Anglo - Chinese School
(Independent)

PRELIMINARY EXAMINATION 2017
YEAR FOUR EXPRESS

GEOGRAPHY CORE **2236/01**
PAPER 1

Monday **7 August 2017** **1 hour 40 minutes**

INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.

Write your Index Number on all the work you hand in. Write in dark blue or black pen on both sides of the paper. You may use an HB pencil for any diagrams or graphs. 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 are encouraged to support their answers with the use of relevant examples. Begin each question on a fresh page. Leave a line after each part-question. 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. 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, an Insert and an Answer Cover Sheet.

Section A

This question is compulsory.

1 A group of students conducted fieldwork study at a beach resort in Bali, Indonesia during the school holidays. Fig. 1 shows part of the area of study.

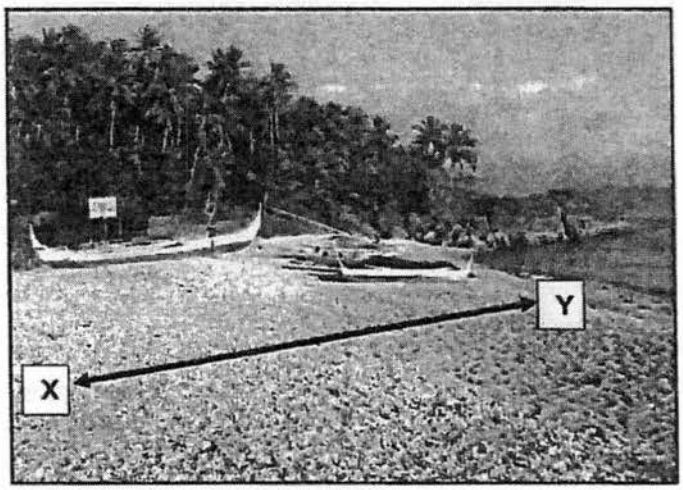

Fig. 1

(a) They collected beach sediments along a line of transect labelled XY as shown in Fig. 1. Their hypothesis statement is **'The further the distance from the low tide mark, the larger the beach sediments.'**
The data collected is shown in Fig. 2.

Distance from low tide mark (m)	0.5	1	1.5	2	2.5	3	3.5	4	4.5
Average length of long axis of sediment (mm)	1.5	2	2.5	5	2.5	3.5	4	4	4.5

Fig. 2

(i) State some safety precautions that the students would need to take before proceeding for their investigations at the beach. **[2]**

(ii) Describe, in detail, how the students collected the data in Fig. 2, using a quadrat and other instruments. **[4]**

(iii) Using data from Fig. 2, present the information, to show the relationship between distance from low tide mark and average length of long axis of sediment, on Fig. 3 on the Insert. [3]

(iv) What conclusion can be drawn from Fig. 3 with reference to the hypothesis? [2]

(v) Suggest some ways to improve the reliability of data collected. [2]

(b) Another group of students conducted surveys by systematic sampling of 40 tourists on a Saturday morning in June. They interviewed tourists at location A, which is next to a hotel and location B, which is next to a local market.
They designed a questionnaire, as shown in Fig. 4, to investigate the hypothesis that **'The duration of stay in Bali is longer for tourists, above the age of 60'**.

*Good morning. We are a group of students conducting Geography fieldwork. Can you please spare some time to answer a few questions? Thank you.*_____

Q1: Age: below 20 / 21 to 40 / 41 to 60 / above 60 years old

*Q2: How many days will you be in Bali?*_____ *days*

Q3: What are your reasons for visiting Bali? (please circle)
business / visit relatives or friends / holiday / study /
*others*_____ *(please specify)*

Q4: What type of accommodation are you staying in? _____

Fig. 4

(i) Which location, A or B, is better to select tourists to be interviewed? Justify your answer. [2]

(ii) Suggest possible improvements to the Questionnaire in Fig. 4 to ensure relevance to the hypothesis that the students are testing. [2]

(iii) The findings from the survey is shown in Fig. 5.

Age – group	Average length of stay (days)
below 20 years	8
21 to 40 years	4
41 to 60 years	7
above 60 years	5

Fig. 5

Evaluate the validity of the hypothesis: 'The duration of stay in Bali is longer for tourists, above the age of 60' by quoting evidence from Fig. 5. [3]

(iv) State a limitation of the study and suggest how it can be improved. [2]

(c) The students also investigated the impacts of visitors at the beach by conducting a perception survey as shown in Fig. 6. The results are shown in Fig. 7.

	-2	-1	0	+1	+2	
Lots of litter						Free from litter
Noisy						Quiet
Crowded						Few visitors
More traffic congestion						Few traffic congestion

Fig. 6

	Score
Cleanliness	+20
Noise level	- 20
Human congestion	-10
Traffic congestion	-15

Fig. 7

Do the results in Fig. 7 suggest that the impacts of visitors have been largely positive? Explain your answer. [3]

Section B

Answer **one** question from this section.

2 **(a)** Study Fig. 8, which shows some factors why Singapore is a leading Meetings, Incentives, Conventions and Events (MICE) destination.

Fig. 8
(Source:https://www.slideshare.net/MICEboard/singapore-presentation-mice-2014)

With reference to Fig. 8 and studies you have made, identify and explain the reasons for this. **[5]**

(b) Study Fig. 9, which shows some tourists on elephant rides in a river in Thailand.

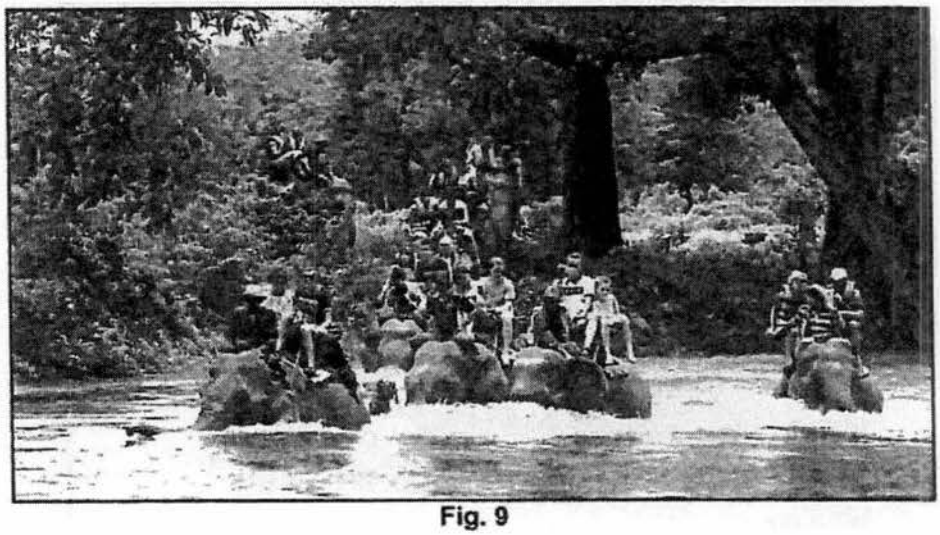

Fig. 9

Explain how tensions might occur among different stakeholders involved in the tourist activity in Fig. 9 and suggest some strategies that the Thai government might use to minimise the tensions mentioned. **[4]**

(c) Study Fig. 10, which shows international tourist arrivals and hotel room occupancy for Pattaya, Thailand from 2002 to 2011.

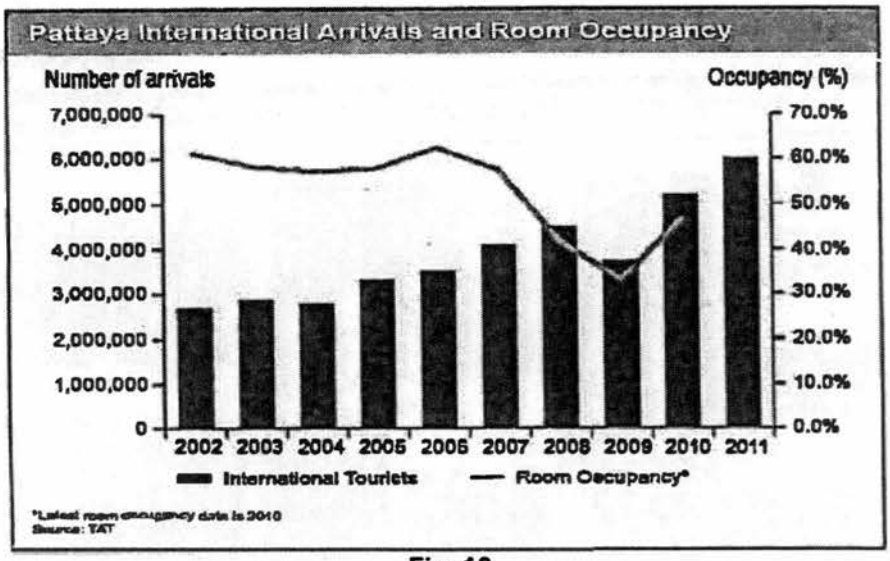

Fig. 10

(Source:http://powerhousedev.com/intl/wp-content/uploads/2013/08/0022_s9.jpg)

(i) Using information from Fig. 10, describe the trend in international tourist arrivals and room occupancy from 2002 to 2010. **[4]**

(ii) Explain how developments in technology promote the growth of tourism in Pattaya, Thailand. **[4]**

(d) "Demand factors are more important than destination factors as the main reason for the growth of global tourism."

How far do you agree? Support your answer with examples. **[8]**

3 **(a)** Study Fig. 11, which shows a coastal area.

