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Class	Name	Index No
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PRELIMINARY EXAMINATION 2017

PURE GEOGRAPHY

2236/01

Paper 1

Level: Secondary 4 Express

Duration: 1 hour 40 minutes
Date: 23 August 2017

Additional material: 1 Insert

READ THESE INSTRUCTIONS FIRST

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

Write in dark blue or black pen.

You may use a soft pencil for any diagrams or rough working.

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

Section A

Answer Question 1.

Section B

Answer one question.

Write all answers in the foolscap papers provided.

Candidates are encouraged to support their answers with the use of relevant examples.

Sketch maps and diagrams should be drawn whenever they serve to illustrate an answer.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

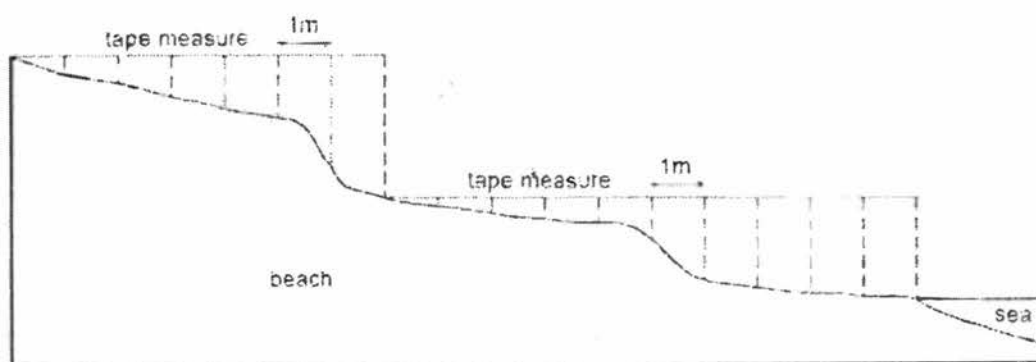
Set by: Mrs Mei Quek

Checked by: Mrs Jessie Leong, Mdm Chee Siew Yan

This Question Paper consists of 8 printed pages, including this cover page

Section AThis question is **compulsory**.

- 1 A group of students were studying beach profiles. They went to their local beach at Havana, the capital city of Cuba. Cuba is an island in the Caribbean, which is attractive to tourists.
- (a) Briefly describe how the gradient of a slope can be obtained using a clinometer. [4]
- (b) The students had forgotten to pack a clinometer for their investigation. Hence they improvised another method to obtain the beach profile as shown in Fig. 1 below.

**Method:**

1. Stretch the tape measure across the beach from the cliff to the shoreline.
2. Measure the difference in height between the tape measure and the surface of the beach in metres.
3. Repeat this measurement every metre across the beach.

Fig. 1

- (i) Suggest the advantages and disadvantages of this method. [3]
- (ii) What might affect the accuracy or reliability of their data collection? [2]

(c) The results of the students' measurement are shown in Table 1 below.

Distance from cliffs (m)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Difference in height between tape measure and beach (m)	0.0	0.2	0.4	0.5	0.5	0.6	0.6	1.0	1.1	1.2	1.2	1.6	1.7	1.8	1.8	1.9

Table 1

(i) Use the results to plot the beach profile (Fig. 2) in the Insert. [3]

(ii) State a suitable hypothesis that the students can further investigate about the beach profile. What additional data would the students need to collect for the investigation? [2]

(d) Another group of students were investigating the impact of tourism in Havana City. They focused on 3 tourist areas, Area 1, Area 2 and Area 3 along the coast. Fig. 3 below shows the results of their investigation.

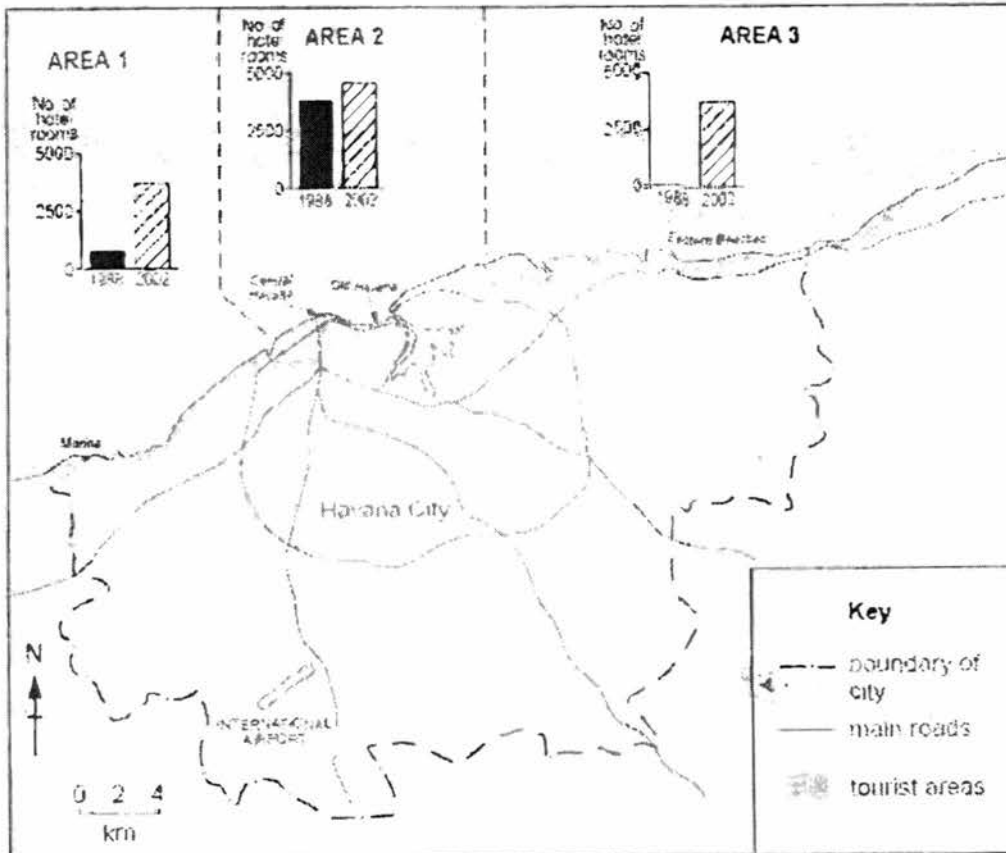


Fig. 3

Page 4 of 8

- (i) Suggest how the students might have obtained the data on number of hotel rooms. [1]
 - (ii) How far would the results in Fig. 3 support the hypothesis that '*Tourism has led to the development of infrastructure and facilities in Havana City?*' [5]
- (e) The same group of students discussed that for their next investigation, they would like to find out whether the rise in tourist numbers is due to the provision of goods and services in the various areas. What data collection methods could they use? Describe how they may carry out this new investigation. [5]

Section B
Answer one question.

- 2 (a)** Study Fig. 4 below which shows a section of a coastal area.

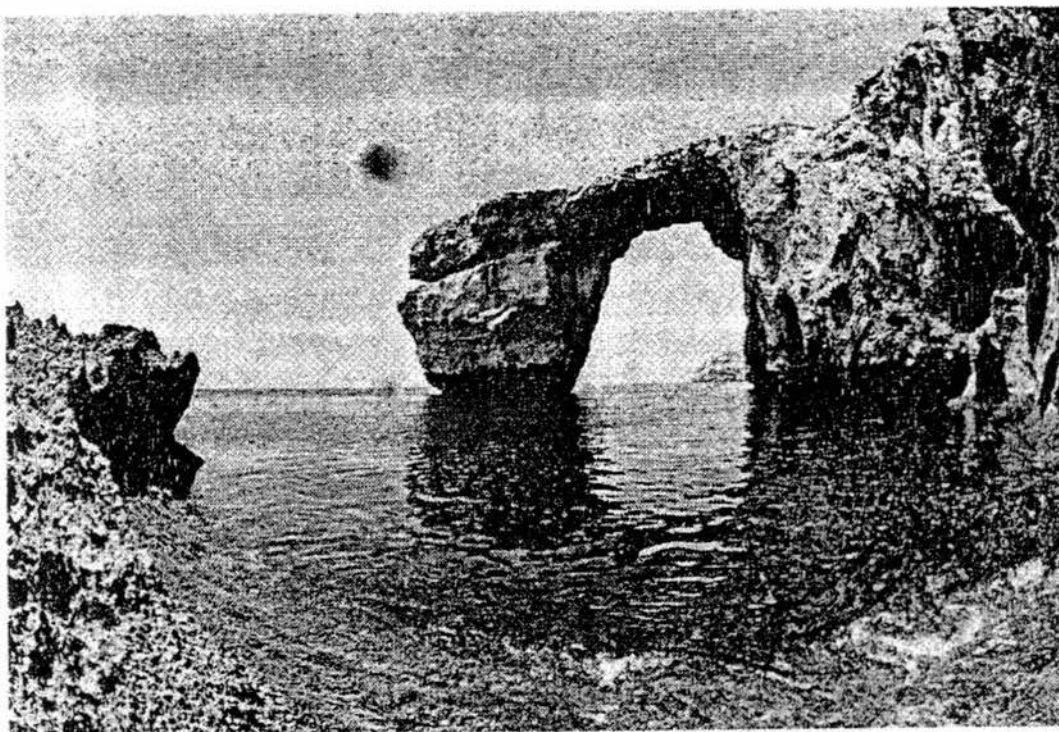


Fig. 4

- (i) Describe the appearance and characteristics of the coast shown in Fig. 4. [3]
- (ii) Explain the coastal processes that led to the shape of the coastline and the formation of the coastal features. [6]
- (b) With the help of labelled diagrams, explain how groynes help to protect a coast against sediment transport. [5]

- (c) Fig. 5 below shows an area of coastline before and after a storm.

