

**Catholic Junior College** JC2 Preliminary Examinations Higher 2

**GEOGRAPHY** 

**9173/02** 10 September 2024 3 hours

## **READ THESE INSTRUCTIONS FIRST**

If you have been given an Answer Booklet, follow the instructions on the front cover of the Booklet.

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 or graphs. Do not use staples, paper clips, glue or correction fluid. DO **NOT** WRITE ON ANY BARCODES.

Answer Question 1 in **Section A**. Answer Question 2 in **Section B**. Answer **one** question in **Section C**.

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.

## Proposed mark scheme

| <b>1</b> (a) | Explain the suitability of the students' research question.  | [4] |
|--------------|--|-----|
|              | <ul> <li>Award 1m for each valid point. Award a maximum of 1 additional mark for further development of each point.</li> <li>The scope of the investigation is manageable as 4 students are able to cover the neighbourhood of East Austin on both days. [1]</li> <li>The neighbourhood of East Austin is easily accessible as it is located near major roads as shown in Resource 1. [1] Furthermore, as the students are from East Austin, they are familiar with the neighbourhood and will know how to navigate around easily. [+1]</li> <li>The liveability needs of the elderly is clearly defined as physical wellbeing, which makes the research more focused and targeted. [1] Students can easily collect data on the physical wellbeing of the elderly through interviews and questionnaires. [1]</li> <li>The age group of the elderly is clearly defined as 65 years and above, which helps students to know who to identify as part of their target group. [1]</li> </ul>  |     |
| (b)          | With reference to Resource 1 and 2, suggest how students could reduce potential risks.   | [6] |
|              | <ul> <li>Award 1m for each valid point. Award a maximum of 1 additional mark for further development of each point.</li> <li>To reduce this risk, students should take extra care while crossing the roads and look on both sides of the roads before crossing. [1] According to Resource 1, students would have to cross the roads to navigate around the neighbourhood, which puts them at risk of traffic accidents. [+1]</li> <li>To reduce this risk, students should wear light and cool clothings and wear a cap to protect themselves from the direct sun. [1] As seen in Resource 2, the area outside the senior center and at the trail lacks sufficient shelter, which may cause students to be exposed to the direct sun and suffer from heatstroke or sunburn. [+1]</li> <li>To reduce this risk, students should bring along umbrellas and ponchos, or do a site recce to know where the nearest sheltered area is that they can quickly move to in the event of a downpour. [1] The lack of shelter as shown in Resource 2 may also put students at risk of being drenched should they be caught in heavy rain. [+1]</li> </ul> |     |
| (c)          | With reference to Resource 2, suggest how rising heat may affect the physical wellbeing of elderly residents in East Austin.   | [5] |
|              | <ul> <li>Award 1m for each valid point. Award a maximum of 1 additional mark for further development of each point.</li> <li>As the waiting area at the senior activity center is not indoors, the elderly in the waiting area are still exposed to the sun and heat. [1] This may cause headaches and discomfort for those who are waiting for long hours. [+1]</li> <li>Due to the lack of comfortable seating at the waiting area of the senior activity center, elderly who wish to rest can only do so on the benches under the direct sun, which could cause discomfort and heat stress. [1]</li> <li>Rising heat may also pose challenges for elderly who wish to be physically fit and frequent the Boggy Creek Greenbelt trail often. as the trail seems</li> </ul>   |     |

