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Name: \_\_\_\_\_ ( ) Class: \_\_\_\_\_



**ANGLICAN HIGH SCHOOL  
PRELIMINARY EXAMINATION 2018**

**S4**

**CORE GEOGRAPHY**

**2236/01**

Paper 1

**12 September 2018**

Secondary 4

**1 hour 40 minutes**

Additional Materials: 5 sheets of writing paper and 1 insert (4 pages)

**READ THESE INSTRUCTIONS FIRST**

Write your index number and name on all the work you hand in.  
Write in dark blue or black pen on both sides of the paper.  
You may use an HB pencil for any diagrams or graphs.  
Do not use staples, paper clips, glue or correction fluid.

**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.

**Hand in Section A, Section B and the question paper separately.**

The number of marks is given in brackets [ ] at the end of each question or part question.

<b>Section A</b>	<b>25 marks</b>
<b>Section B</b>	<b>25 marks</b>
<b>TOTAL:</b>	<b>50 marks</b>

<b>Parent's Name:</b>	
<b>Parent's Signature:</b>	

*This document consists 7 printed pages and 1 insert (4 pages).*

**[TURN OVER**

## Section A

This question is compulsory.

- 1 A group of students from Barbados, which is an island located in the Caribbean, carried out a fieldwork investigation on the effect of coral reefs on the coast.
- (a) The students wanted to find out the effect of coral reefs on wave energy. They suggested that the frequency of waves at the shore will inform them of the wave energy that the coast experiences. They decided to find out the frequency of waves at two different locations (A and B) shown in Fig. 1, Photograph A for location A and Photograph B for location B (Insert). They counted the number of waves that break in a minute for 5 minutes during high tide, and then calculated the average number of waves per minute to get the wave frequency. The data that they collected is shown in Table 1.

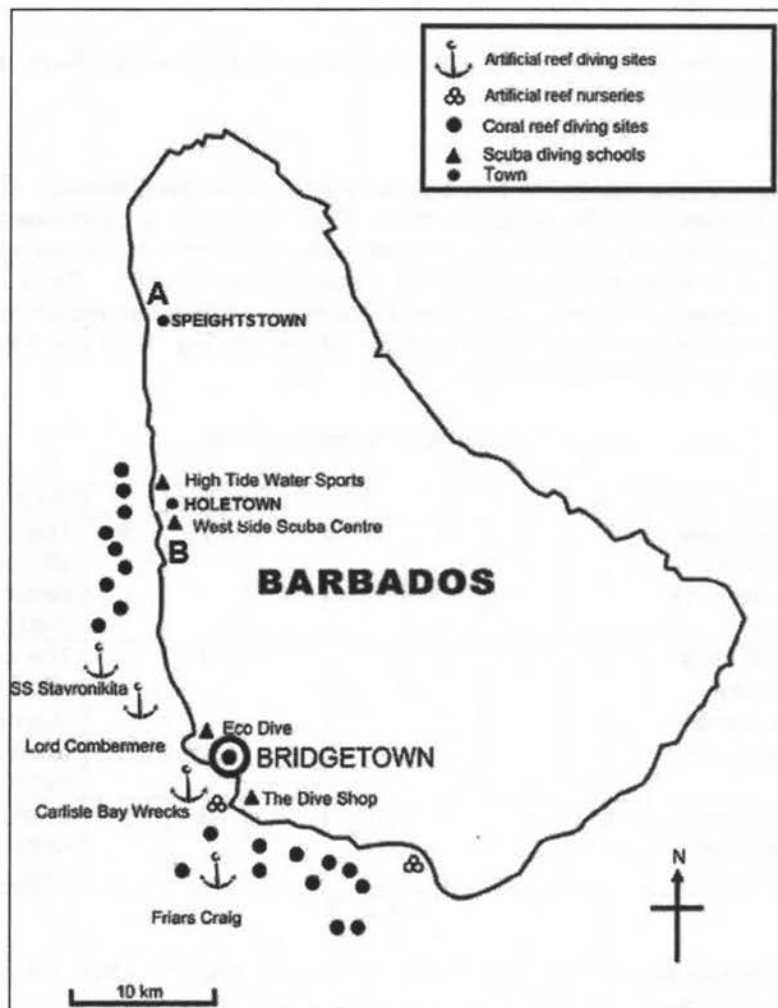


Fig. 1

Table 1

Wave frequency at each location (average number of waves per minute)

Location	11.00 am	11.30 am	12.00 pm	12.30 pm	1.00 pm
A	11	10	10	9	11
B	7	6	6	7	6

- (i) Comment on the time interval shown in Table 1 that the students chose in order to count the frequency of waves. [1]
- (ii) With reference to Fig. 1, Photograph A and B (Insert), suggest one other factor that might affect wave frequency in the locations shown. [1]
- (iii) With reference to Fig. 1 and Table 1, state a suitable hypothesis for the students' investigation. What conclusion can the students make about the hypothesis based on the data shown in Table 1? [3]
- (iv) The students decided to calculate the wave length in each location. Explain how they might be able to do this. [2]
- (b) The students also wanted to find out more about how the presence of coral reefs affected human activities along the coast. They devised a questionnaire, shown on Fig. 2, which asked locals such as shopkeepers and visitors to the beaches along the coast to give each statement a score ranging from -3 to +3. They obtained 10 completed questionnaires, the results of which were tabulated and shown on Fig. 2. They conducted the survey at Bridgetown (shown on Fig. 1) on the same day they calculated the frequency of waves.

Results of questionnaire

Negative points	-3	-2	-1	0	1	2	3	Positive points
The coral reefs do not attract many visitors to the coast.	0	0	2	0	1	1	6	The coral reefs attract many visitors to the coast.
The coral reefs allow for few businesses to open along the coast.	0	0	1	0	1	3	5	The coral reefs allow for many businesses to open along the coast.
There are few water activities along the coast.	0	0	1	0	2	3	4	There are many water activities along the coast.

Fig. 2

- (i) Using information from Fig. 2, draw a bi-polar graph to show the results of the questionnaire. [3]

- (ii) Use Fig. 2 to suggest the advantages and difficulties in using the questionnaire method shown to collect data for analysis. [4]
- (iii) Explain how the students might use the stratified sampling method to select locals to do the questionnaire. [3]
- (c) The students created a landuse map along a main road in Bridgetown known as Broad Street shown in Fig. 3 in order to find out more about how the presence of coral reefs has influenced the human activities in the area.

Hotel	Restaurant	Souvenir shop	Hotel	Restaurant
Broad Street				
Watersports activities shop	Hotel		Restaurant	

**Fig. 3**

- (i) With reference to Figs. 2 and 3, suggest the impacts of the presence of coral reefs on Bridgetown. [2]
- (ii) Outline how the students might have conducted the landuse survey to show the impact of coral reefs on people in Bridgetown. [6]

**Section B**

Choose **one** question from this section.

- 2 (a) Study Fig. 4 (Insert) which shows the changes in the severity of coral bleaching at the Great Barrier Reef, Australia and the proportion of coral reefs being bleached.

Describe the extent of changes in the severity of coral bleaching from 1998 to 2016.

[5]

- (b) Study Fig. 5 (Insert) which shows the changes in temperatures at the coral sea surface in March.

Describe how temperatures have changed from 1900 to 2016 and suggest how this may affect corals.

[4]

- (c) Describe the different conditions that result in deposition. [4]

- (d) Study Fig. 6 (Insert) which shows the visitor arrivals to Top Southeast Asian Destinations.

Compare the trends in arrivals to Thailand and Malaysia from 2007 to 2017. [4]

- (e) 'The environmental disadvantages of tourism outweigh any other advantages tourism might bring.'

To what extent is this true? Support your answer with evidence. [8]

- 3 (a) Study Fig.7 which shows the value of coral reefs.

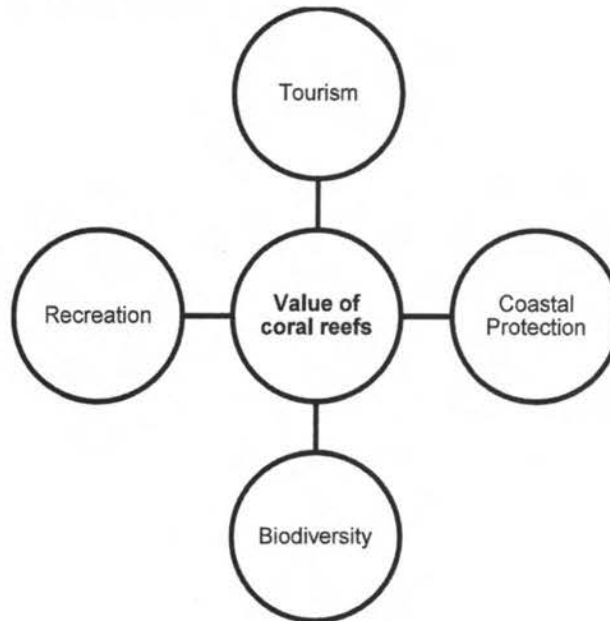


Fig. 7

With reference to Fig. 7 and examples, describe the value of coral reefs to the economy and environment. [4]

- (b) Study Fig.8 (Insert) which shows the changes in the areas for coral bleaching.

Use Fig. 8 to describe the changes in the distribution and extent of coral bleaching. [4]

- (c) Explain how currents and geology influence coastal environments. [5]

- (d) Study Fig. 9 (Insert) which shows the distribution of coral reefs in the world.

Using information from Fig. 9, account for the distribution of coral reefs in the world. [4]

- (e) 'Laws and regulations are the most effective way to reduce erosion of coastal areas.'

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

END OF PAPER

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*Acknowledgements*

Question 1 Figure 1: <https://barbados.org/>

Question 1 Photograph A: <https://barbados.org/>

Question 1 Photograph B: <https://barbados.org/>

Question 2 Figure 4: <https://wallpaper.macofel.com/great-barrier-reef-bleaching-2017/>

Question 2 Figure 5: <https://www.climaterealityproject.org/blog/climate-change-devastating-great-barrier-reef>

Question 2 Figure 6: <https://blog.euromonitor.com/2014/01/datagraphic-sharp-growth-for-inbound-tourism-to-southeast-asia.html>

Question 3 Figure 8: [https://www.researchgate.net/figure/Global-trends-in-the-extent-and-severity-of-mass-coral-bleaching-1998-2006-adapted-from\\_fig1\\_313213136](https://www.researchgate.net/figure/Global-trends-in-the-extent-and-severity-of-mass-coral-bleaching-1998-2006-adapted-from_fig1_313213136)

