FAIRFIELD METHODIST SCHOOL (SECONDARY)
PRELIMINARY EXAMINATION 2021
SECONDARY 4 EXPRESS & 5 NORMAL (ACADEMIC)

HUMANITIES **2272**
GEOGRAPHY ELECTIVE
Paper 2 **Duration: 1 hour 40 minutes**

INSERT

READ THESE INSTRUCTIONS FIRST

This insert contains Fig. 2 for Question 1(d), Fig. 5 and 6 for Question 2(a), Photographs A and B for Question 5(a), Fig. 9 for Question 5(b), Fig. 10 for Question 6(a), Fig. 11 for Question 6(b) and Photographs C and D for Question 6(c).

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This insert consists of 6 printed pages including the cover page.

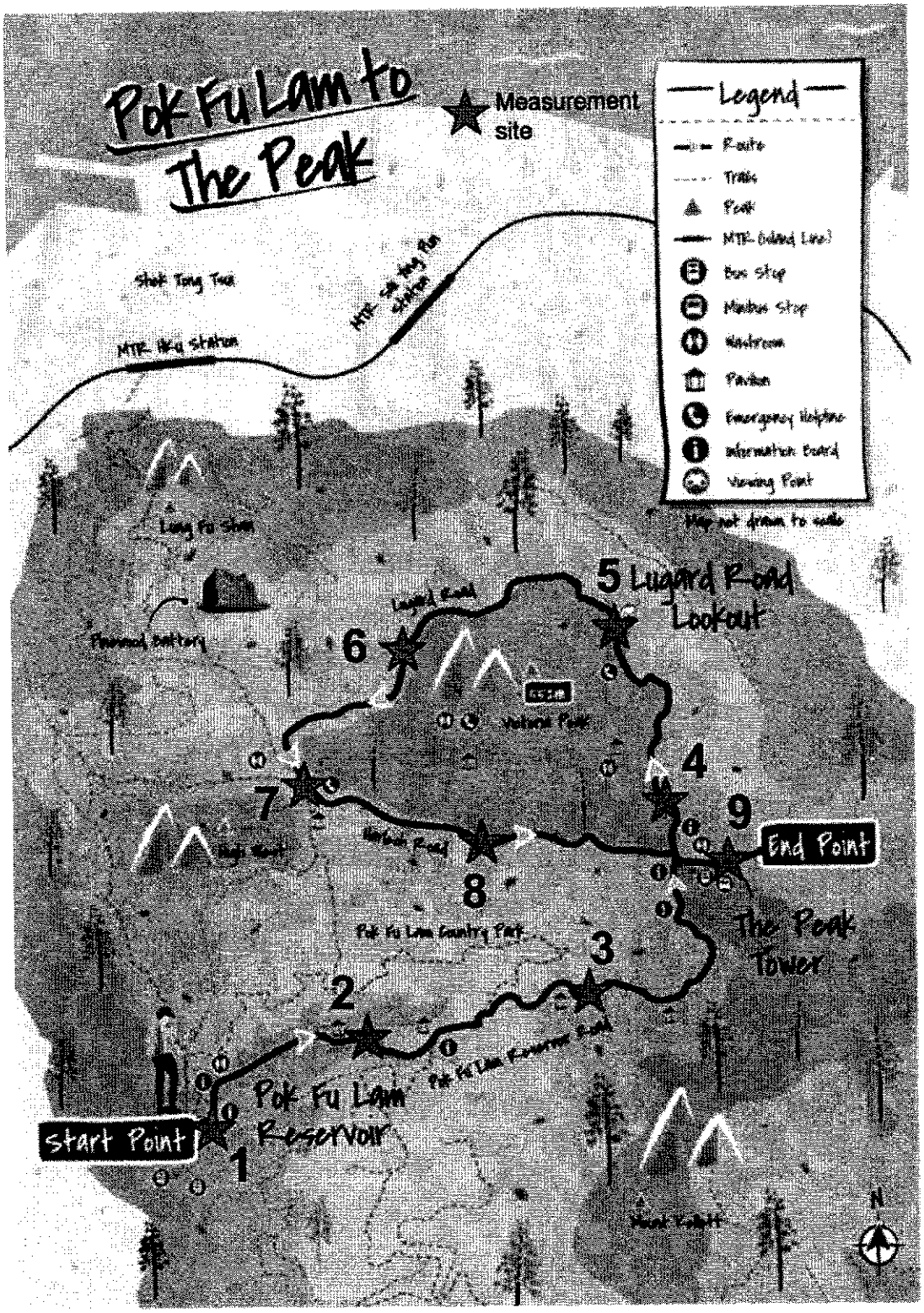


Fig. 2

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Home > The Peak Experience > The Peak Tower