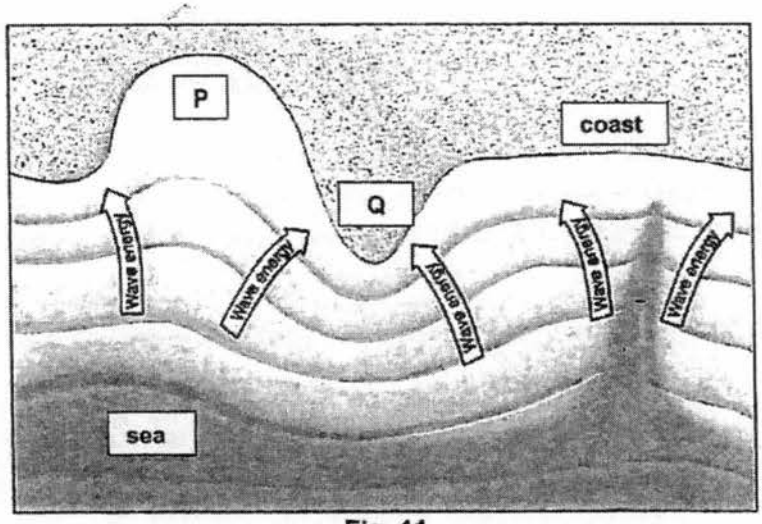

Fig. 11

With reference to Fig. 11, describe and account for the differences in the energy and frequency of waves at locations P and Q. **[4]**

(b) Study Fig. 12, which shows some houses at the edge of a cliff in England.

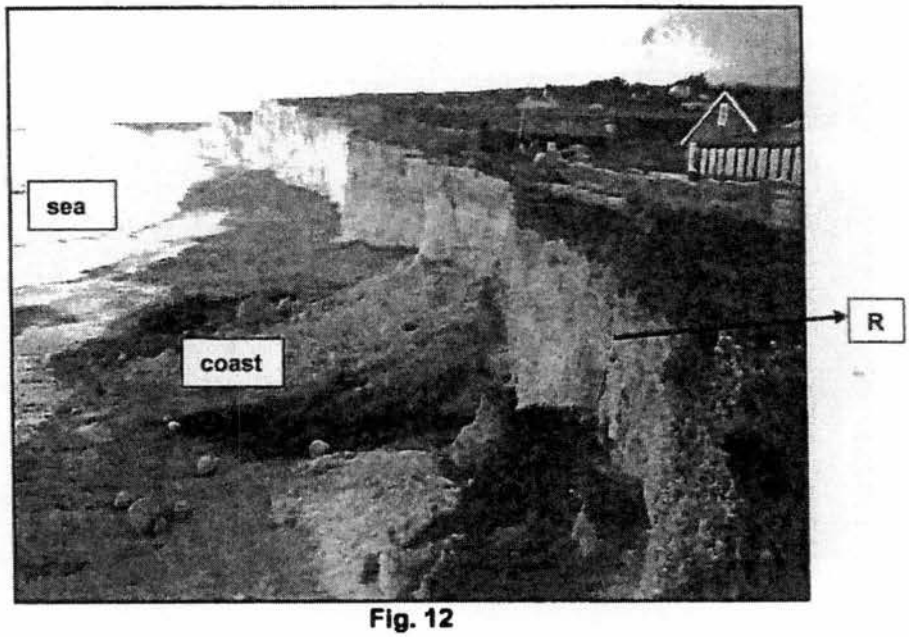

Fig. 12

(i) Describe the coastline shown in Fig. 12 and explain the stages in the development of the coastal feature R. [5]

(ii) Outline two long-term protection measures that can help to manage the coastal area in Fig. 12. [4]

(c) With the help of specific examples, explain any two factors that may lead to fluctuations in the tourism industry. [4]

(d) "Areas with coral reefs and mangroves should be conserved mainly for tourism industry."

How far do you agree? Support your answer with examples. [8]

END OF PAPER

Anglo - Chinese School
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PRELIMINARY EXAMINATION 2017
YEAR 4 EXPRESS

ANSWER COVER SHEET

GEOGRAPHY CORE **2236/01**
PAPER 1

Monday **7 August 2017** **1 hour 40 minutes**

Index Number: _____

Please indicate the Question Number attempted in the box below.

Question No	Marks obtained
1	
Total	/ 50

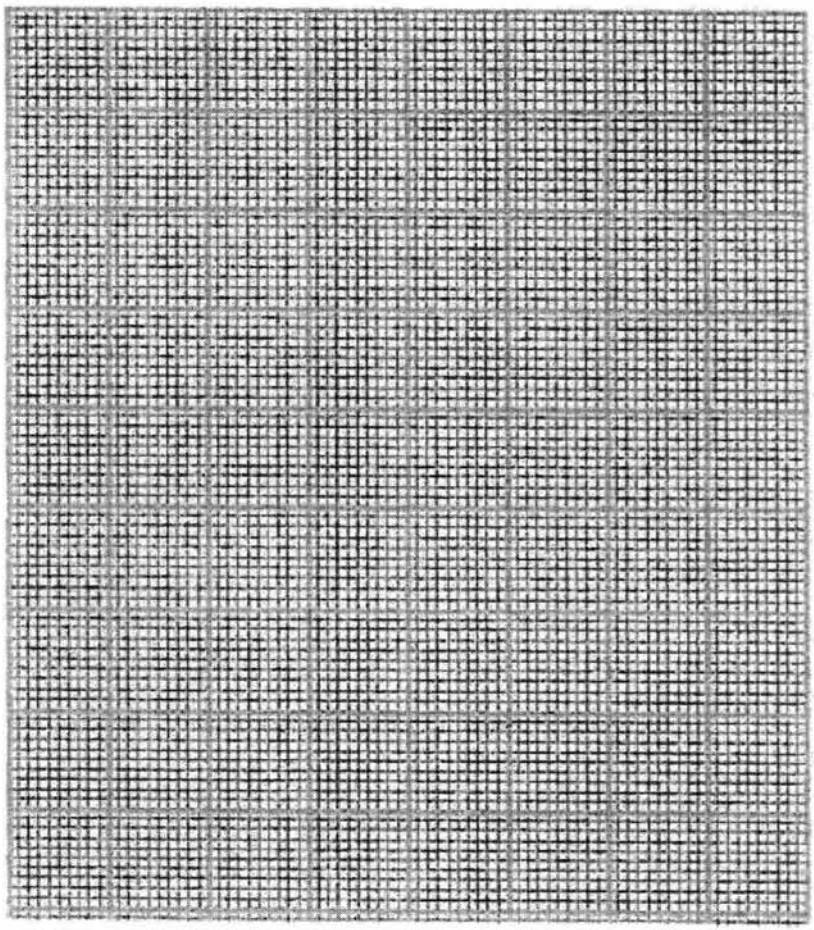
[Turn Over

INDEX NUMBER: _____

INSERT

(Please attach behind Answer Cover Sheet)

Fig. 3 for Question 1 (a) (iii)



Anglo-Chinese School
(Independent)

PRELIMINARY EXAMINATION 2017
YEAR 4 EXPRESS

GEOGRAPHY **2236/02**
PAPER 2

Friday 11 August 2017 1 hr 30 min

INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.

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This question paper consists of **9** printed pages, **1** blank page and an Answer Cover Sheet.
[Turn over

Section A

Answer <u>one</u> question from this section.

1. (a) Study Fig. 1, a map showing the earth's tectonic plates and margins (boundaries).

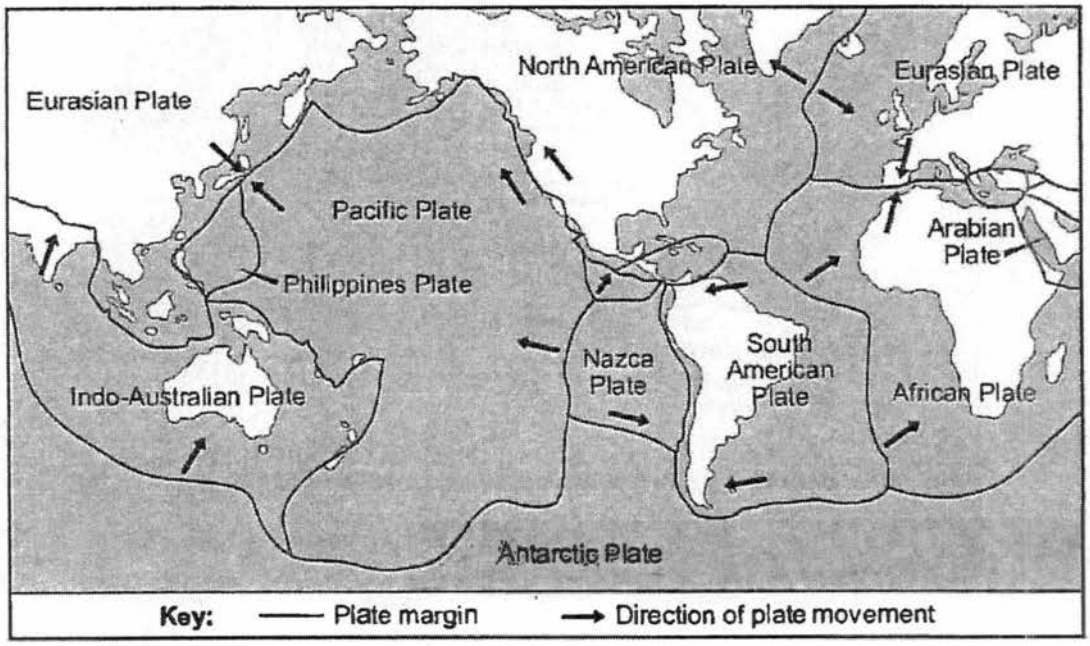


Fig. 1

(Source: David Waugh and Tony Bushell (2007) *New Key Geography for GCSE*, 2nd Edition, Nelson Thornes Ltd, UK)

(i) With the help of Fig. 1, outline the differences between constructive and destructive plate margins. [3]

(ii) With the aid of a labelled diagram, describe the formation of a composite volcano. [4]

(b) Study Fig. 2, a map showing plate boundaries and areas affected by the Japanese tsunami of March 2011.

