HWA CHONG INSTITUTION
JC2 Preliminary Examinations
Higher 2

CANDIDATE NAME		**CT GROUP**	
CENTRE NUMBER		**INDEX NUMBER**	

GEOGRAPHY

9730/01

Paper 1 Physical Geography

23 September 2013

3 hours

Additional Materials: Answer Paper
1 Insert
World outline map

READ THESE INSTRUCTIONS FIRST

Write your name and CT class clearly on all the work you hand in.
Write in dark blue or black pen on both sides of the paper.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Section A
Answer **all** questions.

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

The insert contains all the Figures referred to in the question paper.
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.
Start each answer to the main questions on a fresh sheet of paper.

At the end of the test, fasten your answers in the following sections:
Set 1 : Section A DRQ
Set 2 : Section B Essays

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

Section A

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

Lithospheric Processes, Hazards and Management

1 Photograph A shows a mass movement process at Aldbrough, Yorkshire, U.K.

(a) Identify the type of mass movement shown in Photograph A. [1]

(b) Draw a labeled sketch of the main features of the mass movement in Photograph A. [4]

(c) Account for the occurrence of mass movement shown in Photograph A. [5]

(d) Describe and explain one possible management strategy used to mitigate the mass movement. [2]

Atmospheric Processes, Hazards and Management

2 Fig. 1A shows the temperature profile of the Earth's atmosphere for 1960 and 2010. Fig. 1B charts global atmospheric carbon dioxide from 1959 – 2012 in parts per million (ppm).

(a) In Fig. 1A, compare the temperature profile of 1960 and 2010 in the troposphere and lower stratosphere only. [2]

(b) Using data from Figs. 1A and 1B, account for the differences you have outlined in (a). [5]

(c) Explain the reason for the temperature change with height in the stratosphere in 1960. [3]

(d) Other than by temperature, describe **one other way** the atmosphere can be classified. [2]

Hydrologic Processes, Hazards and Management

3 Annually, the peak discharge of River Cuckmere, UK, is noted and recorded over nine years. They are represented in Table 1. Each discharge is associated with a rank, M, with M = 1 given to the highest flow on record, while N is the total number of years over which there is a record. Fig. 2A shows the plotting of the peak annual discharge with its recurrence interval. Fig. 2B and Photograph B show two strategies employed to mitigate hazards caused by flooding of River Cuckmere.

(a) Using Table 1, calculate the recurrence interval of the 2001 flood. [3]

(b) Explain what is meant by a 20-year flood occurring in any one year. [2]

(c) From Figs. 2A and 2B, describe how a 10-year flood is different from a 20-year flood. [2]

(d) With reference to Fig. 2B and Photograph B, explain how these strategies help mitigate floods. [5]

Atmospheric and Hydrologic Processes, Hazards and Management

4 Fig. 3A shows the mean monthly variation in discharge at three gauging stations along the River Zambezi, which flows through Zambia, Zimbabwe and Mozambique, and empties into the Indian Ocean. Fig. 3B shows a climate graph for the area.

(a) With reference to Fig. 3B, describe the climate for the area and suggest a possible climate type. [3]

(b) Describe the changes in discharge along the River Zambezi. [3]

(c) Using evidence from Fig. 3A and Fig. 3B, account for the variations in discharge at each of the sites X, Y, and Z on the River Zambezi. [5]

(d) Suggest and explain possible negative impacts downstream of the Cahora Bassa Dam. [3]

Section B

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

Lithospheric Processes, Hazards and Management

5 EITHER **(a)** With the aid of diagrams, explain how earthquakes at different plate margins occur. [9]

(b) 'The hazardous effects of volcanoes are most effectively managed by prediction.' Discuss. [16]

5 OR **(a)** Fig. 4 shows the distribution of the world's oceanic ridges. Briefly outline how the plate tectonics theory can be used to account for the global distribution and formation of these ocean ridges. [9]

(b) Describe the mineral composition and the physical properties of granite. To what extent are these the most important factors in the development of granite landforms? [16]

Atmospheric Processes, Hazards and Management

6 EITHER **(a)** Explain the processes of *sensible heat transfer* and *latent heat transfer*. How does an understanding of these processes help explain the Earth's energy budget? [9]

(b) 'The migration of the inter-tropical convergence zone (ITCZ) determines regions prone to drought'. Discuss. [16]

6 OR **(a)** Briefly explain the meaning of the term 'atmospheric stability'. Explain and contrast the formation and characteristics of orographic and convectional rain in tropical and equatorial regions with reference to 'atmospheric stability'. [9]

(b) To what extent are strategies to reduce global warming effective? [16]

Hydrologic Processes, Hazards and Management

7 EITHER **(a)** Describe how climate and size of drainage basins contribute to the characteristics of river regimes. [9]

(b) To what extent is load the principal factor determining whether a river meanders or braids? [16]

7 OR **(a)** Outline the conditions under which fluvial erosion occurs in a channel and explain how this influences channel morphology. [9]

(b) To what extent are the conflicts of interest that operate within, and between, riparian states largely economic? [16]