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YISHUN TOWN SECONDARY SCHOOL
PRELIMINARY EXAMINATION II 2015
FULL GEOGRAPHY PAPER 1
SEC 4 EXPRESS

- 1 (a) A group of students wanted to study about tourism in Sentosa Island, Singapore. Fig. 1 (Insert) shows a map of Sentosa Island. The students wanted to find out which part of Sentosa is the more popular destination among tourists and wanted to test the following hypothesis.
- Hypothesis: The beach is the most popular tourist attraction in Sentosa
- Using Fig. 1, suggest a location in which the students can conduct their questionnaire and give your justifications. [3]
- (b) The students designed a questionnaire, as shown on Fig. 2 (Insert).
- (i) What are some of the considerations that the students need to take into account to ensure that the data collection is reliable? [3]
- (ii) Discuss the advantages of open-ended questions in the questionnaire. [2]
- (iii) The students decided to categorise the tourist sites as shown on Fig. 3. Fig. 4 (Insert) shows the results of parts of the questionnaire. Suggest another graph which can be used to represent the data shown on Fig. 4. [3]
- (iv) Discuss the validity of the hypothesis. [3]
- (c) Study Fig. 5A and Fig 5B, which show the results of the last two parts of the questionnaire as shown on Fig. 2 (Insert).
- (i) Design a perception survey to find out the tourists' impression of the beach. [3]

Negative	-2	-1	0	+1	+2	Positive
Overcrowded						Uncongested
Dirty						Clean

Eroded						Well-managed
Ugly						Beautiful and Scenic
Poor facilities						Excellent facilities

- (ii) Some of the students wanted to conduct another fieldwork to find out about the type of waves and the slope on a part of the beach in Sentosa as shown on Fig. 6 (Insert). Draw an annotated field sketch of the beach in the box provided in the Insert.

[3]

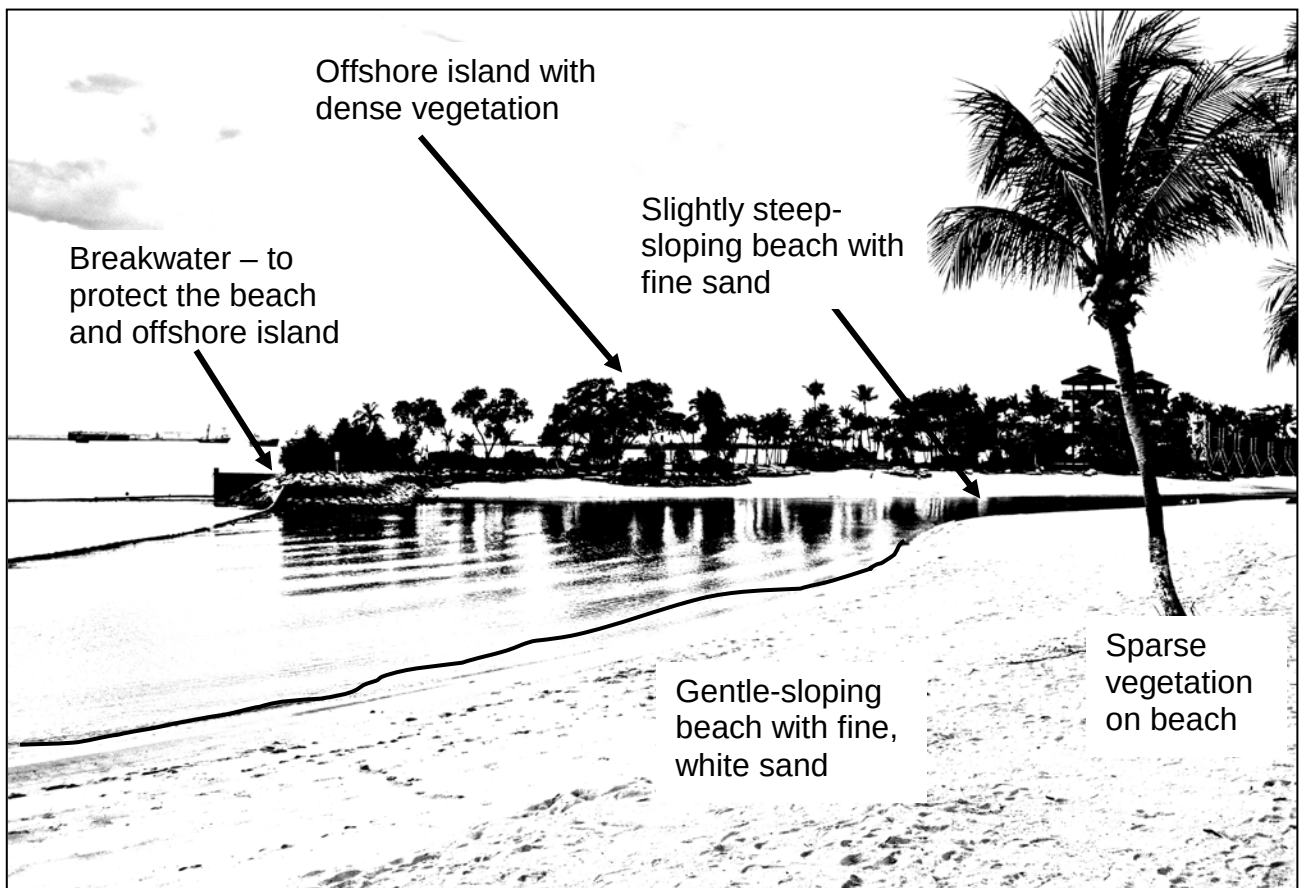


Fig. A

[Reserve 1 m for accurate sketching of beach
Award 1 m for every 2 annotations, Max 2m in total if only labelled]

- (iii) Describe how the students can go about collecting reliable data to determine the type of waves at the beach.

[2]

- (iv) The students wanted to plot the beach profile to determine the gradient of the slope. Discuss how the instruments should be used to ensure that the data collection is accurate. [3]
- 2 (a) Study Fig. 7, which shows the changes in the number of international tourist arrivals at different regions.
- (i) Compare the changes in the number of international tourist arrivals at the different regions from 1980 to 2020. [5]
- (ii) Using specific examples, explain how natural disasters and outbreaks of diseases cause regional fluctuations in tourist arrivals. [6]
- (b) Study Fig. 8, which shows a map of the coral reefs in the world. Describe the distribution of coral reefs in the world and the conditions that favour their growths at the locations. [6]
- (c) Study Fig. 9, which shows a satellite image of the Farewell Spit located in New Zealand. 'Deposition is the most important condition that leads to the formation of the coastal feature such as the one shown on Fig. 9.' How far do you agree with this statement? [8]
- 3 (a) Study Fig. 10, which shows percentage of tourist arrivals in Kenya, Africa, from different regions. Compare the percentage of tourist arrivals in Kenya from different regions and suggest reasons for the tourist arrivals as shown on Fig. 10. [6]
- (b) With reference to examples, explain how the facilities in tourist destination areas may differ from one another. [5]
- (c) Study Fig. 11, which shows the impact of tourism on Country X. Discuss the impact of tourism on Country X as shown on Fig. 11. [6]
- (d) 'Non-governmental organisations (NGOs) are more effective than visitors in managing the negative environmental impact of tourism on a country.' How far do you agree with this statement? Use examples to support your answer. [8]



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PRELIMINARY EXAMINATION II 2015
FULL GEOGRAPHY PAPER 1
SEC 4 EXPRESS

SUGGESTED ANSWERS

NB : Each point is awarded 1m each unless otherwise stated.

- 1 (a) A group of students wanted to study about tourism in Sentosa Island, Singapore. Fig. 1 (Insert) shows a map of Sentosa Island. The students wanted to find out which part of Sentosa is the more popular destination among tourists and wanted to test the following hypothesis.**

Hypothesis: The beach is the most popular tourist attraction in Sentosa

Using Fig. 1, suggest a location in which the students can conduct their questionnaire and give your justifications.

[3]

- They could conduct their questionnaire at Sentosa Station or Sentosa Boardwalk...
- as it is the entrance to Sentosa Island where the tourists would likely pass by to enter it
- Hence there will be high human traffic in the area which can be a good place to find the respondents for the questionnaire.
- The location is thus not biased neutral.

