



Rewarding Learning

ADVANCED
General Certificate of Education
January 2009

Geography

Assessment Unit A2 1

assessing

Module 4: Physical Processes and
Human Interactions

[A2G11]

MONDAY 12 JANUARY, MORNING



A2G11

TIME

1 hour 30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number on the Answer Booklet provided.

Answer **two** questions.

Answer **one** question from each of the **two** optional units you have studied.

INFORMATION FOR CANDIDATES

The total mark for this paper is 70.

Quality of written communication will be assessed in **all** questions.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

You are strongly recommended to read through and consider the questions before choosing those you are going to answer.

This paper is accompanied by a Resource Booklet.

SYNOPTIC ASSESSMENT

*The synoptic element of each question is indicated by **syn**. These synoptic elements require you to demonstrate an understanding of the connections between physical and human geography.*

Unit A: Managing Fluvial and Coastal Environments

- 1 (a) (i) Explain how channelisation of a river may cause increased:
- stream velocity;
 - channel gradient;
 - channel capacity. [6]
- (ii) Explain why these impacts are useful in reducing flood risk. [4]
- (iii) Study **Resource 1** (page 2 of the Resource Booklet) which shows a channelised stretch of the River Shimna, Newcastle. Suggest how channelisation may have disrupted the habitats within this river channel. [4]
- (b) With brief reference to an example, explain why the technical viability of a coastal protection scheme should be considered at the planning stage. [6]
- syn* (c) With reference to case study material:
- discuss the effects of human pressure on a fragile sand dune ecosystem;
 - describe the remedial strategies implemented and evaluate their effectiveness. [15]
- 2 (a) Physical processes create coastal landforms. With reference to place, identify **one** coastal landform and, with the aid of a diagram, describe its formation. [8]
- (b) Study **Resources 2A** and **2B** (page 3 of the Resource Booklet), which show coastal protection measures at the foot of the dune system, East Strand, one of the tourist amenities of Portrush. With reference to the resources:
- (i) suggest reasons why coastal protection measures have been put in place along this section of the coastline; [5]
- (ii) explain fully how the measures shown may protect the dune system. [6]
- syn* (c) With reference to a **regional** scale case study of basin management:
- (i) outline the strategies used to manage the river; [6]
- (ii) discuss the beneficial outcomes and conflicts of interest which resulted from the use of these strategies. [10]

Unit B: The Nature and Vulnerability of Tropical Ecosystems

- 3 (a) Tropical grasslands are generally located between the tropical forest and tropical semi-arid biomes. With the aid of a diagram, explain the reasons for this global distribution of the tropical grassland biome.
- (b) Study **Resource 3** (page 4 of the Resource Booklet) which shows the soil profiles of an oxisol and an aridisol. Identify and account for the contrasts in the characteristics of these tropical zonal soils. [10]

syn (c) “In many tropical countries the benefits resulting from the irrigation of farmland are outweighed by the problem of salinisation.”

With reference to a regional scale case study:

- outline the potential benefits of irrigation;
- describe the impact of salinisation;
- evaluate the possible solutions to the salinisation problem. [15]

4 (a) With the aid of a diagram of an appropriate nutrient cycle, describe the nutrient flows associated with tropical forest ecosystems. [9]

syn (b) Study **Resource 4** (page 5 of the Resource Booklet) which is a newspaper report on proposed large scale deforestation of tropical forest in Uganda.

(i) Discuss the economic and environmental reasons behind the decision to reject the proposed deforestation. [8]

(ii) NatureUganda supports sustainable management of tropical forest ecosystems. How does the paragraph in bold in **Resource 4**, demonstrate this approach? [3]

(c) With reference to regional case studies of a tropical forest **and** a tropical semi-arid ecosystem, describe and explain the differences in their biomass, productivity and trophic structure. [15]

Unit C: Pollution and its Management

- 5 (a) “Pollution occurs when human activity causes substances to be released into the environment in harmful concentrations.”
Discuss the extent to which you agree with this definition.
- (b) Study **Resources 5A–5C** (pages 6–7 of the Resource Booklet), concerning the impacts of radio-active contamination of the environment.
- (i) The resources indicate that the levels of radiation pollution produced by the Chernobyl incident varied geographically. Identify the mapping technique which has been used in **Resource 5A** to illustrate this variation in radiation concentration and explain why it was chosen. [3]
- (ii) With reference to these resources **only**, discuss the economic and social implications of radiation pollution. [6]
- (iii) What do **Resources 5B** and **5C** indicate about the limitations of our knowledge of the impacts of radiation pollution? [5]
- syn* (c) With reference to a small scale study of urban solid waste disposal:
- describe the challenges of urban waste disposal in this location;
 - discuss the role of recycling, reduction and reuse in meeting these challenges. [15]

- 6 (a) With reference to places for illustration, explain how pollution incidents are classified by their frequency. [6]
- (b) Study **Resources 6A** and **6B** (page 8 of the Resource Booklet), which relate to the monitoring of air quality in Northern Ireland.
- (i) Describe how the daily mean concentration of suspended particulate matter would be calculated and suggest why this is an appropriate statistic by which to examine changes in this type of pollution over time. [4]
- (ii) With reference to **Resources 6A** and **6B**, describe and evaluate the steps taken to reduce urban air pollution to acceptable levels. [6]
- (iii) If the Belfast Metropolitan Transport Plan proposals for sustainable transport are unsuccessful, outline the possible health effects of suspended particulate matter. [4]
- syn* (c) With reference to case study material at the global scale, discuss the economic, social and environmental threats posed by continued emissions of greenhouse gases into the atmosphere. [15]

Unit D: Natural Hazards and Human Activity

- 7 (a) Study **Resource 7** (page 9 of the Resource Booklet) which illustrates the potential hazards of volcanic activity.
- (i) With reference to places for illustration, describe some of the potential negative social and economic impacts for people living in the intermediate zone. [6]
- (ii) Discuss how some of the volcanic hazards shown in **Resource 7** could eventually benefit the environment and economy in the long term. You should make general reference to places for illustration purposes. [8]
- (b) Describe and evaluate methods used to predict **earthquake** activity. No case study material is required. [6]
- syn* (c) With reference to small-scale case studies of earthquake activity in a LEDC **and** a MEDC, discuss how the impact and management of primary and secondary effects reflects knowledge **and** perception. [15]
- 8 (a) With the aid of a diagram, explain the cause and distribution of earthquake and volcanic activity at **either** a destructive (convergent) **or** constructive (divergent) plate margin. [10]
- (b) Study **Resource 8** (page 10 of the Resource Booklet) which shows the date of onset and the proportion of annual rainfall from the wet summer monsoon in India.
- (i) Describe the nature of the wet monsoon at locations **A** and **B**. [4]
- (ii) Discuss the possible impacts on the economy and society at **C**, if the onset of the monsoon rain were to be delayed until August. [6]
- syn* (c) With reference to **either** a prolonged drought **or** an extreme storm in mid-latitudes:
- describe its impacts;
 - describe the human responses to the meteorological event. [15]

THIS IS THE END OF THE QUESTION PAPER
