ENVIRONMENTAL MANAGEMENT

Paper 8291/01
Paper 1

General comments

This year has proven to be different to the pattern of previous years in that marks for paper 1 were better than paper 2. Not only was there an equivalence in performance for each section but the final marks were slightly higher. Although this might be a consequence of the majority of Centres having previous experience of this syllabus it seems that candidates possessed a greater understanding of the topics. A better understanding of terms and more attention to the detail of questions seems to have been productive.

Overall the quality of written English was of a high standard and where necessary effective use was made of exemplar material. There were no rubric errors.

Comments on individual questions

Section A

The majority of candidates engaged quite well with both questions in this section. Although the quality of answers varied, this was more a matter of candidate ability rather than the content of the questions.

Question 1

Whilst most candidates found few difficulties with parts *a* and *b,* the final sections posed some problems in terms of graph interpretation and explanation.

(a) Urban sprawl was mainly described in terms of urbanisation and most received at least 1 mark. The second mark was achieved by mentioning the spread of building across neighbouring rural land; not many stated that these usually followed a route branching outwards from the town or city.

(b) Very few candidates found difficulties with the first two questions in part **b**. Most were able to accurately interpret Table 1 and in **i** and **ii**, 3 and 2 marks respectively was the norm. Surprisingly part **iii** was not as well answered; here a lot of answers dwelt on natural population change rather than for MEDCs urban to rural migration and for LEDCs rural to urban migration.

(c) The quality of part **c** answers depended on a correct interpretation of the resources of agricultural land. Most answers dealt with negative effects such as soil degradation, deforestation and pollution, and ignored positive effects such the intensification of farming, green belt conservation and increased land values. The vast majority achieved two marks for this question through only developing one effect.

(d) Although **i** was better answered than **ii** these two questions were found to be difficult. In describing the relationship between population size and arable land per capita a number of patterns are discernable and along with using data from the graph, candidates could have described

- arable land and total population
- arable land and rural population
- arable land and urban population

One reason rather than two for the changes in the amount became the norm. Most dwelt upon the loss of rural land to urban development. Fewer candidates referred to the effects such as population growth, intensification of farming, climatic change and rural to urban migration.

Question 2

Although there is still some confusion between global warming and ozone depletion this question elicited some high quality answers. It is worth noting that the relationship between global warming and ozone depletion is still uncertain. Ozone depletion occurs in the Stratosphere where its reduction would have a cooling effect; and global warming occurs in the troposphere due to greenhouse gases. Perhaps it is unfortunate that gases such as CFCs cause ozone to become depleted but are also powerful greenhouse gases.

(a)   Apart from some confusion with ozone, the three questions in this section were quite well answered with detail as outlined in the mark scheme.

(b)   The majority of candidates achieved at least 3 marks for this part by providing a description of each of the graphs. Weak answers were typified by simple descriptions of each graph. High marks were obtained by those candidates who showed how the four pieces of information are interwoven.

(c)   It now generally accepted that the increased warmth contained in tropical waters has contributed to an intensification of storms, particularly hurricanes or typhoons. The three questions in this part were concerned with this phenomenon.

In various ways most candidates pointed out the positive relationship shown in Fig.2.2. Unfortunately the remaining questions were less well answered. The most common error in **ii** was to suggest that the energy created by tropical storms heated the oceans. Very few realised that as tropical storms develop they are energised by warm oceanic water; thus the more heat the more energy is transferred into the storm. The main problem in part **iii** was that too many candidates referred to events such as tsunamis, floods and landslips; clearly not weather events.

Section B

Unlike paper 2 there was a slight imbalance in the number of responses to each of these questions. **Question 3** was the more popular and frequently of higher quality than 4 and 5.

Question 3

(a)   The majority of candidates displayed a good understanding of plate tectonics. Although some were unclear about convection currents and ocean floor spreading there were some excellent descriptions of the tectonic activity occurring at locations X and Y.