Question 3 Figure 9: <https://slideplayer.com/slide/4914088/>



Secondary 4 Core Geography  
 Preliminary Examination 2018  
 INSERT 2236/01

Photograph A for Location A for Question 1



Photograph B for Location B for Question 1



Fig. 4 for Question 2

Changes in the severity of coral bleaching at the Great Barrier Reef, Australia

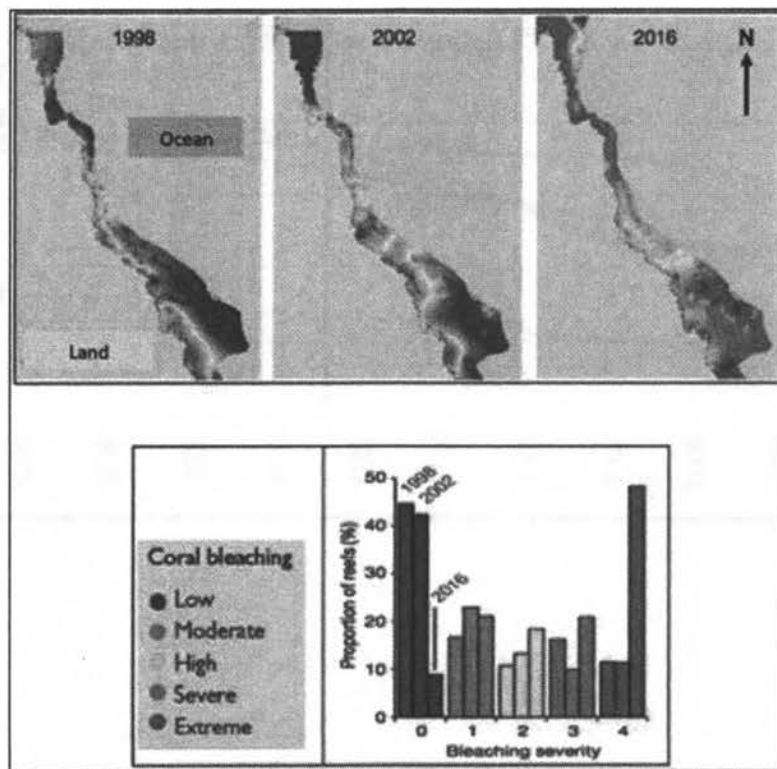


Fig. 5 for Question 2

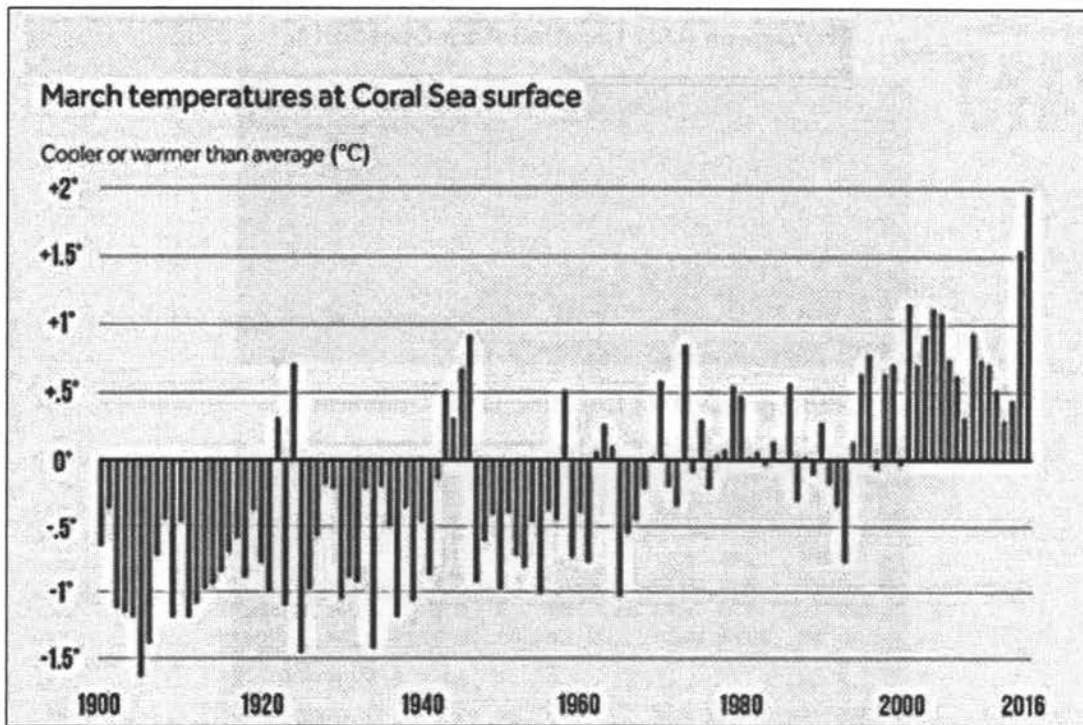


Fig. 6 for Question 2

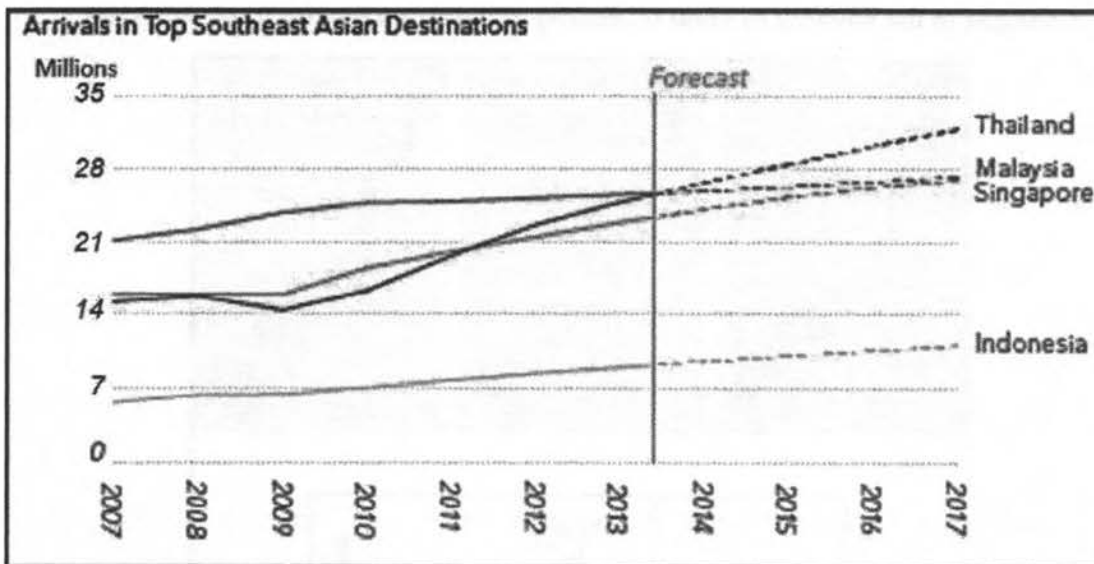
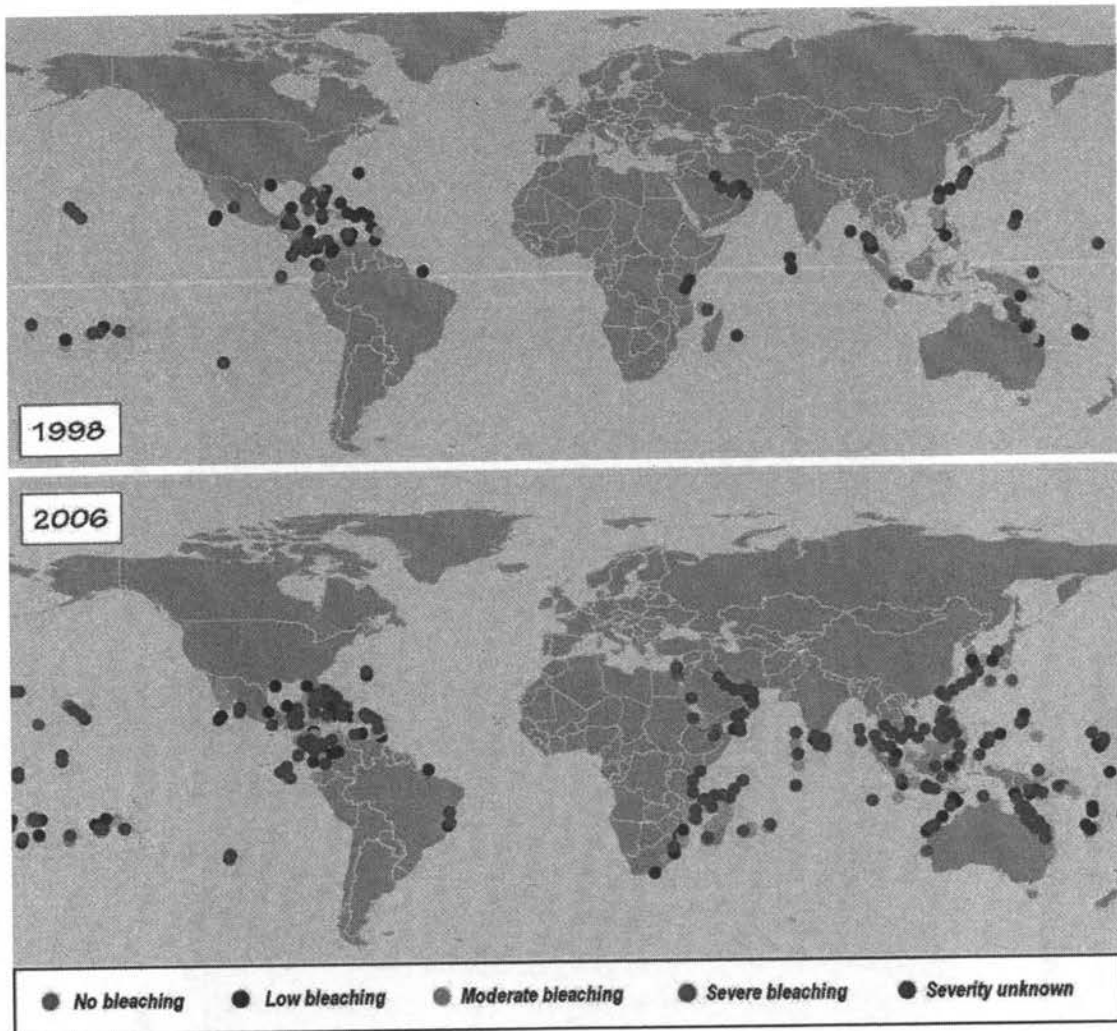


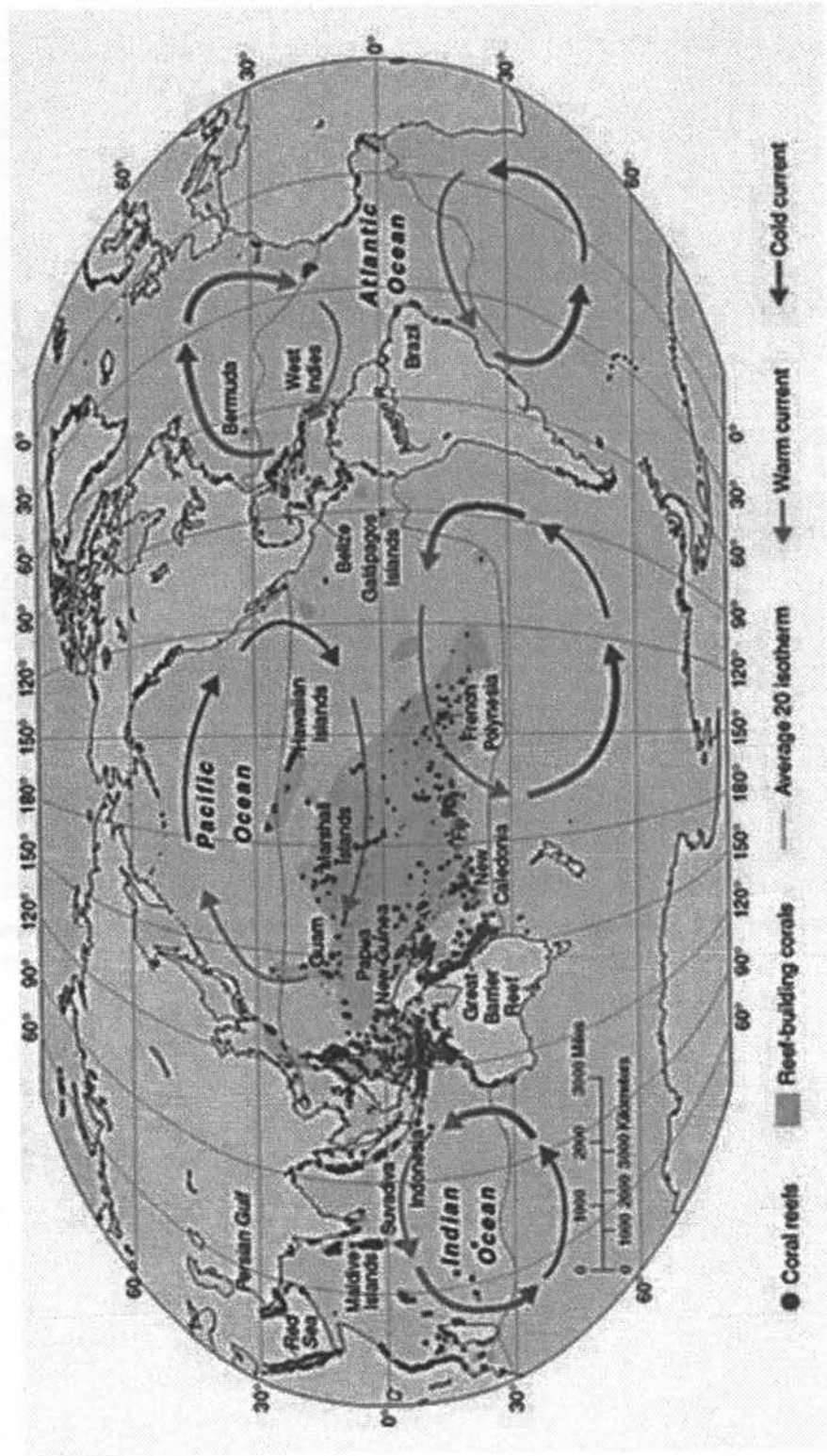
Fig. 8 for Question 3

Changes in the areas for coral bleaching



4

Fig. 9 for Question 3  
Distribution of coral reefs in the world



Name: \_\_\_\_\_ ( ) Class: \_\_\_\_\_



**ANGLICAN HIGH SCHOOL  
PRELIMINARY EXAMINATION 2018**

**S4**

**CORE GEOGRAPHY**

**2236/02**

Paper 2

**28 August 2018**

Secondary 4

**1 hour 30 minutes**

**Additional Materials: 5 sheets of writing paper and 1 insert (4 pages)**

**READ THESE INSTRUCTIONS FIRST**

Write your index number and name on all the work you hand in.

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

You may use an HB pencil for any diagrams or graphs.

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

**Section A**

Answer **one** question.

**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.

The insert contains Fig. 1, Fig. 2, Fig. 4 and Fig. 5 for Question 1, Fig. 6 for Question 2, Fig. 8 for Question 3 and Fig. 11 and Fig. 13 for Question 4.

At the end of the examination, **fasten Section A and B separately.**

**Hand in the question paper, Section A and Section B separately.**

The number of marks is given in brackets [ ] at the end of each question or part question.

Section A	25 marks
Section B	25 marks
TOTAL:	50 marks

Parent's Name:	
Parent's Signature:	

## Section A

Answer **one** question from this section.

- 1 (a) Study Fig. 1 and Fig. 2 (Insert), which shows the topographic map of the United Kingdom and its annual average rainfall amount.

With reference to Fig. 1 and Fig. 2, explain the type of rainfall that is experienced by United Kingdom. [4]

- (b) Explain why relative humidity may vary from place to place. [3]

- (c) Study Fig. 3 below and Figs. 4 and 5 (Insert), which show information about the natural hazards in parts of Southeast Asia.

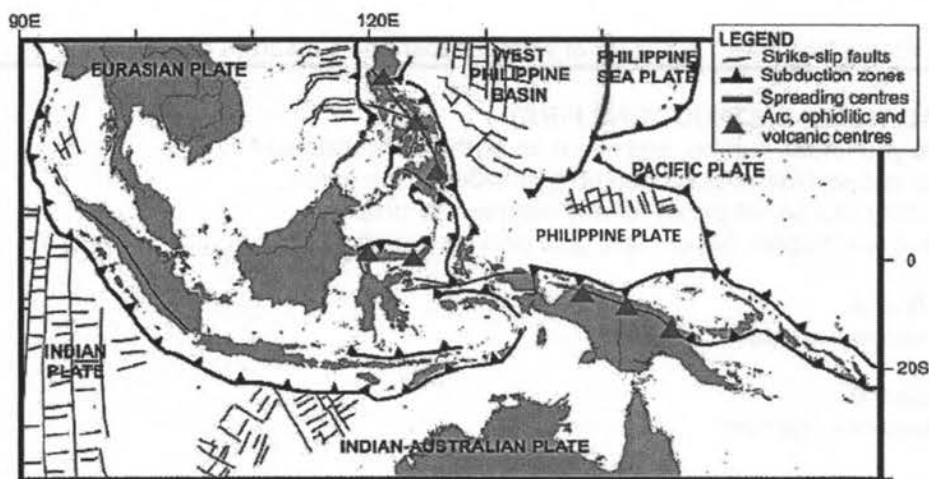


Fig. 3

- (i) Use Figs. 3 and 4 (Insert) to help you show how the occurrence of natural hazards in parts of Southeast Asia are a result of plate tectonics and/or its location. [5]
- (ii) Use Fig. 5 (Insert) to compare the pattern of earthquakes with 0-69 km depth to that of 300-700km depth. [5]
- (d) 'The benefits gained from living in volcanic areas are limited compared to the problems created.'

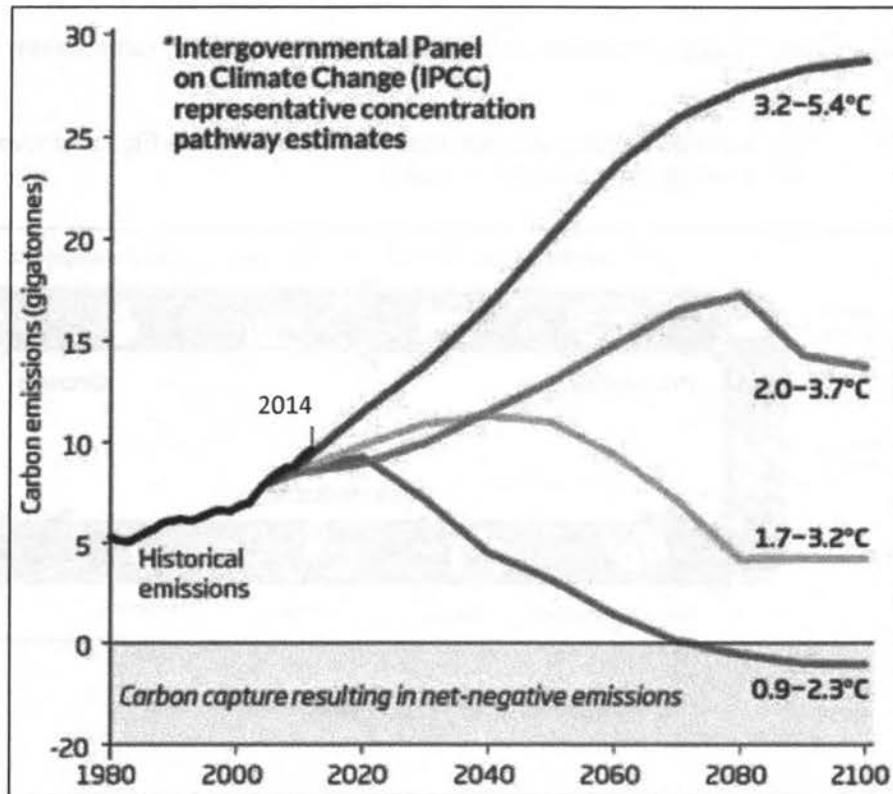
To what extent do you consider this statement to be true? Give reasons to support your answer. [8]



- 2 (a) Study Fig. 6 (Insert), which shows the differences in temperatures over parts of southern Asia on 18 July 2016.

Account for the differences in temperatures in the area shown on Fig. 6. [5]

- (b) Study Fig. 7, which shows carbon dioxide emissions from the global electric power sector.



\*Carbon capture results in a net carbon negative when carbon dioxide is removed from the atmosphere.

Fig. 7

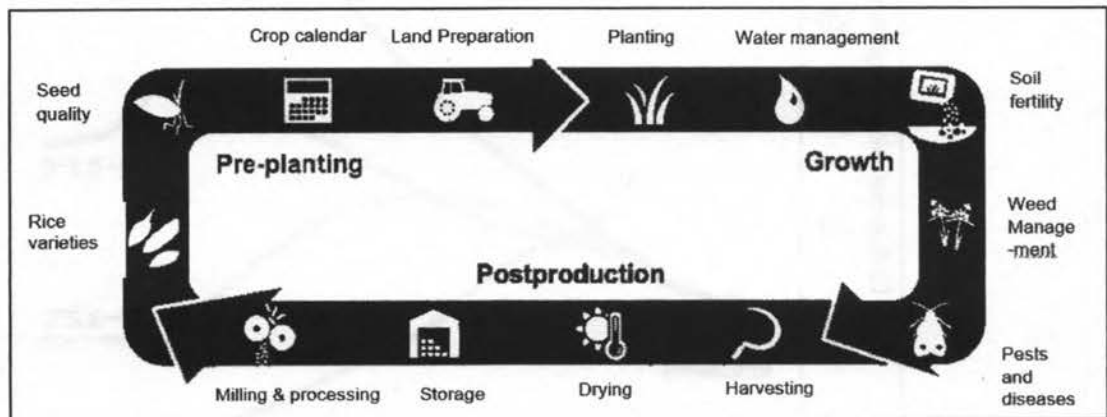
- (i) Describe the changes in the carbon dioxide emissions from 1980 to 2100. [4]
- (ii) Suggest reasons for both the changes and range in the projections of carbon dioxide emissions from 1980 to 2100. [4]
- (c) Describe the characteristics of tropical cyclones. [4]
- (d) 'National responses to climate change are effective in reducing greenhouse gas emissions.'

