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FAIRFIELD METHODIST SCHOOL (SECONDARY)

PRELIMINARY EXAMINATION 2016 SECONDARY 4 EXPRESS

GEOGRAPHY
Paper 1

2236/01
Duration: 1 hour 40 minutes

Date: 24 Aug 2016

READ THESE INSTRUCTIONS FIRST

Write your name, class and index number on the answer paper provided.
Write in dark blue or black pen on both sides of the paper.
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 on the Answer paper provided.
Candidates should 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.

This question paper consists of 11 printed pages including the cover page and an insert which consists of 3 printed pages.

Section A

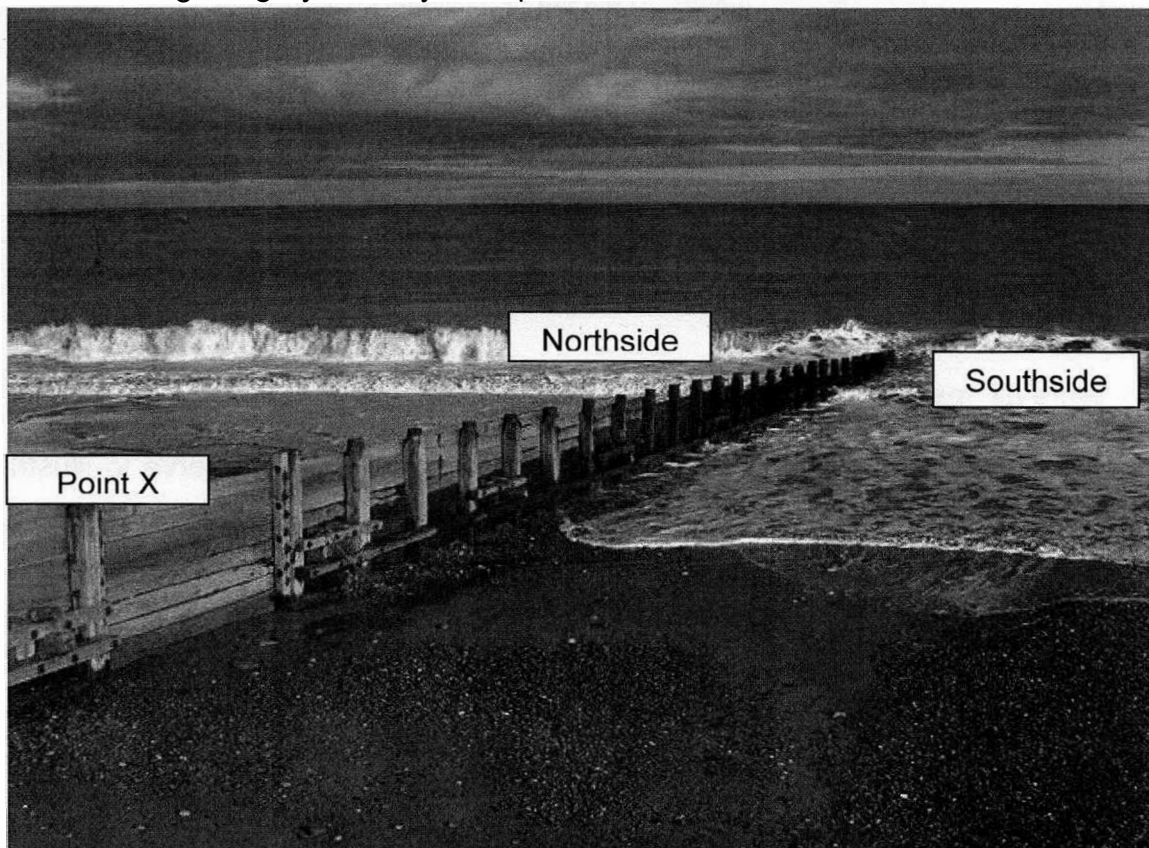
This question is compulsory.

- 1 A group of students carried out a fieldwork exercise on the coast of Aberdeen in Scotland. The area of fieldwork is shown on Map A (Insert) and Photograph A.

Their aim was to test out their hypothesis, "The impact of longshore drift can be managed by building groynes."

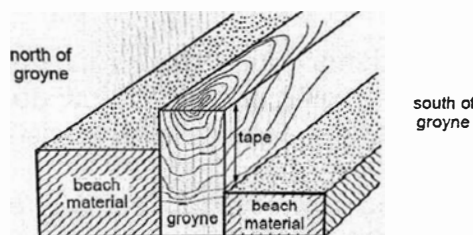
10 samples were taken along the entire length of the coast.

- (a) (i) With reference to Map A (Insert), state the dominant direction of the longshore drift along the Aberdeen coast. [1]
- (b) Look at Photograph A. At each sample site, the students took measurements 5 metres along the groyne away from point X.



Photograph A

At each sample site they measured from the top of the groyne to the beach material on both the north and south side, as shown on Fig. 1.

**Fig. 1**

The measurements are shown on **Table 1** below.

Sample Site	Measurement from top of groyne to beach material	
	North side (m)	South side (m)
1	0.3	1.2
2	1.1	1.5
3	0.9	1.3
4	0.8	1.2
5	0.5	1.3
6	1.2	1.4
7	1.5	1.6
8	1.5	1.7
9	1.6	1.8
10	1.7	1.9
Average	1.1	1.5

Table 1: Build-up of beach material either side of the groyne

(i) Using data from Table 1 and Fig.1, what conclusion could the students make about the hypothesis? Suggest how they can improve the accuracy and reliability of their results. [6]

(ii) What are some of the safety precautions the students have to consider before conducting the fieldwork? [2]

- (c) Another group of students conducted a tourism fieldwork study on the same area. [3]
They considered the guiding question "How do the reasons for visiting Arbeeden, Scotland, vary according to the profile of tourists?"

The students narrowed down the tourists to three different profiles.

Profile A = age between 20-30

Profile B = age between 31-50

Profile C = age 50 and above

Describe with some details, the best method in which they can collect the relevant data to respond to the guiding question.

- (d) Fig. 2 shows the triangular graph the students plotted after getting the results of the investigation. Using Fig.2, complete the data *a* and *b* in Table 2. [1]

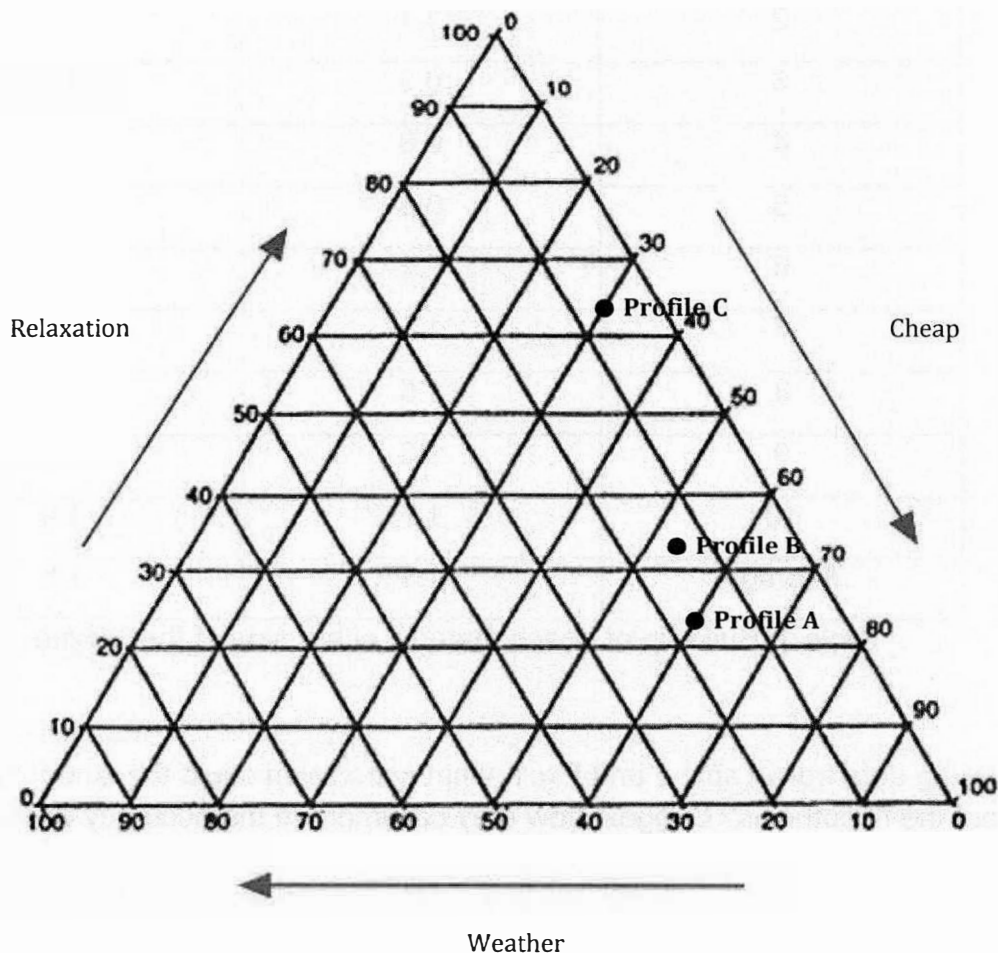


Fig. 2: Reasons for visiting Aberdeen, Scotland

Reasons for visit/Tourist Profile	Relaxation	Cheap	Weather
Profile A	22%	60%	18%
Profile B	a	b	13%
Profile C	61%	30%	9%

Table 2

- (e) Using the information from the completed Table 2 and Fig. 2, draw conclusions in response to the guiding question. [3]

- (f) (i) The students also compared the popularity of Aberdeen with a nearby beach resort town, Nairn. They found that Nairn has 50% more visitors compared to Aberdeen. The student wanted to find out why Nairn had more tourists than Aberdeen. They decided to conduct a landuse survey to find out if the types of services provided is the reason for the disparity. Describe how they can go about conducting the landuse survey in Aberdeen. [3]

- (ii) Fig. 3 shows the results of the landuse survey conducted by the students in Aberdeen Town.

Landuse Survey of Aberdeen TownLegend

	Hostel		High-end Retail Shop
	Hotel		Souvenir Shop
	Spa		Restaurant
	Cafe		Transportation Amenity

Fig.3

- (iii) Using evidence from Table 2 and Fig.3, describe some of the problems with services provided in Aberdeen Town for tourists and explain clearly how the facilities in Aberdeen Town can be improved to attract more tourists. [6]

Name: _____ ()

Class: _____

Section B

Answer Question 2 OR 3

- 2(a) Map B (Insert) is a topographical map of the coastal area around Beer and Seaton in East Devon, England. [2]
- (i) With reference to Map B (Insert), identify the two coastal landforms found in GR 2689 and, with the aid of well-labelled diagrams, explain how the landforms were formed. [5]
- (b) Beer and Seaton are also trying to establish themselves as tourist destinations. Suggest the type of niche tourism Beer and Seaton can develop. Support your answer with evidence from the map. [2]

- (c) Dartmoor National Park is one of the attractions in Devon, England. Fig. 4 shows the origin of the visitors to the national park in 1991.

With reference to Fig. 4, describe the trend of the origin of visitors to Dartmoor National Park in 1991. [3]

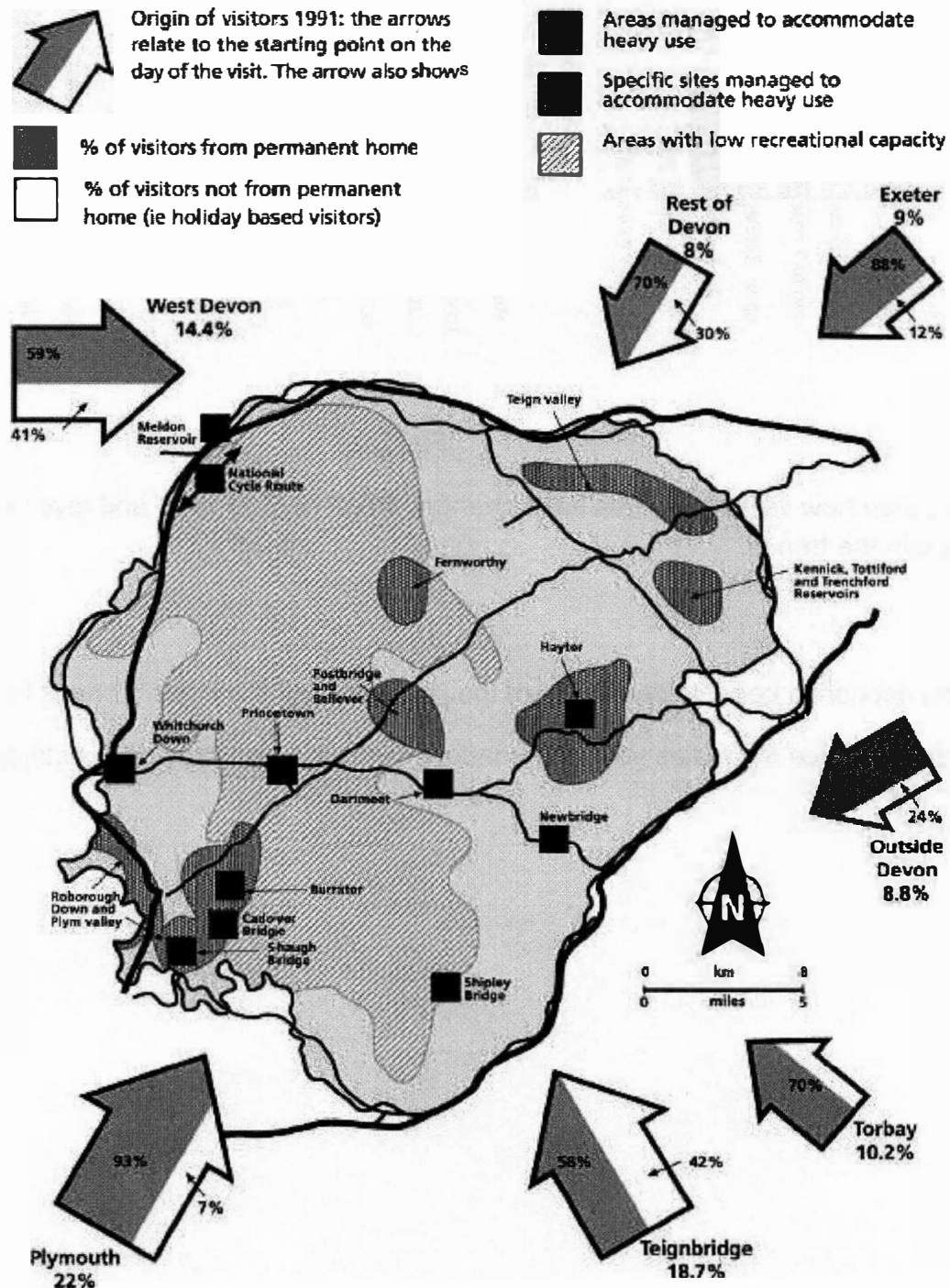


Fig. 4

- (d) Fig. 5 shows the changes in visitor activities in Dartmoor National Park.

