

**ADVANCED SUBSIDIARY GCE
 SCIENCE**

Interpreting Scientific Information

THURSDAY 22 MAY 2008

2843/01

Afternoon
 Time: 1 hour

Candidates answer on the question paper
Additional materials (enclosed): Insert

Additional materials (required):
 Electronic calculator



Candidate
 Forename

Candidate
 Surname

Centre
 Number

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Candidate
 Number

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INSTRUCTIONS TO CANDIDATES

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided.

INFORMATION FOR CANDIDATES

- The number of marks for each question is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **45**.
- The questions in this paper are based on the abridged version of a scientific article, which is printed in the Insert to this question paper.

FOR EXAMINER'S USE		
Qu.	Max	Mark
1	11	
2	15	
3	10	
4	9	
TOTAL	45	

This document consists of **7** printed pages, **1** blank page and an insert.

Answer **all** the questions.

All the questions in this paper are based on the article 'The Rainforest Saver'. This is abridged from an article by Daniel Elkan which first appeared in *The Ecologist* in February 2005.

A copy of the article is provided as an insert to this paper.

Read the article carefully before you answer the questions.

1 (a) What is 'slash-and-burn' farming?

.....
.....[1]

(b) (i) What area of land is estimated to be slashed and burned annually?

.....[1]

(ii) The total area of rainforest worldwide is estimated to be 1.7×10^9 hectares. Approximately what percentage of this is being slashed and burned every year?

Answer % [2]

(c) (i) What percentage of the planet's carbon is stored in forest vegetation?

.....[1]

(ii) Suggest **one** form in which carbon is stored in forest vegetation.

.....[1]

(iii) Use your scientific knowledge to describe a global environmental problem caused by the burning of the carbon in forest vegetation.

.....
.....
.....
.....[3]

(d) Give **two** possible reasons for the poor growth of crops on land that has been 'slashed and burned'.

1.

2.[2]

[Total: 11]

2 (a) State what is meant by 'alley-cropping'.

.....
.....[1]

(b) Suggest the meaning of the term 'mulch'.

.....
.....[2]

(c) State **one** way in which 'alley-cropping' prevents weed growth.

.....
.....[1]

(d) Use a flow diagram to describe the sequence of events Hands planned to carry out **before** the crops were planted.

[3]

(e) The tree Hands selected was the *Inga Edulis*. One of its benefits is that it can 'fix nitrogen'.

(i) Use your scientific knowledge to state what 'fix nitrogen' means.

.....
.....[1]

(ii) Why is it beneficial?

.....
.....[1]

(f) Draw a labelled diagram to show the arrangement of plants in Hands alley-cropping system. The crop grown was maize. Give some indication of the distances involved.

[3]

(g) Explain how this method would prevent the loss of excess nutrients from the soil.

.....

.....

.....

.....[3]

[Total: 15]

3 (a) Describe the experiment that Hands carried out to show the importance of phosphorus to plants.

.....
.....
.....
.....[3]

(b) Immediately after burning, the forest soil contained no more phosphorus than before burning, yet crops planted then thrived. How did Hands explain this?

.....
.....
.....
.....[3]

(c) Explain why the crop yields then fell after 2 years.

.....
.....
.....[2]

(d) How did Hands' alley-cropping system help the situation?

.....
.....
.....[2]

[Total: 10]

4 (a) Use your scientific knowledge to explain why farmers might have doubts about planting corn and beans under trees.

.....
.....[2]

(b) List **two** benefits to the Honduran farmers, other than nutrient retention, of adopting the alley-cropping system.

1.
2.[2]

(c) Even with this system, the farmers had to add extra phosphate to the soil. Suggest a reason why.

.....
.....[1]

(d) Why are there not enough trees to meet demand currently?

.....
.....
.....[1]

(e) (i) An *Inga* seed orchard of an area of 2 hectares provides enough seed to produce trees for 1000 hectares of alley-cropping.
Each hectare of alley-cropping needs 5000 trees.
How many seeds are produced per hectare in the seed orchard?

Answer seeds [2]

(ii) If each tree produces 2000 seeds, how many *Inga* trees are there in the orchard?

Answer trees [1]

[Total: 9]

END OF QUESTION PAPER

7
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