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NAME:		()
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CLASS:	
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YISHUN TOWN SECONDARY SCHOOL

PRELIMINARY EXAMINATION 2 2016

SEC 4 EXPRESS

GEOGRAPHY

PAPER 1 (2236/01)

DATE : 24 August 2016

DAY : Wednesday

DURATION: 1 hour 40 minutes

MARKS: 50

ADDITIONAL MATERIALS

Answer paper
1 Insert

READ THESE INSTRUCTIONS FIRST

Write your class, index number and name in the spaces provided on the work you hand in.

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

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

Section A

Answer Question 1.

Section B

Answer **one** question.

Write all answers on the Answer Paper provided.

Candidates should support their answers with the use of relevant examples.

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

The Insert contains Figs. 1 and 4 and Photograph A for Question 1, Fig. 9 and Photograph B for Question 2 and Fig. 11 for Question 3.

Write your name, Centre Number and Index number in the spaces provided and attach it to your Answer paper at the end of the examination.

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.

Section A

This question is compulsory.

- 1 (a)** A group of students were interested in studying the process of deposition that takes place along the coast.
Study Fig. 1 (Insert), which shows a map of the area under study and Photograph A (Insert), which shows one of the location where the fieldwork was carried out.
- (i) The students wanted to find out how the sizes of beach materials vary with distance from the sea. Suggest a suitable hypothesis that the students could use to carry out their field investigation. [1]
- (ii) Draw a well annotated field sketch of the physical and human features shown on Photograph A (Insert). [2]
- (b)** The students used the quadrat shown on Fig. 2 to find out the proportion of shingles, small pebbles and large pebbles shown on Fig. 3 that were deposited at 10 sites along the sketch of coast from **X** to **Y** shown on Fig. 1 (Insert).

Quadrat for data collection



Fig. 2

Different sizes of particles

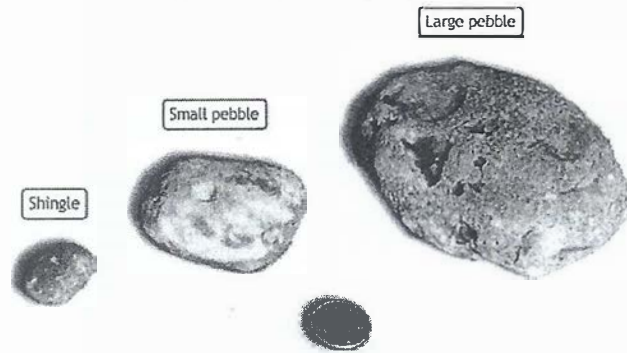


Fig. 3

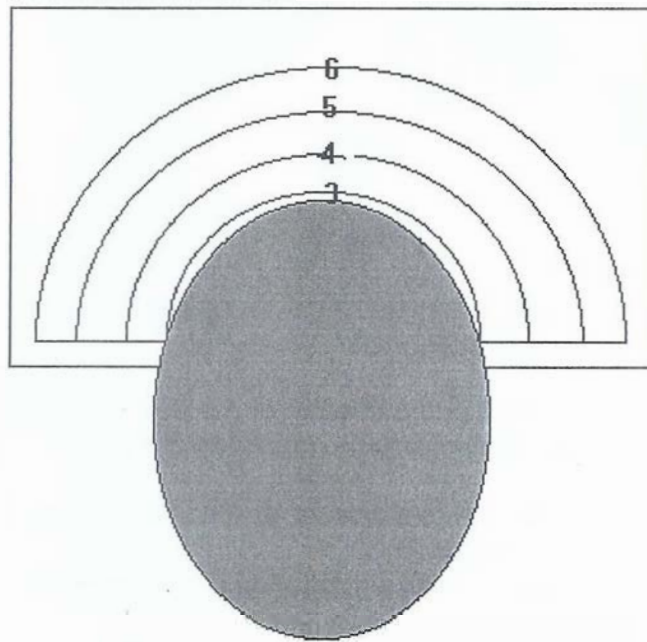
- (i) State the length of the coast from X to Y (in metres) and explain how the measurement is carried out. [3]
- (ii) Describe the functions of the quadrat and how it can be used to collect data on the different sizes of materials deposited on the coast. [3]
- (iii) The data collected by the students at the 10 sites along the coast were represented on Fig. 4 (Insert). Discuss the usefulness of this method of data presentation. [4]
- (iv) The students wanted to find out the shape of the materials that were deposited on the beach. They used the charts shown on Fig. 5 and Fig. 6 to measure the shape of the beach materials.

Power's Scale of Roundness Chart for estimating roundness and sphericity of particles

Roundness classes	Very Angular	Angular	Sub-angular	Sub-rounded	Rounded	Well Rounded
High Sphericity						
Low Sphericity						
Roundness indices	0.12 to 0.17	0.17 to 0.25	0.25 to 0.35	0.35 to 0.49	0.49 to 0.70	0.70 to 1.00

Fig. 5

Cailleux Roundness Index for estimating roundness



This pebble would have a radius of curvature of around 3 cms

Fig. 6

~~A group of 20 students were working in pairs at each of the 10 sites.~~

Describe how the students should carry out the procedures to ensure that the data collection is reliable and suggest why it is a good idea to use both charts shown on Fig. 5 and Fig. 6 to determine the shape of particles. [5]

- (c) Many tourists were attracted to visit the part of the coast shown on Fig. 1 (Insert). The students decided to investigate how the tourists visiting the coastal area would affect the natural environment.

The students wanted to test the hypothesis 'The environmental impact of tourism decreases away from the car park.'

To survey the amount of litter on the coast at two different sites (X and Y), shown on Fig. 1 (Insert), the students used a bi-polar scoring index. Fig. 7 shows the results from the bi-polar scoring sheet at Site X and Y.

Results of the survey of the impact of tourism

	Site X					
	-2	-1	0	+1	+2	
lots of glass						no glass
lots of paper						no paper
lots of wood						no wood
lots of plastic						no plastic
lots of other litter						no other litter

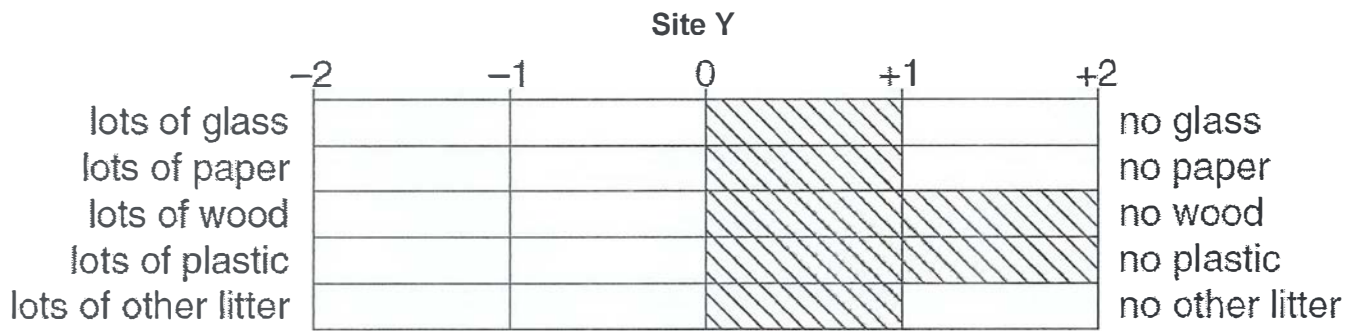


Fig. 7

- (i) Describe the difficulties that the students may encounter in obtaining reliable data when using the bi-polar survey. [3]
- (ii) Using the information from Fig. 1 (Insert) and Fig. 7, what are the conclusions that the students can draw about the hypothesis 'The environmental impact of tourism decreases away from the car park'? [4]

Section B

Answer one question from this section.

- 2 (a)** Study Fig. 8, which shows the distribution of coral reefs in Sri Lanka.

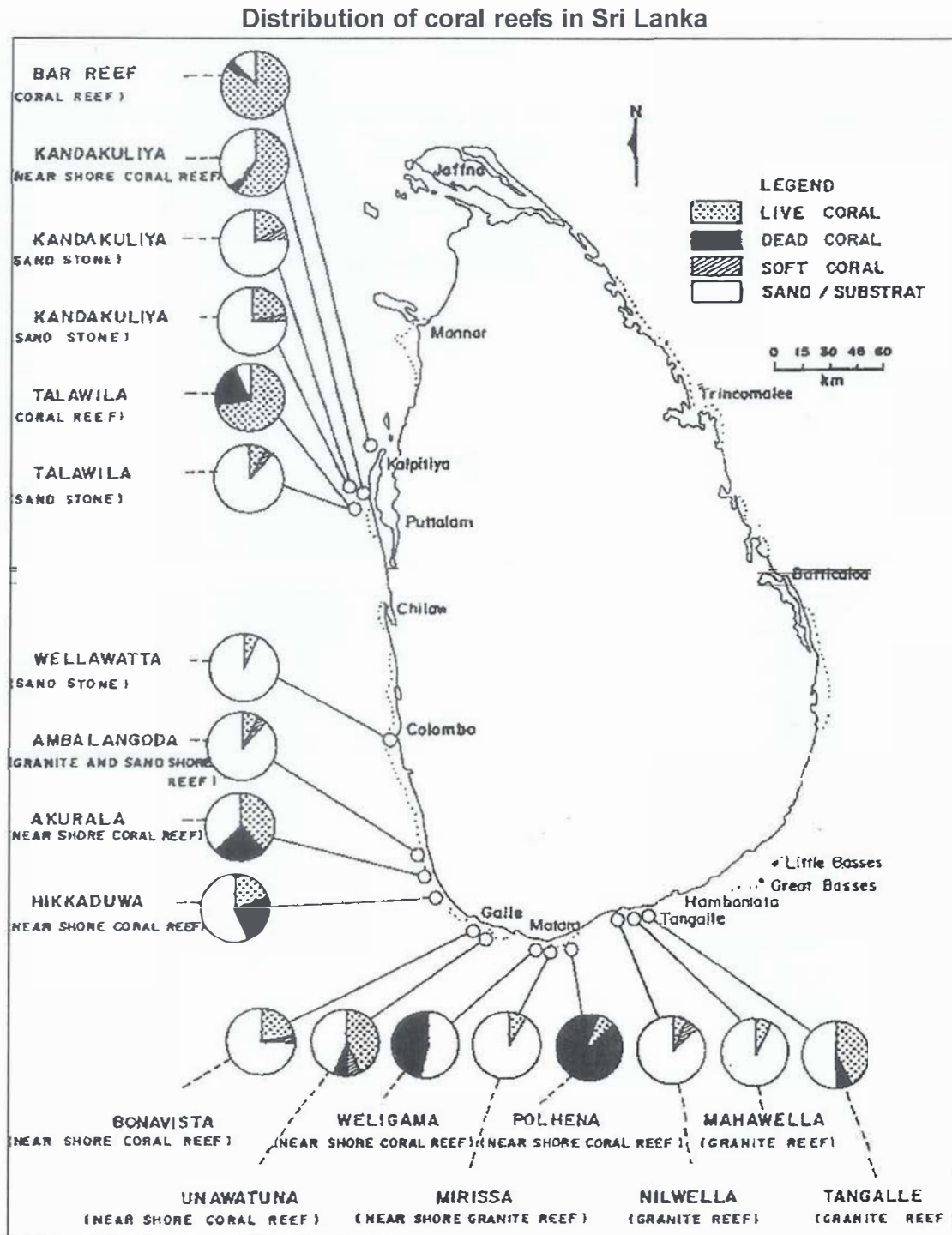


Fig. 8

- (i) Compare the distribution of live and dead corals in Sri Lanka shown on Fig. 8.

- (ii) Using information from Fig. 9 (Insert), describe the extent of the damage and threats to the corals reefs around the world. [5]
- (b) Study Photograph B (Insert) which shows the coastal features of headland and bay located at the Sunny Cove in United Kingdom.
- (i) Describe the characteristics of the coastal features shown on Photograph B (Insert). [4]
- (ii) With the aid of well-labelled diagrams, explain how the coastal features shown on Photograph B (Insert) can be formed. [4]
- (c) 'Restricting coastal development is more effective than protecting coastal resources in the sustainable management of coastal areas.'
- How far do you agree? Use examples to support your answer. [8]

- 3 (a) Study Fig. 10, which shows the coastline that is under threat in India and Fig. 11 (Insert), which shows the areas of the coastline that is vulnerable to sea level rise.

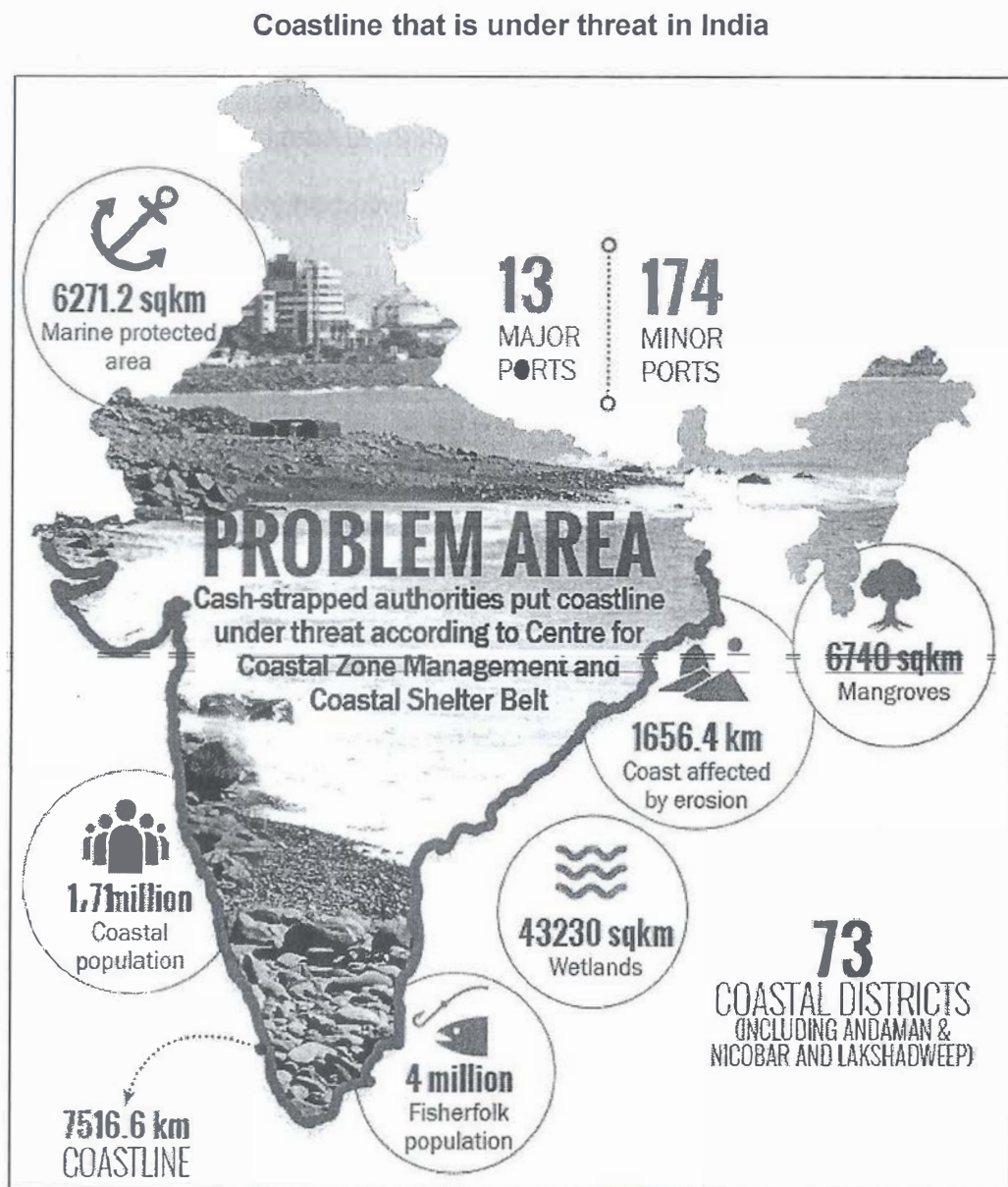


Fig. 10

Using the help of Fig. 10 and Fig. 11 (Insert), describe the pressures that threaten the coastline in India. [4]

- (b) (i) For a named area that you have studied, describe how good facilities can favour the development of tourism. [5]

- (ii) Study Fig. 12, which shows the international tourist incomes in Latin America in 2007.

