TEMASEK JUNIOR COLLEGE
PRELIMINARY EXAMINATION 2015

GEOGRAPHY **9730/01**
Higher 2 **September 2015**

Paper 1 Physical Geography **3 hours**

Additional Materials: **Insert with 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.

Hand in your answers for Section A and Section B separately.

This document consists of 5 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 Figs. 1A, 1B and 1C detail hazards from 3 different volcanoes.

1 (a) With reference to Figs. 1A, 1B and 1C, describe the nature of the main hazard shown in each of the figures. [6]

1 (b) Briefly describe **one** way in which each of the hazards described in **(a)** can be mitigated. [3]

1 (c) Identify one rock likely to be found in the area shown in Fig. 1C and describe its characteristics. [3]

Atmospheric Processes, Hazards and Management

2 Fig. 2A shows average Sea Surface Temperature (SST) anomalies from 10 June to 1 July 2015.
Fig. 2B shows an excerpt of a news article detailing the impacts of the El Nino Southern Oscillation in West Africa.

2 (a) How does the information provided in Fig. 2A confirm the occurrence of the El Nino Southern Oscillation (ENSO)? [2]

2 (b) Explain the development of the El Nino Southern Oscillation and its impact in the Pacific region. [5]

2 (c) Explain ways in which the impacts of drought in West Africa mentioned in Fig. 2B could potentially be mitigated. [5]

Hydrological Processes, Hazards and Management

3 Photograph 3A shows a section of the Tigre River within the Amazon basin.
Photograph 3B shows a section of the Denali River in Alaska, USA.
Fig. 3C shows the relationship between river bed material and river channel pattern.

3 (a) Draw an annotated sketch of the river channel in Photograph 3B showing its key features. [4]

3 (b) With reference to Fig. 3C,

(i) state the percentage composition of the various river bed material for River **X**.

(ii) explain why the rivers such as those in Photographs 3A and 3B often develop under the conditions shown for rivers **Y** and **Z** respectively. [5]

3 (c) Explain how helicoidal flow occurs within a channel such as the one shown in Photograph 3A. [3]

Atmospheric and Hydrologic Processes, Hazards and Management

4 Photographs 4A and 4B show two streams in Singapore.
Fig. 4C shows the Urban Heat Island profile in Singapore with the location of the streams in Photographs 4A and 4B indicated.

4 (a) Compare and contrast the nature of the discharge of the streams shown in Photographs 4A and 4B. [3]

4 (b) Imagine you have been appointed as a consultant to the Public Utilities Board (PUB) to advise them on catchment issues. With reference to Photograph 4B, discuss some of the issues related to the type of channel shown and how the PUB can address them. [4]

4 (c) With reference to Fig. 4C, account for the temperature difference between the locations shown in Photographs 4A and 4B. [3]

4 (d) Discuss some of the issues you would take into consideration when measuring the microclimate variables of the areas shown in Photographs 4A and 4B in order to effectively show the differences between them. [4]

SECTION B

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

Lithospheric Processes, Hazards and Management

5 EITHER

5 (a) Outline the natural and anthropogenic factors which influence weathering processes. [9]

5 (b) "Granite landforms in tropical areas are harder to explain than those in temperate areas."

To what extent is this statement valid? [16]

OR

5(a) Compare the characteristics of:

(i) Island arc and hotspot volcanoes;

(ii) Mid oceanic ridges and rift valleys;

(iii) Block mountains and fold mountains. [9]

5(b) "The impact of lithospheric processes and hazards on the physical environment is often underestimated compared with their impact on the human environment."

How far do you agree with this statement? [16]

Atmospheric Processes, Hazards And Management

6 EITHER

6 (a) Fig. 5 shows a model of responses to the occurrence of natural hazards.

Apply the model to describe and explain the responses to a tropical cyclone event that you have studied. [9]

6 (b) "The unpredictability of tropical cyclones makes them very difficult to manage."

To what extent is this statement valid? [16]

OR

6 (a) Explain the usefulness of understanding the earth's energy budget and radiation balance. [9]

6 (b) Why do pressure belts in the tropics migrate? How important is the migration of pressure belts in influencing the climatic zones of tropical Africa and Asia? [16]

Hydrologic Processes, Hazards and Management

7 EITHER

7 (a) Outline the effects of river floods on the physical environment. [9]

7 (b) To what extent is it best to work with nature in managing river floods? [16]

OR

7 (a) Explain how a river can erode and transport sediments before and after a storm. [9]

7 (b) "Storm and annual hydrographs vary considerably over time and space."

