TEMASEK JUNIOR COLLEGE
PRELIMINARY EXAMINATION 2013

GEOGRAPHY **9730/01**
Higher 2 **September 2013**

Paper 1 Physical Geography **3 hours**

Additional Materials: **Insert with Figures**
Colour Photographs and Diagrams
World Outline Map

READ THESE INSTRUCTIONS FIRST

Write your name, Centre number and index number 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, paperclips, highlighters, glue or correction fluid.

Section A
Answer **all** data response questions.

Section B
Answer **two** questions, each from a different topic.

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.
You should spend time according to marks allocated to questions.
Ensure you receive all Photographs, Figures and the World Outline Map
Diagrams and sketch maps should be drawn whenever they serve to illustrate an answer.
The world outline map may be annotated and handed in with relevant answers.
You are reminded of the need for good English and clear presentation in your answers.

This document consists of 4 printed pages

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SECTION A

Answer **all** the questions in this section
Questions 1,2 and 3 carry 12 marks each and Question 4 carries 14 marks.
You should allocate your time accordingly.

Lithospheric Processes, Hazards and Management

1 Figures 1A, 1B, 1C and 1D show information related to volcanic activity in northern Philippines and the Mount Pinatubo eruption in 1991.

1 (a) Describe and explain the pattern of volcanic activity in Fig. 1A. [2]

1 (b) With reference to information in Fig. 1B,

(i) estimate the thickness of ashfall at Clark Air Base;

(ii) suggest the likely direction of the ash plume during the eruption and cite evidence for your choice. [3]

1 (c) Using information in Figures 1B, 1C and 1D, evaluate the effectiveness of the following measures in managing the hazardous impacts of the volcanic eruption:

(i) monitoring the volcanic and seismic activity of Mt Pinatubo and

(ii) the hazard map compiled in May 1991. [7]

Atmospheric Processes, Hazards and Management

2 Study Figure 2A which shows the locations of three stations in West Africa and Figure 2B which shows the average monthly rainfall and days with precipitation for each station.

2 (a) With reference to the given information, describe the variation in rainfall in West Africa. [4]

2 (b) Explain the variation in rainfall you have described in part (a). [8]

Hydrological Processes, Hazards and Management

3 Study Photographs A and B which show two types of channel patterns.

3 (a) State **two** differences between the channel patterns evident in

Photographs A and B. [2]

3 (b) Briefly explain the formation of the channel pattern in Photograph A. [5]

3 (c) Briefly describe and explain how the channel in Photograph B may change in the course of a year. [5]

Lithospheric and Hydrologic Processes, Hazards and Management

4 Photograph C shows a valley in Northumberland, United Kingdom.

4 (a) Draw a field sketch of Photograph C, clearly annotating the evidence for slope processes and river processes visible in the photograph. [4]

4 (b) Explain how the processes acting on the slope influence the processes occurring in the river channel. [5]

4 (c) Describe how the rate of movement of soil on a slope could be examined. [5]

SECTION B

Answer **two** questions, each from a different topic. All questions carry 25 marks.

Lithospheric Processes, Hazards and Management

5 EITHER

5 (a) Distinguish between different types of volcanic eruptions and related volcanic landforms. [9]

5 (b) With reference to examples, to what extent do you agree with the view that the severity of hazardous impacts of earthquakes depend primarily on human factors? [16]

OR

5(a) Describe how the weathering of granite produces weathering profiles, tafoni and boulder fields. [9]

5(b) To what extent has running water influenced the origin and development of inselbergs and tors in areas you have studied? [16]

Atmospheric Processes, Hazards And Management

6 EITHER

6 (a) Figure 3 shows relationships between upper air flow and surface conditions.

