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**CATHOLIC HIGH SCHOOL**  
**Preliminary Examination**  
**Secondary 4 (O-Level Programme)**

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**GEOGRAPHY**

**2279/01**

**27 August 2025**

Additional Materials:      Insert

**1 hr 45 mins**

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**READ THESE INSTRUCTIONS FIRST**

Write your name, index number and class on all the work you hand in.

Write in dark blue or black pen.

You may use a soft pencil for any rough working.

Do not use staples, paper clips, highlighters, glue or correction fluid.

**DO NOT WRITE ON THE MARGINS.**

Answer **all** questions.

For examiner's use only:

Question 1	/ 20 m
Question 2	/ 15 m
Question 3	/ 15 m
<b>Total</b>	<b>/ 50 marks</b>

1. Write all answers on this booklet.
  2. You may use the additional pages at the back of this booklet, where necessary.
  3. The number of marks is given in brackets [ ] at the end of each question or part question.
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This document consists of **12** printed pages and **2** blank pages.

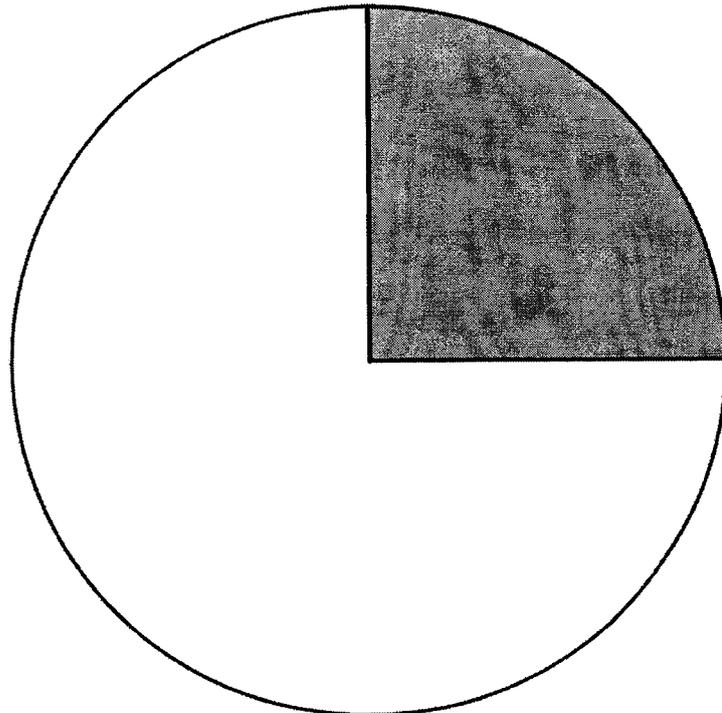
**[Turn over**

Answer all questions.

<b>1</b>	<b>Geography in Everyday Life</b>
	<p>A group of students are interested to investigate the importance of community spaces to residents in a neighbourhood in Singapore. The students believe that community spaces play an important part in building a strong sense of place as residents will interact and build bonds with one another.</p> <p>Study Fig. 1.1 (Insert), which shows a map of Punggol estate that students have selected to conduct their investigation.</p> <p>The students decided to test their hypothesis: 'Community spaces provide opportunities for residents to interact and build a strong sense of place', by conducting a questionnaire survey and also asking respondents to draw a mental map of the sites that provide them with a sense of place.</p>
<b>(a)</b>	<p><b>(i)</b> Their teacher commented that the hypothesis can be improved on.</p> <p>Suggest how the students can improve their hypothesis [2]</p>
	<p><b>Answer:</b></p> <ul style="list-style-type: none"> <li>• Geographical focus – students can indicate which town/areas they are referring to</li> <li>• Specific – students can indicate which community spaces they are looking at, such as One Punggol</li> <li>• Specific – students can indicate which age groups of residents they are examining</li> <li>• Comparison – students can do a comparison between locations, types of community spaces, responses between different age groups</li> </ul> <p>Accept other plausible answers</p>
	<p><b>(ii)</b> With reference to Fig. 1.1, explain how students can collect the data required for their investigation. [5]</p>
	<p><b>Answer:</b></p> <ul style="list-style-type: none"> <li>• [Where] Students can identify which areas/locations to sample residents e.g. Town Centre and Punggol Settlement, which are commercial and/or recreational places</li> <li>• [Who] Students should find out first if the survey respondents are residents of Punggol for relevance</li> <li>• [How many respondents] Students can determine a fixed number of respondents to survey at each location using a sampling method e.g. stratified sampling to gather from different age groups so that data is not biased</li> <li>• [What] Students can record the data on recording sheets, survey forms or take photos of people using the community spaces and for what purposes</li> <li>• [When] Students can identify the timings and the number of times they should collect data, including across weekdays and weekends where possible</li> </ul> <p>Accept other plausible answers</p>

