressed into non-photographic information about savannas. In some answers to **(b)(ii)** more emphasis could have been placed on the reason by making reference to animal survival in the dry season or during droughts. WWF was the most popular choice in part **(c)**, but with quite wide variations in the amount known about its work.

**Question 5**

Part **(a)** posed few problems with the majority of graphs accurately completed and quite full description given in part **(iii)** which did include reference to both past and future population growth. Although a number of candidates failed to use the values for birth and death rates part **(b)(i)** and simply stated them without comment, most realised that the best way to answer was by calculating natural increase (expressed either as 28 per 1000 or 2.8%). Few missed the two marks in **(b)(ii)**, but in **(b)(iii)** more of the answers failed due to poor focus on cities with comment almost exclusively reserved for rural areas. Some excellent case study knowledge was presented in answers to **(b)(iv)**, supported by worthwhile comments about degree of success, particularly when either China or the candidate's home country was chosen. From a few, information that clearly related to China was given after Japan was named as the country. The best answers to part **(b)(v)** came from candidates who attempted to use factors of real significance to this question's comparative theme, such as higher levels of economic development, more effective population strategies and greater status of women. An occasional irrelevant answer based upon falling death rates was included.

Good understanding of the meaning of sustainability shone through the answers given to part **(c)**, and it was quite well applied to the question set. Answers to part **(d)** were slightly disappointing because general statements about the importance of soils for cultivation were rarely supported by any real information about the physical characteristics of soils that make them so useful. One mark answers were common. Answers to all parts of **(e)** were characterised by good understanding of the fishing industry and its problems. Some candidates did not need the help that the diagrams gave for answering **(e)(i)**. Quotas and closed seasons were the most widely suggested strategies in **(e)(ii)**. Much was known about the problems of effective implementation of the strategies in **(e)(iii)**.

One mark answers to part **(f)(i)** were too frequent considering the low level of question difficulty. After having stated that the greatest loss was in Africa, usually with the support of the minus 8% from the graph, there was often no follow up using graph information for other regions. Therefore the size of the difference between Africa and the rest was not emphasised strongly enough. Some of the answers given to part **(f)(ii)** were more appropriate to the question 'Give the reasons why forests are being lost'. Superior answers that included the comparative element stood out. The best answers to **(g)(i)** came from those candidates who named a country or region within a country such as the Amazon Basin and Congo Basin. In order to obtain more than half marks the answer needed to ring true for the named area. From candidates with real case study knowledge of Brazil, Indonesia or their home country many full and convincing answers were seen. Answers to part **(g)(ii)** demonstrated good understanding of the role of plants in recycling carbon dioxide.

### Question 6

Part **(a)** was well answered. In the few cases where not all the sources were known, it was most likely that the answer for methane was wrong or omitted in part **(i)**. In **(a)(iii)** explanatory answers based on the use of both percentage contributions and number of years were needed; some candidates used only the latter. A few relied too much on an overuse of negatives, such as 'stop cutting down trees' or 'reduce burning of fossil fuels' in part **(a)(iv)**. The majority demonstrated good knowledge of renewable energy sources, alternatives to CFCs and the usefulness of catalytic converters.

In **(b)(i)**, the scale at which the graph needed to be drawn in order to accommodate the wide range of values meant that it was not easy for candidates to read off accurately amounts for emissions in Europe and Sub-Saharan Africa. Therefore any value between 9 and 11 times was accepted, and even one slightly outside this range provided that the answer was based on a visible attempt to take correct readings from the graph. A few believed that the difference in kilograms was the same as the number of times greater. Some candidates laid no claim to two of the three marks in part **(b)(ii)** by failing to use values from the graph to describe differences in emissions between developed and developing countries. These candidates seemed to want a question which required them to explain the differences.

The important word 'international' was highlighted in bold in **(c)(i)**, yet it was more likely to be ignored in this part of the question than in the second part. Those candidates who began with the Kyoto Protocol and wrote evaluative answers to **(c)(ii)** produced well focused answers, especially when they showed understanding of the attitude of developing countries and the position adopted by the USA. Some of the comments made in **(c)(ii)** about the difficulties of moving away from a fossil fuel orientated world were considered to be worthy of credit, despite the fact that the international theme did not flow through the whole answer.

Answers to part **(d)** showed considerable variations in quality. Some went no further than a general separation into developing and developed when attempting to relate to the question context of countries. Good answers came from candidates who included references to countries which were explicit. Low lying countries such as Bangladesh and the Netherlands featured frequently in more successful answers.