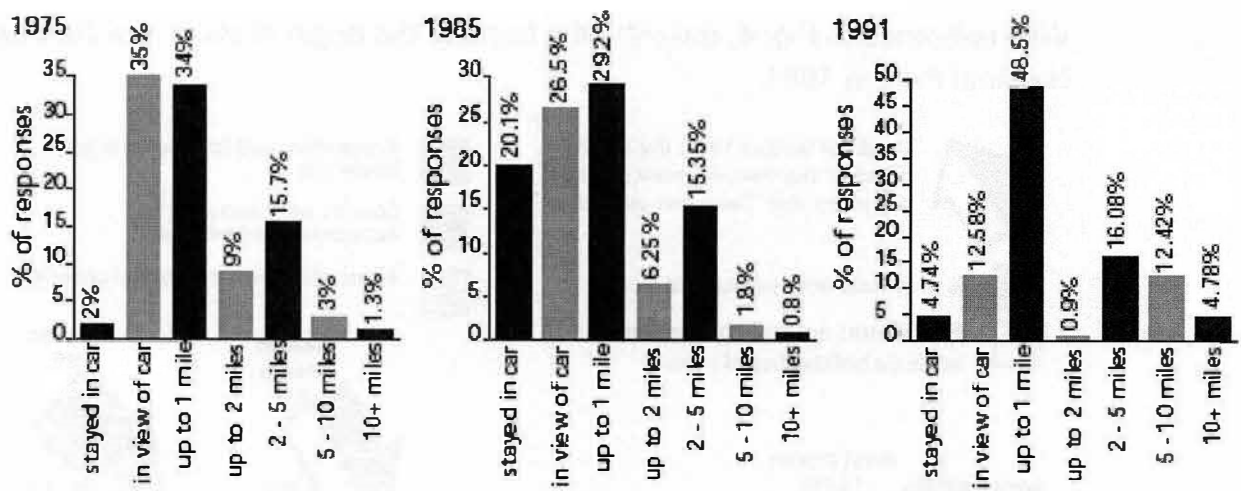


Fig. 5

Describe how visitor activities have changed from 1975 to 1991 and give reasons to explain the trends.

[5]

- (e) 'The economic benefits derived from tourism outweigh the costs it brings to a country.'

With reference to studies you have made, assess the accuracy of this statement.

[8]

3 Fig. 6 shows the coastal area of Biddeford, United Kingdom.

- (a) (i) Identify the coastal landform named Fletcher Neck and, with the aid of well-labelled diagrams, explain how it was formed. [5]

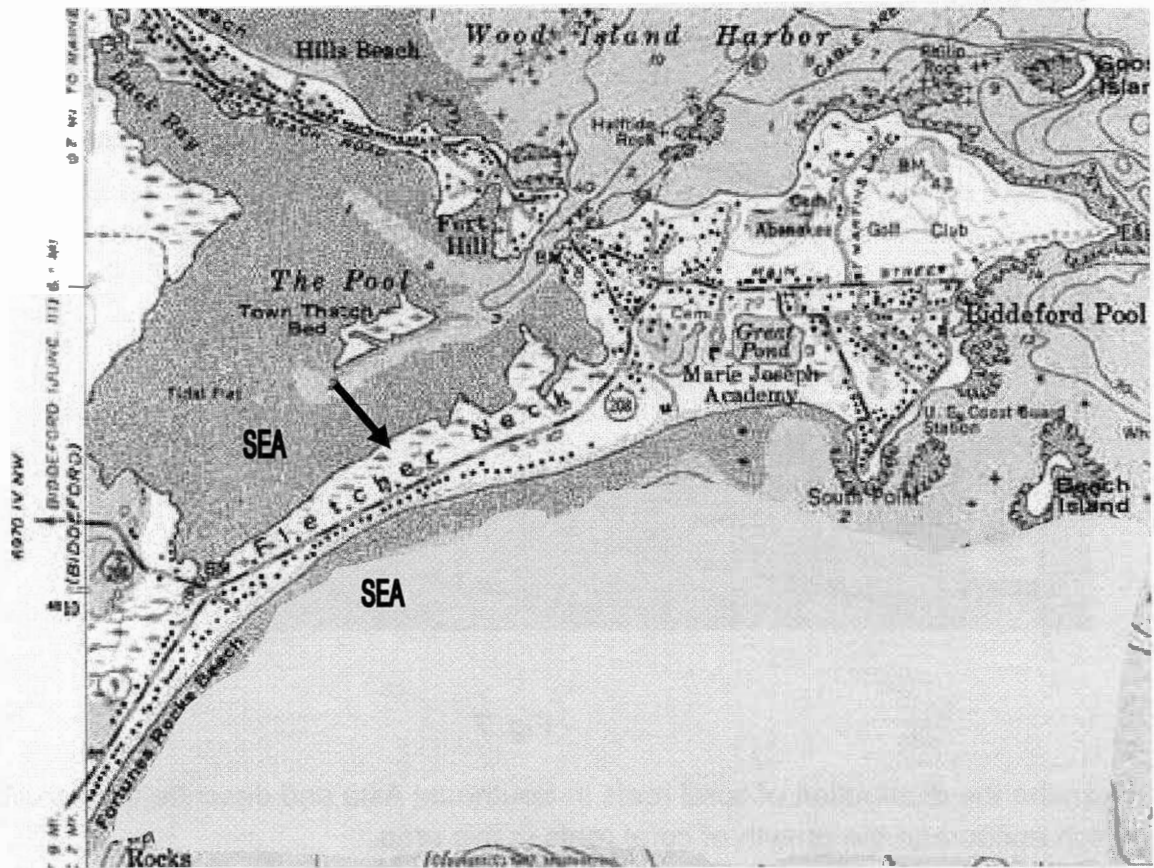


Fig. 6

- (b) Fig. 7 shows the location of the Coral Triangle in Southeast Asia. The Coral Triangle is a region that comprises 76% of all known coral species in the world.

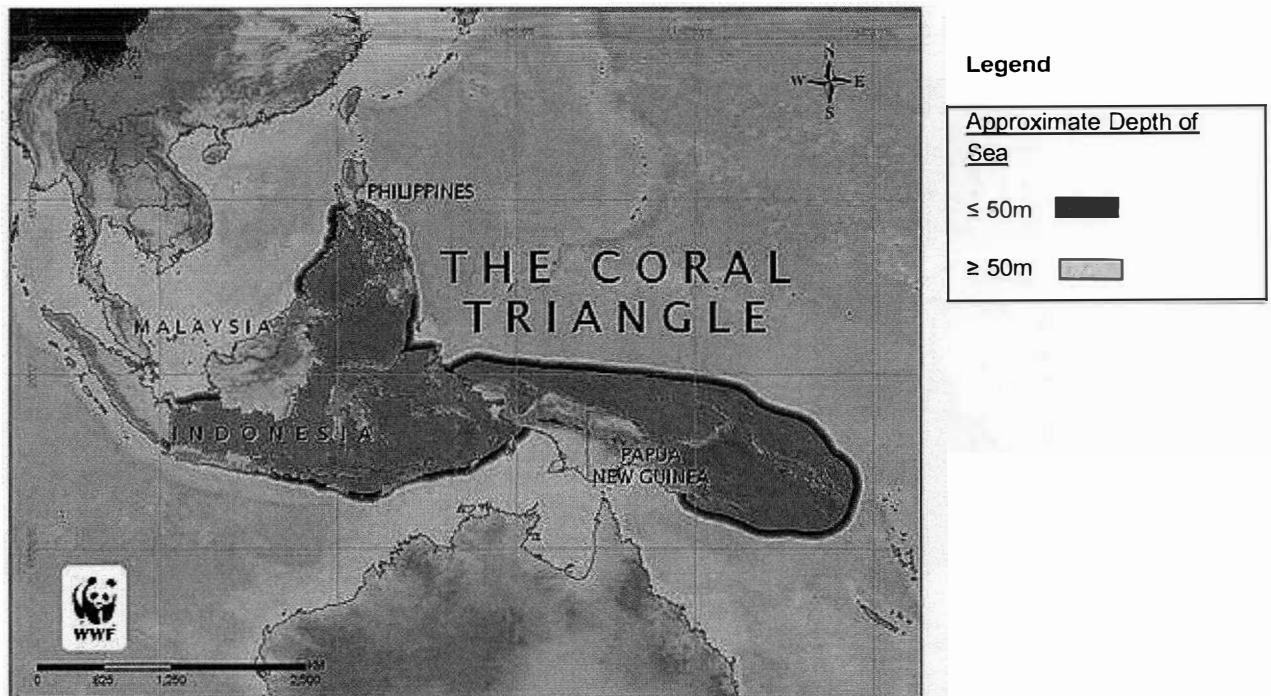


Fig. 7

Describe the distribution of coral reefs in Southeast Asia and describe the conditions which encourage the growth of coral reefs in this area.

[5]

- (c) Fig. 8 is an extract which describes a particular phenomenon in a coastal region.

"The next thing to understand is that corals have a limited temperature range within which they can live. When it gets too hot, they get stressed out—and this relationship with the algae goes sour. The tiny algae are ejected from the corals, turning them white."

Fig. 8

Identify the phenomenon described in Fig. 8 and explain what types of environmental impact it will have the surrounding coastal regions.

[4]

- d Fig.9 shows a coastal protection measure used in South Devon, United Kingdom.



Fig.9

What is the coastal protection measure used? Explain how it works and what its limitations are.

[3]

- e "Erosion is the main threat to coastal areas"

[8]

With reference to studies you have made, assess the accuracy of this statement.

-End of Paper-

Name: _____ () Class: _____

FAIRFIELD METHODIST SCHOOL (SECONDARY)

