XINMIN SECONDARY SCHOOL

新民中学

SEKOLAH MENENGAH XINMIN

PRELIMINARY EXAMINATION 2018

CANDIDATE NAME

CLASS 4 0 INDEX NO

GEOGRAPHY **2236/01**

Paper 1

17th August 2018

COVER PAGE

1 hour 40 minutes

Secondary 4 Express

Setter: Mr Loo Wen Bin
Vetter: Mr Jason Ting

READ THESE INSTRUCTIONS FIRST

This Cover Page contains Fig. 4 for Question 1.

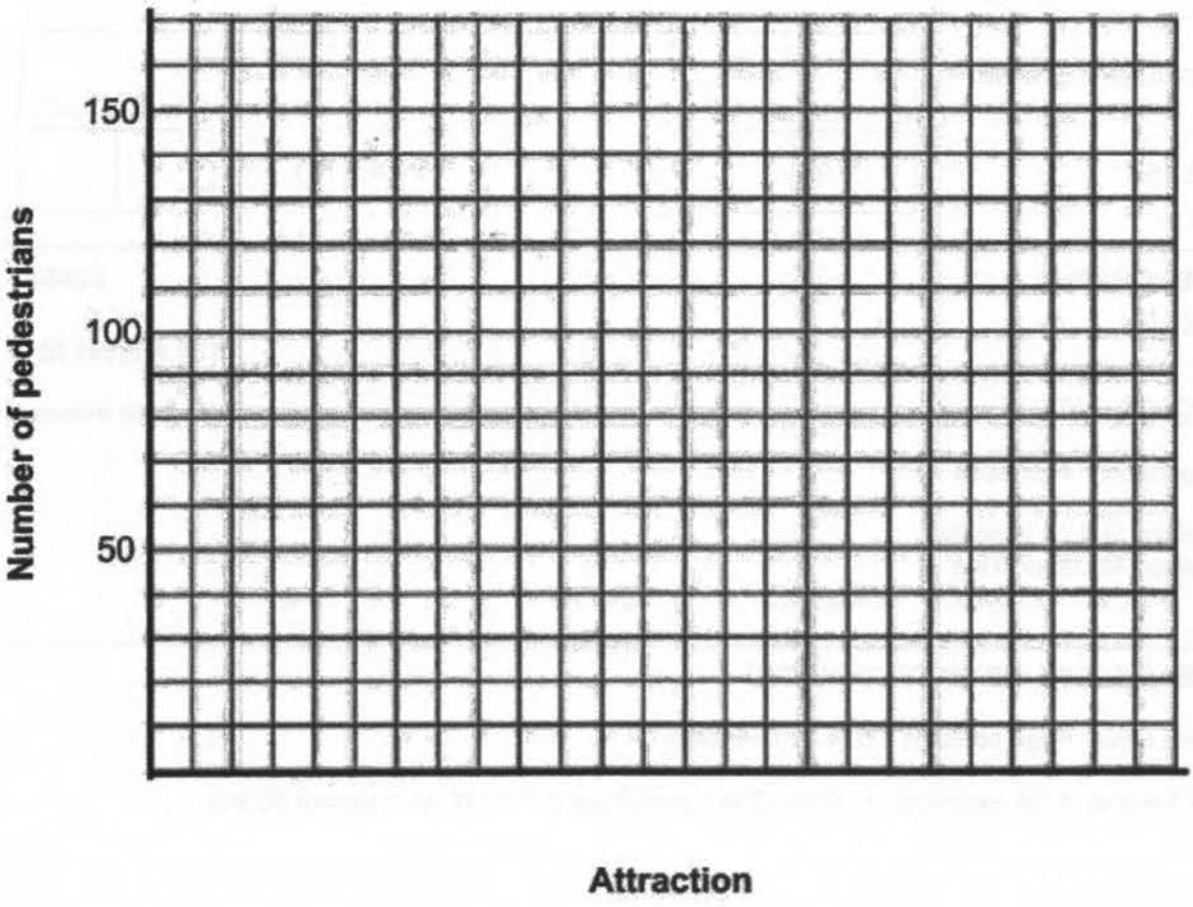
At the end of the examination, attach this Cover Page in front of your answer scripts.

Q1	**(a)**		**(b)**		**(c)**	**/ 25**
Q2 / Q3	**(a)(i)**	**(a)(ii)**	**(b)**	**(c)**	**(d)**	**/ 25**
TOTAL						**/ 50**
PARENT'S SIGNATURE						

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

Fig. 4 for Question 1

Pedestrian volume at Tokyo DisneySea



XINMIN SECONDARY SCHOOL
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SEKOLAH MENENGAH XINMIN
PRELIMINARY EXAMINATION 2018

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GEOGRAPHY **2236/01**

Paper 1

17th August 2018

Secondary 4 Express

1 hour 40 minutes

Setter: Mr Loo Wen Bin
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Additional Materials: Writing Paper
Insert
Cover Page

READ THESE INSTRUCTIONS FIRST
Write your name, class and index number on all the work you hand in.
Write in dark blue or black pen only 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 writing paper provided.
Candidates are encouraged to support their answers with the use of relevant examples.
Sketch maps and diagrams should be drawn whenever they serve to illustrate an answer.

At the end of the examination, fasten all your work securely together.
The number of marks is given in the brackets [ ] at the end of each question or part question.

Section A

This question is compulsory.

1 (a) A group of students carried out fieldwork at Tokyo DisneySea, a theme park in Tokyo, Japan, based on famous characters from Disney.

The students decided to consider the guiding question 'How does the distance of origin from Tokyo DisneySea influence the number of visitors?'. They used secondary data to answer this guiding question.

Students considered two methods to present the percentage of visitors from each region. Fig. 1 is a pie chart showing the percentage of visitors from each region. Fig. 2 (Insert) is a map with flow lines showing the percentage of visitors from each region.

Origin of visitors to Tokyo DisneySea

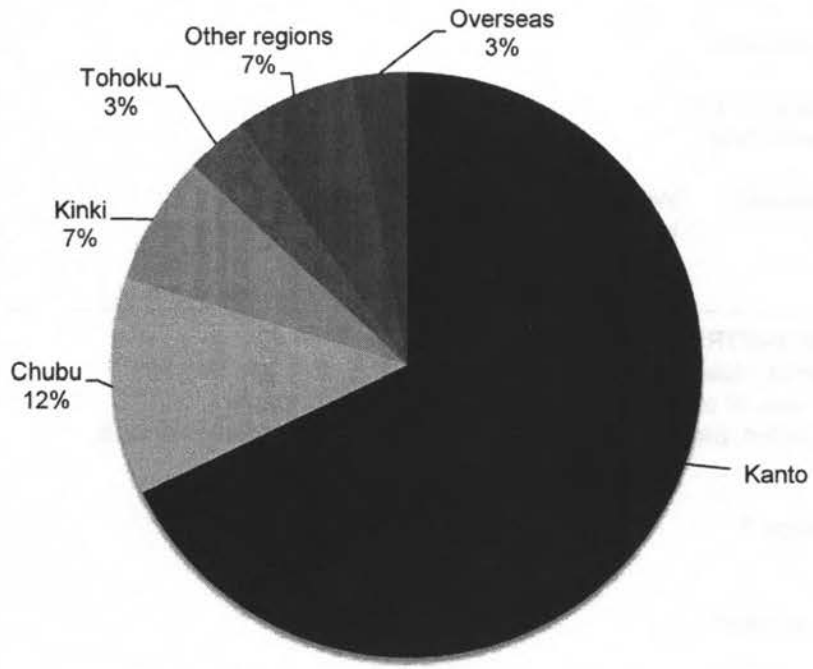


Fig. 1

(i) Suggest one possible source of secondary data the students might have used and explain why it is useful for them to consider secondary data for this study. [2]

(ii) Using Fig. 1, calculate the percentage of tourists to Tokyo DisneySea from Kanto. [1]

(iii) Which method used to show origin of visitors is preferable for this study? Suggest reasons for your answer. [2]

(iv) From studying the information in Figs. 1 and 2, what conclusions might the students draw about the guiding question 'How does the distance of origin from Tokyo DisneySea influence the number of visitors?' [4]

(b) The students examined whether some attractions of Tokyo DisneySea are more popular than others. Fig. 3 (Insert) shows a tourist map and an event schedule of Tokyo DisneySea. They chose to conduct their fieldwork at three sectors of the theme park, which are Mediterranean Harbour, Mysterious Island, and Lost River Delta.

They counted the number of visitors at these attractions on a particular day at two timings, 0830hrs and 1230hrs. Table 1 shows data collected on visitor numbers in Tokyo DisneySea.

Table 1

Results of fieldwork

Pedestrian volume at Tokyo DisneySea Date / Day: 16th June 2018 / Saturday Duration of each conduct: 5 minutes		
Attraction	**0830hrs**	**1230hrs**
Mediterranean Harbour	75	36
Mysterious Island	96	130
Lost River Delta	124	165

(i) Describe how students can collect the data shown in Table 1. [4]

(ii) The students decided to present the data shown in Table 1 using a graph. Using Fig. 4 (Cover Page), present the results appropriately. [3]

(iii) Students used the data in Table 1 and concluded that 'Mediterranean Harbour is the least popular attraction in Tokyo DisneySea'. However, during the review of their fieldwork, they felt that this conclusion might not be reliable.

With the help of Fig. 3, suggest one reason why this is so and suggest one way to make the data collection process more reliable. [2]

(c) **(i)** The students learnt from their Geography lessons that a theme park caters to tourists of different age groups and wanted to investigate how this is so.

Suggest a hypothesis the students could test in Tokyo DisneySea. [1]

(ii) Describe how you would collect data for this investigation, and explain how you would present and use the data to test the hypothesis suggested in **(c)(i)**. [6]

Section B

Answer **one** question from this section.

2 (a) Study Fig. 5, which shows a map of Smith and Ross Islands.

Map of Smith and Ross Islands

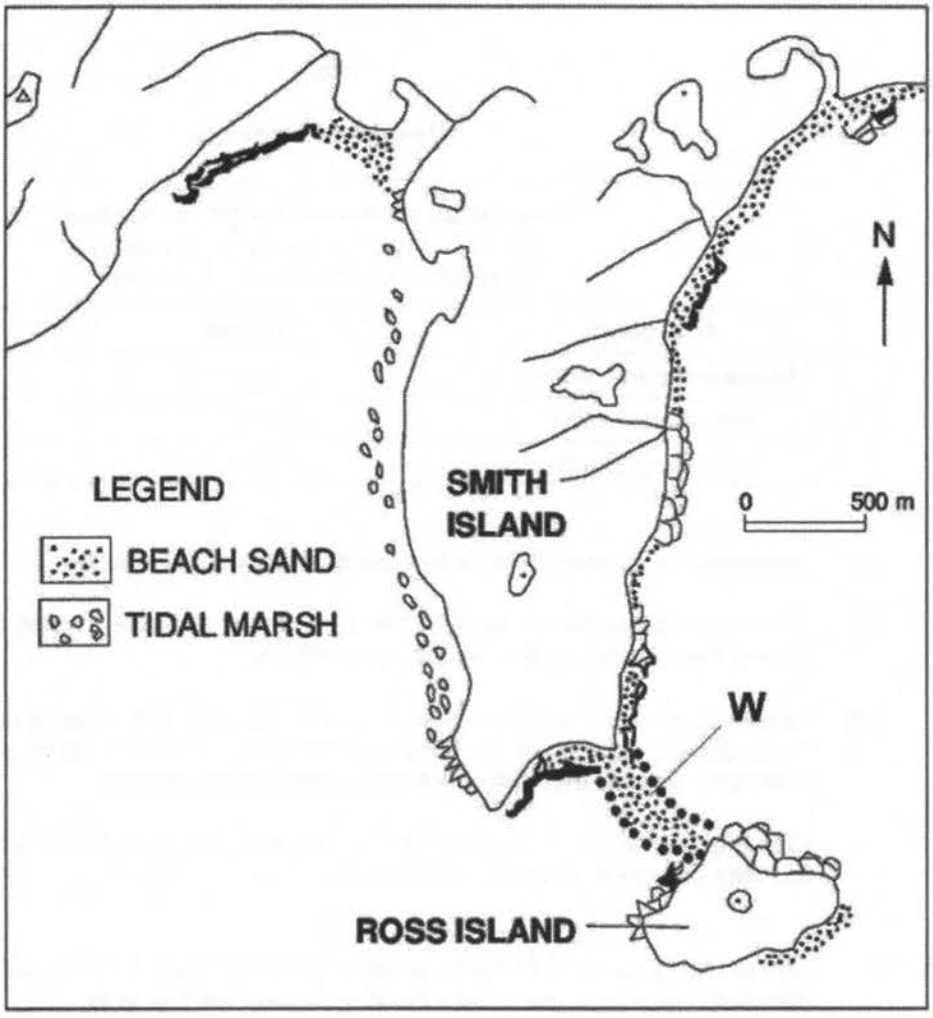


Fig. 5

(i) Using Fig. 5, name and describe the characteristics of landform **W**. [3]

(ii) With reference to Fig. 5, explain how landform **W**, named in (a)(i), may have been formed. [5]

(b) Explain how the media can promote tourism. [4]

(c) Study Fig. 6, which shows aspects of sustainable tourism in Costa Rica, a small state in Central America.

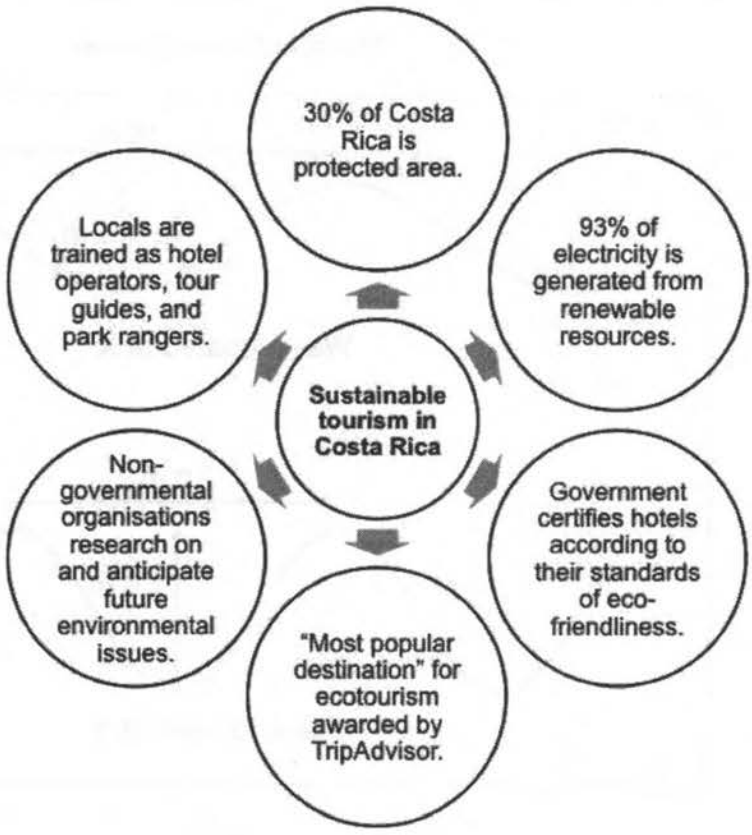


Fig. 6

Explain how sustainable tourism in Costa Rica may benefit both the economy and the environment. [5]

(d) 'All tourists want to go to destinations with rich culture.'

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

3 **(a)** Study Fig. 7 and Fig. 8 (Insert). Fig. 7 shows the characteristics of waves located at points **X** and **Y**. Fig. 8 shows a satellite image of Swanage, a coastal area in United Kingdom, where points **X** and **Y** can be found.

