



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Advanced Subsidiary Level and Advanced Level

**GEOGRAPHY**

**9696/21**

Paper 2 Advanced Physical Options

**October/November 2010**

**1 hour 30 minutes**

Additional Materials: Answer Booklet/Paper

**READ THESE INSTRUCTIONS FIRST**

If you have been given an Answer Booklet, follow the instructions on the front cover of the Booklet.

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use a soft pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **two** questions only. Each question answered **must** be from a different topic.

Sketch maps and diagrams should be drawn whenever they serve to illustrate an answer.

You should make reference to appropriate examples studied in the field or the classroom, even where such examples are not specifically requested by the question.

All the Figures and the Photograph referred to in the questions are contained in the Insert.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [ ] at the end of each question or part question.



This document consists of **3** printed pages, **1** blank page and **1** Insert.



### Tropical environments

Only **one** question may be answered from this topic.

- 1 (a) With the use of one or more diagrams, explain how nutrients are cycled within the tropical rainforest ecosystem. [10]
- (b) To what extent does the clearance of natural vegetation always have a damaging affect on soils in tropical areas? [15]
- 2 (a) Fig. 1A shows the relationship between rainfall and vegetation in parts of West Africa. Fig. 1B shows the average duration of wet and dry seasons in the same area of West Africa.  
Explain the variation in rainfall and describe how it affects vegetation. [10]
- (b) Explain the relative contributions of climate, weathering, rock structure and vegetation to the development of landforms in tropical limestone (karst) areas. [15]

### Coastal environments

Only **one** question may be answered from this topic.

- 3 (a) Explain what is meant by high and low energy waves. Describe the effects they have upon the gradient of beaches. [10]
- (b) Describe the main problems of the management of a stretch or stretches of coastline. How successfully might these problems be overcome? [15]
- 4 (a) Fig. 2 is an extract from a newspaper report on the future of coral reefs.  
Explain why coral reefs are thought to be so vulnerable to changes in the oceans. [10]
- (b) To what extent does rock type and structure determine the shape of coastal landforms? [15]

### Hazardous environments

Only **one** question may be answered from this topic.

- 5 (a) Describe and briefly explain the main characteristics of tropical storms (hurricanes) and tornadoes. [10]
- (b) Explain which areas are most at risk from the hazardous effects of hurricanes and tornadoes. To what extent can their hazardous impact be reduced? [15]
- 6 (a) Fig. 3 shows the global distribution of earthquake epicentres.  
Describe and explain the distribution of earthquake epicentres shown in Fig. 3. [10]
- (b) Why are earthquakes hazardous? How and to what extent can their occurrence be predicted? [15]

### Arid and semi-arid environments

Only **one** question may be answered from this topic.

- 7 (a) Describe and explain the main characteristics of the climates experienced in hot arid and semi-arid areas. [10]
- (b) Describe the main characteristics of ecosystems found in hot arid areas. To what extent is there variation from one desert to another? [15]
- 8 (a) Photograph A shows some landforms in the Sahara desert.  
Using a diagram, identify the landforms in Photograph A and suggest ways in which they may have been formed. [10]
- (b) Using an example or examples, evaluate the ways in which **either** arid **or** semi-arid areas can be developed in a sustainable manner. [15]

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*Copyright Acknowledgements:*

- Question 2 Fig. 1           © G O'Hare & J Sweeney; *The Atmospheric System*; Oliver & Boyd; 1990.  
Question 4 Fig. 2           © Frank Pope, Oceans Correspondent; *Great Barrier Reef 'will be no more within two decades'*; The Times; July 7 2009;  
  <http://extras.timesonline.co.uk/pdfs/coralbleaching.pdf> 18/9/09.  
Question 8 Photograph A   © Sahara Desert; [www.h4ppy.com/blog/uploaded-images](http://www.h4ppy.com/blog/uploaded-images).

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