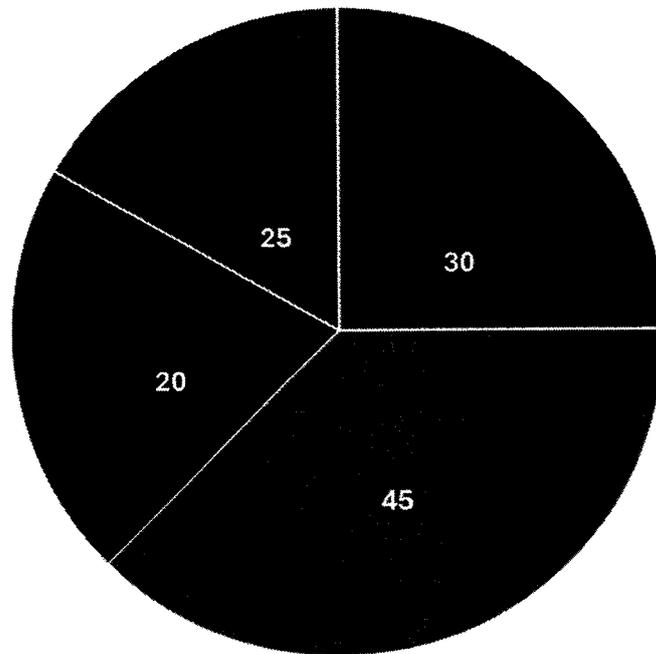
	<p><b>(iii)</b> Suggest why asking the respondents to draw a mental map might be useful to the students' hypothesis. [2]</p>										
	<p>Answer:</p> <ul style="list-style-type: none"> <li>• Mental maps will be able to show how people experience and perceive places.</li> <li>• Students will be able to identify whether the places drawn by respondents will fall into the category of community places e.g. recreational spaces or commercial spaces</li> <li>• Mental maps can further support the data collected by students.</li> </ul>										
	<p><b>(b)</b> Suggest two safety measures that the students need to put in place before they embark on their data collection. [2]</p>										
	<p>Answer:</p> <ul style="list-style-type: none"> <li>• Students must work in groups of at least 2 students</li> <li>• Students must hydrate themselves</li> <li>• Students must seek shelter in the event of rain and/or lightning</li> </ul> <p>Accept other plausible answers</p>										
	<p><b>(c)</b> The students did a quick survey of the frequency in which residents visited Punggol Point Park. The data collected is presented in Table 1.</p> <p style="text-align: center;">Table 1</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Frequency of visit</th> <th>Number of respondents</th> </tr> </thead> <tbody> <tr> <td>Less than once a month</td> <td>30</td> </tr> <tr> <td>1 – 2 times a month</td> <td>45</td> </tr> <tr> <td>3 – 4 times a month</td> <td>25</td> </tr> <tr> <td>5 or more times a month</td> <td>20</td> </tr> </tbody> </table> <p>Present the data in the pie chart below. [3]</p>	Frequency of visit	Number of respondents	Less than once a month	30	1 – 2 times a month	45	3 – 4 times a month	25	5 or more times a month	20
Frequency of visit	Number of respondents										
Less than once a month	30										
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3 – 4 times a month	25										
5 or more times a month	20										

Frequency of visits to Punggol Point Park



- Less than once a month
- 1 to 2 times a month
- 3 to 4 times a month
- 5 or more times a month

Frequency of Visits to Punggol Point Park



- Less than once a month
- 1-2 times a month
- 3-4 times a month
- 5 or more times a month