Characteristics of waves

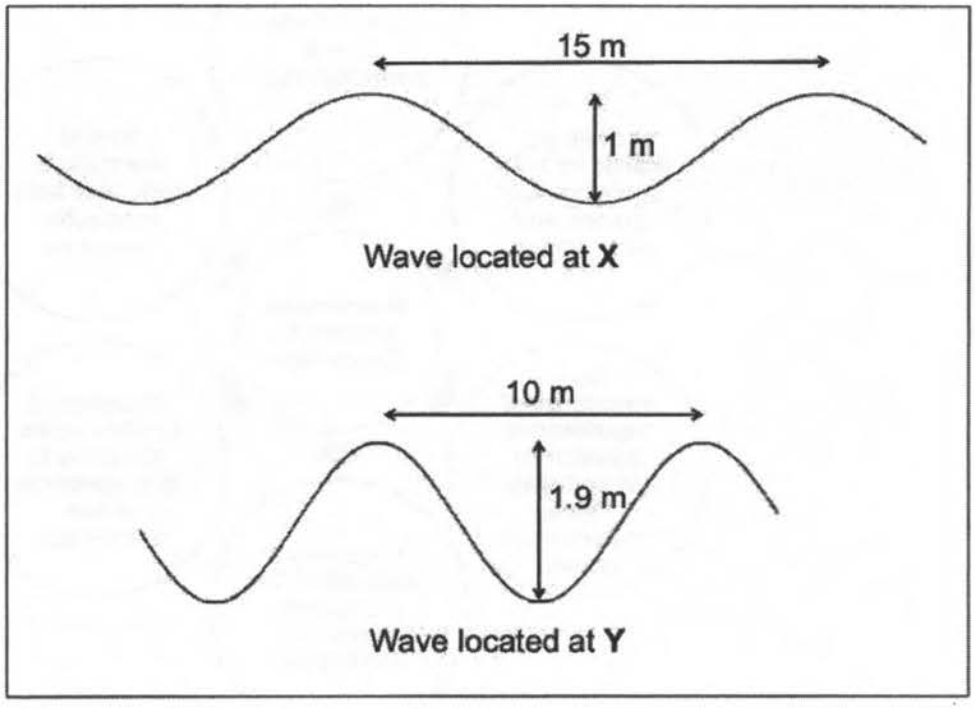


Fig. 7

(i) Using Fig. 7, compare the difference in wave characteristics at points **X** and **Y**. [3]

(ii) With the help of Fig. 8, account for the difference in wave characteristics at points **X** and **Y** as described in **(a)(i)**. [5]

(b) Explain the impact to coastal communities if mangroves were to be cleared. [4]

(c) Study Photograph **A** (Insert), which shows groynes along a coastline.

Describe the features of the groynes shown on Photograph **A** and assess the usefulness of groynes as a means of protecting the coastline. [5]

(d) 'Coastal areas are always endangered by human activities.'

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

End of Paper

BP~289

XINMIN SECONDARY SCHOOL
新民中学
SEKOLAH MENENGAH XINMIN
PRELIMINARY EXAMINATION 2018

CANDIDATE NAME					
CLASS	4	0		INDEX NO	

GEOGRAPHY **2236/01**
Paper 1

17th August 2018

INSERT

1 hour 40 minutes

Secondary 4 Express

Setter: Mr Loo Wen Bin
Vetter: Mr Jason Ting

READ THESE INSTRUCTIONS FIRST

This Insert contains Figs. 2 and 3 for Question 1, and Fig. 8 and Photograph A for Question 3.

Fig. 2 for Question 1

Movement of visitors to Tokyo DisneySea, from region of origin

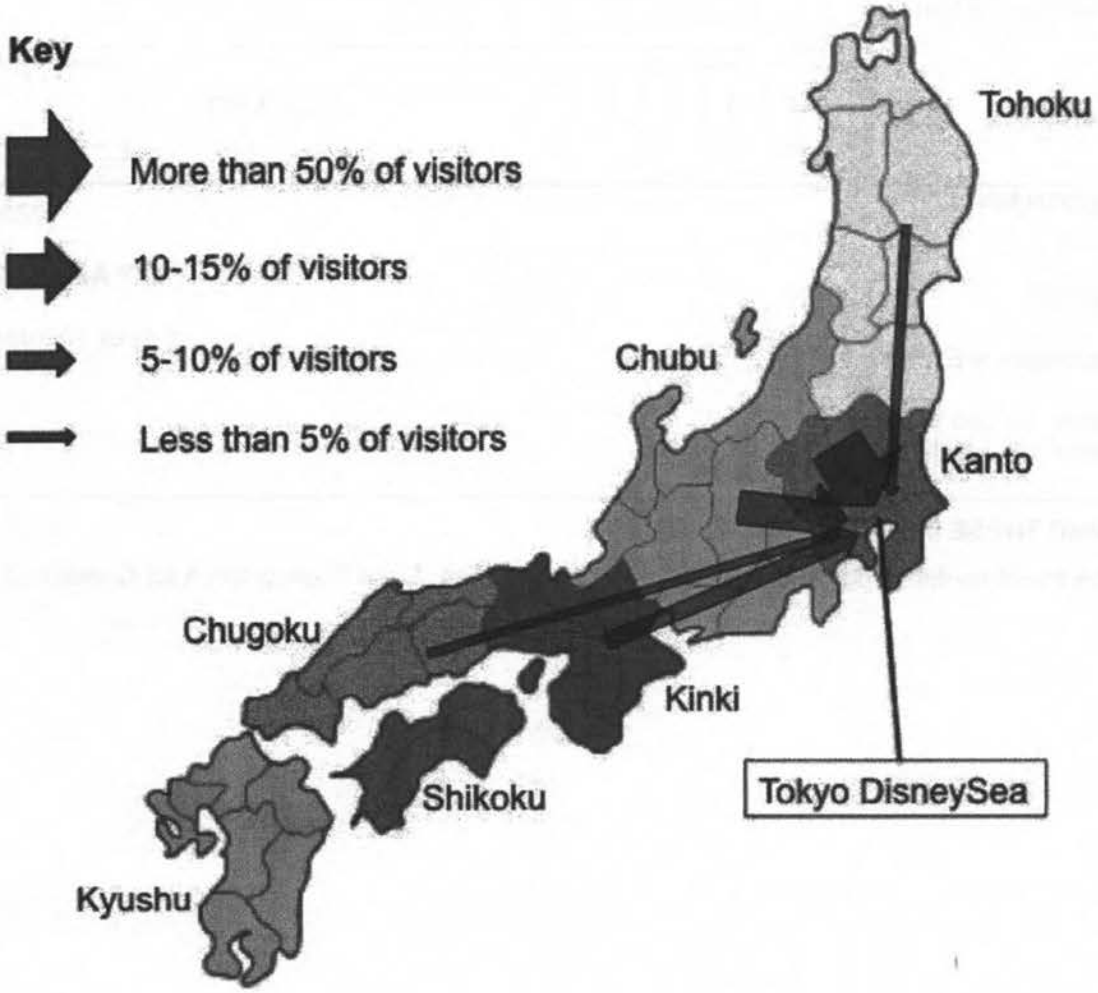
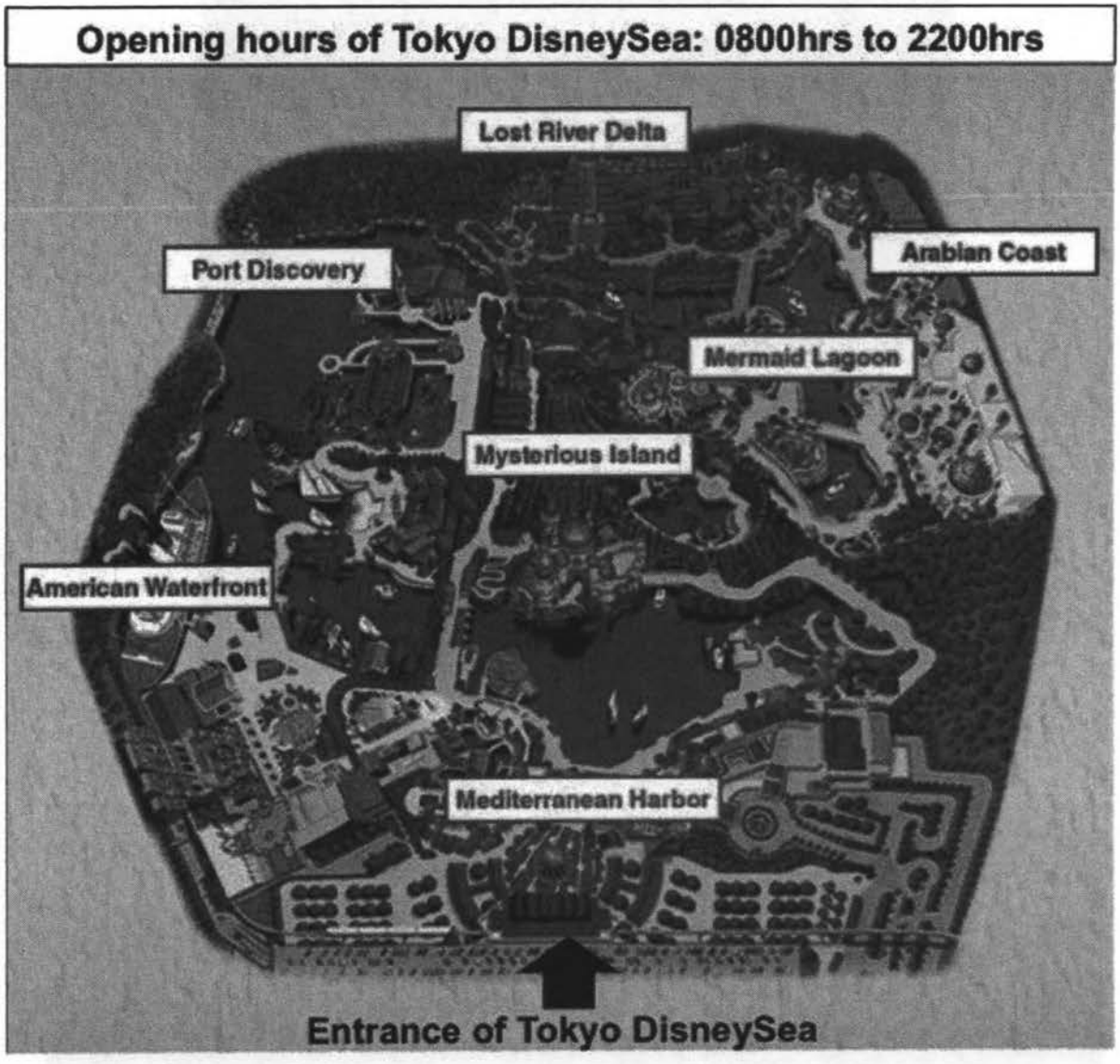


Fig. 3 for Question 1

Tourist Information of Tokyo DisneySea



Special Events* in Tokyo DisneySea (June 2018)		
Time	**Event**	**Venue**
1000-1030 & 1400-1430	New show at Dockside Stage	Mediterranean Harbour
2030 – 2100	Celebrate! Tokyo DisneySea! (Spectacular fireworks display daily)	Best views from Mysterious Island and Mediterranean Harbour

Fig. 8 for Question 3
Satellite image of Swanage

Photograph A for Question 3
Groynes along a coastline

XINMIN SECONDARY SCHOOL
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Preliminary Examination 2018

CANDIDATE NAME

CLASS | 4 | 0 |

INDEX NUMBER

GEOGRAPHY

2236/02

Secondary 4 Express

23 August 2018

Setter: Mrs Wong PL
Vetters: Mr Loo WB & Mr Jason Ting

1 hour 30 minutes

Additional Materials: Answer Paper
1 Insert
1 Cover Page

READ THESE INSTRUCTIONS FIRST
Write your name, class and index number on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid/tape.

Section A
Answer **one** question.

Section B
Answer **one** question.

Candidates should support their answers with the use of relevant examples.
Sketch maps and diagrams should be drawn whenever they serve to illustrate an answer.

At the end of the examination, fasten all your work securely together.
The number of marks is given in the brackets [ ] at the end of each or part question.

Section A

Answer **one** question from this section.

1 (a) Study Fig. 1 which shows temperature data for City A and City B.

Months	J	F	M	A	M	J	J	A	S	O	N	D
	Temperature (°C)											
City A Latitude: 51° N	4	4.5	6.5	9	12.5	15.5	17.5	17	16	11	7.5	5
City B Latitude: 1° N	26.5	27	27.5	28	28	28	28	27.5	27.5	27.5	26	26.5

Fig. 1

(i) Describe the differences in temperature between City A and City B. [4]

(ii) Account for the differences in temperatures between City A and City B in January and July. [4]

(b) Explain why the temperature at the top of mountains differ from that at the foot of the mountain. [5]

(c) Study Figs. 2A and 2B, which show different pressure systems over Asia in January and July.

Pressure system in January

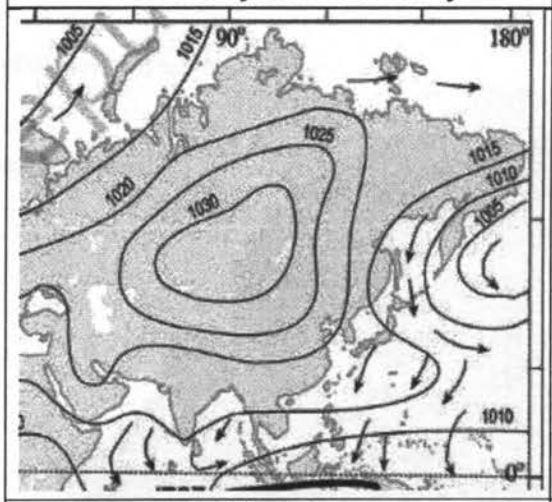

Fig. 2A

Pressure system in July

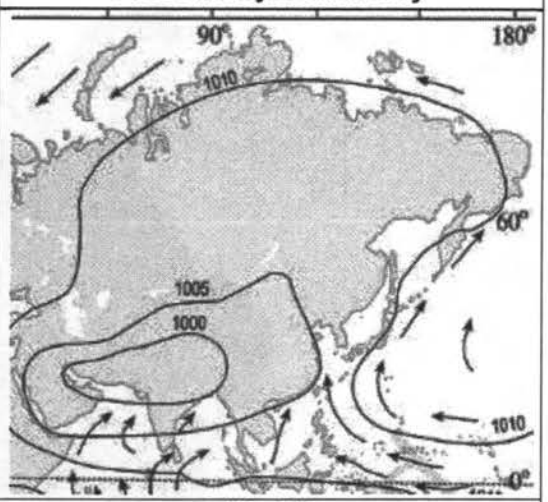

Fig. 2B

Key

Pressure in millibars

Wind direction

Explain how and why the pressure systems are different in January and July. [4]

(d) 'The conditions that give rise to the formation of convectional rain and relief rain are the same.'

To what extent do you consider this statement to be true? Give evidence to support your answer. [8]

2 **(a)** Study Fig. 3 which shows a relief map of Hawaii, a volcanic island.