International tourist incomes in Latin America

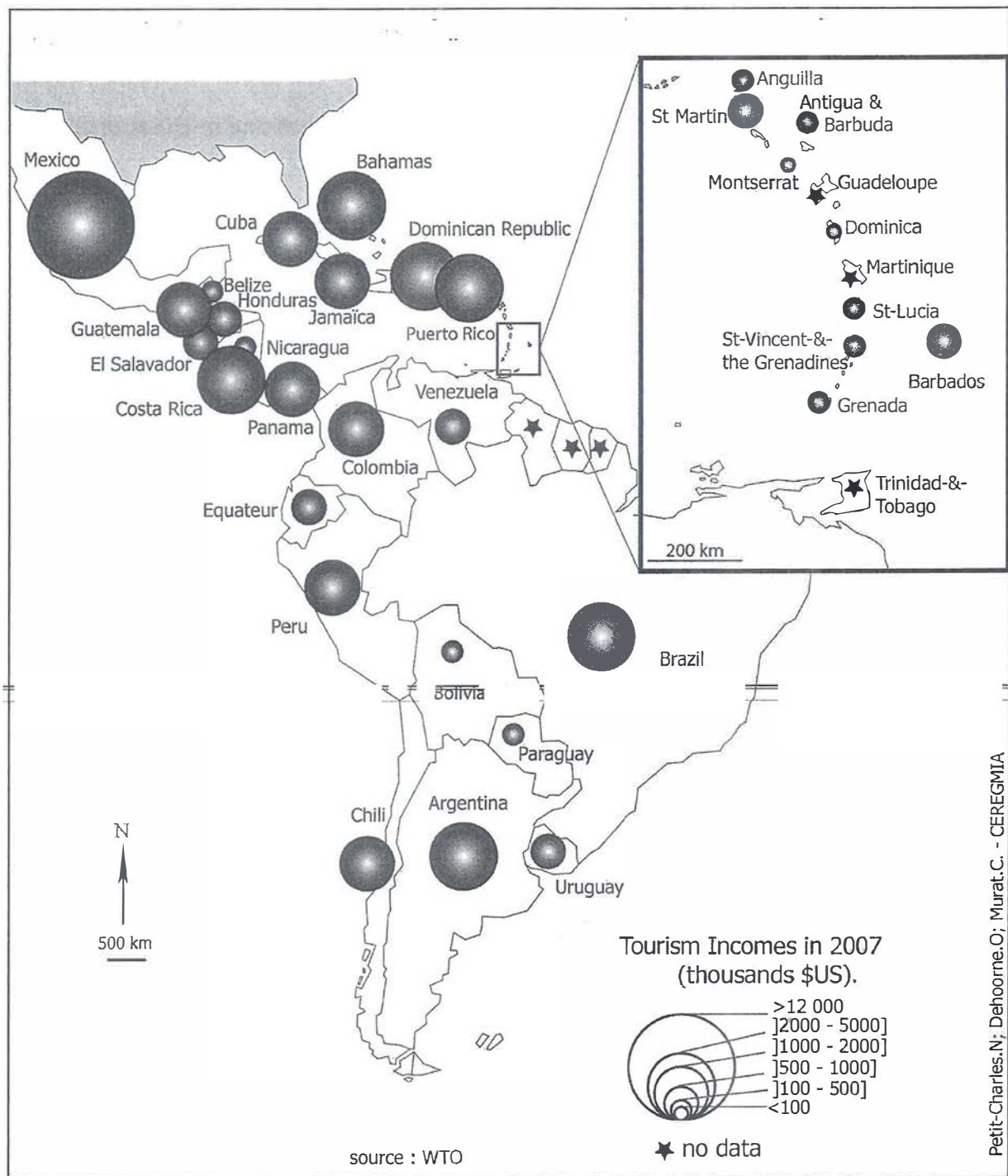


Fig. 12

Describe the variations in the international tourist incomes in South America shown on Fig. 12.

[4]

- (iii) Study Fig. 13, which shows the percentage of tourists to Scotland who visited the attractions in Edinburgh from 1980 to 2010.

Percentage of tourists to Scotland who visited attractions in Edinburgh

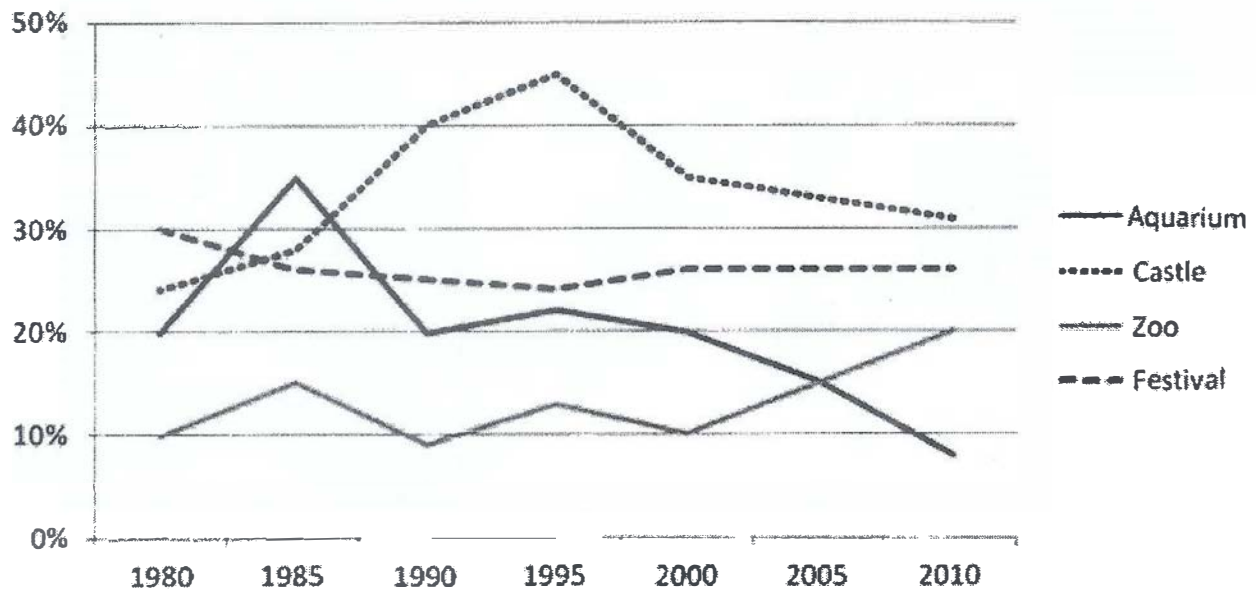


Fig. 13

Compare the percentage of tourists who visited the castle and festival in Edinburgh from 1980 to 2010.

[4]

- (c) 'Eco-tourism is the most effective strategy in sustaining the growth of tourism'.

To what extent do you agree with this statement? Use examples to support your answer.

[8]

----- End of Paper -----

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YISHUN TOWN SECONDARY SCHOOL

PRELIMINARY EXAMINATION 2 2016

SEC 4 EXPRESS

GEOGRAPHY

PAPER 1 (2236/01)

INSERT

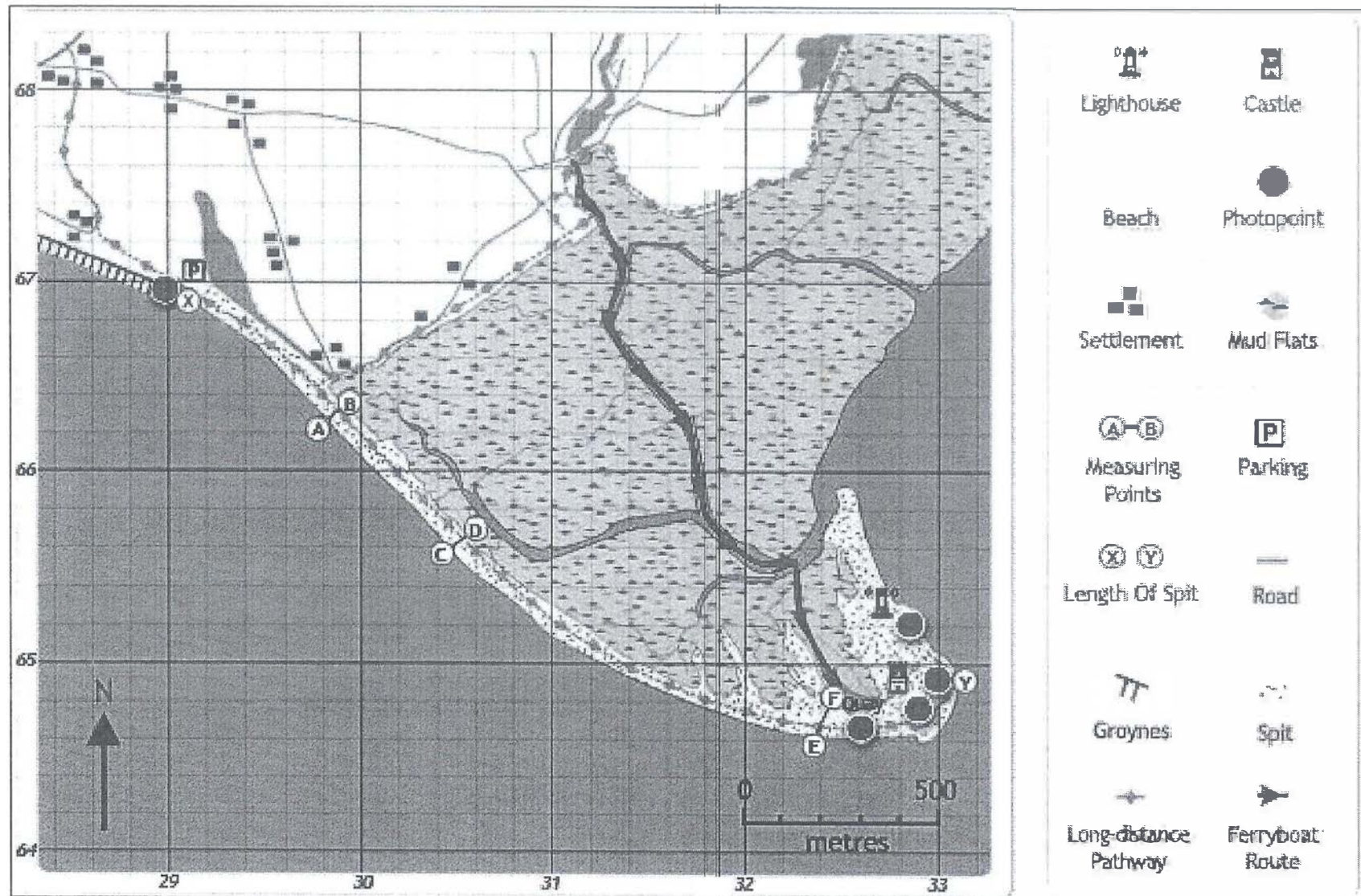
READ THESE INSTRUCTIONS FIRST

The Insert contains Figs. 1 and 4 and Photograph A for Question 1, Fig. 9 and Photograph B for Question 2 and Fig. 11 for Question 3.

This Insert consists of 6 printed pages.