(d)	<p>Study Fig. 1.2 (Insert), which shows two questions in the questionnaire that the students used to collect 50 responses from each age group of respondents.</p> <p>From these questions, the students tabulated the results into Table 2 (Insert) and Fig. 1.3 (Insert).</p> <p>Using information from Table 2 and Fig. 1.3, evaluate how well the data supports the students' hypothesis of 'Community spaces provide opportunities for residents to interact and build a strong sense of place. [6]</p>
	<p>Answer:</p> <p>Supports</p> <ul style="list-style-type: none"> <li>• Community spaces certainly provided opportunities for meeting friends/social interaction as shown by Punggol Town Centre (143) and Punggol Waterway Park (128) had the highest responses for this reason</li> <li>• Community spaces, especially recreational spaces such as Punggol Waterway Park (176) were popular for exercising and this may also involve indirect interaction such as group exercise or sharing of spaces for exercising</li> <li>• Dining and shopping score relatively high as Punggol Town Centre (172) and Northshore Plaza (98) are places where many respondents visit and these activities can be considered social activities where interaction takes place</li> <li>• Recreational spaces, especially Punggol Waterway Park (75) had consistently high sense of place scores across all age groups (1 mark), with older respondents from 46-65 years old and above 65 years old showing high sense of place scores of 22 and 23 respectively (1 mark)</li> <li>• Commercial spaces, like Punggol Town Centre (84) also had high sense of place scores, but the scores came mainly from the youngest age group (1 mark) with a score of 30 from the 16-25 years old group but only 17 from the 46-65 age group.</li> </ul> <p>Does not support</p> <ul style="list-style-type: none"> <li>• Northshore Plaza (37) and Punggol Point Park (24) provided some opportunities for meeting friends/social interaction but to a lesser extent. This could be because they are relatively further from the main transport lines as compared to Punggol Town Centre and Punggol Waterway Park</li> <li>• Punggol Point Park had a low overall sense of place (21) suggesting that not all community spaces are successful at creating a strong sense of place.</li> </ul> <p>Alternative if really need to be lenient</p> <ul style="list-style-type: none"> <li>• Community spaces do provide opportunities for residents to interact, as seen in the high number of respondents visiting these spaces to meet friends, shop, dine, or exercise.</li> <li>• However, the extent to which these spaces build a strong sense of place <b>varies by age group and space type.</b></li> <li>• Recreational spaces like Punggol Waterway Park foster a stronger and more widespread sense of place, especially among older residents,</li> </ul>

	<ul style="list-style-type: none"><li>• while commercial spaces like Punggol Town Centre are more meaningful to younger residents.</li></ul> <p>Minimum of 1 point from each source Minimum of 2 data points required. Cap at max of 4 marks without data</p>
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<b>2</b>	<b>Tourism</b>
	<p><b>(a)</b> Study Fig. 2.1 (Insert), which shows the trend of international tourist arrivals from 1990 to 2024.</p> <p><b>(i)</b> Describe the trend of international tourist arrivals from 1990 to 2015 [3]</p>
	<p>Answer:</p> <ul style="list-style-type: none"> <li>• There is a general increase from 1990 to 2015</li> <li>• as international tourist arrivals increased from slightly under 500m in 1990 to about 1250m in 2015</li> <li>• There were two times when international tourist arrivals dropped, when the SARS epidemic occurred (-2m) and when the financial crisis occurred (-37m)</li> <li>• There was also a period where international tourist arrivals stagnated from 2000 to about 2003.</li> </ul> <p>Accept other plausible answers. Award up to 1 mark for appropriate use of data.</p>
	<p><b>(ii)</b> Explain how the trend of international tourist arrivals from 1990 to 2015 shown in Fig. 2.1 could have been a result of tourists' ability to travel. [3]</p>
	<p>Answer:</p> <ul style="list-style-type: none"> <li>• Ability to travel <ul style="list-style-type: none"> <li>○ Growth in disposable income means people not only want to travel but can afford it. This motivation is fueled by the fact that more individuals now have higher incomes, which gives them the financial freedom to pursue these kinds of meaningful trips. When people earn more, they can afford to prioritize travel as a way to fulfill personal goals and desires.</li> <li>○ Increased leisure time, often thanks to paid vacations mandated by employers or government policies, gives people the time they need to take trips without sacrificing work or income.</li> <li>○ On top of that, innovations in business and technology have made travel easier and cheaper. Transportation costs, such as flights, have dropped due to competition and more efficient airlines,</li> <li>○ Accommodation options have expanded and become more affordable through platforms like budget hotels and vacation rentals. These factors together lower the barriers to travel, making it accessible to a broader population.</li> </ul> </li> </ul> <p>Award 1m maximum for SARs, Financial Crisis</p>

	(iii) Explain the sharp decline in international tourist arrivals shown in Fig. 2.1. [3]
	<p>Answer:</p> <ul style="list-style-type: none"> <li>• Travelers' fear of infection and their safety caused a steep drop in demand for international travel.</li> <li>• Governments have also imposed travel bans, border closures, and quarantine rules, severely restricting international movement.</li> <li>• Airlines and tourism businesses reduced operations or shut down, limiting travel options and accommodations.</li> </ul> <p>Award 1m for example.</p>