Hawaii, a volcanic island

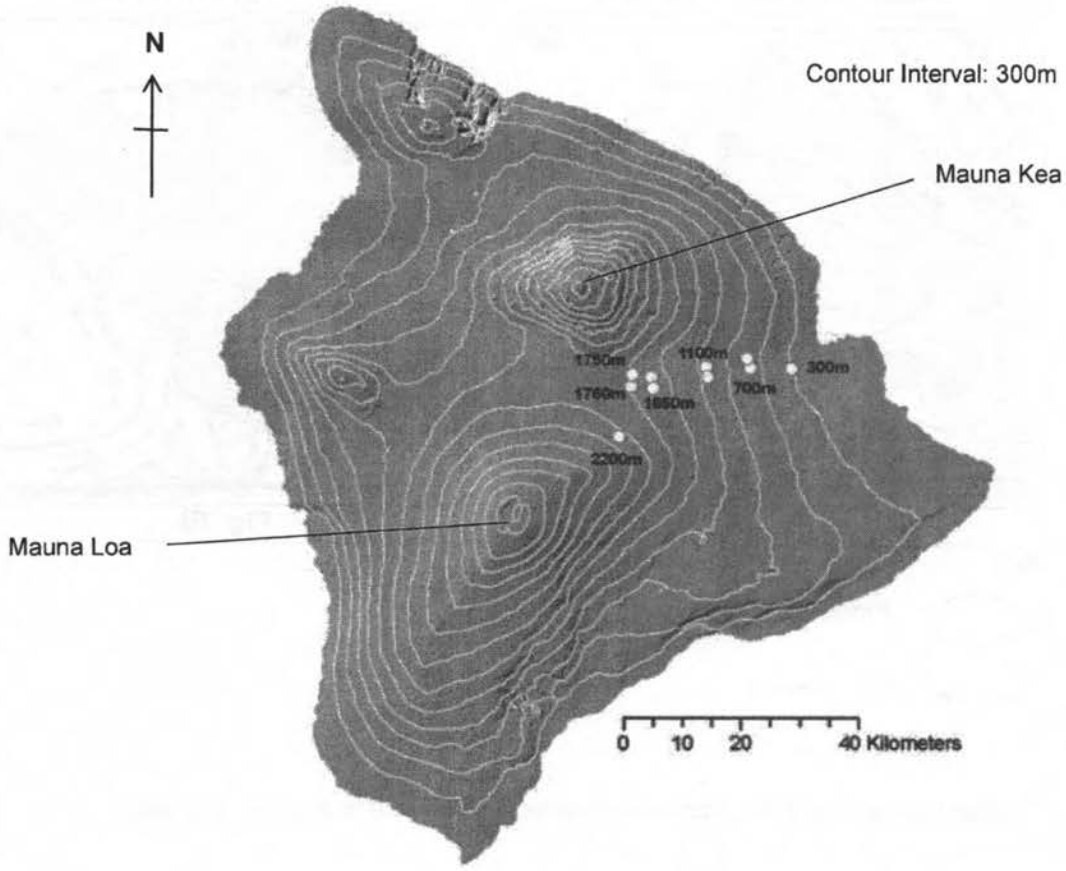

Fig. 3

Describe the relief of Hawaii as shown on the map. [4]

(b) Study Photograph A (Insert), which shows part of Mauna Loa, a shield volcano in Hawaii.

Describe the features of the volcanic landscape in Photograph A. [4]

(c) Study Fig. 4 which shows a news report on the volcanic activity of Mt Kilauea, Hawaii, on 6 June 2018.

6 June 2018
Updates From Kilauea: Dozens More Homes Destroyed

Since the eruption of the Kilauea volcano in May 3 2018 on the Big Island, it has belched out about 250 million cubic meters of lava, making it one of the largest eruptions in decades in Hawaii.

Kilauea has been flinging out lava and ash, destroying 577 homes and forcing over 2,000 people to evacuate.

Over the past week, the lava erupting from Hawaii's Kilauea volcano advanced through two small residential subdivisions along Kapoho Bay, reaching the Pacific Ocean, and wiping out nearly a hundred homes. Kapoho Bay used to be a scenic bay dotted with beach homes, lush greens and turquoise waters.

Civil defence officials said that the lava has now filled in Kapoho Bay, "what used to be the bay is now all lava bed, new land, almost a mile out into the ocean."

Fig. 4

With reference to Fig. 4, describe the effects of the Kilauea eruption on the environment and the lives of the people living in this region. [4]

(d) Describe the successes and limitations of the Kyoto Protocol that attempts to reduce greenhouse gas emissions. [5]

(e) 'The main cause of recent global climate change is largely due to natural factors rather than anthropogenic factors.'

To what extent do you consider this statement to be true? Give evidence to support your answer. [8]

Section B

Answer **one** question from this section.

3 (a) Study Fig. 5, which shows access to clean water in some developed and less developed countries.

Access to clean water in 1990 and 2004

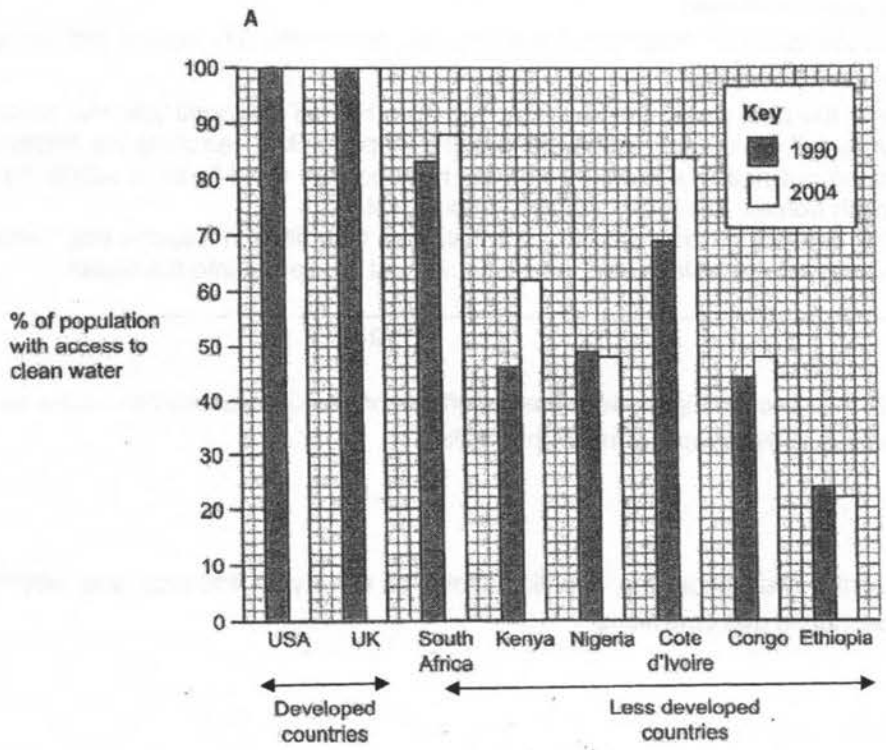

Fig. 5

With reference to Fig. 5, describe the changes in access to clean water between 1990 and 2004 for the various developed countries and less developed countries. [4]

(b) Study Fig. 6 (Insert), which shows the effects of a lack of sanitation.

With reference to Fig. 6 and with information you have studied, explain how access to better sanitation can improve the level of health in less developed countries. [5]

(c) Study Fig. 7 (Insert) which shows how Zika spread around the world and a report on the spread of Zika in 2015 in Brazil. Zika is an infectious disease caused by mosquito bites.

With reference to Fig. 7, describe and comment on the spread of the Zika virus. [4]

(d) Explain the economic impacts of infectious diseases like malaria and Zika. [4]

(e) 'The main challenge in controlling the spread of malaria is the ease in population movement.'

To what extent do you consider this statement to be true? Give evidence to support your answer. [8]

4 **(a)** Study Fig. 8 (Insert), which shows the changes in HIV/AIDS prevalence in Africa between 1986 and 2001.

With reference to Fig. 8 (Insert), describe the extent of spread of HIV/AIDS in Africa between 1986 and 2001. [4]

(b) Explain the social factors that can contribute to the spread of HIV/AIDS in Africa. [4]

(c) Study Figs. 9A and 9B, which show consumption of food in USA and India respectively in 2011.

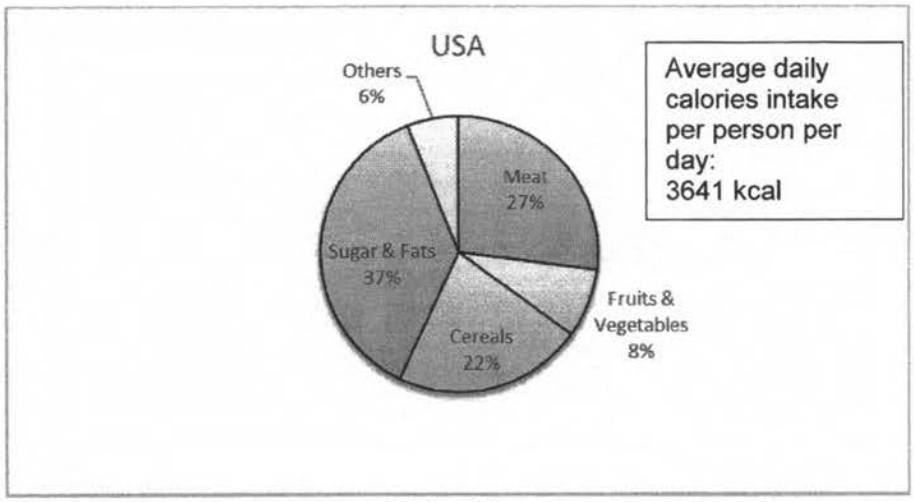

Fig. 9A

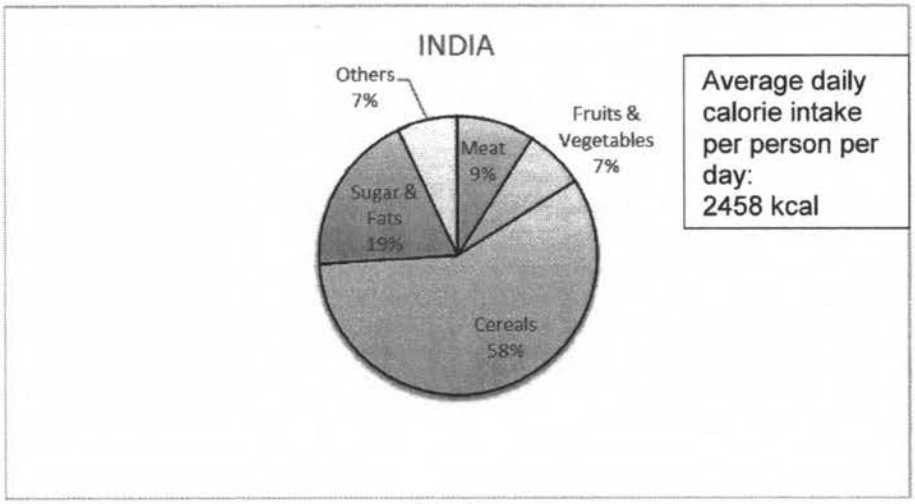

Fig. 9B

Use information from Figs. 9A and 9B to describe and account for the differences in the food consumption pattern in USA and India in 2011. [4]

(d) Study Fig. 10 (Insert), which shows the relationship between food and oil prices between 2000 and 2011. Fig. 11 (Insert), shows the comparison between US grain production used to make ethanol for cars and the number of people the grains could feed.

Using information from Figs. 10 and 11 (Insert), suggest difficulties in achieving food security in less developed countries (LDCs). [5]

(e) 'Political and economic strategies are the most important in overcoming the problem of food shortage.'

To what extent do you consider this statement to be true? Give evidence to support your answer. [8]

End of Paper

XINMIN SECONDARY SCHOOL
新民中学
SEKOLAH MENENGAH XINMIN
Preliminary Examination 2018

GEOGRAPHY **2236/02**

Paper 2 **23 August 2018**

INSERT

Secondary 4 Express **1 hour 30 minutes**

Setter: Mrs Wong PL
Vetters: Mr Loo WB & Mr Jason Ting

READ THESE INSTRUCTIONS FIRST

This Insert contains Photograph A for Question 2, Fig. 6 and Fig. 7 for Question 3 and Fig. 8, Fig. 10 and Fig. 11 for Question 4.

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Photograph A for Question 2

A volcanic landscape in Hawaii

Fig. 6 for Question 3

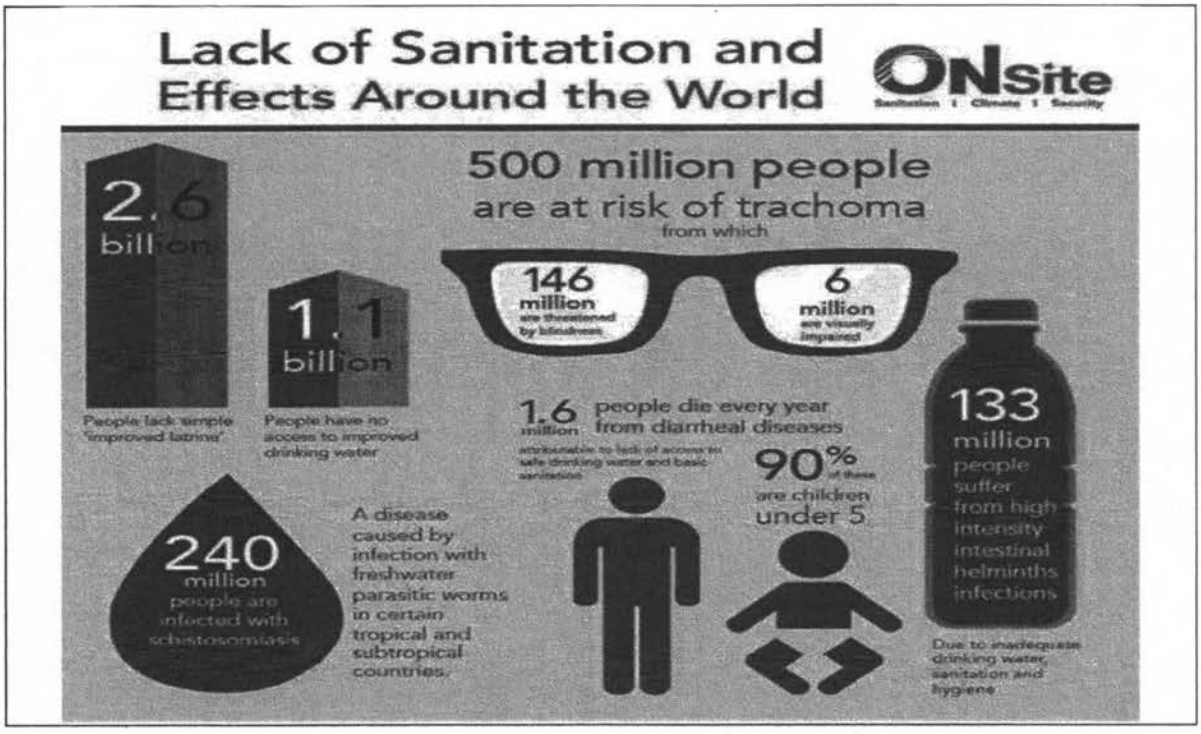
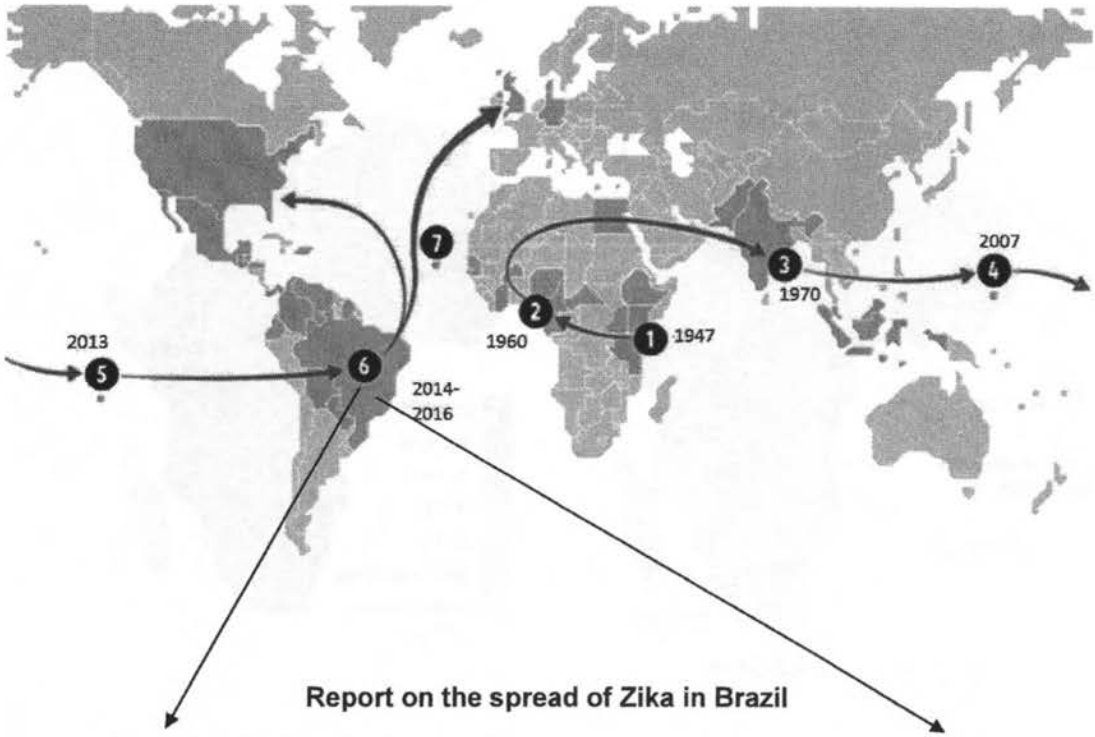


Fig. 7 for Question 3



Report on the spread of Zika in Brazil

March 2, 2015. Between February and April 2015, almost 7,000 cases of this strange illness (Zika) were reported, though in most situations they were mild.