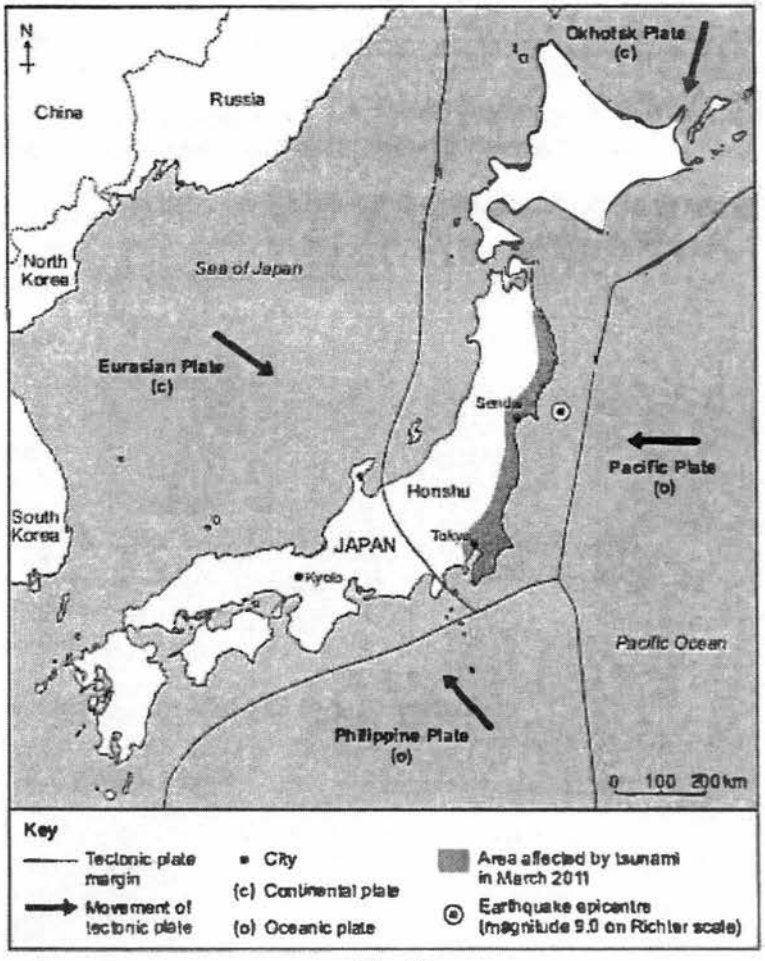


Fig. 2
(Source: USGS/2011 Tohoku Mag 9.0 Earthquake and Tsunami)

(i) Using Fig. 2, suggest two reasons why it was difficult for people to escape from the tsunami in coastal areas of eastern Honshu. [2]

(ii) With the help of Fig. 2, explain the likely cause of the tsunami in March 2011. [4]

(iii) Describe the effect an earthquake and its resultant tsunami may have in Japan and the surrounding islands. [4]

(c) 'Preparedness measures are the most effective in mitigating the impact of earthquakes and tsunamis.'

Do you consider this statement to be true? Explain your answer. [8]

2 (a) Study Fig. 3 which shows the weather forecast for Singapore over a three day period in July.

	Wednesday July 12	**Thursday July 13**	**Friday July 14**
Overnight weather conditions	28°C Mostly Cloudy Slight chance of showers	27°C Mix of cloud and clear skies Chance of showers	27°C Mix of cloud and clear skies Chance of showers
Morning weather conditions	30°C Mix of cloud and sun Chance of showers	30°C Mix of cloud and sun Chance of showers	29°C Cloudy with sunny periods Chance of showers
Afternoon weather conditions	31°C Mix of cloud and sun Chance of thunderstorm	33°C Mix of cloud and sun Chance of thunderstorm	32°C Mix of cloud and sun Chance of thunderstorms
Evening weather conditions	30°C Mix of cloud and clear skies A few showers	29°C Mix of cloud and clear skies Chance of showers	30°C Mix of cloud and sun Chance of thunderstorms

Fig. 3

(i) Identify the day with the lowest range of temperature and suggest how this is influenced by cloud cover. [3]

(ii) Describe and explain the rainfall forecast in Singapore over the three days as shown in Fig. 3. [5]

(b) Study Fig. 4, which is a map showing the distribution and strength of tropical storms.

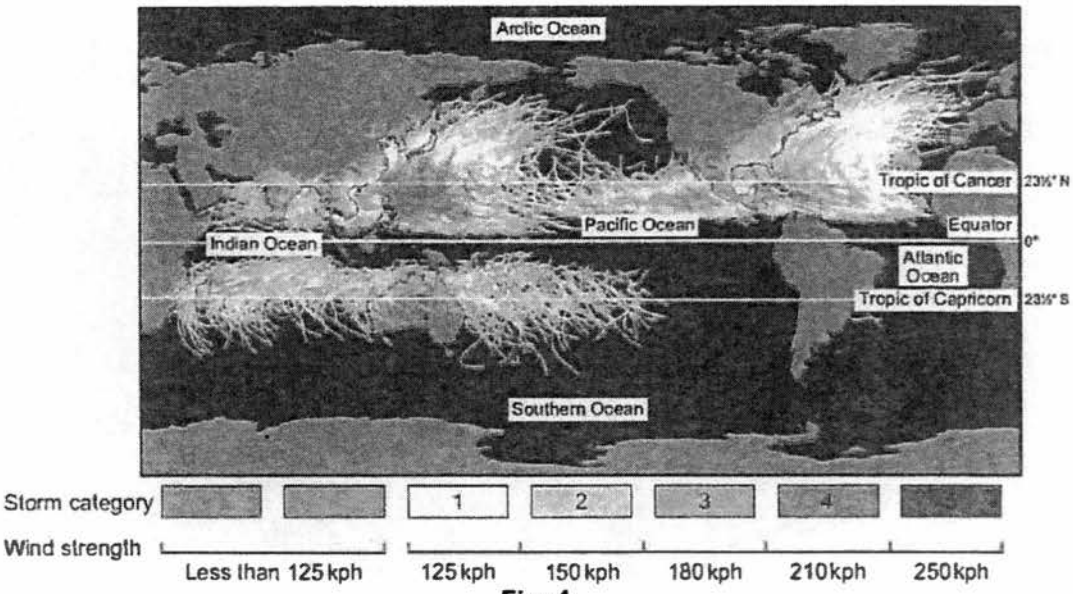


Fig. 4
(Source: NASA)

Using information from Fig. 4, describe the distribution of the tropical storms. [3]

(b) Study Fig. 5 which shows the impact of Hurricane Sandy on selected states in the Eastern United States in 2012.

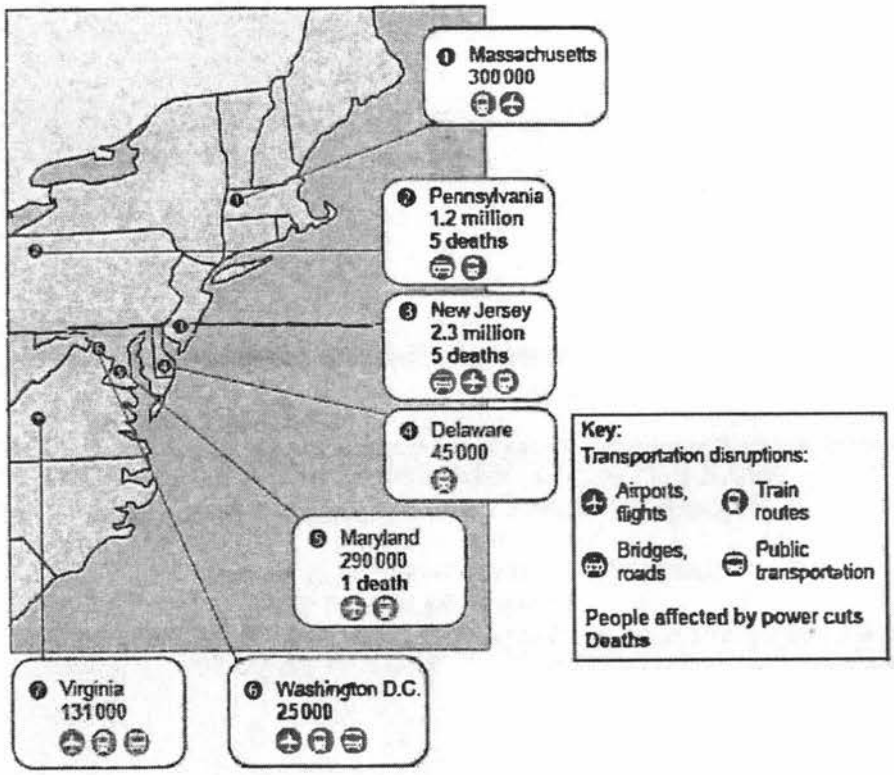


Fig. 5

(i) Explain two conditions necessary for the formation of tropical cyclones. [4]

(ii) With reference to Fig. 5, determine which state was the least affected by Hurricane Sandy, and provide a reason for your choices. [2]

(c) With reference to examples of hazards you have studied, discuss why the highest magnitude events are not necessarily the most harmful. [8]

Section B

Answer one question from this section.

3. (a) Fig. 6 shows the spread of influenza (flu) in Kaien and Digby Islands.

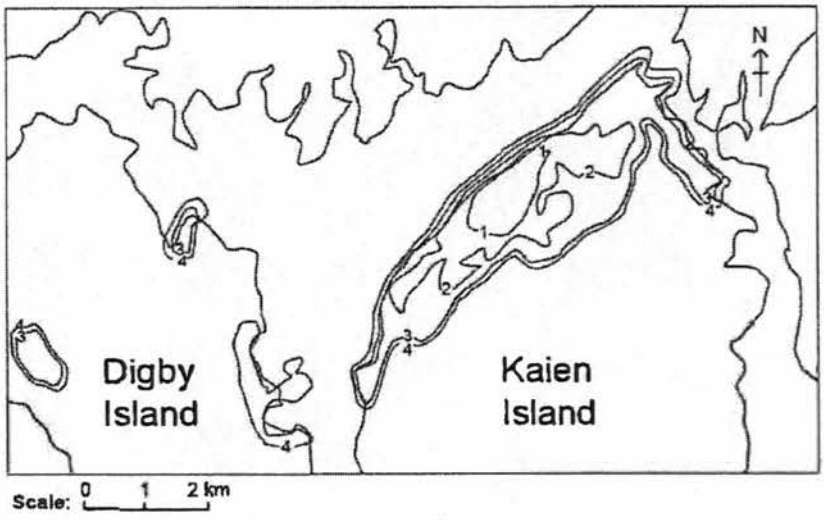


Fig. 6

(i) Identify the type of diffusion shown on the map by the spread of flu in the first 2 weeks. [1]

(ii) Identify the type of diffusion shown on the map by the spread of flu in week four to new areas such as the settlement of Digby Island. [1]

(b) Fig. 7 shows deaths from coronary heart disease for the top 26 countries worldwide in 2005.

