ST ANDREW'S JUNIOR COLLEGE
Preliminary Exam
Higher 1

GEOGRAPHY **8813/01**
Paper 1

13 September 2018

3 hours

Additional Materials: Answer Paper
1 Insert
World outline map

READ THESE INSTRUCTIONS FIRST

Write your name and class 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 paper clips, highlighters, glue or correction fluid.
Begin each question on a fresh page.

Answer **four** questions in total.
Section A
Answer Question 1.
Section B
Answer Question 2.
Section C
Answer **two** questions, each from a different theme.

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 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 **4** printed pages.

[Turn Over

Section A

Theme 3: Geographical Investigation

1 As part of a geographical investigation project in Kuala Lumpur, Malaysia, a group of 20 18-year-old students were tasked to ascertain the flood risk of the area in the vicinity of the confluence of Klang River and Gombak River.

In their background research, they came across photographs of the confluence that showed significant changes made to the river channel between 1977 and the present day (see Resource 1). The group intended to conduct a survey to find out the public's views on whether the risk of flooding has been reduced after these changes were put in place.

The group divided themselves into teams of four and planned to survey 50 members of the public. They were told to conduct the investigation on two weekdays, between 5 pm and 7 pm on each day.

Resource 1 shows the past and present photographs of the confluence of the Klang River and Gombak River. Resource 2 shows a map of the confluence of Klang River and Gombak River, and its vicinity. The blue circle delimits the area within 300 m radius from the confluence, and is where the survey will take place. Resource 3 shows the questionnaire for flood risk survey which the group has crafted to gather data from the survey respondents.

(a) With reference to Resource 1, describe the main changes made to the river channel, and explain why these are meant to reduce flooding. [5]

(b) With the help of Resources 1 and 2, suggest a research question for the group to guide them in their investigation, and briefly explain why it is of a suitable scale. [3]

(c) With the help of Resource 2, outline the steps necessary for the students to obtain a representative sample they require for the survey. [4]

(d) Explain the strengths and limitations of the data that will be collected using the questionnaire shown in Resource 3. [5]

(e) Evaluate this investigation about flood risk in the area shown in Resources 1 and 2, and explain how it could be improved and extended. [8]

Section B

Theme 2: Urban Change

Waste Management in Vancouver

2 Vancouver is the third largest city in Canada. It has a vision of reducing its volume of solid waste by half by 2020, and becoming a zero waste community by 2040.

Resource 4 shows a factfile on the ecological footprint of Vancouver, recently published in a study. Resource 5 shows how the total amount of solid waste disposed would increase from 2016 to 2040 if current waste reduction efforts remain unchanged. Resource 6 shows selected posters used by Vancouver to educate its citizens on waste management.

(a) With the help of Resource 4, explain **one** usefulness and **one** limitation of *ecological footprint* as an indicator of sustainable urban development. [4]

(b) With reference to Resource 5, describe the projection of Vancouver's waste disposal to 2040 if current waste reduction efforts remain unchanged. [2]

(c) Suggest **three** reasons why it will be difficult for Vancouver to achieve its goal of producing zero waste by 2040, as seen in Resource 5. [6]

(d) With the help of Resource 6, explain the extent to which public education as a strategy can help Vancouver to reduce waste. [6]

(e) Using the resources and your own knowledge, suggest and explain why waste reduction is deemed a major part of Vancouver's plans for sustainable urban development. [7]

Section C

Answer **two** questions from this section.
Either Question 3 **or** Question 4 and **Either** Question 5 **or** Question 6.

Theme 1: Climate Change and Flooding

3 **(a)** With the help of flood hydrographs, explain the role of climate in influencing their characteristics. [9]

(b) To what extent can the tropical rainforest climate represent the climate zones in the humid tropics? [16]

4 **(a)** Explain how climate change can negatively impact human activity in countries at low levels of development. [9]

(b) Assess the effectiveness of human responses to climate change. [16]

Theme 2: Urban Change

5 **(a)** Explain why urban population increase is faster in developing countries than in other parts of the world. [9]

(b) Assess the effectiveness of attempts to manage the consequences of rapid urbanisation in developing countries. [16]

6 **(a)** Explain how the issue of crowding **OR** fear is produced in cities in countries at high levels of development. [9]

(b) Assess the success of strategies used to **EITHER** lessen crowding **OR** cope with fear in the city. [16]

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Geography **8813/01**

Paper 1 **13 September 2018**

3 hours

INSERT

READ THESE INSTRUCTIONS FIRST

This insert contains all the Resources referred to in the questions.

