Catholic Junior College

JC2 Preliminary Examinations

Higher 2

GEOGRAPHY 9751/02

Paper 2 **2 September 2019**

3 hours

Additional Materials: Answer Paper
1 Insert

READ THESE INSTRUCTIONS FIRST

Write your class and name on all 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, graphs or rough working.
Do not use staples, paper clips, highlighters, 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.
Diagram 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, you are to hand in **each question separately.**
The number of marks is given in brackets [ ] at the end of each question or part question.

Start each question on a fresh sheet of paper. You will hand in each question separately.

This document consists of 12 printed pages and 1 blank page. [Turn over

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Section A

ANSWER SCHEME

Theme 4: Geographical Investigations

Flood Risk Investigation in Hong Kong

1 A group of Geography students carried out geographical investigation along a river in the New Territories, Hong Kong, in February. They wanted to ascertain the flood risk of the region. They divided themselves into 4 teams of 8 members each to measure the cross-sectional area and river velocity of 4 selected sites along the river. The discharge of each of the 4 sections was calculated by multiplying the cross-sectional area of the river by the river velocity.

The teams were given the following equipment:

- 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. At the field study site C, the team collecting the data noticed that the table tennis ball was stuck in fallen trees or debris in the river. The data collected was then recorded using a data collection sheet.

To calculate the cross-sectional area, the width and depth of the river at each site had to be measured. The students laid an unweighted tape measure along the river bed to determine the width of the river. Depth measurements were taken at equal distances across the river using the meter ruler. This data was used to plot the river's wetted perimeter and then the cross sectional areas of the two rivers were calculated.

Resource 1 shows a sketch map of the river showing sites A to D where the students were assigned to. Resource 2 shows a photograph of Site C. Resource 3 shows the data of the river recorded at different sites.

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

Point marked (accept any possible answer- One of the following)
Possible hypothesis:

'The flood risk at site A and B is higher than the flood risk at Site C and D.

'The higher the discharge is, the greater the flood risk.'

(b) With reference to Resource 2, suggest what safety precautions the teams should take at Site C. [3]

Point marked (full marks to be awarded to responses with at least 2 precautions, 2 marks for well-elaborated answers)

- Students should do a visual check if there are dangerous animals in the river or along the river banks e.g. crocodiles, monitor lizards etc before proceeding to carry out the fieldwork

- Determine the best section for making wading measurements by noting the potential risk such as slippery rocks, deep segments, pot holes

- Students collecting data in the river should always probe the stream bed ahead with a rod when moving from bank to bank. Keep your feet spread apart and alignment of legs parallel to the flow for better stability.

- Always follow safety precautions when entering the stream. If the water is too deep or swift, select another site. Never venture out into the stream alone without another person available to assist you in case of emergency.

- Determine whether the river stage is rising or falling. Beware of rapid rises in river stage when wading and anticipate and allow for changes in flow conditions at the end of the measurement. It is a good idea to select an object (rock, stump, mark along bank, etc.) that is just above water surface and keep watching it to determine if the river stage is rising or falling.

(c) Explain whether the river velocity data collected in Resource 3 is reliable, and suggest how the data collection could be improved to increase its reliability. [5]

Point marked (3 marks for explanation and 2 marks for improvement)

Limitations:

Data was collected in February during the dry season, might not reveal accurate discharge data.

Only one measurement was taken for each of the river sites

Measuring tape was unweighted leading to possible inaccuracies in the measurement of river width.

In addition, there were some issues concerning the use of the table tennis ball as a floating device for the measurement of river velocity. This led to it being stuck by debris and rocks found along the river bed.

Improvements made to planning:

- have a contingency plan to come back during the wet season in June/July and if possible during the intermonsoonal months of March and September to do stream measurements so that an average could be obtained across one year (annual Q) apart from noting the peak and low flow periods.
- Alternatively, students can also look for secondary data to find out about the level of discharge during the wet season to reduce the risk of having to collect primary data as discharge levels will be higher.
- To obtain more than one measurement per day instead of just once in the day. Afternoon measurements may record a different reading owing to greater surface evaporation.

Improvements made to the data collection process:

- When measuring the overall river width, it will be better to use a rope, securing the ends of the rope to iron pegs lodged securely into the ground of the river banks. This will allow the rope to be pulled tightly and taut so that the measurement is accurate.
- As there are irregularities in the river beds, students might want to consider adopting irregular intervals for depth measurements instead of regular intervals. This will allow for a more accurate measurement of the wetted perimeter and eventually the cross-sectional area.
- Students might want to consider other floating devices for velocity measurement e.g. food-grade colour dye, dried orange peel. In addition, they should obtain 3 sets of velocity readings in order to obtain the average velocity of river flow.

