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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

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| <p>Paper 5014/01</p> |
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| <p>Paper 1</p> |
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### General comments

Among the short questions in **Section A**, candidates were more comfortable with the demands of **Questions 2 and 3** than with those of **Questions 1 and 4**. The lowest average question mark was for **Question 1** from the Lithosphere. In contrast, between the two long questions in **Section B**, little difference in average candidate performance was detected. Only in a few cases was there a significant difference between the total marks for **Questions 5 and 6** for an individual candidate; a lower mark for **Question 6** was sometimes due to the failure to complete all parts of **6 (d)**. However, only for a small minority of candidates was shortage of time to complete the paper an issue. In nearly all cases this was caused by the candidate having answered the shorter questions in **Section A** in great detail, often in much more detail than was needed for questions carrying only 2 or 3 marks. Candidates should be encouraged to give short, succinct answers to all parts of **Questions 1-4**. They can always re-visit them and fill out the answers once they have finished all the other questions if they have spare time. Candidates, of course, worked at different speeds; the majority gave what appeared to be full answers to all parts of all the questions. Indeed some candidates not only filled all the lines, but also included several instances where they extended their answers into the empty spaces below.

Unanswered parts of questions were few and far between. The majority of candidates possessed a good knowledge and understanding of syllabus content and gave strong performances. However, for a tiny minority weaknesses were cruelly exposed, which gave rise to gaps in answering as well as many inadequate or incorrect answers. Some scripts were remarkable for the strength and consistency of the answers. In an examination paper composed of structured questions it is almost inevitable that a candidate will lose a few marks along the way, either as a result of failing to appreciate fully particular question need, or from paying insufficient attention to the number of marks available for the question and shaping their answers accordingly. The way that some candidates continued to generate relevant and effective answers throughout virtually every part of all six questions was truly impressive. Lines available were packed with relevant detail and comment, which demonstrated a true appreciation of issues associated with Environmental Management.

The following questions were the ones in which a shortfall of marks was most often noted:

- **Question 1 (a)** – The fault was recognised only by a minority. A majority tried to interpret the diagram in terms of plate tectonics.
- **Question 4 (b)** – Candidates did not always attempt to distinguish between environmental and social problems. Some were unsuccessful because they referred to problems that were economic rather than social in nature (even allowing for the degree of overlap which exists between the two).
- **Question 5 (c)(ii)** – This question was rarely answered with the detail needed for a 4 mark answer. Although 'sustainable' was almost universally understood, the problem was application of the theory to this particular example.
- **Questions 6 (c)(iii)** – The majority of answers were too narrow for all 4 marks to be claimed. Few candidates attempted to explain why it should be a source of concern for developed countries that so many of the proved oil reserves are located in developing countries.

**Comments on specific questions****Section A****Question 1**

- (a) In more than half the answers to (i) A-B was identified as a plate boundary instead of a fault. In part (ii) too many candidates drifted into dialogue about general problems of mining coal or methods of mining instead of concentrating upon problems for extracting coal from the seam shown in the diagram, such as thinness of seams, their discontinuous nature and folding. Sedimentary and crust were circled with greater frequency than tropical swamp forest in (iii); the latter was replaced by savanna grassland in a good number of scripts.
- (b) This left part (b) as the part answered well most consistently, with a mixture of possible local advantages and national or international economic factors included in many answers.

**Question 2**

Candidates encountered few problems in answering this answering this question.

- (a) In answers to (i) the item that showed that plankton had retained all the mercury taken in was used less than it might have been. Food chain was understood in (ii).
- (b)(c) Few failed to fill in the boxes in (b)(i) with oil (or diesel), plastic and sewage (or excrement). The answers given to both (b)(ii) and (c) suggested that a majority of candidates could have given fuller and deeper answers if these have been longer questions worth more marks.

**Question 3**

- (a) Sources of CFCs were well known.
- (b) The most successful answers to (i) came from candidates who were able to observe and describe the overall pattern of increases and decreases, as well as noting that production in 2000 had fallen to levels similar those in 1950. A few answers stayed at 2 marks due to an absence of quoted data, either years or production amounts.
- (b) Answers to (ii) focused more upon greater awareness of dangers for the ozone layer and skin cancers than on international agreements such as the Montreal Protocol. Only a limited number of candidates demonstrated good awareness and knowledge of this agreement.
- (c) The needs of part (c) were fully met by most candidates because they included points that could be identified for both scientists and governments.

**Question 4**

- (a) Few incorrect answers were given to either part of (a).
- (b) Knowledge and understanding of problems that were environmental was more secure than for those that were social in part (b). The list of possible environmental problems was potentially longer, especially if different types of pollution (air, water, land and noise) were identified separately. Social problems like crime and shortage of health and education provision were the ones stated most commonly by candidates who understood the meaning of social. Economic problems resulting from urban growth, such as unemployment, low income and poverty, made regular appearances. However, when appropriate problems were identified, most candidates more than secured the mark for each one by supporting the name with some additional descriptive detail.
- (c) Without any restrictions on type of problem, answers to part (c) showed a great recovery; references to how to improve housing and services were the ones seen most frequently.