Fig. 1 for Question 1

Map of the coastal area



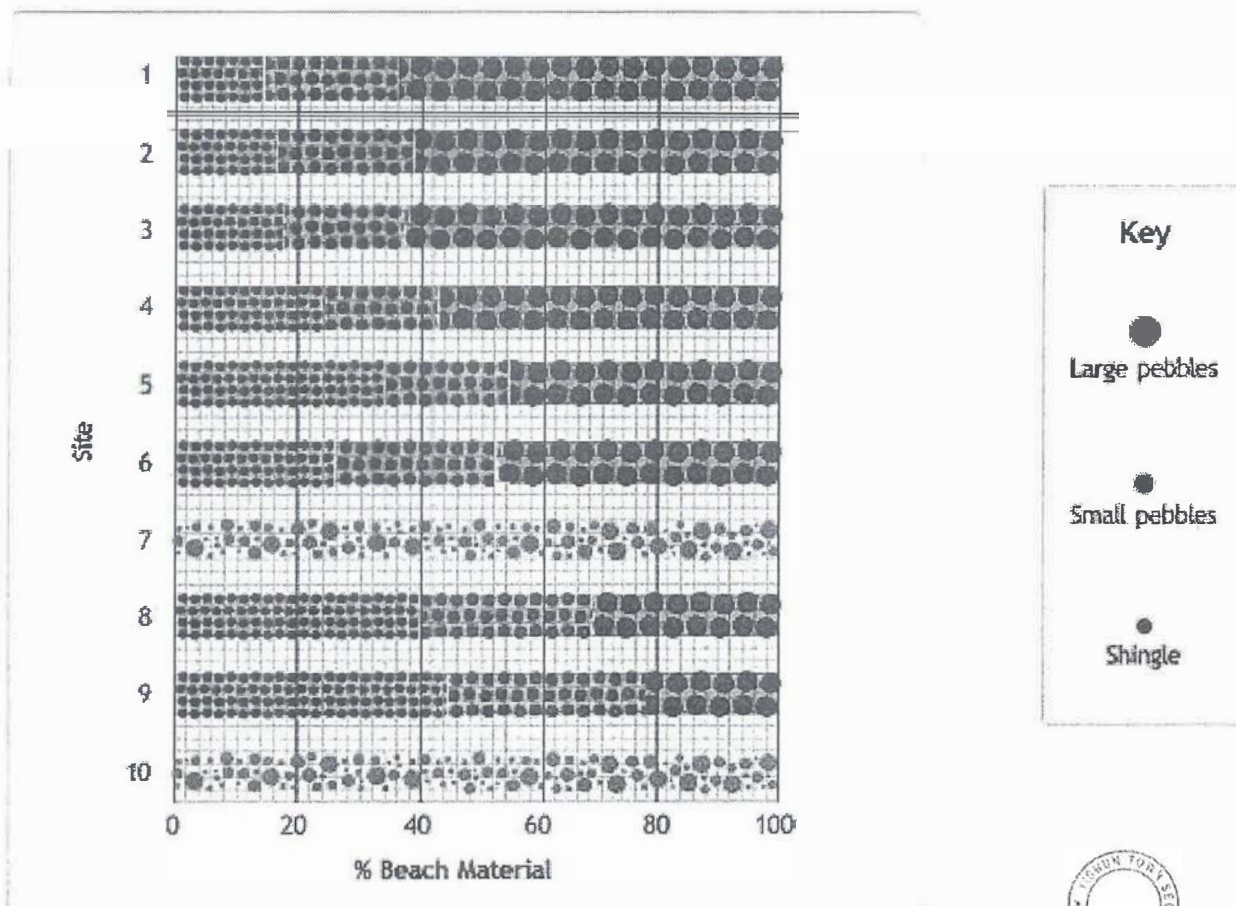
Photograph A for Question 1

Location of fieldwork site



Fig. 4 for Question 1

Data collected on sizes of deposited materials

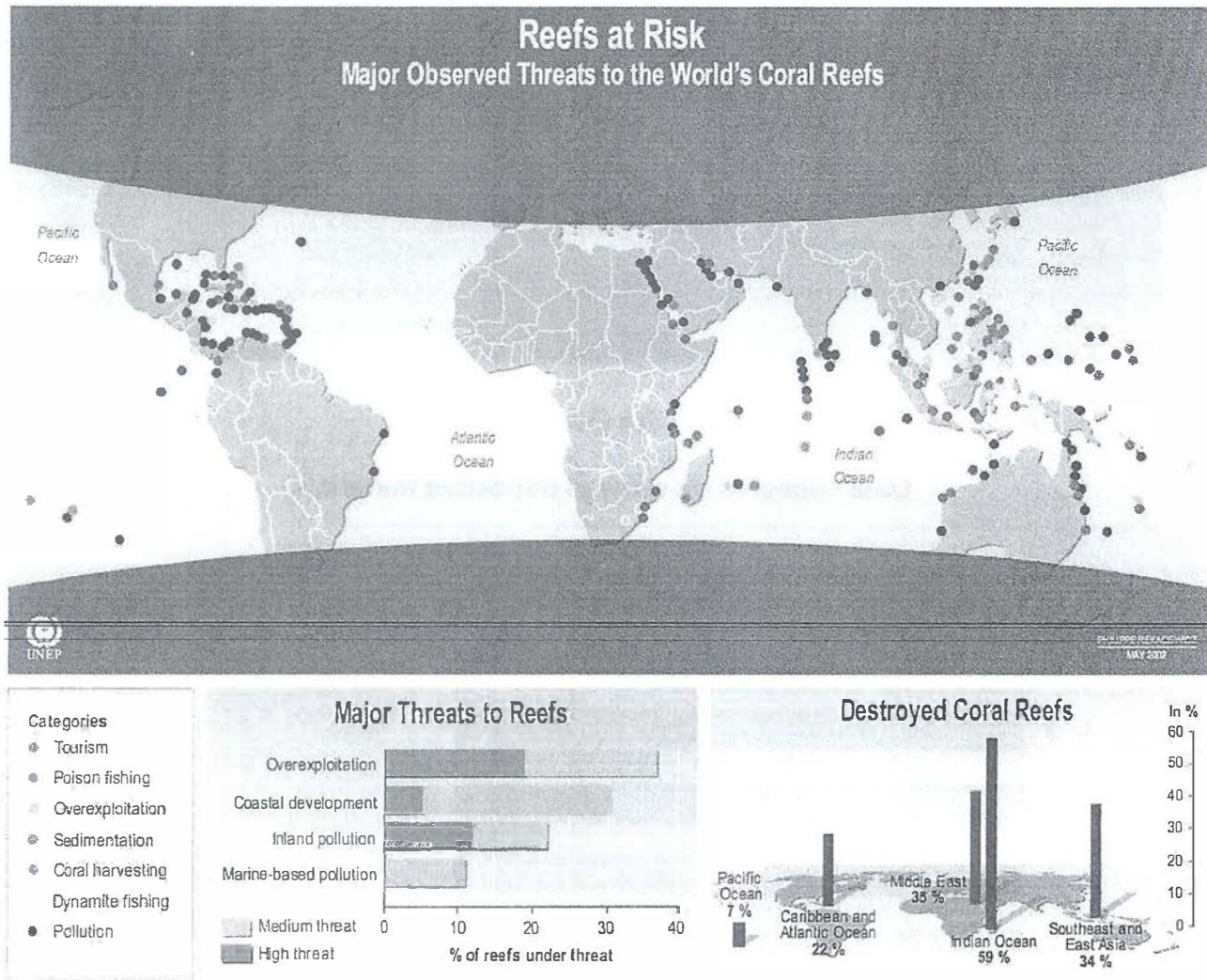


The grey colour for Site 7 and 10 denotes no data available



Fig. 9 for Question 2

Coral reefs at risk

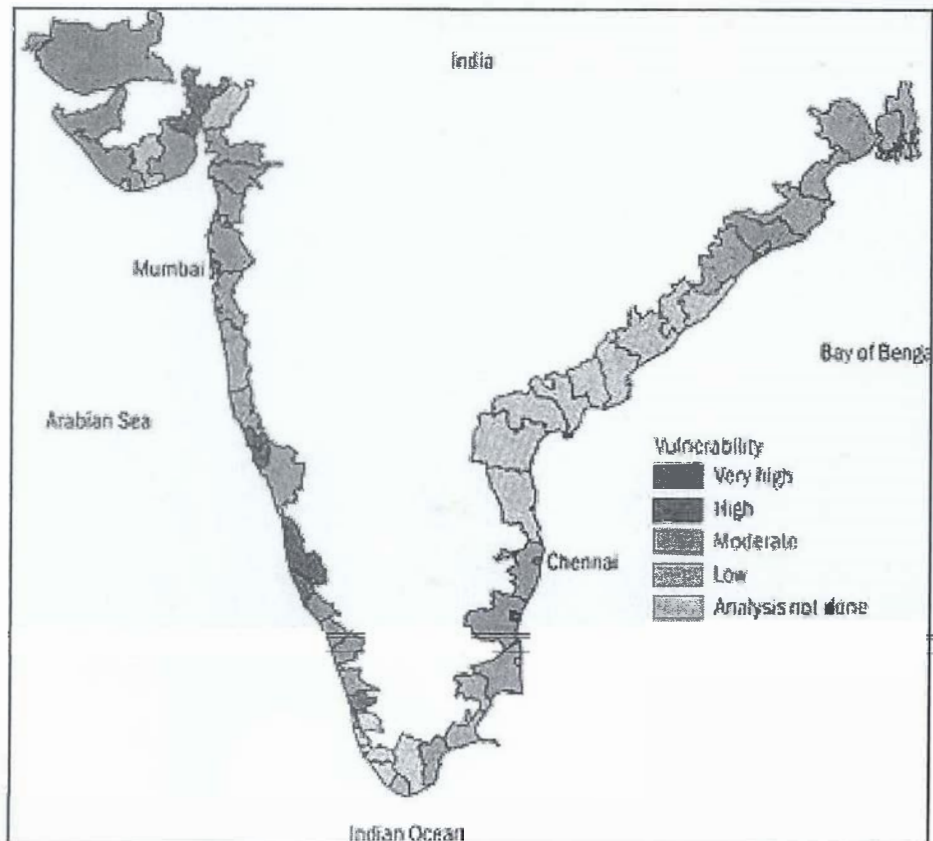


Photograph B for Question 2
Sunny Cove in United Kingdom



Fig. 11 for Question 3

Vulnerability to one-metre sea level rise



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YISHUN TOWN SECONDARY SCHOOL

PRELIMINARY EXAMINATION 2 2016

SEC 4 EXPRESS

GEOGRAPHY

PAPER 2 (2236/02)

DATE : 26 August 2016

DAY : Friday

DURATION: 1 hour 30 minutes

MARKS: 50

ADDITIONAL MATERIALS

Answer paper
1 Insert

READ THESE INSTRUCTIONS FIRST

Write your class, index number and name in the spaces provided on the work you hand in.
Write in dark blue or black ink on both sides of the paper.

~~Do not use staples, paper clips, highlighters, glue or correction fluid/tape~~

Section A

Answer **one** question.

Section B

Answer **one** question.

Write all answers on the Answer Paper provided.

Candidates should support their answers with the use of relevant examples.

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

This Insert contains Fig. 1 for Question 1, Fig. 2 for Question 1, Fig. 5 for Question 2, Fig. 7 for Question 3, Fig. 8 for Question 3 and Fig. 10 for Question 4.

Write your name, Centre Number and Index number in the spaces provided and submit it together with your Question paper at the end of the examination.

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.

Section A

Answer **one** question from this section.

- 1 (a) Study Fig. 1, which shows a photograph of the Himalayan fold mountain range.
- (i) Describe the physical characteristics of the Himalayan mountains. [4]
- (ii) With the aid of a well-annotated diagram, explain how fold mountains such as the Himalayas are formed. [5]
- (b) Study Fig. 2 (Insert), which shows satellite images of Yuriage in Natori before and after the 2011 Tohoku Earthquake in Japan.
- Using Fig. 2 (Insert) and other information, describe the effects of the earthquake on Yuriage in Natori. [4]
- (c) Study Fig. 3, which shows the humanitarian assistance provided by the United States of America to Nepal in 2015 after the earthquake.



Fig. 3

Using information from Fig. 3, explain how short-term responses can help the communities cope with the effects of an earthquake. [4]

- (d) "The increase in earth's average temperature benefits countries in the world."

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

- 2 (a) Study Fig. 4A, which shows the climograph of Andagoya in Columbia and Fig. 4B, which shows the climograph of Mangalore in India.

Climograph of Andagoya, Columbia

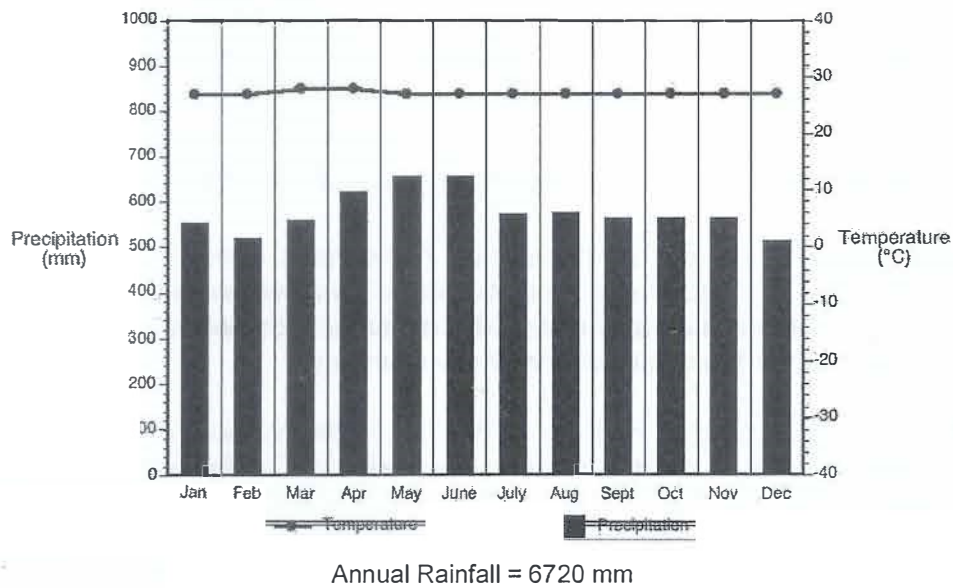


Fig. 4A

Climograph of Mangalore, India

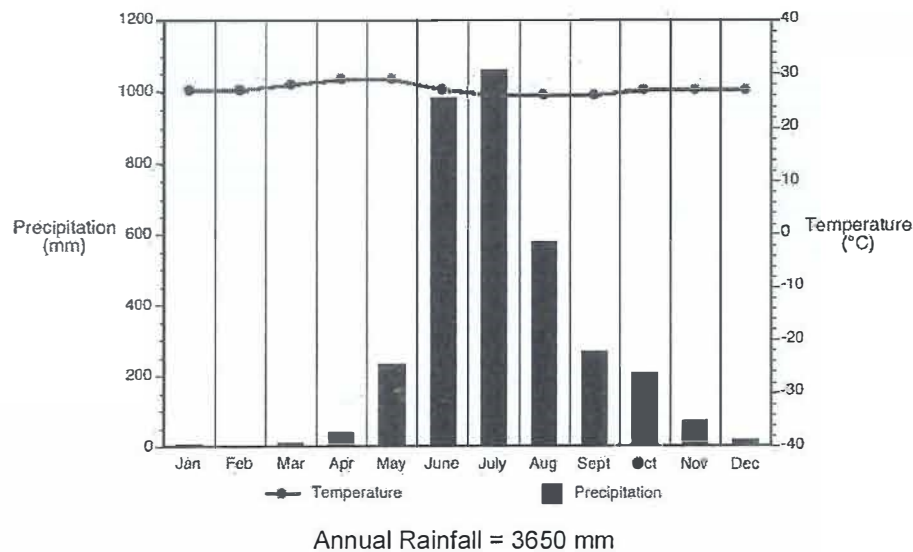


Fig. 4B

- (i) Compare the characteristics of the climate in the cities as shown on Fig. 4A and 4B. [4]
- (ii) Explain the distribution of rainfall in Mangalore, India as shown on Fig. 4B. [5]
- (b) (i) Study Fig. 5 (Insert), which shows the risks of tropical cyclone in the Bay of Bengal and South China Sea.

Describe the areas of tropical cyclones where there are 'high' and 'extreme' risks of occurrence. [4]

- (ii) Study Fig. 6, which shows a newspaper article on the effects of tropical cyclone, Typhoon Haiyan in 2013.