(b)	<p>Study Fig. 2.2, which describes about the approach towards sustainable tourism by a country.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>This type of sustainable tourism focuses on helping disadvantaged communities by directing tourism benefits straight to them. It supports local businesses like small guesthouses, craft sellers, and community tours, boosting incomes and reducing poverty. Unlike tourism dominated by large corporations, it encourages local involvement in managing and deciding on tourism activities. By prioritizing marginalized groups, this approach empowers communities to improve their futures and ensures tourism creates lasting positive impacts, benefiting the people who live in the destinations.</p> </div> <p style="text-align: center;">Fig. 2.2</p> <p>Explain how the government can support this form of sustainable tourism [2]</p>
	<p>Answer:</p> <ul style="list-style-type: none"> <li>• Governments can play a crucial role by <u>creating policies</u> that encourage tourism to benefit local communities. They might offer financial incentives, like grants or low-interest loans, to <u>small local businesses</u> and entrepreneurs in tourism.</li> <li>• Supporting training and capacity-building programs helps <u>residents develop skills</u> in hospitality, management, and marketing.</li> <li>• Governments can also <u>invest in infrastructure</u>—roads, clean water, and communication networks—that makes destinations more accessible and visitor-friendly.</li> <li>• Regulations can be designed to <u>ensure fair wages and protect community interests</u>, preventing exploitation.</li> <li>• Promoting sustainable <u>tourism standards and certification</u> can attract conscientious travelers.</li> <li>• Finally, governments can <u>market</u> these community-focused travel experiences <u>internationally</u>, helping connect tourists with authentic, locally beneficial options.</li> </ul>



(c)	<p>Study Fig. 2.3 (Insert) and Fig. 2.4 (Insert), which show the attitudes of locals towards tourists in two destinations.</p> <p>Describe how the growth of tourism in these destinations might have led to the locals' attitudes towards tourists. [4]</p>
	<p>Answer:</p> <ul style="list-style-type: none"> <li>• Positive <ul style="list-style-type: none"> <li>○ increased tourism can boost the local economy by creating jobs and supporting <b>small businesses</b>, which improves incomes and living standards.</li> <li>○ Locals may feel proud sharing their community and culture with visitors, and appreciate the improved infrastructure like better roads, shops, and services that often come with tourism development.</li> </ul> </li> <li>• Negative <ul style="list-style-type: none"> <li>○ High numbers of tourists can strain local resources, cause overcrowding, and lead to environmental damage, which frustrates residents.</li> <li>○ Some may feel their daily lives are disrupted by noise, traffic, or loss of privacy.</li> <li>○ If tourism development favors outsiders or large corporations over locals, resentment can grow.</li> <li>○ Cultural misunderstandings or disrespectful tourist behavior can also cause tension.</li> </ul> </li> </ul>

<b>3</b>	<b>Climate</b>
<b>(a)</b>	Explain how the temperature of a place might vary due to Earth's revolution around the sun. [3 marks]
	<p>Answer:</p> <ul style="list-style-type: none"> <li>• Earth's revolution around the sun causes different parts of the Earth to receive varying amounts of sunlight throughout the year.</li> <li>• This leads to seasonal changes in temperature, with warmer temperatures when a place is tilted toward the sun and cooler temperatures when tilted away.</li> <li>• Include latitude into the mark scheme</li> </ul> <p>Award 1m for example.</p>
<b>(b)</b>	<p>Study Fig. 3.1 (Insert), which shows global carbon dioxide emissions and population growth.</p> <p>Explain the relationship between the two line graphs. [3]</p>
	<p>Answer:</p> <ul style="list-style-type: none"> <li>• [Positive relationship] The graph shows a clear trend where global carbon dioxide emissions tend to increase alongside population growth. As the global population grows, the demand for energy, transportation, food production, and housing increases, leading to higher carbon dioxide emissions. [Include data here]</li> <li>• For example, more people means more cars on the road, and since most vehicles run on gasoline or diesel, this increases fossil fuel consumption and CO<sub>2</sub> emissions.</li> <li>• Similarly, expanding cities require more electricity for lighting, heating, and cooling, often generated by burning coal or natural gas, which are major carbon sources.</li> <li>• Agriculture also contributes; with more mouths to feed, activities like deforestation to clear land and methane emissions from livestock add to greenhouse gases.</li> <li>• For instance, countries like India and China have seen rapid population growth paired with increased industrial activity, which significantly raised their emissions in recent decades.</li> </ul> <p>Compulsory for 1 mark to be awarded for data Award 1 mark for an example where appropriate</p>

(c) Study Fig. 3.2 (Insert), which shows the generation of energy.

'The development of clean energy sources should be the main mitigation strategy building community resilience to climate change.'