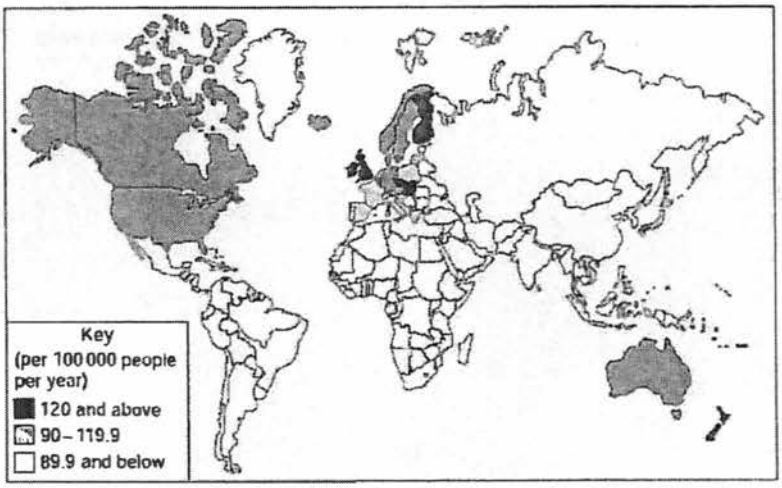


Fig. 7

(i) Describe the pattern shown in Fig. 7. [4]

(iii) Coronary heart disease is a type of degenerative disease. With reference to examples, contrast degenerative diseases with infectious diseases. [4]

(c) Fig. 8 shows the living conditions in a squatter settlement in a less developed country (LDC).

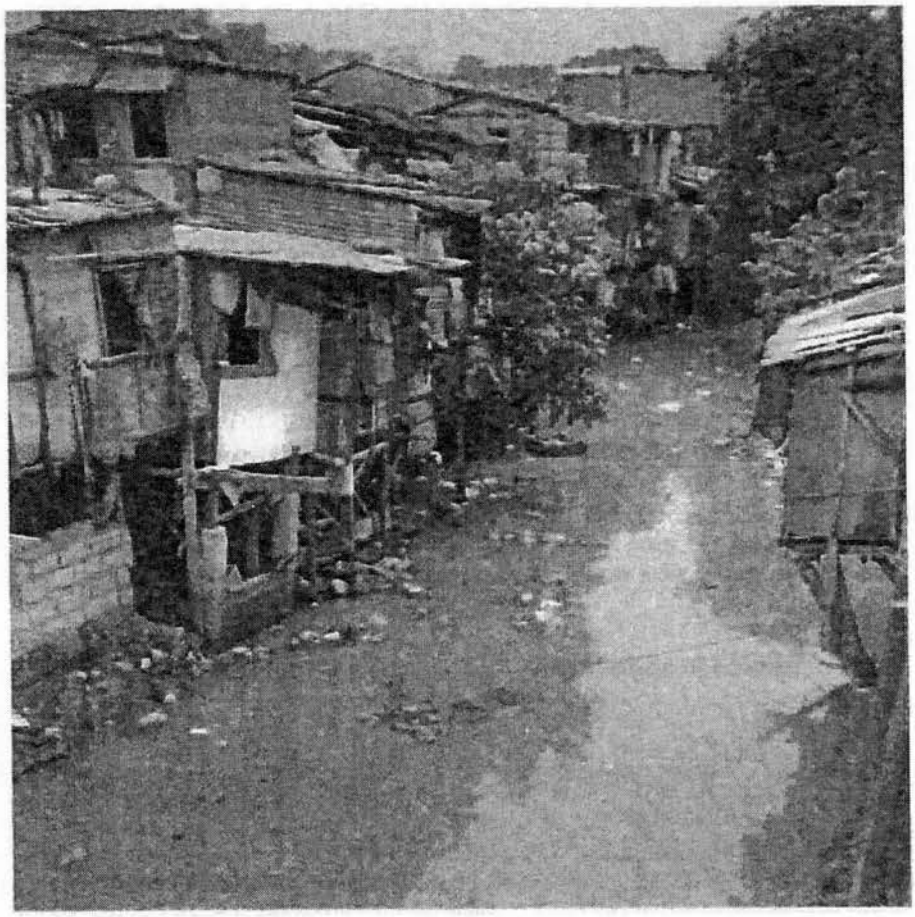


Fig. 8
(Source: © Getty Images/Marcus Lindstrom)

(i) Identify **three** characteristics of this squatter settlement. [3]

(ii) Suggest how **one or more** of the conditions shown affects the lives of the people living there. [4]

(d) Evaluate the effectiveness of strategies introduced to address the problems of food shortage. [8]

4 (a) Study Fig. 9 which shows the percentage of people undernourished, by country, 2006 – 2008.

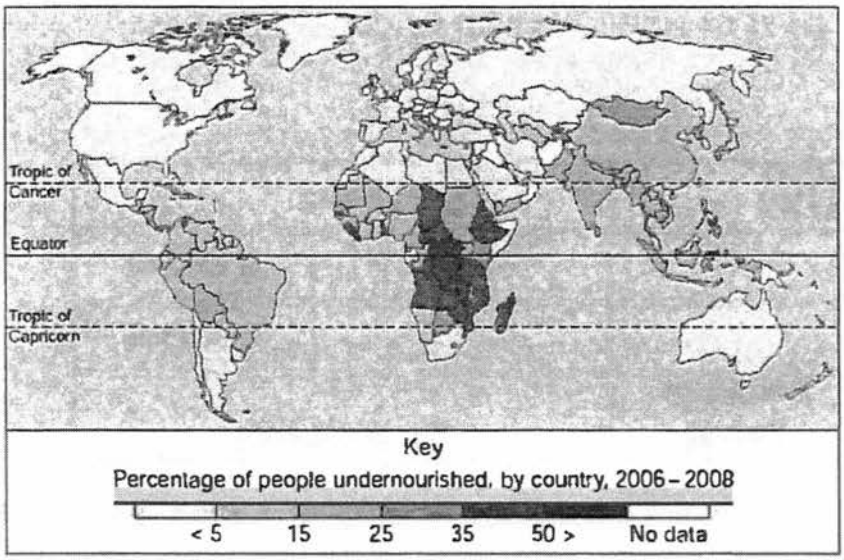


Fig. 9

(Source: Food and Agriculture Organisation of the United Nationes, *Prevalnce of Undernourishment in Total Population (%)*

(i) Describe the pattern of people undernourished shown in Fig. 9. [4]

(ii) Describe the impact of inadequate food consumption. [5]

(b) Study Fig. 10 which identifies the causes of food shortage and insecurity in Haiti.

Physical Factors	• Natural disasters worsen Haiti's situation. • In the 2008 hurricane season, 70% of Haiti's agriculture was destroyed. • The January 2010 earthquake, centred in Port-au-Prince, the capital and most populous city of Haiti killed about 20,000 people.
Economic factors	• Poverty: 76% of Haitians live on under US$2 per day and 56% on under US$1 per day. • 48% of Haiti's food is imported.
Other factors	• Multiple corrupt regimes. • High rates of HIV/AIDS.

Fig. 10

Explain the factors which have contributed to food shortage and insecurity in Haiti. [5]

(c) Chemical fertilisers are used to increase productivity of the land and crop yield. Describe the negative effects of the use of chemical fertilisers on the environment. [3]

(d) Assess the success of technological factors to increase food supply. [8]

Anglo - Chinese School

(Independent)

PRELIMINARY EXAMINATION 2017

YEAR FOUR EXPRESS

GEOGRAPHY ELECTIVE

2267/02

Monday 7 August 2017 1 hour 40 minutes

Marking Scheme

This insert consists of 4 printed pages.

[Turn over

Section A

Answer one question from this section

1 Some students in Adelaide, Australia, wanted to examine the impact of tourism on the Adelaide Central (shown on Photograph A, Insert), which is located in the city centre. Built in 1870, the Adelaide Central Market houses permanent stalls and shops in a covered structure. It is a popular destination for both locals and tourists.

They first conducted a land-use survey of the market to determine the types of shops in the market and presented the data in a land-use map, shown in Fig. 1 (Insert).

(a) Table 1 below is a tabulation of the various types of stalls in the market.

Table 1
Types of land use in Adelaide Central Market

Type of land use	Number found
Fruits and vegetables	16
Meat and Seafood	13
Nuts/Coffee	9
Cafés	6
Bakeries	?
Services	5
Florists	7
Dairy products	3
Retail	11

State the number of bakeries in the Adelaide Central Market. **[1]**

5

(b) With reference to Fig.1, describe the distribution of the three most common land use in the covered Market. **[3]**

- Fruits and vegetables shops are mainly located in the middle part of the market near to the two of the main exits as well as the escalator.
- Similarly, the meat and seafood shops are located in the middle part of the market and near to the fruits and vegetables shops.
- The fringe of the market consists mostly of retail shops.

(c) The students came up with the following hypothesis:

The income of the retail shops is most affected by seasonal changes in tourist numbers, while the income of the shops selling fresh food is least affected.

Describe and justify a method that could be used to investigate this hypothesis. **[4]**

Max 2m for **description**

- Conduct interviews/questionnaires with the shops
- Stratified sampling – students would need to interview a sample from both the two subgroups (retail shops and fresh food stores)
- Questions on the shops' income during different times of the year/ percentage of income from tourists vs locals

Max 2m for **justification**:

- The hypothesis involves two specific types of shops, so there must be a representative sample from each type
- Questions on the shops' income are necessary as the hypothesis is about the economic impact of tourism

(d) The students thought it might also be useful to examine tourists' perception of the Covered Market. Table 2 shows the results of the bipolar survey they conducted with some tourists.