How far do you agree with this statement? Give examples to support your answer. [8]

**Section B**

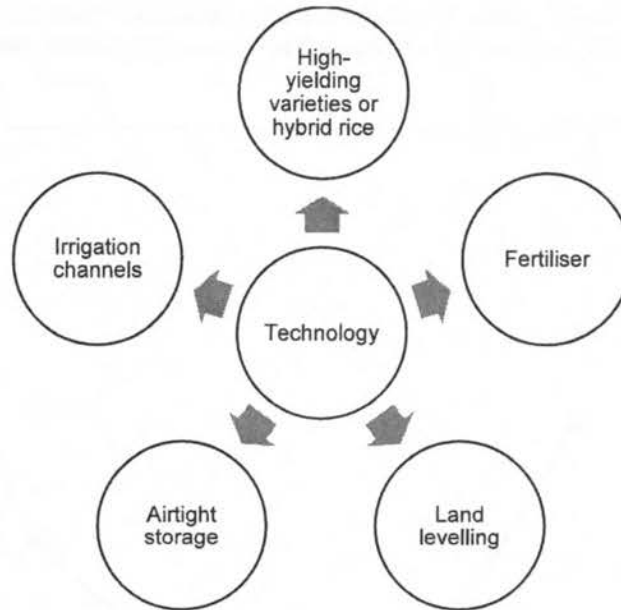
Answer **one** question from this section.

- 3 (a) (i) Fig. 8 (Insert) shows child mortality rates in 2015 across the world.  
With reference to Fig. 8, describe the pattern of child mortality rates throughout the world. [3]
- (ii) Suggest reasons for the pattern of child mortality rates shown in Fig. 8. [4]
- (b) Fig. 9 shows the step-by-step production of rice, while Fig. 10 shows how technology can intensify the production of rice.



**Fig. 9**



**Fig. 10**

- (i) With reference to Fig. 9 and Fig. 10, explain how technology is able to intensify production of rice at various stages of production. [5]
- (ii) Use Fig. 9 and other examples to suggest how shortages in rice supply might occur due to problems that affect the various stages of production. [5]
- (c) 'Technological strategies are most effective in solving the problem of food shortage.' How far do you agree with this statement? Give reasons to support your answer. [8]

- 4 (a) Fig. 11 (Insert) shows the malaria death rates (per 100,000 people) throughout the world in 2015, while Fig. 12 shows the number of malaria deaths in the world by age group.

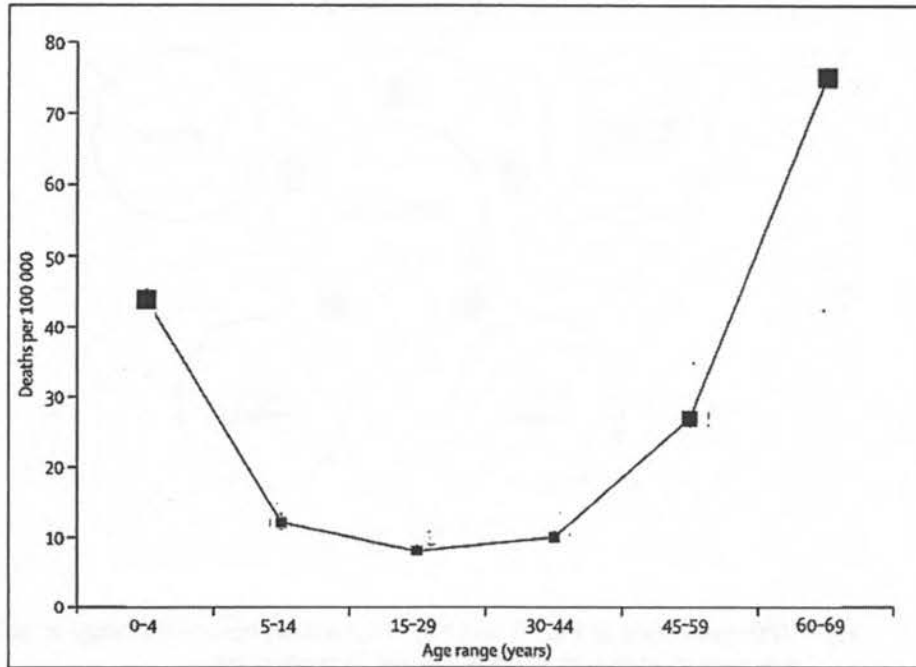


Fig. 12

With reference to Fig. 11 and 12, describe the patterns of malaria deaths in the world and explain the impacts of malaria on people and countries. [6]

- (b) Explain how environmental factors contribute to the spread of malaria. [4]
- (c) Fig. 13 (Insert) shows the areas in parts of Asia that experience resistance to artemisinin, an anti-malarial drug used to treat patients suffering from malaria.

Using Fig. 13, explain how the resistance to artemisinin is a challenge in reducing the spread of malaria in the region shown. [4]

- (d) Fig. 14 shows the main strategies that international organisations such as the World Health Organisation (WHO) and the World Bank employ to prevent and treat malaria.

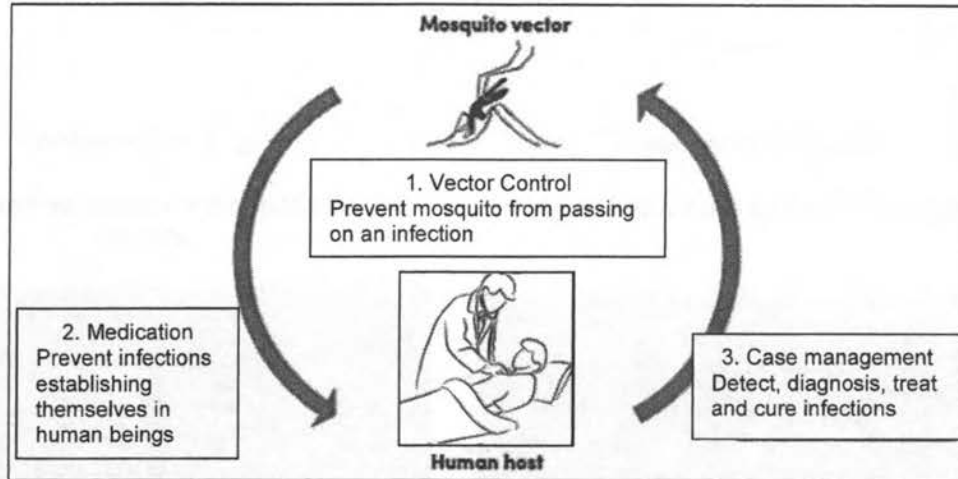


Fig. 14

With reference to Fig. 14 and your own knowledge, describe the strategies that international organisations might take to reduce the spread of malaria. [3]

- (e) 'LDCs are more at risk of infectious diseases than degenerative diseases.' How far do you agree with this statement? Support your answer with examples. [8]

## END OF PAPER

### Acknowledgements

Fig. 1: [http://mapsof.net/uploads/static-maps/topographic\\_map\\_of\\_the\\_uk.jpg](http://mapsof.net/uploads/static-maps/topographic_map_of_the_uk.jpg)

Fig. 2: <https://www.metoffice.gov.uk/learning/precipitation/rain/how-much-does-it-rain-in-the-uk>

Fig. 3: [https://www.researchgate.net/figure/Present-day-tectonic-features-of-South-East-Asia-based-on-mapping-by-Hall-2002\\_fig1\\_280085067](https://www.researchgate.net/figure/Present-day-tectonic-features-of-South-East-Asia-based-on-mapping-by-Hall-2002_fig1_280085067)

Fig. 4: [https://reliefweb.int/sites/reliefweb.int/files/resources/99B768FDE21CD36E852572F00055AE3B-ocha\\_ND\\_idn070502.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/99B768FDE21CD36E852572F00055AE3B-ocha_ND_idn070502.pdf)

Fig. 5: [http://www.shipdetective.com/images/maps/hazards/indonesia\\_seismicity\\_map.jpg](http://www.shipdetective.com/images/maps/hazards/indonesia_seismicity_map.jpg)

Fig. 6: <http://www.vaer-sentral.no/en/weather/weather-for-professionals/temperature/asia.html>

Fig. 7: <http://www.decodingsustainability.com/science-based-targets/>

Fig. 8: [www.fao.org](http://www.fao.org)

Fig. 9: [www.fao.org](http://www.fao.org)

Fig. 10: <http://www.knowledgebank.irri.org/step-by-step-production>

Fig. 11: <http://www.knowledgebank.irri.org/>

Fig. 12: IHME Global Burden of Disease

Fig. 13: IHME Global Burden of Disease

Fig. 14: adapted from [https://www.thelancet.com/article/S0140-6736\(10\)60831-8/abstract?code=lancet-site](https://www.thelancet.com/article/S0140-6736(10)60831-8/abstract?code=lancet-site)

Secondary 4 Core Geography  
Preliminary Examination 2018  
INSERT 2236/02

Fig. 1 for Question 1

Topographic map of the United Kingdom



\*Ignore the names of cities in small font in Fig. 1

Fig. 2 for Question 1

United Kingdom's annual average rainfall amount

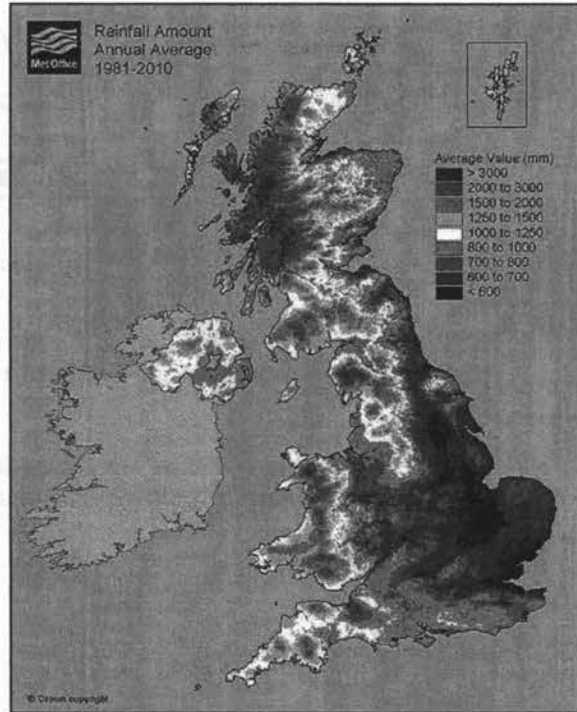


Fig. 4 for Question 1  
The natural hazards in parts of Southeast Asia

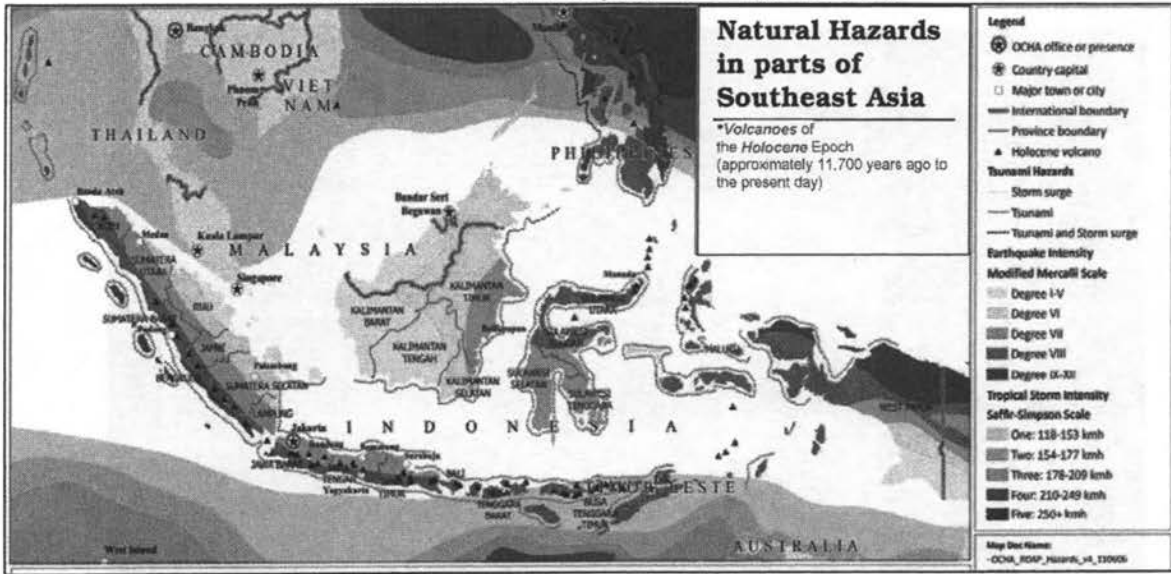


Fig. 5 for Question 1  
Magnitude and Depth of Earthquakes

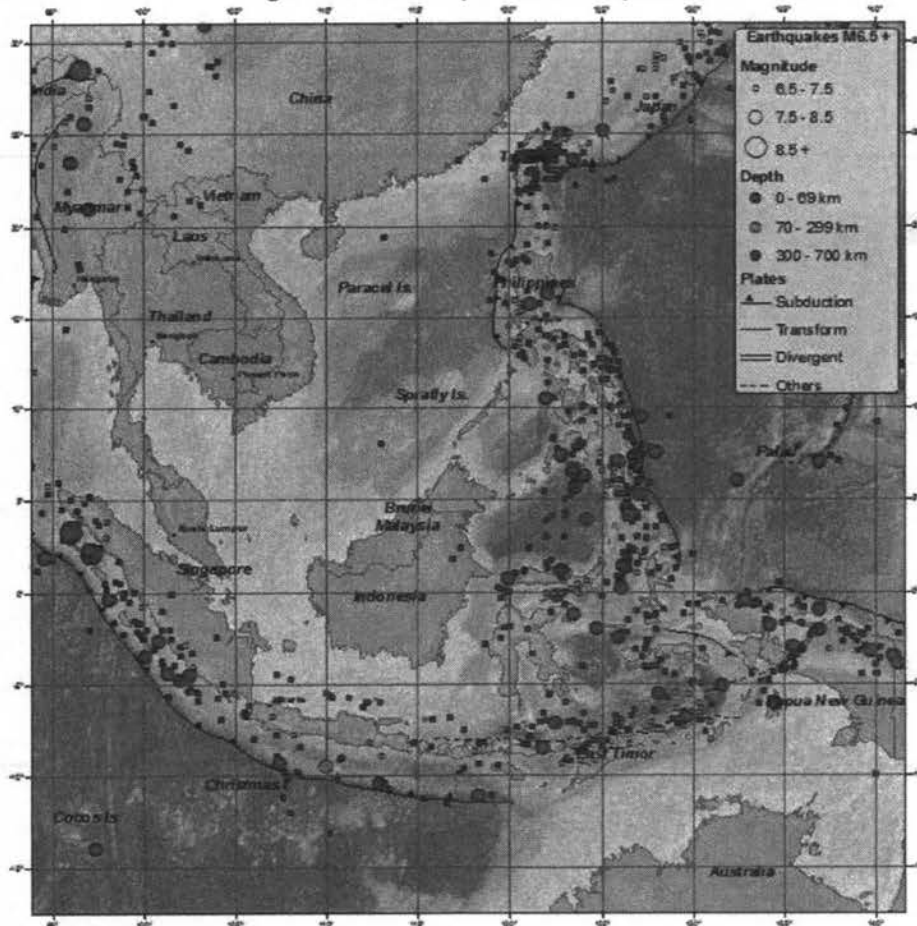


Fig. 6 for Question 2  
Differences in temperatures over parts of southern Asia on 18 July 2016

