

ENVIRONMENTAL MANAGEMENT

Paper 5014/01

Paper 1

General comments

The mark out of 40 for **Question 1 – 4** was usually of a similar order to that obtained from **Question 5** and **6**, each also marked out of 40. Performance in **Question 5** tended to be slightly better than in **Question 6** among weaker candidates. Able candidates were able to give equally effective answers across all questions. Among the short 10 mark questions, **Question 4** stood out as the one with both the lowest average mark and the greatest range of marks. This was the only question in which totals below half marks were common. It was pleasing to see consistent high quality performances from candidates who managed to give full and relevant answers throughout the paper. Occasionally there was evidence that a candidate was struggling against time in order to finish the paper to the point where the quality of answers to the final few parts of **Question 6** obviously deteriorated to levels below those shown in previous questions. A good number of candidates took the opportunity to extend their answers into the empty spaces below the lines when they felt that they still had relevant information to add. This was most useful when answering **5(d)(vi)** and **6(c)(iii)**, the two questions with five marks attached for which fuller answers were anticipated. As ever, the most successful candidates took notice of the stated number of marks for each part of the question and tailored the range and variety of points as well depth of answering to the relative worth of the question. Less successful were candidates who appeared to regard a full answer as one, which filled up all the lines, irrespective of how long it took them to begin answering the question set.

Comments on specific questions

Question 1

Somewhat unaccountably the greatest loss of marks in the typical answer was in part **(a)**; differences were stated, but rarely supported by the use of percentages or proportions from the graph. In contrast full mark answers were the norm in **(b)** for which the photograph proved to be a strong stimulus. Part **(c)** elicited a mixture of precise answers about the dangers of nuclear waste, many worth more than the four marks available, and more general answers which skirted around the exact problems of disposal. The latter type of answer was worth half marks or less. Overall this question was well answered.

Question 2

If there was a fault associated with completing the graph in **(a)(i)**, usually it was either placing the June flow on the 5000 line, or failing to link up the line drawn to all the previous plots. Almost all candidates selected River A in **(a)(ii)**, although a few did manage to make some progress after selecting River B by referring to the possibilities of use for water storage. References to both winter freezing and a seasonal rainfall regime allowed many to claim all three marks in **(a)(iii)**. Part **(b)** was the least well-answered part. Some of the answers would have more appropriate for a question about the disadvantages of big dam construction. In other answers, candidates lost sight of the question context of 'canals taking water from areas of surplus to areas of shortage', and referred to irrigation canals and resulting problems such as salinisation. Both kinds of answer usually included content that could be credited as relevant to this question, but without the correct focus, mark totals above half were unusual for this part.

Question 3

This question vied with the first question as the best-answered question. Careful study of the graph showed that the first three marks in **(a)** were gained. Thermometer was accepted in **(a)(iv)**, although maximum, minimum, or its named equivalent, was better still. A few candidates suggested multiple readings taken regularly during the day in **(a)(v)**, despite having been led towards maximum and minimum by the wording of the question. Most candidates were willing to offer plentiful suggestions in **(b)**; since there was a wide choice of effects for both more and less output, marks were rarely left unclaimed. The most common answers in **(c)** were greenhouses and polythene tunnels, although not always with the elaboration necessary for the second mark to be awarded.

Question 4

The range of marks on this question was from 10 to 2. Some candidates failed to spot the artificially created terraces shown in the photograph. Those who used clearance of trees as the basis for answering had not picked up on the question theme of 'natural shape of the land'. Likewise in the second part some candidates did not notice the clue in the question about the canal replacing a stream channel. Overall, the result was that some struggled to score more than one mark, while others waltzed through the four individual pieces to describe and give reasons and included plenty of extra comment to earn the fifth mark. Irrigation was the best answer to **(b)**; candidates who observed the photograph carefully and noticed the sprinklers towards the bottom left gave the best answers. Some gave non-photograph related answers such as high yielding seeds and fertilizers. Part **(c)** was better answered, but only provided that the candidate made use of the photograph and noted variations in relief and amount of land shown with limited vegetation cover. The simple answer of lack of trees often led to extended answers about processes of soil erosion which was too narrow an approach to answering for this type of short photograph based question.

Question 5

Most candidates gained the first four marks in **(a)(i)**, even if some of the technically correct solutions in terms of percentages shown were not terribly logical in their arrangement with values for individual human and other natural disasters spread around the graph instead of being shown in a block in adjacent boxes. The few who tried to convert the block graph into a vertical bar graph were mostly restricted to one mark for showing a correct key to shading. Part **(a)(ii)** was well answered particularly by those who incorporated examples of water related diseases in their answers, although doing this was not essential for full marks.