May 7, 2015. The cases were confirmed as Zika a few months later. Brazil made a statement that Zika virus was spreading in the country — the first time it was transmitted locally in the Americas. The very same day, the WHO declared an alert to Zika virus infection.

Fig. 8 for Question 4

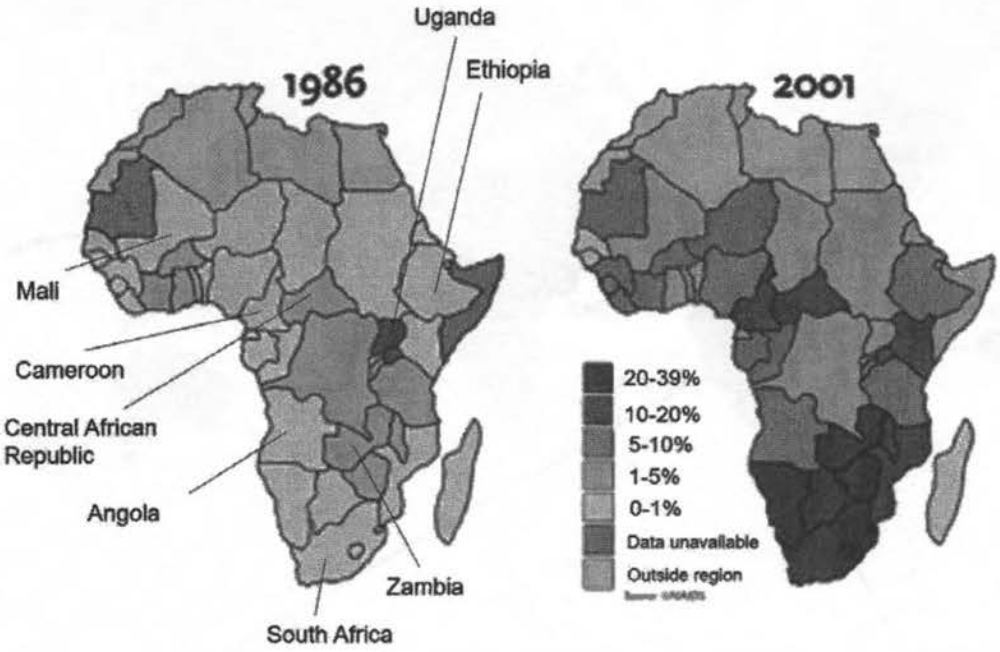


Fig. 10 for Question 4

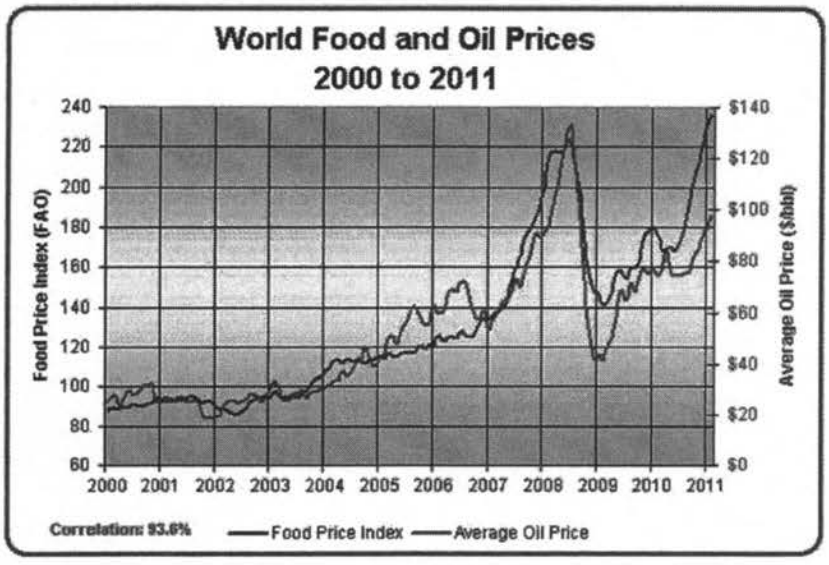
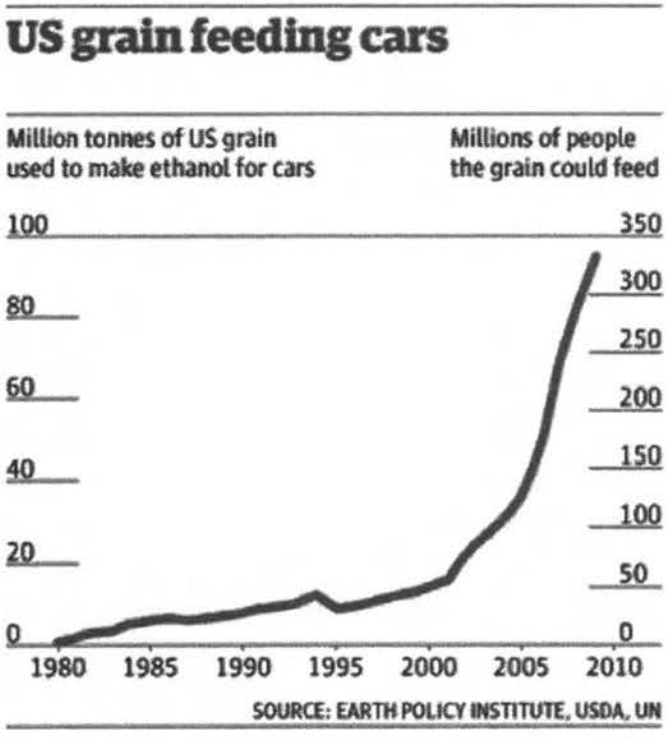


Fig. 11 for Question 4



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SEKOLAH MENENGAH XINMIN
PRELIMINARY EXAMINATION 2018

GEOGRAPHY **2236/01**

Paper 1

17th August 2018

Secondary 4 Express

1 hour 40 minutes

Setter: Mr Loo Wen Bin
Vetter: Mr Jason Ting

MARK SCHEME

This document consists of **12** printed pages including this cover page.

Section A

This question is compulsory.

1 (a) A group of students carried out fieldwork at Tokyo DisneySea, a theme park in Tokyo, Japan, based on famous characters from Disney.

The students decided to consider the guiding question 'How does the distance of origin from Tokyo DisneySea influence the number of visitors?'. They used secondary data to answer this guiding question.

Students considered two methods to present the percentage of visitors from each region. Fig. 1 is a pie chart showing the percentage of visitors from each region. Fig. 2 (Insert) is a map with flow lines showing the percentage of visitors from each region.

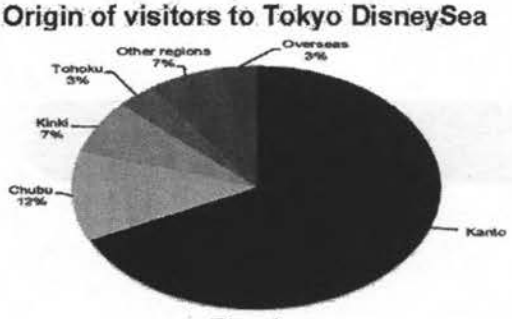


Fig. 1

(i) Suggest one possible source of secondary data the students might have used and explain why it is useful for them to consider secondary data for this study. [2]

Reserve 1m for <u>suggest</u>:

- **Internet sources**
- **DisneySea company performance report**
- **Newspaper report**

Reserve 1m for <u>explain</u>:

- **Such data are difficult to collect in a student's project.**
- **More reliable data on origin of visitors as such study is done by companies with more resources.**

(ii) Using Fig. 1, calculate the percentage of tourists to Tokyo DisneySea from Kanto. [1]

- **68% (0m for no units)**

(iii) Which method used to show origin of visitors is preferable for this study? Suggest reasons for your answer. [2]

Reasons for choosing <u>flow line map</u>:

- **A flow line map provides *spatial reference*, where the distance of origin from DisneySea is clearly visible, OR**
- **This answers the guiding question more directly than the pie chart.**

Reasons for choosing pie chart:

- **A very useful visual representation; easy for comparison of data**
- **A pie chart shows the data as a percentage of a whole, which the flow line map does not.**

(iv) From studying the information in Figs. 1 and 2, what conclusions might the students draw about the guiding question 'How does the distance of origin from Tokyo DisneySea influence the number of visitors?' [4]

Reserve 1m for relationship:

- **The shorter the distance of origin from Tokyo DisneySea, the greater the percentage of visitors visiting Tokyo DisneySea (the reverse is true too).**

Reserve 3m for supporting information with reference to Figs. 1 and 2:

- **From Fig. 1, 97% of visitors visiting Tokyo DisneySea are domestic tourists. Only 3% of visitors come from overseas.**
- **From Fig. 2, 68% of visitors come from Kanto, the region which Tokyo DisneySea is situated within.**
- **The next nearest region, Chubu, has 12% of visitors in DisneySea and Kinki, further away, has 7% of visitors in DisneySea.**
- **A possible anomaly is Tohoku, which has only 3% of visitors in DisneySea despite being the second nearest region to the theme park.**

(b) The students examined whether some attractions of Tokyo DisneySea are more popular than others. Fig. 3 (Insert) shows a tourist map and an event schedule of Tokyo DisneySea. They chose to conduct their fieldwork at three sectors of the theme park, which are Mediterranean Harbour, Mysterious Island, and Lost River Delta.

They counted the number of visitors at these attractions on a particular day at two timings, 0830hrs and 1230hrs. Table 1 shows data collected on visitor numbers in Tokyo DisneySea.

Table 1
Results of fieldwork

Pedestrian volume at Tokyo DisneySea Date / Day: 16th June 2018 / Saturday Duration of each conduct: 5 minutes		
Attraction	**0830hrs**	**1230hrs**
Mediterranean Harbour	75	36
Mysterious Island	96	130
Lost River Delta	124	165

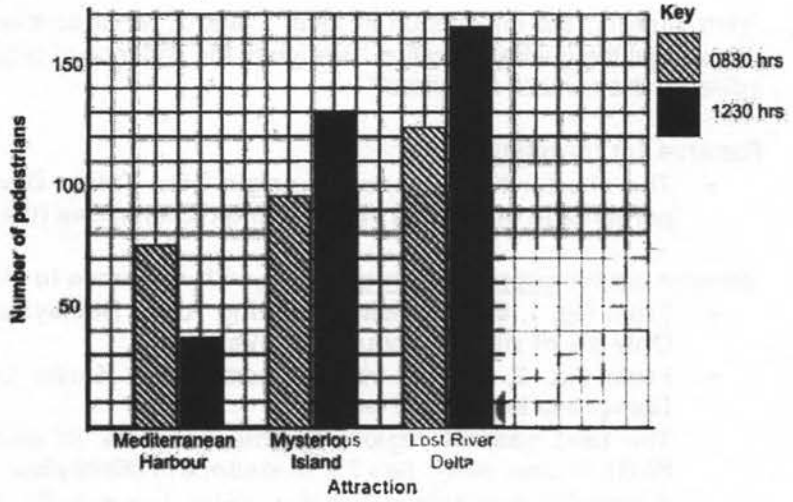
(i) Describe how students can collect the data shown in Table 1. [4]

1m each, max 4m:

- **Select an appropriate site to observe and count the number of visitors for the three attractions.**
- **An appropriate site can be the entry or exit of the attractions, or a road/bridge where visitors will pass by.**
- **Observe and count for 5 minutes.**
- **Using either the pocket tally counter or a traditional tally method.**
- **Ensure all counts are conducted for all selected sites at the same time (i.e. 0830hrs and 1230hrs) on the same day (i.e. 16th June 2018).**

(ii) The students decided to present the data shown in Table 1 using a graph. Using Fig. 4 (Cover Page), present the results appropriately. [3]

0.5m for each bar correctly drawn:



(iii) Students used the data in Table 1 and concluded that 'Mediterranean Harbour is the least popular attraction in Tokyo DisneySea'. However, during the review of their fieldwork, they felt that this conclusion might not be reliable.

With the help of Fig. 3, suggest one reason why this is so and suggest one way to make the data collection process more reliable. [2]

Reserve 1m for <u>suggest one reason</u>:

- **From Fig. 3, there are 4 other attractions where pedestrian flow is not calculated. They might have more/less pedestrian volume as compared to Mediterranean Harbour.**
- **From Fig. 3, there are timings where special events are held in Mediterranean Harbour, which are different from the timings students counted the number of pedestrians. These events may affect pedestrian volume.**

Only accept answers using Fig. 3 as support

Reserve 1m for <u>suggest one way</u>:

- **Conduct a pedestrian count at all 7 attractions.**
- **Conduct a pedestrian count at more timings to ensure reliability of conclusion (i.e. 1430, 2030...).**

(c) (i) The students learnt from their Geography lessons that a theme park caters to tourists of different age groups and wanted to investigate how this is so.
Suggest a hypothesis the students could test in Tokyo DisneySea. [1]

- **Tokyo DisneySea has *<u>different types of attractions</u>* that cater to tourists of different age groups.**

The focus of the question is to investigate <u>how</u> a theme park caters to different tourists. Students should include an element of 'how' (i.e. attractions, facilities, characters...) in their hypothesis.

(ii) Describe how you would collect data for this investigation, and explain how you would present and use the data to test the hypothesis suggested in **(c)(i)**. [6]

1m each, max 3m for <u>data collection method</u>:

- **Students can use a survey questionnaire to collect data.**
- **They should design a short questionnaire with appropriate questions such as 'What is your favourite attraction/facility/character in Tokyo DisneySea?'.**
- **Age is a compulsory question in this case.**
- **Questions can be mainly closed questions so that it is easier for the visitors to respond and easier to analyse results.**

1m each, max 2m for <u>considerations when collecting data</u>:

- **Students should use a stratified sampling according to age.**
- **The strata can include youths below 25, working adults from 26 – 50, and senior citizens above the age of 50.**
- **Since age is a sensitive yet relevant question for this study, age can be asked in terms of a range (i.e. below 25, 25-50, above 50).**

1m each, max 2m for <u>presenting data and forming conclusion</u>:

- **The data collected can be presented appropriately in a comparative bar graph or pie chart comparing the favourite attraction for visitors of different age groups.**
- **If the data shows that people of different age groups come to Tokyo DisneySea due to different attractions, the hypothesis is proven valid.**

Section B

Answer **one** question from this section.