THE PEAK TOWER
SEE YOU AT THE TOP OF THE TOWN

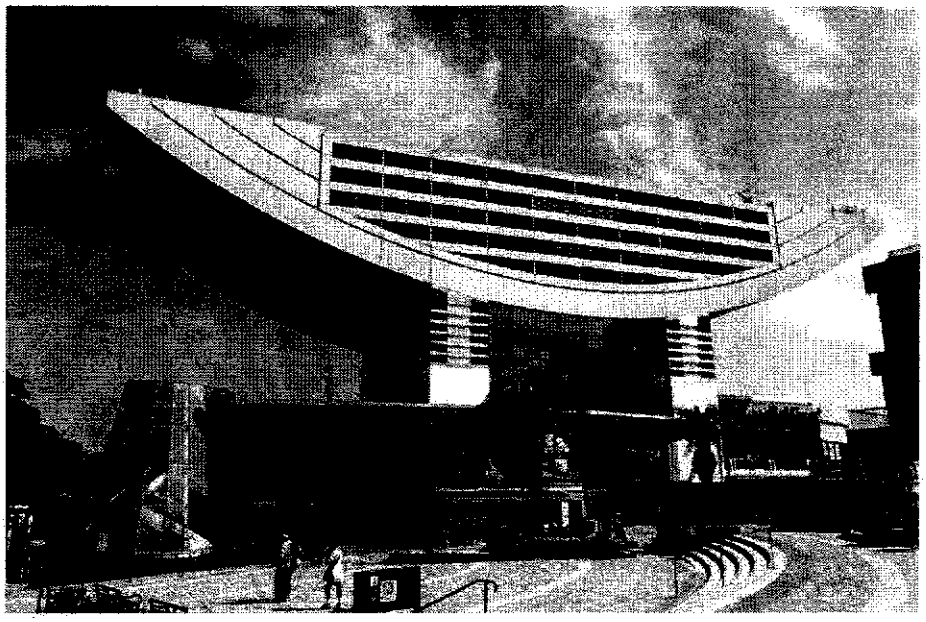


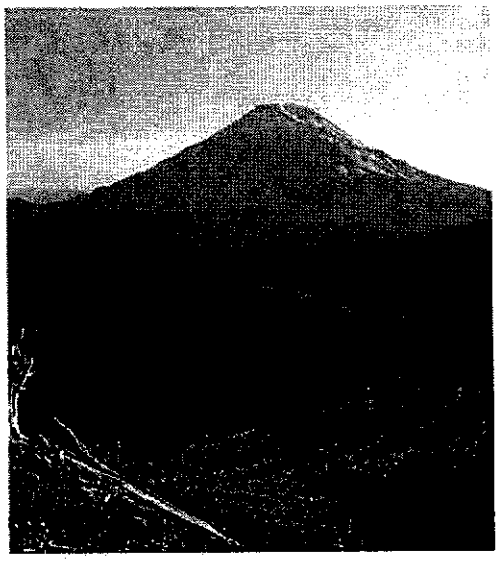
Fig. 5

BEST WAY TO ENJOY AN ULTIMATE PEAK EXPERIENCE

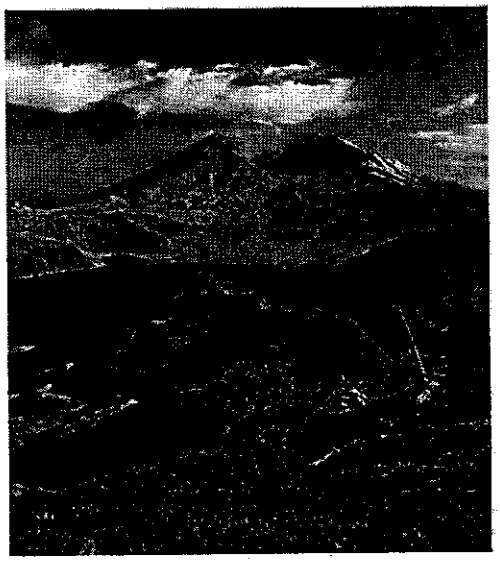


Fig. 6

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Photograph A



Photograph B



Fig. 9

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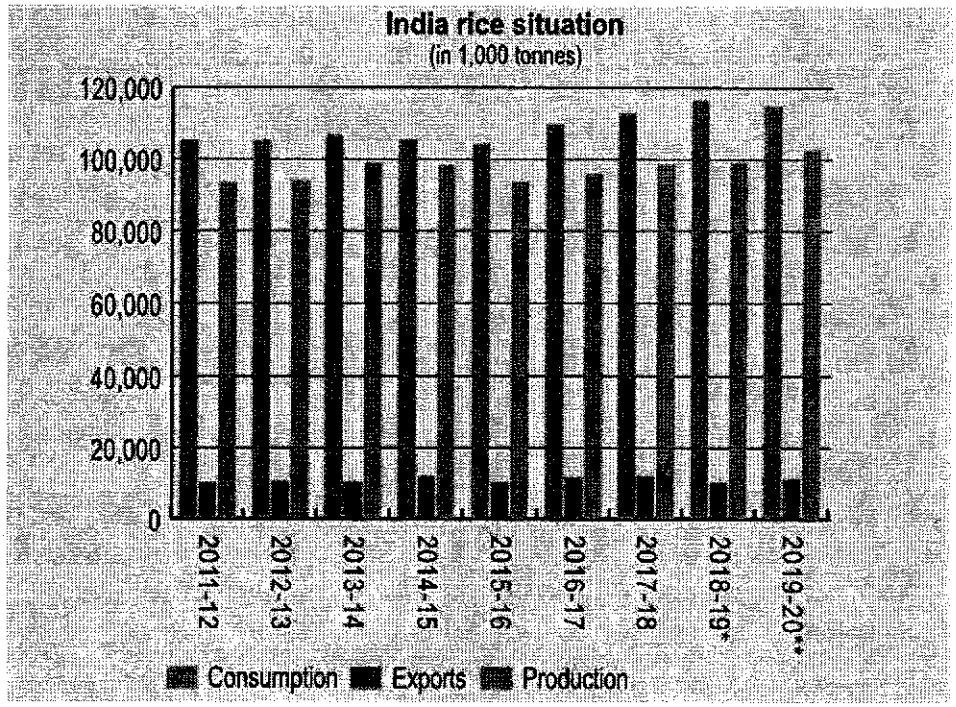
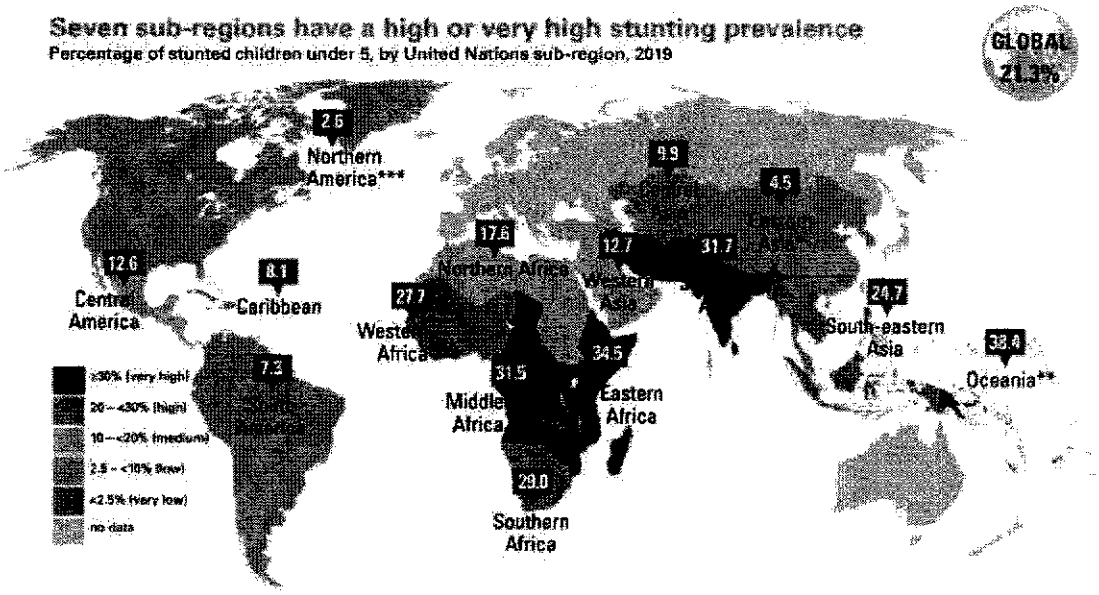


