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**GEOGRAPHY**

**9696/21**

Paper 2 Advanced Physical Options

**May/June 2017**

**1 hour 30 minutes**

No Additional Materials are required.

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**READ THESE INSTRUCTIONS FIRST**

An answer booklet is provided inside this question paper. You should follow the instructions on the front cover of the answer booklet. If you need additional answer paper ask the invigilator for a continuation booklet.

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 Photographs referred to in the questions are contained in the Insert.

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



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This document consists of **3** printed pages, **1** blank page and **2** Inserts.

### Tropical environments

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

- 1 (a) Fig. 1 shows the process of plant succession.

Using Fig. 1, describe the process of plant succession in **either** a tropical rainforest **or** a savanna ecosystem. [10]

- (b) Describe the characteristics of tropical air masses. To what extent do the characteristics of tropical air masses contribute to the development of tropical climates? [15]

- 2 (a) With the aid of diagrams, explain how the processes of weathering and erosion lead to the development of granite landforms in tropical environments. [10]

- (b) Assess the importance of ocean currents in explaining the climatic characteristics of tropical climates. [15]

### Coastal environments

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

- 3 (a) Describe and explain the factors which contribute to the generation of different types of wave. [10]

- (b) Photograph A shows some effects of marine erosion on the Yorkshire coast, UK.

Explain the processes of marine erosion and mass movement. Assess the effects these processes have upon cliff profiles, such as the one shown in Photograph A. [15]

- 4 (a) With the aid of diagrams, describe the characteristics and explain the formation of offshore bars, barrier beaches and barrier islands. [10]

- (b) Describe some problems of sustainable management of a stretch or stretches of coastline and evaluate attempted solutions. [15]

### Hazardous environments

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

- 5 (a) Photograph B shows effects of the Mount Ontake volcanic eruption in Japan, September 2014.

Describe the range of products associated with explosive volcanic eruptions. With reference to Photograph B, explain the effects of the eruption on the surrounding area. [10]

- (b) Describe and explain the range of hazards caused by earthquakes. Assess the extent to which these hazards can be predicted. [15]

- 6 (a) Describe the characteristics of tropical storms (cyclones). Explain how the development of tropical storms (cyclones) can be monitored. [10]

- (b) For any **one** hazardous environment, describe some of the problems of sustainable management and evaluate attempted or possible solutions. [15]

### Arid and semi-arid environments

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

- 7 (a) Describe and explain how animals are adapted to extremes of temperature and drought in arid environments. [10]

- (b) Fig. 2 shows the nutrient cycle for an arid environment.

Using Fig. 2, explain the main characteristics of the nutrient cycle. Discuss why arid environments have low biomass productivity. [15]

- 8 (a) With the aid of labelled diagrams, explain the development of alluvial fans and pediments in arid environments. [10]

- (b) For arid and semi-arid environments, explain the processes of thermal fracture, exfoliation and chemical weathering. To what extent are these processes effective in the weathering of rocks in these environments? [15]

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