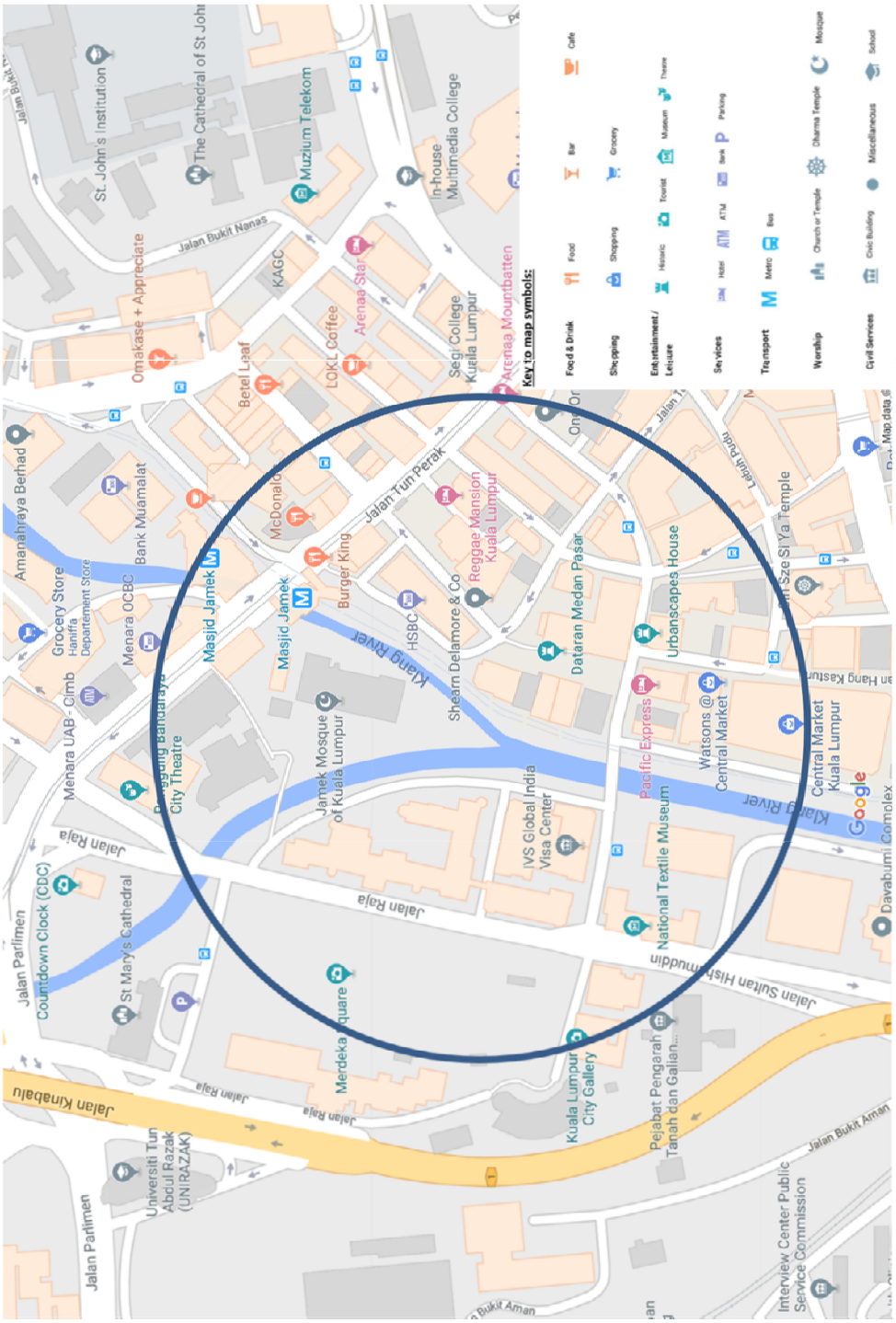
Resource 1 for Question 1

Photographs showing the confluence of the Klang River and Gombak River in Kuala Lumpur, Malaysia

1977 **Present**

Resource 2 for Question 1

Map showing the location of the confluence of Klang River and Gombak River and its vicinity



Resource 3 for Question 1

The flood risk questionnaire used by the students

1. How long have you living and/or working in this area?

Less than 1 year 1–5 years 6–10 years 11–20 years more than 20 years

2. On a scale of 1 (not at all concerned) to 4 (very concerned), how concerned are you about the risk of flooding in this area?

1 2 3 4

3. From what you can remember, has this area ever been flooded in the past? YES/NO

If YES, please tell us briefly when, and what caused the flood?