[Max 1m for explaining biasness of other locations]

- (b) The students designed a questionnaire, as shown on Fig. 2 (Insert).**
- (i) What are some of the considerations that the students need to take into account to ensure that the data collection is reliable?**

[3]

- They need to ensure a large sample size to ensure that the data will be representative of the tourists at Sentosa.
- They need to decide on a suitable sampling method such as systematic sampling.
- They need to consider a suitable location to conduct the questionnaire in order to reduce biasness and obtain a large representative sample size.
- They need to consider a suitable time and duration, i.e. of a higher frequency and longer duration, of conducting the questionnaire to obtain a representative sample of different tourists groups.
- They should also standardise the procedures in posing questions to respondents.

- (ii) **Discuss the advantages of open-ended questions in the questionnaire.** [2]
- Respondents are able to present their own ideas without having to select from predetermined categories which makes the data more accurate.
 - It enables the researcher to obtain data on genuine tourists' attitudes and perceptions
 - Their answers in the close-ended questions would not be restricted to inflexible choices and hence capture diverse viewpoints.
- (iii) **The students decided to categorise the tourist sites as shown on Fig. 3. Fig. 4 (Insert) shows the results of parts of the questionnaire. Suggest another graph which can be used to represent the data shown on Fig. 4.** [3]
- Pie chart / comparative bar graph
 - A pie chart for each category can be used to show the percentage total for the different categories by the different age groups.
 - The 4 pie charts would be easy to interpret hence making it easy to analyse and compare among the categories.
- (iv) **Discuss the validity of the hypothesis.** [3]
- The hypothesis is not valid.
 - The most popular attraction in Sentosa is not the beach as only 20 out of the 75 respondents chose the beach as their choice of attraction to visit.
 - The most popular attraction is actually under the adventure category which includes the Adventure Cove Waterpark, Skyline Luge Sentosa and the Universal Studios Singapore as 29 out of 75 respondents chose that category as their choice of attraction to visit.
- [Reserve 1m for validity. Max 2m if no evidence]**
- (c) **Study Fig. 5A and Fig 5B, which show the results of the last two parts of the questionnaire as shown on Fig. 2 (Insert).**
- (i) **Design a perception survey to find out the tourists' impression of the beach.** [3]

Negative	-2	-1	0	+1	+2	Positive
Overcrowded						Uncongested
Dirty						Clean
Eroded						Well-managed
Ugly						Beautiful and Scenic
Poor facilities						Excellent facilities

**[Award 1m for Likert Scale drawing
Award 2m for suitable categories in the perception survey]**

- (ii) Some of the students wanted to conduct another fieldwork to find out about the type of waves and the slope on a part of the beach in Sentosa as shown on Fig. 6 (Insert). Draw an annotated field sketch of the beach in the box provided in the Insert. [3]

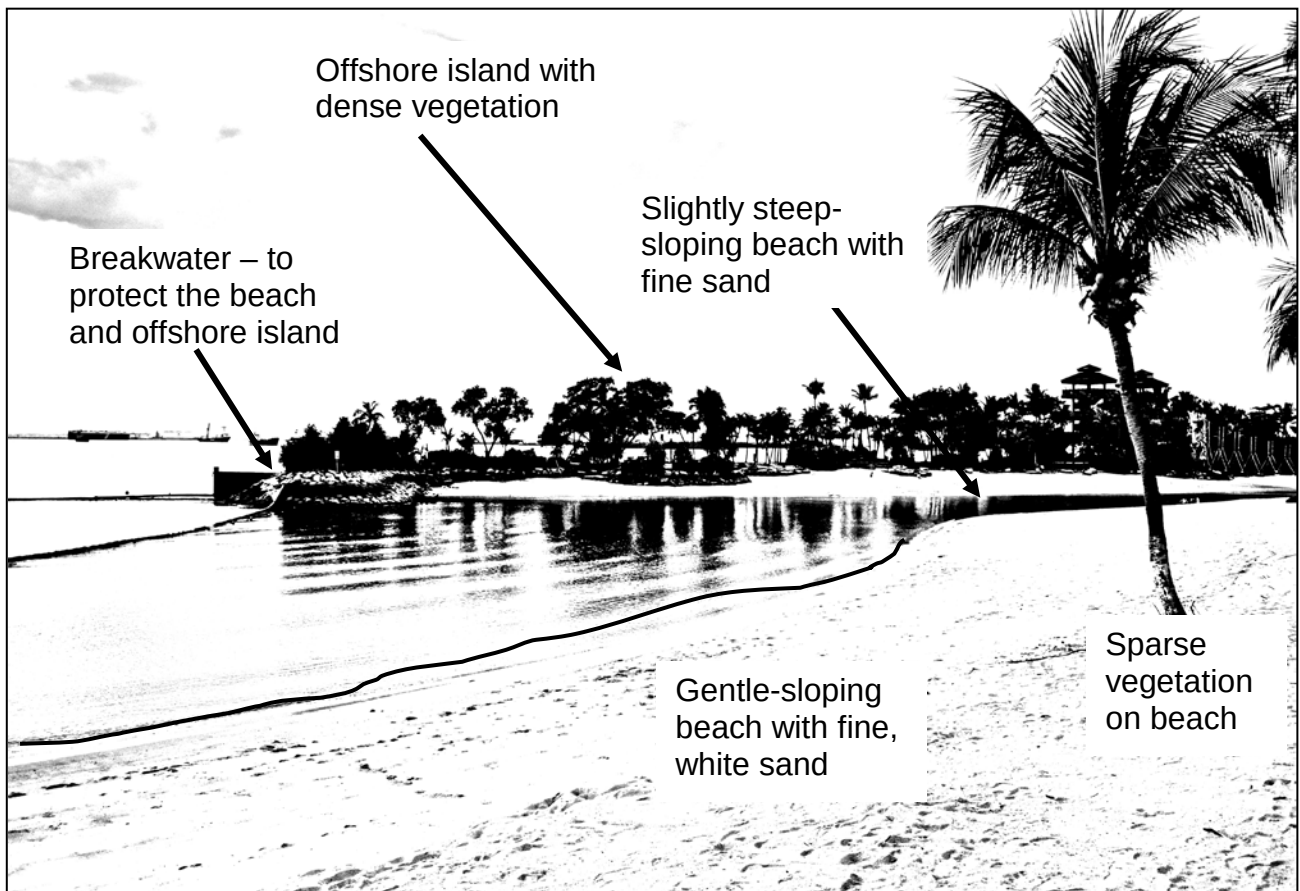


Fig. A

[Reserve 1 m for accurate sketching of beach

Award 1 m for every 2 annotations, Max 2m in total if only labelled]

- (iii) Describe how the students can go about collecting reliable data to determine the type of waves at the beach. [2]

- The students can determine if the waves are destructive or constructive by calculating the wave frequency.
- Wave frequency is estimated by counting the number of waves over a 10 minute period and dividing the total by the number of minutes to determine number of waves per minute.
- Students could observe the waves and record down the number of waves breaking per minute in a table in a recording sheet.
- If the wave frequency is 10 or more per minute, then the waves are destructive.

- (iv) The students wanted to plot the beach profile to determine the gradient of the slope. Discuss how the instruments should be used to ensure that the data collection is accurate. [3]

- They will need to ensure that the ranging poles used to identify the line of transect are held straight and do not sink into the sand.

- They will need to ensure that the clinometer on the ranging pole is held steadily in order to measure the gradient between points A and B.
- The gradient between the 2 points should be measured by 2 people of the same height
- They should hold the clinometer at eye level and align the clinometers to the top of the other person's head before reading the angle
- They should minimise human errors in reading the angles.

2 (a)

Study Fig. 7, which shows the changes in the number of international tourist arrivals at different regions.

(i) Compare the changes in the number of international tourist arrivals at the different regions from 1980 to 2020. [5]

- All regions in the world show a relative increase in the number of tourist arrivals from 280 million in 1980 to 1580 million in 2020.
- Asia Pacific shows the greatest increase of up to 21 times from 20 million tourists in 1980 to 420 million tourists in 2020.
- However, The Americas shows the slowest increase from 60 million tourists in 1980 to only about 4 times of that at 280 million tourists in 2020.
- Similarly, Europe showed the slowest increase about 4 times from 180 million tourists in 1980 to 710 million tourists in 2020.
- Meanwhile, The Middle East showed an increase from 10 million tourists in 1980 to 8 times more at 80 million tourists in 2020...
- Africa shows a increase similar to The Americas and Europe though slightly faster from 20 million tourists in 1980 to 5 times of that at 100 million tourists in 2020.