**PRELIMINARY EXAMINATION 2016
SECONDARY 4 EXPRESS**

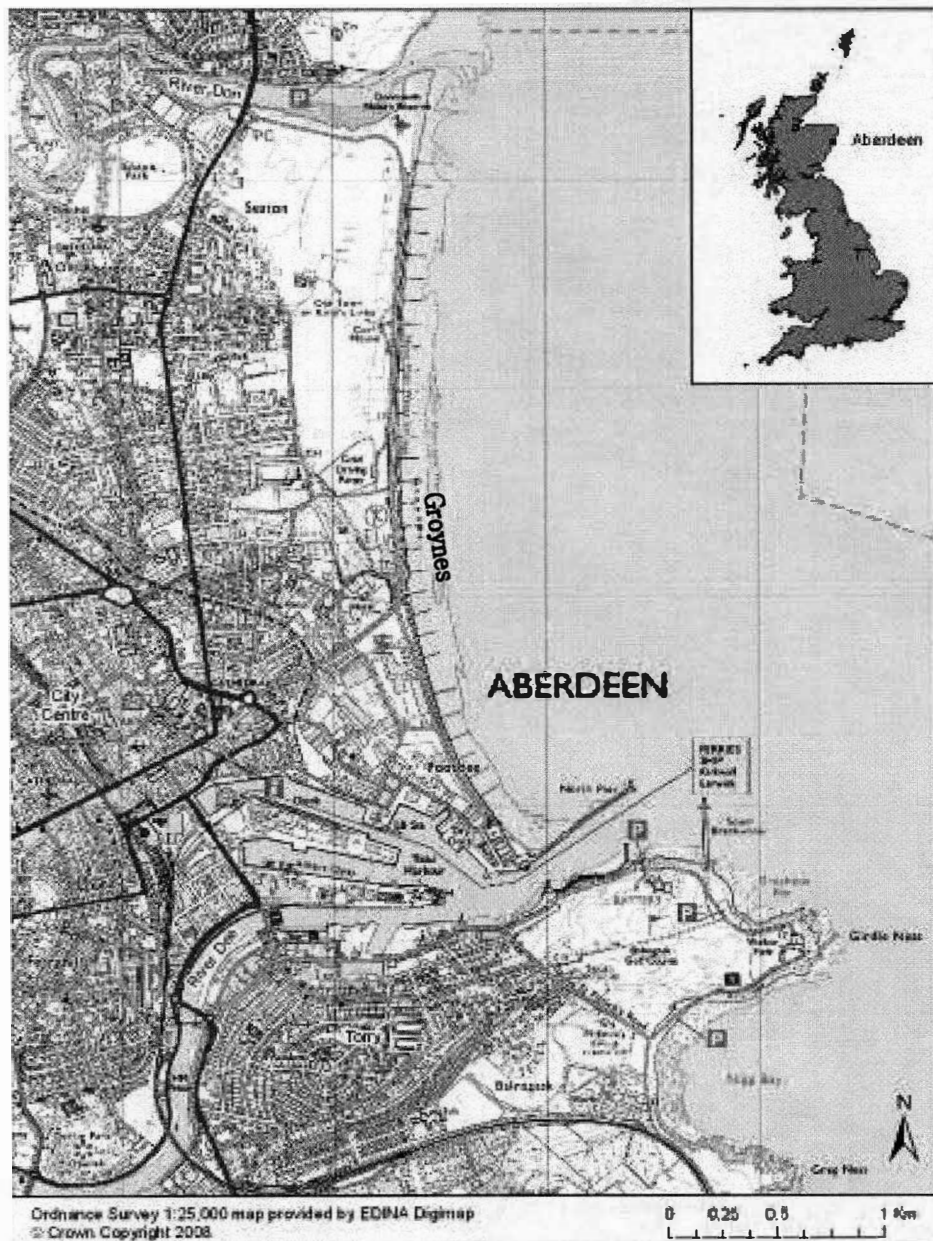
**GEOGRAPHY
Paper 1**

**2236/02
Duration: 1 hour 30 minutes**

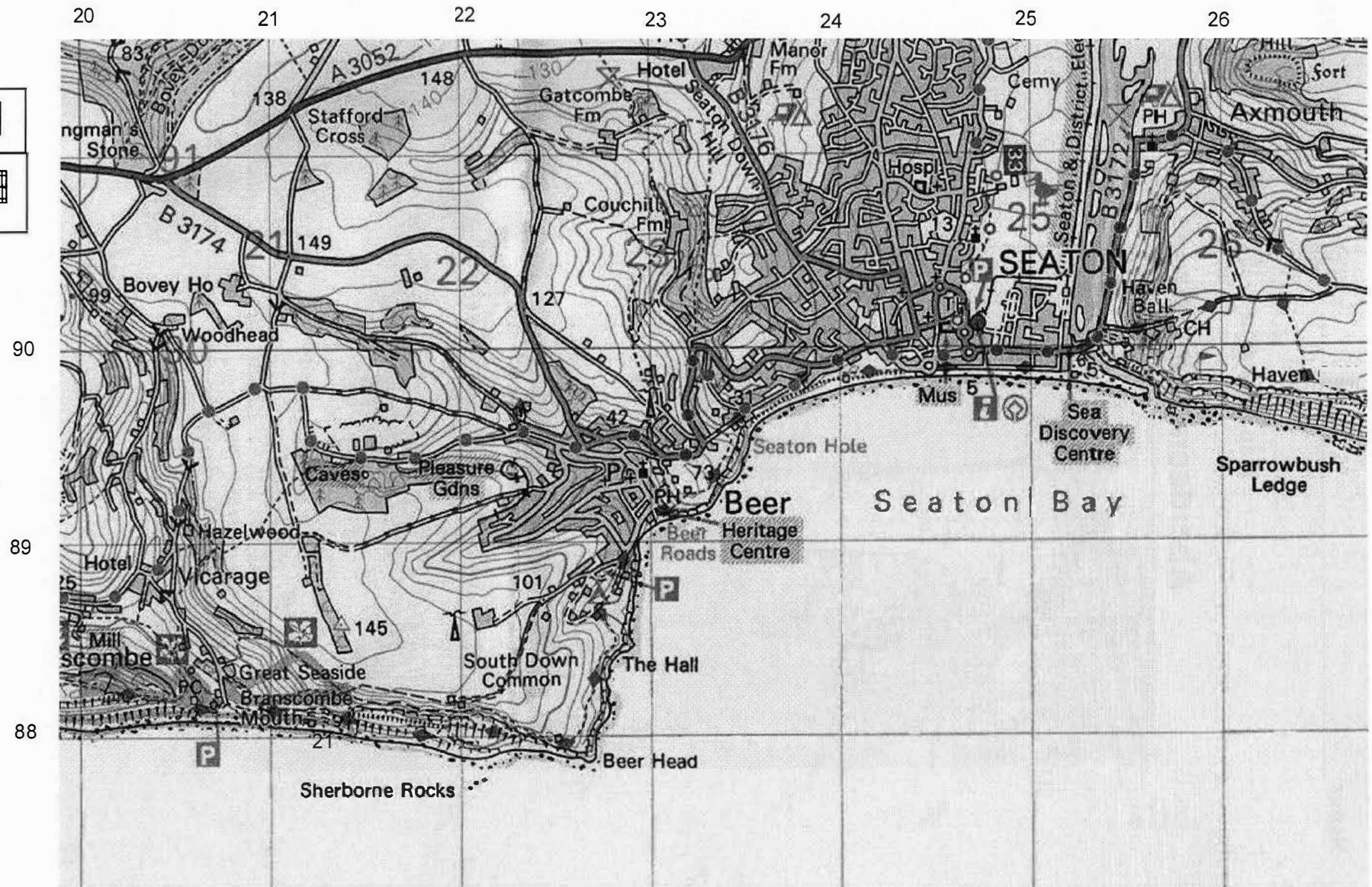
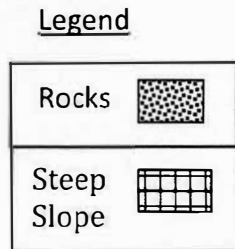
Date: 24 Aug 2015

INSERT

Map A for Q1a

Aberdeen Study Area

Map B for Q2



TOPOGRAPHIC MAP OF THE COAST AROUND BEER AND SEATON, EAST DEVON.

Modified after Ordnance Survey Map, Landranger Sheet No. 192, 1:50,000. Purchasing this map from the Ordnance Survey is recommended. Contours are in metres. Blue squares of one kilometre provide a scale. Ian West. 2010.

Section A

This question is compulsory.

1	A group of students carried out a fieldwork exercise on the coast of Aberdeen in Scotland. The area of fieldwork is shown on Map A (Insert) and Photo A. Their aim was to test out their hypothesis, "The impact of longshore drift can be managed by building groynes." 10 samples were taken along the entire length of the coast.																		
(a)	(i) With reference to Map A, state the dominant direction of the longshore drift along the Aberdeen coast.	[1]																	
	South-east/ north to south X south-west																		
(b)	Look at Photograph A. At each sample site, the students took measurements five metres along the groyne away from point X. At each sample site they measured from the top of the groyne to the beach material on both the north and south side, as shown on Fig. 1 below. Fig. 1 The measurements are shown on Table 1 below. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">Sample Site</th><th colspan="2">Measurement from top of groyne to beach material</th></tr> <tr> <th>North side (m)</th><th>South side (m)</th></tr> </thead> <tbody> <tr> <td>1</td><td>0.3</td><td>1.2</td></tr> <tr> <td>2</td><td>1.1</td><td>1.5</td></tr> <tr> <td>3</td><td>0.9</td><td>1.3</td></tr> <tr> <td>4</td><td>0.8</td><td>1.2</td></tr> </tbody> </table>	Sample Site	Measurement from top of groyne to beach material		North side (m)	South side (m)	1	0.3	1.2	2	1.1	1.5	3	0.9	1.3	4	0.8	1.2	
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	<table border="1"> <tr> <td>5</td><td>0.5</td><td>1.3</td></tr> <tr> <td>6</td><td>1.2</td><td>1.4</td></tr> <tr> <td>7</td><td>1.5</td><td>1.6</td></tr> <tr> <td>8</td><td>1.5</td><td>1.7</td></tr> <tr> <td>9</td><td>1.6</td><td>1.8</td></tr> <tr> <td>10</td><td>1.7</td><td>1.9</td></tr> <tr> <td>Average</td><td>1.1</td><td>1.5</td></tr> </table> Table 1: Build-up of beach material either side of the groyne	5	0.5	1.3	6	1.2	1.4	7	1.5	1.6	8	1.5	1.7	9	1.6	1.8	10	1.7	1.9	Average	1.1	1.5	
5	0.5	1.3																					
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9	1.6	1.8																					
10	1.7	1.9																					
Average	1.1	1.5																					
	(i) What conclusion could the students make about the hypothesis? Use data from Table 1 and Fig. 1 to support your answer. Later, the students discussed their beach fieldwork and how they could have improved the accuracy and reliability of their results. What suggestions could they have made?	[6]																					
	<u>Conclusion of Hypothesis (Award 1 mark per point up to a max of 3 marks)</u> - Hypothesis is mainly valid/ groynes do reduce movement of material - North side of groyne has bigger build up of material/ Distance from top of groyne to beach material is less on north side. (Average measurement from top of groyne to beach = 1.1 to north, 1.5 to south of groyne) - Groyne has less influence towards sea/more than 25-30 m away from point X <u>Suggestions (award 1 mark per point up to a max of 3 marks)</u> - Do more profile measurements either side of the groyne/ every 5m - Do more profile measurements at different sites along the beach/ at other groynes on this beach - Check accuracy of measurements by collecting more readings per sampling point - Test if the results would be the same at different times of the year/days/conditions - Check accuracy of measurements by involving more people to read the measurements for double-checking purpose.																						
	(ii) What are some of the safety precautions the students have to consider before conducting the fieldwork?	[2]																					
	Consult tide tables/work at low tide/watch out for waves and currents to avoid doing fieldwork during high tide																						

Name: _____ () Class: _____

• Watch out for slippery rocks/uneven groyne • Avoid working near foot of crumbling cliffs/wear hard hat • Wear covered shoes to protect against sharp objects • Bring a mobile phone in case of emergency/ to call for assistance X work under teacher supervision/ don't go into sea X Be aware of surrounding cliffs and falling rocks. (No cliffs in this region) X Pick up litter/ protect the natural environment X Ensure that equipment is in working condition (Not a safety concern) Award 1 mark each up to maximum of 2.	
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(c) Another group of students conducted a tourism fieldwork study on the same area. They considered the guiding question "How do the reasons for visiting Aberdeen, Scotland, vary according to the profile of tourists?" [3] The students narrowed down the tourists to three different profiles. Profile A = age between 20-30 Profile B = age between 31-50 Profile C = age 50 and above Describe with some details, the best method in which they can collect the relevant data to respond to the guiding question.	
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Name: _____ () Class: _____

- They can design a simple questionnaire to interview tourists in Aberdeen.
- The questions asked should be related to age and to the reasons why the tourists visit Aberdeen.
- Decide on the locations of the interviews. They must be well spread out throughout Aberdeen and also have high tourists traffic.
- Decide on sampling size. (At least 100 tourists should be interviewed to get a good representation)
- Decide on the type of sampling method
- Conduct the interview and collate the results and present the data using a suitable data representation method.

(Award 0.5 mark for each point)

(d) Fig. X shows the triangular graph the students plotted after getting the results of the investigation. Using Fig.2, complete the data *a* and *b* in Table 2. [1]

Fig. 2: Reasons for visiting, Aberdeen, Scotland

Reasons for visit/Tourist Profile	Relaxation	Cheap	Weather
Profile A	22%	60%	18%
Profile B	A 34	B 53	13%
Profile C	61%	30%	9%

✓ Almost 90% of the candidates are able to read the triangular graph. The minority who did not get the correct answer did not check that the total must add up to 100%

a- 34%

b- 53%

(Accept +/- 1%)

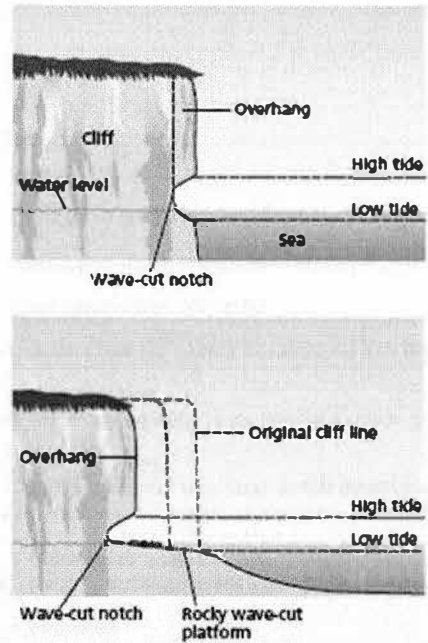
(e)	Using the information from the completed Table 2 and Fig. 2, draw conclusions in response to the guiding question.	[3]
	The older the tourists, the more they visit Aberdeen for relaxation purposes. 61% of the tourists in Profile C visit Aberdeen for relaxation as opposed to 22% of tourist in Profile A Younger tourists are more concerned about budget as opposed to older tourists. 60% of the tourists in Profile A visit Aberdeen because it is cheap compared to 30% of the tourists in Profile C. Few tourists go to Aberdeen because they enjoy the weather. Only an average 18% of the tourists go to Aberdeen to enjoy the weather. (Award 1.5 marks per point. Award 1 mark for conclusion and 0.5 mark for relevant data) Max 2 marks for pure description and listing results. Description- Tourists who are between 20-30 years go to Aberdeen because it is cheap. 60% of the tourists in Profile A (Age 20-30) visit Aberdeen because it is cheap.	
(f)	(i) The students also compared the popularity of Aberdeen with a nearby beach resort town, Nairn. They found that Nairn has 50% more visitors compared to Aberdeen. The student wanted to find out why Nairn had more tourists than Aberdeen. They decided to conduct a landuse survey to find out if the types of services provided is the reason for the disparity. Describe how they can go about conducting the landuse survey in Aberdeen. 1. Draw/ Get a base map of Aberdeen 2. Decide of the classification of shops in Aberdeen e.g. retail/ hostel/ transportation 3. Go to each shop in Aberdeen and decide on the category it belongs to/ Interview the shop owners to find out what is their main business 4. Shade the category on the base map of Aberdeen 5. Calculate the percentage of each category of shop. 6. Analyze the results to see what types of shops are lacking in Aberdeen and use the results to make improvement to attract more tourists (ii) Fig. 3 shows the results of the landuse survey conducted by the students in Aberdeen Town.	[3]