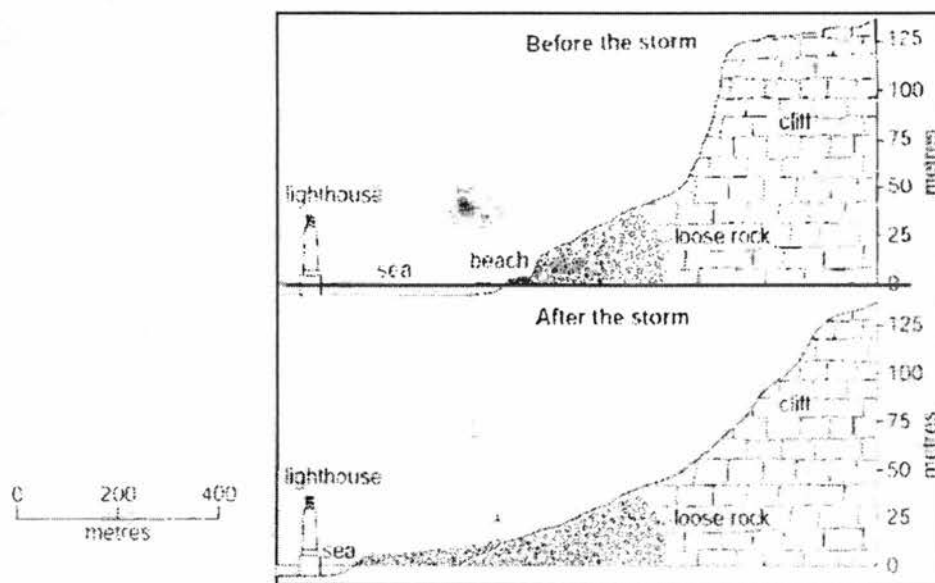


Fig. 5

Using evidence from Fig. 5 only, describe the effects of the storm.

[3]

- (d) 'The only aim of soft engineering strategies is to protect coasts from strong waves.'

How far do you agree with this statement? Explain your answer with examples.

[8]

3 (a) Fig. 6a and 6b below show some human activities that take place at a coastal area.

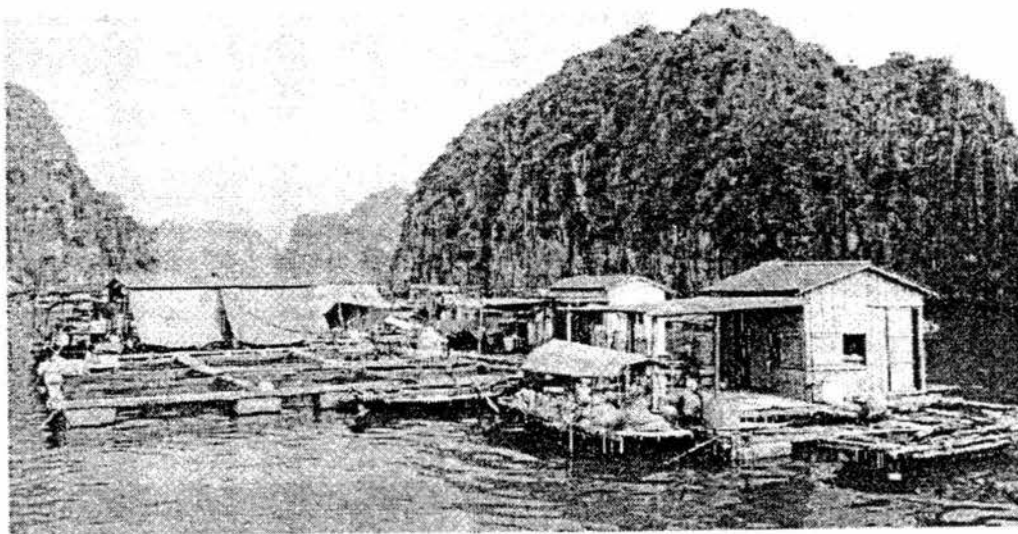


Fig. 6a



Fig. 6b

- (i) With the help of Fig. 6a and 6b, describe the value of coasts to human beings. [3]
- (ii) Explain how the human activities shown can endanger the coastal area. [6]

- (b) Study Fig. 7 below which shows information about international tourists to Kenya from different continents.

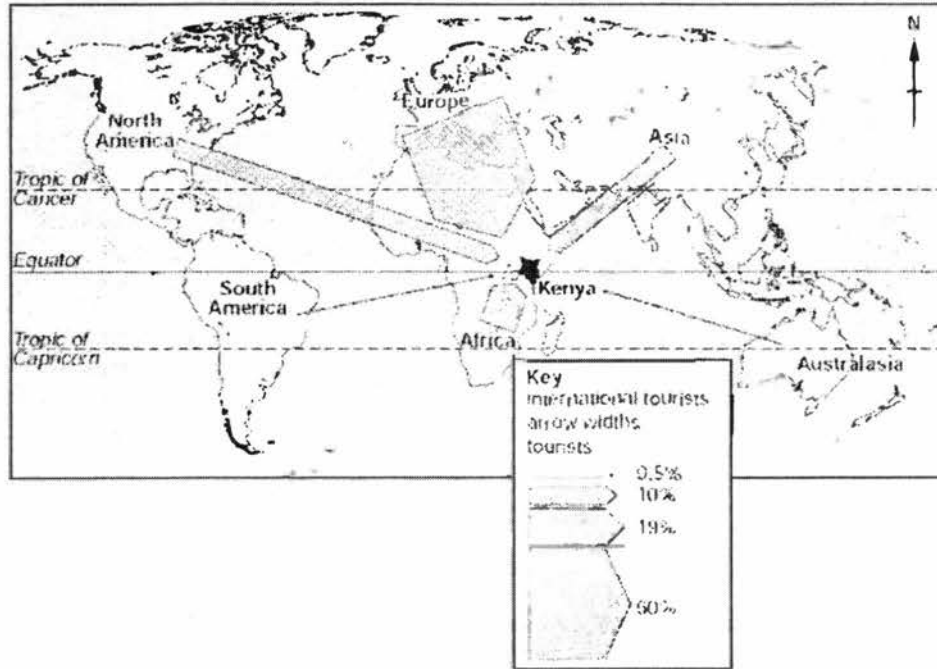


Fig. 7

- Compare the percentage of international tourists to Kenya from the different continents. [3]
- (c) Explain, with examples, how natural disasters can affect the tourism industry. [5]
- (d) 'Destination factors, rather than demand factors, influence the decisions of tourists.' [5]
How far do you agree with this statement? Explain your answer with examples. [8]

~ End of Paper ~

Credits

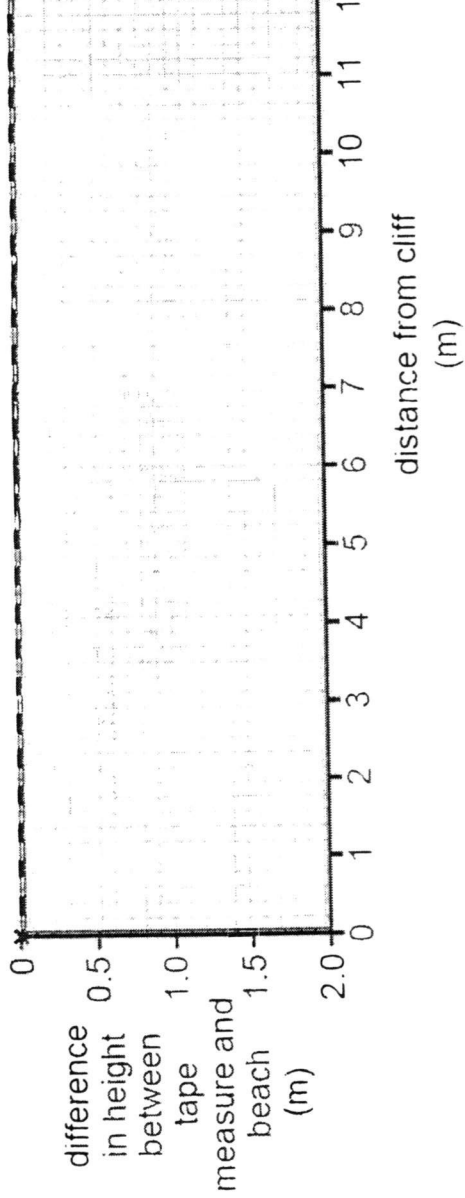
Fig. 1, 2, 3, 5, 7 CIE

Fig. 4 <http://www.metronews.ca/content/dam/thestar/uploads/2017/3/8/azurewindow.jpg>

Fig. 6a <https://upload.wikimedia.org/wikipedia/commons/thumb/...>

Fig. 6b http://www.zicasso.com/sites/default/files/styles/original_scaled_down/public/photos/...

