Name: ____________________ Index Number: _______ Class: _____

Clementi Town Secondary School
Mid-Year Examination 2016
Secondary 4 Express

GEOGRAPHY **2236/01**
Paper 1 **03 May 2016**
1 hour 40 minutes

Additional Materials: 1 Graph paper
1 Insert

READ THESE INSTRUCTIONS FIRST

Do not open the booklets until you are told to do so.
Write your name; register number and class on all the work you hand in.
You may use a soft pencil for any diagrams, graphs or rough working.
Write in dark blue or black pen on both sides of the answer paper.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer All Questions.

~~Write all answers on the Writing Papers provided.~~

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

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

The insert contains Photograph A and B for Question 2.

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 document consists of **4** printed pages and **1** Insert.

[Turn over

Section A

This question is compulsory.

1 (a) A group of students carried out fieldwork at two local beaches in England. Sewerby beach is a pebble beach surrounded by cliffs and Bridlington beach is a long sandy beach.

(i) The students would like to find out whether the two beaches have different beach profiles. State a suitable hypothesis to test this. [2]

(ii) Describe a method that the students could use to collect data to test the hypothesis suggested in **(a)(i).** [3]

(iii) Describe what a high water mark is and how to identify it. [2]

(iv) Table 1 shows the results of the measurements along a transact across the middle of both beaches.

Results of beach profile measurements at both locations

Distance from low water mark to the back of the beach (m)	Angle of slope in degrees	
	Sewerby beach	Bridlington beach
0-5	10	2
5-10	12	5
10-15	12	8
15-20	10	5
20-25	-	3

Table 1

Use the data in Table 1 to construct the beach profiles of both beaches on the graph paper provided. [3]

(v) Comment on the validity of your original hypothesis in **(a)(i)** based on the measurements shown on Table 1 and suggest how reliable it was. You should evaluate the data collection strategy and suggest possible improvements. [6]

(b) A group of students wanted to find out more about the tourism impacts on the Inca Trails of Machu Picchu in Peru. They approached the Department of Natural resource and Environment and obtained secondary data on: Tourist Arrivals to Peru, rainfall and soil loss along the Inca Trails in Table 2. The students crafted the following hypothesis.

Hypothesis: *The growth in tourism resulted in major environmental impact on Machu Picchu in Peru.*

Tourist Arrivals to Peru, Soil loss and rainfall along the Inca Trail

Year	Tourist Arrivals (thousands)	Rainfall(mm)	Soil loss (ton/ha)
2011	650	3788.70	76.79
2012	800	3672.70	80.45
2013	950	5624.00	85.41
2014	1,150	3353.80	61.50
2015	1,200	3828.70	90.33
2016	1,300	3961.90	98.33

Table 2
Source: http://article.sapub.org/10.5923.j.re.20140403.02.html

(i) What conclusions can be drawn from the information shown in Table 2 in response to the hypothesis? Give reasons and support you answer with evidence from Table 2. [4]

(ii) Describe how you would go about collecting additional types of primary data to test the hypothesis proposed by the students. [3]

(iii) State some possible challenges the student might face in the collection of primary data. [2]

Section B
This question is compulsory

2 (a) Study Photograph A and B (Insert 1), which show a stretch of coastline.

(i) Explain the formation of the coastal features shown in the Photograph A with the use of well-labelled diagram(s). [6]

(ii) Describe the conditions necessary for the formation of the features on this coastline with reference to Photograph B. [3]

(b) Study Fig. 1, which shows visitor and GDP growth rate in Singapore from 1999 to 2010.

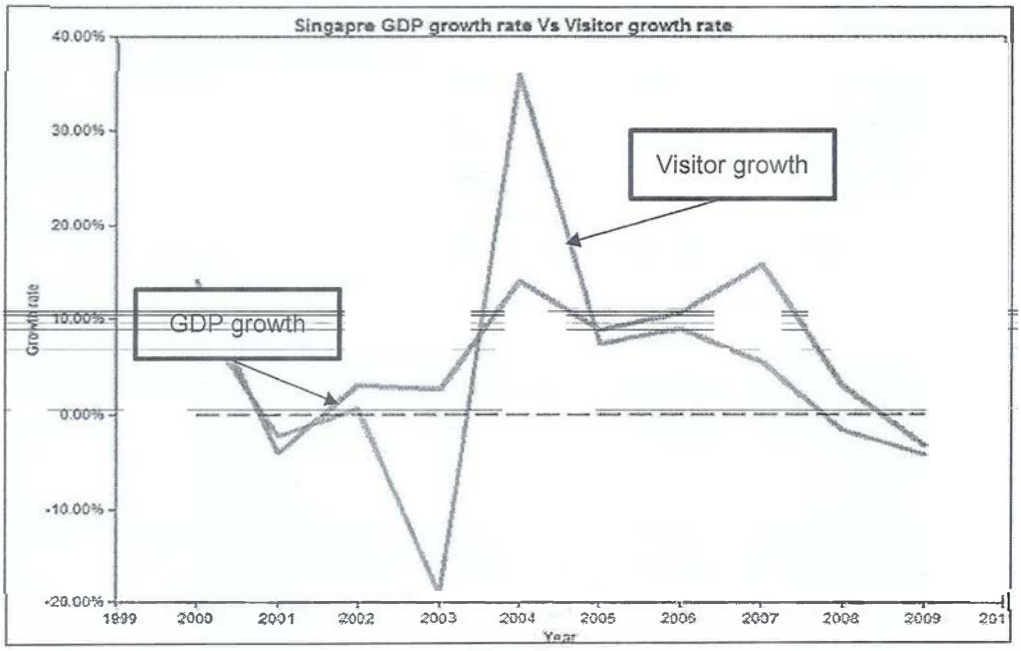


Fig. 1

Source: https://wiki.smu.edu.sg/1011t1is428/S13A1

Compare the growth rates of visitor and GDP over the years. [3]

(c) Explain why the number of visitors going on long-haul flights has grown over the years. [5]

(d) Popularity of tourism in some LDCs has resulted in some undesirable impacts on the locals and the environment.
With reference to examples, assess the effectiveness of the government and other stakeholders in reducing the undesirable effects of tourism. [8]