_____

_____

4. On a scale of 1 (very low) to 4 (very high), what is your current understanding of the risk of this area being affected by flooding?

1 2 3 4

5. What do you think is the most likely way that you might be affected by flooding? (tick one)

- ☐ River/surface water overflowing
- ☐ Sewers overflowing
- ☐ Water flowing over the land/down roads
- ☐ Water rising out of the ground
- ☐ Others: (please elaborate)

6. Which of the following measures do you think would be the best way to minimise future flood risks, without stopping further development in this area? (tick one)

- ☐ Build more/larger sewers
- ☐ Plant more trees
- ☐ Make more surfaces permeable (so rain/floodwater can seep through)
- ☐ Create more green spaces in new developments to absorb rain/floodwater
- ☐ Build flood barriers at key points along the river
- ☐ Others: (please elaborate)

7. For recording purposes only and if you don't mind, what is your postcode/road name?

_____

Thank you for your help.

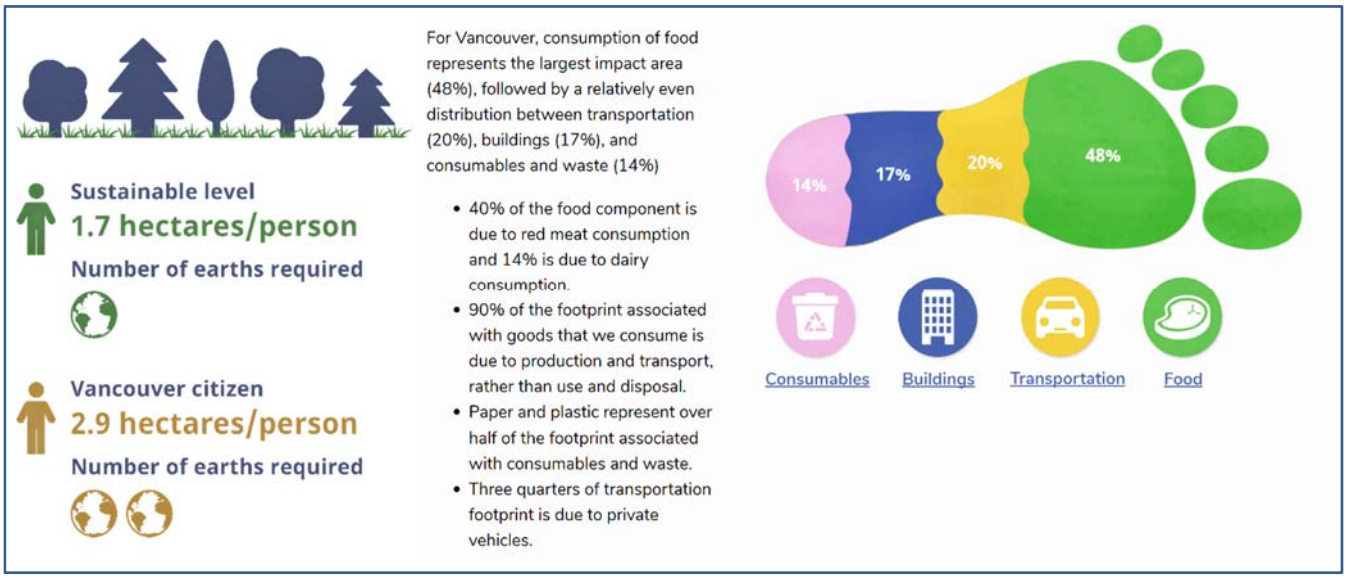
Without asking, record the following:

Gender: M/F

Age range: 16–25 26–35 36–50 50–64 65+

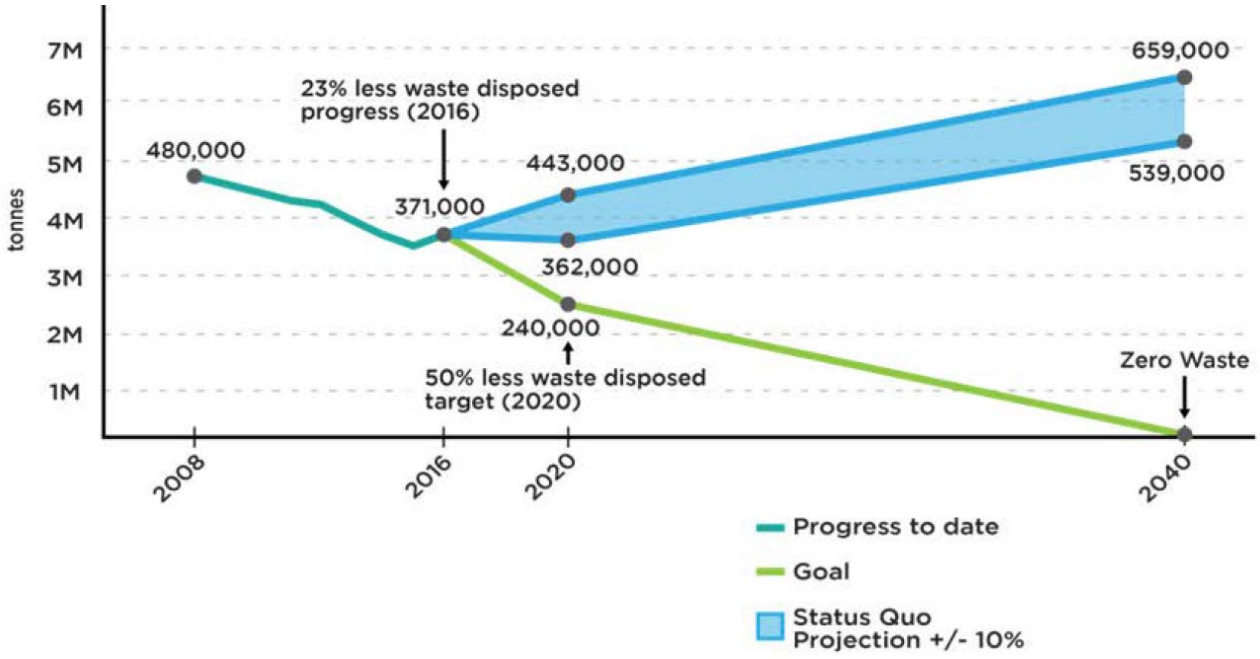
Resource 4 for Question 2

Factfile on Vancouver's Ecological Footprint



Resource 5 for Question 2

Vancouver Waste Disposal* Projection to 2040

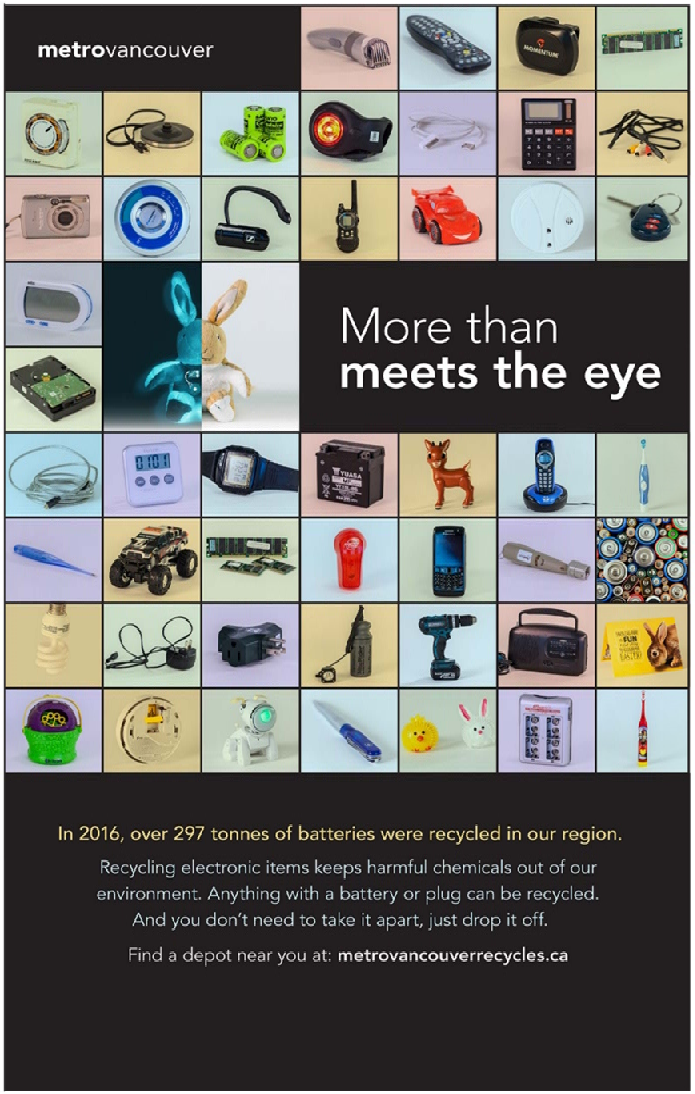


* Vancouver disposes its solid waste using landfills and incineration.