Describe the characteristics of jet streams, how they change over time and their relation to surface conditions as shown in Fig. 3. [9]

6 (b) Discuss the view that urban areas create their own climate. [16]

OR

6 (a) Explain the causes of drought in the tropics and compare its effects in developed and less developed countries. [9]

6 (b) To what extent do you agree that reducing greenhouse gas emissions is the most effective response to global warming? [16]

Hydrologic Processes, Hazards and Management

7 EITHER

7 (a) With reference to examples, describe how alteration to catchment characteristics could lead to conflict of interests within and between states. [9]

7 (b) To what extent are variations in river discharge over time influenced by climate? [16]

OR

7 (a) With the aid of diagrams, describe the main surface and sub-surface flows in a drainage basin and explain the relative importance of these flows in contributing to channel flow in the course of a storm. [9]

7 (b) Assess the extent to which land use planning and zoning is the best way to manage river floods. [16]

END OF PAPER

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GEOGRAPHY **9730/01**
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INSERT

READ THESE INSTRUCTIONS FIRST

This insert contains Figures 1D, 2A and 2B referred to in the questions as well as the World Outline Maps

This document consists of 3 printed pages

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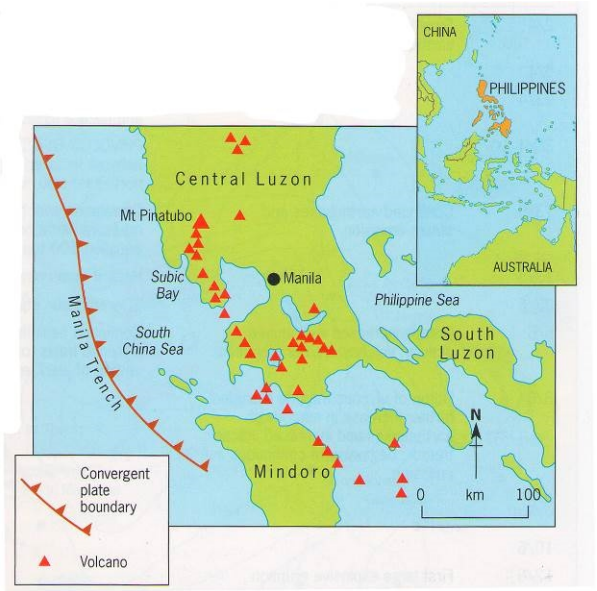
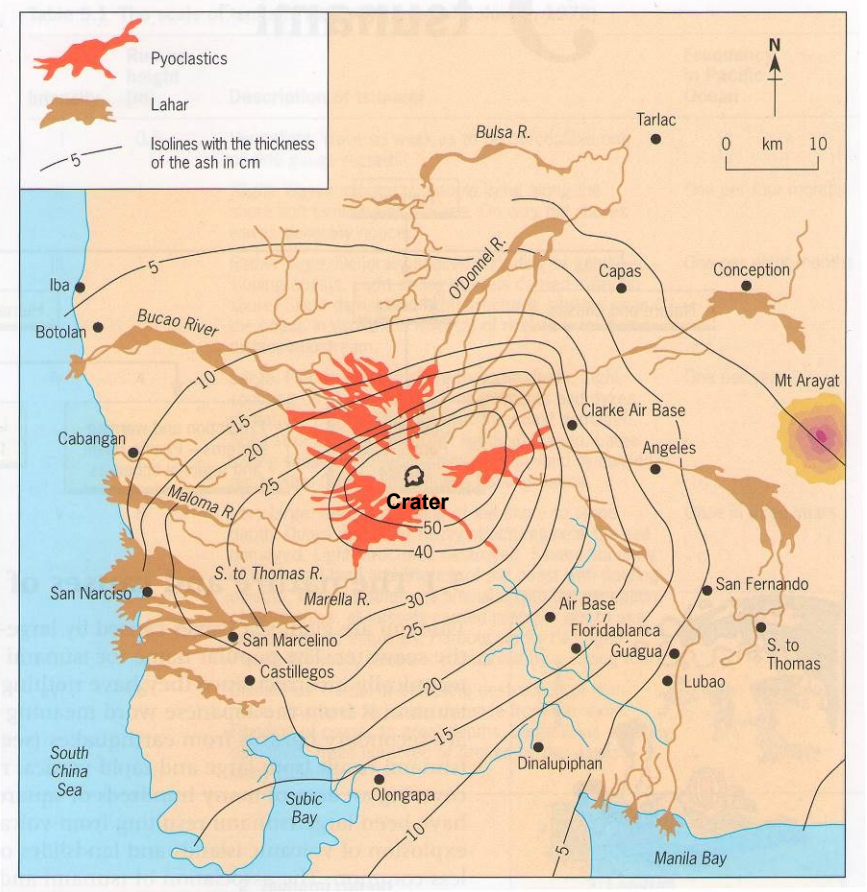
FIGURE 1A FOR QUESTION 1