In **(b)(i)** it soon became clear that virtually all candidates knew basic difference between an earthquake and a volcano; only by concentrating too much either upon similar formation, or effects that were more appropriate for the next part, was there a shortfall in marks. Part **(b)(ii)** was characterised by good answers, many based around non-predictability of earthquakes and warning signs from volcanoes. Most of the strategies stated in **(b)(iii)** for preventing loss of life in earthquakes were valid, except for those, which placed reliance upon monitoring to predict earthquake arrival. The best answers to **(b)(iv)** not only referred to greater wealth and higher levels of technology and education in developed countries, but also to the reliability and efficiency with which strategies are implemented. The typical answer to part **(b)** was strong and well supported by knowledge and understanding.

Some answers to **(c)(ii)** were disappointing. Valid answers about high sea temperatures at that time of year in the northern hemisphere, leading to rising air and the development of deep low pressure systems, tended to be more restricted than expected. There was confusion among some candidates as to whether the seas were hot or cold, or whether the pressure was high or low, at this time of year. Marks in the three other parts of **(c)** were awarded with greater regularity.

Most identified the four actions named in the information box about Cuba to complete the spider diagram. In part (d)(i), the best choice, evacuation, was the one almost universally selected by candidates in (d)(i). Some candidates appeared not to understand what a hurricane shelter was. In part (d)(iii) candidates were asked to 'explain as fully as you can'; some of the less strong answers suffered from repetition of opposition between Cuba and Grenada in terms of preparation. Candidates who commented on differences in size between the two islands and the greater possibilities for evacuation in Cuba were the ones most likely to gain all three marks. By the time part (d)(v) was reached a few candidates had lost the question focus on urgent problems. Successful answers to this part needed to stress either the need for emergency/relief aid and/or the need for aid and assistance from other countries. Less successful were references to medium and longer term needs; some of the answers given overlapped with the main theme in part (vi). The weakest answers to the final part went little beyond use of information provided in the question. However, there were many good answers that included coverage of both farming and tourism by discussing realistic possibilities for the next few years. In the best answers, the need for time for bush and tree crops to grow to sufficient size to produce again and, for question. Some superb sketches were drawn, many of them packed with relevant positive labels both for the main features of the houses (especially when building materials were named) and for the overcrowded and haphazard layout of the area. They were worth many more than the maximum of four marks available. Often the candidate's sketch was focused on just one house, which was acceptable, although it made it more difficult for something related to layout to be labelled. The worth of some really well drawn sketches was reduced by poor negative labelling or even its total absence. The weakest answers of all were from those who attempted to draw plans for the shanty-town or the inside of one house for which no use of the photograph was apparent. Knowledge of a named example in (c)(iii) was not always shown which effectively limited answers to three marks because they lacked the specific content that could only be provided by a case study reference. A few candidates gave answers composed of many general and quite vague statements; attempts to use Mumbai as the example did not receive any credit, as a named example until something related to the city was included beyond what could be deemed as likely from observation of the photograph.

Although answers with the direct and obvious link to farming were the only ones accepted in (d)(i), correct statements about difference in size were allowed in (d)(ii) for other pieces of evidence chosen and used in (i). Only a few candidates failed to state actual size difference. Increased availability of water needed to be used as the main reason in (d)(iii) before some related comment about increased farm output allowed the second mark to be credited. A few candidates mentioned too many factors and failed to identify water as the main reason. An early reference to increased income improved the likelihood of gaining all the marks available in (d)(iv). Although many candidates quoted values from the table, those who stated the difference in income per household between the two dates were the ones who made best use of the values to support their answers. All the evidence given pointed to an answer of 'yes' in the final question (d)(v). Many of the best answers came from candidates who answered in terms of the changing relative strength of the push and pull factors for rural to urban migration. However, 'no' answers were equally acceptable; although few in number, some candidates successfully justified their view by stressing the attractions and greater wealth-making opportunities concentrated in big cities in the developing world compared with the countryside.

Answers to **Question 6** from weaker candidates lacked the consistency demonstrated in their answers to **Question 5**. The parts of the question which posed the greatest difficulties varied from candidate to candidate, but almost always included one or more parts from (a), (b)(i) and (ii), and (d)(ii). The stronger the candidate, the more likelihood that the mark for **Question 6** would be a few marks higher than for **Question 5**. the tourist infrastructure and reputation of Grenada to recover, were emphasised. This style of explanation was often rounded off with an appropriate summary comment.

Responses were generally consistent and strong in **Question 5**. A popular topic area was examined and the majority of candidates had the required knowledge and understanding to maintain momentum up to and including the final part of the question.

Question 6

Deficiencies in technique, for describing from the world map, limited the number of marks claimed by some candidates in both parts of (a). The clear answer of 'no risk in developed countries' was expected in the first part, although some candidates tended to hedge their answers with references to low risk as well, which reduced the effectiveness of their answers. The second part could not be answered without references to places because the full range of risk from low to high existed. Those who tried made little progress with the answer. Africa and India were the most commonly named examples of high risk; North Africa, Middle East and South America were the ones most commonly selected as examples of areas of low risk by those who approached answering in the manner expected.