<u>Landuse Survey of Aberdeen Town</u>  Legend <table border="1"> <tr> <td>Hostel</td> <td>High-End Retail Shops</td> </tr> <tr> <td>Hotel</td> <td>Souvenir Shop</td> </tr> <tr> <td>Spa</td> <td>Restaurant</td> </tr> <tr> <td>Cafe</td> <td>Transportation Amenities</td> </tr> </table> Fig.3		Hostel	High-End Retail Shops	Hotel	Souvenir Shop	Spa	Restaurant	Cafe	Transportation Amenities
Hostel	High-End Retail Shops								
Hotel	Souvenir Shop								
Spa	Restaurant								
Cafe	Transportation Amenities								
<u>Problems (Award 1 mark per point up to a max of 3 marks)</u> • Most of the tourists go to Aberdeen because it is cheap and for relaxation purposes • Lack of accommodation for budget tourists. Only 1 hostel is available as opposed to 3 hotels • Lack of amenities for relaxation. There are more retail shops e.g. souvenir shops and high end retail shops as opposed to 2 amenities for relaxation (café and spa) • Lack of food options for budget tourists. There is only 1 café as opposed to 4 restaurants. <u>Improvement (Award 1 mark per point up to a maximum of 3 marks)</u> • More transport/accessibility • Have more amenities for relaxation e.g. spas/ cafes • Have more food options for budget tourists • Balance the other shops by cutting down shops on retail shops									

Name: _____ () Class: _____

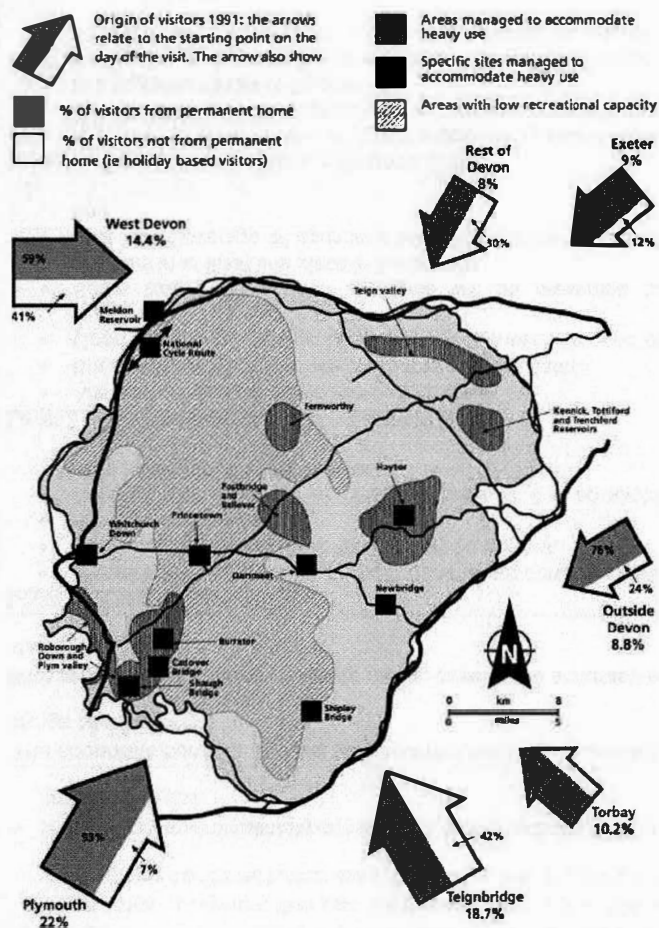
2a	Map B (Insert) is a topographical map of the coastal area around Beer and Seaton in East Devon, England. With reference to Map B (Insert), identify the two coastal landforms found in GR 2689 and explain how they can be formed with the aid of well-labelled diagrams.	[7]
	- Sea cliff [1m] and Wave-cut platform[1m] - Hydraulic action and solution erodes the rock surface along the lines of weaknesses to form a notch. The notch is further eroded into a sea cave. [1m] - As the sea cave is further eroded, gravity will cause the roof of the cave (overhang) to collapse. [1m] - The erosion process continues along the line of weakness and the cliff will retreat inland. A gently sloping rocky platform will form at the base of the cliff, known as the wave-cut platform.[1m] - Award a max of 2 marks for diagram. Minus 0.5 each for missing box/ title/ essential labels	

Name: _____ () Class: _____

		
b	Beer and Seaton are also trying to establish themselves as tourist destinations, suggest the type of niche tourism can Beer and Seton can develop. Support your answer with evidence from the map.	[2]
	- Heritage tourism- presence of heritage center in 2389 - Educational tourism- presence of many coastal features e.g. cliffs/ wave-cut platform Award 1 mark for identification of type of tourism and a reasonable evidence for identification (need to name or locate features mentioned by GR)	

c Dartmoor National Park is one of the attractions in Devon, England. Fig. 4 shows the origin of the visitors to the national park in 1991.

With reference to Fig. 4, describe the trend of the origin of the visitors to Dartmoor National Park in 1991. [3]

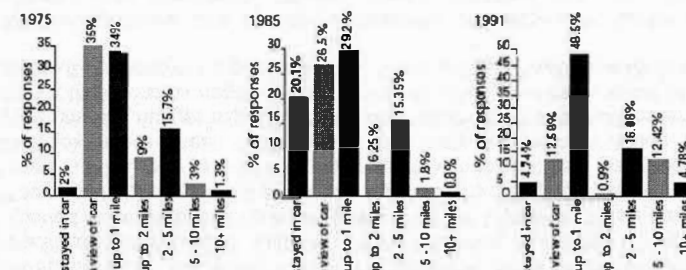


- The largest group of the tourists to Dartmoor National Park came from

Plymouth. 22% of the visitors are from Devon.

- Most of the visitors are from permanent homes as opposed to holiday based visitors. 73.4% of the visitors are from permanent homes. (Award 1.5 marks for each point. Minus 0.5 marks for missing data)

d Fig. 5 shows the changes in visitor activities in Dartmoor National Park.



Describe how visitor activities has changed from 1975 to 1991 and give reasons to explain the trends. [5]

X very poorly-done question. Candidates cannot see trends. Most tried to describe the different types of activities but failed when it got too complicated.

X Some missed out the 2nd part of the question

Description

- The number of visitors who travel a longer distance from their cars has increased. In 1975, 20.1% of visitors travelled more than 2 miles from their cars while in 1991, 33.3% did.
- The number of visitors who stayed in or within view of the car also decreased from 37% in 1975 to 17.2% in 1991.
- What has remained unchanged is the travelling up to 1 mile from their vehicle or in view of the car is the most common activity. 69.9%, 55.7% and 61% of the visitors did that in 1975, 1985 and 1991 respectively.

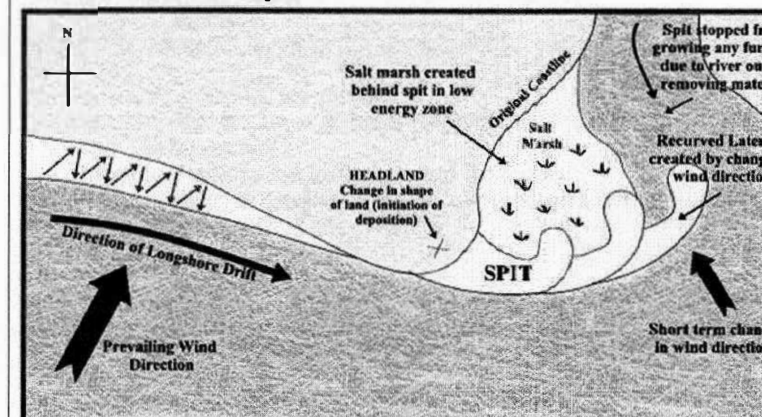
Reasons

	- More people tend to travel further away due to increase in the need for a healthier lifestyle. Walking is a form for exercise. - Access to information could also be another reason for people willing to travel further away from their cars. With technology such as Google Maps, more people can travel further away without the fear of getting lost. - Increasingly environmentally-conscious. Walking reduces the emission of greenhouse gas.	
e	'The economic benefits derived from tourism outweigh the costs it brings to a country.' With reference to studies you have made, assess the accuracy of this statement.	[8]
	<u>Level 1 – Basic Statements (1-3m)</u> - Answers will be generalized or with minimal support if any given at all. - Reasoning is weak and expression may be unclear. - Has little development. - Answers lack examples or other evidence, or it is so sketchy that it adds little support to the answer. <u>Level 2 – Development of Points + Support (4-6m)</u> - Answers will contain some appropriate detail. - But content will lack balance and some relevant detail. - 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. - Max 5m: Coverage of economic benefits/negative impacts of tourism only. <u>Level 3 – Further development + Balance (7-8m)</u> - Answers will be comprehensive and supported by sound knowledge. - Specific details and elaboration of at least two economic benefits and two negative effects of tourism - Reasoning is clear and logical with good expression of language. - Examples or other evidence to support answer will be extensive. # Explanation of benefit must include how it impacts the economy # costs can be from any category i.e. social, economic Tourism brings economic benefits as well as costs. One of the economic benefits is that it helps the economy grow as it contributes to the country's revenue. Tourists spend on food, accommodation and entertainment in the destination country. For example, in 2010, about	

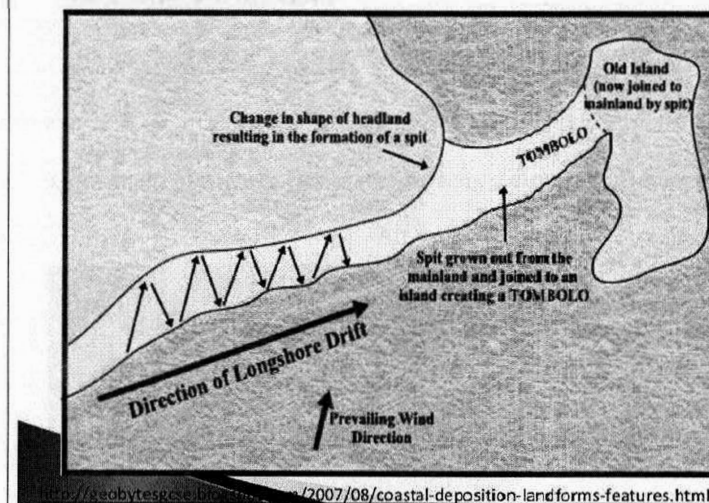
	\$S\$20 billion was generated by tourism in Singapore, accounting for 8% of Singapore's Gross Domestic Product (GDP). Tourist expenditure circulates through the economy via the multiplier effect. This promotes development in the country and improves the locals' standard of living Tourism also increases employment opportunities in a country. It creates many jobs since it is a labour-intensive industry. People are employed in tourism-related jobs like hotel staff, restaurant chefs, tour guides and casino staff. For example, tourism creates about 6% of the jobs in Singapore. It benefits the locals in the country as there are more jobs available and people will be able to learn a higher and more stable income and this will improve their standard of living. Moreover, tourism also brings about infrastructure development in a country. When a country wants to attract tourists to their country, there is a need to build amenities such as transport systems, bigger airports and more attractions. For example, for the 2008 Olympics, the government built the subway system around Beijing to increase the efficiency of travelling around the city. This not only benefits the tourists but also brings about economic benefit to Beijing. As locals also use the subway system, it helps them reduce travelling time to and from work and this increases productivity and will help to increase economic competitiveness and attract more investors to Beijing. However, tourism also brings about certain economic costs to the country. One cost that tourism bring is the underuse of facilities. Since some types of tourism are seasonal, facilities built specifically for certain events may be underused when the event is over. For example, some of the venues built specifically for the 2008 Summer Olympic Games in Beijing, China, were reported to be deteriorating a few years after the Olympics. Some had to be renovated to become more profitable. According to a Beijing Sports University report in 2011, only one-third of major sports venues in China have managed to break even. These facilities can be costly to maintain. Much of the government's budget might be spent on maintaining these facilities and this impact the economy negatively as the money could have been spent on other areas of development e.g. education and upgrading of healthcare facilities Another economic cost tourism is seasonal unemployment. Some tourist activities may experience different climatic conditions that will affect the number of tourists. North East Monsoon in Eastern parts of Peninsular Malaysia experience a drop in number of tourists from December to February or South West Monsoon affecting Western India in the months of June to Sept. This affects the income of the people who are employed in the tourism sector and causes them to have unstable income and this might impact their standard of living. In conclusion, I agree with that statement that the economic benefits do outweigh the social costs of tourism. An increase tourism receipts allow for	
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	more funding for conservation and restoration projects. Furthermore, these economic benefits include a growth in income for the locals as well, which will go a long way in providing a better standard of living for those in less developed countries. In addition, most of the costs mentioned can also be managed by the tourism planning authorities. Long term planning before facilities are built will ensure that facilities has its uses and value after major tourist event	
3	Fig. 6 shows the coastal area of Biddeford, United Kingdom.	
(a)	(ii) Identify the coastal landform named Fletcher Neck and explain how it was formed with the aid of well-labelled diagrams.	[5]
	- Fletcher Neck is a tombolo (0.5m) - The longshore drift moves sediments along the coast. (0.5m) - When there is a change in the direction of the coastline, the longshore drift continues in the original direction. (0.5m) - It loses energy and begins to deposit sediments. (Common Missing point) Sediments accumulates and appear above the surface of the water.(0.5m) - A spit is formed. (0.5m) - If it continues extending and joins up with a nearby island, it will be known as a tombolo. (0.5m) - Award a max of 2 marks for diagram. (necessary labels include direction of longshore drift, direction of prevailing wind, island, deposition of sediment, tombolo)	

The Formation of a Spit



Formation of a Tombolo



- (b) Fig. 7 shows the location of the Coral Triangle in Southeast Asia. The Coral Triangle is a region that comprises 76% of all known coral species in the world. Describe the distribution of coral reefs in Southeast Asia and describe the

	conditions which encourages the growth of coral reefs <u>in this area</u> .	[5]
	<u>Distribution</u> • Coral reefs are found near the Equator and is concentrated near Malaysia, Indonesia and Philippines. • They are usually found in shallow waters and near sheltered coasts. <u>Conditions (must be linked to conditions in the coral triangle)</u> • The region has shallow seas of less than 50m which allows sunlight to pass through to encourage the photosynthesis of algae • The sea temperature in this region is always higher than 18°C as it has a tropical climate • Presence of islands shelter the area from storm waves which can be destructive to corals.	
(c)	Fig. 8 is an extract which describes a particular phenomenon in a coastal region. "The next thing to understand is that corals have a limited temperature range within which they can live. When it gets too hot, they get stressed out—and this relationship with the algae goes sour. The tiny algae are ejected from the corals, turning them white." Fig. 8 Identify the phenomenon described in Fig. 8 and explain what types of environmental impact it will have the surrounding coastal regions.	[4]
	• Coral Bleaching • Reduction of coastal protection ability leads to increase coastal erosion and loss of protection from storm waves • Reduction in safe environment for baby fishes and other marine creatures • Disruption in marine food chain. Marine creatures that live around the coral reefs provide food for larger creatures. May lead to loss of food supply for other marine creatures,	
d	Fig.9 shows a coastal protection measure used in South Devon, United	