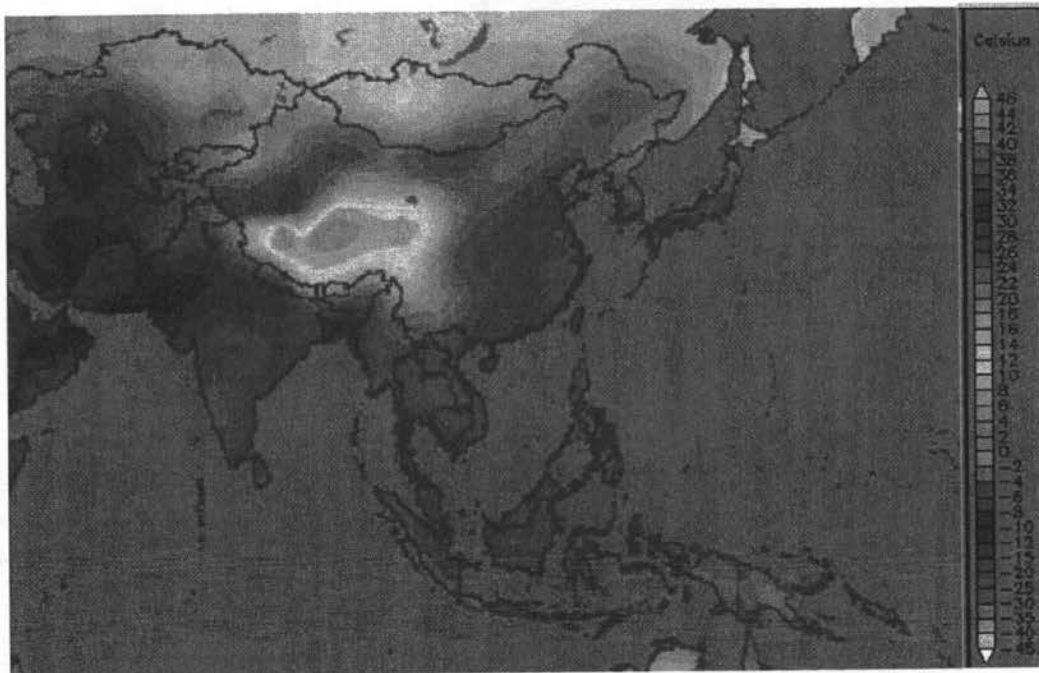
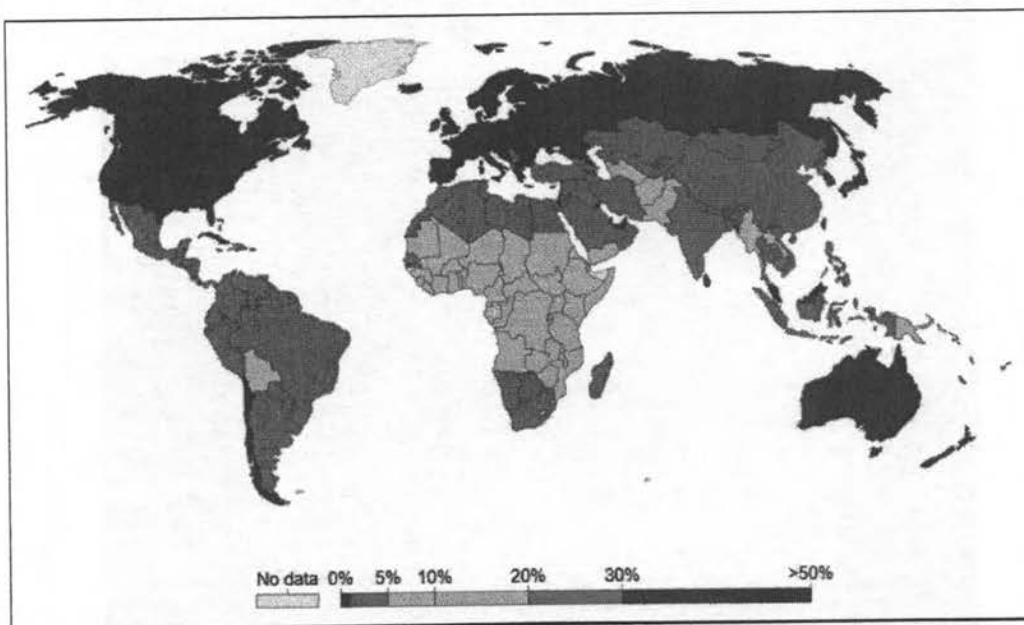
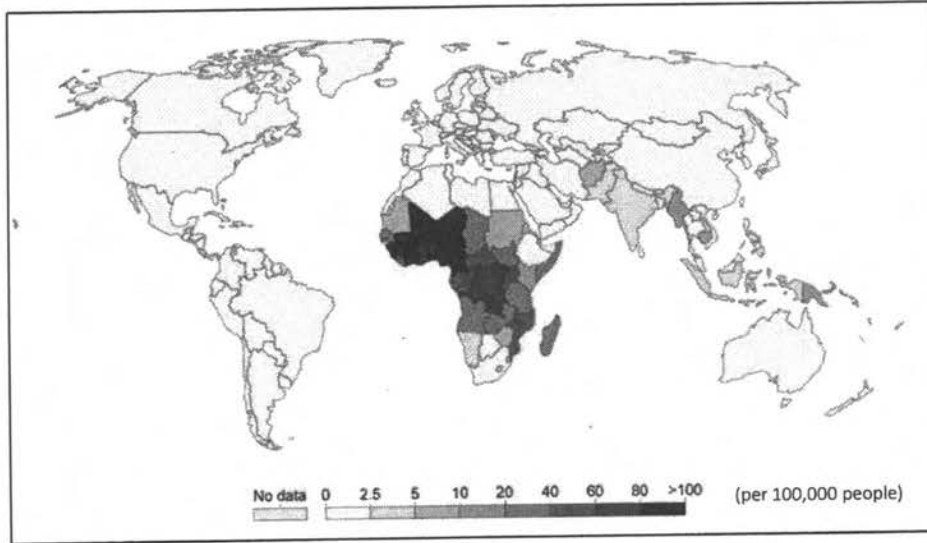


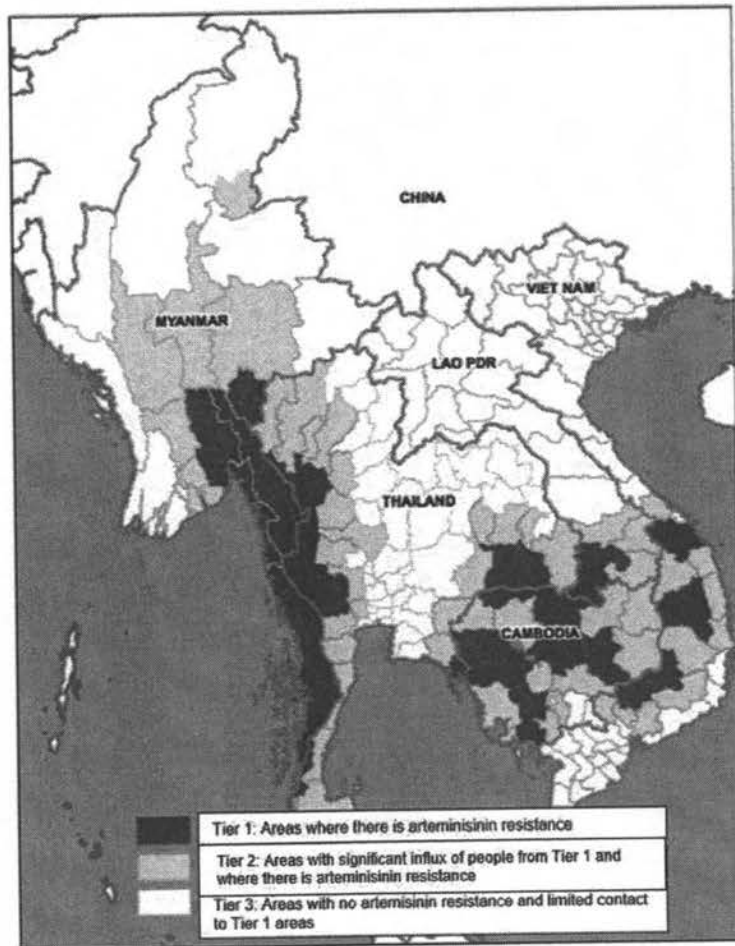
Fig. 8 for Question 3 (a)  
Child mortality rates in 2015

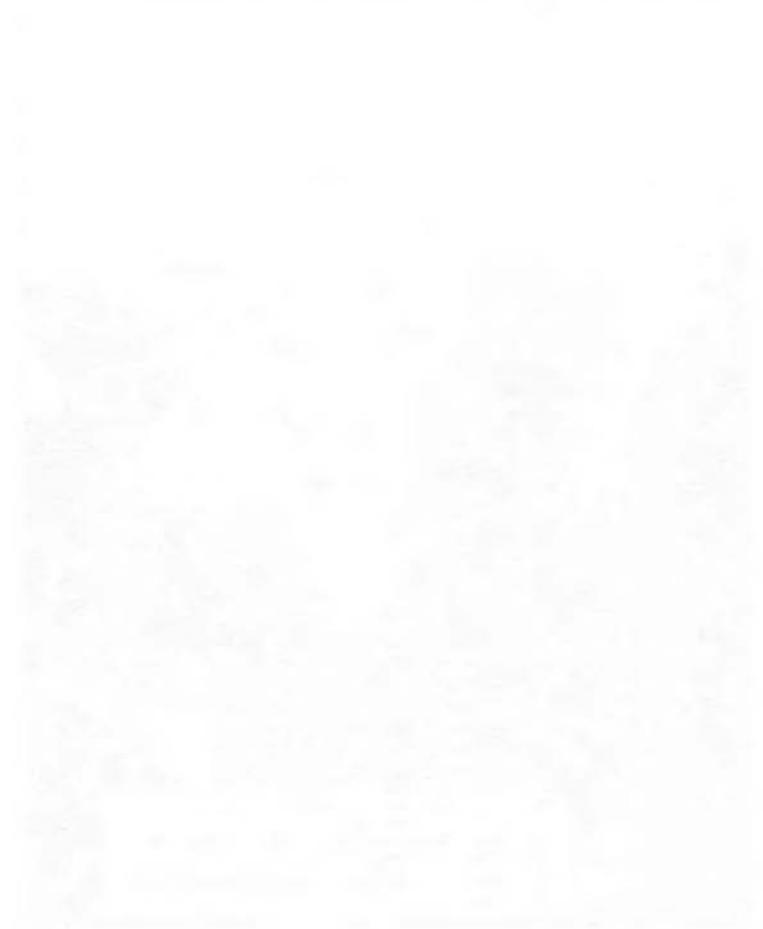


**Fig. 11 for Question 4 (a)**  
**Malaria deaths throughout the world in 2015**



**Fig. 13 for Question 4 (c)**  
**Areas in parts of Asia that experience resistance to artemisinin, an anti-malarial drug**







Name: \_\_\_\_\_ ( ) Class: \_\_\_\_\_



**ANGLICAN HIGH SCHOOL  
PRELIMINARY EXAMINATION 2018**

**S4**

**CORE GEOGRAPHY**

**2236/01**

Paper 1

**12 September 2018**

Secondary 4

**1 hour 40 minutes**

Additional Materials: 5 sheets of writing paper and 1 insert (4 pages)

## **ANSWERS**

### **Section A**

This question is compulsory.

- 1 A group of students from Barbados, which is an island located in the Caribbean, carried out a fieldwork investigation on the effect of coral reefs on the coast.
  - (a) The students wanted to find out the effect of coral reefs on wave energy. They suggested that the frequency of waves at the shore will inform them of the wave energy that the coast experiences. They decided to find out the frequency of waves at two different locations (A and B) shown in Fig. 1, Photograph A for location A and Photograph B for location B (Insert). They counted the number of waves that break in a minute for 5 minutes during high tide, and then calculated the average number of waves per minute to get the wave frequency. The data that they collected is shown in Table 1.

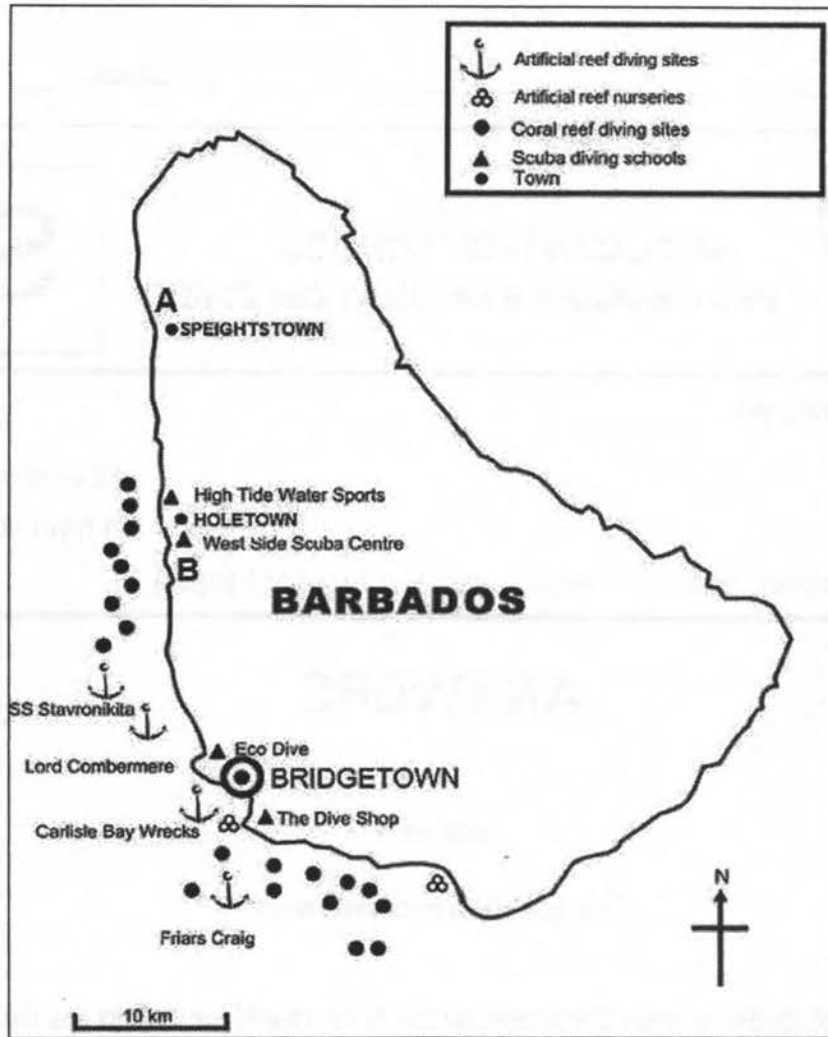


Fig. 1

Table 1

Wave frequency at each location (number of waves per minute)

Location	11.00 am	11.30 am	12.00 pm	12.30 pm	1.00 pm
A	11	10	10	9	11
B	7	6	6	7	6

(i) Comment on the time interval shown in Table 1 that the students chose in order to count the frequency of waves. [1]

- The data was taken at regular, 30 min intervals. 5 sets of data were also collected. This regular, frequent collection of data makes the data collected representative of the type of waves at each location.

OR

- The data was taken at the same time interval for both location A and B, hence there is greater accuracy in comparison of wave frequency.

(ii) With reference to Fig. 1, Photograph A and B (Insert), suggest one other factor that might affect wave frequency in the locations shown. [1]

- Human activities such as boating or sailing shown in the photographs may affect the wave frequency by increasing it.
- It is facing the open sea, and hence may experience stronger winds that could affect wave energy.

(iii) With reference to Fig. 1 and Table 1, state a suitable hypothesis for the students' investigation. What conclusion can the students make about the hypothesis based on the data shown in Table 1? [3]

- Hypothesis: 'The presence of coral reefs decreases wave frequency.'
- Conclusion: The hypothesis is true.
- Data ( must be given as average, with comparatives): Location B, which has about 9 coral reef sites along its coast, has a lower average wave frequency of 6.4 waves per minute, while Location A, which has no coral reef sites along its coast has a higher average wave frequency of 10.2 waves per minute.

(iv) The students decided to calculate the wave length in each location. Explain how they might be able to do this. [2]

- Calculate the wave period, T (in seconds), which is the time taken for one complete wave to pass a point:
  - $T = \text{time taken for 10 wave crests to pass a ruler} / 10$
- Calculate the wave length =  $1.56 \times T^2$

- (b) The students also wanted to find out more about how the presence of coral reefs affected human activities along the coast. They devised a questionnaire, shown on Fig. 2, which asked locals such as shopkeepers and visitors to the beaches along the coast to give each statement a score ranging from -3 to +3. They obtained 10 completed questionnaires, the results of which were tabulated and shown on Fig. 2. They conducted the survey at Bridgetown (shown on Fig. 1) on the same day they calculated the frequency of waves.

Results of questionnaire

Negative points	-3	-2	-1	0	1	2	3	Positive points
The coral reefs do not attract many visitors to the coast.	0	0	2	0	1	1	6	The coral reefs attract many visitors to the coast.
The coral reefs allow for few businesses to open along the coast.	0	0	1	0	1	3	5	The coral reefs allow for many businesses to open along the coast.
There are few water activities along the coast.	0	0	1	0	2	3	4	There are many water activities along the coast.

Fig. 2

- (i) Using information from Fig. 2, draw a bi-polar graph to show the results of the questionnaire. [3]

- 1m for title and axis
- 1m for plotting of positive numbers
- 1m for plotting of negative numbers
- Can be drawn as both horizontal or vertical graphs
- Numbers should be totaled up for each negative & positive points.

- (ii) Use Fig. 2 to suggest the advantages and difficulties in using the questionnaire method shown to collect data for analysis. [4]

- Advantages:
  - Able to show the degree people agree or disagree with the statements
  - Able to show a net overall perception or impression of the place
  - The 'neutral' value of '0' allows people who are unsure to give a neutral stand – which reduces inaccuracies in data collected
- Difficulties
  - Statements have vague terms such as 'many' – visitors may have differing opinions of what 'many' or 'few' counts as
  - Visitors who fill in the questionnaire may have differing opinions about the definition of terms such as water activities
  - Visitors would not know exactly if the cause of the many businesses are the coral reefs – a correlation cannot be made, as they would need to know how the area has changed over time

(iii) Explain how the students might use the stratified sampling method to select locals to do the questionnaire. [3]

- Categories: Decide on the different sub-sets or categories that can describe the profile of locals in the area (e.g. gender, occupation, purpose of visit)
- Parent Population: Use reliable secondary sources of information such as recent surveys to find out the general number of people in the population for each category or sub-set who usually visit the area / number of locals in the country.
- No. of visitors per category: Decide on number of visitors to interview for each sub-set, ensure that each sub-set is proportionate to the sub-sets in the parent population. This ensures that the data is reliable and proportionate to the parent population.