|     | <ul> <li>fairly exposed, with only trees providing shelter from the heat. [1] As the elderly may already be physically exhausted from their exercise, rising heat may cause breathing difficulties for them. [+1]</li> <li>Furthermore, rising heat may also lead to higher instances of rainfall, which could cause the ground to be slippery and muddy, especially at the trail. [1] This could pose a higher risk of slipping and falling for elderly. [+1]</li> </ul>  |     |
|-----|--|-----|
| (d) | Explain three criteria students could use to select participants to take their questionnaire.  | [5] |
|     | <ul> <li>Award 1m for each valid point. Award a maximum of 1 additional mark for further development of each point.</li> <li>Students should ensure that the participants in their survey are all elderly residents above age 65 to be relevant to the target group in the research question. [1]</li> <li>Students may also adopt quota sampling to ensure that there is representation across male and female elderly, such as 10 male and 10 female participants. [1] This is because the physical wellbeing needs may differ between male and female elderly, as they may be prone to different types of health problems. [1]</li> <li>As the physical condition of elderly may decrease with age, students can also ensure a spread of elderly across different age groups. [1] For example, they can ensure there is representation among different age groups of 65-70, 71-75, 76-80 and above 80 years of age. [1]</li> </ul>  |     |
|     | A01  |     |
| (e) | Explain why the sequence of the students' data collection was useful in improving the accuracy and/or reliability of their investigation.  | [5] |
|     | <ul> <li>Award 1m for each valid point. Award a maximum of 1 additional mark for further development of each point.</li> <li>Before the start of the fieldwork, students read newspaper articles to find out more about the health risks associated with rising heat. This is useful in providing them with accurate information on how rising heat can affect the physical wellbeing of the elderly as newspapers are likely credible sources of information. [1]</li> <li>The knowledge of potential health risks can help students be more aware of what to observe when they take their photographs at the start of the fieldwork/ [1]</li> <li>Taking photographs can help students be more familiarised with how the area may allow for rising heat to affect the physical wellbeing of the elderly. [1] This could help the students craft more accurate interview questions about the impacts of rising heat, that are directly relevant to the elderly's experience of the neighbourhood. [1]</li> <li>Based on their findings from the first day, the students went home and crafted a questionnaire to collect further data the next day. This provided sufficient time for students to consolidate their findings and be able to craft a questionnaire based on up-to-date, reliable information from their primary research. [1] This may include information not previously found in their secondary research but experienced by the elderly they have interviewed. [1]</li> </ul> |     |
| (f) | Suggest improvements to the representation of the data as shown in Resource 3.   | [5] |

|     | Award 1m for each valid point. Award a maximum of 1 additional mark for further development of each point.  |      |
|-----|---|------|
|     | <ul> <li>Change the line graph to a bar graph / Pie chart [1]</li> <li>This is because a line graph is best suited for trends over time, as opposed to discrete conditions. [+1]</li> <li>The bars of bar chart should represent the health conditions, instead of strength of agreement. [1]</li> <li>This would allow students to compare the strength of/proportion of agreement across health conditions. [+1]</li> <li>Use different colours for ease of visualisation/reading at a glance. [1]</li> <li>Use patterns for the bar graph/pie chart to allow colour-blind students to see. [1]</li> </ul>  |      |
|     | AO2   |      |
| (g) | Evaluate the students' investigation of whether rising heat has affected the physical wellbeing of elderly residents in East Austin.  | [10] |
|     | Possible Approaches:  |      |
|     | Candidates could evaluate the investigation by reviewing the data collection methods and research findings as shown in Resource 2 and 3.<br>For the data collection methods, candidates could review each of the method in  |      |
|     | turn and/or review all methods collectively, including the order in which they were<br>carried out to assess the impact on <b>accuracy and reliability</b> of data collected.<br>Evaluation of these methods could include looking at <b>the sample size and the</b><br><b>strengths and weaknesses of the different methods</b> of collecting primary data<br>(taking photographs, conducting interviews, distributing questionnaires) and<br>secondary data (reading newspaper articles). For instance, candidates could<br>evaluate how some elderly may not be comfortable being truthful about their<br>physical health when responding to the interview and questionnaires.           |      |
|     | For the research findings in Resource 2 and 3, candidates could consider the <b>suitability of the photographs taken and interviews conducted</b> . Candidates could also consider <b>the clarity of the terms</b> used in the questionnaire survey, and how these could give rise to differing interpretation. For instance, to some elderly, indicating 'strongly agree' may mean that they are experiencing the physical symptom daily, while to others, it may mean that they are experiencing the symptom a few times each week. Candidates could consider how such differing interpretations could <b>affect the conclusions</b> that could be drawn from the analysis of these data. |      |
|     | Levels marked using Generic Level Descriptors for H2 fieldwork evaluative questions.  |      |
|     | A03   |      |

**2.** Resource 4 shows 2 projections of climate change impact on terrestrial ecosystems. Resource 5 shows the share of global emissions and climate technology investment by sector. Resource 6 shows survey responses from the private sector about who they felt should be responsible for funding climate resilience. Resource 7 shows a cartoon about what might happen in the future with climate change.