	Kingdom.  Fig.9 What is the coastal protection measure used? Explain how it works and what its limitations are.	[3]
	• Gabions • The wire cages filled with rocks allows water to filter through and reduces the energy of the waves and reduces erosion. • The limitations are that the wire cages rust easily when they come into contact with sea water and therefore have to be replaced regularly. / Wire cages are also sharp and may pose a danger to beach goers. X many candidates were not able to identify the protection measure.	
e	"Erosion is the main threat to coastal areas" With reference to studies you have made, assess the accuracy of this statement. <u>Level 1 – Basic Statements (1-3m)</u> • Answers will be generalized or with minimal support if any given at all. • Reasoning is weak and expression may be unclear. • Has little development. • Answers lack examples or other evidence, or it is so sketchy that it adds little support to the answer. <u>Level 2 – Development of Points + Support (4-6m)</u> • Answers will contain some appropriate detail. • But content will lack balance and some relevant detail. • Good reasoning and logic in parts of the answer with good expression	[8]

	in places. - Some examples or other evidence will be presented to support answers in at least one place in the answer. - Max 5m: Coverage of economic benefits/negative impacts of tourism only. Level 3 – Further development + Balance (7-8m) - Answers will be comprehensive and supported by sound knowledge. - Specific details and elaboration of at least two economic benefits and two negative effects of tourism - Reasoning is clear and logical with good expression of language. - Examples or other evidence to support answer will be extensive. Erosion is one of the threats to coastal areas. However, it is not the only threat. Rising population and climate change are other threats to coastal areas. Erosion is the action of the waves removing rocks or other beach materials from the coastal areas. In a coastal area, erosion can happen by the action of waves or wind. Erosion processes such as solution, hydraulic action, abrasion and attrition can remove beach materials and cause the coast to be eroded. Erosion usually happens when the beach experiences destructive waves when the backwash is stronger than the swash. Erosion is a threat because erosion pushes back the shoreline, damaging valuable land and properties through flooding and deposition of sediments on property. For example, in East Coast Park, Singapore, erosion of the beach has caused the shoreline to retreat to the beachfront restaurants such as the MacDonald's and sand from the beaches were washed in the Goldkist Resort. This causes much inconveniences to shop owners and to the visitors of the beach. However, other threats like climate change are also threaten coastal areas. Climate change results in rising sea levels. This is because of the expansion of sea water and the melting of the ice-bbergs due to global warming. The rise in sea level is estimated to be between tens of centimetres to more than 1 metre. This could lead to the submersion of low-lying coastal areas such as beaches and river deltas. For instance, low lying islands such as the Maldives are slowly being submerged due to the rise in sea levels. Eventually these areas could disappear. In many of these low-lying areas, homes are being destroyed and families have to be uprooted so that they could escape the rising sea-level. This causes a disruption to livelihood and also to the cultures of the people who live along the coastal regions. Another threat to the coastal is rising population. Many of the earth's inhabitants live along the coast. This puts a strain on the land and water	
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	resources along the coast. More housing materials and space is need to cater to the increasing population along the coast. For example, in the province of Ca Mau in Vietnam, more than 60 000ha of coastal mangroves were cleared for building materials and building shrimp farms. This has made Vietnam more vulnerable to erosion from storms and pollution due to waste emitted from the shrimp farms. This is a threat to coastal areas as it damages the biodiversity and endangers many valuable ecosystems such as coral reefs and mangroves. Without these ecosystems, coastal areas are open to erosion and storms, threatening them. In conclusion, I feel that erosion is not the main threat. Climate change is the main threat. This is because erosion can be managed by various coastal management measures such as building of breakwaters or seawalls. Rising population can also be managed by resettlement policies or other birth control strategies. However, climate change is not an issue who is purely man-made. It can only be solved to a certain extent. Therefore, it will remain the main threat to coastal areas for a long time to come.	
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FAIRFIELD METHODIST SCHOOL (SECONDARY)
PRELIMINARY EXAMINATION 2016
SECONDARY 4 EXPRESS

GEOGRAPHY

2236/ 02

Paper 2

Duration: 1 hour 30 minutes

Date: XX Aug 2016

READ THESE INSTRUCTIONS FIRST

Write your name, class and index number on the answer paper provided.

Write in dark blue or black pen on both sides of the paper.

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.

Write all answers on the Answer paper provided.

Candidates should 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.

This question paper consists of 9 printed pages including the cover page.

Section A

1. a. Fig. 1 shows the cross section of a tropical cyclone.

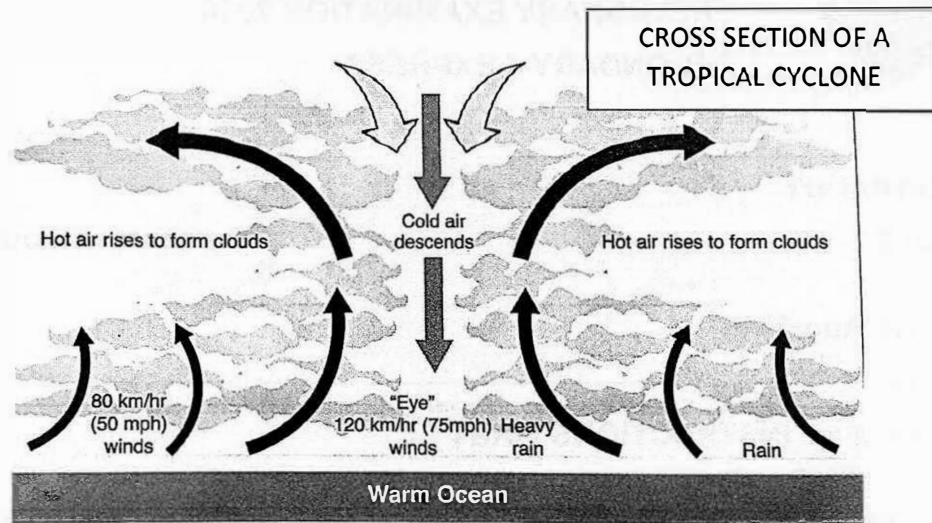


Fig. 1

- (i) With reference to Fig. 1, describe and explain the characteristics of a tropical cyclone. [4]
- (ii) With reference to examples you have learnt, describe and explain two economic impacts of tropical cyclones. [4]
- b. Fig. 2 shows the climograph of Buenos Aires, Argentina. The Association of Tennis Professionals World Tour to Buenos Aires is played on a clay court with an open-top stadium.

Climograph of Buenos Aires

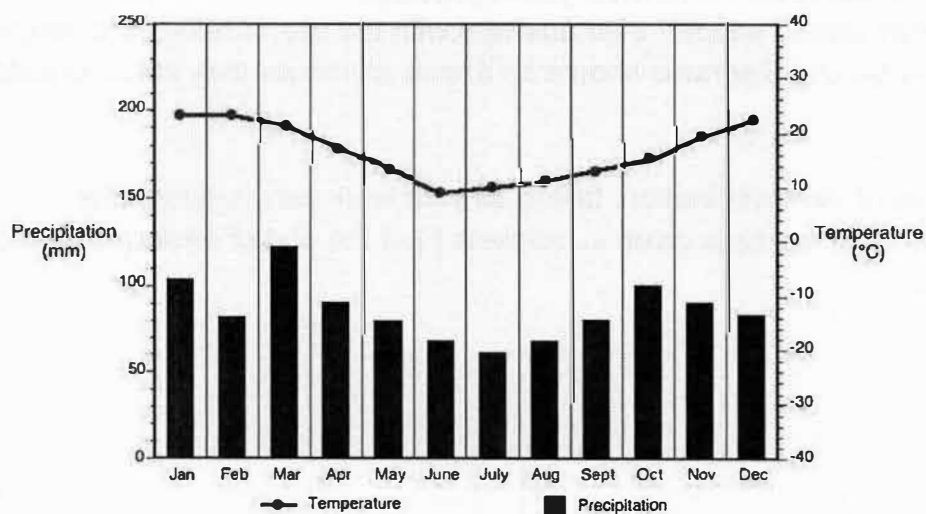


Fig. 2

- (i) The climate patterns of Buenos Aires is similar to but does not fall under the climatic type of equatorial countries. With reference to both rainfall and temperature, compare and contrast the climatic characteristics of Buenos Aires with an equatorial country like Singapore. [4]
- (ii) Suggest when the tournament should be held. Justify your answer with reference to Fig. 2. [2]
- (iii) Suggest the type of rainfall experienced during the summer months in Buenos Aires and state 2 differences between the type of rainfall experienced in Buenos Aires and another type of rainfall you have studied. [3]
- c. 'Climate change is unnatural.' How far do you agree with this statement? [8]

2. a. Describe and account for the global distribution of tropical cyclones. [4]
- b. (i) With reference to specific examples, discuss the environmental and social impact of sea level rise. [4]
- (ii) With reference to the Kyoto Protocol, discuss how successful international strategies have managed the problem of climate change. [3]
- c. Ecuador also faced a series of large scale eruptions in 2016. Fig. 3 shows the profile of Tungurahua, an active volcano in Ecuador.



Fig. 3

With reference to Fig. 3, identify the type of volcano found in Tungurahua. Support your answer with characteristics identified from Fig. 3. [3]

- d. Table 1 shows the 2016 earthquake occurrences with at least 7.0 magnitude.

Magnitude	Death toll	Location	Depth (km)	Date
7.8	0	Indonesia	24.0	March 2
7.8	661	Ecuador	21.0	April 16
7.2	0	Russia	163.2	January 30
7.2	0	South Georgia and the South Sandwich Islands	72.7	May 28
7.1	0	United States	125.6	January 24
7.0	40	Japan	10.0	April 15
7.0	0	Vanuatu	27.2	April 28

Table 1

- (i) Describe and account for the difference in the resultant death tolls in Japan and Vanuatu despite having the same magnitude. [3]
- (ii) 'Living in earthquake-prone areas have no benefit at all.' How far do you agree with this statement? [8]

Section B

- 3 The Zika virus, which is spread by *Aedes aegypti* mosquitoes, triggered a global health emergency in 2016.

Global distribution of areas which are environmentally suitable for Zika virus

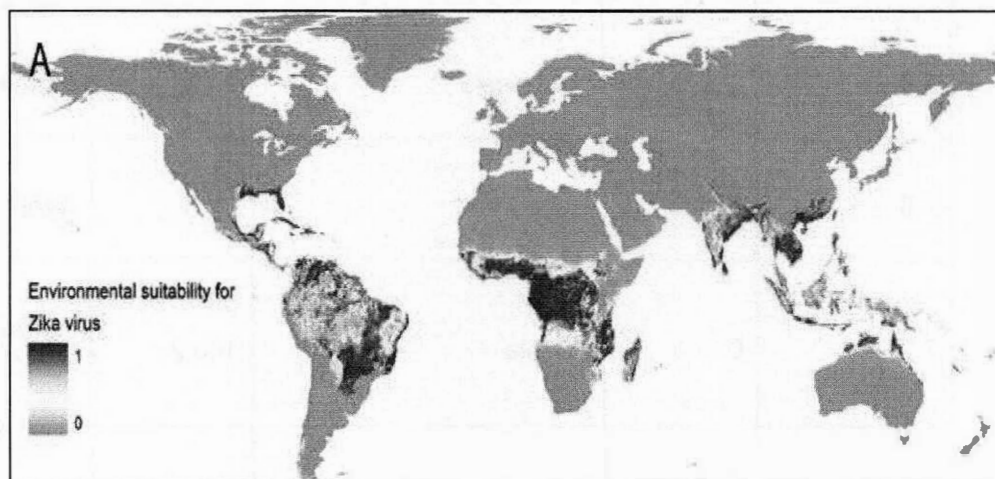


Fig. 4

- a. With reference to Fig. 4, describe and account for the global distribution of areas which are environmentally suitable for Zika virus. [6]
- b. The table below shows the leading causes of death by broad income groups.

Leading causes of death	Deaths in millions	
	High Income	Low income
Coronary heart disease	1.42	0.57
Stroke	0.79	0.45
Lung disease	0.32	0.10
Alzheimer's disease	0.37	0.13
<i>Diarrhoeal diseases</i>	0.83	0.76
<i>HIV/AIDS</i>	0.03	0.72
<i>Malaria</i>	0.03	0.48

Table 2

Diseases in **bold** – Degenerative diseases
Diseases in *italics* – Infectious diseases

- (i) What are degenerative diseases? [1]
- (ii) Based on Table 2, describe the relationship between poverty, affluence and the types of disease affecting people. [2]
- (iii) Suggest reasons for the relationship describe in (i). [4]

- c. (i) With reference to specific examples, explain the economic impact of HIV/AIDS on a country. [4]

- (ii) 'Government strategies are the most crucial approaches in mitigating the impact of infectious diseases.' How far do you agree with this statement? [8]

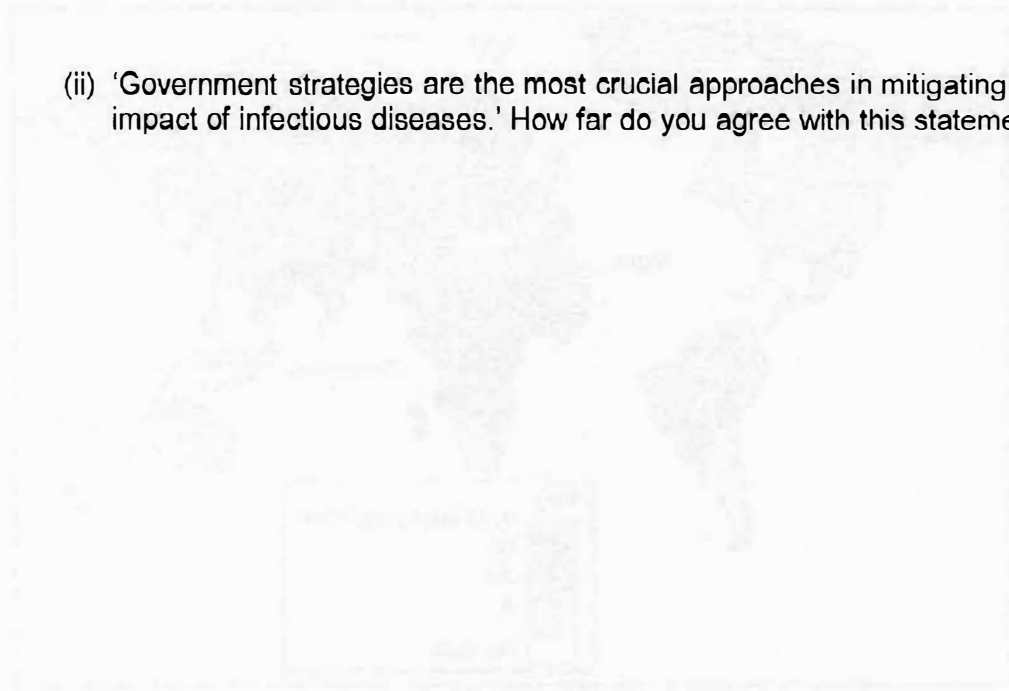


Figure 1: World map showing the distribution of HIV/AIDS cases.