Resource 6 for Question 2

Posters used to encourage waste reduction

A 'green bin' helps to recycle food scraps by turning them into compost to be used as fertiliser.



Section A

Theme 3: Geographical Investigation

1

(a) With reference to Resource 1, describe the main changes made to the river channel, and explain why these are meant to reduce flooding. [5]

Changes	Reduce flooding because…
• Vegetation on the river banks have been removed, and replaced by concrete [1m]	Speeds up the flow, such that flood waters can be removed quickly (i.e. more efficient) downstream: • Reduction of friction between water and the banks (i.e. lowers roughness) • Concrete lining prevents bed or bank erosion, lowers sediment load of the river [2m]
• The river has been widened (note that the natural river banks have been "pushed back" to closer to the buildings) [1m]	• Capacity of the river has been increased, allowing more water to be contained within the channel, helping to prevent bankfull discharge from being exceeded [1m]

(b) With the help of Resources 1 and 2, suggest a research question for the group to guide them in their investigation, and briefly explain why it is of a suitable scale. [3]

Possible research question: [1m]

- To what extent has the channelisation at the confluence of Rivers Klang and Gombak reduced the perception of flood risk among users of the area in its vicinity?

Considerations: [not creditable directly, but must be reflected in the research qn]

- *Fixed variable – channelisation*
- *Variable to be tested – perception of flood risk*
- *Where? – Confluence of the rivers*
- *Who? – Users of the area in the vicinity of the confluence (defined here as within 300m radius)*

Why it is of a suitable scale: [2m]

- Geographical area is small, only 300m radius, which is a little over 0.28km^2
- There is sufficient resources in terms of manpower (20 students) that can be divided into enough teams (5 teams of 4) to be spread out within this area
- A total of 4 hours over two evenings is reasonable amount of time to survey 50 members of the public (average one team surveys 5 respondents every evening)

(c) With the help of Resource 2, outline the steps necessary for the students to obtain a representative sample they require for the survey. [4]

There is no fixed way of sampling, but explanations should be given for the suggested approach. Considerations should include:

- Where to conduct the survey (e.g. stratified sampling to select five locations based on characteristics such as distance from the confluence; landuse; etc)

- Who to find as respondents (e.g. a blend of quota and convenience sampling to obtain sampling profile that is reflective of actual population by age, gender, etc)

Level	Marks	Descriptors
2	3-4	Response demonstrates good to very good knowledge of sampling method(s). Outlines a clear plan with reference to data collection, methods, and may consider limitations. Response is relevant to context of question but may lack clarity and coherence for lower end of the level.
1	1-2	Response demonstrates limited ~~or no knowledge~~ of sampling methods. Outline of method is limited and may not refer to one or more of the facets of an investigation in their outline plan. Much of the response may not be relevant to context of question.

(d) Explain the strengths and limitations of the data that will be collected using the questionnaire shown in Resource 3. [5]

Strengths may include:

- Breadth of coverage – perception of risk (Q2 to Q4), cause (Q5), suggestions on mitigation measures (Q6), profile of the respondents (Q1, Q7 and items at end)
- Clarity of questions – generally clear, unlikely to cause misunderstanding and hence collect invalid and unreliable information

Limitations may include:

- There was no question on comparing between the before and after of the channelisation efforts. This is a major limitation because the investigation was intended to investigate whether flood risks have been reduced *because* of channelisation.
- There is an assumption that respondents are familiar with the mechanisms of flooding in the area (see Q5) and thus be able to identify solutions (see Q6)

Level	Marks	Descriptors
3	5	Response demonstrates excellent ability to identify and explain both strengths and limitations of the questionnaire used. There would be meaningful references to the features of the questionnaire and whether these relate well to the context of the investigation.
2	3-4	Response demonstrates good to very good ability to identify and explain both strengths and limitations of the questionnaire used. References to the questionnaire may not be consistent, and/or at parts, the connections between the questionnaire and the context of the investigation not well considered. Lower end of the level may be answers with an emphasis on only strengths or limitations.
1	1-2	Response demonstrates weak ability to identity and explain either or both strengths and limitations. No or minimal references to the questionnaire features, and at the lower end of the level, the context of the investigation is ignored.

(e) Evaluate this investigation about flood risk in the area shown in Resources 1 and 2, and explain how it could be improved and extended. [8]

Indicative content:

<u>Strengths</u>

- Flood risk is more commonly understood in terms of whether a river floods frequently and the magnitude of the floods. Investigating through the perceptions of the public is often overlooked, so this investigation will contribute a very useful piece of information from the users' views.