(c) The students created a landuse map along a main road in Bridgetown known as Broad Street shown in Fig. 3 in order to find out more about how the presence of coral reefs has influenced the human activities in the area.

Hotel	Restaurant	Souvenir shop	Hotel	Restaurant
Broad Street				
Watersports activities shop	Hotel		Restaurant	

Fig. 3

(i) With reference to Figs. 2 and 3, suggest the impacts of the presence of coral reefs on Bridgetown. [2]

- Positive economic impact
  - There is an increase in employment due to more visitors going to the area to see the coral reefs – this is seen in Fig. 2, where the total positive score was 8 as compared to negative score of 2 for 'the coral reefs attract many visitors to the coast'
  - This is seen in the number of hotels and shops related to the coral reefs or tourism (4 hotels and 3 restaurants)
  - This would eventually lead to an increase in income for the locals

(ii) Outline how the students might have conducted the landuse survey to show the impact of coral reefs on people in Bridgetown. [6]

- 1m for stating time and location:
  - Time: anytime between 8 to 5pm, which is a typical timing for shops to be open
  - Location: along the entire Broad Street
- 4m for explanation of survey method:

- On a blank sheet of paper, mark out the main street 'Board Walk'
- From the starting point (which should be at one end of Broad street), start walking down and observing the different land uses on the ground floor or the second floor of the buildings.
- Use boxes to represent the buildings along the assigned street.
- Label the different land uses observed, in the respective boxes.
- Repeat this process until you reach the other end of the street
- 1m for tabulating types of land uses and link to impact of coral reefs
  - Tabulate the number of each type of land use into a table as shown below:

Accommodation	Food and Beverage	Shops
3	3	2

- A high number of commercial buildings would mean that the area caters mostly to visitors or tourists. This means that there is increased employment and income in the area.

**Section B**

Choose one question from this section.

- 2 (a) Study Fig. 4 (Insert) which shows the changes in the severity of coral bleaching at the Great Barrier Reef, Australia and the proportion of coral reefs being bleached.

Describe the extent of changes in the severity of coral bleaching from 1998 to 2016.  
[5]

- The severity of coral bleaching has increased over the years
- In fig, it shows that in the north-eastern region of great barrier reef, the severity of coral bleaching has changed drastically from a low in 1998 to extreme in 2016
- In the central region of great barrier reef/increased severity of coral bleaching concentrated largely in the central and north-eastern zone of great barrier reef
- The severity of coral bleaching has also increased in the southern zone of great barrier from a low to a moderate
- Anomaly is that in 1998, and 2002, in the south-west zone of great barrier reef, some high to extreme coral bleaching observed but in 2016, these regions were in the moderate range of coral bleaching.
- In 1998, highest proportion of reefs had low coral bleaching of about 45% and extreme coral bleaching in 1998 was also low at about 11%
- However, this has changed over the years in 2016, only 9% of reefs were in the range of low coral bleaching and highest proportion of reefs of 48% were in extreme coral bleaching.
- Proportion of reefs in the low coral bleaching category has decreased drastically by 36% and proportion of reefs in the extreme coral bleaching category has increased drastically by 37%

- (b) Study Fig. 5 (Insert) which shows the changes in temperatures at the coral sea surface in March.

Describe how temperatures have changed from 1900 to 2016 and suggest how this may affect corals. [4]

- Generally, temperatures at coral sea surface has increased over the years at about 2.7°C
- In between certain time periods such as in the 1920s, slightly after 1940s and 1980s, there are spurts of increased changes in temperatures but after 1990s, coral sea surface temperatures have been increasing throughout
- This results in coral bleaching which is the loss of algae as a result of higher sea temperatures and thus corals lose its colour
- Corals growth will be inhibited which results in dying of coral reefs



(c) Describe the different conditions that result in deposition. [3]

- Wave energy (fetch, wind speed and wind duration) capped at 1m
- Sheltered coast
- Shallow seabed
- Wave refraction
- Obstructions in the sea e.g. island
- Bend along the coastline

(d) Study Fig. 6 (Insert) which shows the arrivals to Top Southeast Asian Destinations.

Compare the trends in arrivals to Thailand and Malaysia. [5]

- Arrivals to both countries increased
- Increase to Thailand was higher at about 12mil and Msia was about 600k
- Msia started out to be highest in arrivals in 2007 and was consistently higher than Thailand but both countries had the same number of arrivals in the middle of 2013
- Msia had the slowest rate of increase of 2.85% whereas Thai had the fastest increase of 85%
- Thailand surpassing Malaysia in the forecast after in 2013
- During the forecasted period, arrivals in Msia slowed down and was lower than thailand by 3.6 mil

(e) 'The environmental disadvantages of tourism outweigh any other advantages tourism might bring.'

To what extent is this true? Support your answer with evidence. [8]

0	Content not relevant to the topic/incomplete essay without covering main points	4	<ul style="list-style-type: none"> <li>• Some elaboration for environmental disadv and 1 other advantage</li> <li>• Examples may be brief.</li> <li>• May be one-sided</li> </ul>	7	<ul style="list-style-type: none"> <li>• Fulfilled level 2</li> <li>• Attempt made to evaluate</li> <li>• One reason provided to support stand.</li> </ul>
1	Mere listing of content but weak understanding	5	<ul style="list-style-type: none"> <li>• Elaboration may be lacking for either adv/disadv but good</li> </ul>	8	<ul style="list-style-type: none"> <li>• Fulfilled level 2</li> <li>• Clear criteria used to evaluate relative importance of</li> </ul>



	with minimal link to focus of question.		elaboration for the other. <ul style="list-style-type: none"> <li>• Examples for one may be brief.</li> </ul>		factors <ul style="list-style-type: none"> <li>• Two reasons provided to support stand.</li> </ul>
2	Brief description of only disadvantages/advantages	6	<ul style="list-style-type: none"> <li>• Detailed elaboration of both adv and disadv</li> <li>• Good examples/evidence to support</li> </ul>		
3	Able to provide brief description of both disadv and adv but lack elaboration and examples.				

- 3 (a) Study Fig.7 which shows the value of coral reefs.

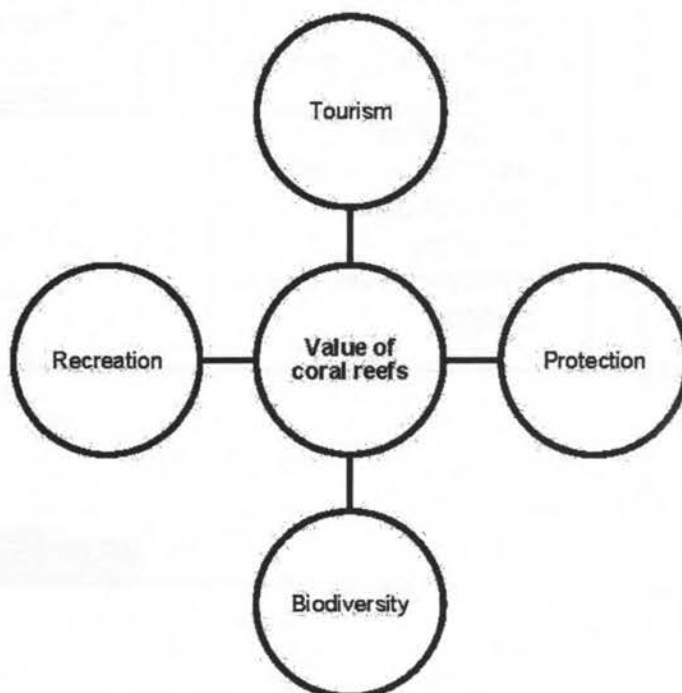


Fig. 7

With reference to Fig. 7, describe the value of coral reefs

[4]

- allowing wide range of marine creatures to breed and grow hence supports biodiversity
- marine creatures that live around reefs provide food for larger creatures
- coral reefs absorb wave energy thus protecting the adjacent land mass from erosion
- Coral reefs provide recreational activities such as diving e.g. great barrier reef and thus can be a form of tourist attraction

- (b) Study Fig.8 (Insert) which shows the changes in the areas for coral bleaching.

Use Fig. 8 to describe the changes in the distribution of coral bleaching.

[4]

- Generally, increase in the number of areas with coral bleaching
- In 1998, greater concentration of areas of severe bleaching was confined to the Carribbean/north of south America such as Colombia
- With no/low bleaching at the SEA region including the area north of Australia
- But in 2006, concentration of severe bleaching has expanded to the eastern coastal fringes of African continent and the SEA region such as coastal areas of Malaysia, Cambodia and Vietnam
- With increased severity of coral bleaching in the Caribbean area

- (c) Explain how currents and geology influence coastal environments.

[5]

- Currents are large-scale continuous movement of water
- Which carry large amounts of energy and can influence coasts through the processes of coastal erosion, sediment transport and deposition
- Longshore current could affect the transportation and deposition of sediments and create landforms such as spits, tombolos and beaches in coastal areas. Geology:
- Geology is the arrangement and composition of rocks
- Rock arrangement could affect the shape of the coastlines. If there are alternating layers of hard and soft rocks, it could lead to differential rates of erosion of the coastline and the formation of headlands and bays.
- Rock composition determines the hardness of rocks and their resistance to erosion which affects the rate of change along coasts.
- More joints found in rocks → more/faster erosion of the coast
- Rock hardness: harder rocks erode more slowly than softer rocks like limestone and shale.
- Chemical composition: different chemical composition could lead to different rates of erosion.

(d) Study Fig. 9 (Insert) which shows the distribution of coral reefs in the world.

Using information from Fig. 9, account for the distribution of coral reefs in the world.

- Coral reefs are found between 30° N and 30° S, which are mostly in the tropics.
- Most of the corals are located in the tropics, with a large biodiversity found near the equator as these places have higher concentrations of sunlight. Corals require sufficient sunlight to trigger algae photosynthesis and the growth of corals.
- They are also found where there are average 20 isotherm where corals require warm waters where sea surface temperatures are not lower than 17-18°C. The high average temperature would also bring about favourable temperatures for corals to thrive.
- Most corals are found near warm ocean currents which ensure there is moderate amount of water movement to ensure that corals receive sufficient levels of oxygen. It also brings warm water to help corals thrive.
- Shallow waters near coastlines, higher concentrations of sunlight (similar to pt 2)

[4]

(e) 'Laws and regulations are the most effective way to reduce erosion of coastal areas.'

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

[8]

0	Content not relevant to the topic/incomplete essay without	4	<ul style="list-style-type: none"> <li>• Some elaboration for laws and 1 other strategy</li> <li>• Examples may be</li> </ul>	7	<ul style="list-style-type: none"> <li>• Fulfilled level 2</li> <li>• Attempt made to evaluate</li> <li>• One reason</li> </ul>
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	covering main points		<p>brief.</p> <ul style="list-style-type: none"> <li>• May be one-sided/Limited success and limitations</li> </ul>		provided to support stand.
1	Mere listing of content but weak understanding with minimal link to focus of question.	5	<ul style="list-style-type: none"> <li>• Elaboration may be lacking for either laws or strategies but good elaboration for the other.</li> <li>• Examples for one may be brief.</li> <li>• Limitations included</li> </ul>	8	<ul style="list-style-type: none"> <li>• Fulfilled level 2</li> <li>• Clear criteria used to evaluate relative importance of factors</li> <li>• Two reasons provided to support stand.</li> </ul>
2	Brief description of laws and regulations	6	<ul style="list-style-type: none"> <li>• Detailed elaboration of both laws and strategies</li> <li>• Good examples/evidence to support</li> <li>• Limitations included</li> </ul>		
3	Able to provide brief description of both laws and strategies but no supporting evidence				

END OF PAPER



**ANGLICAN HIGH SCHOOL  
PRELIMINARY EXAMINATION 2018  
ANSWERS**

**S4**

**CORE GEOGRAPHY**

**2236/02**

Paper 2

**28 August 2018**

Secondary 4

**1 hour 30 minutes**

**Additional Materials: 5 sheets of writing paper and 1 insert (4 pages)**

**Section A**

Answer **one** question from this section.

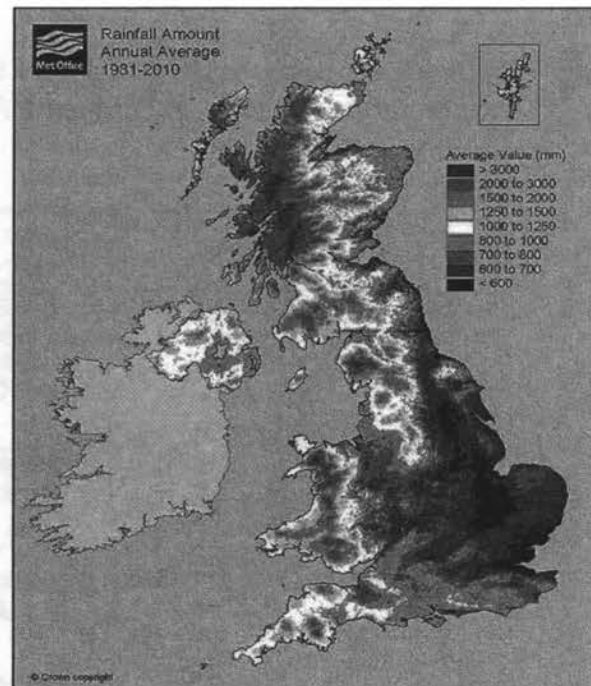
- 1 (a)** Study Fig. 1 and Fig. 2 (Insert), which shows the topographic map of the United Kingdom and its annual average rainfall amount.

**Fig. 1 for Question 1**

**Fig. 2 for Question 1**

**Topographic map of the United Kingdom**

**United Kingdom's annual average rainfall amount**



**\*Ignore the names of cities in small font in Fig. 1**

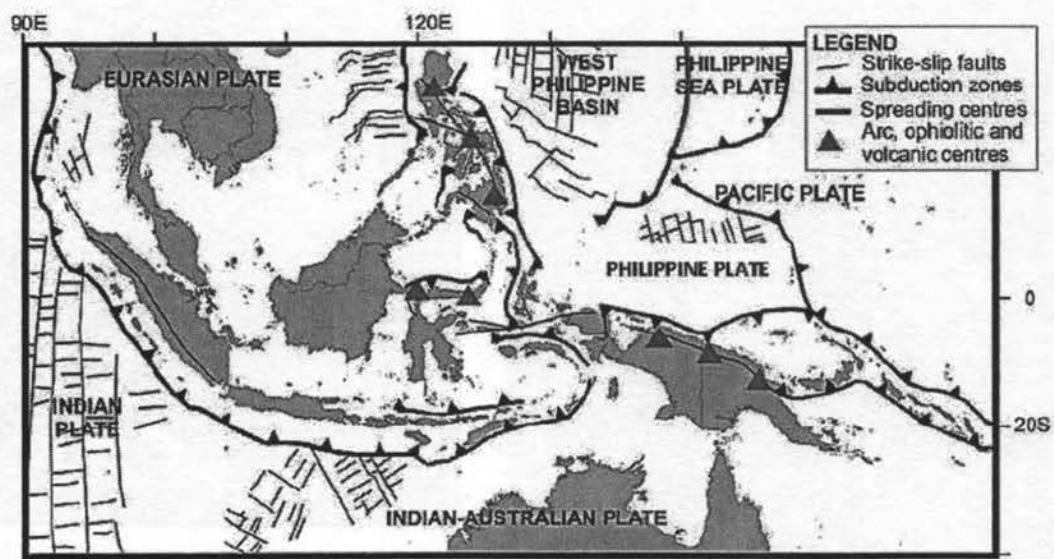
With reference to Fig.1 and Fig. 2, explain the type of rainfall that is experienced by United Kingdom. [4]

- Warm moist onshore wind from Atlantic Ocean/ Irish Sea/ Celtic Sea is forced to rise over the mountains.
- Air cools as it rises. When the dew point temperatures are reached, condensation occurs and clouds form.
- When the water droplets are large and heavy enough, rain falls.
- As relief rain falls on the windward side, it results in higher rainfall on the western coasts of UK (above 1000mm) in areas such as Scotland and Wales
- At the leeward side/ eastern coast of UK, it received lower rainfall of mostly less than 800mm as most of the moisture would have already been deposited.