Figure 2: Line graph showing the impact of government strategies on HIV/AIDS prevalence.



Fig. 5 is a 'Hunger Map' showing the undernourished population worldwide, 2000-2002.

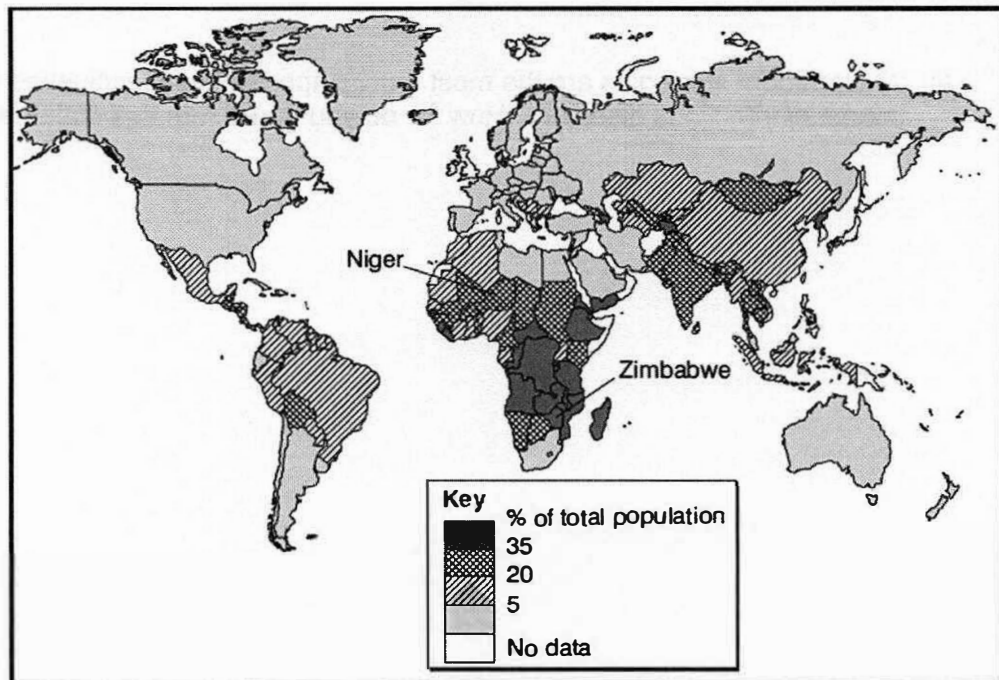


Fig. 5

a. With the aid of Fig. 5, describe and account for the distribution of undernourished population in the world. [4]

b. Fig. 6 below shows the global area of biotech crops from 1996 to 2005.

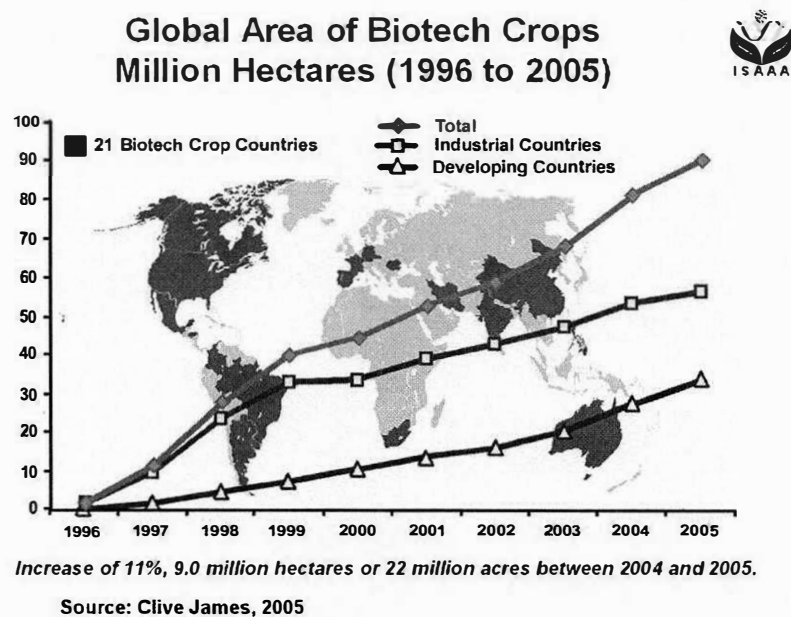


Fig. 6

(i) Describe the trends of the amount of space used globally for the growing of Biotech Crops. [3]

- (ii) Fig. E shows some statistics about how the United States of America turns corn into ethanol.

FOOD OR FUEL?

Nearly a billion people will go hungry tonight, yet this year the U.S. will turn nearly 5 billion bushels of corn into ethanol. That's enough food to feed 412 million people for an entire year.

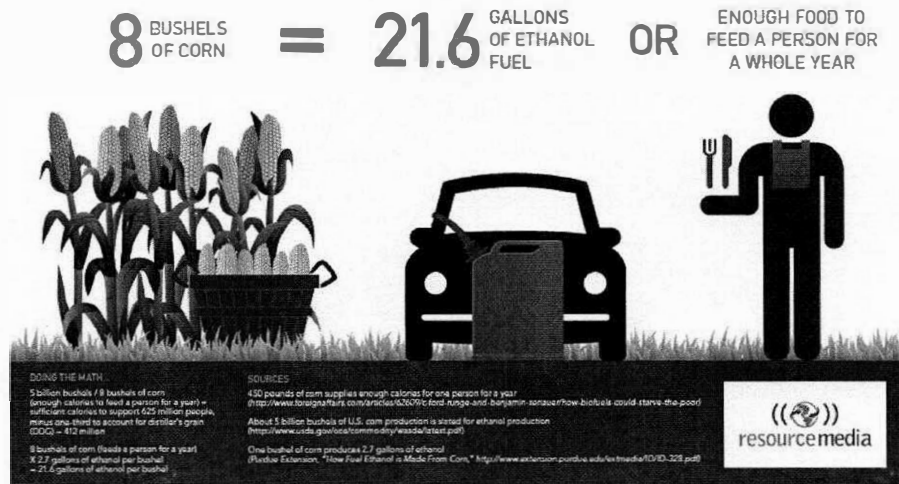


Fig. 7

- With reference to Fig. 7, state one reason why there continues to be food shortage in the U.S. and explain the correlation between the information given in Fig. 6 and the trends described in (i). [2]
- c. (i) With reference to specific examples, explain the economic impact of malaria on a country. [4]
- (ii) While about half of the world's population is at risk of contracting malaria, some areas are more vulnerable than others. With reference to specific examples, describe and explain the socio-economic factors contributing to the spread of malaria. [4]
- d. 'Technological strategies are the most crucial approaches in solving the problem of food shortage globally. 'How far do you agree with this statement? [8]

Answer Scheme

1. a. Fig. 1 shows the cross section of a tropical cyclone.

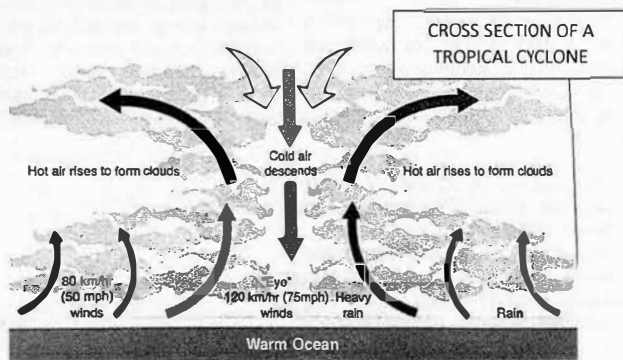


Fig. 1

- (i) With reference to Fig. 1, describe and explain the characteristics of a tropical cyclone. [4]

1. The eye is a low pressure zone because it is where warm moist air over the ocean expands and rises to form clouds.
2. Tropical cyclones have sustained high wind speeds of 80 to 120km/h because of the strong pressure gradient.
3. Tropical cyclones have bands of cumulonimbus clouds surrounding the eye wall that form and bring torrential rainfall.
4. Due to the Coriolis Effect, the air moving inwards is forced to undergo a rotary motion.

Award 1m for any of the above points.

- (ii) With reference to examples you have learnt, describe and explain two economic impacts of tropical cyclones. [4]

1. An economic impact is the costs of repairing damaged infrastructure. E.g When Hurricane Katrina struck in 2005, the cost of repairs for 20 000 homes was US\$81 billion.
2. Another impact of tropical cyclones that is economic in nature is also the loss of income due to damaged crops. E.g When Tropical Cyclone hit Northern Queensland, hundreds of kilometers of banana plantations and cane fields were destroyed, US\$ 350 million worth of banana crop lost.

Award 1m for any of the above points.

- b. Fig. 2 shows the climograph of Buenos Aires, Argentina. The Association of Tennis Professionals World Tour to Buenos Aires is played on a clay court with an open-top stadium.

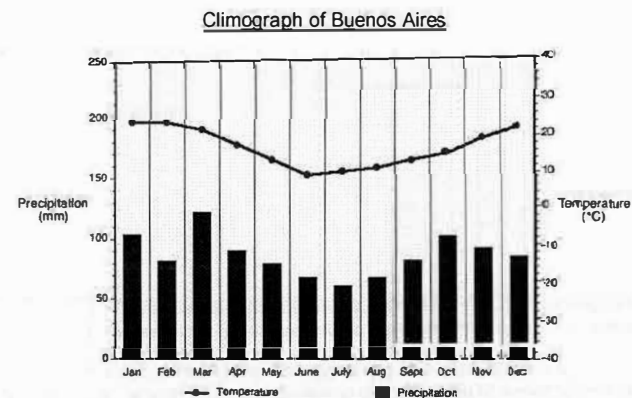


Fig. 2

- (i) The climate patterns of Buenos Aires is similar to but does not fall under the climatic type of equatorial countries. With reference to both rainfall and temperature, compare and contrast the climatic characteristics of Buenos Aires with an equatorial country like Singapore. [4]

Similarities

1. The mean annual temperature does not go below zero degrees in both countries.
2. The rainfall is also constant all year round, with no distinct wet or dry seasons.

Differences

1. The temperature range in Buenos Aires (5 to 6 degrees Celsius) is wider than that in an equatorial country like Singapore (2 to 3 degrees Celsius).
2. The mean annual temperature in Buenos Aires (15-16) is lower than that of the equatorial country like Singapore (27).

Award 1m for any of the above points.

- (ii) Suggest when the tournament should be held. Justify your answer with reference to Fig. 2. [2]

1. June/July/August
2. These are months with the lowest rainfall in the year, no more than 70mm. The open top of the court means there is no protection from rain. Hence the month chosen should be one where there is a relatively lower amount of rainfall. The mean temperature ranges between 10°C and about 24°C which are not extremely high or low temperatures. Hence, temperature is not an important deciding factor.

Award 1m for any of the above points.

- (iii) Suggest the type of rainfall experienced during the summer months in Buenos Aires and state 2 differences between the type of rainfall experienced in Buenos Aires and another type of rainfall you have studied.

[3]

1. Rainfall in Buenos Aires is likely to be convectional rain.
2. Convectional rainfall occurs when it is sufficiently hot whereas relief rainfall only occurs where moist air is forced to rise over a physical barrier such as a physical landform.
3. Heavy rain storms with thunder and lightning usually occur during Convectional rainfall but not so in relief rainfall.

Award 1m for any of the above points.

- c. 'Climate change is unnatural.' How far do you agree with this statement?