[Max 4m if no units and 3m if no comparison. 0m if 'change' is not described]

****Accept alternative answer if increase in ABSOLUTE NUMBER is given, from highest to lowest: Europe 530 million, Asia Pacific 400m, Americas 220m, Africa 80m and Middle East 70m.]**

(ii) Using specific examples, explain how natural disasters and outbreaks of diseases cause regional fluctuations in tourist arrivals. [6]

- Natural disasters refer to events that cause great damage to properties, lead to injuries or cause a great loss of life.
- As a result, they discourage tourists from travelling to a place due to the risks to their safety and the disruption to essential tourist infrastructure in the country.
- For example, the east coast of peninsular Malaysia experiences heavy rainfall and floods due to the Northeast monsoon season from October to February. The beach resorts thus experience a drop in occupancy rates and a loss of revenue during these months as a result of flooding.
- Outbreaks of diseases refer to the sudden and widespread occurrence of a disease in an area.
- Tourist arrivals thus fall as tourists do not want to risk getting infected with a contagious disease.
- E.g.: H1N1 influenza (in 2007) and SARS (Severe Acute Respiratory Syndrome) in 2003 caused businesses in Hong Kong and Singapore to cancel large-scale MICE activities.

- During the outbreak of SARS in 2003, the World Health Organisation and governments also discouraged travelling to affected areas in order to contain the disease. As a result, there are lesser tourists arrivals in these areas hence reducing tourist revenue.

[Max 4m if no specific examples given and no link to impact on tourist arrivals]

(b)

Study Fig. 8, which shows a map of the coral reefs in the world. Describe the distribution of coral reefs in the world and the conditions that favour their growths at the locations.

[6]

- Coral reefs are found in the tropical waters between 30°N and S of the Equator.
- They are majorly found in Southeast Asia at the coastal borders of the cluster of islands in the Philippines, Thailand, Malaysia, Papua New Guinea as well as Indonesia.
- They are also distributed around small islands found in the Pacific Ocean, the South China Sea and the Celebes Sea.
- Coral reefs are also abundant along the Caribbean Sea along countries such as Haiti and the Bahamas.
- They are also distributed along the eastern coasts of the African continent, the southern tip of India and surrounding the Maldives as well as along the Red Sea.
- Coral reefs require conditions such as clear, saline water between 10m to 60m deep which allows sunlight to penetrate in order to grow well.
- They also require some wave action which increases the likelihood of food and oxygen supplies and prevents sediments from suffocating living corals.
- Sea surface temperature of not lower than 17-18°C and average seawater salinity levels also favour their growth as low salinity inhibits coral growth.

[Reserve 2m for distribution to be marked by region/conditions. 2@1m for listing conditions without linking to question]

(c)

Study Fig. 9, which shows a satellite image of the Farewell Spit located in New Zealand. 'Deposition is the most important condition that leads to the formation of the coastal feature such as the one shown on Fig. 9.' How far do you agree with this statement?

[8]

Yes I agree:

- A spit, such as the Farewell spit in Fig. 9, is a long narrow ridge of sand with one end attached to the mainland.
- It requires constructive wave energy to continue depositing sediments in the original direction of the sea even when there are changes in the direction of the coastline.
- The stronger swash carries coarser materials further inland and deposits them whereas the weaker backwash carries finer materials back down and deposits them closer to the sea.
- This is because constructive wave energy is spread out and reduced due to friction and gravity, which leads to deposition of sediments, therefore allowing a large load of sediments to accumulate and build up.

- Eventually, the accumulated materials will appear above the surface of the water, forming a spit.
- The rate of deposition must be greater than the removal of sediments.

I disagree:

- However, longshore drift is also an important transportation process in the formation of the spit.
- When waves approach the coast at an angle, the swash carries the materials up the beach at an oblique angle.
- The backwash will then bring the materials perpendicularly (at right angles) back to the sea due to gravity.
- This results in a zigzag movement of materials along the beach.
- Longshore drift continues to transport materials in the original direction when there are changes in the coastline.
- For example, the Farewell Spit is located at the northern end of the South Island of New Zealand, running eastwards from Cape Farewell, the island's northernmost point.
- It is the longest sand-spit in New Zealand, stretching for about 26 km above sea level and another 6 km underwater.
- The spit grows from west to east as the prevailing winds come from the northwest as seen in Fig. 9.
- Furthermore, conditions that support deposition are necessary.
- Tidal currents and waves must not be too strong so as to prevent the sediments from being swept away before deposition takes place.
- Calm waters and weak currents such as around sheltered coasts are thus also necessary conditions in its formation.
- Additionally, erosional processes at features near the spit such as corrasion, attrition, solution and hydraulic action are also important so as to provide sediments and materials which would be transported and deposited by the waves.

Answers may include the following points:

A complete answer need not include all the above points.

Candidates at each level will show the following characteristics:

Level 1 (0-3 marks)

Answers will be generalized or with minimal support if any given at all. Reasoning rather weak and expression may be unclear. A basic answer that has little development. Answers lack examples or other evidence, or it is so sketchy that it adds little support to the answer.

Level 2 (4-6 marks)

Description on human and natural factors will be supported by appropriate detail. Or, both description on human and natural factors are considered, but support is patchy so that the answer is not full. Good reasoning and logic in parts of the answer with good expression in places. Some examples or other evidence will be presented to support answers in at least one place in the answer.

Level 3 (7-8 marks)

Answers will be comprehensive and supported by sound knowledge. Both description on human and natural factors are considered and well supported. Reasoning is clear and logical with good expression of language. Examples or other evidence to support answers will be extensive.

3 (a)

Study Fig. 10, which shows percentage of tourist arrivals in Kenya, Africa, from different regions.

Compare the percentage of tourist arrivals in Kenya from different regions and suggest reasons for the tourist arrivals as shown on Fig. 10.

[6]

- The majority of the tourist arrivals in Kenya come from Europe, at 60% of the tourist arrivals.
- This is because people from Europe are more affluent. As such, due to their high disposable incomes as well as availability of paid leave and leisure time allow them to travel to faraway and exotic places like Kenya.
- However, 19% of the tourist arrivals, which is the second highest percentage, come from the African continent itself.
- This is because Kenya is in close proximity to other African countries on the continent. Thus it allows them to travel more easily, such as to visit relatives.
- On the other hand, Asia and North America contribute the third highest percentage of tourist arrivals to Kenya at 10%.
- This is likely due to the growing affluence in Asia and the high amount of disposable incomes of Americans that encourage the tourists to travel further into exotic places like Kenya.
- However, South America and Australasia has the least percentage of tourist arrivals in Kenya.
- This could be due to the fact that they are both located furthest away from Kenya and are likely to choose to travel to destinations other than Kenya as they prefer other forms of attractions not offered in a tropical country like Kenya.

[Reserve 2m for describe/explain. 0m for direct opposites. Max 4m if no comparison/no Fig. given for describe]

(b)

With reference to examples, explain how the facilities in tourist destination areas may differ from one another.

[5]

- Facilities used for Meetings, Incentives, Conventions and Exhibitions (MICE) are venues that cater to large-scale events such as trade fairs and international conferences.
- Singapore was the leading convention city in Asia Pacific in 2012 with MICE facilities such as Marina Bay Sands Expo and Convention Center.
- These facilities are also appealing due to the availability of reliable telecommunications networks and a variety of shopping and entertainment options nearby.
- Places with good education facilities encourage educational tourism, which is when people travel to a place for educational purposes or to learn something about the place such as its language and heritage.
- E.g. tours at the Great Sphinx of Giza in Egypt and Intensive overseas educational programmes such as UK universities which attract 1million people annually to study there.
- Medical and Spa facilities encourage medical tourism, which is when people travel to a destination area to undergo medical procedures that would enhance or restore health.

- People seek these medical treatments elsewhere rather than in their home countries as other countries with good medical and spa facilities offer quality health care services at affordable prices. E.g. South Korea for cosmetic surgery.
- It also encourages health tourism whereby people travel to a destination area in order to maintain, enhance or restore their minds and bodies.
- E.g. Dead Sea in between Jordan and Israel. The high salt and mud contents are therapeutic for skin conditions and arthritis.
- Lastly, theme parks are large-scale facilities that is a part of an international chain and provide recreational and fun activities for tourists.
- E.g. Walt Disney Company operates theme parks in California and Florida , USA; Tokyo, Japan; Hong Kong, China.