(d) Suggest two limitations of the data representation method shown in Resource 3 and sketch an appropriate diagram to represent velocity at the 4 sites. [5]

Point marked

- The data representation method in use is not visually friendly as numbers are presented in table format. There are many numbers in columns and rows making it hard to focus on reading the desired information.
- In addition, the table format does not allow students to see the trend regarding the change in velocity across the 4 sites of the river.
- Better to sketch a line graph to clearly show the change in velocity

across the 4 sites (x-axis shows sites A to D while the Y-axis indicates the velocity).

(e) To what extent has the fieldwork exercise been useful in ascertaining the flood risk along the river in New Territories? [9]

Levels marked – refer to generic rubrics in syllabus

[Arguments for]

- The data is useful as it gives some idea of the relationship between the river velocity and discharge. As seen from Resource 3, Site D has a higher velocity than any of the other sites and this may represent higher flood risk. Flooding occurs when a river exceeds bankfull discharge. So the velocity will give us an indicator of which river is more likely to exceed bankfull discharge

[Arguments against]

- However, this data is only based on measurements within a few hours of a particular day in February and the results may not be conclusive enough about the flood risks, especially when the data is collected during the dry season of Hong Kong.
- However, this data alone is insufficient to inform us of flood risk as flood risk would also entail the overtopping of bank nature of the catchment area (such as land use patterns, relief, vegetation cover and drainage density), may affect infiltration rates and the amount of water flowing to the river.
- Besides, there are also problems with the way the velocity was calculated. The obstructions in the channel have caused the float to be stuck frequently at River A.
- More information is required such as a flood risk matrix and also the infiltration rates of the different sites in order to determine flood risk in a more comprehensive way.
- A flood risk matrix can be used to determine the flood risks of all sites along the river. This can be done by assessing the land use of Site A to Site D as well as its proximity to the river. If the land use value is high (e.g. expensive housing), and it is close to the river, the flood risk will be high as the damages caused by flooding would be more severe compared to a naturally vegetated area being flooded.

[Conclusion] Hence, the river velocity data is not very accurate and helpful in ascertain flood risk at the two rivers.

Section B

Theme 1: Tropical Environments

Tropical Deforestation in South America

2 Resource 4 shows tropical deforestation by region from 1990 to 2000 and from 2000 to 2005 (thousands of hectares per year). Resource 5a shows the proportion of deforestation causes and 5b shows proportion of degradation causes from 2000 to 2010. Resource 6 shows a satellite imagery of an area near Rio Jaciparana (a river) and Buritis Village, Brazil, in 2002 and 2012.

(a) With reference to Resource 4, describe the trends in tropical deforestation in the period 1990 to 2000 and in the period 2000 to 2005. [2]

Point-marked (1 mark per trend)

- Both Asia and S America increased in tropical deforestation area (250 thousand hectares and 1000 thousand hectare).
- Africa decreased in tropical deforestation area (500 thousand hectares).
- Ranking of regions remain the same i.e. S America, Africa, Asia.

(b) Using Resource 5a and your own knowledge, suggest reasons for the trends described in (a). [4]

Levels marked

Level 2 (3-4m): Response refers to Resource 5a, and shows logical links between the factors and proportion of causes with the trends shown in (a). Highest marks for data shown, explanations of root causes and knowledge of stakeholders,

Level 1 (1-2m): Response shows limited reference to Resource 5a, and shows tenuous links between factors and proportion of causes with the trends shown in (a).

Possible points:

- Urban expansion and agriculture are major reasons for deforestation in Asia, and this can explain the growth in deforestation in Asia. Explain why.
- South America continues to be high because agriculture is aggressively expanding there e.g. cattle ranching and soy plantations, and this is the main cause of deforestation in S.A.
- In Africa, there is a decline possibly because of internationally protected areas that disallow governments to issue licenses for deforestation to companies.

(c) With reference to Resource 6, explain how and why a storm hydrograph at Rio Jaciparana for 2002 and 2012 might differ. [6]

Point marked

- 2 marks: description of storm hydrographs differences
- 4 marks: explanation of lag time, ascending and descending limb

Possible points:

- You can tell that deforestation has increased in area surrounding Buritis Village.
- **Lag time of storm hydrograph** is shorter due to more overland flow. Overland flow results from less trees for interception, and less infiltration due to lack of roots to crate secondary permeability in the soil. Storm water flows on land faster to the Rio Jaciparana and hence, shorter lag time.
- **Peak flow can be higher**. Due to the quick overland flow, discharge reaches the channel all at once, instead of a steady stream of base flow.
- **Bankfull discharge** could be reached faster due to lower capacity of the channel. This is due to the soil erosion that takes place due to overland flow, brining sediments to the channel and depositing it there.
- **Less baseflow,** due to less infiltration, and less percolation into the subsurface.