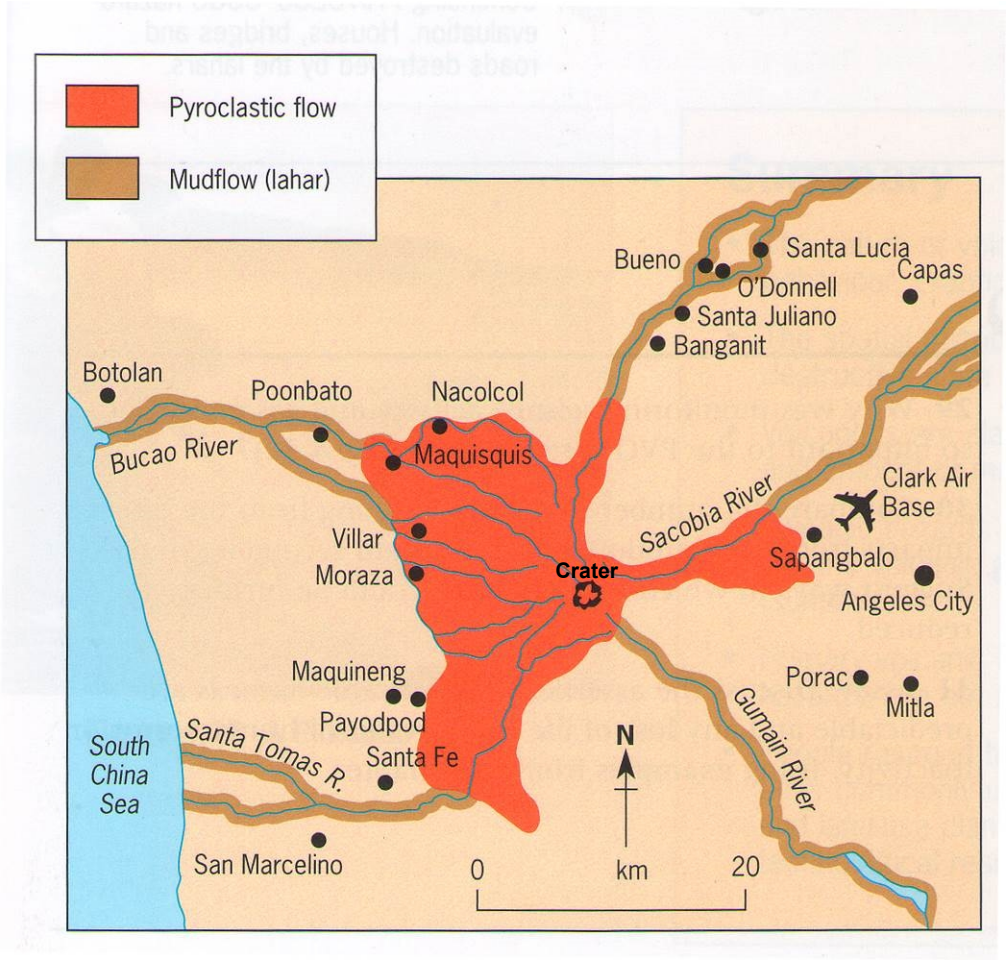
The location of Mount Pinatubo within the Luzon volcanic zone