[Max 3m if no specific examples]

(c)

**Study Fig. 11, which shows the impact of tourism on Country X.
Discuss the impact of tourism on Country X as shown on Fig. 11.**

[6]

- The negative impact shown on Fig. 11 is to the environment as shown by the presence of litter on the eastern end of Country X.
- Not all tourists are ecologically conscious or aware of how their actions can affect the environment and the inconsiderate ones may pollute a place by throwing their litter and thus destroy the natural landscape.
- There is a negative social impact shown on Fig. 11 as the local community becomes influenced by the exposure to foreign ideals and wants a change in their customs and way of life. This is evidence by the local who stated “I don’t like our life anymore. Dad... I want to make lots of money”.
- There is however a positive economic impact as tourism Country X became a source of employment as it is a service industry which requires a large number of workers.
- In Fig. 11, tourism gave rise to the need for more “waiters and waitresses needed” at the restaurants set up and also as tour guides for “tours around the island”.
- The local people can also work at the three hotels such as Hotel St James set up in Country X and gain more income.
- Tourism also increased the demand for local products in Country X e.g. the “Genuine grass skirts for sale” which would then generate income for the local people and raise their standard of living.
- The “increased number of import” will also help the locals raise their standard of living as they now have more choices for their goods and services.

[Max 4m if no reference to Fig/ one-sided.]

(d)

‘Non-governmental organisations (NGOs) are more effective than visitors in managing the negative environmental impact of tourism on a country.’

How far do you agree with this statement?

Use examples to support your answer.

[8]

Agree. Success of management of environmental impact is dependent on visitors.

- Tourists can help to make environmental management measures successful as their cooperation would mean that even though the planning authorities face difficulties in enforcing laws and regulations on proper tourist behaviour as they lack sufficient funds to employ park rangers to patrol protected reserves, or to train more park personnel, visitors themselves are able to self-regulate their behaviours.
- When visitors exhibit the right mindset when going on ecotourism, only then will tourism be a sustainable approach as it meets the present needs of visitors and the host country while protecting and enhancing opportunities for future generations.
- When they travel to natural areas that conserve the environment and sustains the well-being of local people, the visitors can be more responsible such as going in small groups and hence have a low-impact on the places with natural attractions.
- As such, they are then able to appreciate the scenery of an area and understand the local culture while ensuring that part of the revenue earned is put back into maintaining and protecting the area.
- Money also flows into the local economies to improve the standards of living of the locals.
- Locals are also given an incentive to retain their traditions instead of venturing to the cities and towns for jobs as there is a conscious effort to increase the employment of locals
- For example, at the islands of Phang Nga Bay in Phuket, Thailand, local guides are employed to guide and educate visitors about the limestone caves in the area.
- The land is also protected from business enterprises that result in built-up environments which thus minimises the impact on the natural environment by reducing the volume of waste generated, using recycled materials, and conserving resources such as water and energy.
- The wildlife is also nurtured and maintained. For example, eco-villages, nature reserves in Bintan Beach Resort and national parks such as Taman Negara and the Hwange Game Park in Zimbabwe are examples of ecotourism sites where visitors play a role in ensuring the success of measure put in place.
- Other examples include the eco-villages and eco-lodges in rural areas of Western Samoa. Eco-villages such as Uafato Village have been set aside as wildlife conservation areas which are protected by laws. Locals are involved in tourism projects and visitors are encouraged to help with restoration projects like reforestation and rural development projects. Due to the small scale of this locally owned ecotourism site, the negative impacts on Samoan culture and the natural environment are minimised. The Samoans also benefit economically and socially as they earn income from hosting the visitors and at the same time preserve the social, cultural and religious values and natural environment.
- Visitors also play an important role in ensuring the success of measures put in place by taking care to exhibit the correct behaviour so as to conserve the environment.
- For example, they should maintain a small group size within the carrying capacity of the environment and should be accompanied by guides who could educate them on protecting the natural environment.
- The efforts of planning authorities, NGOs and tour operators would be futile if the visitors do not play a part in making tourism sustainable.

- It is therefore important for the visitors to play an active role in conservation to complement the efforts of the other groups
- E.g. if trekkers are aware of the problem of deforestation in the Annapurna regions in Nepal and they would be able to help manage the environmental impacts of tourism by using less wood for hot water baths that would further deplete scarce wood resources there

Disagree. Success of management of environmental impact is dependent on NGOs.

- NGOs are not profit-oriented and act as a check on the planning authorities and intervene when the authorities are too keen to embark on development and are not too committed to the conservation of forests as it is a valuable resource and a source of revenue/
- NGOs like the World Wide Fund for Nature (WWF) are successful in the management of environmental impact because they are concerned with conserving the natural environment and ensuring the sustainable use of renewable natural resources.
- Some of them are interested in conserving natural areas and they normally conduct research and evaluate whether an area will be subject to any potential harm by tourist
- If an area is under threat of development by government or corporations, these NGOs may conduct campaigns, solicit signatures for petition, or organise protests to exert pressure against these unfavourable plans.
- E.g. in 2001, the Nature Society in Singapore played a critical role in reverting plans to reclaim the mudflats of Chek Jawa, a natural coastal habitat in Pulau Ubin and thus, the unique wildlife there has been preserved.
- Furthermore, their role is important in ensuring that even ecotourism becomes sustainable as it is one of the fastest expanding markets in the tourism industry, with an annual growth rate of about 10%.
- However, there may be a lack of funds to finance conservation projects and the volunteers may also not be able to commit themselves fully to champion for conservation as it is not a full-time job
- The NGO programmes may also not be so well coordinated as they may lack support from the community as compared to planning authorities who can rally for more support from different communities.
- As such, they may not be as successful as they lack the scope of influence on others in managing environmental impact.

Answers may include the following points:

A complete answer need not include all the above points.

Candidates at each level will show the following characteristics:

Level 1 (0-3 marks)

Answers will be generalized or with minimal support if any given at all. Reasoning rather weak and expression may be unclear. A basic answer that has little development. Answers lack examples or other evidence, or it is so sketchy that it adds little support to the answer.

Level 2 (4-6 marks)

Description on human and natural factors will be supported by appropriate detail. Or, both description on human and natural factors are considered, but support is patchy so that the answer is not full. Good reasoning and

logic in parts of the answer with good expression in places. Some examples or other evidence will be presented to support answers in at least one place in the answer.

Level 3 (7-8 marks)

Answers will be comprehensive and supported by sound knowledge. Both description on human and natural factors are considered and well supported. Reasoning is clear and logical with good expression of language. Examples or other evidence to support answers will be extensive.

--- END OF PAPER ---



YISHUN TOWN SECONDARY SCHOOL

PRELIMINARY EXAMINATION 2 2015

SEC 4 EXPRESS

GEOGRAPHY

Section A

- 1 (a) Describe the changes in the physical features of Mount Merapi before and after the eruption. [4]
- (b) Account for the reasons why the economic loss from earthquakes is high in the cities. [5]
- (c) (i) Compare the mean monthly temperatures for Chittagong and Blak. [4]
- (ii) Suggest reasons for the pattern of mean monthly temperatures for Chittagong. [4]
- (d) 'Changing land use is the most important cause of the enhanced greenhouse effect.'
- To what extent is this statement true?
- Give examples to support your answer. [8]
- 2 (a) Using Fig. 3A and Fig. 3B, explain why the rainfall in Peninsular Malaysia and Singapore is different between January and July. [5]
- (b) (i) Describe the characteristics of Hurricane Katrina which has resulted in the impact as shown on Fig. 4. [4]
- (ii) Discuss how storm surge occurs and its impact as shown on Fig. 4. [4]
- (c) Describe the success of international communities in responding to climate change. [4]

- (d) 'The most effective measure to mitigate the effects of tropical cyclones is flood plain management.'

Using examples, explain how far you agree with this statement.

[8]

Section B

- 3 (a) (i) Describe how the relief influences the distribution of the plantation in the area shown on Fig. 5. [4]
- (ii) Study the 'all weather roads (loose surface)' from the road junction at grid reference 861479 to the northern edge of the map. Suggest reasons for the pattern of this road and the function it serves. [4]
- (b) Describe the areas in which there will be food shortage and food surplus as shown on Fig. 6. [5]
- (c) Using examples, describe the political impact of inadequate food consumption. [4]
- (d) 'The challenges brought about by intensification of food production have outweighed the benefits.' [8]
- To what extent do you agree with this statement?
- Give reasons for your answer.
-
- 4 (a) (i) Compare the variations in the level of life expectancy between the countries in Asia. [4]
- (ii) Describe and explain the relationship between gross domestic product per capita and life expectancy in Asia. [4]
- (b) Describe the distribution of malaria in Africa as shown in Fig. 8. [4]
- (c) Describe how agribusiness can affect crop production. [5]
- (d) Discuss the extent in which social factors can lead to widespread diseases like Aids and malaria. [8]

--- END OF PAPER ---



YISHUN TOWN SECONDARY SCHOOL

PRELIMINARY EXAMINATION 2 2015

SEC 4 EXPRESS

GEOGRAPHY

SUGGESTED ANSWERS

NB : Each point is awarded 1m each unless otherwise stated.