2 (a) Study Fig. 5, which shows a map of Smith and Ross Islands.

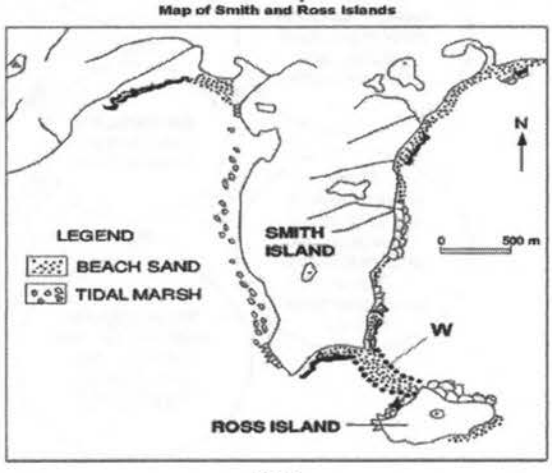


Fig. 5

(i) Using Fig. 5, name and describe the characteristics of landform **W**. [3]

Reserve 1m for naming: W is a <u>tombolo</u>.
1m each, max 2m:

- **W is roughly 500m long.**
- **It is a narrow strip of sand.**
- **It joins Smith and Ross Islands together.**

(ii) With reference to Fig. 5, explain how landform **W**, named in (a)(i), may have been formed. [5]

1m each, max 5m:

- **Landform W is formed by longshore drift in the southeast direction.**
- **The abrupt bend in coastline of Smith Island allows longshore drift to continue southeast.**
- **When wave energy is lower, sediments are deposited in the sea and**
- **over time, the sediments accumulate and rise above the water as a spit.**
- **When the spit extends off Smith Island and connects with Ross Island, a tombolo is formed.**

(b) Explain how the media can promote tourism. [4]

1m each, max 4m:

- **Media reports about a country can influence tourists' decisions to visit.**
- **Media can come in the form of online crowdsourcing platforms like TripAdvisor or travel writers.**
- **On one hand, positive reviews such as friendliness of locals, interesting culture, and attractive scenery can encourage tourists to visit.**
- **On the other hand, negative reviews such as violence, disease outbreaks, and natural disasters can deter tourists from visiting**
- **Media also allows tourists to be more aware of destinations previously not considered as tourist destinations.**

(c) Study Fig. 6, which shows aspects of sustainable tourism in Costa Rica, a small state in Central America.

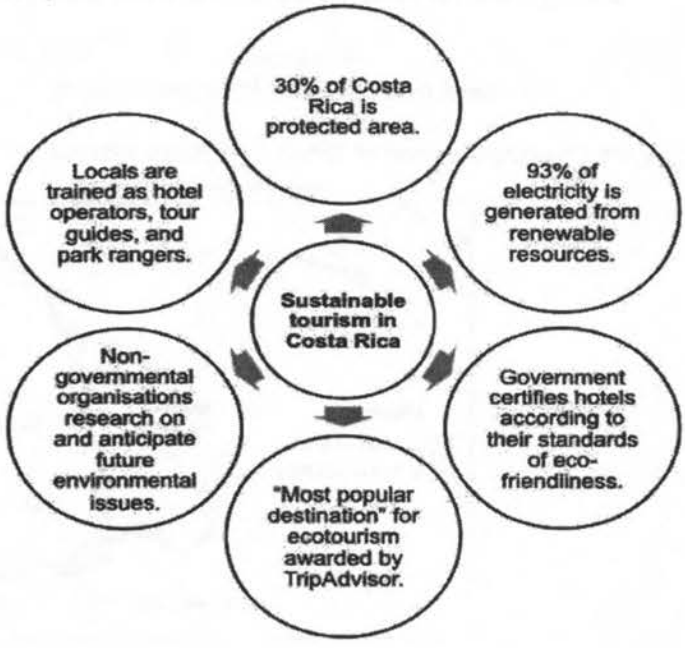


Fig. 6

Explain how sustainable tourism in Costa Rica may benefit both the economy and the environment. [5]

1m each, max 3m for <u>positive economic impacts</u>:

- If locals are trained in the tourism industry, this can bring employment opportunities to the locals in tourism-related jobs such as hotel operators, guides, and park rangers.
- These employment opportunities will then bring an increase in individual income and tourism company profits in Costa Rica.
- Since more tourists will know Costa Rica as a popular ecotourism destination as recommended by TripAdvisor, this will bring in more tourism revenue through travelling and consuming services in Costa Rica.
- If there is an increase in tourist arrivals due to accolades awarded by TripAdvisor, the local authorities would then have to further develop their infrastructure and facilities, which allow tourism to operate on a larger scale and these infrastructure can be used by locals too.

1m each, max 3m for <u>positive environmental impacts</u>:

- 30% of Costa Rica is protected area. This means that fragile natural environments are being conserved so that the habitats will not be destroyed.
- If NGOs can help to anticipate future environmental issues of Costa Rica, tourism can continue to be sustainable where needs of visitors and locals can be addressed without further harm to the environment.
- If electricity is mainly generated using renewable resources, this will reduce the carbon footprint of tourism in Costa Rica and reduce the rate of GHG emissions.

1m each for <u>general benefits in terms of sustainable tourism (applies to both economy and environment)</u>

- If the government certifies hotels according to their level of eco-friendliness, visitors can patronise a hotel based on their environmental efforts so as to support the environmental conservation of a tourist place.
- If hotels adhere to environmental guidelines and continue to use energy generated through renewable resources, this can prevent a depletion/shortage of resources.

(d) 'All tourists want to go to destinations with rich culture.'

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

Candidates <u>MUST</u> include the following type of material:

<u>Places with rich culture (e.g. heritage tourism)</u>

- Tourists travel to places to experience the rich cultures of different places.
- One example of such tourism includes heritage tourism, where people travel to experience the different cultures and history of places. This can take the form of museums, festivals, and national monuments.
- Some places are very unique that United Nationals Educational, Scientific and Cultural Organisation (UNESCO) has declared them World Heritage Sites.
- One such example is Alhambra in Granada, Spain, where it acts as historical evidence of the presence of the Moorish empire in Andalusia, Southern Spain.
- (Other types of tourism include film-induced and pilgrimage tourism)

Candidates may include the following types of material:

Places of conflict

- **Another type of destination tourists go to is a place of conflict, where wars, battles, manmade tragedies or unfavourable political situations have occurred. This is also known as dark tourism.**
- **Dark tourism sites can include battlefields, museums, memorials, or places of mass death events. Survivors, relatives and friends of those affected, or simply people interested to know more about an event take part in dark tourism.**
- **An example of such a site is the ruins of Pompeii, Italy, where the entire ancient city was engulfed by a volcanic eruption of Mt Vesuvius.**

Places with good facilities

- **Another type of destination tourists go to is a place with good facilities, where it offers a wide range of activities and functions with specialised buildings.**
- **One example is MICE tourism, which refers to Meetings, Incentives, Conventions, and Events. Places offering MICE tourism have venues hosting large-scale events with supporting infrastructure like hotels and retail shops. Business travellers and international event organisers usually partake in such tourism.**
- **For example, Singapore is popular for MICE as it is located along international air routes and is also associated with other forms of tourism. It is named the leading convention city in Asia Pacific for more than 10 years. Having large infrastructure such as Marina Bay Sands and the Singapore Sports Hub, it plays host to a range of MICE activities, such as the Youth Olympic Games in 2010.**

A full answer does not need to include all the above points.
Candidates at each level will show the following characteristics:

Level 1 (0 - 3 marks)
At this level answers will be generalised or with minimal support if any stand were given at all. Reasoning is rather weak and expression may be unclear. A basic answer that has little development. Answers lack example or evidence, or it is sketchy that it adds little support to the answer.

L1/1 – Listing of different types of tourism only
L1/2 – Listing of different types of tourism with description that is not elaborate/accurate
L1/3 – Description of different types of tourism with no place-specific examples

Level 2 (4 - 6 marks)
Discussion of the given factor 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 evidence will be presented to support answers in at least one place.

L2/4 – Description of given factor (i.e. place with rich culture) with example
L2/5 – Description of given factor and one other factor with 1 example
L2/6 – Description of given factor and one other factor with 2 examples

Level 3 (7 marks)
At this level, answers will be comprehensive and supported by sound knowledge. The different factors which contribute to the growth in international tourism are considered and well supported. Reasoning is clear and logical with good expression of language. Examples or other evidence to support answers are extensive.

L3/7 – Description of 3 factors with 3 examples

Level 3 (8 marks)
L3/7 + conclusion to explain stand to the statement.

Sample conclusion
In conclusion, I do not agree with the statement. If tourism is an interaction between the different characteristics of tourist profiles and tourist destinations, different types of tourists will choose to go to different types of tourist destinations. A place with rich culture only attracts a particular type of tourists. Different tourist destinations have unique place characteristics that appeal to tourists of various profiles. Relatedly, the purpose of travel, which is different according to tourist profiles, also affects the types of tourist destinations tourists visit.

3 (a) Study Fig. 7 and Fig. 8 (Insert). Fig. 7 shows the characteristics of waves located at points **X** and **Y**. Fig. 8 shows a satellite image of Swanage, a coastal area in United Kingdom, where points **X** and **Y** can be found.

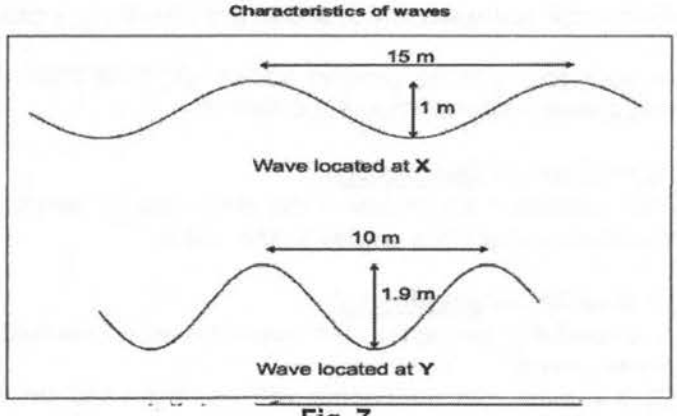


Fig. 7

(i) Using Fig. 7, compare the difference in wave characteristics at points **X** and **Y**. [3]

1m each, max 3m:
- **The wave at X has a longer wavelength than the wave at Y by 5 m.**
- **The wave at Y has a taller wave height than the wave at X by 0.9 m.**
- **The wave at Y is steeper than the wave at X.**
- **The wave at Y has a higher wave frequency than the wave at X.**

(ii) With the help of Fig. 8, account for the difference in wave characteristics at points **X** and **Y** as described in **(a)(i)**. [5]

1m each, max 5m:
- **The wave characteristics and coastal processes at points X and Y differ due to wave refraction, where waves change direction as they approach an indented coastline.**
- **X is a bay while Y is a headland.**
- **Wave energy will converge at Y, resulting in higher wave energy, therefore having a steeper wave.**
- **This means that more erosion will occur at Y.**

- **Wave energy will diverge at X, resulting in lower wave energy, therefore having a gentler wave.**
- **This means that more deposition will occur at X.**

(b) Explain the impact to coastal communities if mangroves were to be cleared. [4]

1m each, max 4m:

- **The coastal area will be exposed to threats of erosion – the property of coastal communities might be under threat of undermining by tides and waves.**
- **The coastal communities may face dangers from coastal hazards such as tsunamis and storm surges.**
- **The coastal communities will lose a food source as mangroves are breeding ground for marine biodiversity.**
- **This can adversely affect the livelihoods of fishermen as there will be less fish to catch.**
- **The coastal communities will have less raw materials for building and daily living as mangroves provide wood for fuel and construction.**
- **The water quality of the coast will deteriorate since mangroves act as natural filters to purify water.**

(c) Study Photograph **A** (Insert), which shows groynes along a coastline.

Describe the features of the groynes shown on Photo graph **A** and assess the usefulness of groynes as a means of protecting the coastline. [5]

1m each, max 2m for <u>description</u>:

- **The groynes are a series of low walls spaced apart.**
- **Constructed at right angles to the coast.**

1m each, max 2m for <u>usefulness</u>:

- **It is useful in protecting the coastline as it interrupts longshore drift and absorbs wave energy.**
- **This means that sediments will be deposited on the updrift side of the groyne instead of being transported away from longshore drift.**

1m each, max 2m for <u>limitations</u>:

- **However, it is unsightly to build; it spoils the natural beauty of the beach.**
- **The downdrift side is not protected by the groyne – this means longshore drift will still erode away the sediments on the downdrift side.**

(d) 'Coastal areas are always endangered by human activities.'

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

Candidates may include the following types of material:

<u>Climate change (endangering)</u>

- **Coastal areas might be endangered by climate change.**
- **The rapid changes in sea temperatures and sea levels may make it less conducive for corals to grow; if these changes take place faster than the ability of corals to adjust, coral bleaching may occur. When sea temperatures increase, corals expel the algae and turn white. Corals will starve to death in the long term.**
- **An example is the Great Barrier Reef. The northern sector closest to the Equator is severely bleached. The corals will die soon if the effects are not reversed.**

- Furthermore, mangroves will have trouble colonising areas further inland as they will be competing for space with human activities.
- For example, in the Gulf of Thailand, more than 5 meteres of shoreline disappears yearly but the mangroves cannot migrate further inland due to human uses.

Coastal development (endangering)

- Coastal areas are also endangered by coastal development. Land is reclaimed for housing, industry, and recreational uses.
- This results in clearing of corals and mangroves, where the coasts become more vulnerable to wave action. Coastal waters are also polluted due to human activities.
- For example, Singapore experienced rapid urbanisation since 1960s. A significant part of the mangroves in Lower Seletar and Kranji regions were cleared for land reclamation.
- Land reclamation also took place in Okinawa, Japan, where coral reefs are suffocated by the sediments.

Encouraging the growth of coral reefs (not endangering)

- However, human action can also benefit coastal areas.
- Measures can be taken to encourage the growth of coral reefs in coastal areas, for instance.
- For example, Maldives has been implementing a coral-growing programme since 1996 to curb beach erosions on many islands. Manmade structures with solar-generated electricity were used to speed up coral growth.
- While the main motivation might be to use corals to reduce coastal erosion, such actions are also benign in sustaining and improving the quality of coastal areas.

A full answer does not need to include all the above points.
Candidates at each level will show the following characteristics:

Level 1 (0 - 3 marks)
At this level answers will be generalised or with minimal support if any stand were given at all. Reasoning is rather weak and expression may be unclear. A basic answer that has little development. Answers lack example or evidence, or it is sketchy that it adds little support to the answer.

L1/1 – Listing of factors only
L1/2 – Listing of factors with description that is not elaborate/accurate
L1/3 – Description of factors with no place-specific examples

Level 2 (4 - 6 marks)
Discussion of one human activity 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 evidence will be presented to support answers in at least one place.

L2/4 – Description of one human activity endangering/benefiting coastal areas with example
L2/5 – Description of two human activities with 1 example
L2/6 – Description of three human activities with 2 examples

Level 3 (7 marks)
At this level, answers will be comprehensive and supported by sound knowledge. The different human activities that endanger or benefit coral reef ecosystems are considered and well supported. Reasoning is clear and logical with good expression of language. Examples or other evidence to support answers are extensive.

L3/7 – Description of 3 activities with 3 examples

Level 3 (8 marks)
L3/7 + conclusion to explain stand to the statement.

Sample conclusion
In conclusion, I do not agree with the statement. While there are many human activities that threaten coastal areas, human activities can also actively seek to improve the state of coastal areas. Maldives is an example which uses coral reefs as recreation and tourism but actively also improves the well-being of these organisms. The case of Maldives shows that human uses of the coast does not have to be mutually exclusive from benefiting the natural ecosystems as well.