Limitations
- However, studying only the perception of the public makes it a very narrow study. Flood risk of an area extends beyond perception of the public.
- Difficult to obtain perceptions of respondents who have lived in the area before and after channelisation.

Improvements and extension
- To more fully meet the investigation's objective to ascertain flood risk of the area, there are other considerations, including flood recurrence history stretching to in the 1970s, climatic data, landuse change over time, infiltration rates, etc
- Flood risk study could consider the various social, economic and environmental costs that could be brought to the area
- Channelisation in this area may result in flooding further downstream, so a study can be carried out for lower stream areas.

Section B

Theme 2: Urban Change

Waste Management in Vancouver

2 Vancouver is the third largest city in Canada. It has a vision of reducing its volume of solid waste by half by 2020, and becoming a zero waste community by 2040.

Resource 4 shows a factfile on the ecological footprint of Vancouver, recently published in a study. Resource 5 shows how the total amount of solid waste disposed would increase from 2016 to 2040 if current waste reduction efforts remain unchanged. Resource 6 shows selected posters used by Vancouver to educate its citizens on waste management.

(a) With the help of Resource 4, explain **one** usefulness and **one** limitation of *ecological footprint* as an indicator of sustainable urban development. [4]

Usefulness: [2m]
- The larger the EF, the less sustainable a city is. In Vancouver, EF is 2.9 gha/pax, which is above the ideal size (1.7 gha) that will help make it more sustainable. It suggests that if everyone uses resources like Vancouver, 2 Earths are required, and clearly, this is not possible.
- The calculation of EF reveals which aspects of resource use could have more scope for reduction. In this case, Vancouver's food consumption is responsible for about half of its EF, so more can be looked into how the footprint linked to food can be reduced. Similarly, the use of paper and plastic, and private transport, all need to be reviewed as possible areas in which Vancouver can reduce reliance on to achieve SUD.

Limitation: [2m]
- The calculation of ecological footprints for cities may obscure the fact that particular groups of city dwellers contribute disproportionately to these footprints. For example, the poorest segment of Vancouver's population would very likely be much less than that of its wealthiest.
- The meaning of EF depends on the quality and range of statistics from which it is calculated. Resource 4 shows us the range of considerations, and it is reasonable to question the reliability of the data for each of the category, such as food and waste.

(b) With reference to Resource 5, describe the projection of Vancouver's waste disposal to 2040 if current waste reduction efforts remain unchanged. [2]

Current waste production: 371,000 tonnes

Projection by 2020 if efforts remain unchanged:
- Could drop to 362,000 but may also rise to 443,000 tonnes

Projection by 2040 if efforts remain unchanged:
- Waste will be increased, to a value in the range of 539,000 to 659,000 tonnes, an increase of 45-77% from 2016.

(c) Suggest **three** reasons why it will be difficult for Vancouver to achieve its goal of producing zero waste by 2040, as seen in Resource 5. [6]

Possible reasons [2m each]:
- Reduce waste production is difficult especially in a population that is rich and large. Resource 5 suggests that waste production will actually increase if nothing more is done to reduce them, so the inclination of the city is to produce more waste. Hence, waste reduction is actually "going against the grain".
- Achieving this goal will require alignment across all sectors of society, not just individuals but businesses as well. Mindsets and behavior of everyone can take a long time to change towards waste reduction, and reusing and recycling resources. Use of laws and policies may not sit well with people, and education efforts may only show after many years.
- Infrastructure and technology in waste management may not be fast enough to meet the continued waste production among its citizens.

(d) With the help of Resource 6, explain the extent to which ~~of~~ public education as a strategy can help Vancouver to reduce waste. [6]

Indicative content
Helpful - Education aims to change mindsets, and in turn, the behavior of its citizens. Reaches out to a variety of segments in the population. Allows a host of platforms and approaches, such as through posters that can be placed in a variety of places, and also can include elements to reach out to the public and stimulate their imagination. etc

Not very helpful - Whether these messages would ever reach the target audience remains a question (e.g. these posters can be ignored, vandalised, etc). Humans may need more active motivation from the authorities than passive messaging. Other means such as financial incentives to encourage waste reduction, reusing and recycling would be required to complement public education. etc

Level	Marks	Descriptors
3	5-6	Response shows the ability to consider the usefulness of public education from more than one perspective, and is able to explain convincingly why it is only to some extent that this strategy can be relied on. The use of examples, though not necessary, may be a feature in the best answers.
2	3-4	Response offers a balanced account on the usefulness of public education to help reduce waste, although it may be that only one-sided view is presented but explained well.
1	1-2	Response provides a simplistic and one-sided view on the use of public education to help reduce waste. There would be little to none of explanation of its chosen stand.