(b) Explain why relative humidity may vary from place to place. [3]

- RH varies with temperature
  - When temperature increases, the amount of water vapour in the air remains the same,
  - but the rise in temperature makes air more able to hold water vapour.
  - Thus, RH decreases as temperature increases and vice versa
- It may also change when the actual amount of water vapour varies
  - due to presence of water bodies contributing to an increase in water vapour through evaporation
  - also affected by the amount of vegetation in an area, transpiration may contribute to an increase in the amount of water vapour in an area

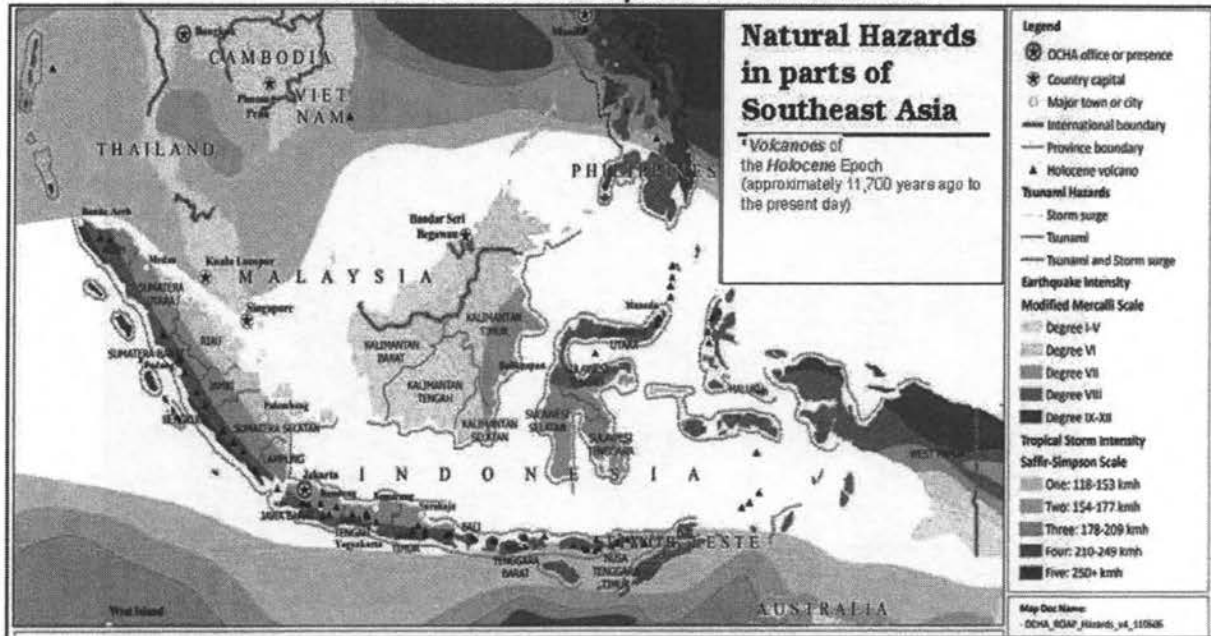
(c) Study Fig. 3 below and Figs. 4 and 5 (Insert), which show information about the natural hazards in parts of Southeast Asia.



[https://www.researchgate.net/figure/Present-day-tectonic-features-of-South-East-Asia-based-on-mapping-by-Hall-2002\\_fig1\\_280085067](https://www.researchgate.net/figure/Present-day-tectonic-features-of-South-East-Asia-based-on-mapping-by-Hall-2002_fig1_280085067)

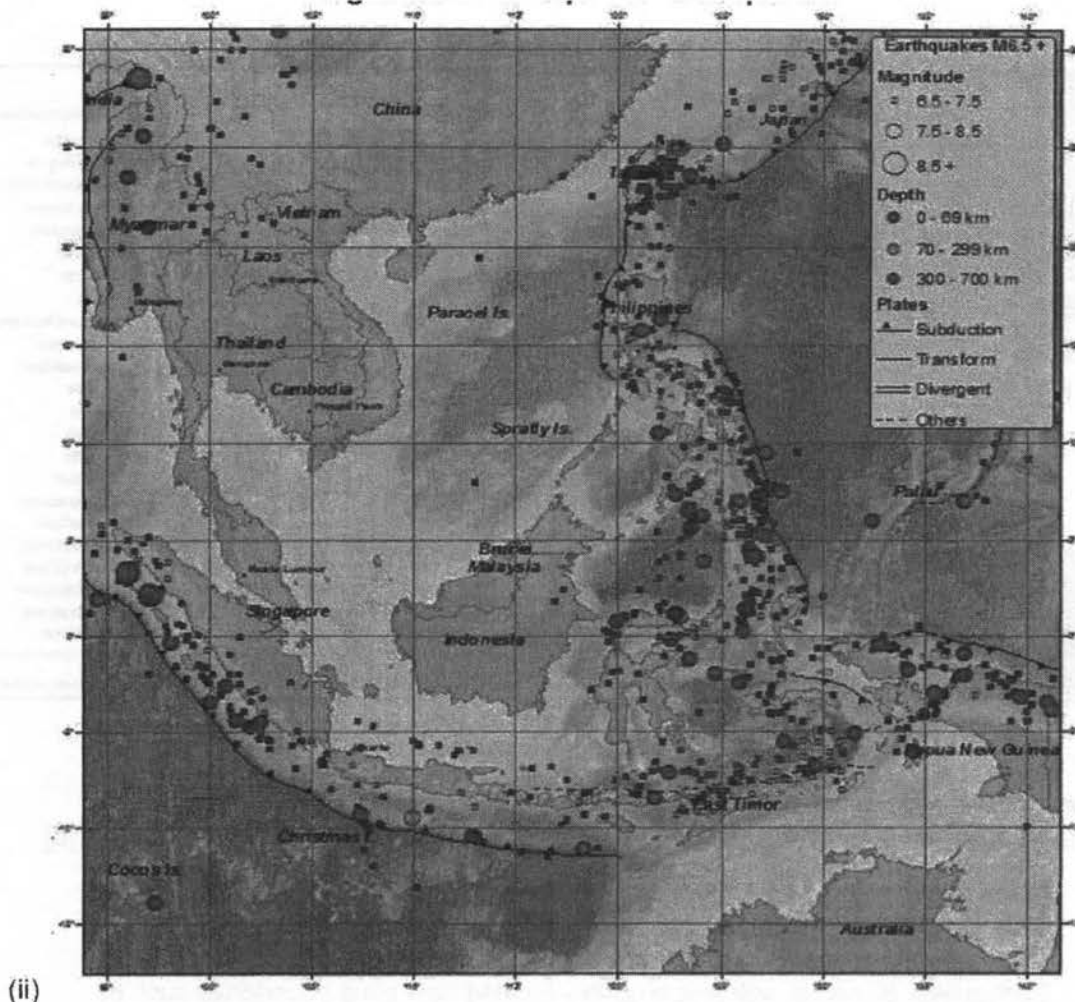


### The natural hazards in parts of Southeast Asia



(i) Use Figs 3 & 4 to help you show how the occurrence of natural hazards in parts of Southeast Asia are a result of plate tectonics and/ or its location. [5]

- Areas such as Thailand, Cambodia and Northern parts of the Philippines located beyond  $10^{\circ}\text{N}$  experience tropical storms of varying intensity from 1 to 4
  - Due to presence of warm sea surface temperatures and Coriolis Effect
- Earthquake, tsunamis, volcanic eruption- located near plate boundaries such as between Indian and Eurasian plates, Indian-Australian plate and Philippine plate, therefore areas such as the west coast of Sumatra in Aceh experience high earthquake intensities of degree IX-XII, higher risk of storm surge, tsunamis, volcanic eruption
  - due to convergence of plates stress builds up sudden release of stress results in stronger seismic waves nearer the epicentre
  - and areas which are further away such as Cambodia, Thailand, Malaysia and Kalimantan experience very low earthquake intensity as energy dissipates
  - tsunamis in these areas due to offshore earthquakes/ movement of seafloor



Use Fig 5 to compare the pattern of earthquakes with 0-69 km depth to that of 300-700km depth. [5]

- Overall: Both are generally located along plate boundaries/ both follow a linear pattern along plate boundaries (similarity)
- Significant:
  - Highest concentrations:
    - Earthquakes with 0-69km depth are mainly found close to the plate boundaries between Eurasian and Philippine plates,
    - between Eurasian and Indian Plate off the coast of Sumatra and
    - between India-Australian and Philippines Plate
    - However, earthquakes with 300-700km depth are found slightly further away from the plate boundaries between Indian-Australian and Eurasian plates and between Eurasian and Philippines Plate
  - Lower concentrations:
    - There are a few earthquakes with 0-69km depth found in the middle of plates such as in the middle of Eurasian plate however, earthquakes with 300-700km are all found along plate boundaries

(d) 'The benefits gained from living in volcanic areas are limited compared to the problems created.'



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

Level 1		Level 2		Level 3	
0	Content not relevant to topic.	4	<ul style="list-style-type: none"> <li>Problems and benefits.</li> <li>Examples for both may be brief. Name of location only without elaboration on what makes it a problem or how it is beneficial.</li> <li>Evaluation for some parts may be one-sided.</li> </ul>	7	<ul style="list-style-type: none"> <li>Both problems and benefits well-explained.</li> <li>Attempt made to evaluate.</li> <li><u>One reason</u> provided to support stand.</li> </ul>
1	Listing the problems or benefits only.	5	<ul style="list-style-type: none"> <li>Problems and benefits.</li> <li>Elaboration may be lacking for one factor but good elaboration for the other.</li> <li>Examples/ evidence for one group may be brief.</li> <li>Evaluation for some parts may be one-sided.</li> </ul>	8	<ul style="list-style-type: none"> <li>Both problems and benefits well-explained.</li> <li>Clear criteria used to evaluate.</li> <li><u>Two reasons</u> provided to support stand.</li> </ul>
2	Generic statements of problems or benefits. Lack elaboration and examples.	6	<ul style="list-style-type: none"> <li>Both problems and benefits well-explained.</li> <li>Good examples/ evidence to support each of the factors for problems and benefits.</li> </ul>		
3	Able to provide brief description of 1 risk/benefit only and list one other. One-sided evaluation. Lack egs.				

Points of Elaboration:

**Problems**

- **Massive destruction by volcanic materials:**
  - Eruptions – lava, pyroclasts – ash, rock fragments and volcanic bombs.
  - Materials can lead to widespread damage of property
  - Lava – high temp – burns the areas it flows, low-silica lava moves rapidly and flows over long distances – destroys everything in its path with hot rock fragments
  - Inhaling the ash could result in serious injury/death.
  - Volcanic bombs – cause damage to properties – eg. Ongoing eruption of Kilauea in Hawaii since 1983 has destroyed many homes and highways
  - Landslides – structural collapse of volcanoes – have the potential to obstruct the flow of

rivers causing floods, blocked roads and buried villages and farmlands.

- Eg. Eruption of Venado del Ruiz – Andes mts in SA in 1985 released a pyroclastic flow. Glacial ice along the way triggered lahars which engulfed the town of Armeno and killed more than 20,000 people.

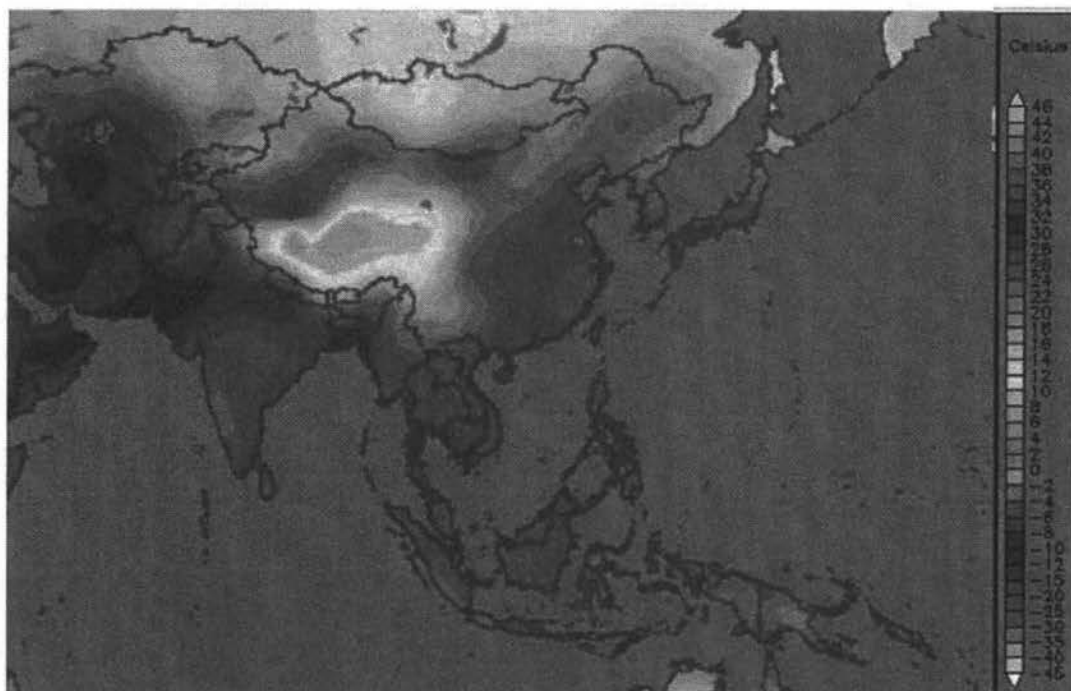
- **Pollution**

- Ash particles ejected during a volcanic eruption can disrupt human activities over large distances from the volcano.
- Eventually settle on ground, block sunlight, suffocate crops, and cause respiratory problems for people and animals.
- Release gases that are harmful to people
- Eg. Eyjafjallajokull in Iceland – 2010 – economic risks

Points of Elaboration: **Benefits**

- Fertile soil
- Precious stones and minerals, building materials
- Tourism
- Geothermal energy

- 2 (a) Study Fig.6 (Insert), which shows the differences in temperatures over part of southern Asia on 18 July 2016.



Account for the differences in temperatures in the area shown on Fig 6.

[5]

1m for data and description of the area (using latitudes/ regions/ countries)

- temps are higher between 22 to 30°C within the tropics/ at lower latitudes/ SE Asia compared to higher latitudes/ Russia and northern parts of China where temps are lower between 2 to 14 °C

2m for explanation of 1 factor:

- temps are higher nearer the equator because the solar angle is higher therefore the sun's rays are more concentrated on a small area.
- temps are lower at the higher latitudes because the solar angle is lower, which means that sun's rays strike at a lower angle and the solar energy is spread out over a wider area.
- in areas much further away from the equator/ higher latitudes, the sun's rays travel through a longer distance of the atmosphere resulting in more insolation to be lost through reflection and scattering/ more energy dissipated

1m for data and description of the area (using latitudes/ regions/ countries)

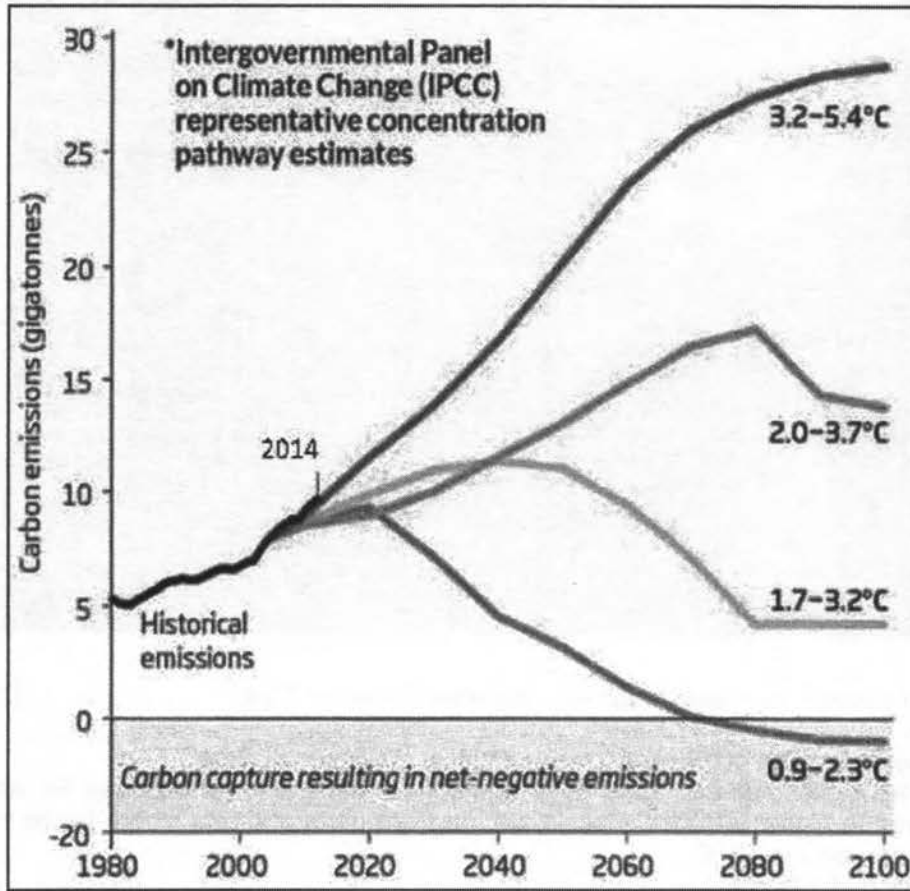
- there is also an area with 0 to 10 °C in the Himalayas, which is a high mountain range/ southwestern parts of China.

