SINGAPORE CHINESE GIRLS' SCHOOL
PRELIMINARY EXAMINATION 2025
SECONDARY FOUR
O-LEVEL PROGRAMME
PAPER 1 (ANSWER KEY)

Answer **all** questions.

1 Cluster 1: Geography in Everyday Life

A group of students would like to study the ecosystem services provided by green spaces in Singapore. They decided to conduct their study in the Bishan-Ang Mo Kio Park.

The students wanted to test the hypothesis: 'The higher the number of trees in the area, the lower the temperature'. The students found a map of the park online as shown in Fig. 1.1 (Insert) and identified the area X to conduct their study.

(a) Using Fig. 1.1, describe how the students can use random sampling to conduct their study in area X. [3]

Award 1 mark for each description of how the sampling can be conducted in area X, to a maximum of 3 marks.

- The students can number each grid square/line.
- Next, they can use a random number generator to select the numbers/coordinates.
- These coordinates/numbers will determine the locations where the students will measure air temperatures in the park.

(b) Study Fig. 1.2, which shows a scatter plot diagram of the results collected by the students.

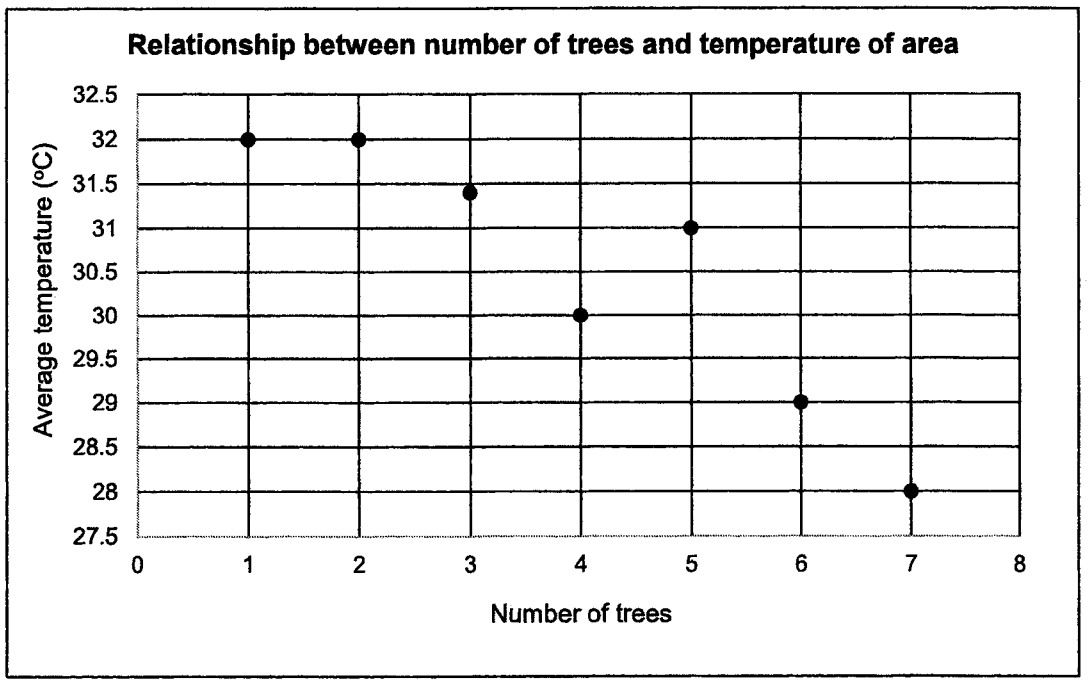
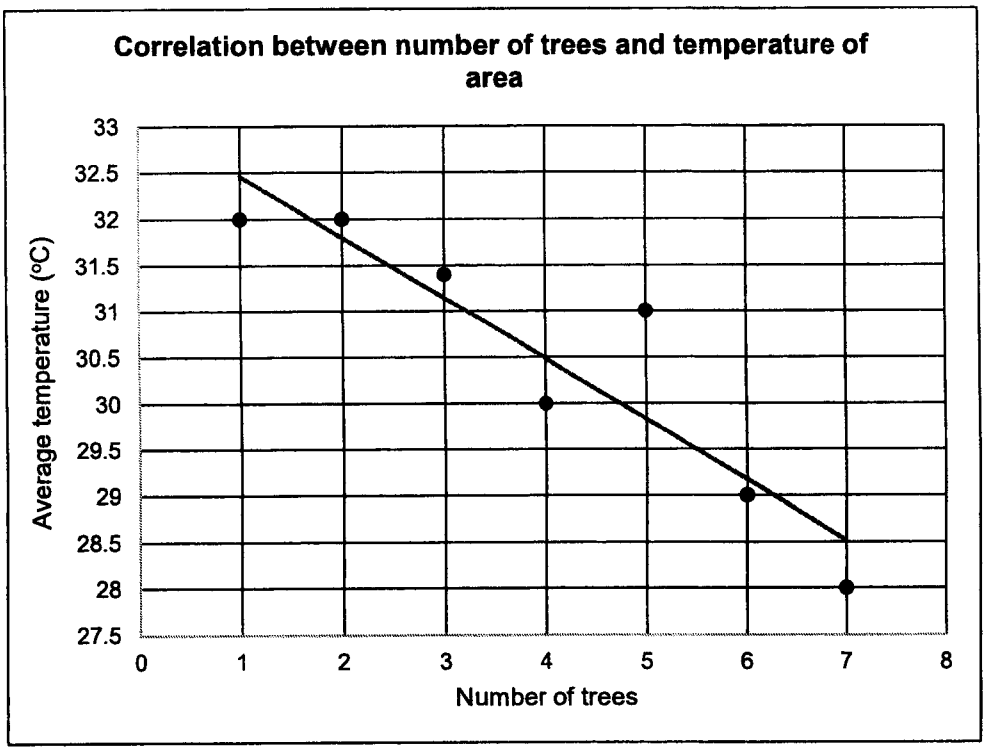