(b)   There were some excellent descriptions of a named tectonic event with some weaknesses in evaluating the effectiveness of its management. Obviously strong candidates gave each element of the question some very detailed analysis. Weaknesses occasionally occurred in the assessment of management strategies, before, during and after the event. A small number of candidates selected earthquake or volcanic events that by their very nature were self-penalising e.g. Vesuvius AD79 and the 1906 San Francisco earthquake. It was impressive that some candidates selected very recent events such as the 2009 Indonesian earthquake.

Question 4

Answers to this question were weaker than 3 and 5.

(a)   Interpretations of the scatter plot were quite varied; perhaps candidates were expecting a positive correlation. Instead LEDCs form a more compact cluster to the left whilst MEDCs have a wide dispersal to the right. This indicates that although LEDCs and MEDCs have a high count for sulphur dioxide emissions, 5 developed countries have very low emissions.

The reasons for this pattern were frequently ignored or weak. Both developed and developing countries rely on industries that emit SO_2 particularly through the burning of coal. However some developed countries either use alternative energy or clean their emissions before they enter the atmosphere.

(b)   This question fell into two parts:

- why atmospheric pollution is an international problem
- why intergovernmental meetings and protocols have proved to be unsuccessful.

The first part was well answered with reasons for the passage of pollutants across international boundaries receiving full descriptions. However many candidates were unclear about the both the role and effectiveness of international agreements and protocols. There was even some confusion between the stated objectives of Rio, Kyoto, Montreal and Bali.

Question 5

Although less popular than **Question 3**, there were some excellent responses to both parts of this question.

(a)   The analysis of Table 5.1 fell into two parts: an assessment of energy consumption followed by the need to relate the importation of energy to consumption. Most candidates achieved good marks in **i** by describing and comparing the figures for each energy type. Part **ii** was slightly less well answered as many candidates only quoted the data instead of relating it to energy consumption.

(b)   This question was assessing syllabus content that had been assessed, albeit in a different way, in previous papers; most candidates should have been aware of its expectations. Answers were not always of the standard I had expected as many either emphasised renewable energy or fossil fuels rather than priorities towards replacing fossil fuels with renewable energy. Developing countries (LEDCs) were therefore described as relying on fossil fuels because that is all they can afford, whilst MEDCs use renewable energy because they are rich and have the technology. This is of course not true as many LEDCs use HEP, have solar energy and biofuels whilst many MEDCs are reliant on the fossil fuels, coal and oil.

Conclusion

This paper proved to be an effective test of both knowledge and ability. It was pleasing that most candidates engaged with the questions and made very good use of exemplar material. It was certainly a pleasant task to assess so many well written and interesting short answers and essays.

ENVIRONMENTAL MANAGEMENT

| Paper 8291/02 |
| Paper 2 |

General comments

This November's paper proved to be an effective test of both a candidate's knowledge and ability to manage data on the Hydrosphere and Biosphere. A smaller November entry, mainly drawing from Centres with some experience of the syllabus, possibly accounts for the significant number achieving quite high marks; many in the 45 to 70 range. Candidate performance for each of the sections showed a slight imbalance with responses to **section B** being better than **section A**; it seems that a number of candidates still have difficulties with data response questions.

Comments on individual questions

Section A

Question 1

Responses to this question were quite varied with more problems being encountered in the early part of the question.

(a) (i) With the information provided in Fig. 1.1 it was surprising that many candidates could not provide accurate definitions of pioneer and climax. Most pointed out that pioneer referred to the earliest stage and climax the final stage. However, very few gave examples of the type of vegetation and most ignored the conditions in which colonising plants develop and the equilibrium of climax communities.

(ii) Although approaches differed, this question was quite well answered. Some used Fig. 1.1 to describe a succession whilst other more successful answers analysed the interactions of soil and vegetation that led to a climax community. The small number of weak answers mentioned a vegetation succession without reference to soils.