End of paper

Clementi Town Secondary School
Mid-Year Examination 2016
Secondary 4 Express

GEOGRAPHY
Paper 1
INSERT

2236/01
03 May 2016
1 hour 40 minutes

READ THESE INSTRUCTIONS FIRST

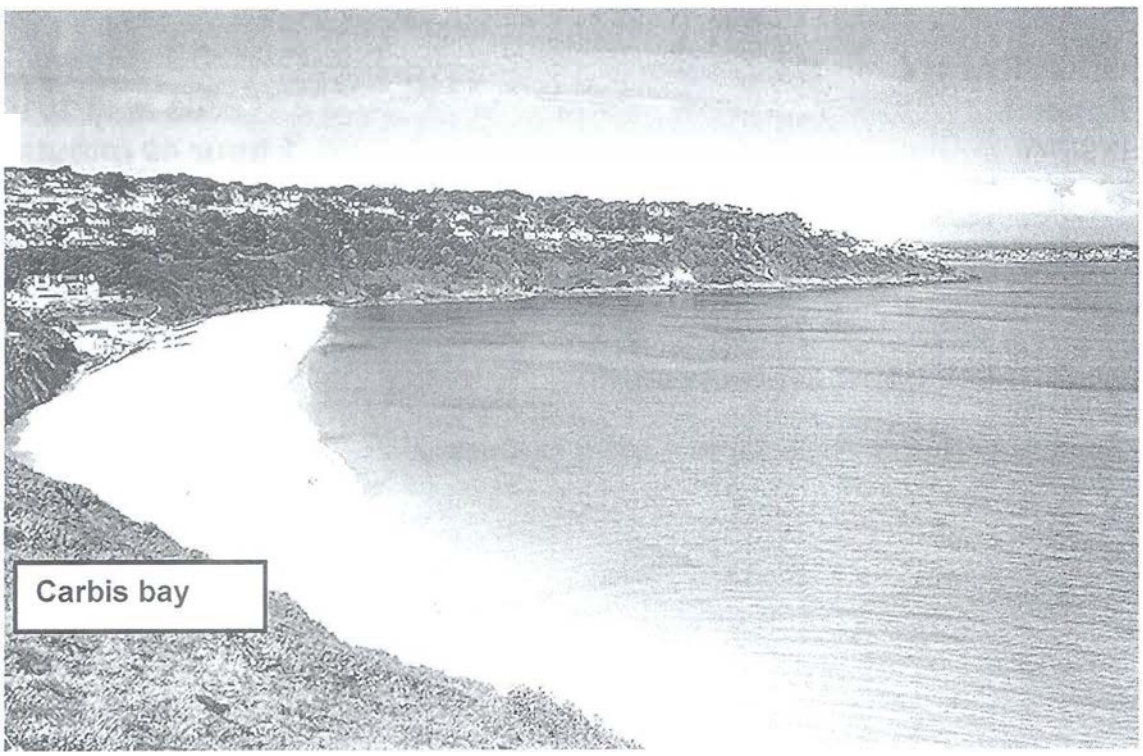
This insert contains Photographs A and B for Question 2.

This document consists of **2** printed pages.

[Turn over

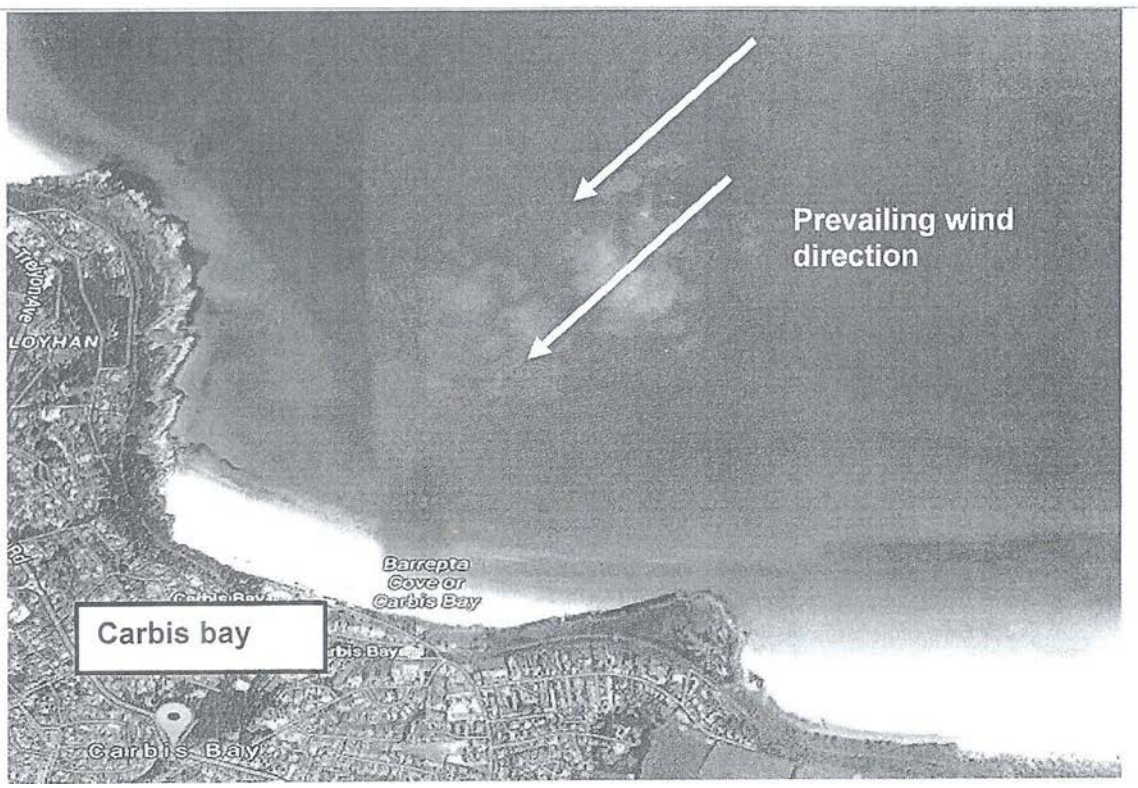
Photograph A for Question 2

Source: https://natureflip.com/carbis-bay-beach



Photography B for Question 2

Source: https://www.google.com.sg/maps/search/Carbis+Bay+beach/



Name: ____________________ Index Number: _______ Class: _____

Clementi Town Secondary School
Mid-Year Examination 2016
Secondary 4 Express

GEOGRAPHY **2236/02**
Paper 2 **10 May 2016**
1 hour 30 minutes

Additional Materials: 1 insert

READ THESE INSTRUCTIONS FIRST

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~~Answer **All** Questions~~

Write all answers on the Writing Papers provided.

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

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

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[Turn over

Section A
This question is compulsory.

1 (a) Study Fig. 1, which shows the wind system in parts of Asia from November to February.