Table 2
Bipolar survey results on tourists' perception of the Covered Market

Negative Evaluative Factor	Score	Positive Evaluative Factor	Score
Small variety of shops and services	-16	Wide variety of shops and services	+11
Low quality of products and services	-4	High quality of products and services	+23
Few historical elements	-29	Many historical elements	+8
Much litter	-10	No litter	+19

(i) Describe a suitable graph to present the information in Table 2. [3]

- Bipolar graph/ bar graph
- Label the positive factors on one end and negative factors on the other
- Lengths of bars correspond with the value of the factor

Sketch graphs are accepted; accurate graphs are awarded max 2m

(ii) Suggest how the students could ensure the reliability of their data. [2]

- Conduct sampling of tourists e.g. systematic sampling of every 5th tourist
- Conduct the survey at the busy areas where there are more tourists
- Conduct a preliminary survey to test the questions before finalizing them
- Conduct the interviews over a few more days to get more responses

2 A group of students wanted to carry out an investigation in school to collect the rainfall and wind direction data. To extend their fieldwork, they decided to compare their results with measurements recorded at the local airport, about 45 km away from the school. The locations of the school and airport are shown in Fig. 2 (Insert).

The rainfall and wind direction data collected in school.

Day	Rainfall (mm)	Wind direction
1	1	W
2	1	W
3	0	N
4	1	NW
5	0	W
6	0	NW
7	8	E
8	12	SE
9	1	NW
10	6	S
11	5	SW
12	4	E
13	7	SE
14	6	SE

Fig. 3

The secondary data that students gathered about the weather condition at the airport.

Day	Rainfall (mm)	Wind direction
1	3	SE
2	1	W
3	0	NW
4	2	W
5	0	E
6	2	W
7	11	SW
8	15	SW
9	2	N
10	9	SW
11	7	SE
12	4	SE
13	9	S
14	7	S

Fig. 4

(a) Identify the weather instrument used to determine the wind direction in Fig 3. [1]

Wind vane

(b) Calculate the average daily rainfall at the school and airport. [2]

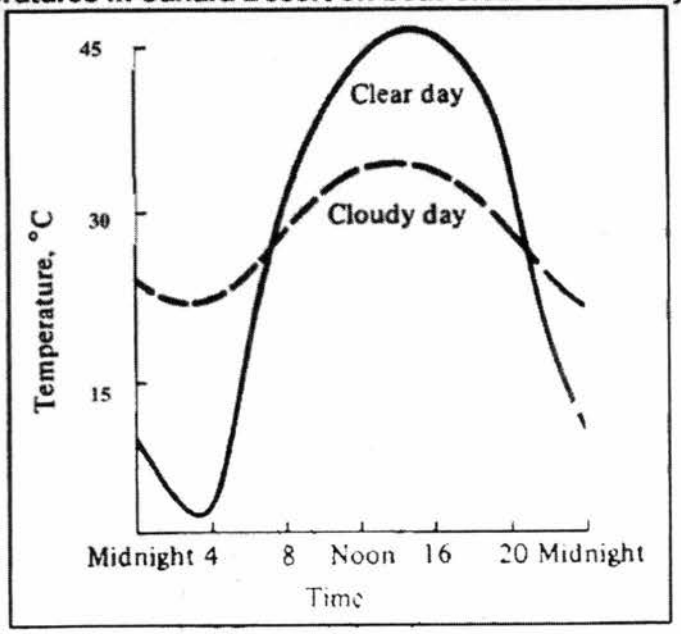
- School: 3.71mm
- Airport: 5.14mm

(c) Students wanted to test this hypothesis, 'There is more rainfall collected in school when the wind is blowing from the South.'
How far does the data in Fig. 3 support the students' hypothesis? [3]

- Only partially true.
- Support- on the 10th day, when the wind is blowing from the south, the amount of rainfall collected in school is 6mm.
- Does not support- Rainfall collected is usually greater when wind is blowing from the south-east. E.g. On the 8th, 13th and 14th day

	(d)	With reference to Fig. 2 (Insert), Figs. 3 and 4, suggest reasons why rainfall is greater at the airport.	[4]
		• Airport is nearer to the sea/school further away from sea. Winds blowing from sea generally bring more rain. • More incidences of winds from S, SE and SW (from sea) at airport • Possible difference in altitude (airport higher above sea level) • Possible relief rainfall as Fig 3 shows an increase in height from 10 m to 50m which is the windward side of the mountain where the airport is located, thus it receives higher amount of rainfall.	
	(e)	Students wondered how they could improve the reliability of their results. Suggest some ways in which the accuracy and reliability of the results could be improved.	[3]
		• Conduct the study again over a longer period of time (more than 2 weeks). • Ensure readings are comparable at the two locations (e.g. time of readings taken). • Taking reading of rainfall at different seasons of the year.	

Section B
Answer only **one** question

3	(a)	Study Fig.5, which shows how daily temperatures in Sahara Desert, North Africa can vary on a clear and a cloudy day.	
		Temperatures in Sahara Desert on both Clear and Cloudy Days  Fig.5	
		With reference to Fig.5, explain how cloud cover influences daily temperature range in Sahara desert.	[4]
		• As cloud cover decreases, daily temperature range increases. • From Fig. 5, daily temperature range on a cloudy day is about 10°C while that of a clear day is about 45°C. • On a clear day with little or no cloud cover, large amounts of heat reach the earth's surface, leading to very high day temperatures in the daytime (up to 46°C). With little cloud cover. • At night, large amounts of heat escape from earth's surface, leading to very low night temperatures (as low as -2°C). Hence, resulting in very large daily temperature range on cloudless days.	
	(b)	'Unfavourable political situations have greater effect on tourist arrivals than natural disasters." How far do you agree with this statement? Support your answer with examples.	[8]
		Level 1 (0–3 marks) Answers are generalised or with minimal support if any given at all.	

		Reasoning rather weak and expression may be unclear. A basic answer that has little development. Answers lack examples or other evidence or, it is sketchy that it adds little support to the answer.	
		Level 2 (4–6 marks) Disagreement or agreement is supported by appropriate detail. Or, both agreement and disagreement are considered, but support is patchy so that the answer is not full. Good reasoning and logic in parts of the answer with good expression in places. Some examples or other evidence will be presented to support answers in at least one place in the answer.	
		Level 3 (7–8 marks) Answers are 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 are extensive. For L3 (8 marks), conclusion is well-explained and relative importance to be weighed to a criterion.	
		Possible Content **Unfavourable political situation** • Unfavourable political situation such as political conflict, unstable government, acts of terrorism • May reduce tourist arrivals in a country or even region • Because it poses risk to tounsts' safety and security • For example, three terrorist attacks hurt tourism in Indonesia generally, with overall visitor arrivals falling by nearly 31% in September 2002. Bali suffered the highest loss, down from 168,170 in September to 86,800 in October. • In 2002, the Bali bombing in Indonesia affected not only tourism industry in Indonesia but other Southeast Asian countries such as Malaysia, Singapore, Philippines and Thailand. *'Students can give other examples such as the gulf war,* Natural disaster • Natural disasters can cause great damage to properties and leading to injuries or great loss of life • Can reduce tourist arrivals • Because it poses greater risks to safety of tourists and may disrupt essential tourist infrastructure • E,g. earthquake and tsunami in 2011 March, tourist arrivals in Japan had decreased by 28% to 6.2 million arrivals by end of 2011 **Possible arguments** • Students will need to explain clearly how it affected tourist arrivals (increase or decrease / same effect) – provision of data will be ideal as evidence • Students can evaluate in terms of - short-term or long-term effects on tourist arrivals - scale – effect on only a country's tourist arrivals or regional or global scale	

		• Another approach – students can explain how unfavourable political situations and natural disasters can decrease tourist arrivals in one place, but increase tourist arrivals in another. • Weighing of the two given factors must be articulated.	

4	(a)	Study Fig. 6, which shows the relationship between distance from the sea and annual temperature range.	

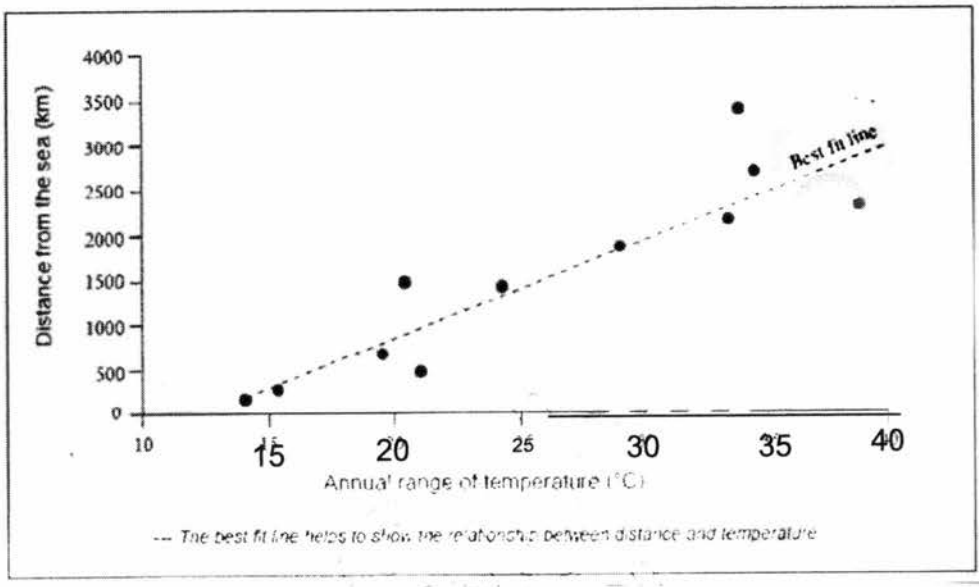


Fig. 6

With reference to Fig.6, describe and explain the relationship between the distance from the sea and the annual temperature range. **[4]**

Description

- The further the distance from the sea, the higher the annual range of temperature.
- Distance of 1428km from the sea experience a lower annual range of temperature of 24.4°C but a further distance of 2125km from the sea experience a higher annual range of temperature of 33.4°C.

Reasons

- Land heats up and cools down more quickly than the sea and coastal areas experience maritime effect with a smaller temperature range at an annual scale.
- Inland areas are affected by the continental effect which experiences a larger temperature range at an annual scale.

(b) 'Strategies introduced by countries have been more effective in managing climatic change than international agreements.'