With reference to 3.2, to what extent do you consider this statement to be true? Explain your answer. [9 marks]

**LEVEL 1: 1-3 marks**

- Basic description of mitigation strategies with no reference to Fig. 3.2
- No examples
- One-sided response

**LEVEL 2: 4-6 marks**

- Good description of Fig 3.2 and at least one other **mitigation** strategy
- Good description of the strengths and limitations, though one side may not have been elaborated adequately
- At least one relevant example has been used to illustrate how the strategies can help to build community resilience to climate change

**LEVEL 3: 7-9 marks**

- Detailed description of Fig. 3.2 and other mitigation strategies
- Well-supported arguments with specific examples
- Discussion that covers both perspectives of strengths and limitations
- Discussion that covers mitigation strategies can be both to reduce carbon emissions and to enhance carbon sinks (award L3/9 only if they have shown this??)
- Clear conclusion with justified stance

Some suggested content can include

- Use of clean energy sources (compulsory)
- International agreements and cooperation
- Use of low-carbon technologies
- Changes in consumption patterns

**DNA - adaptation**

Suggested Essay:

Building a community's resilience to climate change hinges significantly on effective mitigation strategies, which aim to reduce the root causes of climate change by altering how societies produce and consume energy and manage land. One of the most critical aspects of these strategies is the shift towards clean energy sources, which directly reduces greenhouse gas emissions and lessens the community's vulnerability to climate impacts.

Mitigation strategies involve broad changes, including adopting low-carbon technologies and modifying consumption patterns. For instance, replacing fossil fuel-based electricity with solar, wind, or hydropower not only cuts emissions but also fosters energy independence and stability within communities. Denmark is a prime example,

having invested heavily in wind energy to generate a significant portion of its electricity. This shift has reduced emissions, boosted energy security, and created green jobs, strengthening the social and economic fabric that supports resilience.

Similarly, Costa Rica produces over 98% of its electricity from renewable sources such as hydro, wind, and geothermal energy, demonstrating how clean energy can power a nation while supporting environmental goals. Singapore, despite its limited land area, has also made strides by investing in solar energy and green building technologies, integrating solar panels on rooftops and encouraging energy-efficient designs to reduce its carbon footprint and enhance urban resilience. However, it is unable to tap on other sources such as wind energy or hydroelectric power.

International cooperation plays a vital role in enabling these changes, as climate change is a global issue requiring unified action through agreements like the Paris Accord. However, the effectiveness of mitigation is often constrained by technological limitations, economic costs, social acceptance, and institutional capacities. Some communities may lack access to advanced clean energy technologies or the financial resources needed to implement them fully. For example, in developing regions, economic barriers can slow the adoption of renewables, though initiatives like South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) show progress by encouraging private investment in renewable projects.

Beyond reducing emissions, mitigation strategies also focus on enhancing carbon sinks—natural systems that absorb CO<sub>2</sub> from the atmosphere. Protecting and regenerating forests, as well as safeguarding oceans, help stabilize local climates and preserve biodiversity, further bolstering community resilience. Costa Rica's extensive forest conservation and reforestation programs have restored large areas of forest cover, enhancing carbon absorption and reducing risks such as floods and landslides. In South America, efforts to curb deforestation in the Amazon rainforest are crucial for maintaining regional climate stability and protecting communities vulnerable to climate-related disasters.

In conclusion, mitigation strategies, especially the adoption of clean energy sources, are essential for building resilient communities in the face of climate change. While challenges remain, combining emission reductions with the protection of carbon sinks offers a comprehensive approach that addresses both the causes and consequences of climate change, ultimately helping communities adapt and thrive.

– End of Paper –



## Mark Scheme

1	<b>Cluster 1: Geography in Everyday Life</b>
(a)	Study Fig. 1.1 (Insert), which shows a children's playground and an adult fitness corner in Tanjong Pagar.
(i)	<p>Using Fig. 1.1 (Insert), explain the spatial association shown in the photograph. [2]</p> <p>Award 1 mark for each explanation, to a maximum of 2 marks.</p> <ul style="list-style-type: none"> <li>• [Proximity] The playgrounds and fitness corners are usually built near each other, this allows parents or grandparents to exercise while still keeping an eye on their children playing</li> <li>• [Usage] The playground caters to children's needs for play, while the fitness corner serves adults' needs for exercise</li> </ul>
(ii)	<p>Describe how the facilities in Fig. 1.1 (Insert) could benefit local communities. [2]</p> <p>Award 1 mark for each explanation, to a maximum of 2 marks. Award a maximum of 1 additional mark for further development of each explanation, where applicable.</p> <ul style="list-style-type: none"> <li>• These spaces become gathering points where children make friends and adults interact with neighbours</li> <li>• This strengthens community bonds and fosters a sense of belonging [1 m additional]</li> <li>• Encourages active lifestyle through exercising</li> </ul>
(b)	<p>Explain how people acquire a sense of place in their neighbourhoods. [4]</p> <p>Award 1 mark for each explanation, to a maximum of 4 marks. Award a maximum of 1 additional mark for further development of each explanation, where applicable.</p> <ul style="list-style-type: none"> <li>• People acquire sense of place when they <u>associate importance, meanings and memories</u> with specific locations in their neighbourhoods</li> <li>• Most people's sense of place is due to <u>repeated encounters</u> of the natural and built environment, and regular interaction with others in their neighbourhoods</li> <li>• For instance, students would remember <u>significant events</u> that took place at different parts of their schools like the canteen or field [1 m additional]</li> </ul>