Fig. 1.2

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(i) Draw a best fit line on the scatter plot diagram in Fig. 1.2.



(ii) Using Fig. 1.2, explain whether the hypothesis has been proven. [3]

Award 1 mark for each explanation whether hypothesis has been proven, to a maximum of 2 marks.

- Yes, the hypothesis has been proven as the average temperature decreases as the number of trees in the area increases / there is a negative correlation between the two variables.
- When there are the highest number of trees (7) in the area, the average temperature is the lowest at 28 degree celsius. While the lowest number of trees (1) in the area had an average temperature of 32 degree celsius.
- However, there was an anomaly where they are 5 trees as the average temperature increased by 1 degree celsius higher as compared to where they are 4 trees.

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(c) The students also wanted to study about cultural ecosystem services in Bishan-Ang Mo Kio Park. They designed a questionnaire, as shown in Fig. 1.3, to survey the people visiting the park.

Sample of questionnaire

Survey on the usage of Bishan-Ang Mo Kio Park

We are a group of students studying the usage of Bishan-Ang Mo Kio Park. Thank you for your time in completing this survey.

1. What is your gender?
   a. Male
   b. Female
   c. Prefer not to say

2. What is your age?
   a. Below 18
   b. 18 - 24
   c. 25 - 34
   d. 35 - 44
   e. 45 - 54
   f. 55 - 64
   g. 65 and above

3. What is your reason for visiting the park?
   a. To exercise
   b. To relief stress
   c. To admire the view
   d. For educational purposes

4. How often do you visit the park?
   a. Once in the last month
   b. 3 times in the last month
   c. 6 times in the last month
   d. More than 10 times in the last month

5. How do you rate the following features of the park in relation to relieving stress?

	Excellent	Above average	Average	Below average	Extremely poor
Fitness areas	☐	☐	☐	☐	☐
Walking/running paths	☐	☐	☐	☐	☐
Cycling paths	☐	☐	☐	☐	☐
Rest areas	☐	☐	☐	☐	☐

Fig. 1.3

(i) Identify the type of scale used for Questions 4 and 5 in Fig 1.3 respectively. [2]
Award 1 mark each for stating the type of scale for Q4 and Q5.

- Question 4: Frequency scale.
- Question 5: Rating scale.

[Turn over

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(ii) Using Fig. 1.3, evaluate the design of the questionnaire. [6]

Award 1 mark for each evaluation of the design of the questionnaire.
Award a maximum of 4 marks for a one-sided answer.

- Use of close-ended questions with predefined responses guides participants, making it easier for them to answer the survey.
- The responses will be easier to analyse and interpret as they are in fixed categories .
- The responses will be useful for quantitative data analysis to examine patterns and trends.
- It is good that for question 1, a third option is presented as there are some respondents who may find it a sensitive question.
- Providing age ranges instead of asking for specific age for question 2 is also appropriate as there are some respondents who find age a sensitive question.
- The age ranges are also appropriately segmented to cater to the different generations and phases in life .
- For question 3 and/or 4 and/or 5, the options are limiting and do not allow for other answers that the respondents may have .
- Hence, the data collected may not accurately represent respondents' opinions.

(d) At the end of the survey, the students requested for respondents to draw a mental map of the park so that they can analyse the respondents' sense of place for the park. Fig. 1.4 (Insert) shows a mental map that they received from a respondent.