How far do you agree with this statement? Support your answer with examples. **[8]**

Level 1 (0–3 marks)
Answers are generalised or with minimal support if any given at all.
Reasoning rather weak and expression may be unclear.
A basic answer that has little development.
Answers lack examples or other evidence or, it is sketchy that it adds little support to the answer.

Level 2 (4–6 marks)
Disagreement or agreement is supported by appropriate detail.
Or, both agreement and disagreement are considered, but support is patchy so that the answer is not full.
Good reasoning and logic in parts of the answer with good expression in places.
Some examples or other evidence will be presented to support answers in at least one place in the answer.

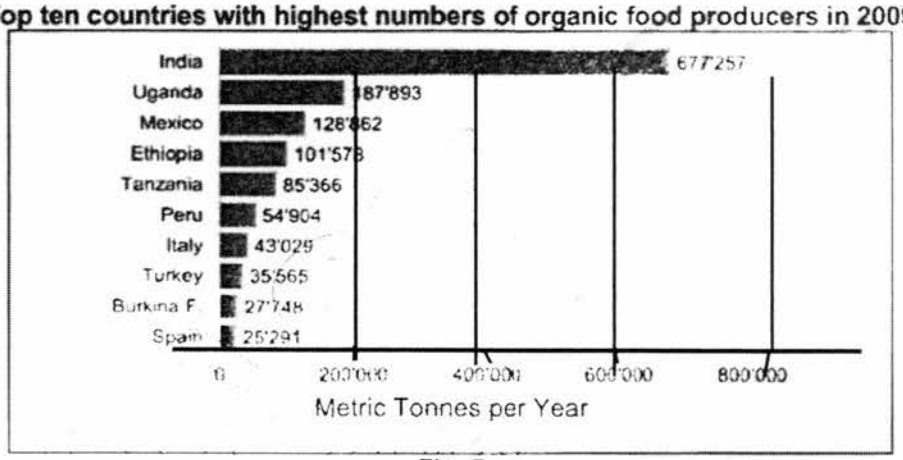
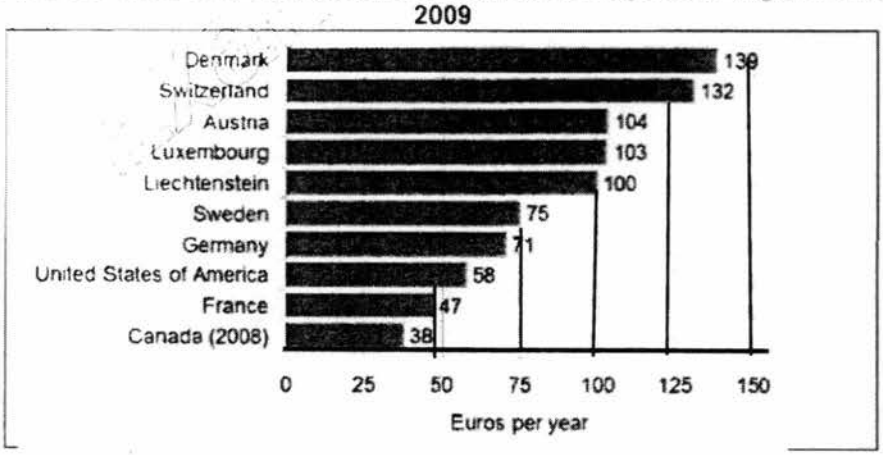
Level 3 (7–8 marks)
Answers are comprehensive and supported by sound knowledge.
Both agreement and disagreement are considered and well-supported.
Reasoning is clear and logical with good expression of language.
Examples or other evidence to support answers are extensive.
For L3 (8 marks), conclusion is well-explained and relative importance to be weighed to a criterion.

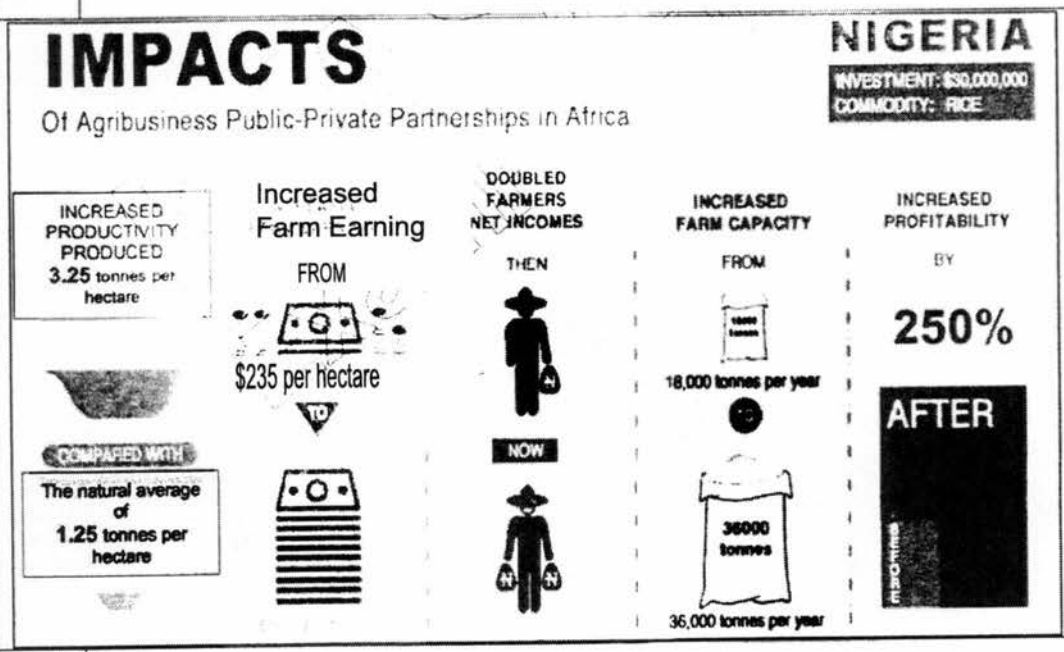
Solutions by Countries	Solutions by International agreements
Singapore 1) Singapore Green Plan 2012 • Reduce energy consumption and greenhouse emission from burning fossil fuels 2) Green Mark Scheme • Constructing 'green' buildings 3) Plant-A-Tree programme • Planting more tree and plants	**Kyoto Protocol (1997)** • Kyoto Protocol: An international agreement to reduce greenhouse gases emission into the atmosphere. ○ Drawn up on 11/12/97, came into effect 16/02/05 ○ Different countries have different targets to hit and progress of carbon emissions will be tracked and reported for review. <u>Successes</u> • Many countries met or exceeded targets set by Kyoto Protocol as there was constant monitoring and reporting by countries for self and peer assessment. • Encouraged sustainable development. • Developed countries are encouraged to work with developing countries in carbon-reducing projects (Clean Development Mechanism — CDM) <u>Limitations</u>

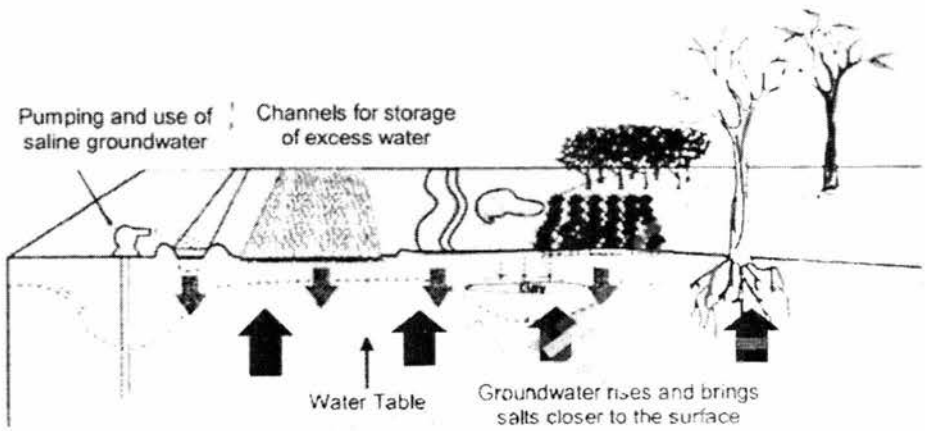
			• Not all countries are able to meet their goals and not all countries have the same emission targets. • Denmark, Sweden and the United Kingdom did not achieve their targets • Many countries did not sign the Kyoto Protocol and continue to contribute to global emissions. • A large portion of the increase in global emissions came from China, India and the United States of America		
		India 1) National Urban Transport Policy (NUTP) - Emphasising public transport 2) Energy Labelling Programme for appliances - Reducing energy consumption and greenhouse emissions from burning fuels 3) Indian Network of Climate Change Assessment (INCCA) - research - Promoting India-specific climate change research	**Copenhagen Conference** (2009) • Held in Denmark, hosted the United Nations Climate Change Conference to build upon measures developed in previous conferences for addressing climate change. Successes • Allow countries to discuss measures to deal with climate change effectively, including improvements to CDM. • International agreement to keep increase in global temperature to below 2°C. • Pledges were made and developed countries pledged to: • Reduce greenhouse gas emissions by 2020. • Provide US$30 billion for developing countries to fight climate change. Limitations • Lack for concrete plans on how to reduce greenhouse gases • Copenhagen Accord (Agreement) was not adopted by all countries. • The Accord was a guideline and no countries will be binded/punished if they do not fulfill their pledges.		

Section C

Answer **one** question from this section.