End of Paper

BP~321

XINMIN SECONDARY SCHOOL
新民中学
SEKOLAH MENENGAH XINMIN
Preliminary Examination 2018

CANDIDATE NAME	**MARK SCHEME**
CLASS	4 0
INDEX NUMBER	

GEOGRAPHY

2236/02

Secondary 4 Express

23 August 2018

Setter: Mrs Wong PL
Vetters: Mr Loo WB & Mr Jason Ting

1 hour 30 minutes

Additional Materials: Answer Paper
1 Insert
1 Cover Page

READ THESE INSTRUCTIONS FIRST
Write your name, class and index number on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid/tape.

Section A
Answer **one** question.

Section B
Answer **one** question.

Candidates should support their answers with the use of relevant examples.
Sketch maps and diagrams should be drawn whenever they serve to illustrate an answer.

At the end of the examination, fasten all your work securely together.
The number of marks is given in the brackets [ ] at the end of each or part question.

Section A

Answer one question from this section.

1 (a) Study Fig. 1 which shows temperature data for City A and City B.

Months	J	F	M	A	M	J	J	A	S	O	N	D
	Temperature (°C)											
City A Latitude: 51° N	4	4.5	6.5	9	12.5	15.5	17.5	17	16	11	7.5	5
City B Latitude: 1° N	26.5	27	27.5	28	28	28	28	27.5	27.5	27.5	26	26.5

Fig. 1

(i) Describe the differences in temperature between City A and City B. **[4]**

- City A has lower mean annual temperature than City B.
- City A's mean annual temperature is 10.5°C while City B is 27.3°C.

- City A's annual temperature range is higher than that of City B.
- City A's annual temperature range is 13.5°C while City B's annual temperature range is 2°C.

2m – mean annual temperature + self-generated data
2m – annual temperature range + self-generated data

(ii) Account for the differences in temperatures between City A and City B in January and July. [4]

- City A is at a higher latitude than City B.
- Thus, the higher the latitudes, the lower the temperatures and the lower the latitudes, the higher the temperature.
- The angle of incidence at A which is at a higher latitude is smaller than the angle of incidence at B.
- Thus, heat is spread over a larger area, thus, temperature is lower than at B.
- Also, at A, the sun rays have to pass through a thicker layer of atmosphere. Thus, more heat will be absorbed, thus lowering temperature.
- City A will experience 4 seasons, thus there will be a greater annual temperature range between summer and winter.

4@1m
At least one explanation each for mean annual temperature and annual temperature range.

(b) Explain why the temperature at the top of mountains differ from that at the foot of the mountain. [5]

- Mountain top (higher altitude) experiences lower temperatures than at the foot of the mountain (lower altitude).
- Sun's solar energy enters the atmosphere and reaches the earth's surface in the form of shortwave radiation.
- About 45% of shortwave radiation is directly absorbed by the earth's surface, heating it up. The warm surface then emits heat in the form of longwave radiation.
- At higher altitudes, you are further away from the earth's surface which is directly heated by the sun.
- Thus, at higher altitude, the temperature is lower than at lower altitude.
- Air is less dense at higher altitudes.
- Air contains less water vapour and dust particles, thus, air absorbs less heat, resulting in lower temperatures at higher altitudes.

3m – using shortwave and longwave radiation to explain why mountain top has lower temperature than at the coast.
2m – using denser air at lower altitudes and why

(c) Study Figs. 2A and 2B, which show different pressure systems over Asia in January and July.

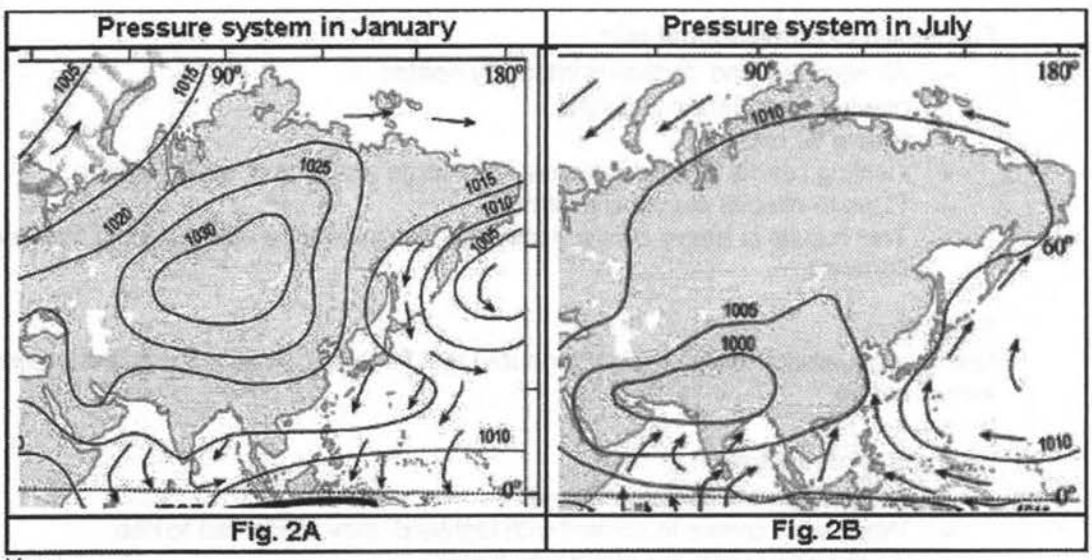


Fig. 2A Fig. 2B

Key

Pressure in millibars

Wind direction

Explain how and why the pressure systems are different in January and July. [4]

- In January, in the northern hemisphere, it is experiencing winter.
- Thus, the lower temperatures in Central Asia results in higher pressure in Central Asia.
- In Central Asia, the continental effect results in very low temperatures in the interior of Central Asia, thus resulting in a high pressure belt in Central Asia, with very high pressure of less than 1035.
- In July, in the northern hemisphere, it is experiencing summer.
- Thus, Asia, which is in the northern hemisphere experience higher temperatures, which result in lower pressure, especially over the north eastern part of India.

2m – describe pressure in January over Asia and Australia and reason
2m – describe pressure in July over Asia and Australia and reason
Award 1 mark if students can state the continental effect in either January or July.

(d) 'The conditions that give rise to the formation of convectional rain and relief rain are the same.'

To what extent do you consider this statement to be true? Give evidence to support your answer. [8]

Candidates may provide information about some of the following points.

Formation of convectional rain

- Air near the land surface is intensely heated up.
- Heated air expands and rises.
- Rising air cools.
- Cooling results in the condensation of large amounts of water vapour.
- Cumulo-nimbus clouds are formed.
- This results in heavy convectional rain, which may be accompanied by thunder and lightning

Example
Mainly in equatorial countries like Singapore and Malaysia. Rain in the late afternoon and/or early evening.

Formation of relief rain

- Winds from the sea blow inland.
- When wind comes in contact with highland, they are forced to rise.
- As the air rises up the highlands, it cools.
- Condensation takes place and rain falls on the windward side.
- By the time air moves over the highland, it has almost lost its moisture.
- The leeward / rain-shadow side has little or no rain.

Examples:
The Death Valley, California, USA – very dry
Found on the leeward side of the Sierra Nevada where the air is very dry.

Possible conclusion

- For any rain formation, it always involves warm air rising, then cools and condenses to form clouds and when rain drops are heavy enough they will fall as rain.
- However, the conditions for forming convectional rain and relief rain are different.
- For convectional rain to form, the air is heated by contact with the warm ground.
- While for relief rain to form, the air needs to blow towards a mountain, and since the air cannot blow through the mountain, it is forced to rise.

A full answer does not need to include all the above points.

Candidate at each level will show the following characteristics:

Level 1 (0-3m)
At this level, 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.
L1/1 – 1 statement on convectional rain or relief rain
L1/2 - 2 statements on convectional rain and/or relief rain
L1/3 - 3 statements on convectional rain and/or relief rain

Level 2 (4-6m)
At this level, answers will have disagreement or agreement and supported by appropriate detail.
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 answer.
L2/4 – explanation of one type of rain with 1 located example
L2/5 – explanation of one type of rain with 1 located example and some simple description of another type of rain
L2/6 – explanation of 2 types of rain with 2 located examples

Level 3 (7-8m)
At this level, answers will be comprehensive and supported by sound knowledge.
Both agreement and disagreement are considered and well supported.
Reasoning is clear and logical with good expression of language.
Examples or other evidence to support answers will be extensive.
L3/7- Explanation of 2 types of rain + stating clearly the conditions
L3/8 – L3/7+ stating if the conditions for formation of the 2 types of rain are the same and in what way they are different

2 (a) Study Fig. 3 which shows a relief map of Hawaii, a volcanic island.

Hawaii, a volcanic island

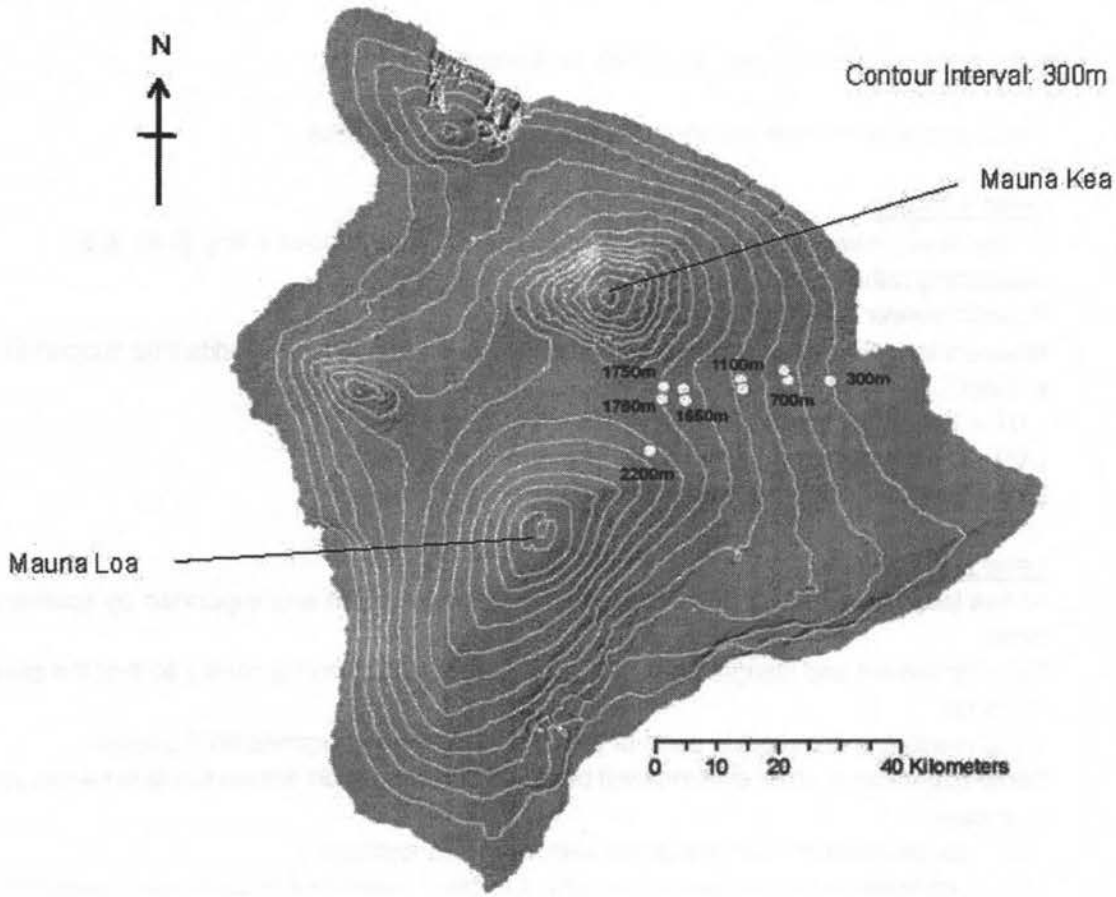


Fig. 3

Describe the relief of Hawaii as shown on the map. [4]

- Hawaii is dominated by 4 main peaks.
- The highest part of Hawaii is in the central part known as Mauna Loa.
- There are 2 main volcanoes in the central part of Hawaii, namely Mauna Loa and Mauna Kea.
- Mauna Loa is 4000m asl while Mauna Kea is 3000m.
- The eastern coast of Hawaii has more gentle slopes as seen by the broader contour lines. / The western coast of Mauna Loa is steeper than the eastern coast.
- The slope of Mauna Loa is not symmetrical, the base is quite wide.

4@1m

(b) Study Photograph A (Insert), which shows part of Mauna Loa, a shield volcano in Hawaii.

Describe the features of the volcanic landscape in Photograph A. [4]

Photograph A

- The whole area is relatively gentle.
- There is active lava flow as seen by the red hot lava flow.
- There is smoke coming out from underneath the ground.
- The hardened lava is black in colour.
- The area shows a few big craters in the background.
- There are many fissures and fractures found on the surface of the landscape.

4@1m

(c) Study Fig. 4 which shows a news report on the volcanic activity of Mt Kilauea, Hawaii, on 6 June 2018.

6 June 2018
Updates From Kilauea: Dozens More Homes Destroyed

Since the eruption of the Kilauea volcano in May 3 2018 on the Big Island, it has belched out about 250 million cubic meters of lava, making it one of the largest eruptions in decades in Hawaii.

Kilauea has been flinging out lava and ash, destroying 577 homes and forcing over 2,000 people to evacuate.

Over the past week, the lava erupting from Hawaii's Kilauea volcano advanced through two small residential subdivisions along Kapoho Bay, reaching the Pacific Ocean, and wiping out nearly a hundred homes. Kapoho Bay used to be a scenic bay dotted with beach homes, lush greens and turquoise waters.

Civil defense officials said that the lava has now filled in Kapoho Bay, "what used to be the bay is now all lava bed, new land, almost a mile out into the ocean."

Fig. 4

With reference to Fig. 4, describe the effects of the Kilauea eruption on the environment and the lives of the people living in this region. [4]

- Lava flow through the residential areas and destroy homes. The lava with high temperatures of between 500° C to 1400° C burns the areas it flow through. People are forced to evacuate, so they may become homeless.
- Lava flow may block main roads, so that emergency help cannot reach the isolated families. [Evidence: Kilauea volcano advanced through two small residential subdivisions along Kapoho Bay.]
- Kilauea eruption also spew out ash and lava and some people may suffer from breathing problems.
- The amount of lava was so much that the bay area is now filled with lava, creating new land that was not there before. There was an extension of the shoreline. [Evidence: ... lava has now filled in Kapoho Bay, what used to be the bay is now all lava bed, new land, almost a mile out into the ocean.]
- The tourist area of Kapoho Bay is destroyed, thus affecting the livelihood of those who depend on tourism. [Evidence: Kapoho Bay used to be a scenic bay dotted with beach homes, lush greens and turquoise waters.]

4@1m
Do not award marks to copied text from the news report.

(d) Describe the successes and limitations of the Kyoto Protocol that attempts to reduce greenhouse gas emissions. [5]

Successes of international agreements – Max 3m

- Some countries like Finland, Greece and Ireland were able to reduce their greenhouse gas emissions by 5% below their 1990 levels.
- Some more developed countries can help LDCs with very high greenhouse gas emissions by installing energy-efficient infrastructure in LDCs. This in turn help LDCs to reduce their greenhouse gas emissions.

Limitations of international agreements – Max 3m

- The Kyoto Protocol does not make it compulsory for countries with low greenhouse gas emissions to provide support to other countries.
- e.g. countries with low greenhouse gas emissions do not have to provide energy-efficient technology to countries with high greenhouse gas emissions.
- Countries which did not sign the Kyoto Protocol continued to contribute significantly to the global emissions.
- Such countries include large industrial countries like USS, China and India.