With reference to Fig. 1.4, explain how the mental map reflects the respondent's sense of place for Bishan-Ang Mo Kio Park. [5]

Award 1 mark for each explanation of the respondent's sense of place to Bishan-Ang Mo Kio park.

- The respondent may have a dog and frequent the dog run as features drawn at the centre of the map are more likely to capture one's attention, such as the dog run.
- The specific name of the cafe is also not labelled which indicates that the respondent does not visit the cafe often. On the other hand, McDonald's is clearly labelled and hence signifies familiarity.
- It is also the only place coloured in, which could mean that it is a place that the respondent frequents and loves.
- The river is also in blue colour as compared to the rest drawn in black, which could also mean that the river is a significant fixture in the part for the respondent.
- The scale of the mental map can indicate the respondent's perception of objects in space such as when objects are drawn larger in proportion than in reality, it could indicate that the objects are significant or of greater familiarity to respondents.
- The type of symbols used in a mental map can also convey personal experiences or memory of places, such as hearts and stars which could indicate a favourite or important location .
- The different perspective in which a mental map is drawn can indicate the respondent's sense of place with the area. Street view which captures a small area with more details can indicate more familiarity versus an aerial view.
- The orientation of places also indicates respondent's sense of place. For example, a place that is important to the respondent could be depicted as being in closer proximity to their home on the map.

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2 Cluster 2: Tourism

(a) Compare mass market tourism with niche travel. [4]
Award 1m for each clear comparison.

- Mass market tourism caters to large groups of people while niche travel caters to small groups of people.
- Operators of mass market tourism arrange for trips to places with mass appeal while niche travel specialise in specific destinations/ offer tourism experiences that most travel agents do not offer.
- In both forms of tourism, the tourists trust that the travel agents have good / expert knowledge of the destinations and are able to provide useful advice and recommendations .
- Mass market tourism is cheaper than niche travel because the operators of the former are able to buy services in bulk.
- Mass market tourism is less customisable, unlike niche travel because the needs of a large group could be varied.

(b) Explain **one** positive economic impact of tourism. [3]
Award 1m for each explanation of one positive economic impact.
Award 1 additional mark for further development of the explanation.

Employment
- Tourism provides employment opportunities in both formal and informal sectors .
- Tourism is a labour-intensive service sector, hence it offers a large number and wide range of employmen .
- Some jobs generated include transport operators or service staff/hotel service staff/tour guides, staff of amusement parks (any 2).
- Tourism accounts for 330 million formal jobs worldwide/10% of the global workforce or between 2015 and 2019, it accounts for 25% of all new jobs.

OR
Income
- Tourism generates income for locals from tourists' spending on consumer goods and services.
- Tourism provides income for government through taxes imposed on tourism spending.
- Tourism revenue is used to improve infrastructure, pay for education and health services, thus increasing standard of living for locals.
- Tourism revenue can help alleviate poverty by transferring wealth from wealthier to poorer regions.
- E.g. Maldives in 1980s was very poor but today its economy has grown due to tourism opportunities, lowering the poverty rate. [1 additional mark]

(c) **(i)** Explain what is meant by 'community-based tourism'. [2]
Award 1m for each description of community-based tourism (CBT).

- Community-based tourism is a type of innovative small scale tourism experience that is managed by local communities.
- It aims to maximise local communities' involvement in tourism and the benefits to them, ensuring economic and social sustainability.
- Locals are encouraged to innovate, set up businesses (e.g. restaurants) and offer tourism experiences like home-stays to cater to the needs of tourists.

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(ii) Explain how community-based tourism can reduce economic leakages in tourism. [2]
Award 1m for each explanation on how CBT reduces economic leakages.

- When services for tourists are not imported, tourism revenue is thus not lost via remittance to other countries.
- Tourism revenue is earned directly by locals and money remain in the local economy.

(d) Describe how international organisations help countries to achieve environmental sustainability in tourism. [4]
Award 1m for each description of the role of international organisations
Award 1 additional mark for further development of the explanation.

- International organisations offer expert advice/ consultancy to countries on environmental management.
- They can also provide financial assistance to different stakeholders to manage the environment.
- They also raise public awareness on how people can contribute to environmental management in tourist destinations.
- E.g. the United Nations Educational, Scientific and Cultural Organisation (UNESCO) helped to inform tourists to Wadi Al-Hitam, Egypt to stay on footpaths while walking to key sites in order to preserve the delicate fossil remains/ natural beauty of the place.

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3 Cluster 3: Climate

(a) Describe the differences in temperature between coastal and inland areas In places which experience cool temperate climate. [2]

Award 1 mark per comparison, to a maximum of 2 marks.