5	(a)	Explain how climate change could affect food production.	[4]
		• Changes in climate may cause existing farmland to become unsuitable for farming while in certain areas that were not suitable for farming in the past. • Climate change may bring about extreme weather events such as tropical cyclones which could lead to the flooding of farmland which could destroy the crops. • Climate change may also bring about extreme weather events such as drought which would reduce the water supply needed for crops to grow properly, hence reducing crop yields. • Climate change may cause glaciers to melt, and this could cause the fresh water supply of rivers to be reduced or discontinued as it floods the low-lying areas. Without sufficient water supply, farming productivity is likely to be reduced.	
	(b)	Study Figs. 7 and 8, which show the top ten countries in the world in terms of production and consumption of organic food respectively in 2009. **Top ten countries with highest numbers of organic food producers in 2009**  Fig. 7 Top ten countries with the highest per capita **consumption of organic food in 2009**  **Fig. 8**	

		Contrast between the production and consumption of organic food in the countries shown in Figs. 7 and 8 and explain why this is so.	[5]
		Contrast: • The major producers of organic food are typically LDCs such as India and Uganda (except Italy and Spain), while the main consumers are typically DCs such as Denmark and Switzerland. Explanation for LDC producers: • The producers are typically LDCs as they tend to be agriculturally-dependent economies. • The farmers there are keen to increase their incomes by farming food for export to meet external demand, hence they grow organic crops which are increasingly popular in the DCs. • DCs, on the other hand, often face higher production costs, which reduces their ability to compete with LDCs, and hence are less able to compete with countries like India. Explanation for DC consumers: • The DCs tend to be the ones consuming most of the organic produce as they tend to have higher incomes, and thus can afford the more expensive organic food **OR** LDCs tend to have lower incomes, and hence lower purchasing power and less ability to buy relatively expensive organic food. • Their higher levels of education and economic development also means DC consumers tend to be more concerned about health and nutrition, and therefore prefer organic food for their perceived food safety and health benefits. **OR** LDCs tend to be more concerned about ensuring sufficient food to avoid malnutrition and/or starvation, hence food quality is often of less concern	
	(c)	Study Fig. 9, which shows the impacts of agribusiness in Nigeria in Africa.	
			
			[4]
		With reference to Fig. 9, explain how agribusiness contributes to the positive impacts in farming in Nigeria.	

		• Increased productivity of 3.25 tonnes per hectare led to increased farm earnings from $235 per hectare to $1000 per hectare. • This in turn doubled the farmers' income. • The farm capacity and productivity has increased from 18000 tonnes per year to 36000 tonnes per year. • Thus the productivity rate of the farm has increased by 250% as compared to the past.	
	(d)	Study Fig. 10, which shows the effects of irrigation systems on soil and water quality.	
		Effects of Irrigation Systems  Fig. 10	
		With reference to Fig. 10, discuss the effects of irrigation systems on the soil and water quality.	[4]
		• Irrigation systems can supply water to dry soil and allow for the intensive cultivation of crops. It can also bring about negative impact on the soil and water quality. • Salinisation can occur as the pumping of groundwater to the irrigation channels can result in raising of the water table, which brings the salts closer to the surface at the upper soil layers as shown on Fig. 10. • As water evaporates from the soil, the salts are left behind which results in the soil becoming saline. This will then result in degradation of land as crops can no longer grow on the saline soil which has a high concentration of salts. • The salts from the groundwater can also enter the river as the water table is being raised from the tapping of groundwater which results in poorer water quality.	
	(e)	"Physical factors play a great role in determining the levels of food production in LDCs." How far do you agree with this statement? Support your answer with evidence.	[8]

	(b)	'Strategies introduced by countries have been more effective in managing climatic change than international agreements.' How far do you agree with this statement? Support your answer with examples.	**[8]**

Level 1 (0–3 marks)
Answers are generalised or with minimal support if any given at all.
Reasoning rather weak and expression may be unclear.
A basic answer that has little development.
Answers lack examples or other evidence or, it is sketchy that it adds little support to the answer.

Level 2 (4–6 marks)
Disagreement or agreement is supported by appropriate detail.
Or, both agreement and disagreement are considered, but support is patchy so that the answer is not full.
Good reasoning and logic in parts of the answer with good expression in places.
Some examples or other evidence will be presented to support answers in at least one place in the answer.

Level 3 (7–8 marks)
Answers are 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 are extensive.
For L3 (8 marks), conclusion is well-explained and relative importance to be weighed to a criterion.

Solutions by Countries	Solutions by International agreements
Singapore 1) Singapore Green Plan 2012 • Reduce energy consumption and greenhouse emission from burning fossil fuels 2) Green Mark Scheme • Constructing 'green' buildings 3) Plant-A-Tree programme • Planting more tree and plants	**Kyoto Protocol (1997)** • Kyoto Protocol: An international agreement to reduce greenhouse gases emission into the atmosphere. • Drawn up on 11/12/97, came into effect 16/02/05 • Different countries have different targets to hit and progress of carbon emissions will be tracked and reported for review. <u>Successes</u> • Many countries met or exceeded targets set by Kyoto Protocol as there was constant monitoring and reporting by countries for self and peer assessment. • Encouraged sustainable development. • Developed countries are encouraged to work with developing countries in carbon-reducing projects (Clean Development Mechanism — CDM) <u>Limitations</u>

- It is determined by the rainfall and average temperature experienced in that place.
- These factors can determine the types of crops that can be grown & productivity of land.
- Generally, output is higher in areas with high temperature and rainfall as they are more favourble for plant growth.
- Crops in the tropics can produce 2 or more successive crops in a year on the same field as the temperature and rainfall are high and constant throughout the year.
- However, there are some exceptions like wheat and potatoes (require less water) thus they grow well in the temperate regions.
- The type of climate is also an important factor for fish and livestock farming as they require different types of climates to grow well. For instance, salmon requires cool temperatures for growth and reproduction.

Other factors

Economic factors
Purpose of farming

- **The tastes and preferences of consumers dictate what how much the producers grow.**
- E.g. China used to be self-sufficient in maize production and an exporter of maize as well. However in recent years due to the increased demand for meat and dairy products, more maize is needed to feed livestock. Together with rising population, China has started importing maize to meet the increasing demand. USA has increased their production of maize to be exported to China.
- Large food companies able to withstand the impact of changes in the environment, e.g. flooding, compared to small-scale farmers.
- Agribusinesses are able to **invest in technology** to increase food production including research to produce crop with greater yield.
- As they have a worldwide network of different farming, distribution and processing centres, they have **greater control over crop production**. Their production costs are reduced and hence the retail cost of food may be kept low. Example Dole – pineapple, bananas

Political factors
Agricultural policy –pertaining to domestic agriculture
- Affects how limited resources such as money and land may best be used.
  -the govt. could direct financial resources towards educating farmers on more efficient farming methods.
  -helping farmers by
  --providing irrigation facilities
  --conducting agricultural research to develop higher-yielding or more resistant varieties of crops.
  - financial loans available to farmers and give subsidies for growing certain crops
- In Oct 2011, ASEAN signed an agreement with China, Japan and South Korea. During times of disaster, rice reserves from the big rice producers will be used to supply rice to countries that have signed the agreement.
- E.g.Thailand started a programme in 2012 for other ASEAN nations to intensify rice production in the region. Thailand worked with neighbouring countries such as Cambodia to increase their efficiency in rice production

Technological factors
Green Revolution - [use of technology to increase food production]

Use of high-yielding varieties

- HYVs are improved strains of crops such as rice, wheat and other cereals that have an increased growth rate and an increased resistance against crop diseases and pests.
- "Wonder Rice" has a growing season of 100 days compared to the 120 days of non-HYVs.
- 70% of rice and wheat grown in India were HYVs by 1990.
- Green revolution helped to increase the production of wheat and rice in India.
- Total wheat production has almost multiplied 4 times that of 1970 by 2010
- Total rice production has multiplied by two times that of 1970 by 2010

Use of chemicals

- Chemical fertilisers replenish the nutrients in the soil and increase yield.
——HYV requires more fertilizers -
and helps to retain soil moisture.
- ——Chemical fertilizers provide specific quantities of a nutrient such as nitrogen potassium but are easily removed by water percolating through the soil.
- Pesticides used to kill insects and small animals that destroy crops.
- ——Herbicides used to kill weed and other undesirable plants that compete with for resources.
- ——With the removal of pests, the crop is protected which in turn would increase crop yield.
- ——

6	(a)	Study Fig.11, which shows the Richter scale used to measure the magnitude of earthquakes and the death tolls of selected earthquakes.	

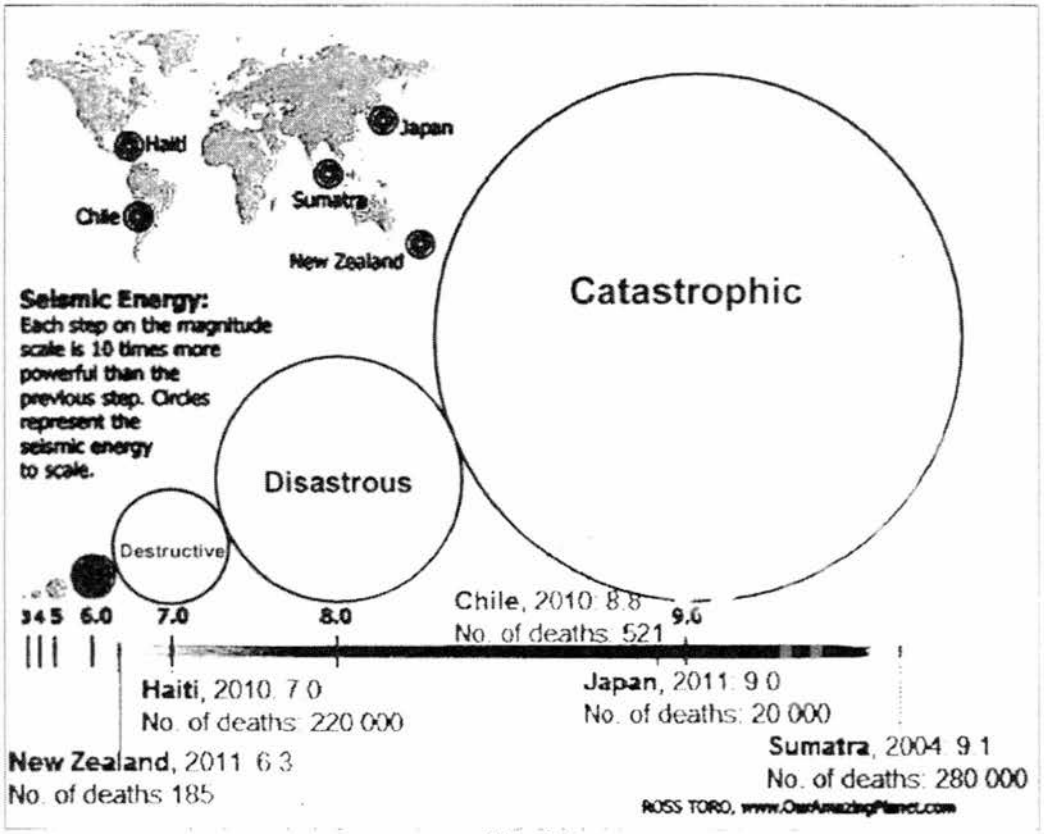


Fig. 11

		Do higher magnitude earthquakes result in higher death tolls? Support your answer using information from Fig. 11.	[4]

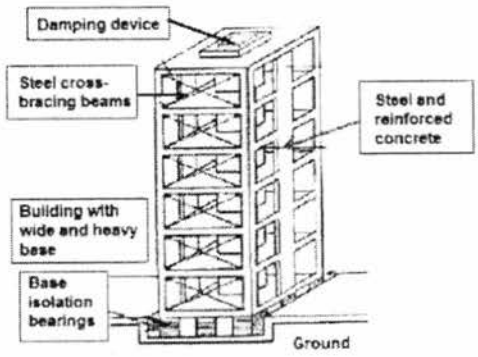
- positive correlation/relationship between the magnitude of earthquake and the death toll.