How far do you agree with this statement? [16]

END OF PAPER

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INSERT

READ THESE INSTRUCTIONS FIRST

This insert contains the figures referred to in the questions as well as the World Outline Maps.

This document consists of 9 printed pages

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FIGURE 1A FOR QUESTION 1

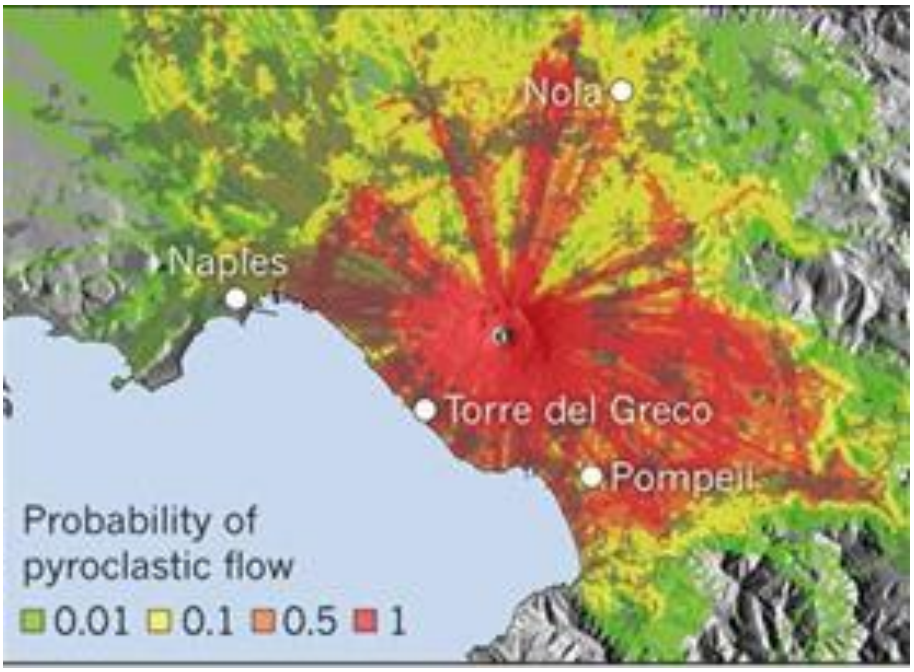


FIGURE 1B FOR QUESTION 1

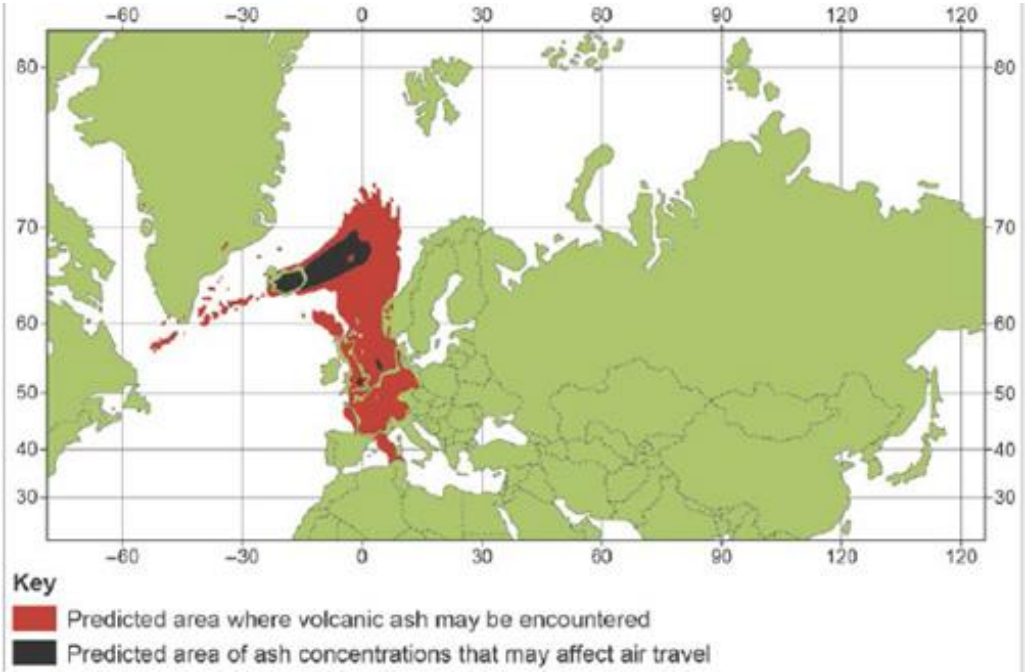