	Coastal areas	Inland areas
Summer and winter temperatures	Cooler summers and warmer winters	Warmer summers and cooler winters
Annual temperature range	Lower / Narrower	Higher / Wider

(b) Study Fig. 3.1, which shows a map showing the direction of monsoon winds blowing over large parts of Asia in December.

Monsoon winds over Asia in December

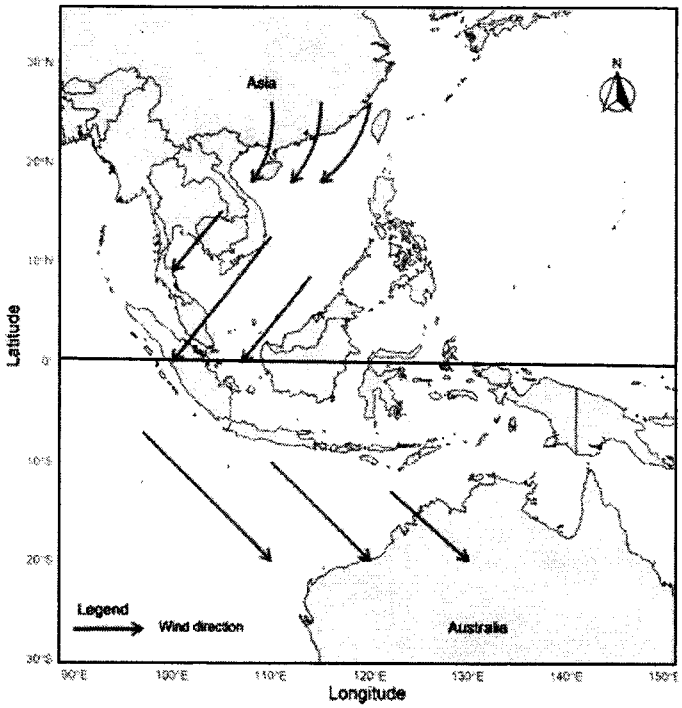


Fig. 3.1

Source: https://www.researchgate.net/figure/The-formation-of-a-the-..._fig2_358899024

With reference to Fig. 3.1, explain why Singapore experiences these monsoon winds in December. [4]

Award 1 mark per explanation, to a maximum of 4 marks.

- Northern hemisphere experiences winter thus lower temperatures and Southern hemisphere experiences summer thus higher temperatures.
- Northern hemisphere experiences lower temperatures which cause the air to cool and sink thus forming an area of high pressure over Asia. Southern hemisphere experiences higher temperatures which cause the air to warm and rise thus forming an area of low pressure over Australia.
- Air moves from an area of high pressure (Asia) to low pressure (Australia).
- As the winds travel in the northern hemisphere, they are deflected to the right forming Northeast monsoon winds experienced in Singapore.

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(c) 'The impact of climate change is more detrimental to the natural environment than humans.'

To what extent do you agree with this statement? Explain your answer. [9]

Possible content

Impact of climate change on natural systems

- Increases in atmospheric and ocean surface temperatures
- Changes in ocean circulations
- Changes in precipitation on land

Impact of climate change on aquatic and terrestrial systems

- Threats to coral reefs / flora and fauna
- Ocean acidification
- Disruption to food webs

Impact on humans

- Direct impacts from extreme weather events: heat waves, droughts, floods, tropical cyclones and wildfires.
- Indirect impacts from breakdown of provisioning, regulating and cultural ecosystem services

A possible approach

The answer makes a clear judgment on the impact of climate is far greater on humans than natural environment with reference to examples and/or case studies. The answer could describe the impacts on human and natural environment. This is followed by a discussion about the amount of time required by different systems to recover, ability of organisms in the systems to avoid the impacts either by adaptation or mitigation measures, scale of impact, existence of long term vs short term impacts; and the interdependence of natural environment and humans. The evaluation could weigh the arguments discussed, arriving at a reasoned conclusion.

Level 1 (1 – 3 marks) • Overall content is vague/shallow with limited details on the impacts. • Arguments are unclear with limited descriptions 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.
Level 2 (4 – 6 marks) • Content has some details on both the impacts - on humans and natural environment. • Develops arguments that support one side of the discussion well, using one or two points with some elaboration on either how the impact is more severe on the humans or how it is more natural environment. • At least one example used demonstrate a good understanding of the issue or phenomenon like 'the drought in Afghanistan in 2018- 2019 which affected over 10 million people due to lack of food and many were displaced.' • Evaluation is well supported by arguments with some attempt to justify the stand.
Level 3 (7 – 9 marks) • Content has good details on both the impacts - on humans and natural environment. • Develops arguments that support both sides of the discussion clearly, using a range of points with good elaboration such as details on how the impact is more severe on humans as well as how it is less or not severe natural environment. • At least two detailed examples used demonstrate a comprehensive understanding of the issue or phenomenon like 'The droughts in California, USA in 2012 to 2016 have dried up many wetlands and because many insects, fish and plants died.' • Evaluation is derived from a well-reasoned consideration of the arguments with good attempt to justify the stand.