Section A

- 1 (a) Describe the changes in the physical features of Mount Merapi before and after the eruption. [4]

Changes in the physical features of Mount Merapi

- in Sep 2010, the summit was taller and more rounded...
- whereas the peak became shorter and the crater was wider and it opened towards the south after eruption in Jun 2011
- the surface of the slopes were smoother and covered with more finer sediments before the eruption...
- but after the eruption, the texture of the slopes are rougher and there are more gullies being formed
- before the eruption, the base of the mountain are covered by denser vegetation...
- however, the vegetation were destroyed and some parts of the slopes were exposed and barren

(max 3 m if no direct comparison)

- (b) Account for the reasons why the economic loss from earthquakes is high in the cities. [5]

Reasons why the economic loss from earthquakes is high in the cities

- in cities like Kyoto in Japan, the destruction to properties and buildings are greater because they are more densely populated and there are many tall buildings and resulting in higher economic cost due to the damage ..
- ..as compared to the rural areas where the settlement is less dense and the damage to properties are confined to a smaller scale
- infrastructure like roads and bridges are often destroyed in the earthquakes and this is likely to cause disruption to industrial and commercial activities which result in greater economic loss
- ..however, the rural areas are mainly engaged in agricultural activities like farming or fishing and hence the revenue loss from these activities would be lower as compared to the secondary and tertiary industries in the cities which generate higher revenue
- more people in the cities are affected as they may lose their jobs or income during the earthquakes which interrupts the economic activities
- though the people in the rural areas may also lose their farm and

income, the magnitude of the problem is lower as the population is lower

(no mark if no mention of economic loss)

- (c) (i) **Compare the mean monthly temperatures for Chittagong and Blak.** [4]

Mean monthly temperatures for Chittagong and Blak

- the average annual temperature of Blak is higher at 27.2°C as compared to Chittagong at 23.6°C which is lower
- the lowest mean monthly temperature for Chittagong is lower at 19.1°C in January but the lowest mean monthly temperature for Blak is at 26.3°C in July
- for Chittagong, the highest mean monthly temperature is at 28°C in May to June and the highest mean monthly temperature for Blak is also about the same at 28°C in November
- there is a smaller annual temperature range of about 1.7°C in Blak but the annual temperature range in Chittagong is higher at 8.9°C
- Blak experiences a uniformly high temperature throughout the year whereas the temperature is more seasonal and fluctuates more between the hotter and cooler months in Chittagong

(max 2 m if no comparison)

- (ii) **Suggest reasons for the pattern of mean monthly temperatures for Chittagong.** [4]

Reasons for the pattern of mean monthly temperatures for Chittagong

- Chittagong has a tropical monsoon climate which experiences greater seasonality
- Chittagong has a lower average temperature because it is located at higher latitude where the **angle of incidence is lower** as the sun's rays fall obliquely on the earth's surface
- they travel through a **longer distance through the atmosphere** before they reach the earth and much of the heat is absorbed by clouds, water vapour and dust particles, so less solar energy reaches the higher latitudes / poles
- the sun's rays are spread out / scattered over a **larger surface area** and the heat is more diffused and therefore, **temperature is lower**
- due to the tilting of the Earth on its own axis, the higher latitude does not receive the same amount of insolation throughout the year and hence there is greater fluctuations and seasonality in the temperature
- thus, places such as Chittagong experience a higher annual temperature range of about 8.9°C
- the high humidity in the tropical region results in extensive cloud cover which tends to keep the maximum temperature from reaching extremely high values and hence the temperature range is moderate

- (d) 'Changing land use is the most important cause of the enhanced greenhouse effect.'

To what extent is this statement true?

Give examples to support your answer.

[8]

Changing land use is an important cause of the enhanced greenhouse effect

AGRICULTURE

- the practice of cultivating land, producing crops and raising livestock, is the third highest contributor of greenhouse gases
- wet rice cultivation contributes to the increase in levels of greenhouse gases
- the use of inorganic fertilisers increases the amount of nitrous oxide in the soil
- nitrous oxides is released when soil is ploughed or when rain flows through the soil
- organic matter like dead leaves and manure releases methane during decomposition which is rapid in rice fields due to high level of moisture in the soil
- tractors run on fossil fuels releases carbon dioxide

CATTLE FARMING

- The rearing of livestock also releases methane into the atmosphere as the result of animal's digestive processes
- cattle release methane as a waste gas and millions of tonnes of methane are released each year from cattle farming
- e.g. every cow produces between 1,000 and 8,000 litres of methane emissions every day
- e.g. Argentine researchers discovered that methane from cows accounts for more than 30% of the country's total greenhouse emissions

Other factors as important cause of the enhanced greenhouse effect

INDUSTRIES

- since the start of the Industrial Revolution in the early 18th century, levels of carbon dioxide in the world have increased by 30%, nitrous oxides by 15% and methane by 150%
- since the start of industrialisation, the rapid increase in the use of fossil fuels in vehicles, factories and power plants has led to high levels of carbon dioxide and nitrous oxides being released into the atmosphere

MANUFACTURING

- industries refer to the production of goods and services within a country
- Secondary industries such as manufacturing involve the burning of fossil fuels that result in greenhouse gas emissions
- greenhouse gases are also released as by-products when goods are produced
- e.g. manufacturing a mobile phone emits 60kg of CO₂
- e.g. manufacturing a computer and a monitor emits 275kg of CO₂
- e.g. largest carbon dioxide emissions from industrial processes are

found in North and Central America, Europe and Asia

- e.g. China and India are also contributing to global carbon dioxide emissions due to their rapid industrialisation

URBANISATION

- urbanization is the process by which an increasing number of people live in urban areas e.g. cities or towns
- large amount of fossil fuels are burnt to provide energy for household activities e.g. heating, cooling, cooking and lighting
- high concentration of cars, buses and other forms of transportation also contribute to the amount of greenhouse gases emitted in urban areas
- constructing infrastructure and producing construction materials also release greenhouse gases

LARGE-SCALE DEFORESTATION

- deforestation is the loss of forests due to the removal or clearance of trees in forested areas
- large-scale forest deforestation and forest fires have reduced the amount of vegetation cover on the Earth's surface at alarming rates
- forests are cleared for timber and mining and to create more land for other activities and urban development
- trees and plants take in carbon dioxide and release oxygen through the natural process of photosynthesis
- when more trees and plants are being cut down or destroyed by forest fires, less carbon dioxide is absorbed from the atmosphere resulting in high levels of carbon dioxide in the atmosphere
- forests absorb billions of tonnes of carbon dioxide every year via photosynthesis
- deforestation is the second largest contributor of greenhouse gases
- e.g. between 2000 and 2010, 52 000 km² of forest was lost every year
- e.g. every day, 142.5 km² of forest (about 4½ times the area of Jurong Islands) is lost
- e.g. greatest overall loss of forest occurs in South America.
- e.g. Southeast Asia experiences the second highest rate of deforestation
- e.g. the cause of forest clearance includes agricultural and commercial activities such as cattle ranching, soybean production, commercial logging and mining

BURNING OF FOSSIL FUELS

- fossil fuels are formed from dead organic matter that has decomposed over many millions of years
- major fossil fuels are oil, coal, natural gas
- due to their high carbon content, fossil fuels contribute to the increase in greenhouse gases by producing large amounts of carbon dioxide when burnt
- fossil fuels are so important as they produce more than 80 per cent of global energy
- the burning of fossil fuels produces a large amount of energy that is important for human activities
- fossil fuels produce energy used for industries, transportation, and

domestic and commercial activities

- The burning of fossil fuels is the highest contributor of greenhouse gases
- e.g. large consumers of fossil fuels are China, the United States of America, Canada and the United Kingdom
- e.g. in Singapore, most of our electricity is generated by fossil fuels
- e.g. in 2010, global carbon dioxide emissions totalled 30.6 billion tonnes, which was a 5.6 per cent increase from 2009

Answers may include the following points:

A complete answer need not include all the above points.

Candidates at each level will show the following characteristics:

Level 1 (0-3 marks)

Answers will be generalized or with minimal support if any given at all. Reasoning rather weak and expression may be unclear. A basic answer that has little development. Answers lack examples or other evidence, or it is so sketchy that it adds little support to the answer.