Typhoon Haiyan makes landfall in Philippines

As Typhoon Haiyan tore across the eastern Philippines, family coconut plantations were smashed like matchsticks and call centres that serve the world fell silent. The storm that killed thousands also wrecked livelihoods in the worst-hit region, a blow that will be felt long after the disaster fades from attention.

At a call and data centre in Palo, 9 kilometres from Tacloban, chairs, desks and computers are soaked in water and caked with dirt. The building was not hit by Haiyan's storm surge but high winds peeled off iron sheet roofing as more than 500 people huddled inside, leaving only the steel frame skeleton and soaking everything below. No one died there but some employees lost family elsewhere.

Fig. 6

Using information from Fig. 6 and other information, explain the hazards associated with tropical cyclones. [4]

- (c) "Energy conservation is the most effective national strategy to mitigate climate change."

To what extent do you agree with this statement? Explain your answer with reference to a country you have studied. [8]

Section B

Answer **one** question from this section.

- 3 (a) Study Fig. 7 (Insert), which shows the global distribution of obese adults in the population.
- (i) Describe the pattern of global distribution of obese adults as shown on Fig. 7 (Insert). [4]
- (ii) Describe the economic impacts of excess food consumption in developed countries. [5]
- (b) Study Fig. 8 (Insert), which shows the percentage of food wastage along the food supply chain by region.
- Compare the food wastage between Sub-Saharan Africa and Europe. [4]
- (c) Study Fig. 9, which shows the effects of irrigation systems on soil and water quality.

Effects of Irrigation Systems

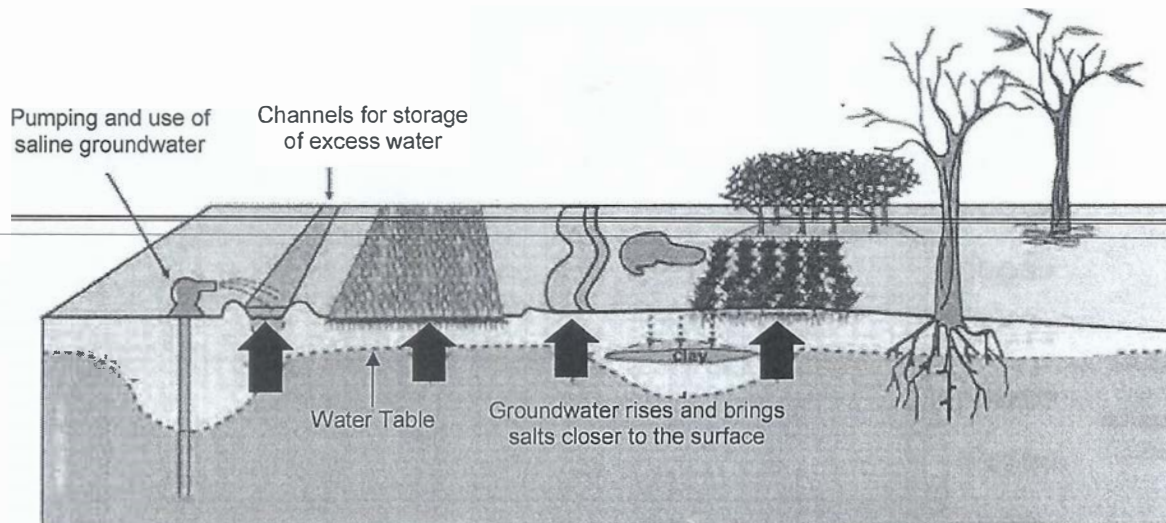


Fig. 9

- With reference to Fig. 9, discuss the effects of irrigation systems on the soil and water quality. [4]
- (d) "Technological advancements is the most effective strategy to ensure food security."
- To what extent do you agree to this statement? Give evidence to support your answer. [8]

- 4 (a) Study Fig. 10 (Insert), which shows the trend of global area of genetically modified (GM) crop production.

Compare the trend of GM crop production between the developed and the less developed countries.

[4]

- (b) Study Fig. 11, which shows the Gross Domestic Product (GDP) per capita and the percentage of population with access to safe water.

GDP per capita and Population with Access to Safe Water

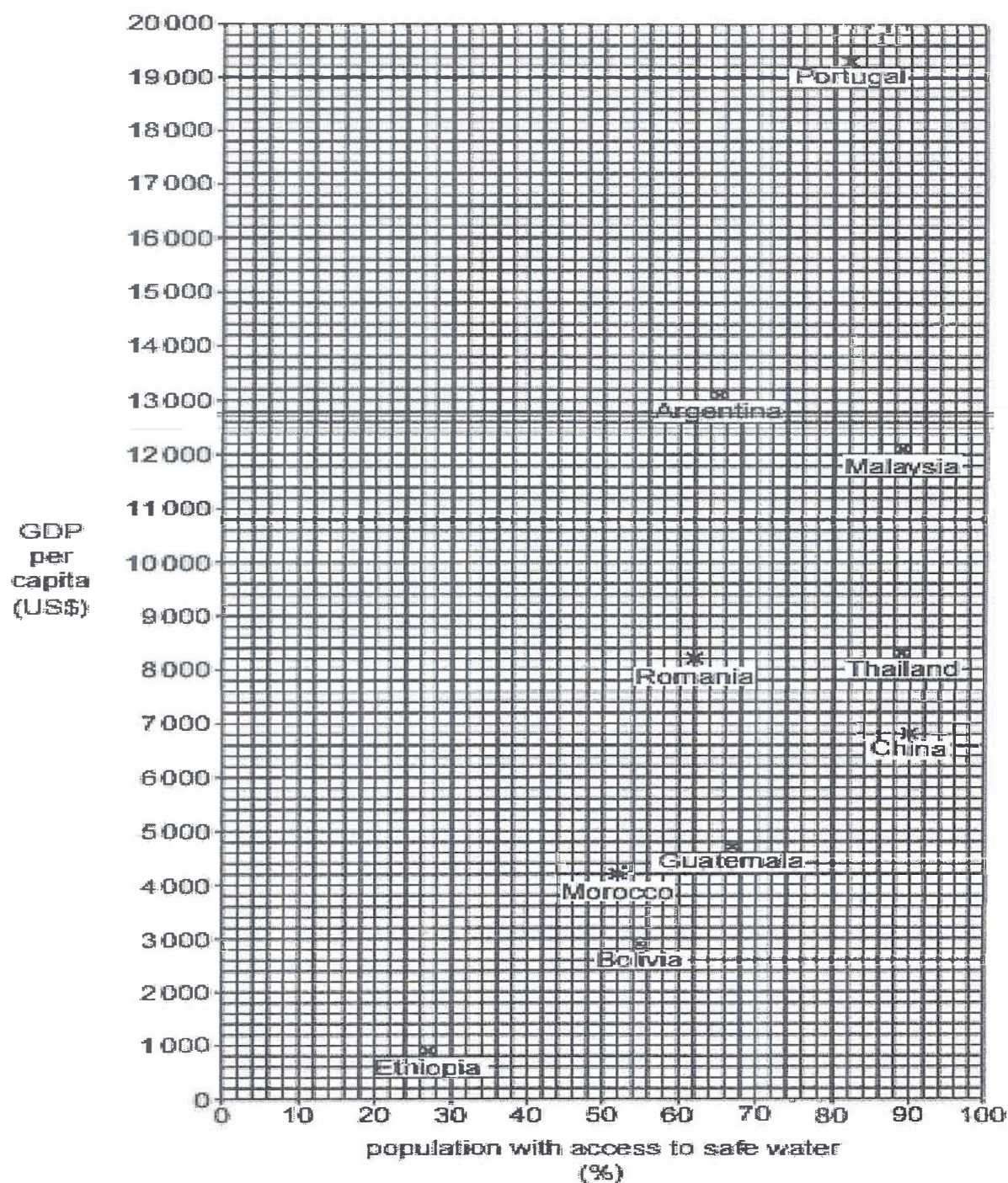


Fig. 11

- (i) With reference to Fig. 11, describe the relationship between GDP per capita and the percentage of population with access to safe water. [4]
- (ii) Describe the economic factors that result in poor health in less developed countries. [5]
- (c) Study Fig. 12, which shows selected development indicators of Botswana and Australia in 2015.

Development Indicators between Botswana and Australia

	Botswana	Australia
Daily Calorie Intake (kilocalories/person/day)	2,264	3,227
Expected years of schooling (years)	12.5	20.2
Infant Mortality Rate (per 1,000 live births)	36.3	3.4

Fig. 12

- Using Fig. 12, explain the variations in Infant Mortality Rate in Botswana and Australia. [4]
- (d) "The socio-demographic impact of HIV/AIDS is more serious than the economic impact."
- How far do you agree? Support your answer with examples. [8]

----- End of Paper -----

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YISHUN TOWN SECONDARY SCHOOL

PRELIMINARY EXAMINATION 2 2016

SEC 4 EXPRESS

GEOGRAPHY

PAPER 2 (2236/02)

INSERT

READ THESE INSTRUCTIONS FIRST

This Insert contains Fig. 1 for Question 1, Fig. 2 for Question 1, Fig. 5 for Question 2, Fig. 7 for Question 3, Fig. 8 for Question 3 and Fig. 10 for Question 4.



This question paper consists of 6 printed pages

Himalayan Fold Mountain Range



Fig. 1 for Question 1



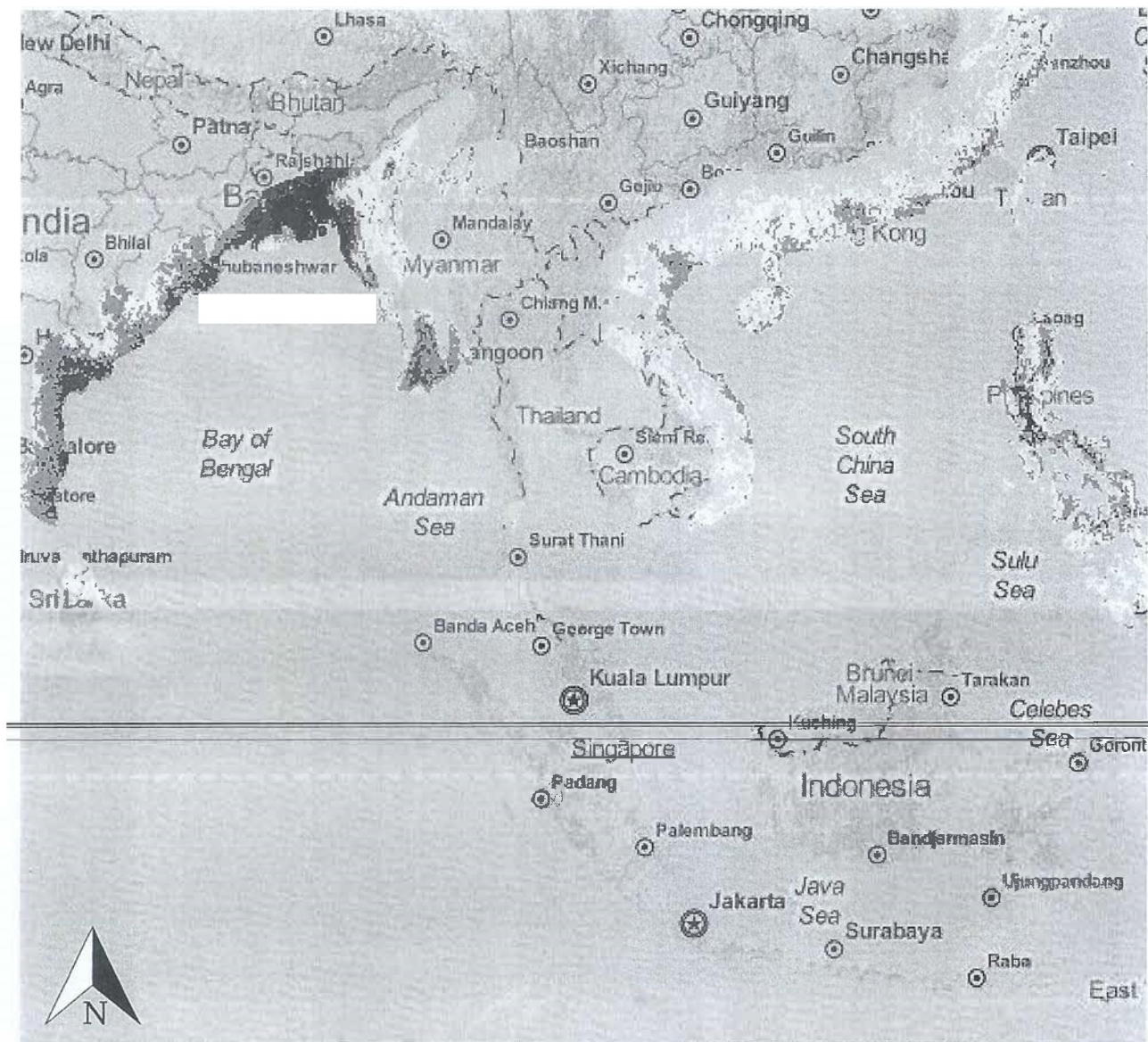
Yuriage in Natori Before and After the 2011 Tohoku Earthquake



Fig. 2 for Question 1



Risks of Tropical Cyclone in Bay of Bengal and South China Sea



Legend:

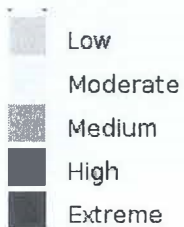
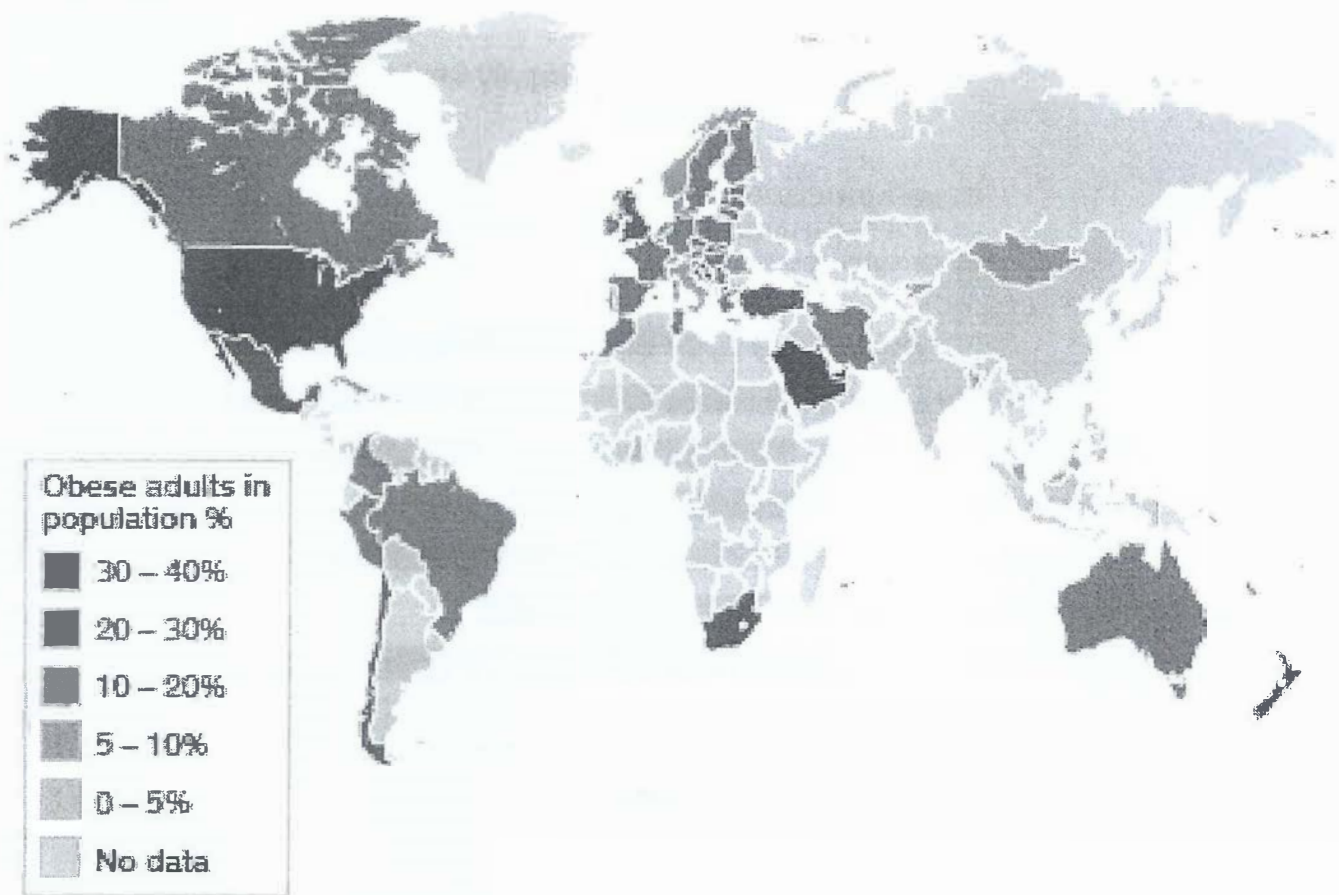


Fig. 5 for Question 2



Global Distribution of Obese Adults



An obese adult is classified as having a

Body Mass Index equal to or greater than 30

SOURCE: World Health Organization, 2005

Fig. 7 for Question 3



Wastage along the Food Supply Chain (by region)

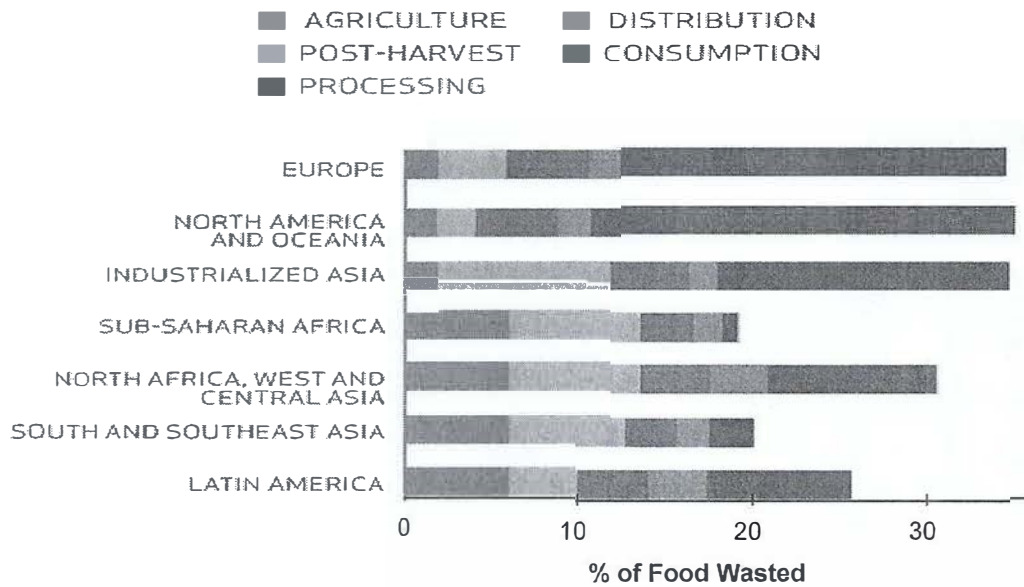


Fig. 8 for Question 3

Global Area of Genetically Modified Crop Production (in Millions of Hectares)

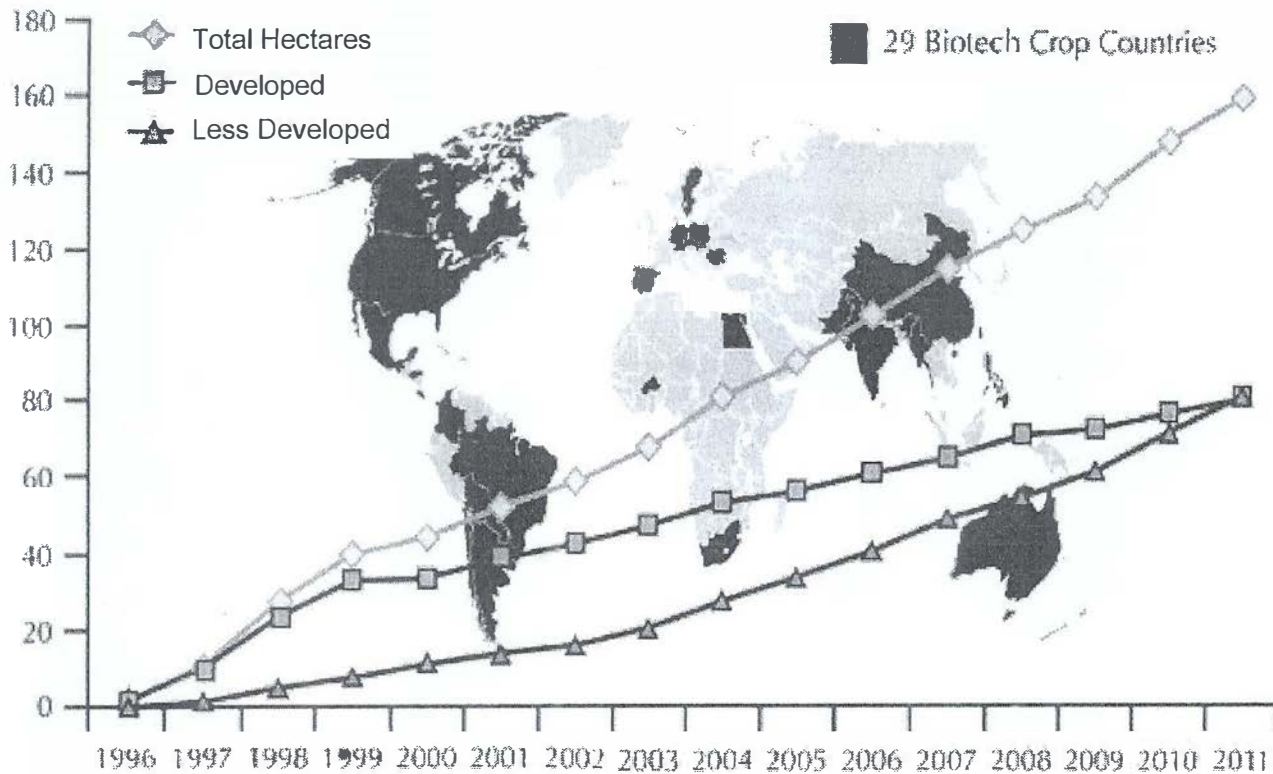


Fig. 10 for Question 4





YISHUN TOWN SECONDARY SCHOOL

PRELIMINARY EXAMINATION 2 2016

SEC 4 EXPRESS

GEOGRAPHY PAPER 1

SUGGESTED ANSWERS

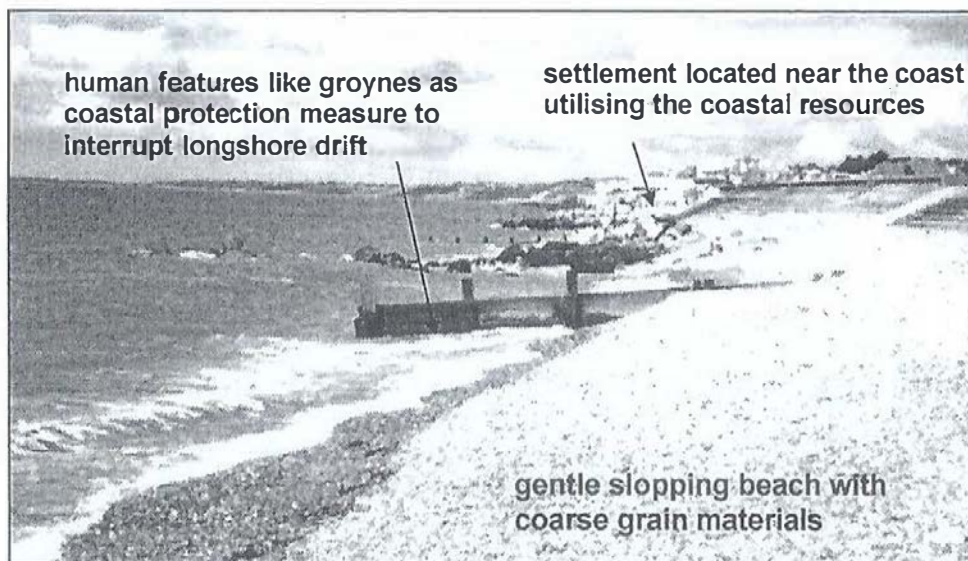
NB : Each point is awarded 1m each unless otherwise stated.

Section A

- 1 (a) (i) The students wanted to find out how the sizes of beach materials vary with distance from the sea. Suggest a suitable hypothesis that the students could use to carry out their field investigation. [1]

- A suitable hypothesis is 'The beach materials are finer nearer the distance from the sea'

- (ii) Draw a well annotated field sketch of the physical and human feature shown on Photograph A (Insert). [2]



(reserve 1 m for drawing and 1 m for annotation)

- (b) (i) State the length of the coast from X to Y (in metres) and explain how the measurement is carried out. [3]

- The length of the coast from X to Y is 2475 metres (+/- 50m)
- It is measured by breaking the curved distance into segments which are fairly straight and then mark off each segment on a straight piece on the paper
- obtain total length from line scale given and read the distance in metres

(reserve 1 m for length, 0 m if answer is in km)

- (ii) Describe the functions of the quadrat and how it can be used to collect data on the different sizes of materials deposited on the coast. [3]

Functions of the quadrat

- the functions of the quadrat are that it can be used for sampling like random and systematic to be conducted and these ensures the analysis of particle sizes to be more reliable

How it can be used to collect data on the different sizes of materials deposited on the coast it can be used to mark out an area that is under study which is standardised

- the quadrat can be used to collect data on the different sizes of materials deposited on the coast as the students can count how many squares that the different sizes particles are found in an area and calculate the percentage of the different particle sizes

(reserve 1 m for each part)

- (iii) The data collected by the students at the 10 sites along the coast were represented on Fig. 5 (Insert). Discuss the usefulness of this method of data presentation. [4]

Usefulness of this method of data presentation

Useful

- large data sets can be used and it can be used to show the proportion of large pebbles, small pebbles and shingles
- patterns can be easily observed for the sizes of deposited materials
- It allows multiple sets of data to be compared easily

Not useful

- trends are difficult to predict as it does not show continuous data for the particles sizes
- only use discrete data
- change over time cannot be mapped

(reserve 1 m for each, max 3m if no reference to context, max 3m if not both sides)

- (iv) The students wanted to find out the shape of the materials that were deposited on the beach. They used the charts shown on Fig. 6A and Fig. 6B to measure the shape of the beach materials.

A group of 20 students were working in pairs at each of the 10 Sites. Describe how the students can ensure that the data collection is reliable and suggest why it is a good idea to use both charts shown in Fig. 6A and Fig. 6B to determine the shape of particles. [5]

How the students can ensure that the data collection is reliable

- To ensure that data collection is reliable, there is a need to ensure that the measurement of the shape of the materials is consistent and there is standardisation between all the 10 pair of students
- It would be ideal that the students carry out a standardisation exercise where all students concur on how the measurement of the materials should be done

- It would be ideal that the same student measure the shape of the materials along the transect so as to ensure consistency and the same student to record the data
- Caution must be exercised to minimise human errors in the measurement so as to increase reliability

Suggest why it is a good idea to use both charts

- It would be a good idea to use 2 charts in determining the shape of particles as it allows for triangulation where the 2 sets of data can be used in the measurement to enhance accuracy
- It would be easier to observe errors or anomaly when 2 different sets of data are used and this will result in greater validity of the results

(reserve 2 m for each part of question)

- (c) (i) **Describe the difficulties that the students may encounter in obtaining reliable data when using the bi-polar survey.** [3]

Difficulties that the students may encounter in obtaining reliable data

- It is difficult to score the intensity of the perception for survey on the impact of tourism because the perception can be biased and subjective
- The evaluation of the impact can differ as different respondent has different interpretation of the scale of intensity
- It may be hard to observe the amount of litter and reach an accurate analysis on the scale of intensity

- (ii) **Using the information from Fig. 1 (Insert) and Fig. 7, what are the conclusions that the students can draw about the hypothesis 'The environmental impact of tourism decreases away from the car park'?** [4]

Conclusions that the students can draw about the hypothesis

- Site X is near the car park but Site Y is further away from the car park
- The data shows that the conclusion of the hypothesis is valid as there is more negative impact on the environment at Site X which is nearer the car park
- There are lots of paper and other litter with an intensity of -2 and glass and wood has an intensity of -1. The only exception is that there is no plastic which has a positive score of +1
- However at Site Y which is furthest away from the car park, there are only positive perception of the impact of tourism where there are no wood and plastic with an intensity of +2 and a positive perception for no glass, no paper and no other litter at +1 intensity

(max 3 m if no reference to data, reserve 1m for valid)

Section B

- 2 (a) (i) Compare the distribution of live and dead corals in Sri Lanka shown on Fig. 8. [4]

Distribution of live and dead corals in Sri Lanka

- the live and dead corals are mainly distributed in the western and southern areas of Sri Lanka
- most of the live corals are found in the central western coast of Sri Lanka near to Kalpitiya, Puttalam where the highest proportion of coral is at Bar Reef with about 80% and Talawila at about 70%
- but the areas with the highest proportion of dead corals is at the southern areas like Polhena with about 90% and Weligama about 50%
- the lower proportion of corals are mostly near the southern coast at about 10-20% around areas like Wellawatta, Mirissa and Mahawella
- however, in some areas there is very low proportion of dead coral like Bonavista, Tangalle in the south and Bar Reef and Kandakuliya at the west