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PAPER 2 (ANSWER KEY)

Answer **all** questions.

1 Cluster 1: Geography in Everyday Life

(a) A survey was conducted in different countries regarding people's views on the importance of environmental protection as compared to economic growth and job creation. Study Fig. 1.1 (Insert) which shows the results of the survey.

Using Fig. 1.1, describe the trend of the survey results. [3]
Award 1 mark for each description, to a maximum of 3 marks.

- For all countries, majority of citizens / more than 50% agree that environmental protection is more important than economic growth and job creation.
- Sweden has the highest percentage of citizens agreeing with environmental protection with 87.9%.
- While Japan has the lowest percentage of citizens agreeing with 50.7%.

(b) Study Fig. 1.2 (Insert), which shows a mural in Penang, Malaysia.

With reference to Fig. 1.2, explain how the mural can enhance the sense of place for locals in Penang. [4]
Award 1 mark for each explanation of how the mural can enhance the sense of place for locals in Penang, to a maximum of 4 marks.

- The mural is a landmark which is highly visible and easy for people to remember.
- It may be culturally significant to the people of Penang as it shows a man eating, which may represent the strong food culture in Penang.
- Many people may take photos there and create memories .
- The people may walk past the mural daily and the repeated encounters helps them recall the features and character of the place.

(c) Explain how social sustainability can be promoted in urban neighbourhoods. [4]
Award 1 mark for each explanation of how social sustainability can be promoted in urban neighbourhoods, to a maximum of 4 marks.

- Neighbourhoods can be sustained socially by ensuring residents feel included and have a sense of shared identity.
- This can be fostered by having shared community spaces to promote regular social interactions.
- If the population in the urban neighbourhood is kept small, it can facilitate regular interactions amongst the residents
    - Residents may come together to discuss issues affecting the neighbourhood and find solutions to various challenges.
    - This builds resilience and positive relationships between residents as this helps to maintain a culture of open communication, mutual respect and understanding, thus reducing misunderstandings and conflicts.
- A majority of the problems faced by local residents are day-to-day, mundane issues which can mostly be resolved locally with an adequate neighbourhood structure.

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(d) Study Fig. 1.3 (Insert), which shows students learning how to recycle in school.

With reference to Fig. 1.3, explain how environmental stewardship can build sustainable urban neighbourhoods. [4]

Award 1 mark for each explanation of how environmental stewardship can build sustainable urban neighbourhoods, to a maximum of 4 marks.
Award a maximum of 2 marks if there is no reference to Fig. 1.3.

- There can be a partnership between different stakeholders to come together to ensure an efficient and sustainable waste recycling process.
- Different stakeholders may have different perspectives, resources and expertise to enhance the environmental stewardship efforts.
- As seen in the figure, public agencies can enhance awareness and education by educating students in schools on the right ways to recycle.
- While private stakeholders can provide recycling facilities such as recycling bins/logistics to collect recyclables for processing.
- Volunteerism can also be promoted among neighbourhood residents to share knowledge with others about the importance of healthy ecosystems.
- This helps residents become more aware of what they can and should do to responsibly use and protect the natural environment.

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2 Cluster 4: Tectonics

(a) Study Fig. 2.1, which shows the formation of a tsunami.

Annotate Fig. 2.1 to explain how a tsunami is formed [3]