FIGURE 1B FOR QUESTION 1



The distribution of volcanic impacts

FIGURE 1C FOR QUESTION 1



Pinatubo hazard map, compiled in May 1991

FIGURE 1D FOR QUESTION 1

Date (1991)	Volcanic activity	Monitoring	Alert level	Response
2/4	Small steam explosions; earthquakes began.			PHIVOLCS alerted.
5/4		PHIVOLCS installed portable seismometers.		
23/4		USGS joined PHIVOLCS' efforts in monitoring and hazard assessment.		Villages within 10 km of the summit were evacuated.
30/4–10/5		PHIVOLCS–USGS radio-telemetered seismic network installed. Earthquakes located on north-east side of summit.		
13/5	Continued earthquakes and steam emission.	Correlation spectrometer (COSPEC) measurements began. SO_2 emission equalled 500 tons a day.	2	Alert system in place.
23/5		Hazard map completed.		Information distributed to local officials.
28/5		SO_2 emission equalled 5000 tons a day.		
5/6	Greatly increased earthquake activity; volcanic tremor identified.	Continued seismic and other monitoring provided basis for eruption forecast and setting of alert levels.	3	Villages on north-west slope were evacuated again.
8/6	Dome of viscous magma extruded; further increase in number of earthquakes and increased volcanic tremor; beginning of continuous ash emission.			
9/6			5	Radius of evacuation extended to 20 km. 25 000 people now evacuated.
10/6				Near-total evacuation of Clark Air Base.
12/6	First large explosive eruption reached 20 km high: pyroclastic flows moved down northwest valleys. Ash spread as far as Vietnam and Cambodia.			Evacuation radius extended to 30 km. 58 000 people now evacuated, 200 000 people relocated.
15/6	Climactic (caldera-forming) eruption. Dome collapse; widespread ashfall; large pyroclastic flows and lahars. Typhoon Yunya produced heavy rainfall and saturated the ash.			Buildings collapsed from loading by water-saturated ash combined with felt earthquakes. Manila International Airport closed.
Ongoing from 16/6	Continuous ash emission punctuated by larger ash eruptions all smaller than 15 June event; continued small pyroclastic flows to northwest and lahars in all directions.	Continuing PHIVOLCS–USGS monitoring.		Continuing PHIVOLCS–USGS hazard evaluation. Houses, bridges and roads destroyed by the lahars.

The timing of events and responses during the Mount Pinatubo eruption, 1991

Note:
PHIVOLCS: Philippine Institute of Volcanology and Seismology
USGS: U.S. Geological Survey