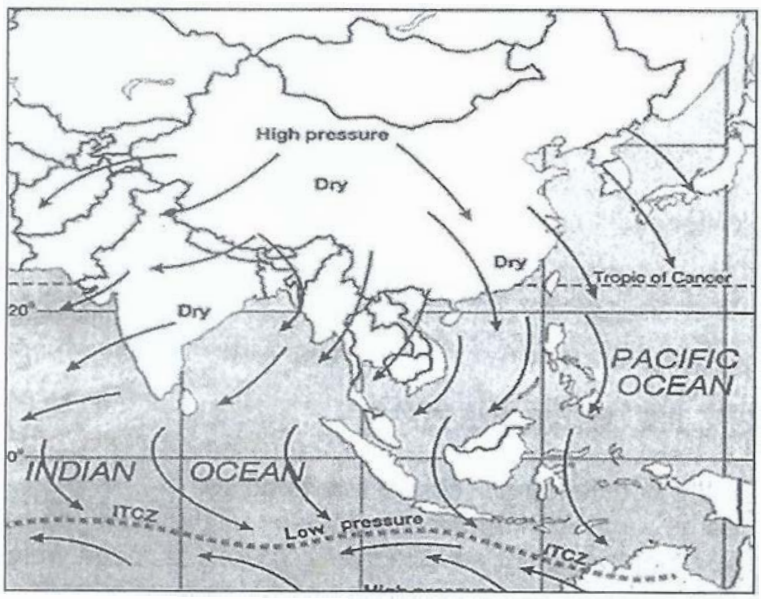


Fig. 1

Source: http://www.unomaha.edu/international-studies-and-programs/

Account for the climatic condition in India from November to February.
Support your answer with information from the map in Fig. 1.

[4]

(b) Describe the formation of relief rain with the use of an annotated diagram.

[4]

(c) Study Photographs A and B (Insert), which show the eruption at Mount Sinabung in Indonesia.

(i) Explain how the tectonic processes resulted in the volcanic eruption as shown in Photograph A. [5]

(ii) Describe the effects of the eruption of Mount Sinabung on the people and the landscape in the area shown in Photograph B. [4]

(d) "The magnitude and focus of an earthquake are the main reasons for the different levels of death and damage found in an area."
To what extent do you agree with this statement? Give reasons to support your answer. [8]

Section B
This question is compulsory

2 (a) Study Fig. 2, which shows the global hunger situation.

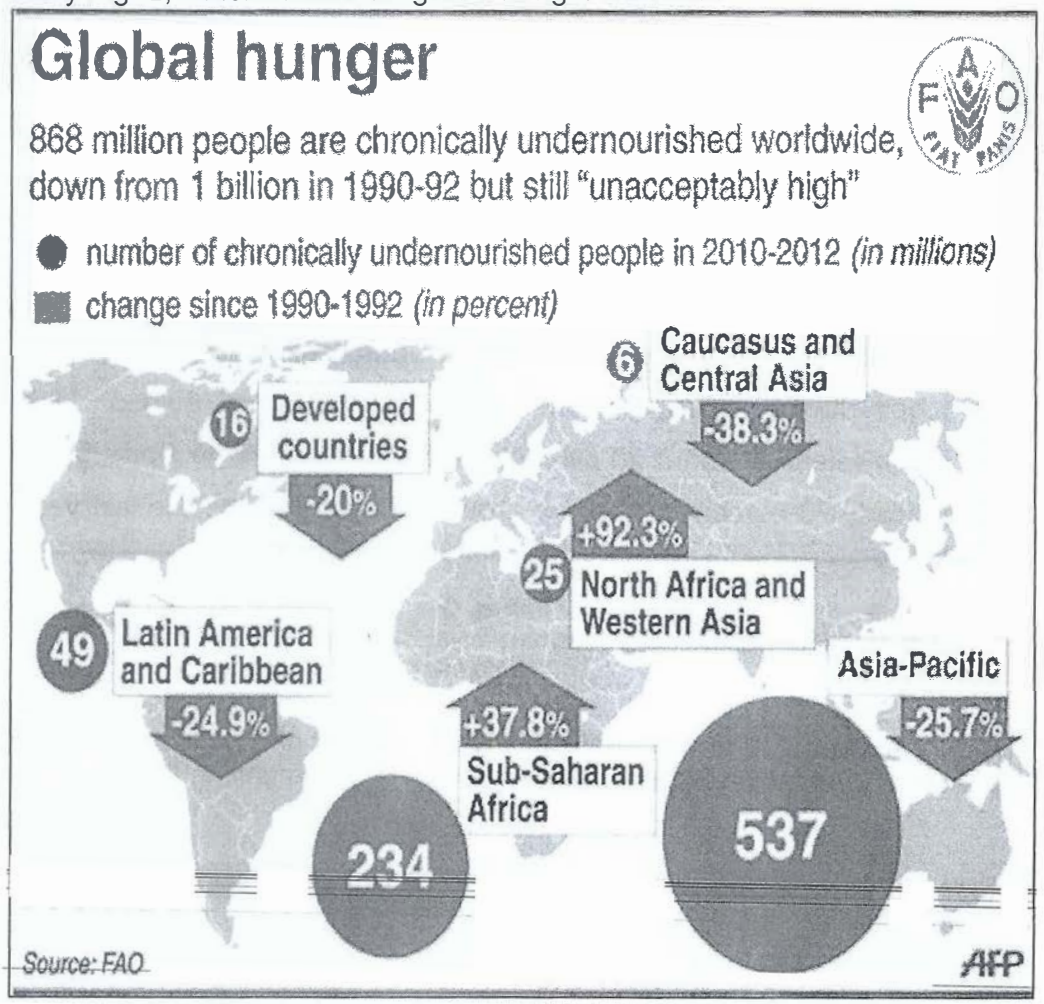


Fig. 2
Source: http://cdn.phys.org/newman/gfx/news/hires/2012/globalhunger.jpg

(i) Describe the distribution and changes in the number of chronically undernourished people in the world from 1990 to 2012. [3]

(ii) Explain the reasons behind the changes you observed in **(a)(i).** [4]

(b) Study Fig. 3, which gives information on the problem of land purchases by foreign investors in Brazil.

> A World Bank study last year said that volatile food prices had brought a "rising tide" of large-scale farmland purchases in developing nations, and that China was among a small group of countries making most of the purchases. In Brazil, one government study estimated that foreigners owned land equivalent to about 20 percent of São Paulo State. In Goiás State, nearly 70 percent of the soy grown went to the Chinese last year,

Fig. 3

Source: http://www.kimmacquarrie.com/soybean-consumption-in-china-endangers-brazils-amazon-rainforest/

With the help of Fig. 3, explain how the problem of land purchasing could affect the price of staple food and the level of food security in Brazil. [5]

(c) Discuss how the type and amount of food consumed affect the lives of people living in LDCs. [5]

(d) "The benefits of technological advancement in food production outweigh its environmental costs."
To what extent do you agree with this statement? Give reasons and use specific examples to support your answer. [8]

End of paper

Clementi Town Secondary School
Mid-Year Examination 2016
Secondary 4 Express

GEOGRAPHY **2236/02**
Paper 2 **10 May 2016**
INSERT **1 hour 30 minutes**

READ THESE INSTRUCTIONS FIRST

This insert contains Photographs A and B for Question 1.