Supporting:

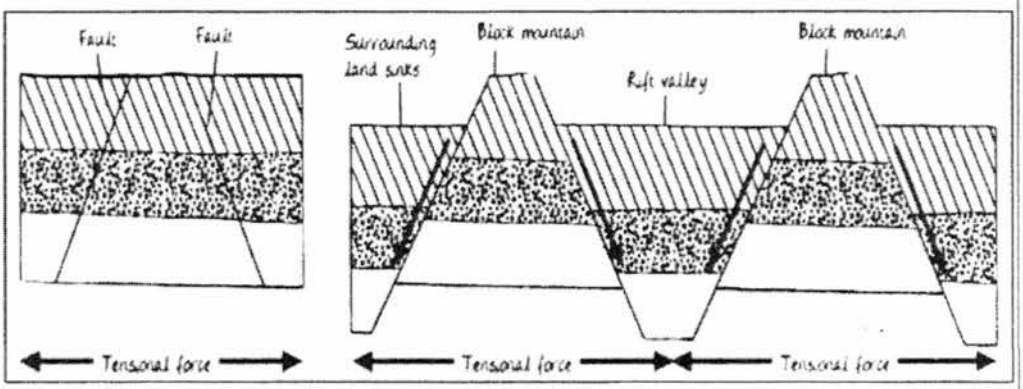
- For example, the Sumatra earthquake was at a magnitude of 9.1 and resulted in 280000 deaths.
- Similarly in New Zealand, there were only 185 casualties when the earthquake magnitude was 6.3.

Non-supporting

However, there are cases when the magnitude does not correlate with the number of deaths. e.g Haiti experienced an earthquake of magnitude 7.0 with 220 000 deaths, but Chile with a higher magnitude earthquake of 8.8 recorded only 521 deaths. (May use example of Japan's 9.0 earthquake with 20 000 causalities).

	(b)	Study Fig. 12 which shows an earthquake resistant building.	
		Earthquake Resistant Building  Fig. 12	
		Use Fig. 12 to account for the main features associated with an earthquake resistant building.	[4]
		• Damping device – act as shock absorbers for seismic energy released during earthquake and counterweights which move in opposite direction to the motion of the earthquake. • Steel and reinforced concrete – are used to withstand earthquakes better than brittle materials such as non-reinforced concrete. • Wide and heavy bases – decreases likelihood of building from collapsing. • Base isolation bearings – act as buffer to prevent the building from swaying too much during an earth quake. • Cross-bracing – reinforce walls using two steel beams to prevent building from collapsing easily.	

	(c)	With the aid of diagram(s), illustrate and explain the formation of block mountains.	**[5]**

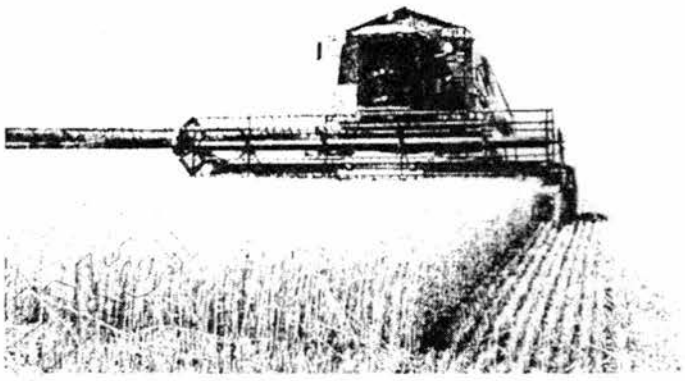


Award 2m for illustration (out of which 1m for labels and 1m for accuracy in drawing).

Explanation:

- Block mountains are blocks of land with steep sides that are formed by continental-continental plate divergence.
- They are formed when sections of the crust extend **along fault lines** and rock masses surrounding a central block sink due to tensional **forces**
- The block of land that is left standing higher **than the surrounding** ; land is a block mountain.

	(d)	Study Photograph A, which shows a method of harvesting used by some farmers.	



Photograph A

		With reference to Photograph A and other studies you have made, explain how technological advancements affect the intensity of food production.	**[4]**
		• Through the use of machinery such as a combined harvester, farming is more efficient as the process of harvesting is sped up and there is also less reliance on human labour. • High-yielding varieties (HYVs) are cross bred to develop improved strains of crops, e.g. shorter growing season which allows for more harvests a year, thus resulting in higher crop output.	

		• Use of irrigation supplies water to land, e.g. use of centre pivot irrigation, thus allowing crops to be cultivated on land that used to be too dry, thus increasing amount of crops produced as there is more arable land available • Use of irrigation supplies water to land, e.g. use of centre pivot irrigation increases crop yield as crops can be grown all year round even when there is less rainfall/dry season. • Use of fertilisers helps to supply nutrients for healthy plant growth which in turn leads to higher crop output/yield OR replenish nutrients that have been used up which allows for shorter /no fallowing period, thus famers are able to plant continuously, thus producing higher yield/output. *Other acceptable points include use of pesticide and HYVs*	
	(e)	'Food shortages are mainly the result of social factors.' To what extent is this statement true? Support your answer with evidence.	**[8]**
		Level 1 (0–3 marks) Answers are generalised or with minimal support if any given at all. Reasoning rather weak and expression may be unclear A basic answer that has little development. Answers lack examples or other evidence or, it is sketchy that it adds little support to the answer. **Level 2 (4–6 marks)** Disagreement or agreement is supported by appropriate detail. Or, both agreement and disagreement are considered, but support is patchy so that the answer is not full. Good reasoning and logic in parts of the answer with good expression in places. Some examples or other evidence will be presented to support answers in at least one place in the answer. **Level 3 (7–8 marks)** Answers are 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 are extensive. For L3 (8 marks), conclusion is well-explained and relative importance to be weighed to a criterion. **Possible answers** **Social factors (Given Factor)** Food shortage may be caused by poor accessibility to food. • Transport facilities such as road and rail links must be made available so that food can be reached even by people who live far away from shops. • The accessibility of food is also dependent on the number and location of food outlets. • Accessibility could be affected due to the physical factors such as mountains and the occurrence of landslides • Food distribution is particularly significant when the local production cannot meet local demand, making imports necessary • For example, in LDCs, food outlets may be few and far apart from one another.	

- As a result, people in these areas may be unable to obtain fresh produce and thus have a smaller food intake.
- E.g. One-third of the population of Timor-Leste experiences food shortages in between food harvests
- The chronic food shortage is made worse by a lack of storage facilities and the difficulty of accessing the numerous remote communities
- As such, poor accessibility to food could lead to food shortage

Alternative Factor: Political factors (Civil Strife)

- Food shortage may be caused by political factors such as civil strife, i.e. internal conflicts such as riots, unrest or civil war.
- Civil strife may lead to disputes over the control of resources that affect food production, such as land and water.
- These resources may even be destroyed which in turn hinders food production.
- Landmines planted on farmlands during civil strife can destroy and stop food production
- Poor governance such as corruption, policy errors and inability to implement policies can hinder food production and cause food shortages
- Governments can also threaten food security when they prioritise other development needs of the country over ensuring food security (when people are able to obtain sufficient quantities of safe and nutritious food to maintain a healthy and active lifestyle)
- An example of civil strife is, in 2011, civil strife in Syria disrupted agriculture and drastically reduced farmers' access to fertilisers and seeds.
- An example of poor governance is, in the Indian state of Madhya Pradesh in 2010, 40 000 villagers were deprived of land for farming due to the development of a steel plant, mining and port.
- As a result, these villagers lost the *means* to produce their own food and were left with extremely limited income to buy food.
- All these factors caused food prices to rise, preventing many people from having access to food.

Economic factors

- The increase in food production may not be able to cope with the rapid increase in demand.
- This is mainly caused by a rapidly growing urban middle class with higher purchasing power and changing food preferences.
- The demand from these countries has the ability to redirect food from poorer countries because they are able to pay a higher price than the poorer countries.
- For example, the sustained growth in demand for food from these countries (Brazil, Russia, India and China) is believed to be depleting global food inventories, especially grain.
- When the demand for food outstrips supply, food shortage would ensue.

Physical/Environmental factors

- Changes in climate may cause existing farmland to become unsuitable for farming, while lengthening the growing season in other areas.
- Climate change is likely to increase the occurrence of extreme weather events such as severe tropical cyclones and drought
- As a result, crops may no longer be able to grow in some areas which were previously suitable for farming, thus causing shortage in food production

		• Tropical cyclones could lead to flooding of farmland which could destroy the crops, causing a shortage in food production • Drought would also reduce water supply needed for crops to grow properly, thus increasing crop failure and reduce crop yield • For example, with global temperatures increase due to human activities, it is projected that countries across the world will see their current food production decrease by up to 50% and these include staple food producers such as Brazil, India, Pakistan, Turkey, parts of the USA, most of Southeast Asia and most of Australia. • In this manner, physical factors such as climate change and extreme weather events may lead to food shortage.	