Fig. 10



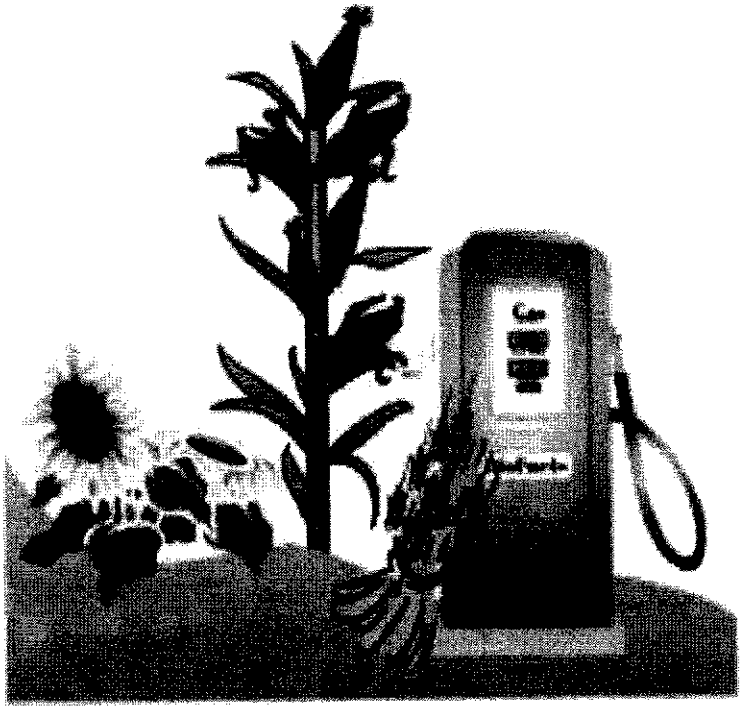
*Stunting - is impaired **growth** and development that children experience from poor nutrition, repeated infection, and inadequate psychosocial stimulation

Fig. 11

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Photograph C



Photograph D

End of INSERT

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FAIRFIELD METHODIST SCHOOL (SECONDARY)
PRELIMINARY EXAMINATION 2021
SECONDARY 4 EXPRESS & 5 NORMAL (ACADEMIC)

HUMANITIES **2272**
GEOGRAPHY
Paper 2 **Duration: 1 hour 40 minutes**

27 August 2021

READ THESE INSTRUCTIONS FIRST

Write your name, class and index number on the Answer Booklet.
Write in dark blue or black pen on both sides of the paper.
You may use a soft pencil for any diagrams or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Write **all** answers on the Answer booklets provided. Complete Section A in one booklet and Sections B and C in another booklet.
Leave 2 lines between each part of the 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, submit Section A and Sections B and C separately.

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

This question paper consists of 8 printed pages including the cover page.

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Section A

Answer **one** question in this section.

1. A group of 20 geography students from Singapore visited Victoria Peak in Hong Kong on a day in November. With an elevation of 552m, Victoria Peak is the highest hill on Hong Kong island. The students were interested to find out how wind speed changes with altitude.

(a) Suggest a guiding question that the students could use to investigate the relationship between altitude and wind speed. **[1]**

(b) The students brought along Instrument X shown in Fig. 1 to measure wind speed.