	<ul style="list-style-type: none"> <li>• People's sense of place may also be associated with significant or memorable events that took place at <u>local landmarks</u> and gathering places.</li> <li>• For example, the Bedok Town Square, which regularly hosts events such as competitions, fairs, performances and roadshows, offering diverse experiences for visitors [1 m additional]</li> </ul>
(c)	Study Fig. 1.2 (Insert), which shows a photograph of Tianjin Eco City in China.
(i)	<p>With reference to Fig. 1.2 (Insert), explain how Tianjin Eco City contribute to sustainable development in China. [4]</p> <p>Award 1 mark for each explanation, to a maximum of 4 marks. Award a maximum of 1 additional mark for further development of each explanation, where applicable. <i>Answer should cover at least 2 aspects of sustainable development.</i></p> <ul style="list-style-type: none"> <li>• [Environmental] Buildings and landscaping in TJ is designed such that it is energy efficient through the use of solar panels</li> <li>• [Environmental] LRT systems run on electricity rather than petrol or diesel. This produces fewer greenhouse gas emissions, and less air pollution compared to private cars or buses.</li> <li>• [Economic] LRT is a reliable transport helps people reach workplaces, schools, and shopping areas more quickly. This boosts productivity and supports local businesses.</li> <li>• [Economic] LRT lowers transport cost for people</li> <li>• [Social] Eco-city provides a healthy living environment as eco-cities have more green spaces, clean air, and less pollution. This improves the residents' health and well-being.</li> <li>• [Social] The presence of green spaces encourage social interaction which helps to build a sense of belonging and togetherness</li> </ul>
(ii)	<p>Outline factors that can hinder sustainable development. [3]</p> <p>Award 1 mark for each explanation, to a maximum of 3 marks.</p> <ul style="list-style-type: none"> <li>• Overuse of natural resources, which leads to depletion and environmental damage.</li> <li>• Poverty, as poorer communities may prioritise short-term survival over long-term sustainability.</li> <li>• Government lack resources such as funds and hence could not invest in sustainable development</li> <li>• Poor planing and implementation of policies which can lead to destruction of natural ecosystem / traffic congestion / pollution.</li> </ul>

2	<b>Cluster 4: Tectonics</b>
(a)	Study Fig. 2.1 (Insert), which shows the age of oceanic lithosphere at the seabed.
	<p>Using Fig. 2.1, explain how the age of the rocks is an evidence of plate tectonic theory. [4]</p> <p>Award 1 mark for each explanation, to a maximum of 3 marks. Reserve 1 mark for data.</p> <ul style="list-style-type: none"> <li>• Rocks nearest to the centre of mid-ocean ridge are the youngest, <u>approx. 0- 20 million years old</u> while rocks furthest away from the ridge are progressively older, approx. 40 – 120 million years old [Data]</li> <li>• This is due to seafloor spreading where two plates move apart at divergent plate boundaries</li> <li>• Magma from deep within the earth rises through the mid-ocean ridge, forming new oceanic crusts</li> <li>• Hence this means that the Earth's lithospheric plates are moving apart due to convection currents in the mantle [therefore an evidence of plate tectonic theory]</li> </ul>
(b)	Study Fig. 2.2 (Insert), which shows the relationship between the magnitude of earthquake and death tolls in Turkey from 1903 to 2023.
(i)	<p>Using Fig. 2.2, describe the relationship between the magnitude of earthquake and death tolls in Turkey. [3]</p> <p>Award 1 mark for each description, to a maximum of 3 marks. Reserve 1 mark for data AND 1 mark for exception.</p> <ul style="list-style-type: none"> <li>• Generally, the <u>higher the magnitude, the higher the death toll</u></li> <li>• For example, 1939 EQ magnitude is 7.8 with a death toll of 33 000</li> <li>• However, there are <u>exceptions</u>. The EQ in 2023 magnitude is 7.8 but death toll is approx 5 000 OR</li> <li>• In the year 1975, the death toll is low approx. 3000 despite a high magnitude of 7.5</li> </ul>
(ii)	<p>Suggest how earthquakes can bring serious impacts to the economy. [2]</p> <p>Award 1 mark for each explanation, to a maximum of 2 marks.</p> <ul style="list-style-type: none"> <li>• EQ damage infrastructure and buildings, <u>disrupting transport and trade</u></li> <li>• <u>Rebuilding</u> requires huge amounts of money</li> <li>• <u>Disruption to services</u> such as electricity, water, and communication networks may be damaged which affects industries</li> <li>• Governments spend <u>large amounts on emergency relief</u> and reconstruction. This diverts money away from other aspects of development</li> </ul>