(reserve 2 m for live and 2m for dead corals distribution, max 3m if no comparison and no %)

- (ii) Using information from Fig. 9 (Insert), describe the extent of the damage and threats to the corals reefs around the world. [5]

Extent of the damage and threats to the corals reefs around the world

- the extent of damage is the most at the tropical regions around the Caribbean Sea, Red sea, coast of Sri Lanka, of Queensland in the northeastern part of Australia and the seas in SE Asia region
- the major risks threats is pollution which is commonly found in most parts of the coastal areas especially around Caribbean and Red Sea
- fishing methods such as dynamite blasting and spearfishing have led to reefs being destroyed and selective depletion of fish population that disrupts the food chain eg. Indonesia and Philippines
- the destroyed coral reefs is the highest in Indian Ocean at 59% and Middle East at 35% followed by Southeast Asia at 34%
- the lowest percentage is Pacific Ocean at 7%

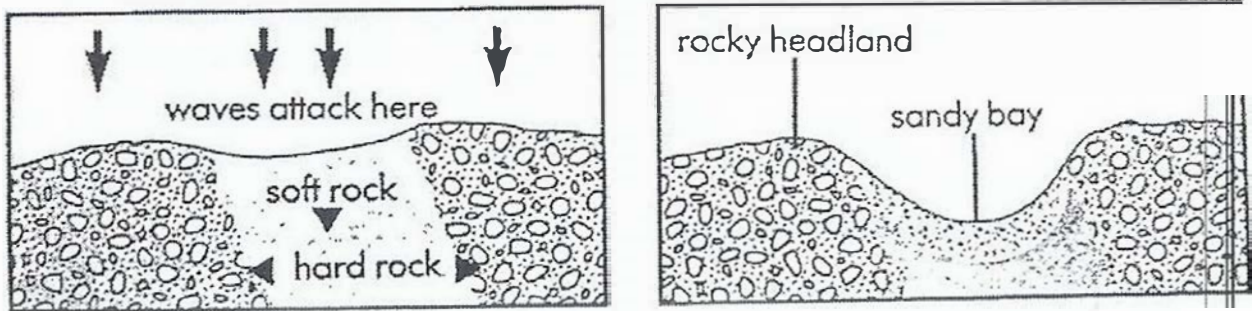
(reserve 2 m for each part and 2 at 1 m for listing, max 4 m if not all figures mentioned, max 4 m if listing)

- (b) (i) Describe the characteristics of the coastal features shown on Photograph B (Insert). [4]

Characteristics of the coastal features

- The physical feature in the right middle ground is an erosional feature known as headland and bay at Sunny Cove in UK
- The headland is very steep with great heights projecting into the sea
- The headland has many gullies at the cliff face
- The bay in the right middleground has a curved shape and is flat and low-lying
- The headland is covered with vegetation at the sides and peak but the bay is barren of vegetation

- (ii) With the aid of well-labelled diagrams, explain how the coastal features shown on Photograph B (Insert) can be formed. [4]



How the coastal features shown on Photograph B can be formed

- a **headland** is the land which projects into the sea, usually with a cliff
- a **bay** is a wide curve of land along a coast which encloses part of the sea
- a cove is a very small bay
- these features are common in areas where alternate bands of resistant and less resistant rocks are arranged at right angles to the coast
- erosion of these rocks with different resistance will cause the coasts to be eroded unevenly and irregularly
- the more rapid erosion of the soft rock e.g. shale, sand or clay causes it to be worn back into inlets, coves or bays
- the hard rock such as granite, basalt or limestone are eroded more slowly and they remain as headlands, promontories or capes

(reserve 1 m for diagram)

- (c) 'Restricting coastal development is more effective than protecting coastal resources in the sustainable management of coastal areas.'

How far do you agree? Use examples to support your answer.

[8]

Restricting coastal development is effective in the sustainable management of coastal areas

- coastal areas are prone to natural hazards which can be disastrous to natural environments and human activities
- e.g. tsunamis and earthquakes
- e.g. Tohoku earthquake in 2011 caused a massive tsunami of sea waves at Japan's coastal areas causing 20,000 deaths
- destruction of the coastal areas and cost over US\$300 billion to rebuild
- people are still attracted to coasts because the coasts provide natural resources like food and building materials
- coasts also provide a myriad of built services like docks, ports, housing and recreational facilities
- however, residents have to spend more in construction and maintenance due to the natural hazards
- governments have developed policies to deal with the threat of natural hazards in coastal areas by researching the severity and how

widespread the problem is, then make and enforce laws including:

- relocation of built structures away from these areas
 - e.g. in USA, Federal Emergency Management Agency (FEMA) steer development away from areas prone to floods and coastal erosion
- regulating development
 - e.g. in Indonesia, there are laws restricting the establishment of new farms and residence on low-lying coastal areas prone to floods
- defense by nourishing beaches, building seawalls and replanting coastal vegetation
 - e.g. in Netherlands, beaches are closely monitored and undergo beach nourishment under long-term erosion

However, protecting coastal resources is also effective in the sustainable management of coastal areas

Protecting coastal resources is also effective in the sustainable management of coastal areas

- it is a management strategy to prevent exploitation or depletion of resources
- areas close to coastline where 90% of all marine fish are caught are vulnerable to over-fishing
- especially in coral reef areas in Southeast Asia where destructive fishing methods are used like blasting and poison fishing
- e.g. in Wakatobi National Park in Indonesia and Goat Island Marine Reserve in New Zealand, zones are marked off to prevent commercial fishing done through local management or establishing a marine reserve which protect marine ecosystems and allows fishes to breed and thrive and help to sustain the coastal environment
- Goat Island Marine Reserve is now a tourist attraction due to its fish, and now has 14 times more snappers in the reserve than outside
- however, there are problems with this strategy as establishing marine reserves is opposed by local fishermen as they see their access to a valuable resource and source of food being denied as the area has supported them for a long time

Answers may include the following points:

A complete answer need not include all the above points.

Candidates at each level will show the following characteristics:

Level 1 (0-3 marks)

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

Reasoning rather weak and expression may be unclear. A basic answer that has little development. Answers lack examples or other evidence, or it is so sketchy that it adds little support to the answer.

Level 2 (4-6 marks)

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

Level 3 (7-8 marks)

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

- 3 (a) Using the help of Fig. 10 and Fig. 11 (Insert), describe the pressures that threaten the coastline in India. [4]

Pressures that threaten the coastline in India

- high population of 171 million at the coastal areas resulting in great pressure on the resources to support the people
- fishing as the 4 m fisherfolk that depends on the coastal areas for fishing which may exert pressure on coastal environment
- 1656.4km of coast affected by erosion which would affect the land use and coastal resources
- Ports with 13 major and 174 minor ports may cause pollution in the waters
- Cash strapped authorities may mean little financial resources to protect the coast

(max 3 m if no reference to figure)

- (b) (i) For a named area that you have studied, describe how good facilities can favour the development of tourism. [5]

How good facilities can favour the development of tourism**MICE**

- MICE venues in Singapore can host large-scale events and have supporting infrastructure e.g. hotels and retail shops
- attracts organisers who organise trade fairs and international conferences, which bring in more business travellers
- Singapore is more successful in getting a share of the growing market for MICE are those located along international air routes or cities associated with other attractions e.g. coastal resorts, entertainment and shopping
- e.g. Singapore was the leading convention city in Asia Pacific in 2012 (according to the International Congress and Convention Association) for 10 consecutive years
- Singapore drew 3.2 million business travelers which accounted for 24% of all visitors in 2012 (according to the Singapore Tourism Board)
- Singapore also hosted
 - Youth Olympic games 2010
 - Annual Meetings of the Boards of governors of the International Monetary fund (IMF)
 - World Bank Group in 2006
 - International Air Transport Association (IATA)
 - Global Aviation Human Capital Summit in 2011
- key factors that contribute to Singapore's success are its reputation as a major aviation hub, availability of reliable telecommunication networks, a variety of shopping and entertainment

Educational facilities

- educational tourism in Singapore is growing when people travel to a the tertiary institutions like NUS and NTU for educational purposes or to learn something about that place, such as its language or heritage
- educational tourism can take several forms:
 - Study tours lasting from a few days to a few weeks

MEDICAL AND SPA FACILITIES

- many tourists are from developed countries e.g. Singapore and less developed countries seeking better medical treatment
- these tourists may want to avoid long waiting periods or high costs for medical treatment in their home countries

(max 4 m if no reference to named example)

- (ii) Describe the variations in the international tourist incomes in South America shown on Fig. 12. [4]

Variations in the international tourist incomes

- the tourist incomes in South America varies across the different countries and the economically more advanced of these developing countries have a higher tourist incomes in countries like Brazil and Argentina is than the less developed LDCs like Bolivia
- the highest is Brazil, Argentina at about US\$2000-5000 thousand
- lowest is countries like Bolivia and Paraguay with about US\$ 100-500 thousand
- the moderate range is Chile, Peru and Colombia at US\$ 1000-2000 thousand

(No m for answers not on South America)

- (iii) Compare the percentage of tourists who visited the castle and festival in Edinburgh from 1980 to 2010. [4]

Percentage of tourists who visited the castle and festival in Edinburgh

- both the percentage of tourists who visited for both castle and festival is above 20 % from 1980 to 2010
- percentage of tourists who visited the castle is fluctuating but percentage of tourists who visited festivals shows a slight decrease and remains almost constant
- in 1980, the percentage of tourists who visited festival is higher at 30% but the percentage who visited castle is lower at about 25%
- both the percentage of tourists who visited festival and castle reach 27% in 1985
- from 1985 to 1995, there is a sharp increase in percentage of tourists who visited castle from 27% to 45% but there is a gradual decrease of tourists who visited festival to 24%
- from 1995 to 2000, the percentage of tourists who visited castle shows a rapid decrease from 45% to 35% but there is a slight increase in percentage of tourists who visited festival from 24% to 26%

- from 2000 to 2010, there is a gradual decrease in percentage of tourists who visited castle from 35% to 31% but the percentage of tourists who visited festival remains at 26%

(max 2 m if no comparison)

- (c) 'Eco-tourism is the most effective strategy in sustaining the growth of tourism'.

To what extent do you agree with this statement? Use examples to support your answer.

[8]

Eco-tourism is an effective strategy in sustaining the growth of tourism

ECOTOURISM

- it is responsible travel to natural areas that conserves the environment and improves the well-being of local people
- it is a form of niche tourism
- it involves visiting relatively undisturbed natural areas
- purpose is to help tourists appreciate natural beauty and biodiversity, provide funds for ecological conservation and directly benefit local communities and foster respect for different cultures and lifestyles

FORMS OF ECOTOURISM

- e.g. visits to national parks, nature reserves and marine parks
- there are regulations that limit camping, walking, waste disposal and disturbance of vegetation and wildlife
- e.g. Waitomo caves in New Zealand
 - the caves are a famous tourist destination because of the glowworms that light up the caves' ceiling
 - tours to the caves are managed by the New Zealand government in partnership with the local Maori
 - conditions are monitored closely within the cave to ensure minimal human impact on its internal environment e.g. a scientific advisory committee was hired to help monitor the cave and help recommend best tourism practices
 - tour operations are closely monitored and are halted if carbon dioxide levels reach 2,400 parts per million
 - number of tourists entering are also controlled when necessary
 - benefit the Maori, who own the caves and receive part of the entrance fees and receive income from being employed as the cave staff

STRENGTHS

- minimise impact
- build environmental and cultural awareness and respect
- provide positive experiences for both visitors and hosts
- provide financial benefits and empowerment for local people;
- provide direct financial benefits for conservation
- raise sensitivity for host countries' political, environmental and social climate

However, eco-tourism is the not an effective strategy in sustaining the growth of tourism

LIMITATIONS

- difficulty in obtaining external funding
 - some local communities, especially disadvantaged ones, may face funding problems when setting up businesses or investing in vehicles to facilitate tourism in their area
- shortage of skilled labour
 - the local community alone may not have enough skilled labour, such as managers or consultants that can successfully help manage the impact of ecotourism
 - in such cases, the community may need to seek the help of NGOs or other organisations to provide skilled labour or training

However, there are other strategies that are effective in sustaining the growth of tourism

COMMUNITY-BASED TOURISM

- tourism that has close contact with, and mainly benefits local communities
- it may be done in partnership with a government or non-governmental organization (NGO)
- e.g. Candirejo Village, Borobudur in Central Java, Indonesia
 - with support from the government, the villagers of Candirejo set up a cooperative in 2003 to manage and implement the community's tourism-related programmes
 - villagers participated in decision-making through discussions and consultations with the cooperative about the programmes to be carried out
 - these programmes include developing homestay accommodations, developing organic farms and organizing local transport
 - the programmes also trained villagers to produce handicrafts, to provide catering and to work as tour guides
 - by 2004, the village had 22 homestays, 22 andongs (local transports of horse-drawn carts) and six local restaurants
 - this was in contrast to 2002 when the village had only 10 homestays, five andongs and no restaurants
 - the village also reported 63 new jobs, five new businesses, as well as a 12.5% increase in average income per villager from 2001 to 2003

STRENGTHS

- involves locals in decision making
 - local communities enlist residents in discussions and consultations about tourism management strategies to be carried out
 - they can also make tourism-related decisions about their own communities
- increase in tourism-related employment and business for locals
 - community-based tourism often makes locals a priority when it comes to business and employment opportunities
 - locals can get employed as guides, waiters, cleaners, drivers and reception staff

LIMITATIONS

- difficulty in obtaining external funding
 - some local communities, especially disadvantaged ones, may face funding problems when setting up businesses or investing in vehicles to facilitate tourism in their area
- shortage of skilled labour
 - the local community alone may not have enough skilled labour, such as managers or consultants that can successfully help manage the impact of tourism
 - in such cases, the community may need to seek the help of NGOs or other organisations to provide skilled labour or training

Answers may include the following points:

A complete answer need not include all the above points.