FIGURE 2A FOR QUESTION 2

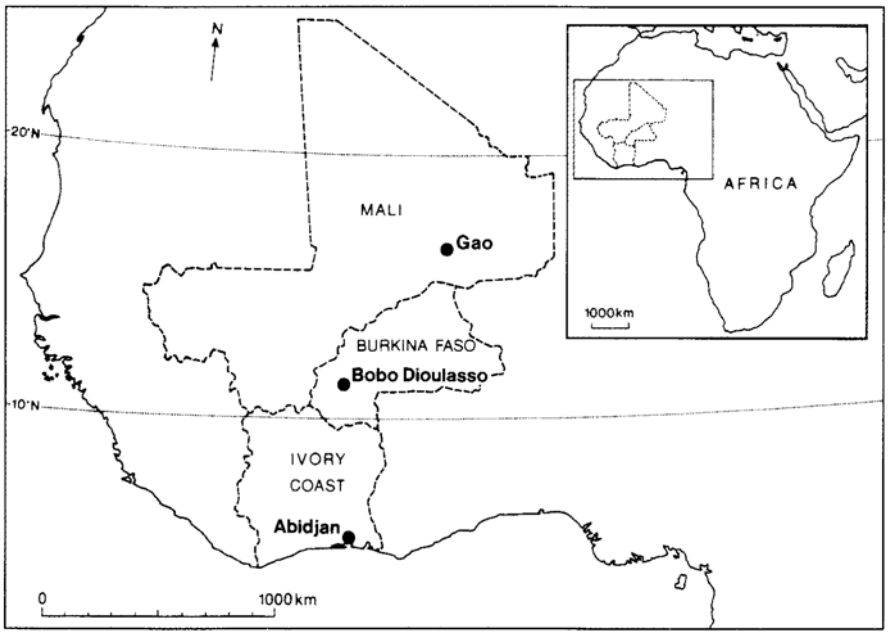
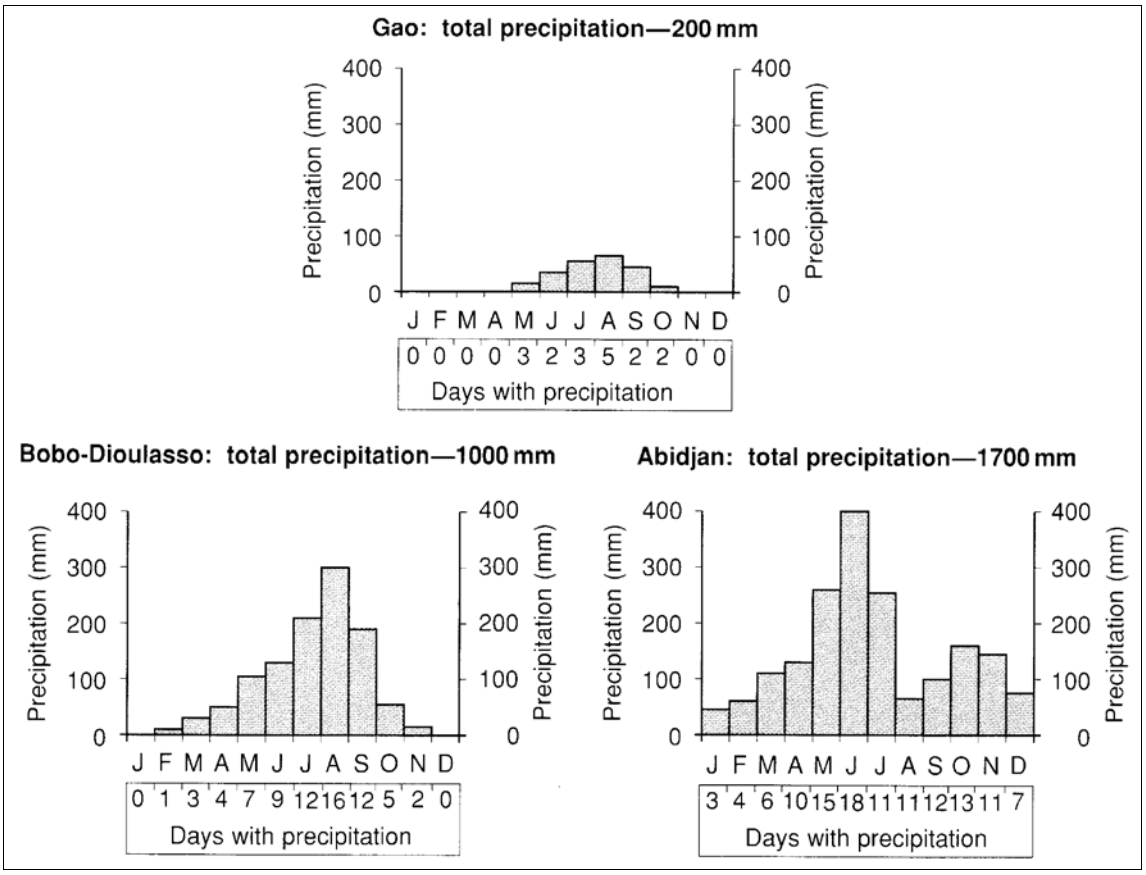


FIGURE 2B FOR QUESTION 2



PHOTOGRAPH A FOR QUESTION 3

PHOTOGRAPH B FOR QUESTION 3

PHOTOGRAPH C FOR QUESTION 4

FIGURE 3 FOR QUESTION 6 EITHER