2m for explanation of 1 factor:

- Temperatures fall with increasing altitude as air becomes less dense and contains less dust and water vapour.
- This means that long-wave radiation from the Earth's surface can escape more rapidly as they will not be trapped in the atmosphere/ less ability to absorb heat.

*\*Do not accept continental effect for areas near Himalayas*

(b) Study Fig. , which shows the carbon dioxide emissions from the global electric power sector.



Carbon capture results in a net carbon negative when carbon dioxide is removed from the atmosphere.

Fig. 7

Source: U.S. Energy Information Administration, Annual Energy Outlook 2015

(i) Describe the changes in the carbon dioxide emissions from 2000 to 2100.  
[4]

- From 1980 to 2014, increased by about 4 gigatonnes.
- From 2014 to 2100,
  - IPCC's highest estimate: to grow drastically by 18 gigatonnes/ 360%
  - Lowest estimate: carbon dioxide emissions to decrease to -3 gigatonnes which results in a net carbon negative.
- Overall, majority of predicted carbon dioxide emissions would still lead to net-positive emissions and a corresponding rise in global temperatures.

(ii) Suggest reasons for both the changes and range in the projections of carbon dioxide emissions from 1980 to 2100.  
[4]

- Increase between 1980 and 2014 was because of increase in **human** activities that caused greater release of greenhouse gases such as carbon dioxide
- Activities such as industrialisation and urbanisation cause burning of more fossil fuels which releases more carbon dioxide
- These increase in greenhouse gases which trap more heat have led to the enhanced greenhouse effect
- Which leads to increase in global temperatures (global warming), highest estimated increase of between 3.2 to 5.4°C, lowest -0.9 to -2.3°C
- There is a range of projections after 2014 as mitigation measures could be put in place to reduce rate of increase of emissions of greenhouse gases. However, these strategies may be limited in their effectiveness.

(c) Describe the characteristics of tropical cyclones.  
[4]

- Occurrence of tropical cyclones
  - 8–15° latitude from the Equator
  - **Warm sea temperature greater than 26.5°C**
- **Characteristics of tropical cyclones**
  - **Weather systems developing over tropical or subtropical waters. Also known as typhoons and cyclones**
  - **Strong winds exceeding 64 knots or 119 km/hr, circulate clockwise in the southern hemisphere and counter clockwise in the northern hemisphere while spiraling inward to the cyclone centre or eye**
  - **Low pressure with clear skies and calm winds at the eye**

(d) 'National responses to climate change are effective in reducing greenhouse gas emissions.'

How far do you agree with this statement? Give examples to support your answer. [8]

0	Content not relevant to the topic.	4	<ul style="list-style-type: none"> <li>National policies discussed (at least one policy).</li> <li>Examples may be brief. Naming of policy only and brief description.</li> <li>Evaluation for some parts may be one-sided. Successes OR limitations only.</li> </ul>	7	<ul style="list-style-type: none"> <li>At least 2 national responses well-explained.</li> <li>Attempt made to evaluate relative effectiveness.</li> <li>One reason provided to support stand.</li> </ul>
1	Listing out the national responses only.	5	<ul style="list-style-type: none"> <li>At least 2 national responses.</li> <li>Elaboration may be lacking for one policy but good elaboration for the other.</li> <li>Examples for one policy may be brief.</li> <li>Evaluation for some parts may be one-sided.</li> <li>Successes OR limitations only.</li> </ul>	8	<ul style="list-style-type: none"> <li>At least 2 national responses well-explained.</li> <li>Clear criteria used to evaluate relative effectiveness of policies to address the problem of climate change.</li> <li>Two reasons provided to support stand.</li> </ul>
2	Generic statements for national level policies. Lack elaboration and examples.	6	<ul style="list-style-type: none"> <li>At least 2 national responses well-explained with balanced evaluation of each policies successes AND limitations.</li> <li>Good examples/evidence to support. For e.g. students may evaluate the success and limitations of each policy but may not have an overall opinion/evaluation of the relative importance of the policies.</li> </ul>		
3	Able to provide brief description of 1 policy and list the other. One sided-evaluation. Lack examples.				

**National Level Policies****Details****SGP 2012: Reduce GHG emissions by using natural gas as an energy source**

- Launched by MOEnv in 2002, plan aims to generate 60% of SG's energy needs by using natural gas by 2012.
- NG is a cleaner form of energy in comparison to coal because it does not produce smoke.

**Balance & Examples****Successes:**

- As early as 2010, about 79% of SG's electricity was being generated from NG.
- Exceeded the MOEnv's targets ahead of schedule.

**Limitations:**

- NG required complex treatment plants to process and pipelines to transport. These pipelines have high maintenance costs because they need to be laid underground and have to be checked regularly for leakages.

**OR****Details****Green Mark Scheme: Constructing 'green' buildings**

- Launched by the BCA in 2005, the scheme allows buildings to be evaluated and certified according to how energy-efficient and environmentally friendly they are.
- Scheme aims to encourage more new 'green' buildings; which are more energy-efficient: buildings that use less energy to provide the same service.
- An example is buildings that run on solar energy.

**Successes:**

- Existing 'green' buildings, such as Plaza by the Park, Standard Chartered @ Changi and the National Library Building, have reported energy savings of 15% to 35% compared to conventional buildings.
- This cuts down GHG emissions by reducing the use of fossil fuels to generate electricity.

**Limitations:**

- Construction companies & developers in SG tend to be conservative about adopting new ideas and materials to build 'green' buildings.
- 'Green' buildings are built using processes that are environmentally friendly and resource-efficient.
- 'Green' buildings may cost more to build bc the materials may be more expensive.
- Products such as bamboo or recycled metal that are non-toxic, reusable, renewable or recyclable.

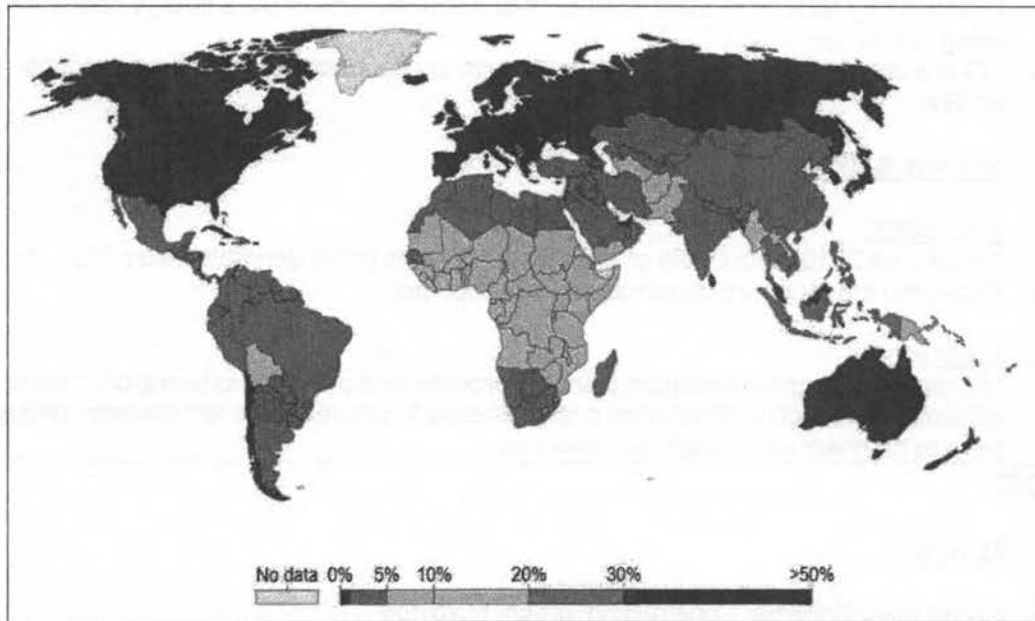
**OR****Plant-A-Tree**



## Section B

Answer **one** question from this section.

- 3 (a) (i) Fig. 8 (Insert) shows child mortality rates in 2015 across the world.



With reference to Fig. 8, describe the pattern of child mortality rates throughout the world. [3]

Reserve 1m for overall, 1m for significant. Max of 1m for anomaly.

#### Overall

- Generally, child mortality rates are lower in developed countries (DCs) than less developed countries (LDCs).
- Child mortality rates are lowest in countries nearest to the equator/ tropics of cancer and capricorn, and decreases further away from the equator towards the north or south poles
- **Do not accept: Uneven pattern**
- **Do not penalise if students write 'DC' instead of 'Developed Country' but emphasize that they should spell it out in formal exams**

#### Significant

- Answers should have region and country examples, comparatives; data (do not penalise if no region for DCs)
- Highest mortality rates of 10 to 20% are located in LDCs in regions such as Sub-saharan Africa, in countries such as the Democratic Republic of Congo, South Sudan and the Central African Republic
- Lowest mortality rates of 0 to about 2% are located in DCs in regions such as North America, in countries such as United States of America and Canada as well as Europe, in countries such as Italy, United Kingdom and France.

#### Anomaly

- South Africa has slightly lower child mortality rates than the rest of the countries in Sub-saharan Africa.

- (ii) Suggest reasons for the pattern of child mortality rates shown in Fig. 8.



[4]

Reserve 2m for one factor. Minus 1m per factor if point is not linked to child mortality rates (still give 1m for point explanation). Links are underlined in answers.

- **Education**

- Low mortality rates in LDCs due to higher levels of education. People who are educated are more likely to be informed on how to lead a healthy lifestyle. Children who receive formal schooling are more likely to learn about health care and nutrition. This reduces risks of children falling sick and dying from illnesses, hence lower mortality rates.
- Parents who are educated also generally earn higher incomes that give them greater access to quality medical treatment, food and living conditions for their children. This reduces child mortality rates as children are able to receive good or immediate medical help when sick.
- When women are educated, they are more informed of nutrition and health care, and hence, child mortality rates tend to be lower. Mothers who are healthy are also able to care and provide for their children more effectively, improving the children's health and lowering child mortality rate.

- **Poverty**

- High mortality rates in LDCs also due to poverty. Poverty is a state of not having enough money and material resources such as food, water, clothing and shelter. Hence, children from families in poverty tend to fall sick easily due to a lack of nutrition, increasing mortality rates.
- Poverty limits the purchasing power that people have to afford basic health care. Children thus may not receive the proper medical treatment they need if their parents do not earn enough money. Hence, they do not get medical attention and may die from simple illnesses.
- Lower mortality rates in DCs due to affluence - abundant supply of money, property and other material goods

- **Other points accepted:**

- Diet
- Living conditions
- Access to safe drinking water
- Proper sanitation
- sub-saharan africa - higher rates of infectious diseases such as malaria in certain countries

(b) Fig. 9 shows the step-by-step production of rice, while Fig. 10 shows how technology can intensify the production of rice.

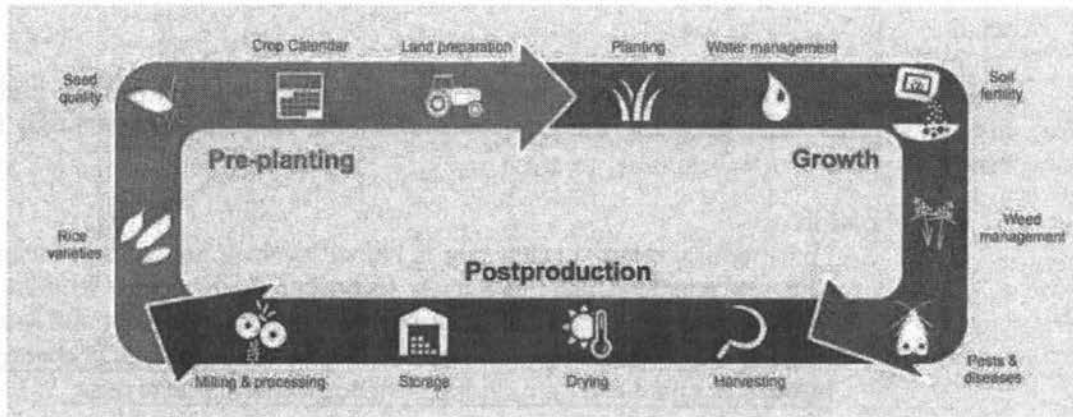


Fig. 9

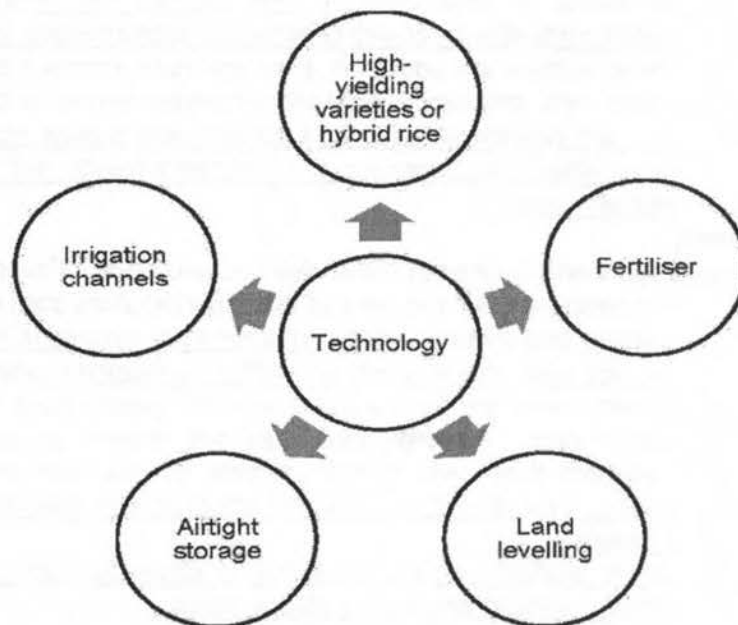


Fig. 10

- (i) With reference to Fig. 9 and Fig. 10, explain how technology is able to intensify production of rice at various stages of production. [5]

Reserve 1m for each stage. Minus 1m for any missing stage. Each point should be linked to 'intensification of production'. If never state which stage, maximum 3m out of 5m. Give 1m for eg.

- **Pre-planting**

- Land can be levelled in order to create flat surfaces that would increase efficiency of farming
  - Allow the use of machinery such as tractors that can plough large areas of land in shorter time and reduce need for manpower
  - Easier sowing of seeds over flat land
  - Less erosion of soil as compared to steeper relief
- Seed quality – use of high-yielding varieties or hybrid rice in order to increase productivity

- These varieties have shorter growing periods and so more harvests can be obtained in a year

- **Growth**

- Water management – use of irrigation channels to ensure sufficient water throughout growing period as rice requires a lot of water to grow
- Fertilizer – use of organic or chemical fertilizer to increase fertility of land or restore fertility of land and ensure sufficient nutrients for plants to grow well

- **Post-production**

- Airtight storage allows for longer shelf life of rice grains - reduces spoilage of food from dampness
- Less food loss or wastage from grains that spoil or rot due to moisture

(ii) Use Fig. 10 and other examples to suggest how shortages in rice supply might occur due to problems that affect the various stages of production. [5]

**Must give at least 2 different stages. Max 3m if never state stage of production. Max 3m for 1 stage of production**

**Growing**

- Extreme weather patterns
  - Might destroy crops during floods or droughts during growing period
  - Cyclone Yasi destroying banana crops in Australia
- Pests
  - Crops may be destroyed if pesticides are not used widely or in the case of an outbreak of pests during the growing season
  - E.g.: worms in Liberia displacing farmers and 46 villages

**Post-production**

- Inadequate logistics of food distribution and storage
  - lack of proper storage and transportation facilities in LDCs and rural farms especially may cause shortages in certain parts of the country
  - Some places may also become inaccessible due to unforeseen circumstances such as landslides
  - e.g.: Timor-este experiences food shortages due to lack of accessibility (many villages in rural, mountainous regions that are not very accessible)

(c) 'Technological strategies are most effective in solving the problem of food shortage.' How far do you agree with this statement? Give reasons to support your answer. [8]

0	Content not relevant to the topic.	4	<ul style="list-style-type: none"> <li>• Technological strategies discussed.</li> <li>• Examples may be brief. Naming of strategy only and brief description.</li> </ul>	7	<ul style="list-style-type: none"> <li>• At least 2 strategies well-explained.</li> <li>• Examples given for both strategies are accurate and</li> </ul>
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			<ul style="list-style-type: none"> <li>Evaluation for some parts may be one-sided. Successes OR limitations only.</li> </ul>		<ul style="list-style-type: none"> <li>detailed.</li> <li>Attempt made to evaluate relative effectiveness.</li> <li>One reason provided to support stand.</li> </ul>
1	Stating or listing strategies (either technological or others)	5:	<ul style="list-style-type: none"> <li>At least 2 strategies given: technological and one other.</li> <li>Elaboration may be lacking for one strategy but good elaboration for the other.</li> <li>Examples for one strategy may be brief or generalised or inaccurate.</li> <li>Evaluation for some parts may be one-sided.</li> <li>Successes OR limitations only.</li> </ul>	8	<ul style="list-style-type: none"> <li>At least 2 strategies well-explained.</li> <li>Examples given for both strategies are accurate and detailed.</li> <li>Clear criteria used to evaluate relative effectiveness of strategies to address the problem of food shortage.</li> <li>Two reasons provided to support stand.</li> </ul>
2	Vague or generalised statements about the strategies. Lack elaboration and examples.	6	<ul style="list-style-type: none"> <li>At least 2 strategies well-explained with balanced evaluation of each strategy's successes AND limitations.</li> <li>Good examples/evidence to support. For e.g. students may evaluate the success and limitations of each strategy but may not have an overall opinion/evaluation of the relative effectiveness of the strategy.</li> </ul>		
3	Able to provide brief description of 1 technological strategy and list the other. One sided-evaluation. Lack examples.				