The formation of a tsunami

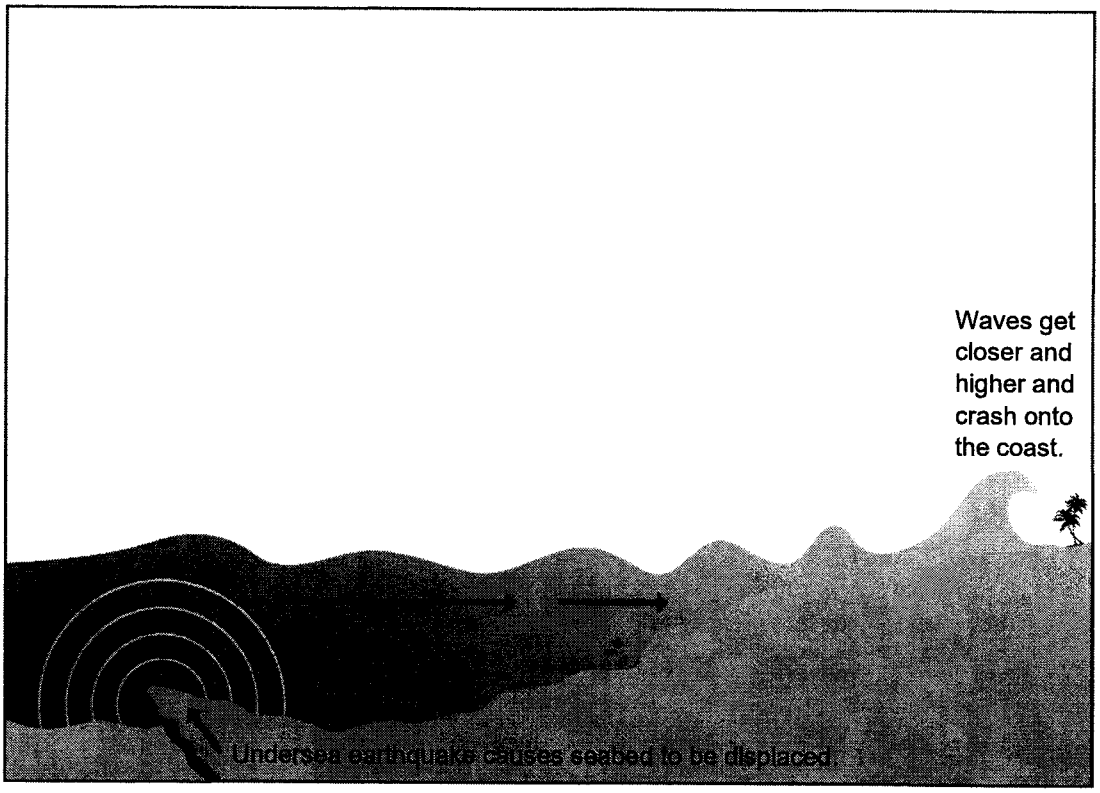


Fig. 2.1

Source: https://www.calstate.edu/csu-system/news/Pages/it-comes-in-waves.aspx

Award 1m for the description of each stage.

- A large volume of water is lifted, forming waves of great wavelength and low wave height of less than 1m.
- The waves travel towards land at high speed of around 800 km/h.
- On approaching the coast, greater friction with the shallower seabed slows the waves down.

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(b) Study Fig. 2.2 which shows volcanic areas along the Pacific Ring of Fire.