Salinisation is a process not always known and understood by candidates. Some confused saltiness in immediate coastal locations, which led to coastal examples in **(b)(i)** and to reasons for invasion by sea water in **(b)(ii)**. The best answers were based upon examples from irrigated Pakistan or India due to over-use and misuse of irrigation water in countries known for their high rate of evaporation. 'Shortage of farmland' was the most common and the correct answer in **(b)(iii)**. The impossibility of stopping, and the difficulties of reducing, the effects of natural climatic hazards like droughts and floods were appreciated by most candidates in **(b)(iv)**, although the amount or depth of comment was not always sufficient for the second mark. Some selectivity was needed in answering the soil erosion questions set in **(b)(v)** and **(b)(vi)**. A few saw deforestation as the only cause of soil erosion and reafforestation as the main method of soil conservation. However, because the question limited candidate choice to areas of farmland and crop growing, it meant that these were relevant only if placed in an agricultural context. For example, both cutting down trees to extend the area of farmland and removal of trees from hedgerows were relevant in **b(v)**, while planting trees either as windbreaks or for agro-forestry were valid choices for flat lowland for area 2 in **b(vi)**. The two quick answers to part **(v)** were over-grazing and over-cultivation, although any example of poor farming practice was acceptable. The best choices in part **(vi)** for area 1 were contour ploughing and terraces (both of which were regularly used by candidates) and for area 2 were windbreaks and any dry farming technique. Although both of the latter were used often enough, some candidates appeared to over-react to the inclusion of 'with low rainfall' in the description of area 2 by concentrating on techniques of irrigation at the expense of the question theme of methods of soil conservation.

Only a few lost sight of the poverty theme in **(c)(i)**; it was easy enough for candidates to gain two or three marks provided that they linked different factors in their explanations. Variations in the quality of answers given to **(c)(ii)** were wider than for any other

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Alternative to Coursework

General comments

The paper was set in a small Caribbean island and considered three different economic activities.

Most candidates clearly understood the context of the questions but sometimes did not make full use of the information presented in the questions. There was no evidence of candidates running out of time and nearly all candidates' answers were clearly presented.

Comments on specific questions

Section A

Question 1

- (a) Candidates were asked to explain why the island would be such a good place for evaporation and there were many good answers worth three marks. Some candidates repeated statements from the source material without adding any of their own explanation; these answers could not be given credit.
- (b) Many candidates appreciated the role of algae as producers.
- (c) However the concept of energy flowing between each feeding level in a food chain was rarely explained. This concept is stated in the syllabus.
- (d) Many candidates appreciated that salt extraction required no inputs from humans and that the supply of salt would never come to an end. They could also see that wildlife could continue to survive in this 'industrial' area. However many thought salt was bad for marine animals.

Question 2

- (a) Candidates found it easy to suggest two ways to reduce further damage to the coastal waters.
- (b) Completing the leaflet to help divers be environmentally responsible proved to be a little more demanding than the Examiners had intended, frequently one or two good points were made but answers worth three marks were not common.
 - (ii) The number of diving sites that cannot be reached by boat was usually correct but candidates often found it difficult to describe a fair sampling method in part (iii).
- (c) The data presented was often used to either identify the range of data for the two categories or work out average % damage.
 - (ii) There were many good reasons given for damage to the dive sites, depending on their ability to think about the situation they gained one, two or three marks.
 - (iii) There does not seem to be a very sound understanding of sampling, many candidates suggested sampling every dive site and others suggested a specific site number from the map.
- (d) (i) Candidates were rather more inclined to explain why method one and two were not scientifically sound, a good number realised that the methods did not measure undamaged corals so % could not be calculated.

- (iii) The table was completed successfully by most candidates as was the % calculation in.
- (e) Good comparisons were given from the table.
- (f) The number of divers that had visited the dive sites was the expected answer; many others were given as well!
- (g) Candidates found it hard to make two clear points for a management plan in each of the three areas as asked in the question. There seemed to be too much emphasis on putting tourists in prison or giving them large fines for environmental crimes.

Question 3

- (a) Many candidates used the data presented to good effect; unfortunately a small number ignored the data completely but could still gain credit for describing the effects of wind erosion.
- (b) Many candidates successfully completed the scale and indicated an east-west transect line. Some candidates did not attempt this question. Part (iii) was attempted to good effect. Most plotting was clearly correct, however, some keys and units on axes were incomplete.
- (iv) The trends shown by the graph were often described correctly though some general statements without any reference to distance could not be given credit.
- (c) The Examiners considered that measuring the crop by weight was going to be a sensible alternative to measuring height or length of leaves. In fact it was rarely suggested.
- (d) Some candidates only described some other densities rather than presenting two other numerical answers in the style of the question.
- (e) The consequences of high density planting were well understood by most candidates. References to irrigation were not given credit in this island context.