(d) With reference to some of the resources, suggest possible effects of tropical deforestation. [4]

Point marked (maximum of 2 m each point)

- Landslides
- Soil erosion and sedimentation
- Disruption of ecosystems and loss of biodiversity
- Disruption of biogeochemical cycles
- Release of stored carbon

(e) Using Resources 5 - 6 and your own knowledge, recommend whether South America should focus on slowing the growth of urban areas to reduce deforestation and degradation. Justify your decision making. [9]

Levels marked

- The balanced approach would be to elaborate on the following:
  - Acknowledge that urban expansion is one of the causes, and it should definitely be reduced.
    - There are so many problems associated with deforestation (as per the resources)
    - Acknowledge that S. A remains the highest in terms of deforestation rates.
  - But urban expansion is not the most important reason. **The most important reason is agriculture** as seen in resources 5a and 5b.
  - Governments should target these as they result in large scale clearance of land, and are motivated by profits.
  - Infrastructure is small, but it facilitates deforestation through providing roads into the forests.
  - Elaborate on the other causes of deforestation.
  - **Explain that it is not about simply focusing on the reasons but the stakeholders** e.g. TNC, provincial governments, small scale farmers etc… working with the international community and NGOs.

C H2 Generic Level Descriptors for Open-Ended 9m DRQ on Themes 1, 2 and 3

Level	Marks	Descriptors
3	7–9	Response demonstrates a clear knowledge and understanding of the context in the question. Uses relevant, detailed and accurate factual information and conceptual understanding. Reflects strong critical thinking skills and may include perceptive insights for the strongest responses. Source(s) is well used to support the response. • Provides a logical and well-developed evaluation well founded on evidence and/or different viewpoints. OR • Makes a decision which clearly addresses different elements of the issue and/or interest of different stakeholders
2	4–6	A satisfactory response which is generally sound and contains relevant points, but may not always focus on the context in the question. Uses factual information and conceptual understanding that is generally appropriate to the given context but lacks detail and may contain some inaccuracies. Displays general critical thinking skills. Source(s) is used to support parts of the response. • Provides an evaluation, which may be limited in depth and sufficient elaboration in some parts. OR • Shows some attempt to address different elements of the issue and/or views of different stakeholders when making a decision but is not well-developed
1	1–3	Response shows a poor understanding of the context in the question. Uses basic factual information and conceptual understanding which has some, but limited relevance to the question. Source(s) is not used or not accurately used to support the response. • Provides little or no evaluation OR • Evidence of decision-making, if present, is simple and may be flawed
0	0	No creditworthy response.

Theme 2: Development, Economy and Environment

United States of America's Apparel Industry

3 Resource 7 shows the global sources of the United States of America (USA) imports of apparel. Resource 8 shows the monthly average wages (US$) for the apparel industry for select economies in 2017. Resource 9 shows a campaign poster by United Students Against Sweatshops (USAS), which was published in an American news website.

(a) With reference to Resource 7, describe the sources of USA's imports of apparel. [4]

Point marked

- 2m: Largest volume of imports of garments come from LDCs such as China ($5.5 billion) Vietnam ($2.75 billion), Indonesia (2.25 billion), Bangladesh (1.75 billion) & Mexico (1.75 billion).
- 2m: Concentration of imports from countries situated in Asia (e.g. China, India, Pakistan, Bangladesh, Cambodia, Vietnam, Indonesia) and South America (Mexico, Guatemala, Honduras, El Salvador, Honduras etc.).

(b) Using Resource 8 and your own knowledge, suggest reasons for the patterns described in (a). [4]

Point marked (2 marks per point)

- Cheaper labour costs, higher amount of import. Higher labour costs, lower amount of import.
- Quote data.
- Favourable government policy to support export processing zones - e.g infrastructure, lower taxes, good infrastructure
- USA firms outsource and offshore production circuit components

(c) Suggest how Resources 8 and 9 reflect elements of the Dependency Theory. [5]

Point marked

- Dependency theory suggests that countries are locked into lower levels of development because of structures that result in exploitation of the LDCs.
- Resource 5 shows low wages especially for Bangladesh and Vietnam, which imply that surplus value (profits) have been extracted from the workers there.