Cross-section of beach



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PRELIMINARY EXAMINATION 2017

PURE GEOGRAPHY

2236/02

Paper 2

Level: Secondary 4 Express

Duration: 1 hour 30 minutes

Date: 7 August 2017

Additional Material: 1 Insert

READ THESE INSTRUCTIONS FIRST

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

Write in dark blue or black pen.

You may use a soft pencil for any diagrams or rough working.

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

Section A

Answer one question.

Section B

Answer one question.

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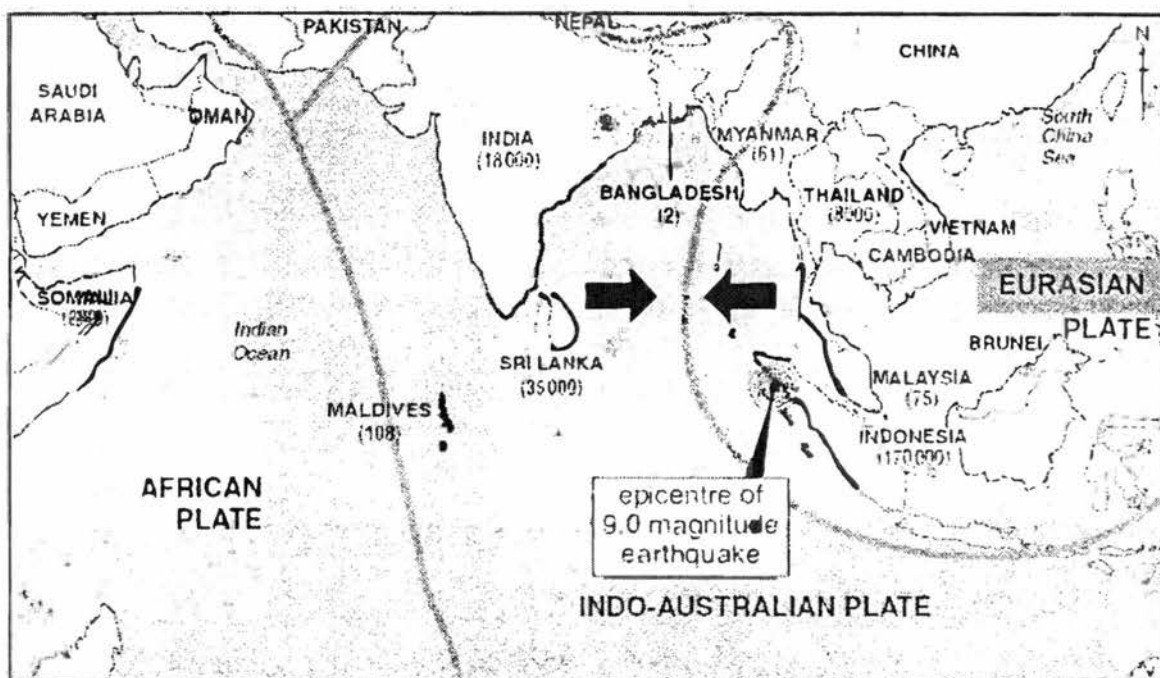
The number of marks is given in brackets [] at the end of each question or part question.

This Question Paper consists of 7 printed pages, including this cover page

Section A

Answer **one** question.

- 1(a) Fig. 1 is a map showing the epicentre of the 2004 Asian Tsunami as well as the countries that were affected by it.



Key

coastline severely hit by tsunamis

plate boundary

(61) number of deaths

plate movement

Fig. 1

- (i) With reference to Fig. 1, explain how the earthquake was triggered. [5]
- (ii) With reference to Fig. 1, describe how distance from epicentre is related to the number of deaths in the countries affected by the tsunami. [4]
- (b) Explain how some countries have been able to reduce earthquake damage through the use of earthquake monitoring and warning systems. [4]

- (c) Fig. 2 below shows a cyclone-resistant housing prototype.

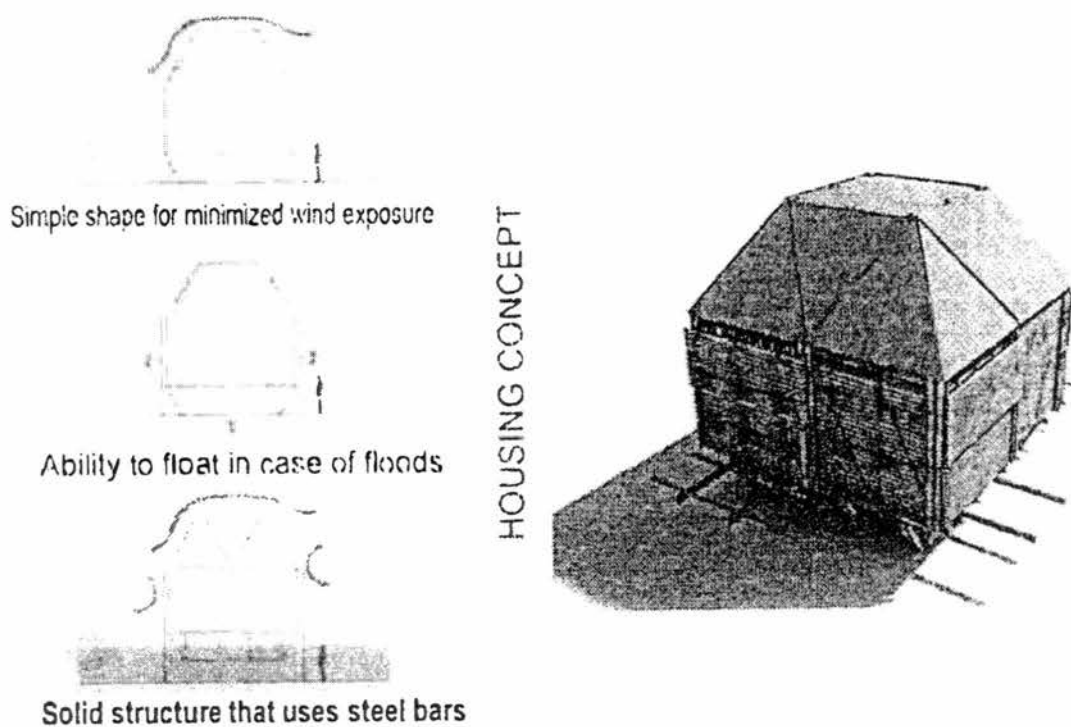


Fig. 2

Suggest how the features of the housing in Fig. 2 can reduce the impacts of tropical cyclones.

- (d) *"All volcanoes are similar in formation, physical characteristics and nature of eruption."*
How far do you agree with this statement? Explain your answer with relevant examples.

2(a) Fig. 3 below shows a climograph of a location in Monsoon Asia.