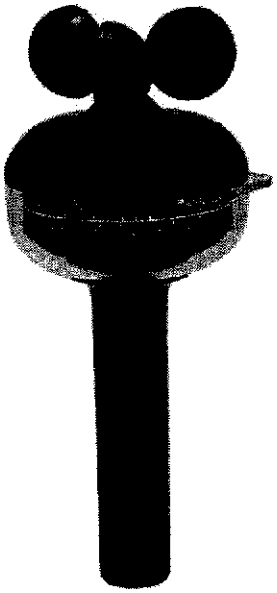


Fig. 1

Name Instrument X shown in Fig. 1. **[1]**

(c) The students started recording the wind speed at the base of Victoria Peak at 8am and walked up Pok Fu Lam Reservoir Road. Fig. 2 (INSERT) shows the walking track from Pok Fu Lam Reservoir Road to Victoria Peak.

They recorded the wind speed at every 50m increase in altitude until they reached The Peak Tower at 400m elevation. The last reading was recorded at around 11am.

Suggest how the 20 students could improve on their data collection method to increase the reliability of their data. **[2]**

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(d) Table 1 shows the wind speed and altitude data recorded by the students.

Site	Altitude (m)	Time	Wind speed (km/hr)
1 (Start)	0	0800	16
2	50	0815	7
3	100	0825	9
4	150	0855	19
5	200	0930	22
6	250	1010	17
7	300	1035	14
8	350	1045	18
9 (End)	400	1100	20

Table 1

(i) Using the information from Fig. 2 and Table 1, plot a best fit line on Fig. 3 in Annex A (at the back of Section A Answer Booklet) to show the relationship between wind speed and altitude. **[2]**

(ii) Using the information from your best fit line in Fig. 3 and Table 1, comment on the relationship between altitude and wind speed. Support your answer with evidence. **[2]**

(e) Upon reaching The Peak Tower at 11am, the students decided to extend their investigation to find out the prevailing wind direction for that day.

(i) Describe how the students should use a compass and a wind vane to measure wind direction readings. **[3]**

Table 2 shows the wind direction readings taken at every one-hour interval from 1100 to 1800.

Time	Wind direction
1100	NE
1200	N
1300	W
1400	NW
1500	NW
1600	N
1700	N
1800	NE

Table 2

(ii) Using information from Table 2, complete the wind rose diagram on Fig. 4 on Annex B (at the back of Section A Answer Booklet) to present the students' data for wind direction. **[2]**

2. A group of 20 geography students from Singapore visited Victoria Peak in Hong Kong on a Monday afternoon in November. The Peak Tower at Victoria Peak (Fig. 5 in INSERT) is 400m above sea level. It is accessible by the

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famous Peak Tram (Fig. 6 in INSERT), road transport and nature trails. It offers a dazzling array of dining, shopping and entertainment venues set against spectacular panoramic views of the vibrant cityscape, making it Hong Kong's No. 1 destination.

The students took the Peak Tram to The Peak Tower. Fascinated by the students' own experience, the students hypothesized that 'The Peak Tram is the main attraction that attracts tourists to Victoria Peak."

The students decided to use a questionnaire to test their hypothesis. They stood at the entrance of The Peak Tower from 1200 to 1400 on that one afternoon in November, and used the systematic sampling method to collect questionnaires from 50 tourists.

(a) Describe one advantage and one disadvantage in using questionnaires during data collection. **[2]**

(b) **(i)** Explain how the systematic sampling method is conducted to collect questionnaires from 50 tourists. **[1]**

(ii) Suggest two improvements to the design of their investigation to increase the reliability of their investigation. **[2]**

(c) Table 3 shows the results collated from their questionnaires regarding the attraction that attracts tourists most at Victoria Peak.

Attraction	Number of tourists
Peak Tram	9
Sky Terrace 428 Sightseeing	15
Shopping	5
Dining	6
Madame Tussauds Hong Kong Wax Museum	7
Madness 3D Adventure Trick Eye Museum	5
Nature Walks	2

Table 3

State and describe an appropriate mode of data presentation that the students could use to present the information in Table 3. **[3]**

(d) After finishing their questionnaire data collection, the students decided to extend their investigation to the environmental impact that tourism has at the nearby Victoria Peak Garden at Victoria Peak.

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The 20 students conducted an environmental perception survey and Table 4 shows their collated data.

	Score					
Positive	**+2**	**+1**	**0**	**-1**	**-2**	**Negative**
No litter	2	11	2	2	3	A lot of litter
Clean and well-kept resting facilities	4	5	4	5	2	Dirty and damaged resting facilities
No overcrowding	3	2	4	8	3	Overcrowded
No footpath erosion	2	4	3	7	4	Footpath erosion
Quiet	3	7	5	3	2	Noisy
Fresh air	5	6	3	4	2	Polluted air

Table 4

Using the information from Table 4, plot a bipolar bar graph on Fig. 7 in Annex C (at the back of Section A Answer Booklet) to present the net perception of each factor. **[3]**

(e) Based on Table 4 and the bipolar bar graph in Fig. 7, evaluate the environmental impacts of tourism at Victoria Peak Garden at Victoria Peak. Support your answer with the overall net score of the students' environmental perception survey. **[2]**

Section B

Answer **one** question in this section.

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3(a) Explain, with the help of examples, why many cities have become tourist attractions. **[4]**

(b) "The greatest hindrance to the growth of tourism is the frequent occurrences of natural disasters."

To what extent do you agree with this statement? Explain your answer. **[8]**

4(a) Explain the difference in annual temperature range between coastal areas and inland areas. **[4]**

(b) "The problems presented by climate change are more economic than environmental for less developed countries."

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

Section C

Answer **one** question in this section.

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5(a) Fig. 8 shows Mount St. Helens, a volcano in Portland, Oregon in the United States of America. Surrounding the volcano are the national park, hunting grounds and many cities.