FIGURE 1C FOR QUESTION 1

The extent of lava flows from the Mauna Loa volcano, Hawaii, USA, since 1843

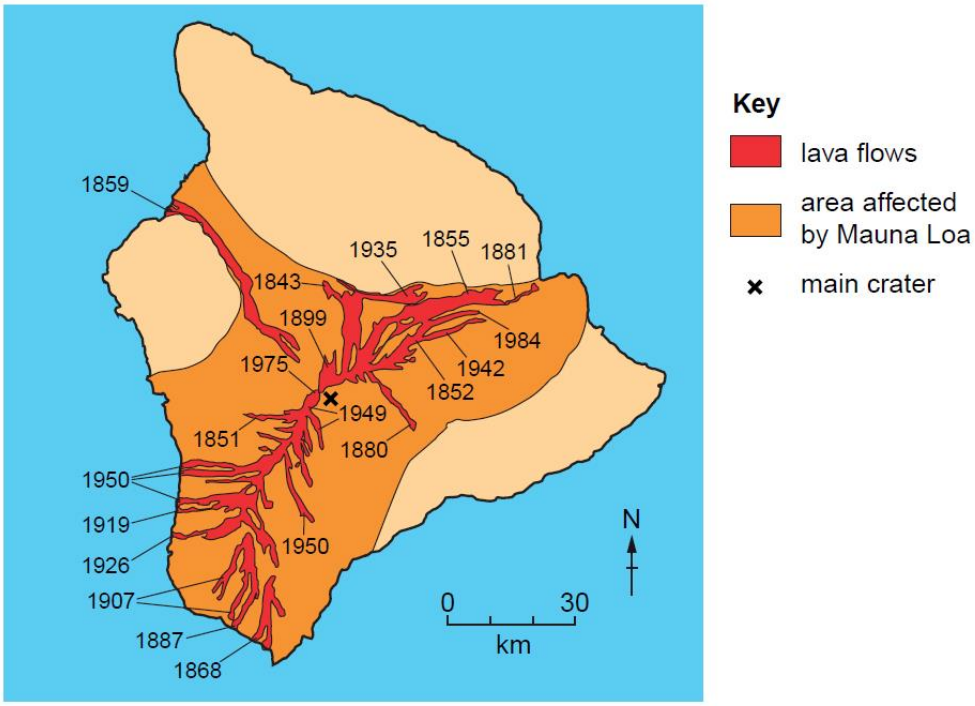


FIGURE 2A FOR QUESTION 2

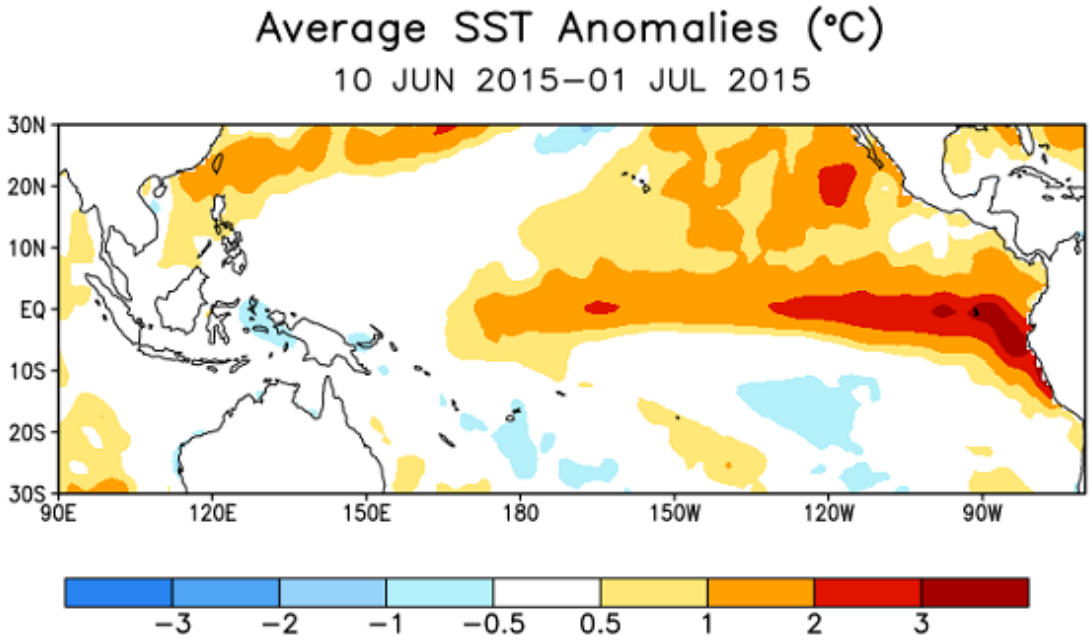


FIGURE 2B FOR QUESTION 2

El Niño could bring drought and famine in West Africa, scientists warn

1 May 2015

A global weather phenomenon could cause a famine in the Sahel this year by combining with already dry conditions.