(b) The three parts to this section were concerned with the Everglades National Park. Parts **(i)** and **(ii)** were well answered. Most candidates gave accurate descriptions of appropriate biotic and abiotic factors and how tourism would adversely affect ecosystems. Answers to part **(iii)**, however, suffered from being over-generalised and often lacked a focus on conservation.

Question 2

Again responses to this question were quite varied, with part **(b)** generally better answered than **(a)**.

(a) Whilst the vast majority achieved correct answers to parts **(i)** and **(ii)** the remainder was less well answered. Many found it difficult to give two clear reasons why sub-Saharan Africa has the lowest percentage provision of improved drinking water. Most answers mentioned the semi-desert conditions but references to the economic and technological factors were frequently vague. Similarly, barring mentioning that Europe's provision was already well developed, there was little specific reference to why.

(b) Many candidates were obviously well versed in the development of the Three Gorges scheme and had few difficulties with the two questions. The quality of answers simply varied according the ability of the candidate.

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Section B

The three questions in this section attracted an equal number of candidates and achieved a similar range of marks.

Question 3

(a) (i) The map showing the spread of the Exxon Valdez oil slick proved quite easy to interpret and most candidates were reasonably accurate in combining time, distance and locations. Many achieved the full 4 marks.

(ii) The graph depicting the gradual recovery to the marine ecosystems posed some difficulties. Whilst there were some excellent answers a significant number failed to interpret the information showing ecological recovery to baseline conditions. The weakest answers concerned themselves with responses by the human community to the disaster.

(b) There were some very good answers to this question that adhered to the components of the question and achieved the correct balance of detail. Through reference to a good range of marine pollutants these candidates outlined how the lack of control combined with distances, ocean currents, accidents and illegal dumping, makes marine pollution difficult to control. Generally two distinct methods of combating pollution threats were clearly described.

Weak answers either omitted one element of the question or were confined to a brief description of oil tanker accidents and the dispersal of oil slicks.

Question 4

This question on forest reserves and the impact of commercial agriculture upon ecosystems was the best answered in *section B*. Here candidates performed well in both parts of the question, showing effective analytical skills in part **(a)** and good use of exemplar material in **(b)**.

(a) Fig. 4.1 contained details of losses and gains in forested areas by continent. Most candidates recognised that the data fell into three categories:

- African and South America with high losses
- North and Central America, Oceania and Asia with relatively low losses
- Europe with a small gain.

With the exception of some weaker candidates who completely failed to describe the content of the graph the only weaknesses were in explaining the pattern of losses and gains. Here strong answers were clear about losses due to economic factors and gains due to afforestation and conservation.

(b) As stated earlier this was generally well answered. Most higher quality answers selected tropical rainforest as their biome (usually Amazonia) and were thorough in their description of the effects of commercial farming and assessment of sustainable usage. Poor answers sometimes substituted detail on commercial farming with exploitation through mining and industry; this had a detrimental effect upon the assessment in the final part of the question.

Question 5

This question posed more difficulties and was less well answered than **Questions 3** and **4**.

(a) Unfortunately the majority of answers failed to recognise the characteristics of the Tundra biome. Although many confused Tundra with Arctic, the majority tried to explain in simple terms the effects global warming might have upon almost any biome. Consequently most failed to mention that melting of snow in the nearby mountains would add to the problems caused by the thawing of the permafrost, thereby increasing surface water.

(b)   This was well answered by a very small number of candidates who had some detailed knowledge of pressure groups such as Greenpeace and Friends of the Earth. These candidates went on to describe various issues that had been highlighted by such groups; atmospheric pollution and loss of biodiversity featured strongly. Most answers however described some environmental issues without any reference to how they were highlighted. It has become an important feature of current global environmental management that issues become highlighted and reported by a wide range of pressure groups and indeed individual people.

The final part of the question was much better answered with National Parks the most popular selection. Candidates who selected one conservation method did better than those who chose to describe two or more.