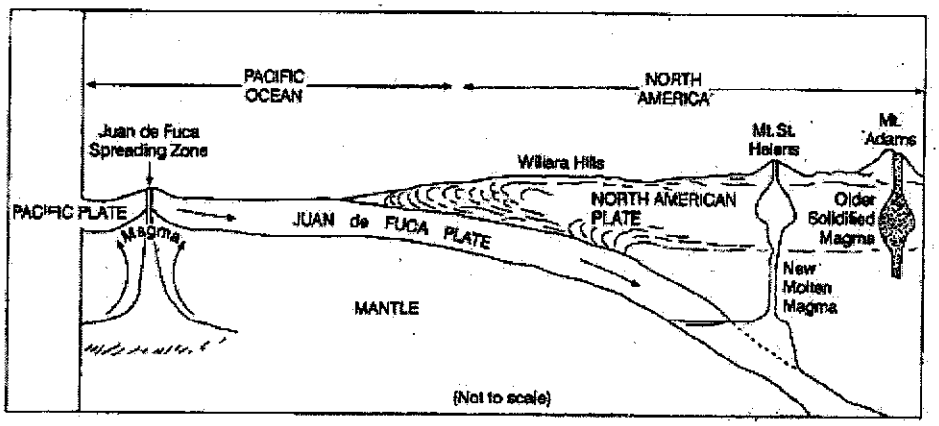


Fig. 8

(i) Use Fig. 8 to explain why Mount St Helens is an active volcano. **[4]**

On 18 May 1980 Mount St. Helens erupted. Photographs A and B (INSERT) show Mount St. Helens before and after the eruption.

(ii) With reference to the photographs, describe the changes in the volcano. **[3]**

(iii) Why do people still want to live in volcanic areas such as those shown in Photograph B? **[3]**

(b) Fig. 9 (INSERT) shows photographs of an earthquake in Turkey on 3 October 2020.

(i) Use Fig. 9 to describe the risks associated with living in earthquake prone areas such as those in Turkey. **[3]**

(ii) Identify the short-term response shown in Fig. 9 and another short-term response and explain the effectiveness of short-term responses to cope with the effects of earthquakes. **[4]**

(c) "The greatest risk for people living in tectonic disaster areas is physical in nature."

How far do you agree with this statement? Explain your answer with the use of examples. **[8]**

END OF PAPER

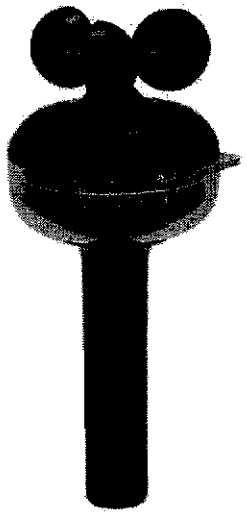
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Suggested Answer Scheme for 2021 Sec 4EXP Elective Geography Prelims

Section A

1.	A group of 20 geography students from Singapore visited Victoria Peak in Hong Kong on a day in November. With an elevation of 552m, Victoria Peak is the highest hill on Hong Kong island. The students were interested to find out how wind speed changes with altitude.	
(a)	Suggest a guiding question that the students could use to investigate the relationship between altitude and wind speed.	**[1]**
	E.g. Does the wind speed increase as altitude increases? (1m)	
	The students brought along Instrument X shown in Fig. 1 to measure wind speed.	
	 **Fig. 1**	
(b)	Name Instrument X shown in Fig. 1.	**[1]**
	Instrument X is a handheld anemometer.	
(c)	The students started recording the wind speed at the base of Victoria Peak at 8am and walked up Pok Fu Lam Reservoir Road. Fig. 2 (INSERT) shows the walking track from Pok Fu Lam Reservoir Road to Victoria Peak. They recorded the wind speed at every 50m increase in altitude until they reached The Peak Tower at 400m elevation. The last reading was recorded at around 11am.	
	Suggest how the 20 students could improve on their data collection method to increase the reliability of their data.	**[2]**
	Any 2 points (2m): The 20 students could have split into 9 smaller groups and collect the wind speed data: at the 9 different altitudes (1m)	

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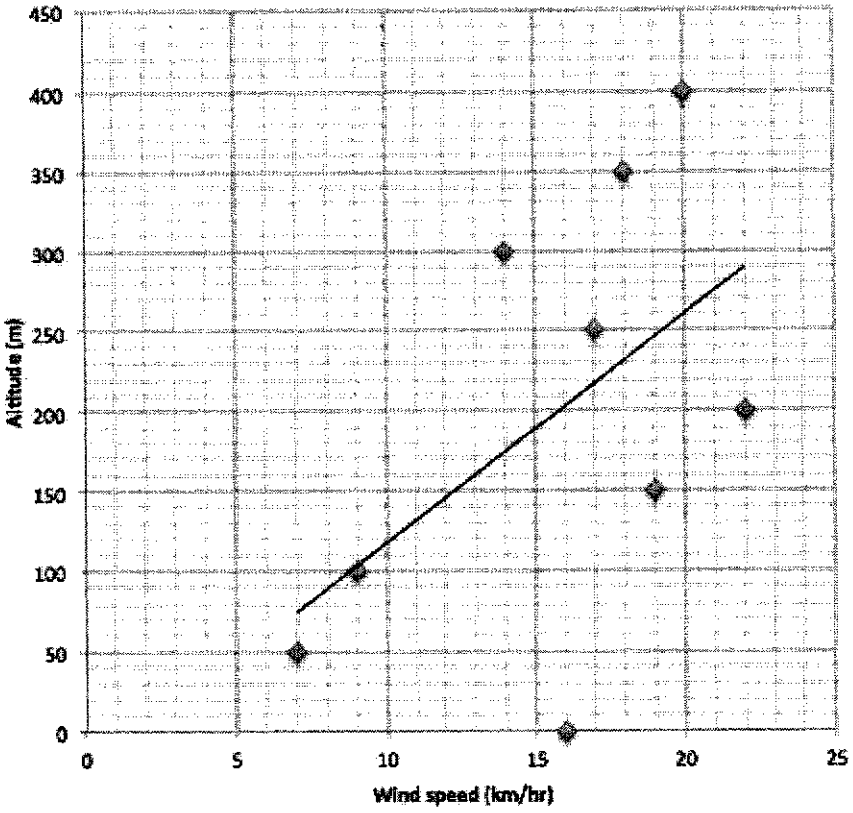
at the same time (1m)
over a few timings throughout the day. (1m)

(d) Table 1 shows the wind speed and altitude data recorded by the students.