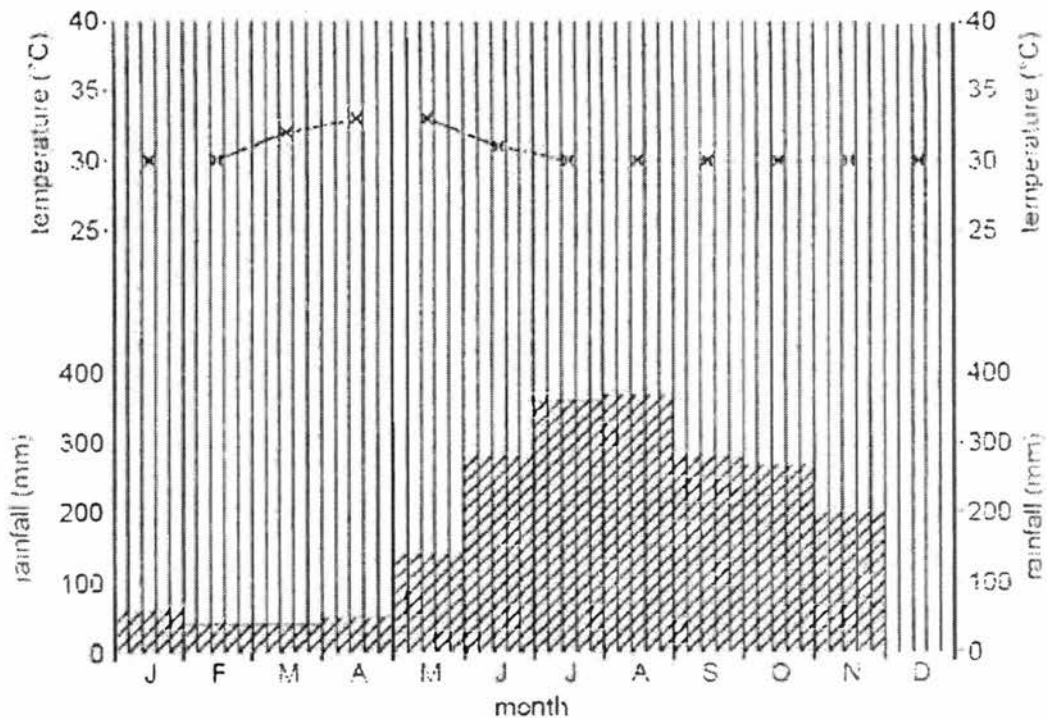


Fig. 3

- (i) Describe and account for the temperature shown in Fig. 3. [3]
- (i) Describe and account for the distribution of the rainfall throughout the year shown in Fig. 3. [6]
- (b) Study Fig. 4 (Insert). Using the information from Fig. 4, account for the formation and movement of the tropical storms. [3]
- (c) With the help of labelled diagrams, describe and explain the formation of relief rain. [5]
- (d) "Global climate change is due to human demand for resources."
How far do you agree with this statement? Explain your answer with relevant examples. [8]

Section B

Answer one question.

3(a) Study Fig. 5 which shows the location of meat processing factories in New Zealand.

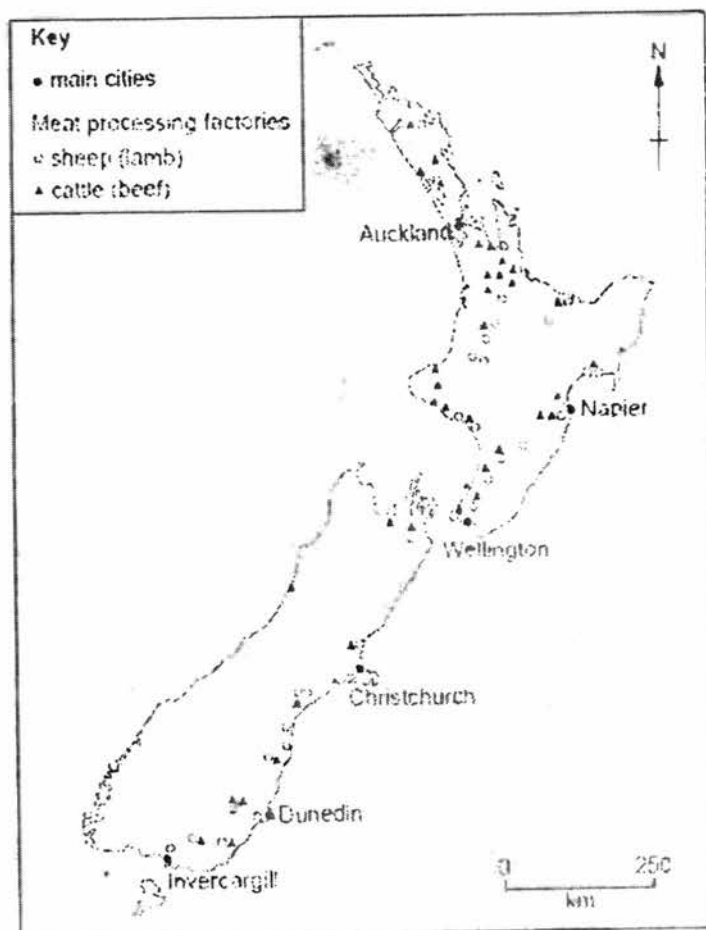


Fig. 5

- (i) Food processing is part of an agribusiness chain. Describe the characteristics of an agribusiness. [3]
- (ii) With reference to Fig. 5, describe the distribution of meat processing factories in New Zealand. [4]

- (b) Fig. 6 shows the estimated costs of obesity in United States of America in 2030.

BULGING OBESITY COSTS IN USA IN 2030



Fig. 6

Using information from Fig. 6 only, describe and explain the impacts of excessive food consumption on a country. [5]

- (c) Explain the physical factors that affect the production of food. [5]

- (d) "Rapid population growth is the most important cause of food shortage in a less developed country."

How far do you agree with this statement? Explain your answer. [8]

4(a) Study Fig. 7a (Insert) and 7b below.

In 2009, three countries were certified malaria-free in the past four years but that is out of 108 where the disease is endemic. Vast numbers of bed nets treated with insecticide have been provided by donors and distributed in malaria-endemic regions. Every small child and pregnant woman should sleep under one to keep away the mosquitoes in the night. New drugs – compounds involving artemisinin – have been developed and widely distributed to replace older antimalarials.

Fig. 7b

- (i) Using information from Fig. 7a (insert) only, describe how the extent of malaria (distribution, number of cases and deaths) has changed over the years. [6]
- (ii) Using information from both Fig. 7a (insert) and 7b, describe and suggest reasons for the number of malaria cases reported in Africa in 2009. [3]

(b) Study Fig. 8 (Insert), which shows the three common traits of corn that are grown using biotechnology in United States of America. Bt corn is resistant to pest, while HT corn is resistant to herbicide.

Describe the changes in the percentage of areas where the different types of genetically engineered corn was grown.

- (c) Explain how multiple cropping and crop rotation can increase a farm's productivity.
- (d) *"Environmental factors are responsible for the spread of all diseases in the less developed countries."*

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

~ End of Paper ~

Credits

Fig. 2 <https://www.treehugger.com/green-architecture/affordable-disaster-resistant-bamboo-housing-floats-in-flood-hot-architects.html>

Fig. 3, 4, 5 CIE

Fig. 6 <https://www.bariatricsurgeryworld.com/wp-content/uploads/2014/04/bulging-obesity-statistics-1.jpg>

Fig. 7a and 7b https://static.guim.co.uk/sys-images/Guardian/Pix/maps_and_graphs/2011/10/18/Malaria_web.gif

Fig. 8 <https://userscontent2.emaze.com/images/b6863f35-486b-4a4b-b06b-992b7e26c848/5cac4c2c7bac99ac77deda2f730e9728.png>