(e) Using the resources and your own knowledge, suggest and explain why waste reduction is deemed a major part of Vancouver's plans for sustainable urban development. [7]

Indicative content

- Protecting the **Environment**: reducing EF of Vancouver (currently two times larger than Earth can sustain), addresses climate change and other environmental impacts (pollution, GHGs from decomposition of waste, etc), pushes the city towards circular metabolism
- Contribute to **Economic** well-being: waste can become a resource that support new business opportunities, reducing the need for increasingly scarce materials and inputs; new business models and technology that will bring the linear economy towards a more circular one; new jobs that are 'green', reduced waste disposal costs, reduced household costs by avoiding buying and replacing short-lived consumer goods, etc.
- Benefitting **Society**: Strengthening community connections in a society that is diverse (becoming a zero waste community provides the opportunity for all Vancouver residents to be more connected through programs involving repair, sharing, and reuse), Recovery of products that are reusable and rescuing food that is edible can provide employment across different segments of society, especially for the lower income groups.

Level	Marks	Descriptors
3	5-7	Response considers fully the dimensions (i.e. breadth) that help a city achieve SUD, and shows convincingly how waste reduction contributes to these (i.e. depth). Examples may be used, though not necessary.
2	3-4	Response provides a partial account of the relationship between waste reduction and SUD. May have only breadth or depth.
1	1-2	Response lacks both breadth and depth, and sketchy on why waste reduction has a key role to play in SUD.

Section C

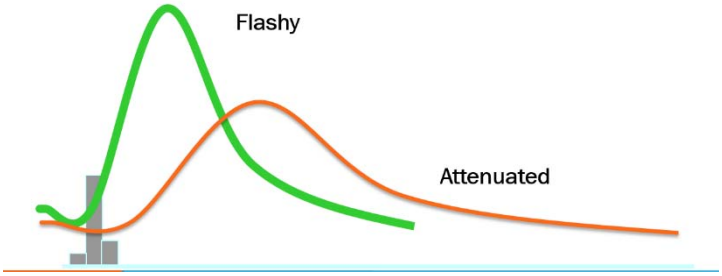
Answer **two** questions from this section.
Either Question 3 **or** Question 4 and **Either** Question 5 **or** Question 6.

Theme 1: Climate Change and Flooding

3 (a) With the help of flood hydrographs, explain the role of climate in influencing their characteristics. [9]

Indicative content:

- Flood hydrographs (also known as storm hydrographs) measures the discharge of a river at a specific gauging station over time, and typically after a rainfall event.
- For the "characteristics" of flood hydrographs, students should examine the key components of rising and falling limbs, lag time and peak discharge and the shape of the hydrograph.
- Essentially, for the purpose of this question, there two main shapes of flood hydrographs i.e. flashy and attenuated. (Students are strongly encouraged to draw the different shapes of hydrographs; refer below) We also assume that human influences are minimal so that the effect of climate is clearer.
- Conceptually, the best answers will be aware of the various flows that contribute to these components and how these components vary.



(b) To what extent can the tropical rainforest climate represent the climate zones in the humid tropics? [16]

In this question, students should show awareness that the context of the essay discussion should include all the three climatic zones within the humid tropics i.e. Af, Aw and Am. The details of the characteristics of the three climatic zones i.e. temperature and rainfall data should be mentioned. Students to identify the similarities and differences of these three climatic zones to ascertain the extent in which the tropical rainforest climate could represent the climates zones in the humid tropics.

Argument 1: The tropical rainforest climate can represent the climate zones in the humid tropics if only temperature characteristics are considered.

Argument 2: However, the tropical rainforest climate is limited in representing the climate zones in the humid tropics when we consider the rainfall patterns in these three zones.

4 (a) Explain how climate change can negatively impact human activity in countries at low levels of development. [9]

It would be useful to classify effects of climate change on the lives of people by dimensions – economic (e.g. agriculture as livelihood), environmental (e.g. sea level rise affecting coastal settlements and tourism) and social (e.g. health and vector-borne diseases). These effects will affect immensely the lives of people living in countries at low levels of development. Lack of financial support, poor governance, lack of technical knowhow, pressure of growing population will make difficult in the developing countries. Use of located examples would gain credit.