This document consists of **2** printed pages.

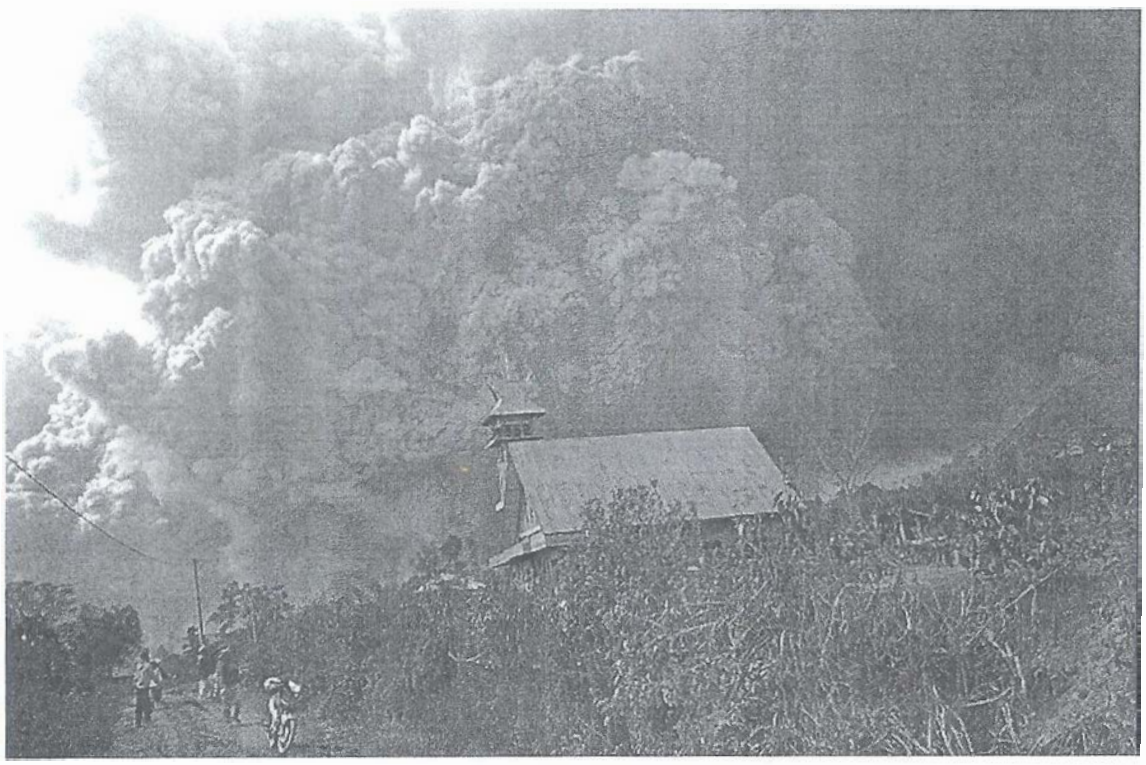
[Turn over

Photograph A for Question 1

Source: http://guardianlv.com/2015/06/mount-sinabung-eruption-forces-evacuation-of-thousands/

Photograph B for Question 1

Source http://darkroom.baltimoresun.com/2014/02/mount-sinabung-volcano-kills-at-least-11-fears-over-more-eruptions/#1



Clementi Town Secondary School
Mid-Year Examination 2016
Secondary 4 Express

Answer Scheme

GEOGRAPHY **2236/01**
Paper 1 **03 May 2016**
1 hour 40 minutes

Section A

1 (a) A group of students carried out fieldwork at two local beaches in England. Sewerby beach is a pebble beach surrounded by cliffs and Bridlington beach is a long sandy beach.

(i) The students would like to find out the whether the two beaches have different beach profiles.
State a suitable hypothesis to test this. 2

Award 2m for valid hypothesis
The pebble beach has steeper beach profile than the sandy beach / The bigger the size of beach materials, the steeper the beach profile.

Sewerby beach is steeper than Bridlington beach - 1m for hypothesis that are too general (not specific)

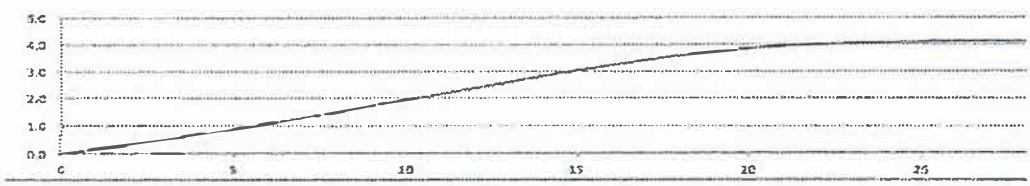
(ii) Describe a method that the students could use to collect data to test the hypothesis suggested in **(a)(i)**. [3]

1. *Mark a transact at Sewerby beach and another transact at Bridlington beach from the low water mark to the back of the beach.*
2. *Put poles at each break of the slope OR use tape measure to measure 5m and put ranging poles at 5m intervals along the beach.*
3. *Use two ranging poles of the same height (alternatively use two persons of similar height). At each sample point in turn, place a pole at the start and finish points.*
4. *The observer resting the clinometer on top of a ranging pole, sights it at the top of the ranging pole held by the person at the next break of slope or sight the clinometer at the eyes of person 2 and reads off the slope angle.*
5. *Repeat steps 3 and 4 for the other intervals along the transacts*

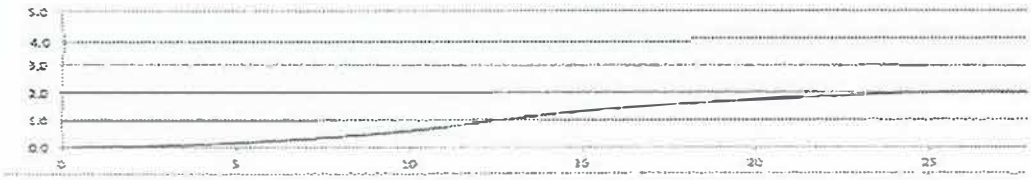
(iii) Describe what a high water mark is and how to identify it. [2]
The high water mark is the highest point to which the waves reached on that particular day.
Identify a line of debris (e.g. seaweed, shells, pieces of wood or leaves) on the beach that is closes to the sea.

(iv) Table 1 shows the results of the measurements along a transact across the middle of both beaches.