Site	Altitude (m)	Time	Wind speed (km/hr)
1 (Start)	0	0800	16
2	50	0815	7
3	100	0825	9
4	150	0855	19
5	200	0930	22
6	250	1010	17
7	300	1035	14
8	350	1045	18
9 (End)	400	1100	20

Table 1

(i) Using the information from Fig. 2 and Table 1, plot a best fit line on Fig. 3 in Annex A (at the back of Section A Answer Booklet) to show the relationship between wind speed and altitude. **[2]**



Title: Relationship between wind speed and altitude (0.5m)
Positive line graph (0.5m)
Best fit/ balanced line (0.5m)

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	Accurate plotting of at least 7 out of 9 data points (0.5m)		
	(ii)	Using the information from your best fit line in Fig. 3 and Table 1, comment on the relationship between altitude and wind speed. Support your answer with evidence.	[2]
	There is a positive/direct relationship between altitude and wind speed. (1m) When the altitude is low at 50m, the wind speed is low at 7km/hr. (0.5m) When the altitude is high at 400m, the wind speed is high at 20km/hr. (0.5m)		
(e)	Upon reaching The Peak Tower at 11am, the students decided to extend their investigation to find out the prevailing wind direction for that day.		
	(i)	Describe how the students should use a compass and a wind vane to measure wind direction readings.	[3]
	The students should use a compass to determine the North direction (0.5m) and position the wind vane's North in the same direction as the compass arrow pointing North. (0.5m) The students should stand at an open area where wind is not obstructed. (0.5m) Students should hold the wine vane away from their bodies and slightly above their heads. (0.5m) Lastly, students should read the wind direction from where the arrow is pointing to. (1m)		
	Table 2 shows the wind direction readings taken at every one-hour interval from 1100 to 1800.		

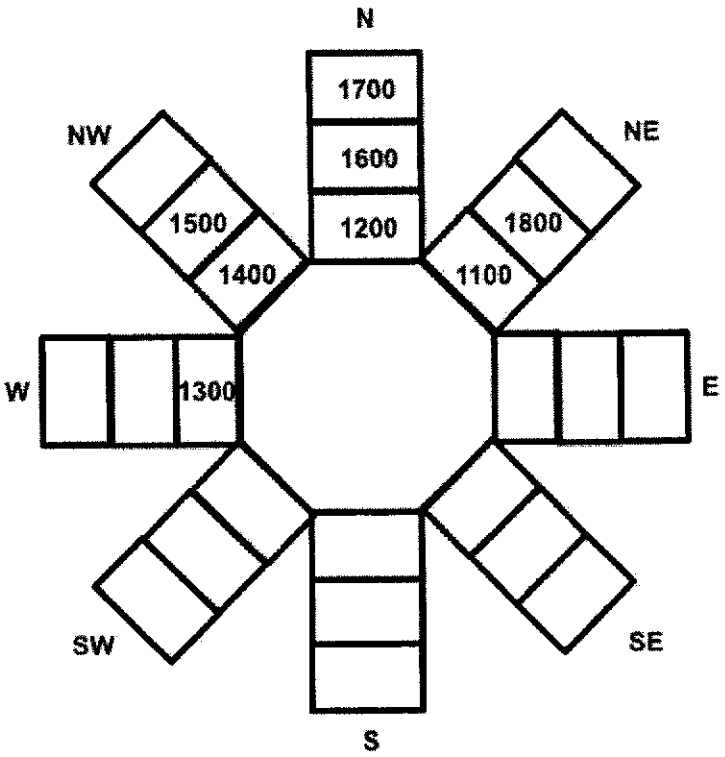
Time	Wind direction
1100	NE
1200	N
1300	W
1400	NW
1500	NW
1600	N
1700	N
1800	NE

Table 2

	(ii)	Using information from Table 2, complete the wind rose diagram on Fig. 4 in Annex B (at the back of Section A Answer Booklet) to present the students' data for wind direction.	[2]

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Label compass direction (1m)
Label timings (1m)

2. A group of 20 geography students from Singapore visited Victoria Peak in Hong Kong on a Monday afternoon in November. The Peak Tower at Victoria Peak (Fig. 5 in INSERT) is 400m above sea level. It is accessible by the famous Peak Tram (Fig. 6 in INSERT), road transport and nature trails. It offers a dazzling array of dining, shopping and entertainment venues set against spectacular panoramic views of the vibrant cityscape, making it Hong Kong's No. 1 destination.

The students took the Peak Tram to The Peak Tower. Fascinated by the students' own experience, the students hypothesized that 'The Peak Tram is the main attraction that attracts tourists to Victoria Peak."

The students decided to use a questionnaire to test their hypothesis. They stood at the entrance of The Peak Tower from 1200 to 1400 on that one afternoon in November, and used the systematic sampling method to collect questionnaires from 50 tourists.