Fig. 7a for Question 4

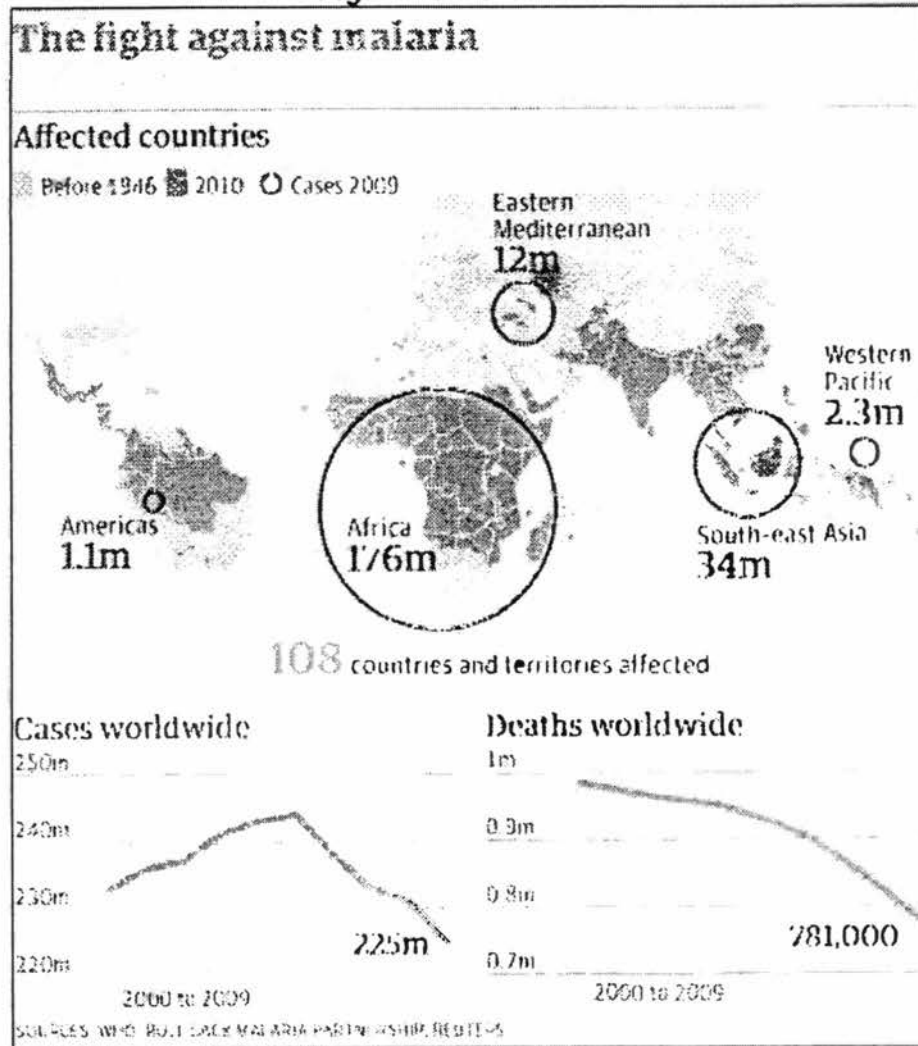
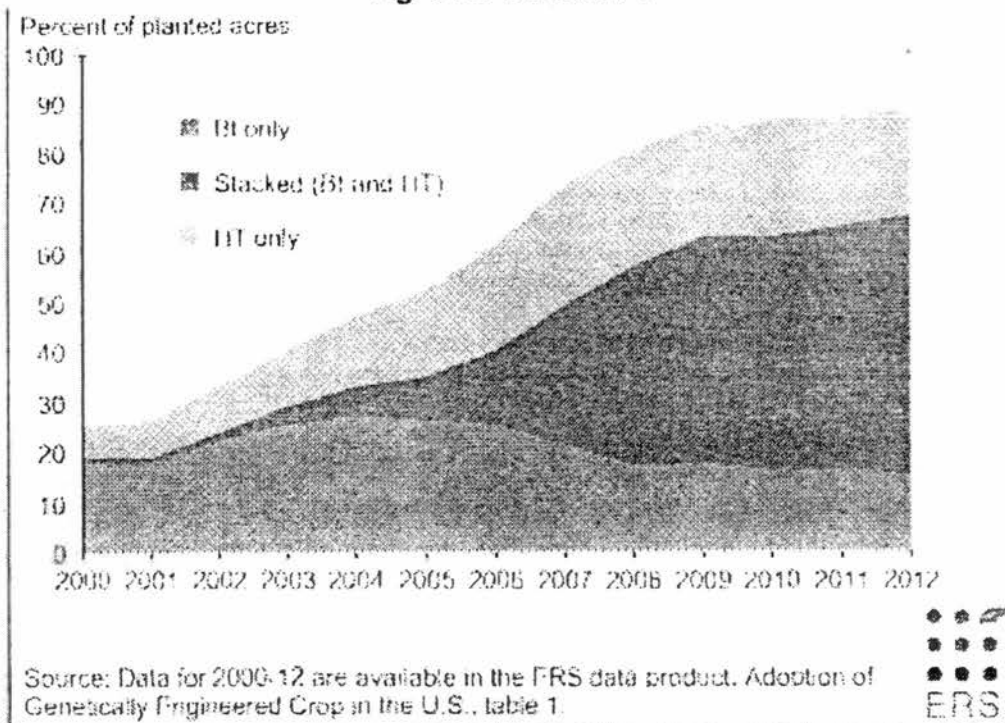


Fig. 8 for Question 4



St. Hilda's Sec School
 Sec 4Exp Pure Geography
 Answers to Preliminary Exam 2017 Paper 1

1(a)

- Place ranging poles along transect line
- Ensure they are vertical, not sunk into sand
- Same length of pole above surface at each point
- Use a clinometer to measure / read angle of elevation
- Hold clinometer next to top / at agreed height on ranging pole / eye level
- Sight other ranging pole at top / agreed height on ranging pole / eye level

(b)

(i) Advantage

- Easy to do / no need to measure angle
- Needs little equipment / only needs tape measure / ruler

Disadvantage

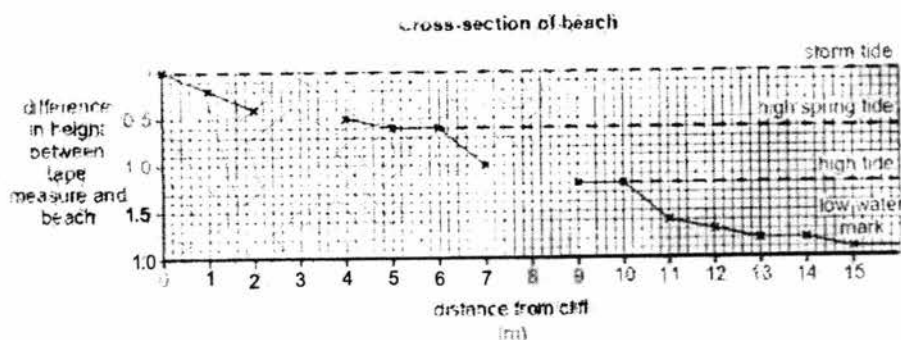
- Tape might not be long enough
- Difficult to ensure tape measure is straight
- Complication of having to add height difference to readings/ measurements.

(ii)

- Reading / parallax error of the difference in height - inaccurate
- Measurements taken every metre may miss change in slope - unreliable

(c)

(i) 3 marks for correct plotting of all points; 2 points for 1-4 errors, 1 mark for 5-8 errors



(ii) Any possible answer

E.g.: The beach profile is influenced by the size of materials; Data: sediment size

(d)

(i) Secondary data / internet research / annual reports from hospitality industry / government

(ii)

- Support to some extent only / only for facilities, not for infrastructure
- Facilities: increase in no. of hotel room in all 3 Areas
- I.e.: Area A from 625 (1998) to 3750 (2002) – any data
- Infrastructure: not able to see how no. of main roads / international airport have developed
- However, able to see that there are main roads leading directly to Area 2 (Central Havana) from airport

(e)

- Landuse survey

- Find out the no. of shops, buildings that provide goods and services to the tourists in the tourist areas
- Analyse the results i.e.: areas with more amenities attract more tourists
- Interview tourists / use survey forms or questionnaires
- Can include those working in tourism-related jobs / shopkeepers
- At least 30 respondents
- Use random / systematic sampling
- Ask both open and closed questions on the factors / causes

2(a)

(i)

- Rocky coast / made up of rock
- Presence of notches, caves, arch
- Uneven coastline / headlands+bay

(ii)

- Alternate bands of more resistant / hard rocks and less resistant / soft rocks are arranged at right angles to the coast.
- The less resistant / soft rocks get eroded faster and curve inwards as bays.
- The remaining more resistant / hard rocks extending into the sea are called headlands.
- Some parts of headland may have less resistant rocks that erode more quickly.
- Base of headland gets undercut to form cave.
- Caves develop at either side of headland and erosion joins the two caves together to form arch.

(b)

1 mark for diagram(s)

- Groynes are low walls, built at right angles to the shore
- Tips may be further angled about 5 to 10 degrees
- To prevent materials from being transported along the coast by longshore drift.
- Cause deposition on the side facing longshore drift (updrift side), thus extending and enlarging beach on the downdrift side

(c)

- Collapse of cliff
- Almost vertical rock face becomes less steep rock face
- Extent of loose rocks increased from 400m to 760m / extended seawards

(d)

Relevant points: Need to explain 2 strategies and bring in at least 1 other aim for each strategy, e.g.: extending the beach (growing of mangroves), beautifying the beach (beach nourishment), stabilizing sand dunes etc

Strategy (E.g.)	Description (WHERE?)	Successes	Limitations
Encouraging coral reef growth (Thuru, Maldives) What's coral reef ecosystem? • Masses of corals growing in tropical shallow seas Distribution • Between the tropics	• Conserve coral reefs and restore damaged ones • Create artificial reefs by placing steel / concrete on sea floor • WHERE? - Along coast	• Coral reefs weaken wave energy by reducing speed of waves approaching coast • Enhance fishing opportunities • Healthy coral reefs can help protect coasts • E.g.: In 2004 Indian Ocean Tsunami, coral reefs provided buffers	• Need years to establish coral reef ecosystem • Not all coastal regions can support coral reefs (limited to only tropical shallow seas) • Can be severely damaged by severe storms • Require constant effort to reduce water