Candidates at each level will show the following characteristics:

Level 1 (0-3 marks)

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

Level 2 (4-6 marks)

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

Level 3 (7-8 marks)

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

———— End of Paper —————



YISHUN TOWN SECONDARY SCHOOL

PRELIMINARY EXAMINATION 2 2016 SEC 4 EXPRESS GEOGRAPHY

SUGGESTED ANSWERS

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

Section A

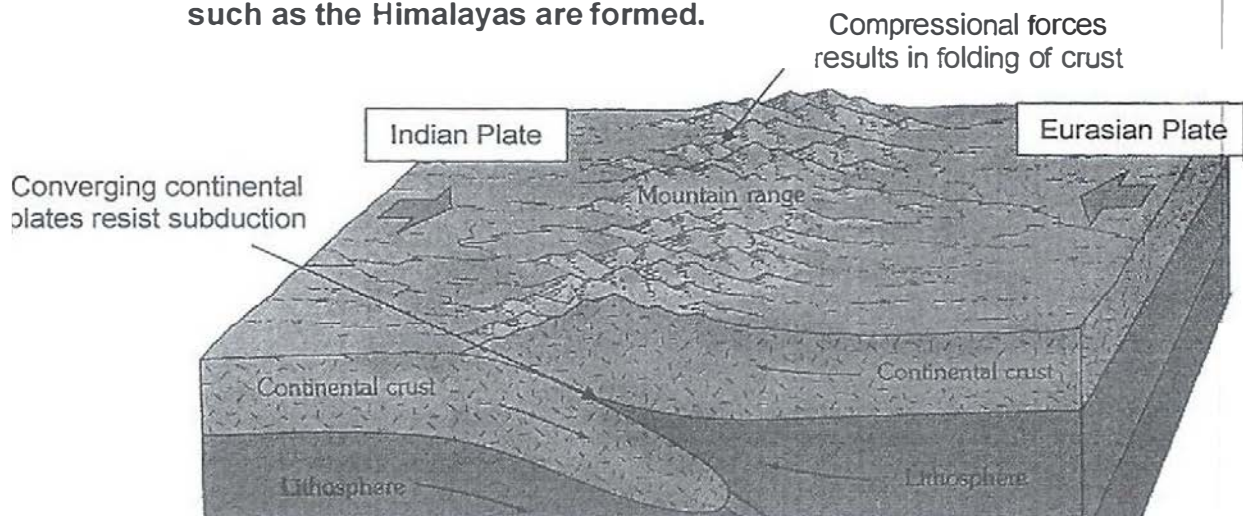
1 (a) Study Fig. 1, which shows a photograph of the Himalayan fold mountain range.

(i) Describe the physical characteristics of the Himalayan mountains. [4]

- The Himalayan Mountains are found at great heights and has steep, almost vertical slopes.
- The fold mountain in Fig. 1 also has jagged peaks that is snow covered.
- There are also folds found on the feature which is a result of compressional forces.
- The texture of the feature is also rough.
- There is also little/no vegetation found at the foreground near the summit of Fig. 1.

2@1m for listing.

(ii) With the aid of a well-annotated diagram, explain how fold mountains such as the Himalayas are formed. [5]



(Reserve 2m for diagram)

- Fold mountains such as the Himalayas are located at continental-continental convergence plate boundaries
- When the Indian and the Eurasian plates converge and collide,
- They resist subduction as they are of similar densities
- This results in compressional forces on the crust and causes folding of rocks on the upper crust.
- The bending of the crusts forms a range of fold mountains, known as Himalayas mountain range.

- (b) Study Fig. 2 (Insert), which shows satellite images of Yuriage in Natori before and after the 2011 Tohoku Earthquake in Japan.

Using Fig. 2 (Insert) and other information, describe the effects of the earthquake on Yuriage in Natori. [4]

- Destruction of buildings and they are all flattened / inundated by flood waters brought by the tsunami
- Transport infrastructure such as roads and bridges are also destroyed
- Livelihoods are also affected as agricultural farmlands and industries are being destroyed
- There might also have been fires outbreak as shown on the left centerground on Fig. 2.
- Natural vegetation that was previously found in the area is also destroyed.

(max 3m if no reference to Fig.)

- (c) Study Fig. 3, which shows the humanitarian assistance provided by the United States of America to Nepal in 2015 after the earthquake.

Using information from Fig. 3, explain how short-term responses can help the communities cope with the effects of an earthquake. [4]

- The provision of medical supplies after an earthquake can help to reduce the loss of lives and serious injuries since health and medical problems can be handled quickly.
- This can also help to prevent epidemics from spreading especially when the environment is unsanitary after an earthquake, hence helping about 40,000 people over three months in Nepal.
- The setting up of emergency shelters by providing 6,200 rolls of heavy-duty plastic sheeting would also help to provide temporary shelter for families which have lost their homes in the earthquakes hence reducing their exposure to cold/rain which might exacerbate problems of ill-health among survivors.
- Food assistance of nearly 2,830 metric tons of rice provided after the Nepal earthquake helps to ensure that malnutrition and starvation are minimised as many affected survivors will not have the resources to obtain enough food.

(max 3m if no ref. to Fig.)

- (d) "The increase in earth's average temperature benefits countries in the world."

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

Answers may include the following points:

I agree that increase in earth's average temperature benefits countries:

- The increase in earth's average temperature has allowed some regions to have longer growing seasons, hence allowing the increase in crop

- yield for consumption and export.
- Furthermore, there is also an increase in the crop types that can be grown in cool climate areas such as the United Kingdom. The warmer temperatures have now enabled the cultivation of crops such as blackberries and maize.
 - Even countries at higher latitudes such as Canada is projected to produce soybeans, potatoes and wheat which can increase the global production of these crops.
 - The melting of glacials due to the increased temperatures can also allow countries to access previously unknown resources. For example, Norway has managed to find a reserve of oil due to the melting of glacials in their country's political boundary.
 - New sea routes such as the one in the Arctic Circle have also opened up for trading and tourism purposes. Hence, allowing the countries to have an additional source of income.

However, I disagree that increase in earth's average temperature benefits countries:

- The increased production of crops that are usually found in the tropics however means that production of fruits and nuts requiring cool weather conditions is now reduced.
- Climate change has resulted in increased temperature and rainfall in various parts of the world.
- Insects thrive in these favourable conditions, which may lead to the spread to insect-borne diseases transmitted to humans or animals by insects.
- For example, heavy rainfall has allowed mosquitoes to grow in a number of aquatic habitats and resulted in the spread in malaria and dengue fever in regions with moderate temperatures such as Europe and North America.
- Cool climate areas such as Bhutan and Nepal reported for the first time in 2004 having dengue fever which was confined to the tropics.
- The increased temperatures have also resulted in sea level rise as glacials in Greenland and Antarctica melt and the expansion of waters due to the warmer atmosphere.
- The rise in sea level will threaten over 600 million people worldwide who are living in areas less than 10 metres above sea level. It will also result in the destruction of coastal land and wetland habitats.
- For example, countries such as Tuvalu in the Pacific Islands will end up being covered fully and the citizens will now have relocate to other countries. The Majuro Atoll in the Pacific Ocean will also lose 80% of its land if the sea level rises by half a metre.
- The increased in temperatures has also resulted in an increased occurrence of extreme weather events such as cyclones, floods, droughts, heat waves etc.
- These extreme weather events is believed to increase as a result of higher land and sea surface temperatures warmed by the increased temperatures. The greater amount of water vapour and latent heat in the atmosphere is believed to be the powerful driving force of these extreme weather events.
- There has been an increased in extreme weathers from 1980 to 2005 which brings about significant economic loss and loss of lives in

countries. Examples of the destruction these events bring can be seen in Cyclone Yasi in Australia, Cyclone Haiyan in Philippines and the Myanmar Flood in 2015.

A complete answer need not include all the above points.

Candidates at each level will show the following characteristics:

Level 1 (0-3 marks)

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

Level 2 (4-6 marks)

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

Level 3 (7-8 marks)

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

2 (a)

Study Fig. 4A, which shows the climograph of Andagoya in Columbia and Fig. 4B, which shows the climograph of Mangalore in India.

(i) Compare the characteristics of the climate in the cities as shown on Fig. 4A and 4B.

[4]

Similarities

- Both Andagoya and Mangalore are tropical climates with an average annual temperature of 27°C to 28°C
- and a small annual temperature range of 1°C to 2°C.
- Both Andagoya and Mangalore receive a high annual rainfall of more than 2000mm.

Differences

- The rainfall received in Andagoya is evenly distributed throughout the year with a monthly average of 560mm.
- However, the rainfall in Mangalore is unevenly distributed with distinct wet and dry seasons. The months from June to August receive high rainfall above 600mm with the highest rainfall of 1050mm in July whereas from November to April, Mangalore receives little or almost no rainfall.

Reserve 2m for each characteristic – temperature or rainfall.

(max 2m if no comparison words)

(max 3m if no fig. cited)

(ii) Explain the distribution of rainfall in Mangalore, India as shown on Fig. 4B.

[4]

- In the months of October to March, the Southern Hemisphere experiences summer and Northern Hemisphere experiences winter
- A low pressure area develops in the southern hemisphere while a high pressure area develops in the northern hemisphere.
- Wind blowing from the high pressure area in Continental Asia to the low pressure area in Australia as NE Monsoon is dry hence resulting in little or no rainfall during these months.
- However, from June to September, a high pressure area develops over the Southern Hemisphere as it experiences winter while a low pressure area develops over Continental Asia in the Northern Hemisphere.
- Hence, as the winds blow from the Southern Hemisphere to India, it carries moisture from the Indian Ocean to Mangalore. Hence, resulting in heavy rainfall from June to September.

(b) (i) Study Fig. 5 (Insert), which shows the risks of tropical cyclone in the Bay of Bengal and South China Sea.

Describe the areas of tropical cyclones where there are 'high' and 'extreme' risks of occurrence.

[4]

- Areas that face 'high' and 'extreme' risks of occurrence along the Bay of Bengal and the South China Sea are coastal regions of the countries shown on Fig. 2.
- The entire Eastern Coast of India where Bangalore is located stretching till where Bangladesh is faces high risk of tropical cyclones.
- The Southern tip of Myanmar faces high risk of tropical cyclones whereas the Western coastline faces extreme risk of tropical cyclones.
- The Northern and Central islands of Philippines are also at high and extreme risk of tropical cyclones.

2@1m for listing.

(max 3m if no direction words or no reference to map)

(ii) Study Fig. 6, which shows a newspaper article on the effects of tropical cyclone, Typhoon Haiyan in 2013.

Using information from Fig. 6 and other information, explain the hazards associated with tropical cyclones.

[4]

- Typhoons usually bring about strong winds which can destroy buildings and plantations, causing them collapse and result in the loss of livelihoods as loose debris fly and hit people and buildings.
- Furthermore, the strong winds can peel off the roofing of buildings that are built from non-durable materials such as iron sheet.
- The typhoon also brings about storm surge which can cause coastal flooding as it causes water level to rise beyond normal high tide levels, which can cause structural damage to buildings as it soaks the foundations of the buildings.
- Large amounts of rainfall can also brought by the typhoons which results in inland flooding due to the sudden addition of water in rivers

and streams causing them to overflow. Excess water accumulated can also destabilise slopes which results in landslides.

(max 3m if no reference to Fig.)

- (c) “Energy conservation is the most effective national strategy to mitigate climate change.”

To what extent do you agree with this statement? Explain your answer with reference to a country you have studied. [8]

Answers may include the following points:

I agree that energy conservation is the most effective national strategy:

Singapore Green Plan 2012

- The Singapore Green Plan was launched by the Ministry of Environment in 2002 and aims to generate 60% of Singapore's energy needs using natural gas by 2012.
- This is because natural gas is a cleaner form of energy as compared to coal since it does not produce, hence reducing our reliance on the burning of fossil fuels to obtain energy.
- It has been a successful plan that was fulfilled even before 2012, as about 79% of Singapore's electricity is being generated from natural gas from as early as 2010.
- It was also successful as it exceeded the Ministry of Environment's target as well.

disagree that energy conservation is the most effective national strategy:

- Energy conservation projects adopted at the national level however has its limitations.
- The limitations of the Singapore Green Plan 2012 were that natural gas requires complex treatment plants to process and special pipelines to transport. Hence, raising the maintenance cost as they have to be laid underground and checked regularly for leakage.

Singapore Green Mark Scheme

- Besides adopting the energy conservation approach, countries can also look towards being energy-efficient where less energy is being used to provide the same service.
- The Green Mark Scheme was launched by the Building and Construction Authority (BCA) in 2005 in order to be energy efficient.
- and it allows buildings to be evaluated and certified according to how energy-efficient and environmentally friendly they are.
- This scheme aims to encourage the development of more 'green' buildings, which reduces the amount of energy needed to produce the same service. Examples of such buildings include the Biopolis, University Town in National University of Singapore.
- Hence, helping to cut down on greenhouse gas emissions by reducing the use of fossil fuels to generate electricity in these buildings.
- It has been successful as existing 'green' buildings such as Plaza by

the Park and National Library Building have reported energy savings of 15 to 30% compared to conventional buildings.

**A complete answer need not include all the above points.
Candidates at each level will show the following characteristics:**

Level 1 (0-3 marks)

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

Level 2 (4-6 marks)

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Level 3 (7-8 marks)

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

Section B

- 3 (a) Study Fig. 7 (Insert), which shows the global distribution of obese adults in the population.**
- (i) Describe the pattern of global distribution of obese adults as shown on Fig. 7 (Insert). [4]**
- The global distribution of obese adults with BMI equal or greater than 30 are found mainly in the developed countries and more advanced developing countries that are growing rapidly.
 - The North American, European and Australian continent has a significant percentage of obese adults in the population of at least 20%.
 - Countries with a high percentage of 30 to 40% of obese adults in the population are found in countries such as the United States of America and Saudi Arabia in the Middle Eastern region.
 - In the Middle Eastern region, countries such as Turkey has 20-30% of obese adults in its population while Iran has a lower percentage of 10-20%.
 - In the South American continent, countries such as Brazil, Columbia, Bolivia and Chile also have 10-20% of obese adults in its population.
 - On the Southern Tip of the African continent, South Africa also has 20-30% of obese adults in its population which is significant as compared to the rest of the countries on the continent.
 - In Asia, countries such as India, China, Mongolia, Japan, Philippines, Indonesia and Malaysia also have the least amount of 0 to 5% of obese adults in the population.
- (ii) Describe the economic impacts of excess food consumption in [5]**

developed countries.

- Excess food consumption can lead to adverse effects on health to individuals such as being obese and other related illnesses such as high blood pressure, coronary heart disease, diabetes and certain cancers.
- More funds have to channelled to the health care system when people suffer from obesity-related illnesses which would reduce the amount of funds remaining for economic development.
- Excess food consumption in developed countries can also result in lower productivity due to poorer health conditions. Adults who are obese may be more prone to falling ill, hence resulting in workers being absent from work and taking more days of leave. This will lead to lower income as the inability to work will result in lower productivity.
- Employees who are absent from work can also cost companies millions in productivity and insurance costs.
- Increased absenteeism from school and work due to obesity-related illnesses can result in loss of educational opportunities for children in school.

(b) Study Fig. 8 (Insert), which shows the percentage of food wastage along the food supply chain by region.

Compare the food wastage between the Sub-Saharan Africa and Europe.