(a) Describe one advantage and one disadvantage in using questionnaires during data collection. **[2]**

Advantage (Any 1m):
- Students can reach out to a larger audience/ can collect larger amounts of data within a short amount of time.
- It does not take each respondent too long of their time.

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- It ensures anonymity and respondents may feel more comfortable and free to express their views.

Disadvantage (Any 1m):

- Respondents may not understand the language/ words used in the questionnaire and misinterpret the question.
- Respondents may be in a rush and provide incomplete or dishonest answers.

Note: The focus of the question is on data collection, hence answers on data representation is not accepted.

(b) (i) Explain how the systematic sampling method is conducted to collect questionnaires from 50 tourists. **[1]**

Determine a reasonable fixed sampling interval (e.g. 2 or 5) and select every nth member of the public (e.g. every 2nd or every 5th) for the questionnaire until 50 questionnaires from tourists are collected. (1m)

(ii) Suggest two improvements to the design of their investigation to increase the reliability of their investigation. **[2]**

Any two improvements:

- The students could extend the investigation to other times of the day (e.g. till dinner)/ days of the week (e.g. weekends) **to capture a wider range of respondents.**
- The students could increase the sample size from 50 to 100 tourists **to have a better representation of the population.**
- The students could conduct the investigation during the summer months **to capture data from a different season.**
- The students could stratify the tourists into different regions **to ensure a wider representation of different types of tourists.**

(Accept any plausible answer regarding 'improvement')

(c) Table 3 shows the results collated from their questionnaires regarding the attraction that attracts tourists most at Victoria Peak.

Attraction	Number of tourists
Peak Tram	9
Sky Terrace 428 Sightseeing	15
Shopping	5
Dining	6
Madame Tussauds Hong Kong Wax Museum	7
Madness 3D Adventure Trick Eye Museum	5
Nature Walks	2

Table 3

State and describe an appropriate mode of data presentation that the students could use to present the information in Table 3. **[3]**

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The students could use a simple bar graph to present the information in Table 3. (1m)
Draw the attractions on the x-axis. (0.5m)
Draw the number of tourists on the y-axis. (0.5m)
Plot the bar for each attraction based on the numbers in Table 3. (0.5m)
Write an appropriate title: The attraction that attracts tourists most at Victoria Peak, Hong Kong. (0.5m)

OR
The students could use a pie chart to present the information in Table 3. (1m)
Convert each data set in Table 3 into percentage of the data set. (0.5m)
Calculate the degree value for each attraction. (0.5m)
Use a protractor and mark out the sector for each attraction based on the degree value for each attraction. (0.5m) Each sector of the pie chart should have a label and percentage.
Write an appropriate title: The attraction that attracts tourists most at Victoria Peak, Hong Kong. (0.5m)

Drawings (X)

(d) After finishing their questionnaire data collection, the students decided to extend their investigation to the environmental impact that tourism has at the nearby Victoria Peak Garden at Victoria Peak.

The 20 students conducted an environmental perception survey and Table 4 shows their collated data.

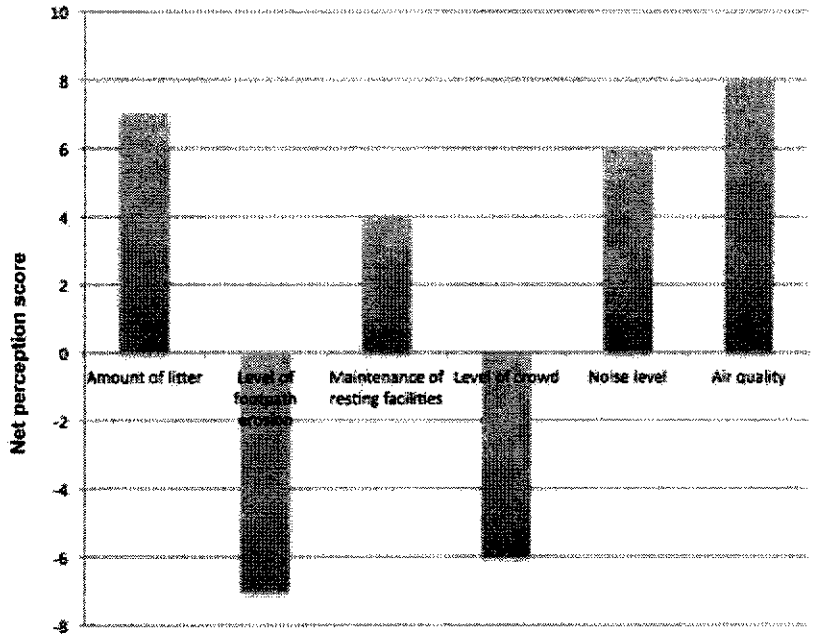
	Score					
Positive	**+2**	**+1**	**0**	**-1**	**-2**	**Negative**
No litter	2	11	2	2	3	A lot of litter
Clean and well-kept resting facilities	4	5	4	5	2	Dirty and damaged resting facilities
No overcrowding	3	2	4	8	3	Overcrowded
No footpath erosion	2	4	3	7	4	Footpath erosion
Quiet	3	7	5	3	2	Noisy
Fresh air	5	6	3	4	2	Polluted air

Table 4

Using the information from Table 4, plot a bipolar bar graph on Fig. 7 in Annex C (at the back of Section A Answer Booklet) to present the net perception of each factor. **[3]**