E.g.: SEA Environmental conditions (Fig 1.56) Pressures (Fig 1.59) • Overcollection • Fishing methods • Recreational use of coast • Coastal development • Climate change		to weaken wave energy Other value of coral reefs • Provide habitat for marine creatures • Tourist attractions	pollution (as discharging of sewage and other waste into the sea pollutes the sea and can threaten the growth of coral reefs) • To succeed in a long run, need cooperation from public, fishermen, industries, government
Planting mangroves (Parts of Aceh) What's mangrove ecosystem? • Tropical / sub-tropical plants that are halophytes (salt-tolerant) Distribution Between the tropics, along low lying, sheltered coasts with muddy and waterlogged land E.g.: Southeast Asia, Australia, W Africa, tropical areas of the Americas Adaptation • Leaves – special salt glands to secrete excess salt • Fruits floating fruits; tube-like fruits • Roots pencil roots; prop roots; kneed roots Pressures (Fig 1.69) • Demand for fuel wood and charcoal • Conversion to other land uses • Coastal development • Rising sea level	• WHERE? - Along coasts	▪ Roots can absorb energy of incoming waves ▪ Roots help to trap sediments, bind loose soil and reduce coastal erosion ▪ Extensive areas of mangroves can reduce the loss of life and damage caused by tsunamis. • E.g.: In 2004, Indian Ocean Tsunami, mangroves planted by one of the villages in Tamil Nadu, India slowed down the waves. Much of the land around the village was flooded, but the village itself suffered minimal damage • Extends and enlarges beach seawards as mangroves grow seawards Other value of mangroves ▪ Provide breeding ground and habitat for marine creatures ▪ Provide wood and non-wood forest products ▪ Improve water quality – natural filters	• Need years to establish mangrove ecosystem • Not all coastal regions can support mangroves (limited to only tropical / sub-tropical sheltered areas) • Depth of coast may become shallower affecting coastal transportation and port activities • Narrow mangrove strips provide limited coastal protection against tsunamis • When uprooted or snapped off at mid-trunk and swept inland, can cause extensive property and life damage • Young mangroves are fragile, thus mangrove planting require cooperation of locals who need to prevent their farm animals from grazing on mangrove plantations
Beach nourishment (Siloso Beach, Singapore)	• Constant replenishment of sand to a beach that is being eroded e.g.: by longshore drift • WHERE?	• Extends and enlarges beach seawards → (lead to) • Improves beach quality and protects against storms	• Short term protection (10 years) • Sand needs to be constantly replenished • Impractical for places with scarce supply

	- Along beach		- Serious consequence on wildlife e.g.: coral reefs and coastal environment may be covered by sand - Costs very high
Stabilising coastal dunes (Triton Place, W Australia) What's a coastal / sand dune? - Loose sand piled up on a coast by wind - Conditions that help the formation of a dune = ✓ coast with abundant dry sand ✓ coast that experience prevailing onshore winds ✓ availability of space for sand to be piled up ✓ presence of vegetation (e.g.: spinifex and marram grass) to 'trap' sand Why does it need to be stabilised? - A dune can be blown further inland by strong winds and can cause damages by burying houses and roads - So, need to stabilise them by planting grasses to prevent them from migrating inland	- Plant vegetation (e.g.: spinifex and marram grass) - Build fences, access paths to prevent dunes from being disturbed by human traffic	- Roots of grasses can trap and bind sand together, preventing erosion - Matting used for planting can add nutrients when it rots - Stabilised dunes help defend coasts and human property like houses and roads against coastal erosion and flooding from waves - Dunes provide habitat for many animals. (e.g.: migratory birds)	- Vegetation cannot totally prevent coastal erosion - Moving vehicles and people walking across dunes can damage the vegetation and lead to destabilisation - Sufficient, convenient access must be provided so that there is no need for the use of shortcuts through the dunes - In a long run, human activities need to be minimised along coasts - Costs of fences and maintenance high

L1 (0-3)

- Answer will be generalized or with minimal support if any given at all.
- Reasoning may be rather weak and expression may be unclear.
- Basic answer that has little development, lack examples or other evidences / sketchy examples.

L2 (4-6)

- Disagreement / agreement will be supported by appropriate detail. Or, both disagreement & agreement considered but with patchy support.
- Good reasoning and logic in parts of answer with good expression in places.
- Not a full answer, some examples or other evidence presented in at least 1 place in answer.

L3 (7-8)

- Both disagreement & agreement are considered and well supported.
- Reasoning is clear and with good expression.
- Comprehensive answer, supported by sound knowledge. Examples or other evidence extensive.

3(a)

- (i)
- Fishing / aquaculture - livelihood
 - Settlement - for fishermen and their family
 - Recreation / tourism - fishermen may supplement their income by bringing tourists out to sea in their boats
- (ii)
- Overcollection of corals or other marine life - disrupts coral reef ecosystems
 - Fishing methods i.e.: dynamite blasting likewise destroys coral reef ecosystems
 - Aquaculture may lead to removal of mangrove ecosystems
 - Sewage or litter from settlement may pollute the coastal areas
 - Recreational use of coast can lead to water pollution like oil spills from boats
 - Coastal development for tourism i.e.: land reclamation can lead to loss of coastal ecosystems

(b)

- Largest group from Europe i.e.: 60%
- Smallest from S America & Australia i.e.: 0.5%
- 9% more tourists from Africa than N America & Asia

(c)

- Can discourage tourists from visiting destination
- & citizens of affected country from travelling
- E.g.: Iceland volcanic eruption, 2011; Japan 'sunami, 2011 (any relevant e.g.)
- However, may encourage domestic tourism
- Or, encourage tourist industry to slash prices to lure tourists back to destination, hence may still be attractive to tourists who want a good deal

(d)

Relevant points: Need to compare demand factors with destination factors

Demand factors	Destination factors
Disposable income • The amount of money available for an individual to spend, or save, after taxes • Rapid economic growth (e.g.: in China, India) has increased disposable income, allowing people to travel	Attractions • Features or qualities that make a place interesting or enjoyable • Can be natural or built E.g.: Dubai
Leisure time • A part of a day, week, year without work commitments aka relaxation time • Increase in leisure time due to shorter working weeks, more public holidays & more paid annual leave • With more income + paid leave, may be more inclined to travel	Investments in infrastructure & services • Transport & communication networks, electrical frameworks, systems for water & waste disposal, accommodation • Particular type of help or work provided to customers E.g.: Changi Airport Terminal 4
Changing lifestyle • Travelling has become a form of relaxation • People live longer & are more physically fit to travel frequently i.e.: healthy retirees	Access to information • Tourists are more likely to visit when travel-related info (transport routes, weather conditions) is easily obtained outside &

such as 'grey' nomads in Australia	within destination Helps is info is available in different languages, local tour guides & travel agents are knowledgeable
L1 (0-3) - Answer will be generalized or with minimal support if any given at all. - Reasoning may be rather weak and expression may be unclear. - Basic answer that has little development, lack examples or other evidences / sketchy examples. L2 (4-6) - Disagreement / agreement will be supported by appropriate detail. Or, both disagreement & agreement considered but with patchy support. - Good reasoning and logic in parts of answer with good expression in places - Not a full answer, some examples or other evidence presented in at least 1 place in answer. L3 (7-8) - Both disagreement & agreement are considered and well supported. - Reasoning is clear and with good expression. - Comprehensive answer, supported by sound knowledge. Examples or other evidence extensive.	

St. Hilda's Sec School
 Sec 4Exp Pure Geography
 Answers to Prelim Exam 2017 Paper 2

1(a)

(i)

- The oceanic Indo-Australian plate converges with the continental Eurasian plate
- As they do so, the Indo-Australian plate subducts under the Eurasian plate
- They exert friction on one another, causing pressure to build up at the boundaries.
- Pressure gradually builds up in the plates and energy is stored up in the Earth's crust.
- When the rocks can no longer contain the pressure, energy is released suddenly as an earthquake. This energy radiates out through the crust and onto the Earth's surface.