	<ul style="list-style-type: none"> <li>• Tourists would avoid the area, leading to decrease in <u>tourism revenue</u></li> </ul>	
(c)	<p>Evaluate the risks and benefits of living near volcanoes.</p> <p>Award 1 mark for each description, to a maximum of 6 marks. Award a maximum of 1 additional mark for further development of each explanation, where applicable. Both risks and benefits are to be discussed.</p> <p><b>Benefits of Living Near Volcanoes</b></p> <ul style="list-style-type: none"> <li>• <u>Geothermal energy</u> can be harnessed from the Earth's natural heat which is associated with active volcanoes giving off heat at depth</li> <li>• Steam from high-temperature geothermal fluids can be used to drive turbines and generate electrical power</li> <li>• Geothermal heat warms more than 70% of the homes in Iceland, and The Geysers geothermal field in Northern California produces enough electricity to meet the power demands of San Francisco. [1 additional mark for example]</li> <li>• <u>Tourism</u> activities can develop at the volcanic cone as the scenery is most breathtaking. o For example, Mount Fuji, the 3,776 metres tall volcano in Japan, is the central feature of the Fuji-Hakone-Izu National Park which was designated a UNESCO World Heritage site in 2013</li> <li>• Provides <u>fertile soil</u> for farming after volcanic materials are broken down and weathered, and makes available valuable minerals and building materials</li> <li>• The <u>precious gems</u> that are formed are exposed and made available for mining. o Some precious gems including peridot is formed from the cooled lava. Most of the metallic minerals mined in the world such as copper, gold, silver, lead, and zinc are associated with magma</li> </ul> <p><b>Risk</b></p> <ul style="list-style-type: none"> <li>• Eruptions can <u>destroy homes, infrastructure</u>, and farmland</li> <li>• <u>People can be injured or killed</u> by lava, ash, or pyroclastic flows</li> <li>• <u>Tourism, agriculture, and businesses can be severely disrupted</u> during and after eruptions</li> </ul>	[6]

3	<b>Cluster 5: Singapore</b>
(a)	Study Fig. 3.1 (Insert), which shows Singapore extreme weather events in 2023.
	<p>Using Fig. 3.1, describe the impacts on people. [3]</p> <p>Award 1 mark for each description, to a maximum of 3 marks. Award a maximum of 1 additional mark for further development of each explanation, where applicable. <i>Reserve 1 mark for data.</i></p> <ul style="list-style-type: none"> <li>• <u>Heat stress as evidenced in AMK of 37 °C</u>, increases people's vulnerability to heat exhaustion and heat stroke</li> <li>• <u>Flash floods as evidenced in Woodlands, which is the wettest month in Dec</u>, may affect transportation and hence people may experience delay in commuting</li> <li>• <u>Strong gusts from storms as evidenced in Pasir Panjang of 85 km/h</u>, can damage property, uproot trees, and pose safety risks to people</li> </ul>
(b)	<p>Study the newspaper extract in Fig. 3.2.</p> <div style="border: 1px solid black; padding: 10px;"> <p><b>The Marina Barrage, a dream 20 years in the making</b> An iconic landmark, a symbol of the city-state's success in water management.</p>  <p>The Marina Barrage has become an iconic landmark and a popular social space for many Singaporeans.</p> <p>It is the result of visionary planning at the highest political level, and painstaking planning and implementation by scores of officers at PUB, Singapore's national water agency.</p> </div>

Fig. 3.2

(i) Using Fig. 3.2, describe how Marina Barrage has benefited Singapore. [3]

Award 1 mark for each description, to a maximum of 3 marks.  
Award a maximum of 1 additional mark for further development of each explanation, where applicable.