Use the data in Table **1** to construct the beach profiles of both beaches on the graph paper provided. [3]



Sewerby beach



Bridlington beach

accurate plotting of points *2 marks*
1 or 2 errors *1 mark*
correct axis and units *1 mark*

(v) Comment on the validity of your original hypothesis in **(a)(i)** based on the measurements shown on Table 1 and suggest how reliable it was. You should evaluate the data collection strategy and suggest possible improvements. [6]

Validity
Hypothesis is true, Sewerby beach (pebble beach) has a steeper profile compared to Bridlington beach. Data from Table 1 to support.
Max 2m

Reliability
+ systematic sampling applied to both sites, regular intervals
- accuracy of data is questionable, might miss out the small variations in slope which can be important on a beach, given that data collection is based on fixed intervals
- only 1 set of data per site, insufficient, did not take into account the possibility of error in reading the measurements from the clinometer.
- time taken and tide condition not stated, data lacked reliability if it is taken at different timings at different sites.
Max 3m

Improvements
the need for a number of profiles across the width of the beach to ensure the validity of results / sample more transacts.
Measuring from break of slope to break of slope. Normally end up taking more slope readings, but the profile that you draw is more accurate.
Check and indicate tide timings at both sites before doing fieldwork.
Max 3m
A complete answer does not have to contain all these points

(b) A group of students wanted to find out more about the tourism impacts on the Inca Trails of Machu Picchu in Peru. They approached the Department of Natural resource and Environment and obtained secondary data on: Tourist Arrivals to Peru, rainfall and soil loss along the Inca Trails in Table 2. The students crafted the following hypothesis.

Hypothesis: *The growth in tourism resulted in major environmental impact on Machu Picchu in Peru.*

Tourist Arrivals to Peru, Soil loss and rainfall along the Inca Trail

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2016	1,300	3961.90	98.33

Table 2
Source: http://article.sapub.org/10.5923.j.re.20140403.02.html

(i) What conclusions can be drawn from the information shown in Table 2 in response to the hypothesis? Support you answer with evidence from Table 2 and reasons. [4]

Conclusions
*Growth is tourism resulted in **negative** impact on the environment in Machu Picchu. Do not accept if students did not mention whether the impact is negative or positive.*
The increase in tourist arrivals resulted in the increase in the amount of soil loss.
Max 2m

Data to support
Point out anomaly in 2014
Max 3m

Reason – increase in the number of trekkers who are mainly tourists resulted in more trampling and greater erosion of soil, contributing to soil loss.
Max 1m

A complete answer does not have to contain all these points

(ii) Describe how you would go about collecting additional types of primary data to test the hypothesis proposed by the students. [3]

- *Carry out Traffic Survey; collect primary data on the number of trekkers along the Inca Trails*
- *Carry out a biopolar survey on the tourist and local perception of soil loss along the Inca trail*
- *Observation survey of what other activities carried out along the Inca trails that could have contributed to soil loss*
- *Use of surveys/questionnaires/interviews with tourists and locals on their perceptions with regards to if activities carried out could have led to soil loss*
- *Map out the different types of activities that could have a direct impact on soil loss*

(iii) State some possible challenges the student might face in the collection of primary data. [2]

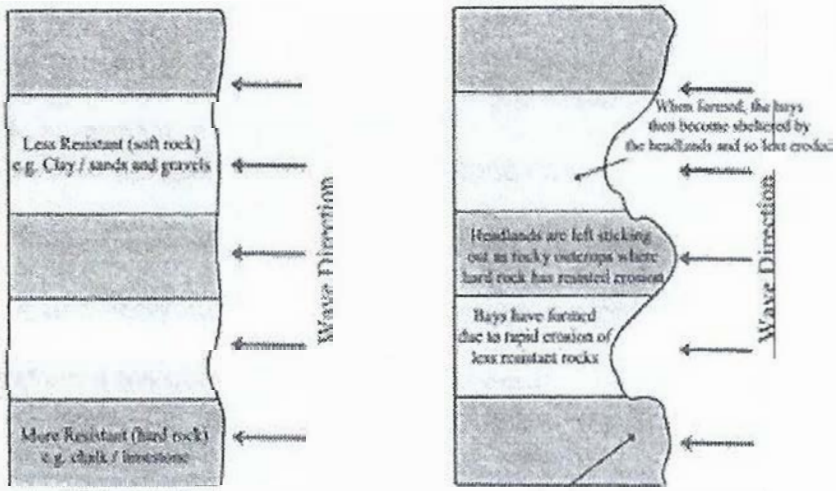
- *Language barriers such that responses may not be accurately depicted*
- *Unwilling tourists who do not want to be interviewed so students may not be able to get a minimum number of tourists responses to ascertain the reliability of the hypothesis*
- *Timing of investigation must take into account when tourists most likely to visit, otherwise there may not be enough of sampling obtained to support or bust hypothesis*
- *Range of tourists if insufficient to represent across a broader spectrum, there may be some biasness to responses surveyed*
- *Inca Trail is a tough trek and students need to be physically strong*

Section B
This question is compulsory

2 (a) Study Photograph A and B (Insert 1), which show a stretch of coastline.

(i) Explain the formation of the coastal features shown in the Photograph A with the use of a well-labelled diagram. [6]

The Formation of Headlands and Bays



Max 2m for diagram.

- *At an exposed coast with alternative bands of resistant rocks and less resistant rocks at almost right angles to the coast.*
- *Continual erosion of the coast through processes such as hydraulic action and abrasion.*
- *Rapid erosion of the less resistant rocks will lead to the formation of Carbis bay, which is the wide inward curve of the coastline.*
- *The resistant rocks that are eroded more slowly will remain as cliffed headlands, the narrow land that protrudes into the sea.*

Max 4m for explanation.

(ii) Describe the conditions necessary for the formation of the features on this coastline with reference to Photograph B. [3]

- *Exposed, unprotected coast.*
- *facing incoming prevailing wind, making it weak against erosion by incoming waves.*
- *Strong onshore wind speed as seen by the moving clouds and long fetch given that there is no obstruction infront of carbis bay.*
- *large waves of high energy/destructive waves resulting in greater erosion.*

Max 2 marks if students made little or no reference to Photograph B. Do not accept presence of lines of weaknesss.

(b) Study Fig. 1, which shows visitor and GDP growth rate in Singapore from 1999 to 2010.