Volcanic areas along Pacific Ring of Fire

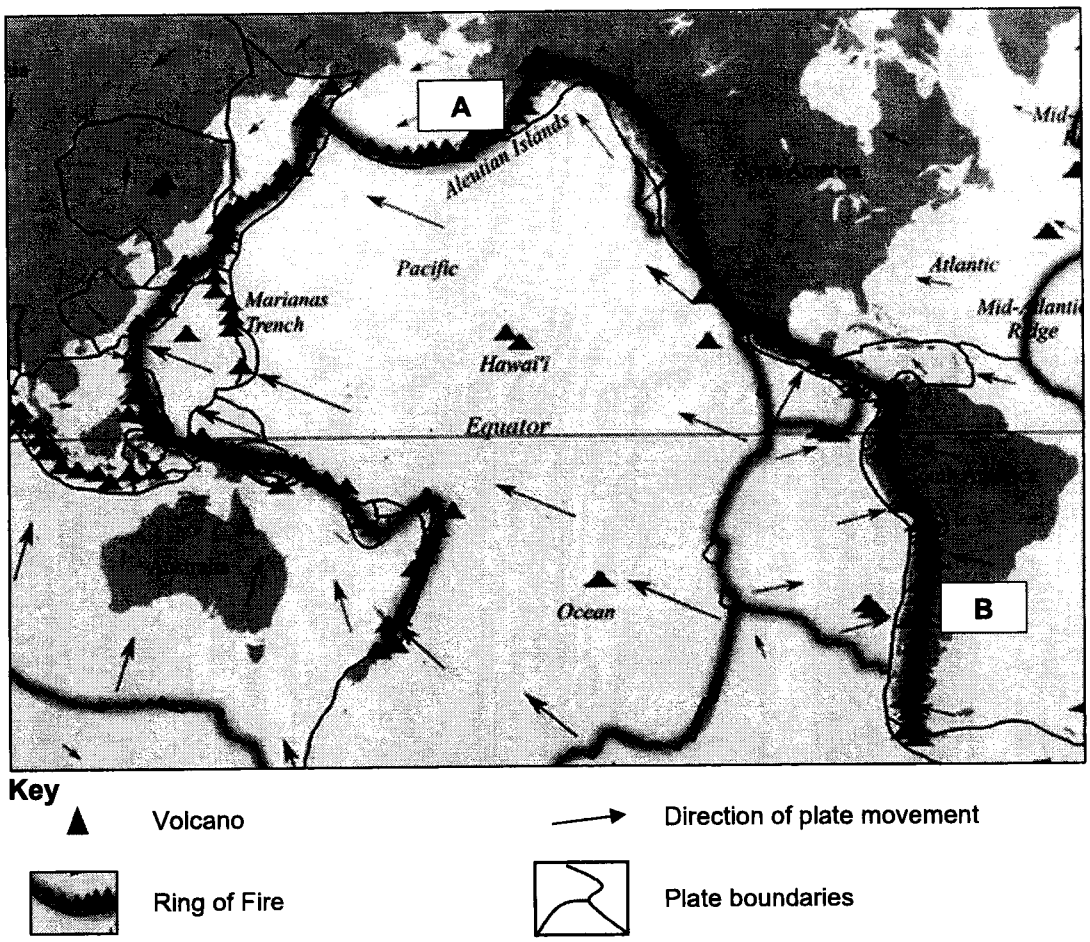


Fig. 2.2

Source: https://science.howstuffworks.com/environmental/earth/geology/ring-of-fire.htm

With reference to Fig. 2.2, compare the occurrence of the volcanoes at A and B. [3]

Award 1m for each clear comparison.

- Volcanoes at both A and B are formed by the convergence of tectonic plates.
- The volcanoes at A are formed when two oceanic plates converge while the volcanoes in South America are formed when one oceanic plate and one continental plate converge.
- Volcanoes at A occur in the sea while those at B occur on land.

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(c) 'Timely evacuation is more effective than other disaster management strategies after a tectonic hazard occurs.'

How far do you agree with this statement? Explain your answer. [9]

Relevant Content:

- Response to disasters
  - Search and rescue
  - Timely evacuation
  - Provision of basic social and psychological services
- Recovery from disasters
  - Restoration and improvement of facilities and living conditions of affected communities

A possible approach:

- The answer could first highlight that the effectiveness of strategies for disaster risk management depends heavily on the context or place characteristics, thus the same strategies are likely to be more effective in some locations and not others.
- With reference to selected strategies, the answer could then outline the ideal conditions for / challenges in implementing these strategies before referring to relevant examples to illustrate the argument.
- Some challenges include the lack of domestic resources (technological and financial), and the inability of stakeholders to collaborate and integrate disaster management into their practices.
- The answer could also consider the alternative view of strategies being universally effective by explaining why this might be the case, before arriving at a conclusion of whether some strategies are more effective than others.

Level 0 • No credit worthy response.
Level 1 (1 – 3 marks) • Arguments are unclear with limited descriptions 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.
Level 2 (4 – 6 marks) • Content has some details on strategies for response and recovery in disaster risk management. • Develops arguments that support one side of the discussion well, using one or two points with some elaboration on effectiveness of strategies for disaster risk management. • At least one example used demonstrate a good understanding of the issue or phenomenon like 'In the Philippines, only 10 to 20% of buildings are insured against earthquakes due to high insurance cost.' • Evaluation is well supported by arguments with some attempt to justify the stand.
Level 3 (7 – 9 marks) • Content has good details on strategies for response and recovery in disaster risk management. • Develops arguments that support both sides of the discussion clearly, using a range of points with good elaboration such as details on effectiveness of strategies for disaster risk management. • At least two detailed examples used demonstrate a comprehensive understanding of the issue or phenomenon like 'during the 2011 earthquake in Tohoku, Japan, nearly all the 3000 students of Kamaishi City survived. Schools in the city have disaster prevention education programs, including evacuation drills. Hence, they were able to respond quickly and evacuate to higher ground, away from the tsunami. However, the 2010 earthquake in Haiti resulted in more than 220,000 deaths and one of the reason was no timely evacuation.' • Evaluation is derived from a well-reasoned consideration of the arguments with good attempt to justify the stand.

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3 Cluster 5: Singapore

(a) Study Figs. 3.1A and 3.1B (Insert), which show distribution of coastal ecosystems in Singapore in 1950 and 2002 respectively.

Using Figs. 3.1A and 3.1B, describe the changes in the distribution of coastal ecosystems in Singapore between 1950 and 2002. [4]

Award 1m per description, max 4 marks.

Overall
- In general, various coastal ecosystems have seen a decrease in the areas they occupied .