Level 2 (4-6 marks)

Disagreement or agreement will be supported by appropriate detail. Or, both agreement and disagreement are considered, but support is patchy so that the answer is not full. Good reasoning and logic in parts of the answer with good expression in places. Some examples or other evidence will be presented to support answers in at least one place in the answer.

Level 3 (7-8 marks)

Answers will be comprehensive and supported by sound knowledge. Both agree and disagreement are considered and well supported. Reasoning is clear and logical with good expression of language. Examples or other evidence to support answers will be extensive.

2 (a)

Using Fig. 3A and Fig. 3B, explain why the rainfall in Peninsular Malaysia and Singapore is different between January and July.

[5]

Reasons why the rainfall in Peninsular Malaysia and Singapore is different between January and July

In January

- the rainfall in Peninsular Malaysia and Singapore is higher because the the Northeast monsoon blows across South China Sea and brings more moisture towards this area
- this is because the northern hemisphere is experiencing **winter** as the sun is overhead the Tropic of Capricorn
- the temperature in the interior of Asia will be **low** and the cold air contracts, becomes denser and sinks thus resulting in **high** pressure and at the same time, the southern hemisphere is experiencing **summer** and the temperature in Northern Australia is **high** and the warm air expands, becomes lighter and rises resulting in **low** pressure
- as air moves from **high** to **low** pressure, the wind will blow from the **interior of Asia** which has **high** pressure to Australia which has **low** pressure

- the wind blows out of **interior of Asia** as North-West Monsoon and arrives in Singapore and Peninsular Malaysia as the **North-East Monsoon**
- after crossing the Equator into the Southern Hemisphere, the Coriolis effect deflects the winds to the **left** and reaches parts of Indonesia and Australia as the North-West Monsoon

In July

- the rainfall in Peninsular Malaysia and Singapore is lower as compared to January because the southwest monsoon blows across the Straits of Malacca which is a narrower stretch of water body and it is sheltered by the island of Sumatra
- in July, the northern hemisphere is experiencing **summer** as the sun is overhead the Tropic of Cancer
- the temperature in the interior of Asia will be **high** thus resulting in **low** pressure and at the same time, the southern hemisphere is experiencing **winter** and the temperature in Australia is **low** resulting in **high** pressure
- as air moves from **high** to **low** pressure, the wind will blow **from Australia** which has **high** pressure **to interior of Asia** which has **low** pressure
- the wind blows out of **Australia** as South-East Monsoon, and, after crossing the Equator, the Coriolis effect deflects the wind to the **right** and blows across South-east Asia as the **South-West Monsoon** and blow into the **interior of Asia** as the South-East Monsoon

- (b) (i) **Describe the characteristics of Hurricane Katrina which has resulted in the impact as shown on Fig. 4.** [4]

Characteristics of Hurricane Katrina which has resulted in the impact

- Hurricane Katrina is large scale and covers about 650km in diameter which has resulted in extensive damage
- it brings heavy rain which resulted in flooding and the water level reached up to 6 metres
- strong winds that reach a speed of about 160 km per hour has shattered windows of high-rise office buildings and ripped holes in the roof of the Superdome
- such storms are sometimes accompanied by thunder and lightning

- (ii) **Discuss how storm surge occurs and its impact as shown on Fig. 4.** [4]

How storm surge occurs and its impact

- Hurricane Katrina has caused a 7 m storm surge at Gulfport Memorial Hospital which is a giant wave caused when strong winds raise the ocean surface
- it is caused by the combination of low air pressure and strong winds
- when tropical cyclone forms over the warm ocean waters off the Gulf Coast, the intense low pressure in the eye of the cyclone causes the sea level to rise
- strong winds push the water towards the coast and create huge waves, giving rise to a storm surge
- the storm surge resulted in major damage and flooded several of

- Mississippi's beachfront casinos
- the huge waves also hit Alabama's coast and flooded the streets of Gulf shore
- In New Orleans, 6 metres of water flooded the city's east side

(c) **Describe the success of international communities in responding to climate change.** [4]

Success of international communities in responding to climate change

- Kyoto Protocol was first drawn up in Kyoto, Japan on 11 December 1997 and came into force on 16 February 2005
- the Kyoto Protocol is successful as it is an international treaty which requires all developed countries to reduce their emissions of six greenhouse gases by an average of 5.2% from 1990 levels between 2008 and 2012
- greater responsibility to reduce greenhouse gas emissions was placed on 37 developed countries and the European countries
- many countries have met/exceeded the targets set e.g. Austria, Finland, Greece, Ireland and Spain
- countries were required to monitor and report their greenhouse gas emissions, helping to ensure that they were on track in keeping to their emission targets
- the Kyoto Protocol was also successful in encouraging sustainable development
- developed countries help to transfer energy-efficient technologies and the knowledge on non-polluting types of energy to developing countries which help them produce less greenhouse gases
- the Clean Development Mechanism (CDM) gave Certified Emission Reduction (CER) credits to countries which carried out emission-reduction projects in less developed countries
- CDM also helped developed countries reduce their greenhouse gas emissions when they take on emission-reduction projects in less developed countries

(d) **'The most effective measure to mitigate the effects of tropical cyclones is flood plain management.'**

Using examples, explain how far you agree with this statement. [8]

FLOOD PLAIN MANAGEMENT AN EFFECTIVE MEASURE TO MITIGATE THE EFFECTS OF TROPICAL CYCLONES

- floodplain management refers to a masterplan to reduce the potential of flood damage which involves mapping the land use of an area and implementing measures to prevent floods
- achieved by ensuring that
 - new developments in floodplains are not prone to floods
 - reducing the potential of flood damage in developed floodplains
 - evacuation plans are drawn up to ensure that people are able to leave a flooded area quickly
- e.g. in Virginia Floodplain Management Program staff works with

- localities to establish and enforce floodplain management zoning
- floodplain zoning regulates how development is allowed within floodplains
- the program's main goal is to protect people and their property from unwise floodplain development. It also protects society from costs associated with developed floodplain
- local governments can set more restrictive standards to ensure higher levels of protection for residents in flood hazard areas
- also, the state has used the Virginia Uniform Statewide Building Code to set construction standards for structures built in Federal Emergency Management Agency designated flood hazard areas
- e.g. in the case of Hurricane Katrina, in Louisiana, many buildings were constructed behind levees that were intended to protect them from the 100-year flood
- areas that were protected by the levees are shown by various zone designations, depending upon the unique flood hazard for that specific area
- following Hurricane Georges in 1998, the City of Pascagoula, has enforced more than minimum standards, established higher elevations requiring new construction be built to 13.1 feet msl.
- as a result of this local decision to enforce higher standards, buildings impacted by Hurricane Katrina that were built to this elevation suffered less flood damage than older housing units built to previous requirements

OTHER EFFECTIVE MEASURE TO MITIGATE THE EFFECTS OF TROPICAL CYCLONES

DESIGNING BUILDINGS RESISTANT TO WINDS AND WATER DAMAGE

- buildings can be designed to be resistant to wind and water damage during tropical cyclone
- e.g. galvanised steel hurricane ties are nailed to the roof to prevent it from being blown off by strong winds of tropical cyclones
- e.g. a layer of secondary water resistance is added to the roofs of houses to prevent leaking if the roof is blown off
- e.g. in Florida, United States of America, the state government aids homeowners by employing specialised companies to improve the design of the roof and the opening of the houses
- the measures are effective as the houses of most citizens living on Jensen beach in Florida suffered only minor roof damage when Hurricane Wilma struck in 2005

REGULAR INSPECTION OF RIVER EMBANKMENTS AND COASTAL DIKES

- protective barriers e.g. river embankments and coastal dikes need to be regularly inspected to protect coastal areas from damage by storm surge
- e.g. river embankments are walls constructed along the river banks to prevent the river from overflowing
- e.g. coastal dikes are artificial walls to protect the coastal areas from floods
- these structures need to be reinforced as they are continuously eroded by river waters and coastal waves

- e.g. the construction of a protective barrier along the coast in Apia, Samoa, protected the coastline and the harbour when Cyclone Val struck the island in 1991
- the harbour previously destroyed by Cyclone Ofa in 1990, was left largely intact when Cyclone Val struck, mainly due to the presence of the new protective barrier
- regular inspection and maintenance of protective barriers is costly as it involves repairing any damage on these barriers