### Technological Strategies

#### Details

- Storage
  - Refrigerated warehouse storage or refrigerated delivery trucks to keep food fresh for a longer period of time
  - Use of silos in LDCs
  - Successes: crops can be distributed to places further away, reduce loss of crops to pests
  - Limitations: expensive on a large scale, adds on to cost of production

- Example: Timor-Leste – the FAO has helped reduce the loss of crops to pests by 20% to 40%
- Farming technology
  - Use of HYVs, irrigation, chemical fertilisers, pesticides, machinery
  - Success: can grow food in places previously considered unsuitable for agriculture
  - Limitations: many farming technology too expensive
  - Example: Singapore high-tech farms, Green Revolution
- Biotechnology

**OR**

**Political and Economic strategies**

- National strategies: FELDA or high-tech farming
- International strategies: Global Agriculture and Food Security Programme

**Agricultural strategies**

- multiple cropping

**[TURN OVER**

- 4 (a) Fig. 11 (Insert) shows the malaria death rates (per 100,000) throughout the world in 2015, while Fig. 12 shows the number of malaria deaths in the world by age group.

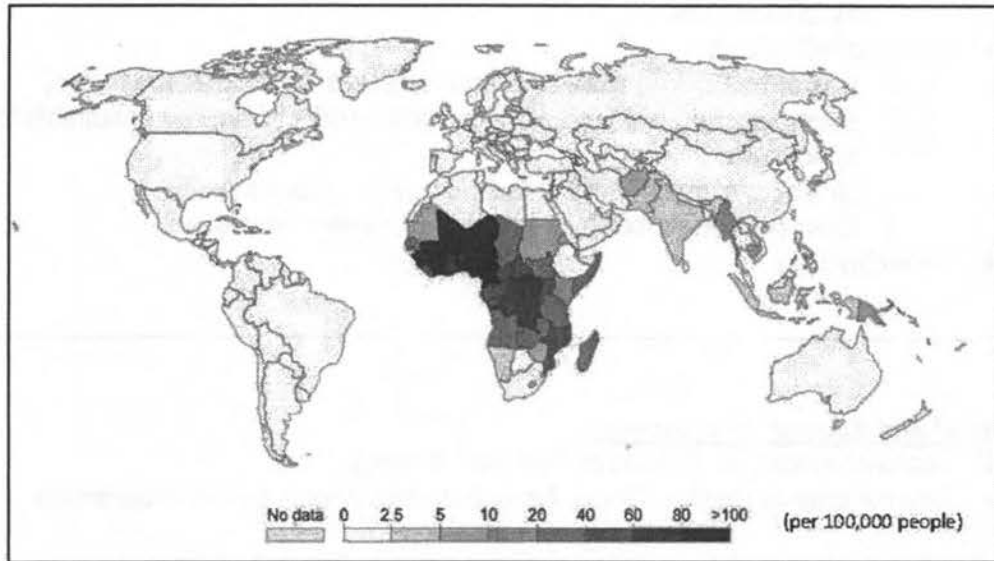


Fig 11

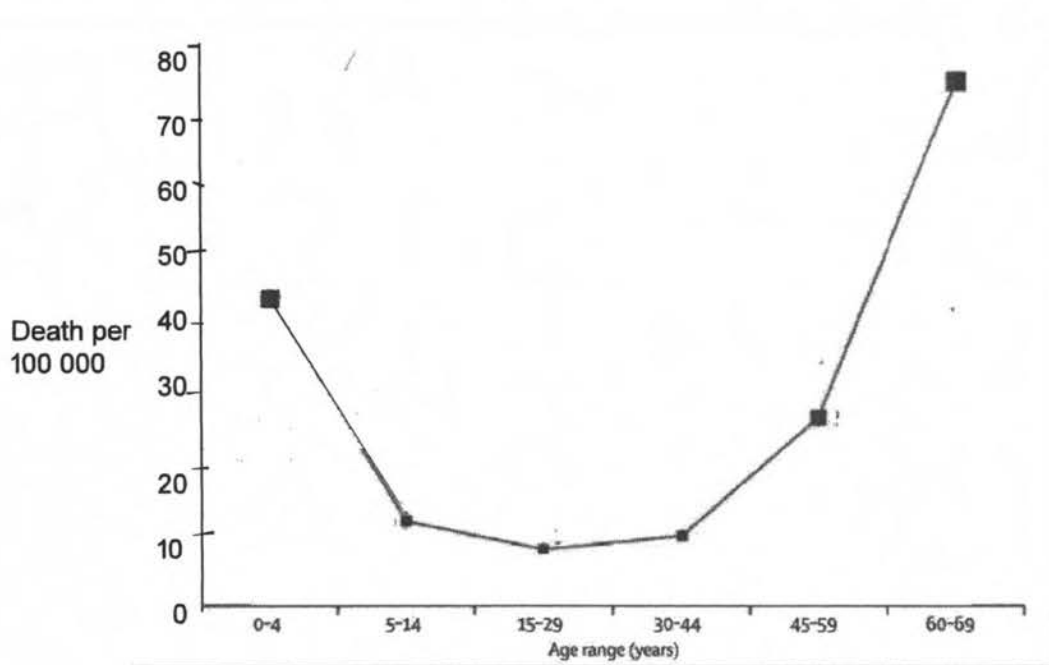


Fig. 12

With reference to Fig. 11 and 12, describe the patterns of malaria deaths in the world and explain the impacts of malaria on people and countries. [6]

**Reserve 1m for describe and 1m for explain.**

**Describe (2-3m):**

- Generally, incidence of malaria occurs among countries located along the equatorial region with tropical climates, within Africa and Asia.
- Highest incidence rates are found in Africa in countries such as Democratic Republic of Congo (60-80 per 100000) and Nigeria (above 80 per 100000), and among young children under 5 years old and older people above 60 years old
- Lower incidence rates in countries in Southeast Asia and South Asia in countries such as Malaysia (0 - 2.5 per 100000) and India (2.5-5 per 100000), and among people between the age of 5 and 44.

**Explain impacts (3-4m):**

- **Increased infant mortality rate** as can be seen in fig. 12, where majority of deaths are among children under 5 years old. A large number may be infants
- **high death rate** globally
- there is a burden on households – increased medical expenses and eventually, funeral costs
  - high death rates also mean that children who lose parents would become orphans and lose their main carer
- countries affected would have to care for these broken families
- loss of productivity due to high death rate among working people

(b Explain how environmental factors contribute to the spread of malaria. [4]  
)

- Overcrowded living conditions
  - Situations where large numbers of people live very close together in a small area. In such conditions, people tend to share same spaces and also tend to interact with each other more often and more closely
  - Housing for refugees and migrant workers is often overcrowded with many people sharing one room. Such dwellings often have unhygienic conditions.
  - Their houses sometimes do not have proper doors and windows to keep out Anopheles mosquitoes that tend to be active at night
- Poor drainage and stagnant water
  - Creates conditions favourable for the growth of mosquito populations
  - In places where there is low awareness of malaria and no precaution is taken to remove pools of stagnant water, mosquitoes breed quickly and without interruption
  - E.g.: Rajasthan, India, water from 8000 km of canals in the Great Indian Thar Desert leaks into many places
- Effect of climate
  - Temperature, rainfall and relative humidity have a direct impact on mosquitos. Monsoons create favourable conditions for mosquitoes to breed by bringing large amounts of rainfall
  - Heavy rains form pools of water that provide ideal and secure breeding grounds for mosquitoes
  - higher temperature decreases the time needed for mosquitoes to mature
  - Post-monsoon period poses more risk for the disease to spread. As the flooded areas dry up, they leave behind pools of stagnant water. Consequently, epidemics of malaria often take place,
  - Such as in Pakistan during 2006 and 2009



- (c) Fig. 13 (Insert) shows the areas in parts of Asia that experience resistance to artemisinin, an anti-malarial drug used to treat patients suffering from malaria.

Using Fig. 13, explain how the resistance to artemisinin is a challenge in reducing the spread of malaria in the region shown. [4]

Reserve 1m for reference

- **Not cured:** Resistance to artemisinin, an anti malaria drug, means that the malaria parasites do not die even with medication. Hence, people infected with malaria will therefore not be cured of the malaria virus
- **Longer period of infection:** They then carry the malaria virus for a longer period of time and have greater ability to spread it to other people and places
- **Population movement:** hence, people resistance to the artemisinin, can spread the malaria virus across borders through expansion diffusion from Tier 1 to Tier 2. The movement of people across borders spreads and transmits the diseases to the new locations.
- Malaria control programmes also become ineffective because it is difficult to monitor the movement of people as the volume and speed of movement occurs at a large scale
- Malaria may also spread from Tier 1 to Tier 2 locations through uncontrolled migration and lack of coordination between countries along border districts



- (d) Fig. 14 shows the main strategies that international organisations such as the World Health Organisation (WHO) and the World Bank employ to prevent and treat malaria.

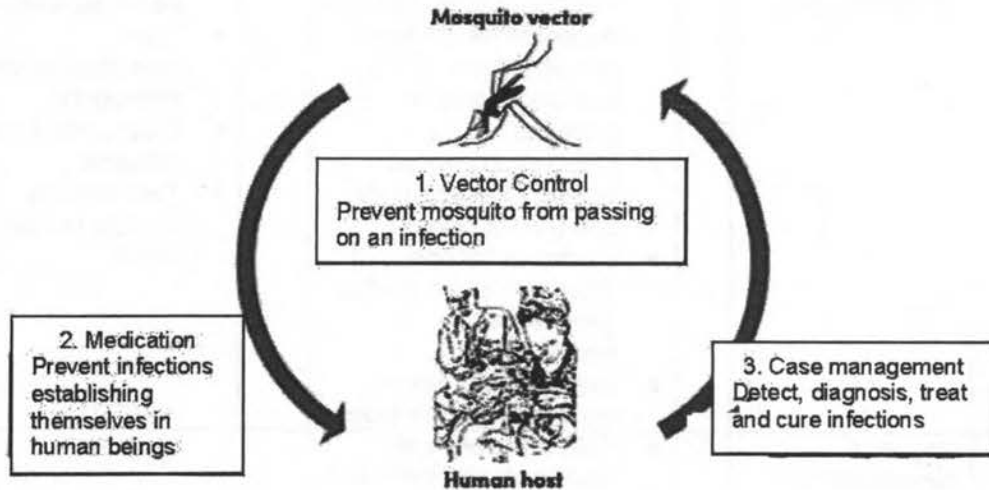


Fig. 14

With reference to Fig. 14 and your own knowledge, describe the strategies that international organisations might take to reduce the spread of malaria. [3]

**Must address all 3 stages.**

- Vector control
  - Through providing funds for thermal fogging
  - Provide items such as insecticide-treated bed nets
- Medication
  - Prevent infections establishing themselves in human beings by providing anti-malarial drugs
  - Lowering taxes on and costs of anti-malarial drugs
- Case management
  - Provide training to close the gap between knowing and doing in malaria control
  - Provide screening for patients
  - Work with local governments, community groups and NGOs
  - Maintain long-term commitment to malaria control by governments and civil society groups

- (e) 'LDCs are more at risk of infectious diseases than degenerative diseases.' How far do you agree with this statement? Support your answer with examples. [8]

0	Content not relevant to the topic.	4	<ul style="list-style-type: none"> <li>● Discussed why LDCs are more at risk of infectious diseases than degenerative diseases</li> <li>● Examples may be brief.</li> </ul>	7	<ul style="list-style-type: none"> <li>● Both sides are well-explained with balanced evaluation.</li> <li>● Good examples/evidence</li> </ul>
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			Naming of examples only. <ul style="list-style-type: none"> <li>• Evaluation for some parts may be one-sided.</li> </ul>		to support. <ul style="list-style-type: none"> <li>• Attempt made to evaluate.</li> <li>• One reason provided to support stand.</li> </ul>
1	Stating reasons for infectious diseases briefly.	5	<ul style="list-style-type: none"> <li>• Discussed why LDCs are more at risk of infectious diseases than degenerative diseases, and why some LDCs face degenerative diseases.</li> <li>• Elaboration may be lacking for reasons for one type of disease.</li> <li>• Examples for one disease may be brief or generalised or inaccurate.</li> <li>• Evaluation for some parts may be one-sided.</li> </ul>	8	<ul style="list-style-type: none"> <li>• Both sides are well-explained with balanced evaluation.</li> <li>• Good examples/evidence to support.</li> <li>• Clear criteria used to evaluate</li> <li>• Two reasons provided to support stand.</li> </ul>
2	Vague or generalised statements about the reasons. Lack elaboration and examples.	6	<ul style="list-style-type: none"> <li>• Both sides are well-explained with balanced evaluation.</li> <li>• Good examples/evidence to support.</li> </ul>		
3	Able to provide brief description of reasons why LDCs face more infectious diseases. One sided-evaluation. Lack examples.				

### Reasons why LDCs are more at risk of infectious diseases

#### Education

- Education refers to the process of teaching and learning, often within the context of formal institutions such as a school or university
- People who are educated are more likely to be informed on how to protect themselves from infectious diseases
- They generally also earn higher incomes that give them better access to quality medical treatment and living conditions
- LDCs have lower levels of education and hence, may be exposed to more infectious diseases due to poor knowledge of its modes of transmission or lack awareness of these diseases
- Level of education for women may also be lower, so they may lack awareness on how diseases may be spread to children or infants
- **Example:** of 60.7 million primary school-age children who were out of school worldwide in 2012, 30.6 million of them were from Sub-Saharan Africa, made up of many LDCs.
- **Example:** LDCs suffer from high rates of HIV/AIDS due to lack of education. People

did not know how to protect themselves and avoid being infected. There are also cultural practices that keep girls from knowing about sex and sexuality until marriage. For example, sex is a very private subject in Nigeria and discussion of it is often seen as inappropriate. Sexuality awareness education is therefore not conducted in schools in Nigeria.

#### Poverty

- Poverty is a state of not having enough money and material resources such as food, water, clothing and shelter
- Poverty limits the purchasing power that people have to afford basic health care
- It also means that people are more likely to be exposed to health risks because of poor quality housing and insufficient nutrition
- Children are most vulnerable to infectious diseases due to poverty. Children living in poverty have poor access to vaccination.
- **Example:** people have limited provision of and access to health care in LDCs. For example, there is a critical shortage of doctors in India. The country has 6 doctors for every 10,000 people. Little healthcare spending in India goes to rural areas, and hence, there are few medical centres in rural areas. As a result, people usually delay receiving treatment as centres are usually far away from their homes.

#### Other accepted points:

- Living conditions (use example from malaria)
- Access to safe drinking water (cholera in Lao People Democratic Republic)

#### Reasons why LDCs are at risk of degenerative diseases

- Degenerative diseases are those where affected tissues or organs deteriorate over time because of lifestyle choices, eating habits, bodily wear and tear or genetic causes
- Some degenerative diseases such as cancer and coronary heart diseases are also strongly linked to a person's diet and lifestyle
- **Example:** with more LDCs becoming more affluent, such as the countries with a growing middle-class such as China and Brazil, these countries are able to afford more food and may consume more meat. Such diets, coupled with lower levels of physical activity, could lead to heart disease, obesity, and diabetes
- Furthermore, coupled with a lack of knowledge of how to lead healthy lifestyles, LDCs may also face more risk of such diseases
- Poor lifestyle choices such as smoking in LDCs also may lead to cancer of the lung.
- **Example:** 80% of the world's one billion smokers are from LDCs. The prevalence of smoking has been increasing in LDCs, particularly in Asia

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