Mangroves
- Mangroves experienced the greatest decrease in area occupied.
- In 1950, large areas mainly found in northern and western parts of the main island along the coastal areas but in 2002, only small areas remain.
- In 1950, stretches of mangroves were found further inland along rivers e.g. Sungei Seletar and Sungei Serangoon but are no longer present in 2002.

Coral Reefs
- In 1950s, mainly found around offshore islands in the Southern part of Singapore but in 2002 reduction in area around offshore islands e.g. Pulau Sudong / no longer found e.g. Sentosa.

Sand / Mudflats
- In 1950, stretched from eastern to southeastern coast of Singapore but in 2002, no longer found and replaced by reclaimed land.

(b) Evaluate the social impacts tourism activities have brought to Singapore. [3]

A0 3 *Award a max of 2 mark for either side of argument.*
Award a maximum of 1 additional mark for further development of each description, where applicable.

Positive
- Through strict law enforcement, Singapore's reputation of being a country with low crime rates encourages order in society and deters violent crimes against tourists.
- Tourism justifies the preservation of historic places in Singapore to ensure that places of historical and cultural significance remain attractive to tourists as well as locals.
- For example, Singapore's last remaining kampung, Kampung Lorong Buangkok was identified as a site for urban redevelopment. However, as the site was deemed to be culturally significant to Singapore's history and heritage, it was ultimately preserved.

Negative
- Though heritage conservation plays an important role in showcasing a place's cultural identity to locals and tourists, it can be especially challenging in Singapore where land resources are scarce.
- It is also difficult to balance the interests of different stakeholders.
- For example, when Chinatown was redeveloped in the 1990s, people lamented the overemphasis on Mandarin Chinese elements which ultimately led to the neglect of the neighbourhood's multi-ethnic residents and diverse dialect groups.

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(c) Study Fig. 3.2 (Insert), which shows innovations adopted by the local farming industry in Singapore.

AO 2 Using Fig 3.2, explain how the various innovations address the vulnerabilities Singapore faces. [3]

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

- Crops are grown without the use of soil frees up scarce land resources in Singapore for other uses.
- Crops are grown in structures that are stacked vertically in an area.
- The amount of crops grown / harvested per unit area is higher compared to traditional farming methods thus maximises space / land utilised.
- There is less dependence on human labour / fewer people employed to complete work on the farms overcoming shrinking working population caused by ageing population / decreasing birth rates.
- The use of robots to perform tasks as seen in the left foreground of picture.
- The farming method helps to increase local food production in Singapore thus reducing dependence on imports which can lead to food insecurity.

(d) Evaluate the likelihood of Singapore suffering from economic losses from volcanic eruptions in the region. [3]

AO 3 *Award a max of 2 mark for either side of argument.*
Award a maximum of 1 additional mark for further development of each explanation, where applicable.

No losses from the following:

- Far from the nearest volcano thus hazards such as pyroclastic flows, lahars and landslides do not reach Singapore.

Losses occur when:

- Ash clouds reach Singapore causing low visibility that results in grounding of flights / widespread cancellation of flights affecting the aviation industry's income.
- Ash clouds can damage aircraft frame, engine and windows which would result in high repair costs borne by aviation companies
- Widespread cancellation of flights would also affect the daily operations and activities of other related industries, thus wider economic consequences.
- Widespread cancellation of flights would negatively impact Singapore's status as a global air hub which is an economic asset.

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(e) Explain how integrated master planning helps Singapore achieve sustainable development. [5]

AO 1 *Award 1 mark for each explanation.*
Award a maximum of 1 additional mark for further development of each explanation, where applicable.

- This approach allows trade-offs to be objectively discussed, ensuring decisions would serve overall national interests.
- Singapore adopts a long-term approach to land-use planning which involves identifying different demands for land use and reviewing best option for development.
- Feedback from developers, industry organisations and public is also considered.
- For example, Marina Bay area started as a plan to meet the economic and infrastructural needs in the 1970s has now transformed the Marina Bay area into a space that balances work, play, culture, and commerce while seamlessly enabling one to experience both nature and urban development.
- This long-term approach identifies problems that may arise in the future and takes steps to pre-empt them.
- Integrated master planning also balances economic, social, and environmental development to create a sustainable nation.
- This offers abundant growth and job opportunities while safeguarding the city's clean and green landscape and quality living spaces.

(f) Explain why good governance plays an important role in the sustainable development of a country. [2]

Award 1 mark for each explanation, max of 2 marks.

- It ensures that there is a clear vision of sustainable development that would be communicated effectively to the people.
- It ensures that sufficient resources are dedicated to sustainable development even in face of other competing needs.

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