LOCATING UTILITY LINES UNDERGROUND

- utility lines such as power and telecommunication lines and water supply networks can be placed underground to avoid damage by strong winds and storm surges
- this can ensure that services are maintained during and after a tropical cyclone
- land use control regulates the use of the land by placing restriction on how the land can be used
- e.g. developers may need to pay higher taxes to use the land along the coasts to discourage development in these vulnerable areas
- e.g. land along the coast can be used for recreational purposes like parks
- e.g. protected zones where no development can take place can also be allocated to serve as a barrier against storm surges and flooding
- this method is successful only when the authorities are able to enforce them
- however, it requires much time and manpower
- developments like buildings along coasts may be around for a long time and hence residents staying along the coastline may be reluctant to move out of these areas
- it is costly as government needs to purchase the land to convert them into recreational areas

PREDICTION AND WARNING

ANALYSING LONG-TERM CLIMATE RECORDS

- this method establishes the pattern of the occurrences and the severity of the damage caused by past cyclones
- by analysing this pattern, it is possible to predict when cyclones of a similar severity would occur
- however, climate records of past events only indicate the frequency of tropical cyclones and do not give accurate details about when future tropical cyclones will occur

COMPUTER MODELLING

- computer modelling allows for prediction about the cyclone's path, likely affected areas and degrees of damage
- however, the predicted paths of tropical cyclones may not be completely accurate because the predictions are based on weather information available at the particular point in time and weather conditions may change quickly
- when the approach of tropical cyclones is predicted, people can then be

- warned and evacuated in time
- e.g. Japan and United States of America have installed warning systems for tropical cyclones
 - information on the severity of tropical cyclones and the necessary precautionary measures are announced to the public through these warning systems

Answers may include the following points:

A complete answer need not include all the above points.

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Level 1 (0-3 marks)

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Level 2 (4-6 marks)

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Level 3 (7-8 marks)

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Section B

- 3 (a) (i) **Describe how the relief influences the distribution of the plantation in the area shown on Fig. 5.** [4]

- the plantations are more extensively found in the central area and scattered amongst the forest in the eastern part of the area and they generally avoid undulating or steep slope
- the coffee plantation at Molomo Estates is found in areas where the slope is very gently sloping as seen by the wide spacing in the contours lines in the areas bounded by grid line 82 to 84
- in the area near the mountain Kifufu, the coffee plantation at Kifufu Estate is located on the gentler slopes in the south and south west part of the terrain where the slopes are relatively gentler with the exception of the northern slopes in grid square 8551 which is steeper as the contours are closely spaced
- the plantation at Lerongo Forest Farm is located on gentler slopes about 4600ft high at the base of the mountain Lerongo in grid square 8552

(max 3 if no map evidence)

- (ii) **Study the 'all weather roads (loose surface)' from the road junction at grid reference 861479 to the northern edge of the map. Suggest reasons for the pattern of this road and the function it serves.** [4]

Reasons for the pattern of this road and the function it serves

- the pattern of the 'all weather roads (loose surface)' runs almost parallel to the contour lines near the base of the Lerongo and Kifufu mountains
- this is to avoid steep slopes so that it is easier to construct the road
- it connects the different plantations namely Lerongo Forest Farm and Molomo Estates in the north and Pongo Estate and Kifufu estate in the south
- it serves these plantations and ensure good accessibility of these places to the other parts of the country and this helps to facilitate the transportation of the plantation crops like coffee for sale
- the road also serve the huts in the linear settlements in grid square 8352 and connects these settlements to the other places

- (b) **Describe the areas in which there will be food shortage and food surplus as shown on Fig. 6.** [5]

Areas in which there will be food shortage and food surplus

- the areas which will experience food shortage where the annual population growth is greater than the increase in food production are mainly in Africa whereas South America and Asia are areas with food surplus as the annual population growth is less than the increase in food production
- food shortage mainly occur in the African countries like Egypt, Sudan and Ethiopia in eastern Africa, in central African countries like Chad, Central African Republic, Democratic republic of Congo and Zambia also experience food shortage and western African countries like

Algeria, Mauritania and Guinea in the Sahel region also experience food shortage

- in South America, Venezuela, Ecuador and Peru also has food shortage
- food shortage also occur in Asia, Nepal and Bangladesh, Cambodia and Papua New Guinea in Indonesia
- food surplus mainly occur in Asia like India, Pakistan and China, Myanmar and Thailand
- in South America, food surplus take place Colombia, Brazil in the east and Argentina in the south
- in central America, Mexico also has annual population growth less than the increase in food production leading to food surplus

(max 3 m if no mention of countries)

- (c) Using examples, describe the political impact of inadequate food consumption. [4]**

Political impact of inadequate food consumption

- inadequate food supply leads to an inadequate food consumption, causing many people to become malnourished, starve or even die
- such conditions often cause political instability in the form of wars and social unrest
- social unrest is a political situation in which people protest or behave violently, often to communicate their unhappiness about a political system or situation
- e.g. food prices in Mozambique increased by as much as 30% in 2010
- this was caused by a drought in Russia that decreased its wheat production, which increased the price of wheat sold to Mozambique
- this result in initially peaceful protests that turned violent, leaving 400 people injured and 10 people dead

- (d) 'The challenges brought about by intensification of food production have outweighed the benefits.' [8]**

To what extent do you agree with this statement?

Give reasons for your answer.

CHALLENGES BROUGHT ABOUT BY INTENSIFICATION OF FOOD PRODUCTION

Effect of irrigation on water and soil quality

- Food and Agriculture Organisation of the United Nations (FAO) estimates the poor management of irrigation has caused the productivity of 50% of the world's irrigated land to decrease drastically.
- two effects of poor managing of irrigation are salinisation and waterlogging.

SALINISATION OF SOIL

- salinisation is the building up of salts within the soil
- it may take place when flood irrigation is carried out

- in flood irrigation, farmer allows water to cover the surface of a field
- continuous cycles of flood irrigation add to the salinity or level of salt in the soil because water contains naturally occurring salt
- when water in the field used up by plant or evaporated, salts in the water are left behind
- over time, the salt in the soil build up, thus lowering the quality of the soil
- it can also happen in area where dams are constructed for irrigation
- e.g. in Egypt, the construction of the Aswan High Dam across the River Nile disrupts the flow of water
- it leads to sediments and minerals being trapped in the reservoir behind the dam and those minerals are dissolved in the water
- when water from the reservoir is used to irrigate the field, it will increase the salinity of the soil
- if this process continues over a period of time, concentration of the salts in the soil may become too high for most crops to grow well
- salinisation is also likely to happen in arid region and coastal areas.
- in some dry regions like Syria and Kuwait, the main source of irrigation is groundwater, which is rich in minerals and salts
- as more water is pumped up from underground, the salinity of the soil also increases.
- in coastal areas like Libya and In some parts of India, salt water from nearby seas can seep into the groundwater
- these underground water are then pumped up for irrigation, the salinity of the soil is increased
- due to salinisation, the soil surface may appear hard and cracked, with little to no plant growth

WATERLOGGING

- it happens when too much water is used in the field, causing the soil to become saturated with water
- e.g. in some places in India, farmers over-irrigate the land or use large amount of irrigated water to wash excess salt from the land to reduce salinisation
- thus, air and nutrients that the crop need cannot reach the roots of the crops, causing them to wither and die
- it causes crop output and food production to decrease

EFFECT OF CHEMICALS ON WATER AND SOIL QUALITY

- overuse of fertilisers and pesticides cause chemicals to be concentrated in the soil
- over time, they seep into groundwater, contaminating it
- they may be washed into streams and rivers by surface runoff
- when these chemicals reach the streams and rivers, they become nutrients for algae to grow on the surface of the water

EUTROPHICATION IN WATER BODIES

- excess chemical fertilizers used in farms may be washed by rain into nearby rivers or lakes or seep into groundwater, contaminating it
- this causes eutrophication to occur, a process by which excess fertilizers in water bodies cause the rapid growth of algae, reducing the oxygen supply available for other aquatic life
- the algae forms a thick layer over the surface of the water, blocking

- sunlight from reaching the marine plants and animals
- when the aquatic plants and animals die, they release carbon dioxide into the water
- this further reduces the oxygen supply available for other aquatic wildlife
- eventually, many aquatic plants and animals die from lack of oxygen

BENEFITS BROUGHT ABOUT BY INTENSIFICATION OF FOOD PRODUCTION

MODERN IRRIGATION METHODS

- irrigation is the practice of supplying water to the land through artificial means
- it includes huge irrigation facilities (e.g. human made dykes, dams, canals) to divert water from water source (e.g. river and reservoirs) to farms
- it includes the use of automated irrigation systems (e.g. water sprinkles, sluice gates) to control the amount of water for watering the crops
- it enables farmers to control the amount of water supplied to crops
- it is usually practiced in countries where rainfall is insufficient (e.g. Egypt) or countries that experience seasonal or irregular rainfall (e.g. India)
- it ensures that the crops receive enough water during the dry season
- thus, farmers in India can grow two to three rice crops in a year instead of one crop without irrigation