(ii)

- There is no relationship between distance from epicentre and number of deaths.
- Although Indonesia suffered the most deaths of 170,000 as it is a closest to the epicenter
- Countries that are further away such as Sri Lanka, had more deaths of 35,000 than relatively close countries such as Malaysia which had far fewer deaths of only 75
- Even countries equally distant from the epicentre like India (18000 deaths) & Bangladesh (2 deaths) differ greatly

[1m each. Students can quote any other relevant data]

(b)

- Involves **studying history** (when, where) of earthquakes—prediction of seismic risks.
- Hence **restrict development** in certain areas
- Involves **installing earthquake sensors** in earthquake-prone zones
- It helps **monitor the frequency of vibrations** and detect possible developments of an earthquake.
- For e.g., in Japan, earthquake motion data is gathered from hundreds of observation stations installed on **bridges and roads**.
- These stations **monitor ground motion** and enable the occurrence of an earthquake to be **predicted**.
- Earthquake sensors are also used to quickly **estimate damage** to bridges, railways or other infrastructure

[any 4 pts, 1m each]

(c)

ACCEPT POSSIBLE ANSWERS

- 'Simple shape for minimized wind exposure', so housing will not be toppled so easily
- 'Ability to float in case of floods', so instead of being submerged by the flood water, housing will be intact
- 'Solid structure that uses steel bars' prevent walls and roofs from being blown off by the strong winds of cyclones / swept off by flood water
- Or being damaged by debris in the wind / flood water
- Thus enables the house to stay dry from the rain

(d)

Level 1 (0-3m)

Answers will be generalised or with minimal support if any given at all

Reasoning is 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 (4-6m)

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 in at least one place in the answer.

Level 3 (7-8m)

Answers will be comprehensive and supported by sound knowledge

Both agreement and disagreement are considered and well supported with development of the importance of at least 1 similarity and 1 difference.

Reasoning is clear and logical with good expression of language.

Examples or other evidence to support answers will be extensive.

Suggested answer:

Similarity in formation

- Both are landforms formed by magma ejected from the mantle onto the earth's surface.
- Both are fed by a magma chamber, which is a reservoir of molten rock beneath the earth's crust.

Differences in physical characteristics and nature of eruption

Stratovolcano	Shield volcano
steeper at the top and gentler at the base; Secondary cones may develop as magma from the vent seeps into the sides of the cone and erupts.	gently sloping sides and a broad summit
high-silica lava; more viscous; develop from successive eruptions of lava and pyroclasts (ash, rock fragments and volcanic bombs)	low-silica lava; flows easily and spreads out over a large area before solidifying
Usually explosive	usually not explosive
	common near divergent plate boundaries

2(a)

(i)

Describe

- High throughout the year i.e.: $\geq 30^{\circ}\text{C}$
- Small temp. range i.e.: $< 3^{\circ}\text{C}$ → need to be worked out, unacceptable to write bet. 30 & 33°C

Account for

- Low latitude, high solar angle
- Heat from sun concentrated on a small area

(ii)

Describe

- High total annual i.e.: 2090mm
- Seasonal (dry in DJFMAM, wet in JJASON)

Account for

- SW monsoon – Summer in NH, Winter in SH
- Air from Australia moves to C Asia due to pressure difference
- Picks up moisture from the ocean and brings heavy rain in JJAS
- NE monsoon – Winter in NH, Summer in SH
- Air from C Asia moves to Australia due to pressure difference
- Blows across cold land, no rain

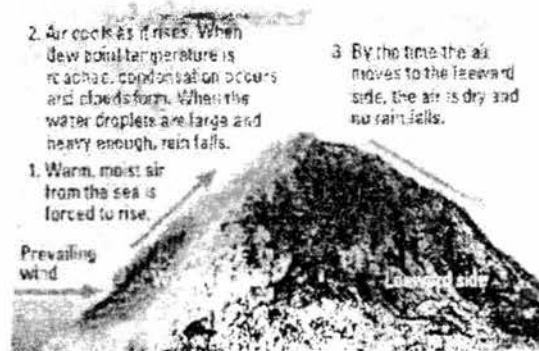
(b)

Formation

- Between the tropics + Over oceans e.g.: Indian / Pacific / Atlantic
 - As high ocean surface temp ($>26.5^{\circ}\text{C}$) / heat + moisture from ocean waters are necessary
- Movement-**
- From water to land e.g.: India Ocean $\rightarrow$ SE of Africa
 - Due to Coriolis Effect, deflect to the right in the NH (rotate anti-clockwise), to the left in SH

(c)

1m for diagram that shows direction of (prevailing) wind, windward vs leeward side



- Wind blows over sea, picking up large amounts of water vapour.
- Warm moist air encounters a mountain or upland area, forcing it to rise.
- As air rises, it cools and dew point temp. is reached. Water vapour condenses to form water droplets and clouds
- Rain falls mostly on windward side
- Leeward side little or no rain, descending air warmed by heat near earth's surface = dry wind aka 'rain shadow effect'

(d)

Level 1 (0-3m)

Answers will be generalised or with minimal support if any given at all

Reasoning is 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 (4-6m)

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 in at least one place in the answer.

Level 3 (7-8m)

Answers will be comprehensive and supported by sound knowledge

Both agreement and disagreement are considered and well supported with development of the importance of at least 1 human and 1 natural cause.

Reasoning is clear and logical with good expression of language.

Examples or other evidence to support answers will be extensive.

Suggested answer:Agree

Demand for WOOD/tree-based products such as paper and building materials $\rightarrow$ 1

Demand for FOOD RESOURCES $\rightarrow$ 1, 2

Demand for PRECIOUS MINERALS/manufactured goods $\rightarrow$ 1, 2

1. Deforestation: loss of forests due to the removal or clearance of trees in forested areas.
 - Deforestation causes increase in levels of carbon dioxide in two ways:
 - Fewer trees to absorb carbon dioxide
 - Forests absorb billions of tonnes of carbon dioxide every year via photosynthesis.
 - With deforestation, there are fewer trees/plants to absorb carbon dioxide, leading to an increase in carbon dioxide levels in the atmosphere.
 - Carbon oxidation is the process by which carbon in the soil reacts with oxygen in the atmosphere to form carbon dioxide.
 - Deforestation exposes soil to sunlight which increases soil temperature and the rate of carbon oxidation in soil.
2. Changing land use: as population increases, the demand for industrial, agricultural land also increases. Previously forested land is also converted to urban or built-up areas as people choose to live in cities.
 - Therefore, changes in land use contribute to greenhouse gas emissions.
 - Agriculture
 - Agriculture refers to the practice of cultivating land, producing crops and raising livestock. To meet increasing demand for food
 - Cattle farming contributes to greenhouse gas emissions as cattle releases millions of tonnes of methane into the atmosphere annually, gases as are released from the digestive systems of cattle.
 - Industries
 - 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 byproducts when goods are produced.
 - Urbanisation
 - Urbanisation is the process by which an increasing number of people live in urban areas.
 - Large amounts fossil fuels are burnt to provide energy for household activities in urban areas.
 - Such activities include: Heating (not in Singapore, but in temperate countries) Cooling (Air-conditioning) Cooking and Lighting

Thus, deforestation + changing land use increases GHGs → EGHE

Disagree:

1. Variations in solar output
 - higher sunspot activity is linked to higher amounts of solar radiation emitted.
2. Volcanic eruptions
 - When a volcano erupts, large volumes of carbon dioxide, water vapour, sulfur dioxide, dust and ash are released into the atmosphere.
 - Together with dust and ash, these particles reflect solar energy back into space.
 - This results in a cooling influence on regional and global temperatures.

3(a)

(i) (ANY 3)

- Commercial / Intended for sale
- Large scale (of land)
- Huge capital required for inputs e.g.: machinery
- Involves hired labour

(ii) (ANY 4)

- Unevenly distributed;
- More on North Island;
- Mainly in coastal areas;
- and near main cities (give examples)
- Especially on east coast of south island

(b)

Describe (Compulsory):

- Estimated \$66 billion per year to treat obesity related disease

Explain:

- Over-consumption of nutrients can affect most of the body's systems & lead to OBESITY related health problems (high blood pressure, coronary heart disease, diabetes, certain cancers)
- Thus, increase country's overall cost of providing healthcare, leaving less resources for other areas of development in USA

Describe (Compulsory):

- Estimated \$390 to \$580 billion loss of economic productivity.