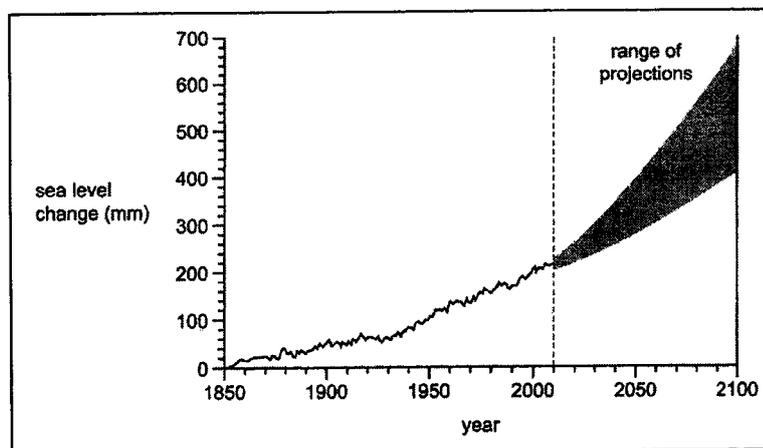
- Marina Barrage creates a reservoir by storing rainwater, helping Singapore meet its water needs
- It reduces dependence on imported water and strengthens national water security [1 m additional]
- Barrage acts as a tool for flood control. During heavy rain, excess water is released into the sea
- Marina Barrage has parks and cycling paths. Hence it provides a leisure space for residents and attracts tourists.

(ii) Outline two political considerations involved in the planning large scale sustainable development projects such as Marina Barrage. [2]

Award 1 mark for each description, to a maximum of 2 marks.

- There must good political leadership who have a clear vision to identify the needs of Singapore
- Government must have the willpower and commitment to see through the project as it takes years to for the project to come to realisation

(c) Study Fig. 3.3, which shows changes in global rise in sea level.



<b>Fig. 3.3</b>	
	<p>Describe the changes in the sea level from 1850 to 2100. [3]</p> <p>Award 1 mark for each description, to a maximum of 3 marks. Reserve 1 mark for data.</p> <ul style="list-style-type: none"> <li>• Generally, the change in sea level has increased from 1850 to 2100, from 0 mm in 1850 to 700 mm projected in 2100</li> <li>• The increase is a gradual one from 1850 to 2010</li> <li>• After which, there is a sharp increase from 90 mm in 1950 to 200 mm in 2010</li> <li>• From 2010 to 2100, it is predicted to have a wide range in the change in sea level rise.</li> </ul>
<b>(d)</b>	<p>'Sea level rise is the main challenge that Singapore faces.'</p> <p>To what extent do you agree with the statement? Explain your answer. [9]</p>
	<p><u>Relevant content</u></p> <p>The answer could highlight other challenges that Singapore faces such as</p> <ul style="list-style-type: none"> <li>- Food insecurity</li> <li>- Water insecurity</li> <li>- Energy insecurity</li> <li>- Changing demographics</li> <li>- Global uncertainties</li> <li>- Regional competition in tourism</li> </ul> <p>Relevant examples or case studies should be made to illustrate the argument.</p> <p><u>A possible approach:</u></p> <p>The answer could highlight which challenge will hamper Singapore's progress to achieve sustainable development. Relevant examples or case studies should be made to illustrate the argument.</p>

Level	Marks	Generic Level Descriptors for 9-Mark AO3 Questions
3	7 - 9	Develops arguments that supports both sides of the discussion clearly using a range of points with good elaboration. Examples used demonstrate a comprehensive understanding of the issue or phenomenon. Evaluation is derived from a well-reasoned consideration of the arguments.
2	4 - 6	Develops arguments that support one side of the discussion well using one or two points with some elaboration. Example(s) used demonstrate a good understanding of the issue or phenomenon. Evaluation is well supported by arguments.
1	1 - 3	Arguments are unclear with limited description or may be listed. No examples provided or examples are generic, demonstrating a basic understanding of the issue or phenomenon. Evaluation is simple, missing or unclear.
0	0	No creditworthy response

Sea level rise is no doubt a challenge, as it threatens Singapore's survival in the long run as we have no hinterland. However, **food security and demographic change may present more immediate challenges**. Changing demographics poses social and economic challenges as a shrinking workforce means increased healthcare costs, and pressure on younger generations to support the elderly. Unlike sea level rise, which is gradual and long-term, demographic change is already happening and will have immediate implications for the economy. Food security is equally a challenge because it has an immediate impact on our daily lives should there be disruptions in food supply chain.