Conclusion

As stated earlier, this paper has performed well in its objective of testing a candidate's knowledge of the Hydrosphere and Biosphere as well as differentiating between different levels of ability. Whilst the quality of English and presentation of answers in *section B* continues to impress, there is still a need for candidates to practise data response questions. This syllabus is now in its fifth year and Centres should by now have built up a bank of questions. I would advise building these into teaching programmes/schemes of work.

ENVIRONMENTAL MANAGEMENT

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<tr><td>Paper 8291/03
School Based Assessment</td></tr>
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General comments

This November's reports were generally of a high standard with very few achieving less than 16 out of 40 and most in the 24 to 34 range. Most of the research reports in this higher range were well structured and contained a high input of original primary information. The reports began with a clear statement of intent which was followed by relevant sections covering analysed results and conclusions.

Whilst this trend is very positive there is an important issue regarding Internet information. Generally higher quality reports contain a balance of primary data and background material derived from secondary sources. However a significant number of candidates do rely on secondary information, invariably obtained from the Internet. This session saw some candidates copying and pasting a large quantity of background information that actually obscured their personal input; ultimately to the detriment of the report.

In the early stages of planning their work, it is important that candidates are made fully aware of the requirements of this School based assessment. Pages 13 to 17 of the syllabus provide detailed information to both teachers and candidates on both project design and how the written reports will be assessed.

Finally, I need to raise some administrative issues that have arisen this session and influence the external moderation of coursework:

- occasionally the title and hypotheses bear little resemblance to those contained on the original proposal form
- the candidate record card should show the same title as that of the candidate's report
- the marks awarded on the candidate record card, the MS1 form (candidate register and marks) and the summary sheet should be the same
- All research reports should have arrived at CIE by 30th October (30th April for the June session); this means Centres must anticipate the postage time and complete their internal procedures well in advance - I suggest posting them two weeks before the deadline
- Projects must be internally assessed and where necessary moderated.

Comments on assessment criteria

Skill C1: Research and planning

For most candidates this was quite well done. Most reports contained a title, hypothesis and sufficient background material, thereby satisfying criteria *a* and *b*; significantly criteria *c* and *d* were more variable in quality. It is important that candidates provide a detailed methodology in which specific methods receive some brief explanation and justification.

There is a strong case for candidates to draft the content of their research and planning section before they begin their primary and secondary research. In terms of the components of scientific method this can always be modified at a later date as a result of feedback into the earlier stages.

Skill C2: Data collection and Presentation

This skill was reasonably well achieved with the majority of candidates receiving at least one mark for each of criteria *a*, *b*, *c* and *d*. Although there were some candidates who relied entirely upon written descriptions, there was some effective inclusion of photographs, graphs and tables; for the most part information was accurately recorded and presented. There is rarely a major problem with how reports are organised and the quality of written English.

Criterion *e,* which involves the use of statistical tools to analyse the data is generally the weakest element in this skill area. There is a difference between data presented as part of a description (e.g. bar charts, line graphs, photographs etc.) and that used for analysis i.e. via a correlation test, chi squared etc. Very few candidates set about verifying the significance of their results via a suitable statistical test.

Skill C3: Conclusions and Evaluation

This proved to be the weakest part of this November's submissions. Conclusions must be supported by reference to the data; otherwise they are only worthy of one mark. Many candidates are still confused by the term 'evaluation'. It involves a candidate assessment of the strengths and weaknesses evident within the project they have undertaken with recommendations, if needed, on how it could have been improved. Of the three criteria in this skill area, *b* was generally achieved quite well.

Conclusion

As in previous sessions it is always a pleasant and rewarding task to moderate such a varied and interesting set of research reports. The global spread of Centres and the commitment of candidates and their staff ensures that this element of the examination remains a strength rather than weakness. The feeling I obtain through reviewing this work is that the majority of candidates find it an enjoyable and rewarding task.
Many thanks.