Explain:

- Can result in more absences from work, more days of leave taken, due to OBESITY related health problems
- Also higher insurance costs & compensation claims to employees

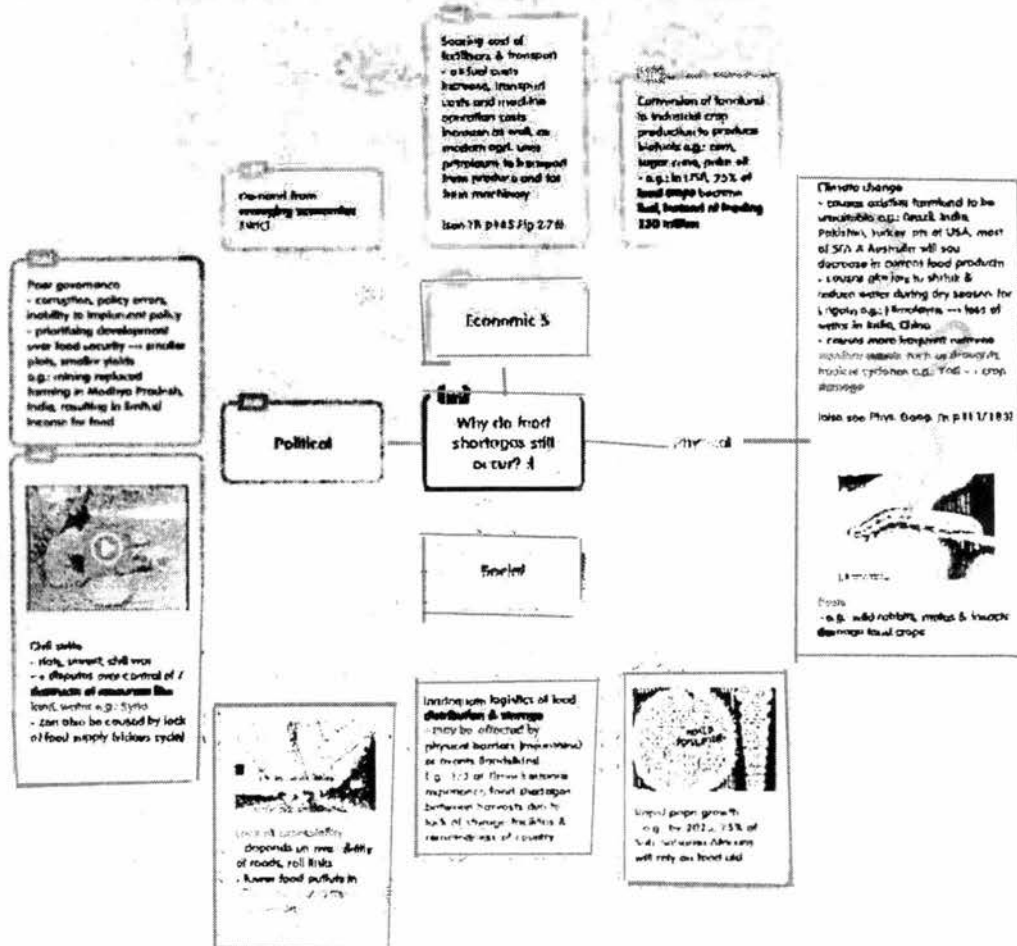
(c) (ANY 2 out of 3 of the physical factors. up to 3m per factor)

Factor	How it affects	
Physical Different crops require different temp., rainfall, soil, drainage & relief	Climate	
	<u>HIGH</u> temp. & <u>HIGH</u> rainfall - more conducive for plant growth - i.e.: in the Tropics, long growing season enables farmer to have 2-3 harvests / year	<u>LOW</u> temp. & <u>LOW</u> rainfall - no food production during winter - however, greenhouses can overcome short growing season
	Soils & drainage	
	<u>FERTILE</u> soil - more productive - i.e.: floodplains, deltas, volcanic areas	<u>INFERTILE</u> soil - less productive - however, chem. fertilisers can overcome this
	<u>PROPER</u> soil drainage - more productive	<u>IMPROPER</u> soil drainage - less productive, hinders growth of crops
	Relief	
	<u>FLAT</u> land or <u>GENTLE</u> slope - more productive - retains water, allows use of machines	<u>STEEP</u> slope - less productive - water drains off fast, use of machines is limited, soil erosion is more likely to occur - however, terracing can overcome this e.g.: Longji Rice Terraces, China
	<u>LOW</u> altitude - favours most crops	<u>HIGH</u> altitude - favours cool climate crops e.g.: strawberries, tea, coffee

(d)

Relevant points:

- Agreement that rapid popn growth is an important cause in LDCs
- But acknowledge at least 2 other factors i.e.: physical (e.g.: climate change etc), political (e.g.: poor governance), economic (e.g.: rising demand from BRIC), other social (e.g.: lack of accessibility)
- Examples given **MUST** be of LDCs



L1 (0-3)

- Answer will be generalized or with minimal support if any given at all.
- Reasoning may be rather weak and expression may be unclear.
- Basic answer that has little development, lack examples or other evidences / sketchy examples.

E.g.: I agree, LDCs always lacking in food.

L2 (4-6)

- Disagreement / agreement will be supported by appropriate detail. Or, both disagreement & agreement considered but with patchy support.
- Good reasoning and logic in parts of answer with good expression in places.
- Not a full answer, some examples or other evidence presented in at least 1 place in answer.

E.g.: I agree to some extent, for example in Sub-Saharan Africa. Countries have high birth rate as the people lack family planning.

L3 (7-8)

- Both disagreement & agreement are considered and well supported.
- Reasoning is clear and with good expression.
- Comprehensive answer, supported by sound knowledge. Examples or other evidence extensive.

E.g.: I agree to some extent, for example in Sub-Saharan Africa. Countries have high birth rate as the people lack family planning. However, there are other causes, such as the conversion of farmland to biofuel crop production. In USA, 25% of all food crops grown become biofuel, which can feed 300 million people for 1 year, most of whom are from LDCs. Another cause is civil strife. In a conflict area, farmland may have been destroyed by landmines.

4(a)**(i)**

- Distribution – no. of affected countries had decreased from 1946 / from worldwide to tropical regions only
- 108 countries affected in 2010
- E.g.: Australia is not affected anymore (any other e.g.)
- No. of cases – increased and then decreased / overall decreased
- From 233m (2000) to 225m (2009)
- Death – decreased
- From 1m (2000) to 781,000 (2009)

(ii)

- 176m in Africa
- or 78% of cases worldwide
- possible reason: bed nets are not always effective / used correctly as they should be i.e.: some employed as fishing nets
- possible reason: older antimalarial drugs have become ineffective, as the parasite develops resistance to them
- possible reason: newer artemisinin treatment are unaffordable

(b)

- Overall, increase
- From 26% (2000) of planted areas to 88% (2012) of planted areas
- Slight decrease in Bt corn, from 19% (2000) to 16% (2012)
- Increase in HT corn, from 6% (2000) to 22% (2012)
- Largest increase in Stacked corn, from less than 1% (2000) to 50% (2012)

(c)

- MC: Non leguminous crops (corn, sorghum) benefit from nitrogen generated by leguminous crops (ground nut, soya bean) – improves fertility & increases productivity
- Minimises pests as some crops (garlic, pepper, onions) act as repellent – no crop loss
- Prevents pests & diseases from wiping out all crops in monoculture
- CR: No planting of the same crop on the same piece of land – prevents decrease in soil fertility & increases productivity
- Both: Dependence of 1 crop is prevented as there is larger variety of crops grown – farm is productive every season / different times of the year

(d)

Relevant points:

- Agreement that env. factors are responsible for spread of Malaria
- But disagreement as HIV/AIDS is not dependent on env. factors for its spread i.e.: social or economic factors need to be explained
- Examples given MUST be of LDCs

L1 (0-3)

- Answer will be generalized or with minimal support if any given at all.
- Reasoning may be rather weak and expression may be unclear.
- Basic answer that has little development, lack examples or other evidences / sketchy examples.

L2 (4-6)

- Disagreement / agreement will be supported by appropriate detail. Or, both disagreement & agreement considered but with patchy support.
- Good reasoning and logic in parts of answer with good expression in places.
- Not a full answer, some examples or other evidence presented in at least 1 place in answer.

L3 (7-8)

- Both disagreement & agreement are considered and well supported.
- Reasoning is clear and with good expression.
- Comprehensive answer, supported by sound knowledge. Examples or other evidence extensive.

FACTORS contributing to its spread

Malaria	HIV/AIDS
Social - Lack of proper sanitation: stagnant pools of waste water near settlements are breeding grounds for mosquitoes Economic - Limited provision of & access to health care: shortage of drs, lack in rural areas & cost of malaria treatment (ACT) e.g.: In India, 6 drs: 10,000 pax, 4% GDP on health care spending & concentrated in urban areas, ACT unaffordable to poor Environmental - Overcrowded living conditions: encourages speed & ease of spread - Poor drainage & stagnant water e.g.: Seepage from Indira Gandhi Canal Project into Rajasthan, India - Effect of climate: temp, rainfall, RH (p208 Fig 3.52), post-monsoon period e.g.: 2006-9, Pakistan	Social - Social stigma related to the disease: hinders early intervention - Education: lack of awareness & sexuality awareness education. e.g.: Nigeria - Lifestyle choices: drug injection, sharing needles, unprotected sex / sexually active at young age / multiple sexual partners - Lapses in medical practices: mistakes, corruption & negligence e.g.: 2001-11, 130,000 patients in USA exposed to tainted blood Economic - Vice trades: illegal drugs & commercial sex - Mobility: more likely to get involved in risk-taking behaviours, spread in shorter period of time to more pax e.g.: 2010, infected Australians had travelled to Papua New Guinea