Descriptions from the map were usually sufficiently full to claim both marks in **(e)(i)**. The question asked in **(e)(ii)** exposed wide variations in candidate familiarity with labelling diagrams; some were clearly not used to doing this, and a few left this question unanswered, passing on quickly to the next question. Label 1 was best placed in the lower atmosphere at or below where Asian brown cloud was named. The best possible position for label 2 was where lines for incoming radiation were shown to be deflected back upwards towards the top of the cloud; a pleasing majority clearly labelled one or both of these precise points. In **(e)(iii)**, although a few introduced the hole in the ozone layer to ruin their answers, most clearly understood the difference between reflection of incoming radiation by the brown cloud and retention of outgoing radiation by atmospheric concentrations of carbon dioxide. 'Yes' answers dominated in **(e)(iv)**. Candidates needed to use both the role of winds in the transfer of air pollutants and the high levels of population and economic growth in major Asian countries in order to give an explanation that was full enough to be worth all three marks. Occasional answers of 'no' were also quite successful when based upon the fact that the special conditions for the formation of the cloud existed over a wider area in Asia than elsewhere.

In the final part **(f)**, candidates needed to change gear between the first and second parts of the question. In many of the answers that failed to reach the top band of assessment, the main weakness was that views and explanation never fully replaced description of methods. However, there were other candidates who answered with real enthusiasm and supported their views with further content and genuine feeling and understanding. It was revealing to see how much relevant information could be packed into the lines left for answering. This being the last question, it was possible that some candidates were stretched for time; for whatever reason, there were significant variations in length and depth of answers given between different candidates.

<p><b>Paper 5014/02</b></p>
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<p><b>Paper 2</b></p>
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**General comments**

This paper explored the impact of human activities on the environment of New Caledonia, an island in the Pacific Ocean. The candidates generally made good use of the sources of information provided and they displayed good knowledge of the subject. The practical technique tested was well understood by most candidates. They wrote clearly and attempted all the questions.

**Comments on specific questions****Question 1**

- (a) This number handling exercise was done successfully by many candidates, unfortunately sometimes the percentage was not quoted to one place i.e. 47.3 or 47.4%.
- (b) The concept of supply and demand was well understood. However some candidates did not suggest enough changes to the lives of the people or the economy of New Caledonia to gain maximum marks. This is an example of where candidates need to look at how many marks are available for a question and provide an answer of sufficient depth or number of points.
- (c) There were many good thoughtful questions given and usually the layout allowed for plenty of alternative responses. Some candidates wanted to explore more effects on the environment which was inappropriate as it was titled as a health questionnaire.
- (d) Many candidates appreciated that they needed to sample from more than one location; some used real locations from the map and others described this in general terms. The idea of taking a representative sample was less well understood though it was rare to see an answer suggesting the whole population should be interviewed. Those candidates that knew about the subject easily gained two marks.
- (e) The X was often nearer the smelter than the Y but the Examiners were disappointed to see that the prevailing wind direction was ignored and some letters were placed in the sea.
- (f) The graph was plotted correctly by most candidates and the relationship between rainfall and dust was clearly stated as well. Part (iii) was not as well answered because candidates often confined themselves to suggesting the smelter should work in the rainy season but failed to discuss weather forecasting or a suitable number of days working and non working.

**Question 2**

- (a) The data handling was more testing here and many candidates either failed to take note of the units used for the data or carried out an incorrect mathematical procedure.
- (b) The number of tomato plants seemed to be an obvious difference between the two gardens but it was rarely given as an answer. All the other alternatives on the mark scheme were seen.
- (c) This proved to be a hard question. Many candidates were convinced that sea water was being used and it was rare to find a correct answer. However in part (ii) the process of evaporation or absorption of water leaving the salt behind was well understood by many candidates. Part (iii) asked candidates to describe a method of measuring flow using all the equipment shown, the Examiners were pleased to see a large number of clear and complete answers, sometimes with excellent diagrams.
- (d) In part (i) most candidates chose two or three correct statements suggesting irrigation may not be sustainable but many found it demanding to take one statement and then make two further points of explanation. The same difficulty applied to part (ii).

**Question 3**

- (a) The effects of oil pollution were either not very well known or candidates did not describe events very clearly. In part (ii) a small number of candidates misread five miles offshore as five miles of shore. Maximum marks were only occasionally given.
- (b) The first part of the question required some thought about the data presented and there were some good answers describing the effects along the food chain. Weaker candidates described death and destruction only in general terms. Part (ii) did not have as many references to breeding as expected. Some species are going to take much longer than others to recover, for example because they take longer to reach breeding age. Part (iii) often had a statement that all the species had recovered and only a small number of candidates suggested some possible figures that related to the data given.
- (c) The first six months following the oil spill was often well described, but some candidates spoilt good answers by referring to drinking water implying that the sea is used for this. References to farming crept in as well and these were not given credit. Suggesting longer term effects proved to be a little harder, however the best candidates scored maximum marks.

**Overall**

The candidates completed all the questions and usually attempted to answer the question being asked. Nearly all the answers were easy to read and clearly expressed. This was evidence that the candidates had been well prepared by Centres.