- Resource 6 shows the poor working conditions of the workers, which indicates exploitation as well.
- Profits flow back to the headquarters of many of these TNCs that have either placed their branch plants here or have contracted these Bangladeshi and Vietnamese firms to do their low-end work.
- Bangladesh and Vietnam will also not have the incentive to increase the minimum wage levels and remained locked and dependent on such investments.

(d) With reference to Resources 9 and 10, and your own knowledge, explain the roles of non-state actors in influencing the global garment industry. [6]

Levels marked

- Level 3 (5-6m) Responses cover all non-state actors and specify the type of influence to production, consumption and location. Clear links are drawn to the type of influence in the global garment industry - location, standards of production (environmental, labour, product), international trade
- Level 2 (3-4m) Responses cover one or both non-state actors. Type of influence and actor is not specified, with little links to garment industry.
- Level 1 (1-2m) Response covers one or both non-state actors, but does not specific type or influence to garment industry at all.
- NSA - Media agencies, watchdogs, standard organisation

(e) Using some resources and your own knowledge, suggest how the global shift of manufacturing may impact the USA's economic development. [6]

Levels marked

- Level 2 (4-6m): All resources are used and linked to the impact on economic development. Areas of economic development are explicit e.g. loss of jobs, movement to other parts of production circuit, reskilling that leads to higher average wages, deindustrialisation etc. Best responses indicate who in the USA suffer or benefit from the impacts.
- Level 1 (1-3m): Responses are fragmentary and explanations are brief, with no explicit mention of what constitutes development and who suffers/benefits.

Theme 3 – Sustainable Development

Urban waste management in the Less Developed World

4 Resource 10 shows the sources of plastic waste from different regions of the world. Resource 11 shows global mismanaged plastic by region. Resource 12 shows the change in urbanisation level and change in Gross Domestic Product (GDP) per capita in the developing regions of East Asia and Sub-Saharan Africa.

(a) With reference to Resource 10, describe the trends in sources of plastic in the oceans. [3]

Point marked

- Plastic garbage is highest for developing countries – South America, Africa and Middle East, Indian and South Asia, China, East Asia and Oceania. Data.
- Lowest in developed regions of N America, Europe and Central Asia. Data.
- Microplastics are generally lower in proportion to plastics, but more for N America. Data.

(b) With reference to Resources 10, 11, and 12 suggest reasons for the trends described in (a). [6]

Point marked (maximum of 3m for each explanation which includes reference to both resources)

- DCs have the technology and proper waste disposal that does not lead to the oceans. Could be exports, incineration or landfills. Elaborate on these strategies.
- N America has more microplastics because normal waste is disposed of "properly", as per Resource 12, while microplastics could have been broken down by these disposal solutions and inadvertently flow to the sea.
- LDCs may not have the infrastructure or regulation to manage plastic waste, thus resulting in waste being thrown indiscriminately into the sea. Mismanaged waste the most in E Asia and the Pacific in Resource 12.
- LDCs may receive the imported plastic waste from DCs and dump them into the sea.
- Rising economies in China, East Asia and Middle East lead to more consumption and thus more plastic waste is generated.

(c) Describe the patterns of change in urbanisation level and GDP per capita in Sub-Saharan Africa in Resource 12. [4]

Point marked

- East Asia shows positive relationship between urbanisation level and GDP p.c. while SSA shows a little more variation in urbanisation level in GDP p.c. Data.
- 2m for E Asia
- 2m for SSA

(d) Suggest potential urban problems arising from the trends in (c). [4]

- Environmental
- Economic
- Transport
- Social (housing)

(e) With reference to some resources and your own knowledge, explain why environmental indicators such as plastic waste are insufficient indicators of sustainable urban development in less developed countries. [8]

Levels marked

- Level 2 (5-8m): Responses are thoroughly explained and show a keen understanding of SUD, and other dimensions besides environmental dimension.
- Level 1(1-4m): Response lacks explanation and/or do not show a keen understanding of SUD dimensions in LDCs.

Possible points:

- Insufficient as it is not holistic in covering all SD dimensions
  - *Elaborate on 2-3 examples of how economic and social dimensions can be measured*
- Even within the environment dimension, plastic waste itself is insufficient
  - *Elaborate on 1-2 examples of other environmental indicators (e.g. pollution index, ecological footprint)*
- The data collection process/methods of obtaining plastic waste data may be problematic
  - *Elaborate on 2-3 difficulties of obtaining such data (e.g. timeliness, lack of proper measuring tools)*

**** END OF PAPER ****