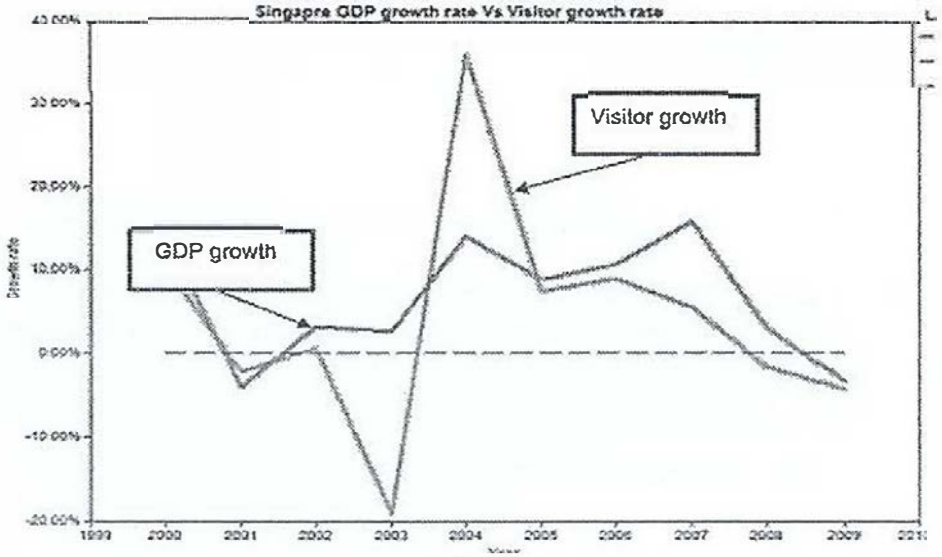


Fig. 1

Source: https://wiki.smu.edu.sg/1011t1is428/S13A1

Compare the growth rates of visitor and GDP over the years. [3]

Credit points of comparison at one mark each.
Award one mark for the use of statistics from graph to support comparison.

Decline in Visitor growth rate leads to the decline in GDP. Similarly increase in Visitor growth rate also leads to the increase in GDP.
However the rates of increase and decline are different. For example in 2013, despite a decline of 20% in Visitor rate, the decline of GDP was only 1%.

(c) Explain why the number of visitors going on long-haul flights has grown over the years. [5]

Improvements in airline technology promote bigger and faster aeroplanes → shorter time to travel over long distances resulted in the popularity of long-haul flights.

Increase in disposable income → more money available to spend on traveling to further places.

Increase in leisure time, more paid leaves → people can spend more time traveling, more willing to go to further places and longer trips.

Accept other plausible answers. Note that students must link the factors to the increase in long-haul flights and not just the increase in tourism.

(d) Popularity of tourism in some LDCs has resulted in some undesirable impacts on the locals and the environment.

With reference to examples, assess the effectiveness of the government and other stakeholders in reducing the undesirable effects of tourism. [8]

Government

- *Can greatly influence the future quality of environments by determining how many visitors a site can cope with*
- *Allocating space for infrastructure such as roads and hotels*
- *Most important group in ensuring that the tourist areas are protected Enforce rules, regulations, values and principles for sustainable tourism. Work together closely with the industry and community. Eg Bhutan accepted only 18000 tourists in 2006, restrict the number to guard against cultural erosion and other negative impacts of tourism*
- *Even the most well-planned and well-funded programme can sometimes fail due to unforeseen factors*
- *Local communities or NGOs may oppose the management strategies of planning authorities*
- *Tourism management strategies often have limited impact without cooperation from stakeholders.*
- *Might face the problem of having insufficient funds and manpower to effectively implement policies and rules.*

Local communities

- *A group of people living in the same territory*
- *Benefit economically from tourism, especially through ccmmunity-based tourism*
- *Community-based tourism: tourism that has close contact with, and mainly benefits local communities in partnership with government or NGOs.*
- *Consultations about tourism management strategies were carried out with residents. Make tourism-related decisions. Candirejo Village, near Borobudur in Central Java, Indonesia. Villagers set up a cooperative in 2003 to manage and implement the community's tourism-related programmes*
- *Includes developing homestay accommodations, organic farms and local transport*
- *Trained villagers to produce handicrafts, to provide catering and to work as tour guides*
- *Disadvantaged locals may face funding problems when setting up businesses or investing in vehicles to facilitate tourism*
- *lack the knowledge and skills to take on higher end jobs (eg managers, consultants, guides) - could not influence decision making, trapped in doing low income jobs.*

Visitors

- *Visitor spending can provide funds to help conserve environments, preserve culture or maintain tourist attractions. Includes entrance fees or purchase of souvenirs.*
- *Income from employment and business. Eg. Hotel staff, tour guides etc*

- *Demand gives opportunities to locals to set up businesses*
- *Visitors may realise the value of conserving and preserving the destination*
- *Raise awareness by sharing their experience.*
- *Vandalism and littering may damage tourist attractions*
- *Sheer number of tourists can also damage tourist sites through their collective footsteps, noise or touch.*
- *A place may lose its identity when dancers deliberately pose for tourists to take photographs. A place or performance does not feel 'authentic'*
- *Dilution of local culture more pronounced when visitors outnumber locals in an area and commercial activities focus mainly on tourism*

Tour operators

- *Offer valuable feedback about the social and environmental conditions of a tourist attraction. Prevent tourists from litter, wandering into restricted areas or from making too much noise to prevent damage to a tourist site.*
- *Tour operators have an incentive in maintaining the quality of an attraction because the attraction is their source of income.*
- *Phuket Alterative Tours (PAT) was set up by a team of tour operators in Phuket in 2006. Tour operators who want to operate under PAT are required to sign an Environmental and Cultural Code of Practice with the following guidelines - Operate in an environmentally sustainable way. Seek to enhance the natural environment. Create awareness about environmental conservation for visitors to Phuket*
- *The need to generate profits can sometimes bring tour operators into conflict with other stakeholders may override concerns to preserve the environment when addressing these concerns would reduce their profits*

Level 1 (0-3 marks)

- *At the level answers will be generalised or with minimal support.*
- *Reasoning rather weak and expression may be unclear. A basic answer that has little development.*
- *Examples not given*

Level 2 (4-6 marks)

- *Content lack balance with some relevant details. This means only successful and not successful points considered*
- *Both successful and limitations are considered, but support is patchy so that the answer is not full. General assessment.*
- *Only assessed the role of one stakeholder.*
- *An example presented to support evaluation in at least one place in the answer.*

Level 3 (7-8 marks)

- *Answers will be comprehensive and supported by sound knowledge.*
- *Both successful and limitations are considered and supported with detailed and substantial reasoning*
- *Detailed examples to support answers can be found in most places.*

Name: _____ Index Number: _____ Class: _____

Clementi Town Secondary School
Mid-Year Examination 2016
Secondary 4 Express

Answer Scheme

GEOGRAPHY **2236/02**
Paper 2 **10 May 2016**
1 hour 30 minutes

Section A
This question is compulsory.

1 (a) Study Fig. 1, which shows the wind system in parts of Asia from November to February.

