National Junior College
SH2 Preliminary Examinations 2017

GEOGRAPHY **9751/02**
Paper 2 Data Response Questions

3 Hours
Higher 2 **28 August 2017**

READ THESE INSTRUCTIONS FIRST

Write your index number and name on the work you hand in.
Write in dark blue or black pen on both sides of the paper.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.

Candidates answer **all** questions.

The Insert contains all the Resources referred to in the questions.
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.
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.

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.

This document consists of **6** printed pages.

Section A

Theme 4 – Geographical Investigation

1 A group of budding student researchers were tasked to undertake a fieldwork exercise to ascertain which sites along the newly built Punggol Waterway are likely to flood. The sites are labelled in Resource 1 as Sites X, Y and Z.

The group was divided into three teams to measure the river velocity, the cross-sectional area of the river channel and the infiltration rates of the river bank at each site.

The first two teams were given the following equipment to gather the primary data on river velocity and cross-sectional area:

- 1 x Table tennis ball
- 2 x Tape measures
- 2 x Stop watch
- 1 x Meter ruler
- 4 x Range poles

To measure river velocity, the time taken for the table tennis ball to cover a pre-determined distance defined by two range poles at the side of the river was recorded for each site. The team noticed that the table tennis ball would stay stationary or even swerve its direction of movement momentarily.

To calculate the cross-sectional area, the width and depth of the river at each site had to be measured. The width was measured by laying the tape measure across the width of the river, and anchoring the tape to both banks of the river using the range poles. The tape measure had to be tight and taut. The depth was measured and recorded by using the meter rule at every 30-cm interval mark across the width. The data was then plotted and the cross-sectional area was calculated using the following formula:

Cross-sectional area = Width x Depth

At every site, the team collecting the river velocity data worked downstream from the team collecting the measurements for cross-sectional area.

The third team was given the following equipment to gather the primary data on infiltration rates:

- 1 x Infiltration ring
- 1 x Hammer
- 1 x 30-cm ruler
- 1 x Stop watch
- 2 x Water bottles (1.5l)

To measure the infiltration rate, the infiltration ring was hammered into a random spot along the river bank at each site, and the ruler was placed vertically into the ring to record the fall in water level. Water was then poured into the ring and the drop in the water level was taken every 30 seconds. This was recorded for about 10 minutes, and the data was plotted onto a graph.

Resource 1 shows a map of the Sites X, Y and Z along the Punggol Waterway. Resource 2 shows the river velocity data collected along all three sites. Resource 3 shows the infiltration curves for all three sites.

(a) With reference to Resource 1, state a suitable hypothesis for the fieldwork investigation and explain its suitability. [3]

(b) Explain how the teams should minimise the impact of their fieldwork investigations along the Punggol Waterway. [3]

(c) Explain whether the river velocity data collected in Resource 2 is reliable, and suggest how the data collection could be improved to increase its reliability. [5]

(d) Give reasons for the disparity in the infiltration rates across all three sites as shown in Resource 3. [5]

(e) To what extent has the fieldwork exercise been useful in ascertaining the flood risk at each of the sites along the Punggol Waterway? [9]

Section B

Theme 1: Tropical Environments

The Atacama Desert

2 The Atacama Desert is a plateau in South America desert located along the Pacific coast. It is the driest non-polar desert in the world.

A blank climograph is provided in Resource 4. Resource 5 shows the location of the Atacama Desert with respect to the Andes mountain range and the prevailing winds in the region. Resource 6 shows the ocean current flows in the South Pacific Ocean. Resource 7 shows a photograph of the landscape, comprising mainly of yardangs and salt deposits, in the Atacama Desert.

(a) With reference to Resource 5, describe the climate of the Atacama Desert using a climograph. You should use the blank climograph provided in Resource 4.

The completed climograph should be handed in with your script. [5]

(b) Using a well-labelled diagram, explain the impact of the strong Peruvian current shown in Resource 6 on precipitation in the Western Pacific region. [5]

(c) With the aid of Resources 5 and 6, as well as your own knowledge, account for the aridity of the Atacama Desert. [8]

(d) Explain the formation of yardangs and salt deposits shown in Resource 7. You may refer to the climatic conditions of the Atacama Desert as described in part (a), as well as Resource 5 in your answer. [7]

Section C

Theme 2: Development, Economy and Environment

Economic development and coffee production

3 Coffee is a cash crop that grows best at temperatures between 15°C and 28°C with rainfall of between 1500 and 2500mm per year.

Resource 8 shows the global distribution of coffee production. Resource 9 shows the average monthly coffee prices at source between December 1995 and August 2016. Resource 10 shows a news article on the introduction of a new blend of coffee in Guelph, Canada.

(a) With reference to Resource 8, describe and explain the global distribution of coffee production. [4]

(b) Suggest ways in which the production of coffee could possibly lead to economic development for the countries listed in Resource 8. [4]

(c) Countries which depend primarily on coffee production as a means of developing their economies tend not to perform well.

How does the data in Resource 9 help to explain this phenomenon? [4]

(d) Explain how initiatives like the blend of Café Femenino beans used in the new Gryphon coffee in Guelph, as discussed in Resource 10, could lead to bottom-up development in Peru. [4]

(e) To what extent is information from Resources 9 and 10 useful in assessing the level of economic development of countries where coffee production is high? You may make references to any of the resources as well as your own knowledge. [9]

Section D

Theme 3: Sustainable Development

Climate change and Lagos

4 The capital city of Nigeria, Lagos, is a megacity with over 15 million inhabitants. Given that half of these urban dwellers reside on land that is barely two metres above sea level, Lagos is vulnerable to the impacts of climate change.

The urban growth of Lagos and the locations of its slum communities are depicted in Resource 11. Resource 12 shows a topographic map of Lagos while Resource 13 shows a photograph of flooding in Lagos.

(a) Using Resource 11, describe how the city of Lagos has grown from 1900 to present. [4]

(b) Describe the distribution of the slum communities in Lagos as shown in Resource 11, and suggest reasons for their locations. [5]

(c) Explain how climate change can lead to flooding in the low-lying areas as shown in Resource 12. [4]

(d) Describe and explain the housing and transport problems that residents in Lagos face during flooding as shown in Resource 13. [8]

(e) Give **two** reasons why Nigerians continue to move to Lagos despite the problems the city experiences due to climate change, such as those shown in Resource 13. [4]