**Section B****Question 5**

- (a) Although a few candidates merely listed individual plants and names of animals in part (i), most made a better choice and used the values showing numbers of tree species and/or percentage of known plant species. Some skirted around the answer needed in (ii) by again concentrating on individuals, instead of looking at biodiversity as a whole. Those candidates, who introduced ideas of genetic diversity in relation to food supply and drugs, gave the most precise and complete answers.
- (b) Much good understanding about feeding levels and food chains was shown in answers throughout all parts of (b). Differences between producers and consumers, and between herbivores and carnivores, were well known in parts (i) and (ii). In (iii), candidates were required to choose an entry from each of the feeding levels for 1 mark and to give a likely or realistic chain for the second mark; the second mark proved to be the more difficult one to claim. Some used an example of a food chain they had learnt; unfortunately, few of these applied to the Amazon rainforest as demanded by the question. Many candidates gave full and accurate answers to (iv) by referring to the great size of energy losses and reasons for energy loss due to respiration, movement etc. Only a few, generally weaker candidates, struggled to explain why amounts of biomass were different. One or two were under the mistaken belief that biomass increased in size from feeding levels one to three, because the animals were larger in levels two and three.
- (c) In (i) candidates were expected to make use of information from both the sketch and map, which some failed to do. While there were few problems with the understanding of sustainable in (ii), applying this understanding to a question worth 4 marks was more of a challenge. There were many 2 mark answers, based around recognition that a wild product was being collected without any destruction of forest trees, and that the rubber trees were able to recover to leave the forest ecosystem intact. Additional points that more candidates had been expected to make included references to the large area needed to support one rubber tapper and his family, and to the presence of nothing more than a track through the forest linking the rubber trees with minimal damage to forest surroundings. Some exceedingly good answers were given to (iii); many were worth more than the 2 marks available when candidates showed an appreciation of the problems associated with reliance upon primary products, such as low value, fluctuating prices and at the mercy of world market demand. Narrower responses, in which candidates referred to problems of rubber collection in more local terms and in relation to distance from markets, were typical of 1 mark answers.
- (d) Very good use was made of the values in the graph in this part. The most convincing answers came from candidates who recognised the overall pattern of great fall in forest destruction between 1996 and 1997 followed by a steady rise from 1998 onwards, culminating in a big jump of 7,000 sq km between 2001 and 2002.
- (e) Likewise most used the information provided in an explanatory way through a productive use of values, such as the calculation of how many millions of square kilometres of forest remained, followed by comment.
- (f) Scale size was not critical, but use of uniform scale was of vital importance. For many this was a relatively straightforward 4 marks, although some dropped a mark by drawing a summary line that was straight instead of one which linked all the individual plots. By doing this, variations in rates of growth between the 10 year periods were lost. Despite the instruction in the question, a few drew bar graphs; not all of them were weak candidates.

- (g) Social and economic also caused problems in this part. Economic problems were more likely to be identified accurately in (i), but were frequently explained to the exclusion of social in (ii). This question was rounded off by some full and well written answers to (v). In the best answers candidates began by expressing a definite opinion, supported it with a varied range of points, and passed comment either in passing or briefly at the end about why they considered the other view to be less good. Many candidates, in support of the first view in the question, used the valid argument that developing countries like Brazil needed to maximise use of their natural resources, in much the same way that developed countries had already done with their own resources, and that developing countries could learn from the mistakes of others by incorporating methods of forest use that were more sustainable than total clearance. A good point, often well made by candidates in support of the second view, was that there were other ways to tackle the cause of Brazil's problem, especially its continued population growth. When brief references to examples of population policies were also included in passing, some particularly effective answers were generated. Considerably inferior answers came from candidates who failed to state a clear view and limited their support for either view to just one idea.