Account for the climatic condition in this region from November to February Support your answer with information from the map in Fig. 1. [4]

- *From December to January, the northern hemisphere experiences winter and southern hemisphere experiences summer.*
- *Air over Central Asia is cold and sinks, forming a region of high pressure.*
- *At the same time, air over the Southern Hemisphere, Australia is warm. Warm air expands and rises, forming a region of low pressure.*
- *Due to a difference in air pressure, winds blow from the Northern Hemisphere, Asia continent to the Southern Hemisphere, Australia as Northeast monsoon in the northern hemisphere.*
- *Cold dry winds from Central Asia bring little rain to India sub-continents, resulting in India having cool and dry climate during this period of time.*

(b) Describe the formation of relief rain with the use of an annotated diagram. [4]

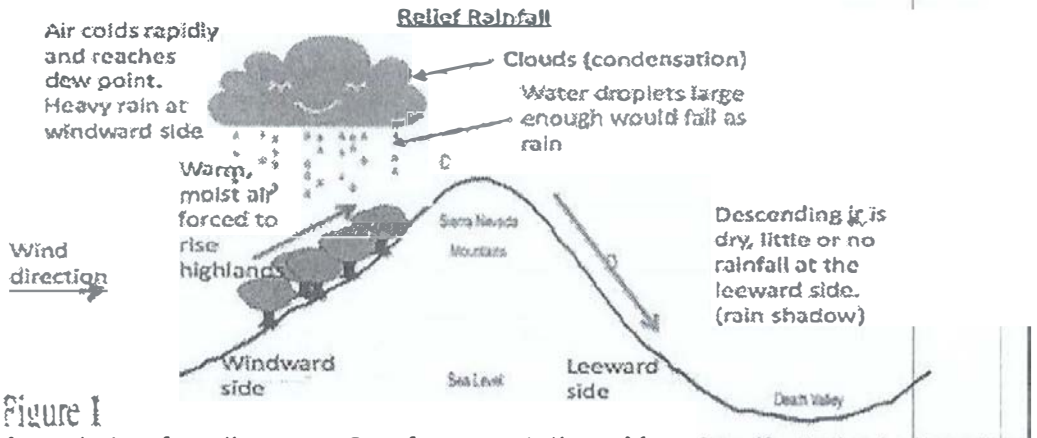


Figure 1

Award 1m for diagram, 3m for annotation. Max 2m if student describes without the use of an annotated diagram.

(c) Study Photographs A and B, which show the eruption at Mount Sinabung in Indonesia.

(i) Explain how the tectonic processes had resulted in the volcanic eruption as shown in Photograph A. [5]

- *The eruption is likely to happen near subduction zone at convergent plate boundary.*
- *due to the convergence between two oceanic plates or the convergence of an oceanic plate with a continental plate, the denser oceanic plate is subducted beneath the plate that is less dense.*
- *Partial melting of the subducted plate resulted in the production of magma due to the high temperature in the mantle area.*
- *large amount of gases produced by the melted oceanic plate gets trapped and are unable to escape, resulting in the build up of pressure.*
- *Eventually, with increase pressure and the new magma generated being less dense than the surrounding magma, it forces its way up through layers of rocks*
- *forming violent volcanic eruption as seen in Photograph A, releasing tons of ashes in the air.*

(ii) Describe the effects of the eruption of Mount Sinabung on the people and the landscape in the area shown in Photograph B. [4]

- *Pyroclastic flow consists of huge amount of superheated boulders, rock fragments and ashes traveling at 80km/hr or faster. It could destroy everything in its path, causing widespread damage and loss of lives.*
- *Landslides can occur due to structual collapse of a volcanic cone during a violent/explosive eruption. Landslides could bury farmlands and villages, causing people to lose large area of farmlands and their houses.*
- *Milion of tons of volcanic ashes could bury people, roads and vehicles, along its way and engulf towns further away.*
- *Heat from the gases and ashes could also cover and burning down and destroying large area of forest and crops.*
- *Volcanic bombs of heated rocks can fall in areas surrounding the volcanoes, causing damage to property.*

(d) "The magnitude and focus of am earthquake are the main reasons for the different levels of death and damage found in an area."
To what extent do you agree with this statement? Give reasons to support your answer. [8]

The higher the magnitude of an earthquake (More than 6.0) results in the release of large amount of energy from the source of the earthquake. High

possibility of having greater damage from infrastructure collapsing, as they are unable to withstand the force exerted by the earthquake and strong vibrations. May result in the death of more people who are buried under the debris. Eg. Magnitude 9.2 earthquake near Ache, Indonesia in 2004 caused around 228 000 deaths.
The strength of shaking from an earthquake diminishes with increasing distance from the earthquake's source.
Deep Focus – 70 – 700km below earth surface. Less severe damage on land as seismic energy has dissipated (lost much of their energy) before reaching surface. Shallow Focus – Upper 20 km. Greater damage on land as seismic wave energy reaches the surface quickly and is still strong when it reaches the surface. Earthquake of high magnitude and shallow focus often result in the most devastating impacts.
The higher the population density of an earthquake-prone area, the higher the chances of people getting killed or injured. Densely populated earthquake zone. The destruction of an infrastructure in an area will have an impact on a larger number of people. higher number of causality and damage
LDCs unlikely to have the resources and advance technology for monitoring, prediction and response. Unable to ensure that those who are injured receive timely medical assistance and inadequate resources to ensure that people know what to do and are able to evacuate safely before getting injured when earthquake, resulting in casualty and damage.
Tsunami is a rare but deadly even triggered by offshore earthquake. Threat of tsunamis is higher because of the fact that it is less predictable as it can occur suddenly/ quickly, where it is harder to escape from. The impact of a tsunamis is also more widespread because tsunamis can travel long distances and cause more widespread destruction at coastal areas when it sweeps inland. For example, 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.

Level 1 (0-3 marks)
- *At the level answers will be generalised or with minimal support.*
- *Reasoning rather weak and expression may be unclear. A basic answer that has little development.*
- *Examples not given*

Level 2 (4-6 marks)
- *Content lack balance with some relevant details. This means only agree OR disagree.*
- *Agree AND disagree but support is patchy so that the answer is not full. General assessment, does not address the question adequately.*
- *Good reasoning and logic in parts of the answer.*

Level 3 (7-8 marks)
- *Answers will be comprehensive and supported by sound knowledge.*
- *Agree and disagree with detailed and substantial and clear reasoning on the effects of climate change on people.*
- *Detailed examples to support answers can be found in most places.*

Section B
This question is compulsory

2 (a) Study Fig. 2 (Insert 1), which shows the global hunger situation.