[8]

Natural	Unnatural
<u>Variations in solar output:</u> the sun emits varying amounts of solar radiation due to changes in its magnetic field. An increase in magnetic activity results in an increase in solar radiation. The magnetic activity of the sun has a cycle, which is associated with the earth's cycles of high and low global temperatures. A peak in the number of sunspots in 2000 coincided with higher solar activity. Global temperatures increased during this period.	<u>Deforestation:</u> causes the loss of large amount of trees which take in billions of tonnes of carbon dioxide every year via photosynthesis. The decrease in forests means fewer trees to absorb a significant amount of carbon dioxide from the atmosphere. Soil is also exposed to the sunlight, increasing its temperature and the rate of carbon oxidation in the soil. This process causes carbon in the soil to react with oxygen in the atmosphere to produce carbon dioxide. Between 2000 and 2010, 52,000 square kilometres of forest was lost every year. This means that every day, 142.5 square kilometres of forest, which is about four and a half times the area of Jurong Island, was lost.
<u>Volcanic eruptions:</u> when a volcano erupts, large volumes of carbon dioxide, water vapour, sulphur dioxide, dust and ash are released into the atmosphere. These particles can result in global dimming, which temporarily cools the earth. The 1991 eruption of Mount Pinatubo in the Philippines caused temporary global dimming. The eruption	<u>Urbanisation:</u> refers to an increasing concentration of people in towns and cities. Large amounts of fossil fuels are burnt to provide energy for household activities including heating, cooling, cooking and lighting. High concentration of vehicles contributes to the greenhouse gases. Constructing

released 17 million tonnes of sulphur dioxide into the atmosphere, forming sulphur-based particles that spread around the earth in two weeks.	infrastructure and producing construction materials also releases greenhouse gases.
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Earth's climate does change naturally, but the current warming is not natural. Known natural causes of warming, such as the sun, have been constant in the past 30 years, so they cannot explain the warming of the past 30 years. It has been shown beyond a shadow of doubt that humans have increased CO₂ in the atmosphere by 30% in the last 150 years. Both natural and human factors contribute to global warming, however, evidence has shown that the warming we are currently witnessing is largely as a result of human forcing. Humans have increasingly been contributing unnatural sources of greenhouse gases into the system, causing the system to become unbalanced.

Levels	
(0-3 m)	• Answers are general with minimal or no support. • Description of human activities or other factors is rather weak and expression not very clear. • A basic answer that has little development. • Answers lack examples or other evidence, or it is so sketchy that it add little support to the answer.
(4-6 m)	• Human activities or natural factors are supported by appropriate detail. • Or, both 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.
(7-8 m)	• Answers are comprehensive and supported by sound knowledge. • Both 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.

2. a. Describe and account for the global distribution of tropical cyclones.

[4]

1. Tropical cyclones are found between latitudes of 8° and 15° north and south of the Equator.
2. This is where the Coriolis effect is strong and causes the winds travelling towards the equator to begin rotary motion.
3. They usually develop over warm bodies of ocean with sea temperatures of more than 26.5°C
4. An area of low pressure is formed as warm, moist air over the ocean expands and rises due to the warm ocean temperatures.

Award 1m for any of the above points.

- b. (i) With reference to specific examples, discuss the environmental and social impact of sea level rise. [4]

Environmental:

1. Rising sea levels cause many wetland habitats to be lost.
2. Majuro Atoll in the Pacific Ocean will lose 80 percent of its land if the sea rises by half a meter. Sometimes Corals like those in Seychelles may also be bleached because of sea level rise. OR Mangroves along the Gulf of Thailand have been facing troubles colonising the areas further inland despite sea level rise as they will be in competition with human activities such as farming and the construction of sea defences.

Social:

1. Sea level rise will also cause low lying areas to be lost to flooding and many people will have to be relocated or face destruction of property.
2. 600 million people worldwide live in areas less than 10 metres above sea level such as Venice.

Award 1m for any of the above points. Accept other plausible answers.

- (ii) With reference to the Kyoto Protocol, discuss how successful international strategies have managed the problem of climate change. [3]

1. The Kyoto Protocol is an agreement linked to the United Nations Framework Convention on Climate Change (UNFCCC), which is an international convention setup with the goal of reducing the amount of greenhouse gases in the atmosphere.
2. Many countries such as Finland, Greece and Ireland have met or exceeded the targets set by the Kyoto Protocol. It was also successful in encouraging sustainable development by giving out CER credits to countries which carried out emission reduction projects.
3. There were still countries such as Denmark, Austria and Spain which did not achieve their targets and which continued to contribute significantly to the global emissions. These increased by 35%.

Award 1m for any of the above points.

- c. Ecuador also faced a series of large scale eruptions in 2016. Fig. 3 shows the profile of Tungurahua, an active volcano in Ecuador. With reference to Fig. 3, identify the type of volcano found in Tungurahua. Support your answer with characteristics identified from Fig. 3. [3]

1. It is a stratovolcano.
2. From Fig. 1, we can see that a lot of smoke has been erupted, suggesting that the eruption was explosive. In a stratovolcano, more viscous lavas allow gas pressures to build up to high levels thus causing explosive eruptions.
3. From Fig. 1, we can also see that the sides of the volcano are concave. A stratovolcano is quite steep because lava barely flows at all. The lava will cool and solidify near the vent, forming a steeper side near the top and a gentler side below.
4. The shield volcano is usually quite flat and shorter but the volcano in Fig. 1 is 5023 m and that is quite tall so it must be a stratovolcano.

Award 1m for any of the above points.

Table 1 shows the 2016 earthquake occurrences with at least 7.0 magnitude.

Magnitude	Death toll	Location	Depth (km)	Date
7.8	0	Indonesia	24.0	March 2
7.8	661	Ecuador	21.0	April 16
7.2	0	Russia	163.2	January 30
7.2	0	South Georgia and the South Sandwich Islands	72.7	May 28
7.1	0	United States	125.6	January 24
7.0	40	Japan	10.0	April 15
7.0	0	Vanuatu	27.2	April 28

Table 1

- (i) Describe and account for the difference in the resultant death tolls in Japan and Vanuatu despite having the same magnitude. [3]

1. Japan has a higher death toll than in Vanuatu at 40 deaths compared to 0.
2. This is probably due to the depth of focus at which the earthquake took place at, Japan which took place at 10 km while the depth of focus took place at 27.2km.
3. The deeper the depth of focus of the earthquake, the more distance from the surface of the earth and hence, the impact of the earthquake is less felt as the energy would have dissipated more, if it started from a deeper depth.

Award 1m for any of the above points.

- (ii) 'Living in earthquake-prone areas have no benefit at all.' How far do you agree with this statement? [8]

Risks	Opportunities
Some risks associated with living in earthquake zones include the threat of tsunamis, disruption of services, fires, landslides, destruction of properties, destruction of infrastructure and loss of lives. One of the most damaging hazards of an earthquake is a tsunami. It is one of the most damaging hazards associated with Earthquakes. In 2004, a 9.2 magnitude earthquake occurred in the Indian Ocean and triggered a tsunami with waves that spread throughout the Indian Ocean. The tsunami caused damage to coastal communities in 12 countries.	Infrastructure will be developed with advanced engineering to withstand the vibration associated with an earthquake either in the aftermath of an earthquake or before it hits. Roads, bridges and dams can be built to resist the shaking of the ground so that they do not collapse, or can be easily repaired if they collapse. Homes, office buildings and factories can be fitted with trip switches that ensure all electrical points are switched off in the event of an earthquake. This measure prevents fires from breaking out. In Japan, machines in many factories automatically shut down when they sense earthquake vibrations. Large underground water tanks are emergency reservoirs for possible fire fighting after an earthquake. Underground water tanks are found in Tokyo, Kyoto and Kobe in Japan. Although reinforced infrastructure remains untested until an earthquake occurs, past earthquake events in Chile, Japan and California have demonstrated the benefits of reinforced infrastructure. These benefits include fewer lives lost, faster rescue and evacuations, and less money spent on recovery for the affected area.
An earthquake can disrupt services such as the supply of electricity, gas and water and potentially affect a	Earthquake regions will develop emergency drills. This will become even more important in earthquake

large area. Vibrations on the ground can snap pipes and break cables which may cause the outbreak of fires. Communication services such as television broadcasts and telephone connections may also be affected. The earthquake in Kobe, Japan, in 2004 damaged pipes and transmission lines. This disrupted electricity, gas and water supplies to about a million of Kobe city's 1.4 million residents.	prone regions so people will be kept safe. This creates awareness among the population and reduces levels of panic and irrational behaviour during an event too. People take part in emergency drills by moving to safe locations, listening to instructions given by trained personnel and practising first aid. Every year since 1960, Japan conducts emergency drills on 1 September to commemorate Disaster Prevention Day. People from all over Japan are involved in the annual Disaster Prevention Day, where an earthquake of high magnitude is simulated. The intention is to prepare the people mentally on how to react to a disaster. Countries which are not so earthquake prone may not develop the same rigour of training and drills, hence the people may not be as safe and protected during an earthquake.
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Governments have to find solutions to prevent the risk of a natural disaster and secure the population. There are disastrous risks involved in earthquake prone areas but there are nonetheless room for future opportunities as well. The high risk is not a reason to discourage the increase of population in these cities, as it has been explained with Tokyo, the population is still increasing. Most people are more focused and interested in the imminent benefit than a potential risk, which explains why they don't consider earthquake risk so much. Indeed, people may choose to live in a city like Vancouver even though there is a high risk of earthquakes because of the beautiful landscape, the good economy and the peaceful environment.

Levels	
(0-3 m)	- Answers are general with minimal or no support. - Description of risks or other factors is rather weak and expression not very clear. - A basic answer that has little development. - Answers lack examples or other evidence, or it is so sketchy that it add little support to the answer.
(4-6 m)	- Risks or opportunities are supported by appropriate detail. - Or, both risks or opportunities 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.
(7-8 m)	- Answers are comprehensive and supported by sound knowledge. - Both Risks or opportunities 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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3. The Zika virus, which is spread by *Aedes aegypti* mosquitoes, triggered a global health emergency in 2016.

Global distribution of areas which are environmentally suitable for Zika virus

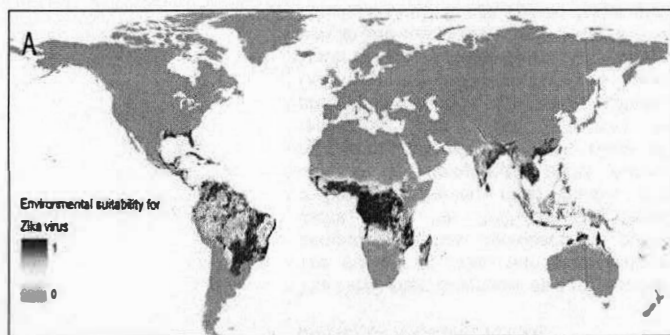


Fig. 4

- a. With reference to Fig. 4, describe and account for the global distribution of areas which are environmentally suitable for Zika virus.

[6]

Describe

- The Zika virus can be found at latitudes near to the equator.
- Found along stretches of coastline such as west of Central Africa, East of South America and Southeast Asia.
- It also can be found north of the Equator, near US and other temperate areas.
- It can also be found in densely populated areas.

Account

- The areas close to the equator have positive breeding grounds as it is both warm and damp mostly all year
- And in the US, Florida and Texas could sustain the infection when temperatures rise in summer.
- There also needs to be a large enough human population to transmit it as it is a vector borne disease.

Award 1m for each point. Accept other plausible answers.

- b. The table below shows the leading causes of death by broad income groups.

Table 2	
	Deaths in millions

Leading causes of death	High Income	Low income
Coronary heart disease	1.42	0.57
Stroke	0.79	0.45
Lung disease	0.32	0.10
Alzheimer's disease	0.37	0.13
<i>Diarrhoeal diseases</i>	0.83	0.76
<i>HIV/AIDS</i>	0.03	0.72
<i>Malaria</i>	0.03	0.48

Diseases in **bold** – **Degenerative diseases**

Diseases in *italics* – *Infectious diseases*

- (i) What are degenerative diseases?

[1]

It is a disease where the function of affected tissues or organs changes for the worse over time because of lifestyle choices, eating habits, bodily wear and tear or genetic causes. It is strongly linked to a person's diet and lifestyle.

Award 1m for each point. Accept other plausible answers.

- (ii) Based on Table 2, describe the relationship between poverty, affluence and the types of disease affecting people.

[2]

- Positive relationship - With increased poverty comes about the increase of infectious diseases.
- This is seen by how a greater number of people from the lower income countries suffer from Malaria and HIV/AIDS as compared to high income countries (0.72 mil and 0.48 mil VS 0.93 mil).
- Positive relationship – With increased affluence comes about the increase of degenerative diseases.
- This is seen by how the greatest number of people who suffer from coronary heart diseases come from high income countries (1.42 mil).

Award 0.5 m for each point. Accept other plausible answers.

- (iii) Suggest reasons for the relationship describe in (i).

[4]

- In DCs, there is increasing consumption of meat and other non-staple food due to being able to afford it.
- Such diets, coupled with low levels of physical activity, can lead to heart disease and obesity which are more common in DCs.
- Infectious diseases are more common in LDCs because the people cannot afford a better diet
- And sometimes, they also lack access to medical treatments and facilities as they stay in rural areas where these are often lacking.

Award 1m for each point. Accept other plausible answers.

- c. (i) With reference to specific examples, explain the economic impact of HIV/AIDS on a country. [4]

1. Government may allocate limited resources to care for HIV/AIDS patients and by doing so, governments divert resources that can be used instead for other purposes
2. In 2010, the government of South Africa spent US\$1.2 billion on health care expenditure for HIV/AIDS patients
3. Businesses are less likely to invest in places without adequate infrastructure, skilled labour force or with a population with poor health.
4. In Uganda, economic growth slowed by 1.2% each year due to HIV/AIDS.

Award 1m for each point. Accept other plausible answers.