USE OF CHEMICALS

Fertilisers

- fertilisers are substances added to the soil to provide nutrients for healthy plant growth
- chemical fertilisers can be divided into macronutrients and micronutrients
- macronutrients mainly include nitrogen, potassium and phosphorus often use in large quantities
- micronutrients include boron, copper, manganese, iron, zinc used in small quantities
- these chemicals can be mixed to meet specific needs of crops and different soil types
- farmers purchase different mixtures of nutrients to increase the output of crops

Pesticides

- pesticides are chemicals used to destroy pests which affect crop growth
- they may be in the form of insecticides which kill insects or poison which gets rid of other animals or pests that eat the crops
- e.g. India, arsenic is used by farmers to poison rats which attack rice crops

Herbicides

- herbicides are toxic chemicals used to destroy weeds
- the use of chemical fertilisers may encourage the growth of weeds, which are wild plants that compete for nutrients from the soil and hinder crop growth
- removing the weeds by hand is labourious and time-consuming

- thus, farmers may choose to spray herbicides to remove weeds
- however, excessive use of chemical fertilisers such as pesticides and herbicides may lead to problems

Answers may include the following points:

A complete answer need not include all the above points.

Candidates at each level will show the following characteristics:

Level 1 (0-3 marks)

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Level 2 (4-6 marks)

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Level 3 (7-8 marks)

Answers will be comprehensive and supported by sound knowledge. Both agree and disagreement are considered and well supported. Reasoning is clear and logical with good expression of language. Examples or other evidence to support answers will be extensive.

- 4 (a) (i) Compare the variations in the level of life expectancy between the countries in Asia.**

[4]

Variations in the level of life expectancy between the countries in Asia

- in general, majority of the South/West Asian country has a lower life expectancy than the East/South-east Asian country
- the higher life expectancy are the more developed countries of East/South-east Asian country like Taiwan, South Korea, Japan and Singapore with the highest at 95 years
- the developing countries in South/West Asian country have lower life expectancy and Afghanistan has the lowest life expectancy of about 41 years of life
- high life expectancy of 81 years old in China and 76 years old in Vietnam and they belong to the East/South-east Asian country

- (ii) Describe and explain the relationship between gross domestic product per capita and life expectancy in Asia.**

[4]

Relationship between gross domestic product per capita and life expectancy in Asia

- there is a positive relationship between the life expectancy and gross domestic product per capita
- as the gross domestic product per capita (US\$) is high like in Singapore at US\$48,000 and \$42000 in Japan and this is linked to the higher life expectancy of Singapore at 95 years
- the life expectancy is lower at Afghanistan at 41 years and it has the

lowest GDP per capita of US\$1000

- Vietnam is an exception with a lower GDP per capita of US\$3500 but a much higher life expectancy of 76 years
- a higher GDP per capita can lead to longer life expectancy because a country that has more financial means can promote campaigns that bring about more consciousness healthy living
- the higher income means the people are richer and can reduce starvation, malnutrition and have better nutritional food which help them live longer
- the countries with higher GDP have better standard of living and hygiene which will lower infant mortality and increase life expectancy

(reserve 2 m for each part)

(b) Describe the distribution of malaria in Africa as shown in Fig. 8. [4]

Distribution of malaria in Africa

- malaria is highly concentrated in the central parts of the African continent south of the Sahel region
- the countries in the north like Egypt, Libya, Algeria and Morocco are free from malaria
- only a small area in the northeast South Africa, northern Namibia and northern Botswana have malaria as compared to the other parts of these countries where malaria is not found
- the largest extent of malaria occurrence is found in Nigeria where almost the whole country is affected
- in most countries in central Africa, malaria is scattered in large parts like in, Sudan and Ethiopia in eastern Africa, in central African countries like Chad, Central African Republic, Democratic republic of Congo and Zambia

(c) Describe how agribusiness can affect crop production. [5]

How agribusiness can affect crop production

- agribusiness refers to large farming companies which are involved with most industries along a food supply chain
- place importance in scientific and business principles in farming
- this includes research and development, farms, processing and packaging, distribution and retail outlets and this will help to increase crop production and make the process more efficient
- larger companies are more able to withstand the impact of changes in the environment like damage to crops caused by pests or flooding as compared to small-scale farmers and hence they can ensure greater security in crop production
- larger companies have greater financial capacity to absorb losses
- there is investment in food production, including research into producing crops with greater crop yields
- e.g. Dole food company is an agricultural transnational corporation based in USA

- (d) **Discuss the extent in which social factors can lead to widespread diseases like Aids and malaria.**

[8]

Social factors can lead to widespread diseases like Aids and malaria

OVERCROWDED LIVING CONDITIONS

- overcrowded living conditions refer to situations where large numbers of people live very close together in a small area
- in such conditions, people share the same space, use same items and interact more often
- as a result, diseases can spread very quickly and easily
- e.g. Housing for refugees and migrant workers do not have proper doors and windows to keep out Anopheles mosquitoes that are active at night and mosquitoes can go easily from person to person due to crowded living conditions to spread malaria

EDUCATION

- in developing countries like Africa, people are not aware of how diseases like Aids and malaria can be transmitted which makes them vulnerable
- in the case of Aids, the cultural practices that keep girls from knowing about sex and sexuality until marriage in Nigeria where sexuality education is not conducted in schools makes it harder to educate the girls how to protect themselves

LIMITED PROVISION OF AND ACCESS TO HEALTH CARE

- shortage of doctors, lack of health services in rural areas and the cost of malaria and Aids treatment can contribute to the spread of malaria and Aids
- according to United Nations Development Programme (UNDP), India has a critical shortage of doctors with 6 doctors for every 1000 people and only 4% of the country's GDP is spent on healthcare
- most of India's spending on health care is concentrated in urban areas, while little spending goes to rural areas
- medication is often available but medical centres are far from homes which delay people receiving treatment
- the longer an infected person waits, the greater are the chances of the person spreading the disease

However, other factors can lead to widespread diseases like Aids and malaria

ECONOMIC FACTORS

- Poverty and the inability to afford treatment can cause Aids and malaria to spread
- e.g. the most effective medication is Artemisinin Combination Therapy (ACT) for malaria but it is expensive
- it can cost many times the monthly income of the people and some do not even receive treatment
- the lack of jobs may lead to vice trade like prostitution which contributes to the spread of Aids
- e.g. women in China move from villages to cities to search for jobs can only find employment in jobs with low pay and no job security
- they often resort to commercial sex due to the lack of viable options

which makes them vulnerable

- tourism industry also contributes to the spread of Aids as well as they may be engaged in unprotected sex
- e.g. in 2010 Queensland, Australia recorded its highest incidence of Aids with 206 people diagnosed with HIV
- e.g. some tourists were infected with HIV when they travelled for a vacation to Papua New Guinea which has a high Aids prevalence

ENVIRONMENTAL FACTORS

POOR DRAINAGE AND STAGNANT WATER

- creates conditions favourable for the growth of mosquito populations
- in these places, no precaution is taken to teach the people or remove the pools of stagnant water which allows mosquitoes to breed quickly
- e.g. Rajasthan, India.
- water from 8,000 km of canals in the Great Indian Thar Desert leaks into many places, creating swamps which formed breeding grounds for the Anopheles mosquitoes
- regular outbreaks of malaria in the desert areas of western India since 1980s

Answers may include the following points:

A complete answer need not include all the above points.

Candidates at each level will show the following characteristics:

Level 1 (0-3 marks)

Answers will be generalized or with minimal support if any given at all. Reasoning rather weak and expression may be unclear. A basic answer that has little development. Answers lack examples or other evidence, or it is so sketchy that it adds little support to the answer.

Level 2 (4-6 marks)

Disagreement or agreement will be supported by appropriate detail. Or, both agreement and disagreement are considered, but support is patchy so that the answer is not full. Good reasoning and logic in parts of the answer with good expression in places. Some examples or other evidence will be presented to support answers in at least one place in the answer.

Level 3 (7-8 marks)

Answers will be comprehensive and supported by sound knowledge. Both agree and disagreement are considered and well supported. Reasoning is clear and logical with good expression of language. Examples or other evidence to support answers will be extensive.

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