(e) 'The main cause of recent global climate change is largely due to natural factors rather than anthropogenic factors.'

To what extent do you consider this statement to be true? Give evidence to support your answer. [8]

Candidates may provide the following information:

Causes of climate change

Natural cause – variations in solar output

- Natural causes like variations in solar output can also cause climate change.
- The sun emits solar radiation due to changes in its magnetic field. An increase in magnetic activity results in increase in solar radiation. The magnetic activity of the sun has a cycle that lasts about 11 years. This solar activity cycle was discovered through the study of sunspots.
- Sunspots are cooler regions on the sun's surface that appear as dark spots. Although the spots are cooler, there are more sunspots when solar activity is high. This is because the areas surrounding the sunspots radiate more energy, which compensates for the lower temperatures of the sunspot areas. In short, sunspot activity is linked to the amount of solar radiation emitted.
- The solar activity cycle is associated with the earth's cycles of high and low global temperatures. In 2000, there was an increase in the number of sunspots which coincided with higher solar activity. Global temperatures increased during this period.

Natural cause – volcanic eruption

- Volcanic eruptions also cause changes in global temperatures.
- When a volcano erupts, large volumes of carbon dioxide, water vapour, sulphur dioxide, dust and ash are released into the atmosphere.
- Sulphur dioxide reacts with water to form sulphur-based particles in the atmosphere. Together with dust and ash, these particles reflect solar energy back into space. This results in global dimming.
- An example of cooling influence is the eruption of Mt Pinatubo in the Philippines in 1991.
- The Pinatubo eruption released 17 million tonnes of sulphur dioxide into the atmosphere, forming sulphur-based particles that spread around the earth in two weeks.
- The sulphur-based particles reflected solar energy back into space and lowered temperatures in the northern hemisphere by as much as 0.6 C. The temporary lowering of global temperatures lasted for two years in some locations.

Human / Anthropogenic causes

- The **burning of fossil fuels** produces a large amount of energy that is important for human activities. Fossil fuels include oil, coal and natural gas.
- They are needed for industries, transportation and domestic and commercial activities. Due to the high carbon contents, fossil fuels contribute to the increase in greenhouse gases by producing large amount of carbon dioxide when burnt.

- The burning of fossil fuels is the highest contributor of greenhouse gases which leads to temperature increase.

Deforestation

- Another human activity that is responsible for temperature increase is **deforestation**.
- Forests absorb billions of tonnes of carbon dioxide every year via photosynthesis, thus taking in a large amount of global greenhouse gas emissions.
- With deforestation, there are fewer trees and plants to absorb carbon dioxide, leading to an increase in carbon dioxide levels in the atmosphere.
- There is plenty of carbon in the soil, accumulated through the decay of organic matter such as dead leaves and animals.
- When deforestation exposes soil to sunlight, the soil temperature increases, increasing the rate of carbon oxidation. This releases more carbon dioxide into the atmosphere. Thus, deforestation is the second largest contributor of greenhouses gases which then leads to temperature increase.

Possible conclusion

Human causes of climate change are the main cause of the rise in global temperatures. This is due to the increased amount of human activities in both DCs and LDCs, especially in changing the land use from forests to building homes, factories and transport systems, etc.

The rate of global rise in temperatures has been exceptionally fast and between 1980 and 2000, temperature has increased by 0.4° C in 20 years. Over the last 100 years, the earth has seen a gradual rise in temperature of 0.7° C. This period coincided with the rise of industrialisation.

Natural causes like increase in sunspots do not occur on a frequent basis and thus does not contribute to a sustained rise in global temperature. Also, volcanic eruptions have few long term effects on the earth's climate. The temporary cooling will stop once the volcanic dust and ash settle. For example, two years after Mt Pinatubo had erupted, global climate returned to its original state. Furthermore, despite the large volumes of carbon dioxide released by volcanoes, human activities since the mid-1980s have resulted in more than 100 times the amount of carbon dioxide emitted by volcanoes.

A full answer does not need to include all the above points.

Candidate at each *level* will show the following characteristics:

Level 1 (0-3m)

At this level, 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.

L1/1 – Identify natural factors / anthropogenic factors
L1/2 - 2 simple statements on natural / anthropogenic factors
L1/3 – 3 simple statements on natural and/or anthropogenic factors

Level 2 (4-6m)

At this level, answers will have disagreement or agreement and supported by appropriate detail.

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 answer.

L2/4 – either detailed explanation of one human factor or one natural factor

L2/5 – either detailed explanation of one human factor or one natural factor + some description natural or human factor + at least 1 supported example for either human factor or natural factor

L2/6 – both human and natural factor + 2 supported examples

Level 3 (7-8m)

At this level, answers will be comprehensive and supported by sound knowledge.

Both agreement and disagreement are considered and well supported.

Reasoning is clear and logical with good expression of language.

Examples or other evidence to support answers will be extensive.

L3/7 – 2 human factors and 1 natural factor + 3 supported examples or 2 natural factors and 1 human factor + 3 supported examples

L3/8 – as above + conclusion – has to be because of human factors and reason must be given to qualify for L3/8. **If the conclusion is 'natural factors play a greater role', only L3/7 will be awarded.**

Section B

Answer **one** question from this section.

3 (a) Study Fig. 5, which shows access to clean water in some developed and less developed countries.

Access to clean water in 1990 and 2004

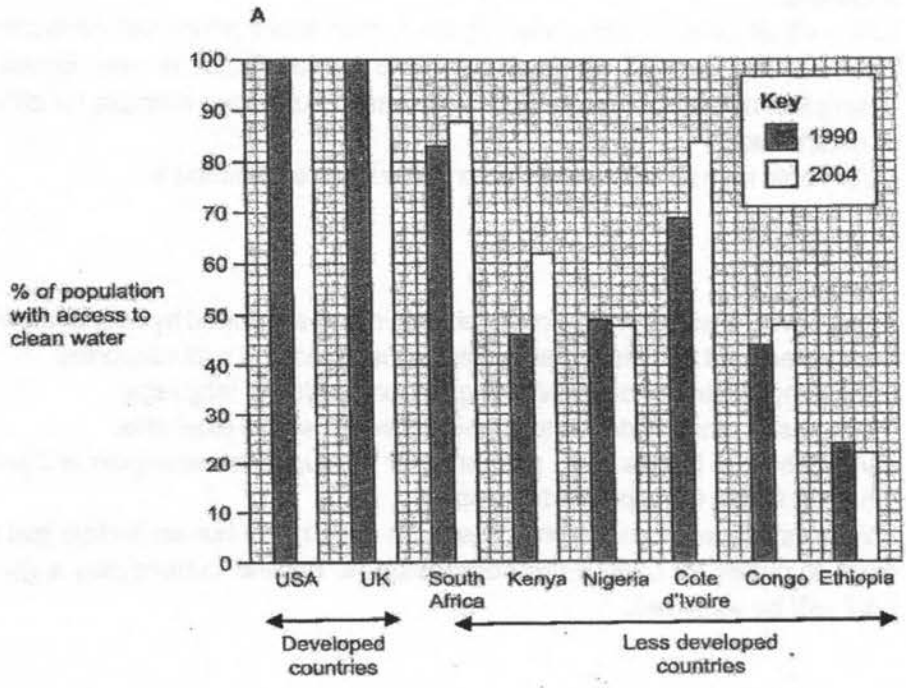


Fig. 5

(i) With reference to Fig. 5, describe the changes in access to clean water between 1990 and 2004 for the various developed countries and less developed countries. [4]

- **Overall statement**: DCs tend to have 100% access to clean water while LDCs tend to have less access to clean water. *
- Between 1990 and 2004, DCs like USA and UK have 100% access to clean water.
- Among the LDCs, Ethiopia has the lowest percentage access to access to clean water; only 22% of the population has access to clean water. In fact, for Ethiopia, the access to clean water dropped by 2%.
- Throughout the years from 1990 to 2004, South Africa had the most access to water among the LDCs. (at least 80%)
- Between 1990 and 2004, many LDCs have increased in their access to clean water. This include countries like South Africa, Kenya, Cote d'Ivorie and Congo.**
- The LDCs which have a drop in percentage of population with access to clean water are Nigeria and Ethiopia.
- Among the LDCs, Cote d'Ivoire has the greatest increase in access to clean water.

*Reserve 1m for describing difference in DCs vs LDCs.
**Reserve 1m for general trend in LDCs.

(b) Study Fig. 6 (Insert), which shows the effects of a lack of sanitation.

With reference to Fig. 6 (Insert) and with information you have studied, explain how access to better sanitation can improve the level of health in less developed countries. [5]

Access to better sanitation can improve the level of health in LDCs:

- More access to clean water for daily use will lead to less contamination by bacteria.
- Reduces infant mortality rate; less children will die below 1 year of age. (90% of these are children under 5 years of age.)
- Life expectancy of the people will increase. (1.6 million people die every year of diarrheal diseases)
- Reduces the number of deaths from diarrheal diseases. (Attributable to lack of access to safe drinking water and basic sanitation)*
- Reduces chances of being infected by various water-borne diseases. Eg. helminths infection and parasitic worms (information from Fig. 6)*
- Reduces the chances of people suffering from trachoma, a disease due to using contaminated water to clean the face and eyes. (information from Fig. 6)*

5@1m
Students need to infer from the information given in the inforgraphics of Fig. 6.
*1m max for quoting any of the 3 mentioned diseases, namely, diarrheal diseases, helminths infection and parasitic worms and trachoma.

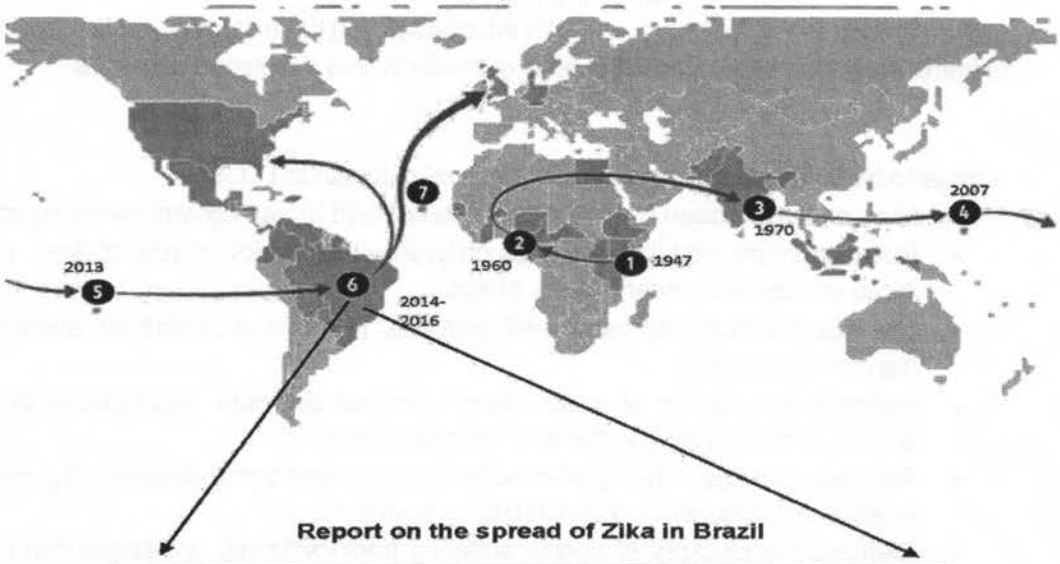
(c) Study Fig. 7 (Insert) which shows how Zika spread around the world and a report on the spread of Zika in 2015 in Brazil. Zika is an infectious disease caused by mosquito bites.

With reference to Fig. 7 (Insert), describe and comment on the spread of the Zika virus. [4]

- **Relocation diffusion** is the introduction of a disease to a location outside its current geographic range.
- E.g. by 2007, Zika has spread to No 4 on the map and then across the Pacific Ocean to No 5 in 2013. Then by 2014 – 2016, Zika spread to northern parts of South America. (spread to other parts of the world in chronological order)
- **Expansion diffusion** occurs when an infectious disease is spread outwards from its source.
- E.g. Zika originated in eastern Africa in 1947 and then spread to other countries in eastern part of Africa
- E.g. By 2014, Zika has already spread to Brazil and by 2015, Zika has become epidemic in Brazil. Zika has already to a very large part of Brazil.

Reserve 2m for stating expansion diffusion and 1 example and max 3m for stating relocation diffusion and 1 example.
Expansion diffusion: use Brazil (the report) and/or within eastern Africa.
Relocation diffusion: use the spread of Zika around the world and/or spread of Zika from eastern Africa to western Africa.

How Zika spread across the world



Report on the spread of Zika in Brazil

March 2, 2015. Between February and April 2015, almost 7,000 cases of this strange illness (Zika) were reported, though in most situations they were mild.

May 7, 2015. The cases were confirmed as Zika a few months later. Brazil made a statement that Zika virus was spreading in the country — the first time it was transmitted locally in the Americas. The very same day, the WHO declared an alert to Zika virus infection.

(d) Explain the economic impacts of infectious diseases like malaria and Zika. [4]

- The household has to increase spending on medical expenses to treat malaria/Zika. The treatment of such diseases can be very expensive.
- The government has to set aside funds for the provision of healthcare for patients of such infectious diseases. The expenditure can be as high as 40% of public healthcare spending as the government has to spend on building hospitals and clinics and buying medication and insecticide-treated nets.
- People infected with malaria/Zika are not able to work due to poor health, which results in a loss of income for these people.
- Over time, people infected with malaria/Zika will fall ill so often, that there will be a loss of productivity for the workforce.
- The country will face a slowdown of economic growth, as there will be less investment and tourism coming into the country.

(e) 'The main challenge in controlling the spread of malaria is the ease in population movement.'

To what extent do you consider this statement to be true? Give evidence to support your answer. [8]

Candidates may provide the following information:

Population movements due to efficient transport and communications (socio-economic challenge)

- Population movement is the movement of people across borders. The movement of people spreads and transmits disease to new locations. Malaria control programme become ineffective because it is difficult to monitor the movement of people.
- The volume and speed of movement is increasing and occurring at a larger scale than before. This is due to the ease of travelling with better transport links between countries and the efficiency of modern transportation.
- E.g. the Greater Mekong sub region in Southeast Asia sees a large-scale population movement.

Socio-economic challenges in controlling the spread of malaria (TB p227)
Limitations of healthcare (a socio-economic challenge)

- This is due to the ability of the malaria parasites to develop resistance to anti-malarial drugs.
- The resistance to drugs is caused by the incomplete treatment of an infected person. This causes some of the surviving parasites to develop resistance to the drugs.
- In 2009, resistance to anti-malarial drugs was observed along the Thai-Cambodian border.

Effects of climate change (an environmental challenge)

- Climate affects the temperature and the amount of rainfall an area receives.
- Changes in temperature and the amount of rainfall affect the behaviour and range of mosquitoes.
- Increased temperatures can cause mosquitoes to breed and mature faster.
- Increased rainfall also provides more pools of stagnant water for mosquitoes to breed. These suitable conditions have also lengthened the periods in which mosquitoes can breed and transmit malaria. This results in a greater frequency of malaria infection.

Effect of monsoons (an environmental challenge)

- The number of malaria cases increases during monsoons.
- This is because monsoons bring high rainfall during the wet season. High rainfall is strongly correlated with the high increase in malaria cases in India.
- In urban areas in India, heavy rains created long lasting pools of stagnant water for mosquitoes to breed. The mosquitoes transmit malaria to the urban population when they mature.

A full answer does not need to include all the above points.