[4]

- The amount of food wastage in the developed region of Europe is highest with more than 30% as compared to the developing regions of Sub-Saharan Africa with 20% food wastage.
- In Europe, the greatest amount of food wastage of 20% occurring in the consumption stage.
- However, the consumption stage is where the least amount of food wastage occurs in Sub-Saharan Africa with less than 1%.
- Food wastage at the agriculture stage is moderate at 7-8% in Sub-Saharan Africa,
- but in Europe food wastage in the agriculture stage along the food supply chain is one of the lowest at 2%.
- The post-harvest stage where food wastage occurs is highest in Sub-Saharan Africa at about 9-10%. However, it is only 3-4% of food wastage in Europe.

(max 2m if no comparison words)

(max 3m if no fig. cited)

(c) Study Fig. 9, which shows the effects of irrigation systems on soil

and water quality.

With reference to Fig. 9, 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.
- However, this 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. 9.
- 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.
- When there is no drainage of excess water that is brought by the irrigation channels, it can also result in waterlogging causing the soil to be over-saturated.
- 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.

(d) “Technological advancements is the most effective strategy to ensure food security.”

To what extent do you agree to this statement? Give evidence to support your answer.

[8]

Answers may include the following points:

I agree that technological advancements can help countries ensure food security:

- Technological advancements such as the development of genetically modified (GM) food and high yielding varieties can help ensure food security as the foods developed can be identified with specific strains and cross-breeding to achieve maximum yield.
- For example, ‘Wonder Rice’ can be grown over a shorter period of 100 days as compared to non-HYVs which require 120 days. The IR8 which is promoted throughout Asia after its success in India which enabled farmers to grow twice as much as grain as traditional varieties.
- GM food has allowed food to be more tolerant of extreme weather conditions/soil conditions which previously were too hostile for intensive crop growth thus allowing more crops to be grown. This would increase the crop yield which would increase the supply of the food available for the people in the country.
- GM crops such as Bt-Cotton has a gene from a naturally occurring soil bacterium which makes it resistant to heliothis caterpillar, hence protecting the crop and preventing risks of damage by pests.
- There can also be GM crops developed to help improve nutrition in the country such as the ‘Golden Rice’ infused with Vitamin A to prevent blindness.
- Use of irrigation and machinery has allowed plantations to expand in size and grow more food supply to reduce shortage of food, especially in areas that are not suited for crop production.

- For example, in the North African country of Libya, the extensive irrigation project called the Great Man-Made River has made it possible to grow crops in the Saharan Desert which would channel water from underground aquifers to the coastal areas of Libya.
- The use of chemical fertilisers and pesticides has allowed multiple cropping to be practiced which ensures that food supply is stable throughout the year/reduce likelihood of short-term shortage of food. For example, the technique of multiple cropping is being practiced in Indonesia where different crops are grown on a small-scale farm.
- In order to prevent food wastage, developments in the storage of food can also help to ensure better food security in countries. The use of refrigerated warehouse of storage keeps food fresh for a longer period of time.
- In less developed countries, farmers can also make use of silos which is an airtight structure for storing crops that have been harvested. With improved use of storage technologies, crops can be distributed to further areas from its area of production in a country.
- This would allow a larger variety of food to be made available and more accessible to people. For example, the use of Timor Leste has helped to reduce the loss of crops to pests by 20 to 40%.

I disagree that technological advancements can help countries ensure food security:

- However, even with the development of technology there are other factors which can also affect the food supply in a country.
- Even though there is an increase in crop yield due to the development of GM food and irrigation systems, there is a misdistribution of food in the country between the rich and poor. Poverty can make people unable to afford to buy food even if there is actually an adequate supply of food for purchase.
- Furthermore, the development of GM food is mostly targeted at cash crops such as soya bean, corn and canola and does not involve crops for consumption in poorer countries in Sub-Saharan African such as cassava, sorghum and banana.
- There are also certain climates in the world that does not support commercial growth of food and are prone to extreme weather events which destroy crops/render a year unsuitable for crop growth. Even though climate as a variable is being reduced through technology like greenhouses allowing places that used to depend on other countries to produce food for them to be self-sufficient.
- Agricultural strategies such as multiple cropping can also help to ensure food security as it is a practice where the total crop production from a single piece of land is achieved by growing single crops one after another, or growing several crops simultaneously.
- Leguminous crops such as groundnut and soya bean have roots that are able to replenish nitrogen in the soil. When these crops are planted next to non-leguminous crops such as corn and sorghum, the non-leguminous crops benefit from the nitrogen generated by the leguminous crops.
- For example, garlic, pepper and onions may be planted next to crops like tomatoes.
- Growing multiple crops also help to minimize the problem of pests destroying crops. It also helps to reduce the dependence on one crop

crop so that the variability in prices markets, climate and pests and diseases do not have a drastic effect on local economies.

- For example, in the Garhwal Himalays, India practices baranaja, which involves sowing 12 or more crops on the same field like beans and millet.
- Political reasons such as conflict and war can also affect the food security of the country, especially in countries that are poorly governed. A poorly governed country would usually result in civil strife which would cause disputes such as control of resources that affect food production such as land and water. This lack of food supply can be the root cause of conflict, which would then start a vicious cycle of civil strife and shortage of food.
- Governance can also affect food security when they prioritise other developmental needs over ensuring food security. In the Indian state of Madhya Pradesh in 2010, villagers were deprived of farmland as the government developed mines, steel plant and a port. Hence, causing 40,000 people to lose the means to produce their own food and left with limited income to buy food.
- National agricultural policies can also help to ensure food security such as providing land and training to the farmers and also land reform.
- The Federal Land Development Authority Scheme (FELDA) in Malaysia in the 1960s-70s aimed to reduce poverty in the rural areas through agricultural activities. Hence, they developed unused land for agriculture and settlement. Farmers are provided with land, seeds and tools and farming. There are also building of modern processing facilities for crops.
- This has allowed 90,000 families to be resettled by 1985 and most of them were involved in agricultural activities like rubber, oil palm, sugar cane, coffee and cocoa.
- Land reform can also be practiced where land is being redistributed in an area to increase agricultural productivity. This can help increase food production and enhance food security as land is more accessible to farmers.
- For example, in 2010, the Venezuelan government passed a law which made it easier for the government and landless farmers to acquire privately owned land. This has nationalized 2,500 sq km of agricultural land.
- This has led to increased productivity and increased crop yield, which have stabilized the supply of rice.
- This steady supply has allowed the price of rice to become stable and affordable, hence enhancing food security.

A complete answer need not include all the above points.

Candidates at each level will show the following characteristics:

Level 1 (0-3 marks)

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

Level 2 (4-6 marks)

Disagreement or agreement will be supported by appropriate detail. Or,

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

Level 3 (7-8 marks)

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

- 4 (a) **Study Fig. 10 (Insert), which shows the trend of global area of genetically modified (GM) crop production. Compare the trend of GM crop production between the developed and the less developed countries.** [4]

Similarities

- The trend of GM crop production between the developed and less developed countries are both increasing from 1996 to 2011.
- Both are increasing and have reached an area of 80 million hectares for Genetically Modified crop production in 2011.

Differences

- The increasing trend of areas being used for producing GM crop is more rapid in the developed countries from 0 million hectares in 1996 to 50 million hectares in 2003.
- But the increase in the less developed countries is slower from 0 million hectares in 1996 to 20 million hectares in 2003.
- The increase in production of GM crop has increased rapidly in the less developed countries from 2003 onwards from 20 million hectares to 80 million hectares in 2011.
- However, the increase in area producing GM crop in the developed countries slowed down from 2003 onwards from 50 million hectares in 2003 to 80 million hectares in 2011.

(max 2m if no comparison words used)

(max 3m if no Fig. cited)

- (b) **Study Fig. 11, which shows the Gross Domestic Product (GDP) per capita and the percentage of population with access to safe water.**
- (i) **With reference to Fig. 11, describe the relationship between GDP per capita and the percentage of population with access to safe water.** [4]

- (Reserve 1m) Countries with higher GDP per capita tend to have a larger percentage of its percentage with access to safe water.
- Countries such as Thailand, China and Malaysia with at least a GDP per capita of US\$6800 have more than 90% of their population having access to safe water.
- Bolivia, Morocco and Guatemala have a GDP per capita ranging from US\$2900 per capita to US\$4700 per capita and have a moderate percentage of 52% to 69% the population with access to safe water.
- Ethiopia has the lowest GDP per capita of US\$800 and the least percentage with only 27% of its population having access to safe water.

- However, there are exceptions such as the country of Portugal with the highest GDP per capita of US\$19,400 but 82% of the population with access to safe water.
- Argentina has a GDP per capita of US\$13,100, higher than that of Malaysia, Thailand and China but only 69% of its population having access to safe water.

(max 3m if no Fig. cited)

(ii) **Describe the economic factors that result in poor health in less developed countries.**

[5]

- Less developed countries usually have a lower GDP per capita which would mean they would have limited financial capacity and resources to carry out projects that improve the health condition of its citizens.
- With limited financial capacity and resources, the government would not be able to improve the accessibility and affordability of healthcare services for its population. Hence, less developed countries usually have very poor doctor-patient ratio and patient-bed ratio.
- There would also be insufficient resources to be channelled into environmental projects such as improving the quality of water, increasing the number of public taps with treated water and providing proper sanitation services for its people which then result in poor health conditions.
- In less developed countries, there are also many people who live in poverty which limits their purchasing power to afford basic health care. This would mean that people are more likely to be exposed to health risks because of poor living conditions and insufficient nutrition.
- Children in less developed countries living in poverty are also most vulnerable to nutrition-related diseases due to inadequate food consumption. They are also rarely given vaccination at a young age and are exposed to many types of diseases.

(c) **Study Fig. 12, which shows selected development indicators of Botswana and Australia in 2015. Using Fig. 12, explain the variations in Infant Mortality Rate in Botswana and Australia.**

[4]

- The infant mortality rate (IMR) in Botswana is 36.3 infant deaths per 1,000 live births which is higher than Australia's IMR of 3.4 infant deaths per 1,000 live births. The first reason why IMR is higher in Botswana is due to its lower daily calorie intake of 2,264 kcal/person/day as compared to Australia with a higher 3,227 kcal/person/day.
- Better nutrition of the mother and infant is important to ensure good health conditions. The higher daily calorie intake in Australia would mean that the mother is in better health in pregnancy and giving birth to care for the newborn. Babies that are well-taken of during pregnancy and infancy stage are more likely to be healthier and live.
- Poor diets in Botswana can result in malnutrition where there is insufficient or balanced amount of nutrition it needs to maintain healthy tissues and organ functions. Hence, the lower daily calorie intake in Botswana can result in higher IMR.

- The educational levels of the population can also determine the IMR of the country. In Botswana, the expected years of schooling is 12.5 years which is lower than Australia's expected years of schooling of 20.2 years.
- Women who receive education are more informed of nutrition and healthcare, which would then result in a lower IMR. An educated population would also be more informed on how to lead a healthy lifestyle, and care for their children more effectively especially in their first year of birth.
- Lower educational levels will also result in higher infant mortality rate in Botswana as mothers are less likely to have the knowledge of how to care for their newborn. Hence, they are less effective in ensuring that their child receives adequate nutrition and care.

(d) **“The socio-demographic impact of HIV/AIDS is more serious than the economic impact.”**

How far do you agree? Support your answer with examples.
Answers may include the following points:

[8]

I agree that the socio-demographic impact of HIV/AIDS is more serious:

- The spread of HIV/AIDS can change the structure and composition of a population and result in a decline in health indicators such as life expectancy and infant mortality rate.
- The disease would result in a high number of deaths which reduces the life expectancy in the country, population size and population growth. Most of these deaths occur in less developed countries where HIV/AIDS is prevalent in African countries such as Botswana, Kenya and Uganda.
- Life expectancy in a HIV/AIDS prevalent country can be reduced by 6 years than if the disease was absent. According to UNAIDS, if the disease continues to spread it could be 10.8 years by 2025.
- In Uganda for example, the life expectancy was 39 to 51 years old from 1950 to 1974 but reduced to 49 by 1996 as HIV/AIDS emerged.
- Infant mortality rate can also increase due to the prevalence of HIV/AIDS disease. While countries such as USA and Singapore has a decrease in the infant mortality rate, it has increased for Kenya and Uganda from 1980 onwards.
- Large number of children can also lose their parents due to HIV/AIDS leading to an orphan crisis. There are about 17 million orphans in the world due the HIV/AIDS and 87% of them live in Sub-Saharan countries such as Nigeria, Tanzania and Uganda.
- Due to the loss of their parents, these orphans lack access to basic necessities such as shelter, food, clothing, health and education. They are also likely to suffer from malnutrition and experience a lower standard of living.
- These orphans are cared for by their extended families which are plagued by deeper poverty as the medical costs and living expenses of the orphans living with them is high. Many of these orphans are also HIV-positive themselves.
- Orphans that are not being cared for by relative or family friends are vulnerable to forced labour, into the sex industry and recruited as child

soldiers. They also suffer the emotional trauma of losing their parents and face the social stigmatisation of being associated with HIV/AIDS.

I disagree – the economic impact of HIV/AIDS is more serious:

- The economic impacts of HIV/AIDS are more serious as the cost of treating the diseases is very high and it's borne by both individuals and the country.
- The health care expenditure for HIV/AIDS include not only the antiretroviral (ARV) drugs that keeps the virus from progressing in the body but also in the form of treatment and research. Further costs can also come from treating other complications from HIV/AIDS.
- In Singapore, the ARV drugs costs US\$100 to US\$1,200 every month and in less developed countries it can cost up to US\$69 to US\$900 per year. Furthermore, the drug has to be taken daily for the patient's entire life. In places where the drugs are subsidised or free, the cost is often borne by NGOs or by the government.
- Pregnant mothers with HIV/AIDS also have to receive antenatal treatment to reduce the risk of passing the virus to their babies.
- Resources would have to be allocated by the government to care for the HIV/AIDS patients in countries where it is prevalent, hence resulting in the diversion of resources that can be used instead for other purposes.
- The government of South Africa for example spends US\$1.2 billion in 2010 to care for the HIV/AIDS patients. Without the epidemic, the money could have been spent on developing other public services such as roads, public transport systems, schools and sanitation in the country.
- Since much of the government's resources is channelled towards caring for the HIV/AIDS patients, the economic growth of a country is hindered as business are less likely to invest in countries without adequate infrastructure, no skilled labour force, and a population with poor health.
- The high death rates brought by HIV/AIDS can shrink the workforce and lead to illnesses that cause an employee to be absent from work for long periods, resulting in reduced labour productivity.
- A less effective education system can also result in a lower skilled workforce, which deters foreign investments and hinders economic growth.
- Uganda's economic growth for example is being slowed by 1.2 each year due to the disease. If the trend continues, it is predicted that Uganda's economic growth would be reduced by 39% by 2025 as a direct result of the HIV/AIDS epidemic.

A complete answer need not include all the above points.

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