| 2a | Explain how changes in precipitation and temperature can lead to varied outcomes on populations.  | [4] |
|----|---|-----|
|    | Award 1 mark for every explanation. Award a maximum of 1 additional mark for further development of the explanation.  |     |
|    | <ul> <li>Some populations could be dependent on agriculture of livelihoods, and the changes in precipitation and temperatures could reduce crop yields, affecting large numbers of populations. [1]</li> <li>Some tropical populations are also already at risk of high heat stress and further increases in temperature could lead to worse health outcomes for these populations than other people who live in temperate areas. [1]</li> <li>Some populations could be unable to adapt to the changes in decreasing rainfall because of financial resourcing or technology, and thus be worse off than others in managing lower rainfall. [1]</li> <li>In contrast richer nations/populations like Singapore could invest \$1 billion in desalination plants and water recycling methods like reverse osmosis water and this helps them adapt to the reduction in rainfall more than</li> </ul> |     |
|    | <ul> <li>others. [+1]</li> <li>Some populations are living in low-lying and flood-prone areas, and with increasing rainfall in some places, through the intensification of monsoons, their risk level increases when rivers flood more than usual. [1]</li> </ul>   |     |
|    | A01   |     |
| 2b | With reference to Resource 4, compare the projections of climate change impact  | [6] |
|    | on terrestrial ecosystems.  |     |
|    | Award 1 mark for every comparison. Award a maximum of 1 additional mark for further development of the comparison.  |     |
|    | <ul> <li>The future with rapid economic growth etc (Projection 1). will have larger areas of woodland decline, compared to the future with local solutions. [1]</li> <li>The larger woodland decline is generally seen in North Asia, parts of Europe, North America and parts of South America. [+1]</li> <li>The future with rapid economic growth etc. (Projection 1) will have larger areas of forest type change, compared to the future with local solutions. [1]</li> <li>The larger forest type change is seen in North Asia, parts of Europe, North America. [+1]</li> </ul>   |     |
|    | <ul> <li>Forest cover and woodland gains are larger in the regions of Northern<br/>Europe and North Asia, as well as Asia, in a future with rapid economic<br/>growth (Projection 1). [1]</li> </ul>  |     |
|    | • However, forest and woodland gains are more in Africa, for the future with (local sustainability measures (Projection 2). [1]   |     |
|    | <ul> <li>Reduction of desertification is larger and more contiguous in a future with<br/>rapid economic growth etc but more smaller in area and patchy in the<br/>other scenario. [1]</li> </ul>  |     |
|    | • The exception is in Australia where the reduction of desertification is larger in area for the future with local solutions. [1]   |     |
|    | A02   |     |
| 2c | Cite data from Resource 5 to describe the share of global emissions and climate technology investment.  | [5] |
|    | Award 1 mark for every description.   |     |

|    | <ul> <li>Industry contributes the most to emissions, as seen by its 34% share. [1]</li> <li>Industry invests the second least in proportion, in climate technology, as seen by its 9%. [1]</li> <li>Energy contributes the least to emissions, as seen by its share of 12%. [1]</li> <li>Energy accounts for the second highest investments in climate technology, as seen by its share of 27%. [1]</li> <li>Mobility invests the most in climate technology, as seen by its share of 48% of investments. [1]</li> <li>The built environment invests the lowest share of climate technology investments, of only 4%. [1]</li> </ul>  |     |
|----|--|-----|
| 2d | With reference to Resource 6, describe the survey responses from the private sector.   | [5] |
|    | Award 1 mark for every description. Award a maximum of 1 additional mark for further development.  |     |
|    | <ul> <li>Overall, the private sector had more agreements about government at all levels being entirely responsible for funding climate resilience. [1]</li> <li>Amongst the government, the federal government had the highest percentage of those who felt that they should be entirely responsible. [1]</li> <li>25% felt that the federal government was entirely responsible, compared to 15% and 8% for the other two levels of government. [+1]</li> <li>Local government and private businesses had the highest percentage of those who felt that they were not responsible at all. [1]</li> <li>This is seen by the 15% respondents that felt that way for each of them. [+1]</li> <li>Private businesses were generally seen as having the least percentage of respondents who felt that they were more responsible than other parties. [1]</li> <li>This is seen by only 15% of respondents who felt that way. [+1]</li> </ul> |     |
| 2e | Explain reasons for uncertainty over the present and future impacts  | [6] |
|    | <ul> <li>Award 1 mark for every explanation. Award a maximum of 1 additional mark for further development of the explanation.</li> <li>The lack of full understanding of physical processes means that increases in temperature and impact to precipitation might lead to unknown impacts to hydrological and atmospheric systems. [1]</li> <li>This is due to the unknown feedback loops that connect the hydrological, atmospheric and lithospheric systems. [+1]</li> <li>The incomplete in-situ data due to the vast expanses of oceans, deserts and polar regions means that scientists are unable to track the impact of climate over time and draw definitive conclusions for the present and future. [1]</li> <li>The incomplete data is also costly to address and may not be undertaken one situ by all countries. [11]</li> </ul>   |     |