Professor Adam Scaife, a long term forecaster at the UK Met Office Hadley Centre, said models now agreed an El Niño event was likely and the first impacts may be felt as early as June.

"[A] place that's really important to stress is west Africa, where there is increased risk of drought during El Niño." he said.

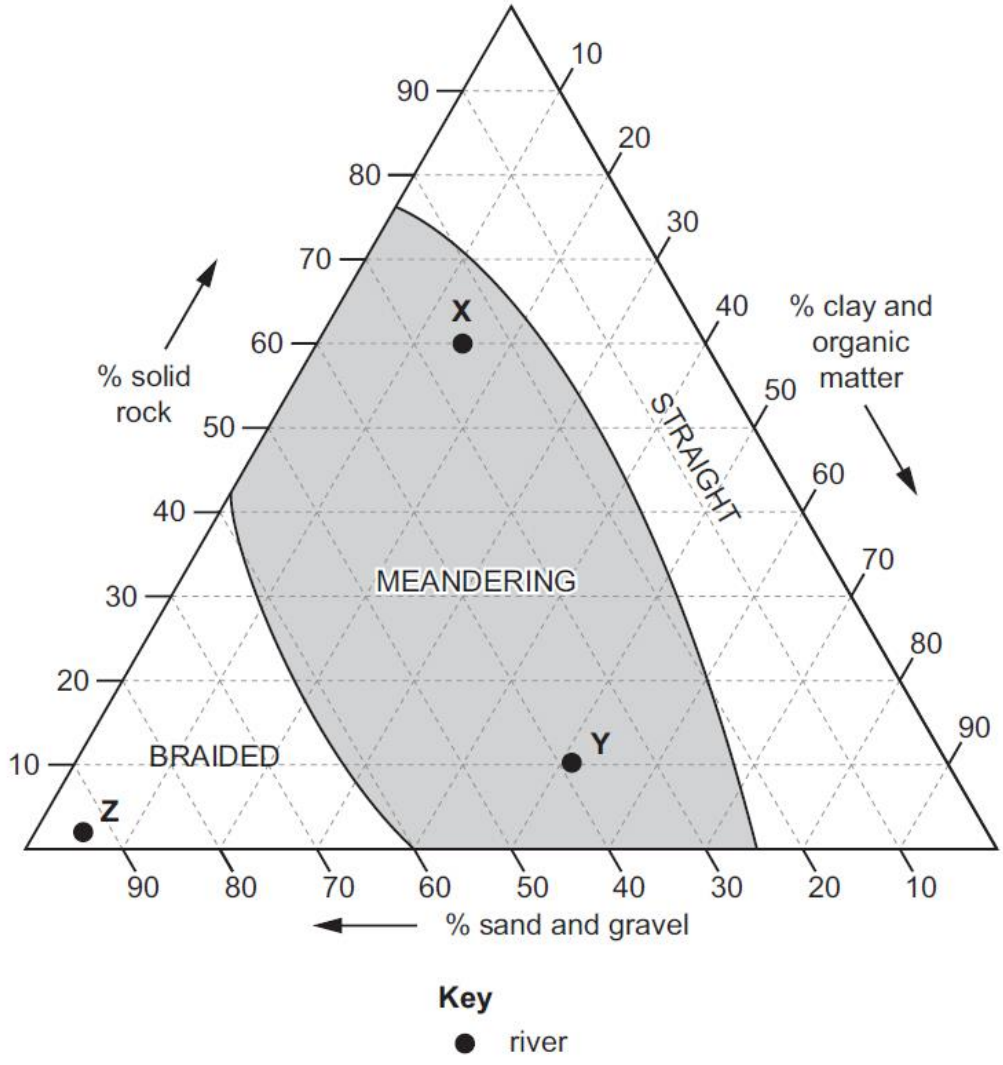
Met Office predictions of a drought as early as June were deeply concerning for people awaiting crop-growing rain in the sub-Saharan areas of northern Nigeria, Niger, Chad, Mali, northern Senegal and Mauritania.