(b) Assess the effectiveness of human responses to climate change. [16]

Human responses to climate change may be categorised as mitigation or adaptation. According to IPCC, mitigation measures are “human intervention to reduce the sources or enhance the sinks of greenhouse gases”. Need to mention the point that reduction strategies are to reduce or minimise carbon dioxide and other GHG emissions – this is the criteria for success. These aim to reduce the severity of the impacts brought about by climate change.

Adaptation measures form “the process of adjustment to actual or expected climate and its effects”. Hence, these help societies to live with the impacts of climate change, so as to become more suited to a changing environment.

Effectiveness of strategies will depend on willingness of the country, financial condition of the country or level of economic development, technical knowhow, the scale of application etc.

Both mitigation and adaptation are complementary, so they are often adopted together. They represent a two-pronged approach to the challenge of climate change. Combining strategies of mitigation and adaptation will be the best way of dealing with climate change because all strategies have their strengths and limitations.

To note that the crux of the question is not to produce a catalogue of responses, but assessing their effectiveness by looking at whether they have served their objectives. Hence, examples of named locations for adaptation and named policies/schemes for mitigation must be mentioned and assessed.

Theme 2: Urban Change

5 (a) Explain why urban population increase is faster in developing countries than in other parts of the world. [9]

- Although urban population is high in countries at high levels of development i.e. developed countries, the pace at which this is increasing is much faster in countries at low levels of development i.e. developing countries.
- Reasons for urban population increase being faster in developing countries include **rural-urban migration** and **natural increase**. For example, in countries such as India, the attraction of the city has remained very strong and the rural areas have not been able to provide sufficient opportunities to retain young adults. Elaborate on the push-pull factors.
- Reasons for slower urban population increase in developed countries has to do with an already high urbanisation level (hence low rural-urban migration), low natural increase (e.g. women unwilling to have more babies), and counter-urbanisation (e.g. the appeal of the rural, the negative experience of urban living, the improved transport networks, etc).

(b) Assess the effectiveness of attempts to manage the consequences of rapid urbanisation in developing countries. [16]

This question allows a wide range of approaches, letting you use your materials flexibly. The 'consequences of urbanisation' would include traffic congestion, waste management and housing problems (best exemplified through slums in developing countries). It would be good to approach this question by considering at least two of the 'consequence' (e.g. slums and waste) and select associated attempts for assessment of the effectiveness. Use of examples will be needed to help illustrate and deepen assessment.

The best answers are done thoroughly with a balance between the problems and the solutions and an awareness of the relative success of the management strategies put in place. There may even be offer of further solutions or improvements that can be made for the future. The best answers will use detailed examples to illustrate the points. Evaluation is an integral part of the answer.

6 (a) Explain how the issue of crowding **OR** fear is produced in cities in countries at high levels of development. [9]

Indicative content
For fear in the city:
Answers may consider how cities at high levels of development (e.g. economic, social, and environmental) may host factors which contribute to fear. There are several sources of fear in the city (e.g. crime and terrorism). Fear may be derived from known or actual risk, for example in relation to the experience of crime or the interpretation of published crime statistics, or in terms of the perception of crime. Perception depends on the interplay of elements including the characteristics of the individual, the physical environment, past experience, the representation of crime in the media, etc. Fear of terrorism may be associated with particular strategic locations, such as government buildings or airports, with certain religious or cultural activities; or be identified with certain groups of city residents or city visitors. Fear in the city may also be defined in part in relation to gender, such as for a woman traveling around or living in the city on her own, and age, where the young and the elderly may be less secure and more vulnerable to fear.

A higher level response will identify traits or characteristics associated with cities at high levels of development and make explicit links to how these contribute to fear in cities. For instance, a city with a high level of economic development may raise the international profile of the city and makes it a possible target for terrorists and hence increased fear amongst residents in the city. (Note, we are also just as interested in parts of a city)

(b) Assess the success of strategies used to **EITHER** lessen crowding **OR** cope with fear in the city. [16]

Having established the factors which contribute to crowding in the city or fear in the city in part (a), you would now explain how to either lessen crowding or better cope with fear.

Indicative content
Answers should include a discussion of both successes and failures in mitigating the chosen issue (crowding or fear). You should address more than one strategy to mitigate crowding/fear. For the former, the answer could include urban design improvements. For the latter, they could discuss enhancing legal powers of law enforcers.

A higher level response could look at the effectiveness of strategies with reference to a specific case study. Another possible approach could be to analyse the application of selected strategies in different cities and account for the success (es) and failure(s).