Candidate at each level will show the following characteristics:

Level 1 (0-3m)
At this level, 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.
L1/1 – 1 simple statement on ease in population movement
L1/2 – 2 simple statements on ease in population movement and/or other challenges
L1/3 - 3 simple statements on ease in population movement and/other challenges

Level 2 (4-6m)
At this level, answers will have disagreement or agreement and supported by appropriate detail.
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 answer.
L2/4 – Explain population movement only + 1 example.
L2/5 – Explain population movement + describe another challenge e.g. climate change + 1 example
L2/6 – Explain population movement + explain another challenge, e.g. resistance to anti-malarial drugs / insecticide-resistant mosquitoes + 2 examples

Level 3 (7-8m)
At this level, answers will be comprehensive and supported by sound knowledge.
Both agreement and disagreement are considered and well supported.
Reasoning is clear and logical with good expression of language.
Examples or other evidence to support answers will be extensive.
L3/7 – Explain population movement + 2 other challenges + 3 examples
L3/8 – above + conclusion

Possible conclusion:
Agree – population movement is the main challenge
Population movement is very widespread and common among DCs and LDCs due to a variety of reasons.
With the rise of technology and tourism, people travel to other places. If they are infected, they will bring malaria with them to other destinations.
For DCs, population movement can be due to tourism; for LDCs, population movement can be due to seeking employment in other states and other countries.

4 (a) Study Fig. 8 (Insert), which shows the changes in HIV/AIDS prevalence in Africa between 1986 and 2001.

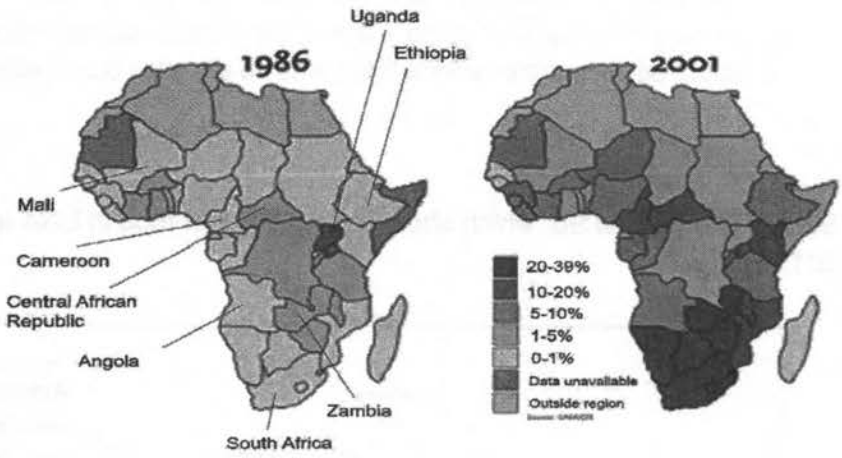


Fig. 8

With reference to Fig. 8 (Insert), describe the extent of spread of HIV/AIDS in sub-Saharan Africa between 1986 and 2001. [4]

- General trend: Between 1986 and 2001, there was an increase in HIV/AIDS prevalence rate. (Reserve 1m for general trend)
- In 1986, only Uganda has the highest HIV/AIDS, with 10-20%.
- In 1986, the surrounding countries of Uganda, e.g. Zambia has only 1 – 5% prevalence rate.
- But in 2001, most of southern Africa experienced the highest HIV prevalence of 20 to 39%, which in 1986 only shows the lowest HIV prevalence of 0-5%
- However, in 2001, Uganda did not suffer a very high HIV/AIDS, its HIV/AIDS prevalence rate has been reduced to 1 – 5%

4@1m
Reserve 1m for stating general trend
Reserve 1m for data and specific examples.

(b) Explain the social factors that can contribute to the spread of HIV/AIDS in Africa. [4]

- Social stigma: HIV patients may face various forms of discrimination, which may include refused access to health care facilities, rejection by family or community and being expelled from school or denial from housing. This has led to people with HIV/AIDS not revealing their HIV/AIDS status. This will lead to greater spread of HIV.
- Education: In some places, people are not aware of how it is being transmitted due to a lack of education. As a result, these people do not know how to protect themselves and avoid being infected, causing them to be vulnerable to HIV/AIDS.

- Education: In some countries, cultural practices that keep girls from knowing about sex and sexuality until marriage may also cause the spread of the disease.
- Lifestyle choices: drug injection or sharing of needles, or refusal to use condoms may lead to people to be at greater risk of being infected.
- Lapses in medical practice: Blood transfusion tainted with HIV/AIDS. This often occurred in countries where there was no effective blood screening before blood was donated.

(c) Study Figs. 9A and 9B, which show consumption of food in USA and India respectively in 2011.

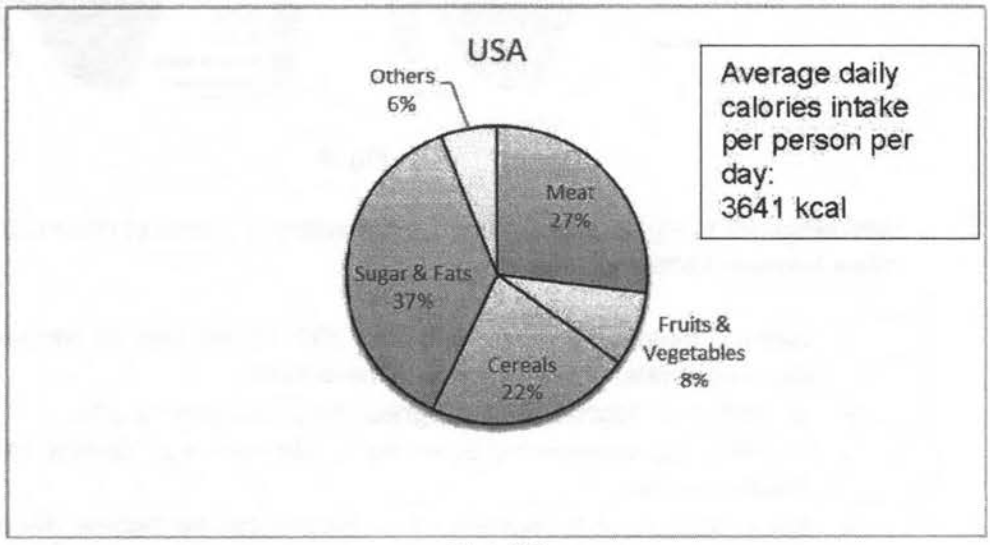


Fig. 9A

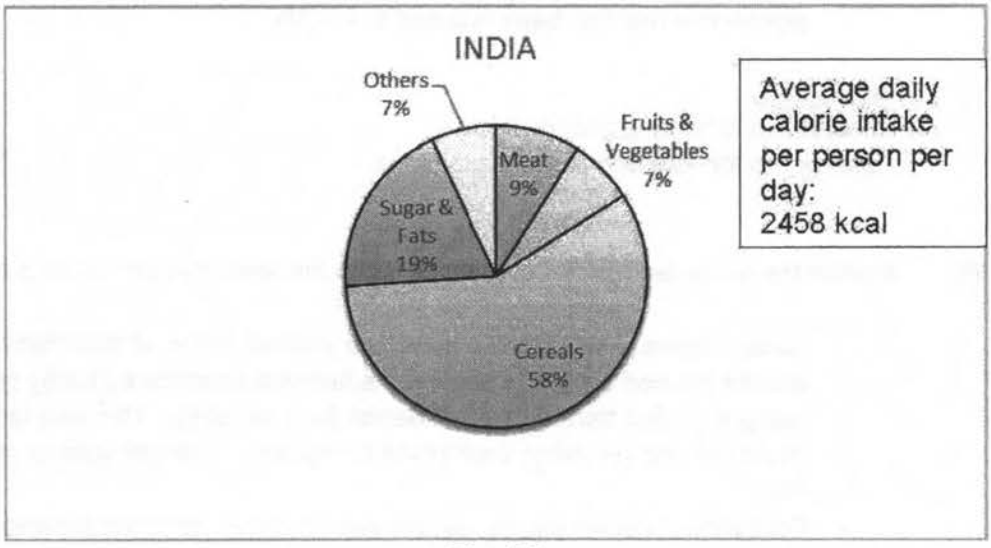


Fig. 9B

(c) Use information from Figs. 9A and 9B to describe and account for the differences in the food consumption pattern in USA and India in 2011. [4]

Compare the food consumption pattern in USA and India. (max 2m)

- USA has a higher average daily food intake than India, a difference of 1183 kcal.
- USA also consumes more meat than India, a difference of 18%.
- On the other hand, India consumes more cereals/ grains than USA, a difference of 36%.
- USA consumes more sugar and fats than India, a difference of 18%.

Reasons for the differences food consumption pattern. (max 2m)

- USA consumes more meat than India because USA has higher income than India. With more income, the people will be able to afford to consume more varieties of food.
- Meat is generally more expensive than other food, thus, it will require the people to have higher income.
- India consumes more cereals/grains than USA because India is a country where many people are vegetarians. Thus, there will be a high consumption of cereals and grains.
- USA consumes more sugar and fats than India because people in USA have fast food as their regular diet. / USA has more **availability** of fast food.

(d) Study Fig. 10 (Insert), which shows the relationship between food and oil prices between 2000 and 2011. Fig. 11 (Insert), shows the comparison between US grain production used to make ethanol for cars and the number of people the grains could feed.

Using information from Figs. 10 and 11, suggest difficulties in achieving food security in less developed countries (LDCs). [5]

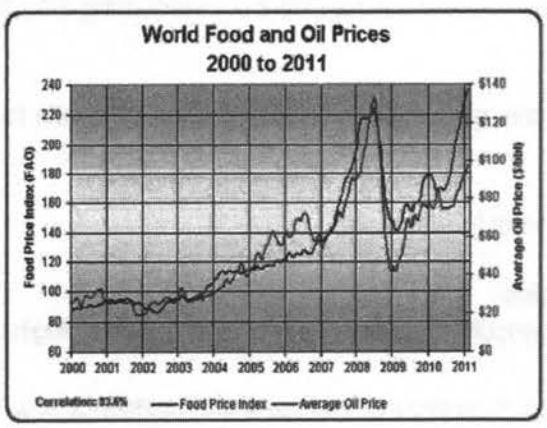


Fig. 10 (Insert)

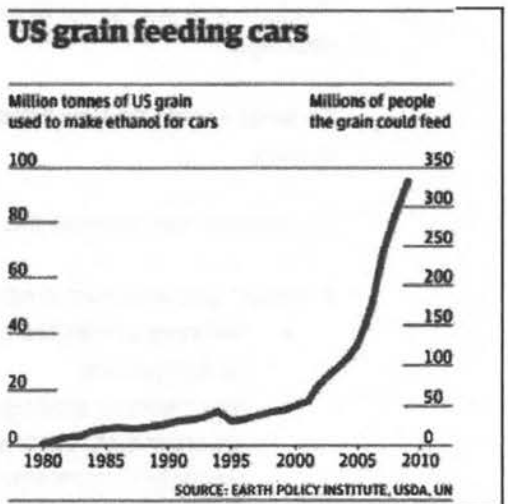


Fig. 11 (Insert)

With reference to Fig. 10

- Prices of food and oil are on the rise. With a rise in oil / petroleum, there will be an increase in the price of fertilisers as well as transport.
- Modern farming uses oil (petroleum) products to fuel farm machinery and to transport farm produce.
- As fuel costs increase, transport costs and machine operation costs increase as well. As a result, the prices of food rise also rise.

With reference to Fig. 11

- After 1995, more grains are used to produce ethanol for cars instead of using them to feed the population.
- Grains are food crops but they are used for industrial purposes, thus, there will be less food available for consumption. / Farmers will convert their farmland to growing grains for industrial use rather than growing food. / Many crops in the US became fuel for vehicles instead of food for people.
- Over time, the price of grains will increase as people demand for grains as food increase.
- Rise in food prices are transferred to the consumer. But for many people in LDCs, a very large portion of their income is spent on food. Any increase in food prices may result in them not being able to afford enough food to meet their basic nutritional needs. (the link)

2m – to explain how increase in oil prices will lead to rise in food prices
2m – to explain how more grains are used to produce ethanol for cars will lead to rise in food prices
1m – to summarise the link of these 2

(e) 'Political and economic strategies are the most important in overcoming the problem of food shortage.'

To what extent do you consider this statement to be true? Give evidence to support your answer. [8]

Candidates can provide the following information:

Political and economic strategies

- National strategies e.g. Agricultural policies e.g. Felda scheme; **high-tech farming in Singapore**
- International strategies e.g. food programmes and aid assistance e.g. responding to emergencies; cash and voucher scheme; school meals; Global Agriculture and Food Security Programme 2010.

High-tech farming in Singapore

Agrotechnology parks that house high-tech farms have been built in Singapore in the 1970s. These parks are equipped with necessary infrastructure that modern farms require, such as computers. Local farms produce up to 8% of vegetables, 8% of fish and 26% of eggs

consumed in Singapore. As a result, Singapore can ensure that there is some form of food supply even during times of disaster.
However, high –tech farms involve high cost in setting up. This will mean higher prices of food produce for consumers.
Shortage of trained workers for high-tech farming results in this industry being a very small one. Local consumers still choose to buy cheaper food produce from neighbouring countries like Malaysia and Thailand.

Responding to emergencies

The United Nations World Food Programme (UNWFP) provides emergency food assistance during wars and natural disasters. Food was successfully delivered to 99% of targeted recipients during the 2011 Sudan food crisis. However, during such emergencies, food prices may be inflated, which results in high costs for UNWFP. The extent of its assistance may also be limited by how much funds they can receive from donor countries.

Other strategies

- Technological e.g. storage, Green Revolution; GM crops
- Agricultural e.g. multiple cropping and crop rotation; water and soil conservation
- Leasing farmland to other countries
- Social e.g. support local farms; **population** control

Population control

In many LDCs, the growth in food production is slower than population growth. This is particularly a concern in countries like India and many African countries, where hunger and malnutrition are widespread. In addition, it is estimated that the world population will reach 10 billion by 2050. Controlling the population growth in LDCs is essential to ensure that people have sufficient food.
One way to alleviate this problem is for people to be educated on family planning as well as to be given access to reproductive health facilities. For example, in certain areas in the Philippines, the supply of traditional staples like fish are not enough to meet the increasing demand for food due to high population growth. In some villages in the Philippines, community-based family planning programme have been introduced to provide people with contraceptives. These programmes aim to slow down population growth to alleviate the problem of food shortage.

Possible conclusion

Political and economic strategies are most important as they are strategies taken by the government. They are likely to have the resources and capital to help in ensuring food security for their citizens.
The government will introduce suitable technological strategies like Green Revolution or Genetically-modified crops to the local farmers to increase their yields. Poor farmers in LDCs will not have enough resources to embark on such big projects like Green Revolution involving the construction of irrigation and drainage facilities, the purchase of High-yielding variety seeds.
The government can also introduce national strategies to support local farmers and to control population growth. Once the government can initiate strategies that can help with food production within the country, then there will be less chances of needing food aid.

A full answer does not need to include all the above points.

Candidate at each level will show the following characteristics:

Level 1 (0-3m)
At this level, 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.
L1/1 – 1 statement on political and economic strategy
L1/2 – 2 statements on political and economic strategy or other strategies
L1/3 – 3 statements on political and economic strategy and other strategies

Level 2 (4-6m)
At this level, answers will have disagreement or agreement and supported by appropriate detail.
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 answer.
L2/4 – 1 political strategy + 1 example
L2/5 – 1 political strategy + some description of another strategy + 2 examples
L2/6 – 1 political strategy + 1 other strategy + 2 examples

Level 3 (7-8m)
At this level, answers will be comprehensive and supported by sound knowledge.
Both agreement and disagreement are considered and well supported.
Reasoning is clear and logical with good expression of language.
Examples or other evidence to support answers will be extensive.
L3/7 – 1 political strategy + 2 other strategies + 3 examples
L3/8 – above + conclusion

End of Paper