PHOTOGRAPH 3A FOR QUESTION 3

PHOTOGRAPH 3B FOR QUESTION 3

FIGURE 3C FOR QUESTION 3

The relationship between river bed material and river channel pattern



PHOTOGRAPH 4A FOR QUESTION 4

PHOTOGRAPH 4B FOR QUESTION 4

FIGURE 4C FOR QUESTION 4

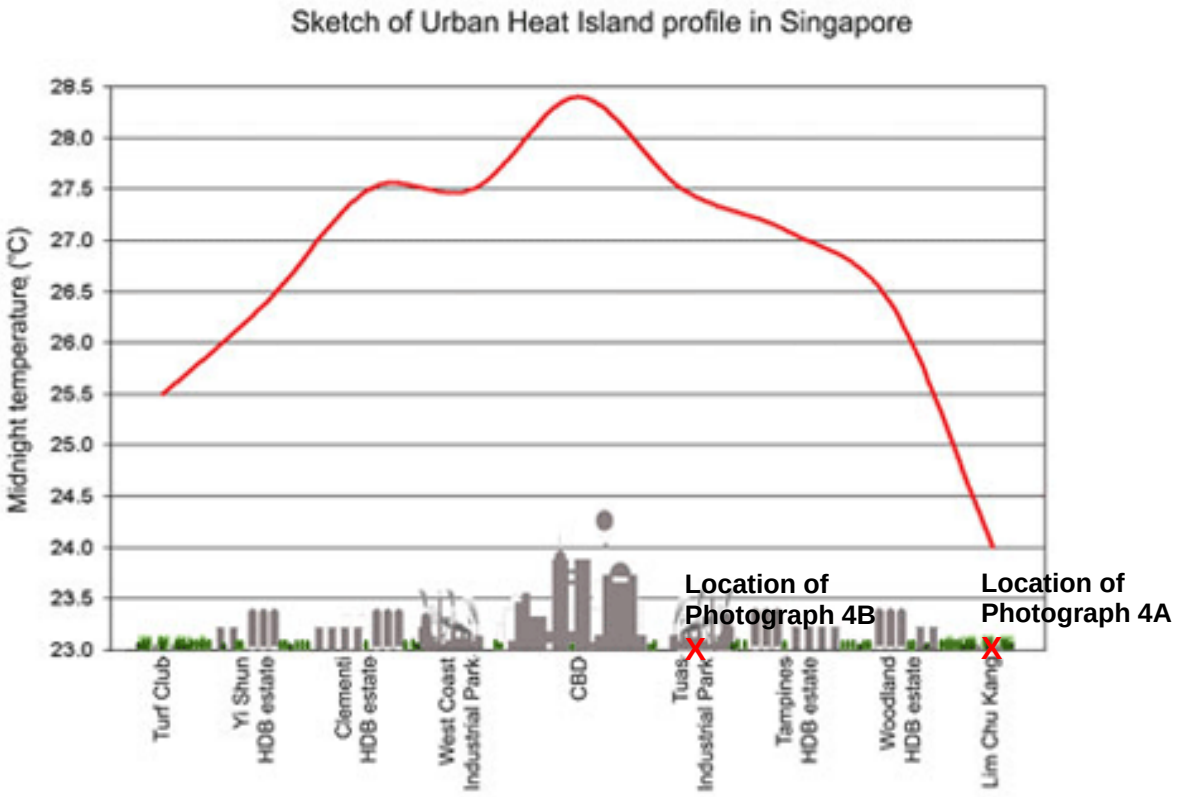


FIGURE 5 FOR QUESTION 6 EITHER