### Question 6

- (a) (i) to (iv) gave few problems. In some answers to part (v) candidates expected the Examiner to take for granted that they knew which of the five were fossil fuels. In reality, while virtually all included oil and coal, some did not include natural gas as the third fossil fuel. From answers to (i), most should have realised that these were the top three consumed every year, but not all candidates included an explicit statement to this effect. For the third mark candidates needed to give some idea of fossil fuel use compared with that of the two non-fossil fuels, either in tonnes or in percentage terms. The ratio shown for recent years was about 9:1 in favour of fossil fuels.
- (b) Answers to parts (i) to (iv) were largely correct. Most calculated the percentage in (iv) with real accuracy. It was close to 25% depending on the amounts read from the graph. High quality answers also dominated part (v). Variations in answer quality between candidates reflected amount of accurate supporting detail used. Precise information was expected, not general statements such as 'cheaper', 'easier' and 'cleaner'. The best answers came from candidates who packed the lines with two-sided detail, with positive statements about methods of mining for both coal and oil incorporated in A, about the ease of transporting and using a liquid compared with a bulky and dirty solid substance in B, and about types of emissions from low grade coal in C. Some answers were very impressive.
- (c) A few showed non-familiarity with the pictogram style of diagram used in (i). Either an inappropriate symbol was chosen (usually the barrel of oil), or in the worst examples, only the numbers 1 and 5 were written in the boxes. Although some took too narrow an approach when answering part (ii) because they referred only to the row showing energy use, the majority recognised the main message that there was double the use of energy in developed countries from a population five times smaller than in developing countries. It was then disappointing to find that 3 and 4 mark answers to part (iii) were quite rare. Few candidates were able to take their answers further away from the diagram information by referring to areas with great oil reserves such as the Middle East and their significance to future energy supplies.
- (d) 'Energy conservation' was understood by the majority of candidates. Although it was separated out from alternative energy sources by being labelled A as opposed to B, this did not prevent some candidates from referring to alternatives within their answers to part (ii). 'Increased efficiency in use' and 'insulation' were the two methods of energy conservation in the syllabus referred to most by candidates who focused well upon question need. There were some excellent answers to (iii) based upon use of a range of named alternative sources; these illustrated disadvantages such as cost and availability in terms of both place and time. Solar and hydro were the popular choices in (iv). The choice of geothermal was the one that candidates found most difficult to justify.

**Paper 5014/02**  
**Alternative to Coursework**

**General comments**

This paper invited candidates to consider environmental issues and methods of gathering and interpreting data in the context of one state of India. The majority of candidates understood and made good use of the source material and their written responses were usually clearly expressed. The mathematical and graphical questions did not pose any difficulties for nearly all the candidates. The section of **Question 1** requiring a drawing of ten slum settlements did pose difficulties for a significant minority of candidates.

Candidates had no problems completing the paper in the time available.

**Comments on specific questions**

**Question 1**

- (a) Some climate data for the state was presented and most candidates could select the correct responses from the table.
- (b) Many thoughtful responses suggested why weather forecasting would be important to people in the area.
- (c) The Examiners had hoped to see nearly all candidates draw ten separate shelters and that they would either be well spaced in the slum area or clustered along the road. This was the case for some candidates but others simply placed an x somewhere on the diagram and others filled the entire slum area with just ten shelters.
- (c) In part (ii) the location near the road made the container easy to empty was all that was needed for the mark. In part (iii) the diagram presented did not seem to have enough impact upon the candidates, only a few realised that the slope would cause water to run downhill through the shelters after it had filled up the waste container and spread water related diseases through the shelters.
- (e) It was clear that the candidates appreciated the risks of living in a slum settlement and generally they scored highly here. Suggestions for new services to do with roads or transport were not given credit as the diagram shows road and railways next to the settlement.

**Question 2**

This question explored the difficulties of farming an important cash crop in the state.

- (a) Candidates needed to think about advantages and disadvantages of growing GM cotton. Parts (i) and (ii) were usually correctly answered. In part (iii) the candidates needed to bring some of their own knowledge and understanding of farming methods to their explanations, unfortunately some candidates simply repeated the source statement, this was not enough for maximum marks here.
- (b) This tested candidate's knowledge of practical methods of gathering data. Only a small number of candidates realised that the samples should come from the same field to ensure that variables such as pH, temperature, rainfall and soil conditions would be the same. This surprised the Examiners as this type of question has appeared regularly in previous papers and the candidate responses have shown that controlling other factors in an investigation was generally understood.
- (c) A wide range of appropriate safety precautions were suggested. The mathematics in parts (ii)-(iv) were correctly completed by nearly all the candidates and they often went on to correctly describe the trend in the data in part (v).
- (d) This required candidates to complete a questionnaire to find out more about growing cotton. There were many examples of excellent questions and good layout with a sensible range of alternative answers, these gained maximum marks. Responses with either poor questions or limited alternatives for response still gained some credit.

### Question 3

This question changed the focus to the environment around a village in the state and candidates had to make a series of judgements about environmental issues.

- (a) Candidates needed to have read and thought about the source material provided before writing their answer. Only a minority of candidates gave three good reasons for the villagers taking part in forest management, these candidates took an idea from the source and made a clear statement of their own such as tree cover reducing the risks of flooding or soil erosion. In part (ii) medicinal plants were often cited and most went on to make the second point that the plant population could become locally very rare or extinct.
- (b) The monkeys' value was considered from the villagers' point of view by all the candidates and a range of good answers were seen.
- (c) The answers often lacked focus on either what life would be like in the village or damage to the environment, there was much copying of the source without any input from the candidate.
- (d) There were very few candidates who did not write at length about their plan for sustainable development. The best answers contained a clear understanding of maintaining supplies from the local environment without degrading it and then working on some of the other factors such as clean water supplies and having control over mining activity. Some candidates only scored limited marks by suggesting a list of improvements that would have turned the village into a major town or city without suggesting how these changes could have been supported.