- (ii) 'Government strategies are the most crucial approaches in mitigating the impact of infectious diseases.' How far do you agree with this statement? [8]

Singapore's National Environment Agency (NEA)'s approach to vector control – Surveillance and Regulation	The NEA has a five-pronged approach to vector control: 5 steps to Mozzie wipe out. It was launched on 28 April 2013. There is a 'Colour Code Alert System', which indicates the seriousness of the dengue situation through colour-coded banners. The colours indicate the corresponding preventive measures to take. The WHO cited Singapore as a role model. The number of cases with more serious dengue fever has decreased in recent years since the 2005 dengue fever outbreak. However, most people are unaware or complacent about Aedes mosquitoes breeding at their place of residence. This posed difficulties in preventing the breeding of the mosquitoes. Due to climate change, mosquitoes breed faster at higher temperatures. More people had been infected with Den-1, a new dominant virus. It can spread faster and majority of the population has no immunity against this new virus.
Individuals	Individuals to take precautionary measures such as using a spray, protective clothing or insecticide-treated nets can be used to reduce contact with mosquitoes. Vaccination helps to reduce a person's chance of getting infected and spreading the disease. Individuals can choose not to take the vaccinations. In 2009, Singapore began providing vaccinations for its

	population against the H1N1 influenza virus before it emerged in the country. Clinics island-wide were made H1N1-ready. When the outbreak occurred, most of the cases were mild and death rates were low.
NGOs	NGOs facilitate the formation of international institutions and reinforce the standards promoted by these institutions through public education, organised attempts to hold states accountable to these, and enhance institutional effectiveness by reducing the implementation costs associated with international institutions. NGOs helped set trends that have now been institutionalised within AIDS prevention: 1. Advocacy for persons living with HIV/AIDS, 2. Targeting educational materials to specific groups, 3. Improved access to experimental drug trials and health care, and 4. Peer education. NGOs are often created and staffed by community members. This gives them credibility with and understanding of the communities they serve. Thus, NGOs are more likely to attract community participation for HIV/AIDS prevention and care efforts. They are also more likely to recognise what will be appropriate and effective for their constituencies, and in so doing, increase the potential for transforming community attitudes, beliefs and behaviours from within the community. The AIDS Support Organisation (TASO) - Uganda was organised in response to the urgent need in Uganda for medical, emotional and practical support for people with HIV/AIDS and their immediate families. However, as NGOs often operate with volunteer or modestly paid staff, they risk the likelihood of erosion due to burn-out. They need to maintain a balance between paid and volunteer staff in order to maintain project continuity, while preventing attrition which is especially common in the emotionally demanding field of combating HIV and AIDS.

At the end of the day, the individuals themselves must make a choice to seek treatment and make a change in their lifestyle choices. However, individuals alone are not capable of dealing with the impact of infectious diseases; it requires the collective effort of other parties like community and international organization. While NGOs and international agencies have set up specific programmes to stem the spread of HIV/ AIDS, some of the consequences of wider development policies, such as increased mobility or migration or increased income to spend on recreation, can counteract these programmes and contribute to the spread of the virus. Long-term solutions are especially needed so that women and young girls have equal access to employment, education and income generating opportunities. Many HIV/ AIDS prevention programmes for youth in school fail because HIV/ AIDS education is seen as irrelevant to their social and cultural circumstances. Youth education must therefore begin with an analysis of the needs and roles of young people in their particular community in order to respond appropriately to their needs. The wider community must also be encouraged to use information services and consequently NGOs should produce accessible material and widely publicise these different services.

Levels	
1 (0-3 marks)	At this level answers will be generalised or with minimal support if any stand were given at all. Reasoning rather weak and expression may be unclear. A basic answer that has little development. Answer lacks examples or other evidence, or it is so sketchy that it adds little support to the answer.
2 (4-6 marks)	Agreement or disagreement will be supported by appropriate detail. Or, both agreement and disagreement are considered, but support is patchy so 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.
3 (7-8 marks)	At this level answer will be comprehensive and supported by sound knowledge. Both agreement 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. Fig. 5 is a 'Hunger Map' showing the undernourished population worldwide, 2000-2002.

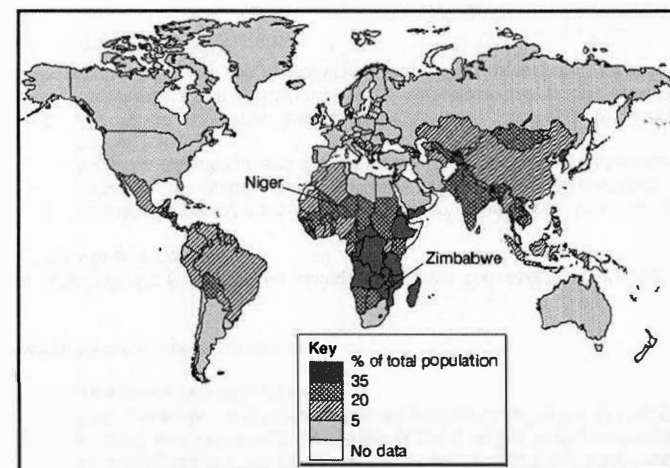


Fig. 5

- a. With the aid of Fig. 5, describe and account for the distribution of undernourished population in the world.

[4]

Describe

- 0-5% of the total population in developed countries suffer from undernourishment. They are North America, Europe, Russia, Australia and northern part of Africa.
- 5-20% of the total population in developing countries are undernourished. Developing countries include China, Kazakhstan, Central and majority of South America, including South East Asia.
- Countries which has 20-35% of its population that are malnourished are less developed countries like India, Pakistan, Mongolia, Thailand, Vietnam and some central parts of Africa.
- The highest percentage of its population (more than 35%) that are malnourished are only found in Sub-Saharan Africa like Zimbabwe.

Account

- Lack of Disposable income/ Affordability: Africans have low purchasing power thus are unable to afford meat, eggs, dairy, fish, etc. Often their income is used for purchasing basic needs like carbohydrates.
- Pricing: Africans are not able to afford the high costs of meats, eggs, sugar, seafood when certain food prices spike.
- Stability of food supply: Africa prone to civil wars/ conflict can affect the stability of its food supply.
- Inaccessibility: meat, dairy, etc. easily available in numerous food outlets in DCs. In Africa certain foods can only be purchased at towns far away from most settlements.

Award 1m for each point. 2 marks max each for describe and account. Accept other plausible answers.

- b. Fig. 6 below shows the global area of biotech crops from 1996 to 2005.

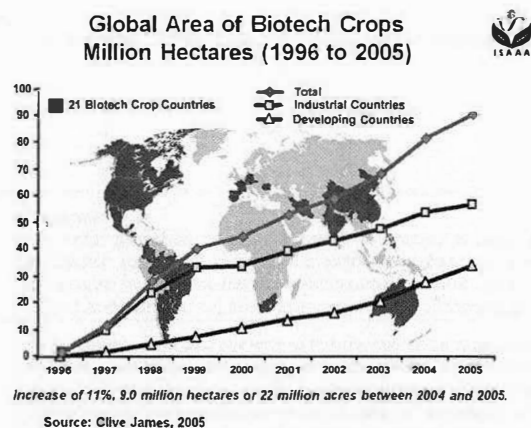


Fig. 6

- (i) Describe the trends of the amount of space used globally for the growing of Biotech Crops. [3]
1. There is an overall increase in the total amount of space used globally for the growing of Biotech Crops from 1996 to 2005.
 2. From 1996 to 1999, the amount of space used globally for the growing of Biotech Crops in industrial countries increased at a faster rate than from 1999 to 2005.
 3. From 1996 to 2002, the amount of space used globally for the growing of Biotech Crops in developing countries increased at a slower rate than from 2003 to 2005.
 4. The increase in the amount of space used globally for the growing of Biotech Crops in developing countries (32 million) is less than that of industrial countries (56 million).

Award 1m for any of the above points. Accept other plausible answers.

- (ii) Fig. 7 shows some statistics about how the United States of America turns corn into ethanol.

FOOD OR FUEL?

Nearly a billion people will go hungry tonight, yet this year the U.S. will turn nearly 5 billion bushels of corn into ethanol. That's enough food to feed 412 million people for an entire year.

8 BUSHELS OF CORN = 21.6 GALLONS OF ETHANOL FUEL OR ENOUGH FOOD TO FEED A PERSON FOR A WHOLE YEAR



Fig. 7

With reference to Fig. 7, state one reason why there continues to be food shortage in the U.S. and explain the correlation between the information given in Fig. E and the trends described in (i). [2]

1. Much of the crops grown in the US, such as corn, has been converted to ethanol so that this can be converted to fuel. 8 bushels of corn can feed a person for the whole year but instead, has been used for biofuel instead.
2. This has a positive correlation with what is shown in (i) because an increasing number of land space has been converted and what should be used as food to feed the hungry is going to fuel transport instead. This is seen not only in the industrialised countries like the US but the developing countries as well.

Award 1m for any of the above points.

- c. (i) With reference to specific examples, explain the economic impact of malaria on a country. [4]

1. Countries affected by malaria would need to set aside funds for the provision of health care, Building maintenance, Investments in hospitals and clinics and the purchase of medication and insecticide-treated nets.
2. For Africa, the total annualized cost of a package of malaria interventions (including scaling up of insecticide-treated bed nets and treatment coverage, introducing intermittent preventive treatment) costs \$824 million.

3. People infected with malaria might not be able to work due to their poor health, resulting in loss of labor. Areas endemic to malaria were found to experience a slowdown in economic growth of productivity.
4. Economists have estimated that malaria costs endemic countries 1.3% of GDP annually in lost productivity. This translates to an annual loss of \$12 billion for the entire African continent.

Award 1m for any of the above points. Accept other plausible answers.

- (ii) While about half of the world's population is at risk of contracting malaria, some areas are more vulnerable than others. With reference to specific examples, describe and explain the socio-economic factors contributing to the spread of malaria. [4]

1. The water they bring into slums has trash in it, human disposal and much more disgusting stuff. This attracts flies and mosquitoes to come and flies and mosquitoes carry a lot of bacteria that leads them to catch Malaria.
2. There were 1 million cases of malaria in the slums in Mumbai, India in 2008.
3. Most of India's health care spending is concentrated in urban areas.
4. They face a critical shortage of doctors, i.e. only 6 doctors for every 10,000 people so those who face a limited provision of and access to health care cannot get treatment for malaria.

Award 1m for any of the above points. Accept other plausible answers.

- d. 'Technological strategies are the most crucial approaches in solving the problem of food shortage globally. 'How far do you agree with this statement?' [8]

Technological	GM Food: - From the year 1996 to 1999, there has been a sharp increase in the production of GM food. From 7 million acres in 1996, it rose to 100 million acres in 1999 Successes: - Increases income for farmers – GM food is modified to stay fresh for a longer period of time and be more pest-resistant, hence <u>increasing the crop output</u> and farmers' income - Increases food supply – GM food crops are able to <u>produce higher outputs</u>, E.g. Super rice doubled the amount of output for rice Potential Risks: - Potential health risks – food might contain allergies. E.g. lectin in potatoes / fear of the unknown consequences of consuming food that is unnatural. E.g. GM pea caused health problems in research mice. - Loss of biodiversity – Pest resistant plants are indirectly destroying harmless insects such as
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	Monarch butterflies. E.g. BT toxin kills the European corn borer
Political & Economic	1. Agricultural policies: • refers to laws pertaining to domestic agriculture • Amount of food produced is regulated to ensure sufficient food supply and that food is affordable Singapore • High-tech farming (1970s – present) • Agro technology parks – high tech farms with necessary infrastructure that modern farms require <u>Success:</u> • Produce up to 8% of vegetables, 8% fish and 26% of eggs consumed in Singapore • Reduce reliance on imports <u>Limitations:</u> • High cost of setting up • Translate to high prices for consumers • Shortage of trained workers 2. International Strategies: strategies implanted across many countries. They may involve countries across the world or within a region, eg. SE Asia. International strategies include food programmes and food aid initiated by international organisations. Food programme : Introduced either by national govts or international organisations s.a. UN, WB; designed to address specific food shortage issues. • UNWFP- Responding to Emergencies • Provision of emergency food assistance during wars and natural disasters <u>Success:</u> • Food successfully delivered to 99.5% of targetted recipients during 2011 Sudan food crisis <u>Limitations:</u> • Food prices may be inflated during such emergencies -> high cost for UNWFP • Extent of assistance –limited by how much they receive from donors World Bank Global Agriculture & Food Security programme • Provides finance to countries which want to increase agricultural productivity • Provides assistance to improve food security in countries and regions <u>Success:</u> • Helped 7.5 mil people in 12 countries

	- Funded a project in 2010 in Rwanda to improve agricultural productivity and crop yields e.g potato yields & reduce soil erosion in hillside agriculture. <u>Limitations:</u> - Funds come from donors who may influence how they are used for vested interest - Funds may also be limited by how much funds GAFSP receive from donors, which will affect the extent of its assistance.
Social	Population Control: The consequences of a population rise during the lead up to a period of serious world food shortages is real. UK's population is predicted to rise to 75 million in the next 40 years. This is an increase of 25% in their population. Not only is this an enormous extra number of people to feed, but it also means that a large additional area of farmland will be lost under urban development. In many LDCs especially, one way to alleviate this problem is for people to be educated on family planning as well as to be given access to reproductive health facilities. In some places such as the Philippines, community based family planning programmes have been started to provide people with contraceptives. This is in hopes that the population growth is slowed down so that there will be enough food to go around. However, not everyone will have access to education or contraceptives facilities.
Agricultural	Multiple cropping This refers to growing more than one crop on the same field during the season. This technique makes effective use of inputs such as soil, water, fertiliser etc. Thus output per unit area increases. It could enable the country to be self-sufficient in food production and export the surplus to generate revenue to finance the cost of other projects. Crops are prone to insect pest attacks which may cause reduction in crop yield and losses. In the Garhwal Himalaya of India, a practice called baranaja involves sowing at least 12 species are grown on a field at a time in what looks like a messy arrangement of varieties of cereals, lentils, vegetables, creepers and roots, and harvesting them at different times. With multiple cropping, incidence of crop failure owing to biotic agents is minimised. However, the need is to ensure adequate supply of irrigation water to grow more crops simultaneously. But sometimes, there is shortage of irrigation water due to losses during conveyance, distribution and application.
Better governance at the national and international levels through the use of political and economic strategies is required to address the issue of food	

shortage. Political strategies may be more effective than technological strategies because international strategies like UNWFP, FLO & WFTO are necessary programs. These programs address the many common pressing concerns in countries and represent a concerted effort to find a solution to such concerns. Additionally, UNWFP may be more effective in solving food shortages as it targets mass-scale concerns especially people who cannot afford food. Even if technological strategies generate higher productivity and thereby higher crop yield, accessibility to food itself is determined by political effectiveness. There should not be a bottle neck due to the in-effectiveness of the political authorities who should manage distribution and equality for all in society. The world has the resources and technology to eradicate hunger and ensure long-term food security for all, in spite of many challenges and risks. It needs to mobilize political will and build the necessary institutions to ensure that key decisions on investment and policies to eradicate hunger are taken and implemented effectively.

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