|    | <ul> <li>The intrinsic measurement errors in current climate data due to lack of technology and measuring methods will lead to unclear projections of impacts. [1]</li> <li>The uncertainty over future greenhouse gas emissions because of variations in country and global approaches to addressing climate change will lead to unconfirmed impacts overall. [1]</li> </ul> |     |
|----|---|-----|
|    |   |     |
| 2f | With reference to Resource 7, describe the challenges in implementing strategies to respond to contemporary climate change.   | [4] |
|    | Award 1 mark for every description. Award a maximum of 1 additional mark for further development of the description.  |     |
|    | <ul> <li>Economic challenges are present in the funding of adaptation measures<br/>for flooding, with levees, dams etc costing large sums of money that may<br/>be inaccessible for LDCs. [1]</li> </ul>  |     |
|    | • The melting Arctic Ice will be politically challenging to solve because there could be lack of clarity about whose problem it is, and who problem to manage. [1]  |     |
|    | <ul> <li>There is also the issue of inaccurate projections, from now till 2060 that<br/>will affect the targeted strategies put in place to address them. [1]</li> <li>Betracting reinferents is also an according to manage because</li> </ul>   |     |
|    | <ul> <li>Retreating failing failing states are connected to deforestation, through the<br/>clearance for extraction and plantation activities. [1]</li> </ul>   |     |
|    | • It becomes politically challenging when LDCs argue that they deserve the chance to develop economically, and their responsibility is not to carry the burden that DCs left behind when DCs are responsible for carbon emissions in the earlier decades. [1]   |     |
|    | A02   |     |

| 3 | 'Cities find it more challenging to be sustainable than liveable.'   |      |
|---|--|------|
|   | Evaluate this statement.   | [20] |
|   | Marked using H2 Essay Level Descriptors  |      |
|   | Candidates could approach the question by making a judgement on<br>whether cities find it more challenging to be sustainable than liveable.<br>Candidates could evaluate the degree to which it is more challenging to be<br>sustainable than liveable through the use of criteria such as spatial and<br>temporal scale of issues and challenges surrounding urban sustainability<br>and liveability.   |      |
|   | Candidates could also approach the question by making a judgement on<br>whether cities find it more challenging to be sustainable than liveable<br>through a consideration of two or more case studies. Candidates could<br>consider the contextual factors such as the economic, social and<br>environmental factors, which may contribute to the difference in extent to<br>which cities find it more challenging to be sustainable than liveable. |      |

|   | AO3   |      |
|---|---|------|
| 4 | 'Climate change has become the greatest challenge to sustainable urban development.'  |      |
|   | Evaluate this statement.  | [20] |
|   | Marked using H2 Essay Level Descriptors   |      |
|   | Candidates could approach the question by making a judgement on<br>whether climate change had created challenges for sustainable urban<br>development through a consideration of alternative causes such as<br>government inattention, and/or population trends. Candidates could<br>evaluate the impact of climate change vis-à-vis these other possible<br>detractors through an examination of scale of impact, or intensity of<br>impact. |      |
|   | Candidates could also consider how cities have responded to the challenge of climate change through a consideration of two or more case studies to examine the claim of climate change being a significant challenge to sustainable urban development.  |      |
|   | AO3   |      |