(i) Describe the distribution and changes in the number of chronically undernourished people in the world from 1990 to 2012. [3]

Credit up to 2m for descriptions.
Credit 1m for the accurate use of data from Fig. 2.
Majority of the chronically undernourished people are in the Asia-pacific and and Sub-Saharan, with the greatest number of 537 millions in Asia-Pacific. However there is a significant decline in the number of chronically undernourished people in Asia-Pacific, with 25.7% decline in the number of undernourished people in 2012.

Decresed in the % of chronically undernourished people in all parts of the world, except for Sub-Saharan African region and North Africa and Western Asia region.

(ii) Explain the reasons behind the changes you observed in (a)(i). [4]

Climate change - Increase in temperature melting of glaciers resulting in loss of water during dry season in Western Asia region, causing smaller harvest/crop failure for farmers.

Drought could cause significant damage to crops in Sub-Saharan Africa. Due to crop failure, there could be significant food shortages, especially in LDCs because farmers are poorer, have less surplus (low reserves) and could not cope with the loss.

Civil war - Bombs destroy farmlands, making it difficult and unsafe for farming to continue. Increase in theft case also resulted in drastic shortage of food resources in Sub-Saharan Africa.

Poor governance - Value gains from economic development (mining, cash crop etc) over food security, lease out farmland instead of giving them to the locals. Farmers left with small plots of land or nothing and lost the means to use fertile land to produce important staple food and lack the income to buy food

*Accept other plausible answers. Students must make reference to their answers in **(a)(i).***

(b) Study Fig. 3, which gives information on the problem of land purchases by foreign investors in Brazil.

> A World Bank study last year said that volatile food prices had brought a "rising tide" of large-scale farmland purchases in developing nations, and that China was among a small group of countries making most of the purchases. In Brazil, one government study estimated that foreigners owned land equivalent to about 20 percent of São Paulo State. In Goiás State, nearly 70 percent of the soy grown went to the

Fig. 3

Source: http://www.kimmacquarrie.com/soybean-consumption-in-china-endangers-brazils-amazon-rainforest/

With the help of Fig. 3, explain how the problem of land purchasing could affect the price of staple food and the level of food security in Brazil. [5]

- *Large area of land owned by government or landlords instead of local farmers.*
- *High demand for soy means increase in price and profit of producing soy, which encourage foreign investers to produce mainly cash crops instead of staple food.*
- *Arable land converted to produce cash crop like soy beans instead of staple food like rice.*
- *Lack of supply of staple food eventually leads to the increse in the price of staple food, making it unaffordable for the locals*
- *Decine in the level of food security.*
- *Low surplus of food stored, no resource for stock pilling (unstable supply) due to lack of funds and supply of staple food.*

Max 2m if students simply copy from Fig. 3 without explanation.

(c) Discuss how the type and amount of food consumed affect the lives of people living in LDCs. [5]

food they eat does not provide the proper amounts of vitamins and minerals to meet daily nutritional requirements.

Malnutrition reduces physical and mental development during childhood. Stunting, for example, affects more than 147 million pre-schoolers in developing countries

affects school performance → lack of nutrients affect the level of concentration and eye sight → weaker performance → lower Income as an adult.

Vitamin A – from eggs, cheese, meat and vegetables, maintains eyesight and keeps the body immune system healthy. Vit A deficiency might result in visual impairment and blindness → Children miss their chance to learn in school and have a better future

It also causes women to give birth to low birth-weight babies → affect mental and physical development of children → Cannot fight off common infections → higher chances of diarrhoea and measles.
Loss of school days and education opportunities à less able to read or write as the lack of nutrients result in brain damage à affect their future productivity.
Due to poor health, farmers are less productive and are unable to implement improvements.

(d) "The benefits of technological advancement in food production outweigh its environmental costs."
To what extent do you agree with this statement? Give reasons and use specific examples to support your answer. [8]

Benefits of GM Food

Increase income of farmers	GM crops increased income for farmers worldwide due to increased productivity GM crops that are pest-resistant help farmers to save money on the costs of pesticides and on the labour needed to administer the treatment Coupled with higher output, farmers earn higher income An example of such crops is Bt-cotton, which has increased farmers' income in India by US$12.6 billion from 2002 to 2011
Nutritional benefits for consumers	Certain crops have been genetically modified to have higher nutritional value For example, the Golden Rice has been developed to have higher levels of Vitamin A Since deficiency in Vitamin A can result in blindness, the increased intake of Vitamin A through rice, particularly in LDCs, can help prevent children from suffering from this disease
Decreased environmental pollution	GM crops are environmentally friendly because they are resistant to insect and pest attack as well as to herbicides This helps to reduce the release of chemical into the environment that could lead to pollution

Risks of GM Food

Dominance of agribusiness	GM crops are expensive because a lot of research and time have been put into it Therefore, they require high capital investment, which is usually affordable only to big companies and DCs GM crops are expensive because a lot of research and time have been put into them. Therefore they require high capital investment which can be afforded by big companies only. Small scale farmers and LDCs will not be able to afford the GM seeds due to the high price for set-up. This will further widen the income gap between the wealthy and poor farmers.

Genetic pollution resulting in loss of biodiversity	GM foods also have the potential to harm other organisms. If the resistance of GM foods is transferred to wild plants, it can have negative effects on insects and other animals which feed on them This can cause a reduction of biodiversity which refers to the variety of life forms found in a particular ecosystem GM foods also harm other organisms when insects and animals avoid GM foods and feed on other plants instead This allows the insect-resistant GM plants to survive and dominate the landscape An example of a species negatively affected by GM food is the monarch butterfly, which feeds exclusively on milkweed. In a controversial study conducted by Cornell University in 1999, nearly half of the monarch butterfly caterpillars died after eating milkweed dusted with pollen from Bt-corn. In contrast, all the monarch butterfly caterpillars survived when they were fed only with milkweed that had not been in contact with Bt-corn pollen.
Decreased environmental pollution	There is a growing concern that incorporating foreign genes into plants may have adverse effects on human health, such as allergic reactions. For example, adding gene from nuts can be harmful as a number of people are allergic to nuts. A proposal to introduce a gene from Brazil nut into soya bean was rejected due to the possible health risk.

Level 1 (0-3 marks)

- *At the level answers will be generalised or with minimal support.*
- *Reasoning rather weak and expression may be unclear. A basic answer that has little development.*
- *Examples not given*

Level 2 (4-6 marks)

- *Content lack balance with some relevant details. This means only agree OR disagree.*
- *Agree AND disagree but support is patchy so that the answer is not full. General assessment, does not address the question adequately.*
- *Good reasoning and logic in parts of the answer.*
- *Very general examples given*

Level 3 (7-8 marks)

- *Answers will be comprehensive and supported by sound knowledge.*
- *Agree and disagree with detailed and substantial and clear reasoning on the effects of climate change on people.*
- *Detailed examples to support answers can be found in most places.*