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	 0.5m for each bar column: Amount of litter: 4 + 11 + 0 – 2 – 6 = **7** (0.5m) Level of footpath erosion: 4 + 4 + 0 – 7 – 8 = **-7** (0.5m) Maintenance of resting facilities: 8 + 5 + 0 – 5 – 4 = **4** (0.5m) Level of crowd: 6 + 2 + 0 – 8 – 6 = **-6** (0.5m) Noise level: 6 + 7 + 0 – 3 – 4 = **6** (0.5m) Air quality: 10 + 6 + 0 – 4 – 4 = **8** (0.5m)	
(e)	Based on Table 4 and the bipolar bar graph in Fig. 7, evaluate the environmental impacts of tourism at Victoria Peak Garden at Victoria Peak. Support your answer with the overall net score of the students' environmental perception survey.	**[2]**
	Overall net score of the students' environmental perception survey = 7 – 7 + 4 – 6 + 6 + 8 = 12 (1m). Therefore, tourism has no negative impact on the environment at Victoria Peak Garden at Victoria Peak. (1m)	

Section B

3a.	Explain, with the help of examples, why many cities have become tourist attractions. [Explain any 2 points <u>with examples</u>] - *Presence of historical buildings/ museums/monuments/castles* Eg Eiffel Tower in Paris, Great wall of China in Beijing, Angkor Wat in Siem Reap, Cambodia, Roman Colosseum in Rome, Italy, Taj Mahal in New Delhi - *Famous landmarks /buildings/towers* Eg Sydney , Statue of Liberty in USA, Leaning tower of Pisa in Italy, Great Wall of China in Beijing - *Culture/Theatres/cinemas/galleries* Eg Louvre Museum in Italy, muti-culture-ism in Singapore or Malaysia,	**[4]**

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	- *Food and nightlife* Eg food streets in Bangkok, Taipei OR other relevant examples - *Shopping* Eg Bangkok, Tokyo, Milan, Sydney or other relevant examples - Spiritual – eg Mecca in Bakkah city, Saudi Arabia, Jerusalem in Israel, Vatican City in Rome, Italy, Bodhgaya, Bihar, India. - Places of conflict – eg Auschwitz, Poland, Cu Chi Tunnel in Ho Chi Minh City, Vietnam, National Memorial Sept 11 in New York City, USA. (2m if just listing)	
b.	"The greatest hindrance to the growth of tourism is the frequent occurrences of natural disasters." To what extent do you agree with this statement? Explain your answer. Natural hazards refer to earthquakes, floods or volcanic eruptions. Such hazards can pose great risks to the safety of tourists and may disrupt essential tourist infrastructure such as airports and roads which can discourage tourists from visiting the place, disrupting international tourism. Natural hazards may also discourage locals from travelling within or out of the country thus disrupting regional tourism. [E] In 2011 after the Tohuku earthquake and tsunami, Japan's total tourist arrivals fell by 28%. Tourists especially those from Japan and S. Korea avoided Japan and the reduction in tourists fell from 12% in March to 8% in April and 2% in May. These reductions have a huge impact on the economy of Japan. [E] In 2010 when the volcano in Iceland Eyjafjallojokull erupted for nearly a month, it paralyzed flights around Europe, destroyed agriculture and caused the glacier to melt. While the death rate was small, close to 800 residents had to be evacuated and affected neighbouring economies such as United Kingdoms. However, other factors can pose significant disruptions to tourism. [D/E] **Unfavorable political situation** may include political conflicts and can pose dangers to tourists/ disrupt services and cause damage to infrastructure causing some governments to issue travel advisories/ discouraging people from travelling thus disrupting tourism. [E] Due to Libya's civil war in 2011, commercial airlines reduced or stopped their flights to Libya. Between March to October 2011, there were no commercial flights thus no tourist arrivals by air. Egypt reached a peak of 14.7 million tourists in 2010. In Feb 2011, 'Arab Spring' uprising took place in Egypt and caused a sharp decline in tourist arrivals to 9.8 million. [E]The protests in Hong Kong from June 2019 to November 2019 reduced the number of tourists to Hong Kong by 40% (Hong Kong received 65 million tourists). Flights were also interrupted in August and more than 200 flights were cancelled because of the protests at the airport. Travel advisories from nearly 22 countries discouraged tourists from visiting Hong Kong and these have resulted in loss of tourism revenue for Hong Kong OR the protests in	**[8]**

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Myanmar in 2021 has reduced tourism to negative figures as it is not only unsafe to travel, many investors are leaving the country and countries around the world are boycotting the military regime.

[D/E] **Recessions** cause a general slowdown in economy which causes loss of income/ jobs/ demand for goods and services thus discouraging people from travelling thus disrupting regional/ international tourism in the long run.
[E] European Sovereign Debt Crisis which started in 2000 when Greece was unable to pay its debt caused other countries using Euro to be faced with collapse of businesses and financial institutions, and massive unemployment.

[D/E] Sudden and widespread occurrence of **diseases** in an area may cause fear of infection causing government agencies to issue travel advisories/ discouraging people from travelling thus disrupting regional/ international tourism in the long run.
[E] SARS outbreak spread over 6 months in 2003, killing 775 people and infected more than 8000 in 25 countries. Hong Kong's hotel occupancy dropped from 82 to 15% in May 2003. Singapore's visitors down nearly 70% for most of April 2003. OR COVID19 that spread so quickly from China in late December to many parts of the world, caused massive lockdown in many countries and borders closure. Tourism came to a standstill as few could leave the countries and many airlines have their planes grounded.
[E] COVID 19 has reduced tourism to a standstill as many countries enter lockdown. Tourism sector was hardest hit as international travels were mostly banned in all countries, resulting in losses in terms of jobs, revenues, closure of business and so forth.
[Eg] International tourism in 2020 has resulted in a loss of about 1 billion arrivals and US$1.1 billion in international tourism receipts. Tourism may not return to pre-COVID levels until 2024 or beyond.
[Eg] In Singapore, tourist arrivals fell significantly, by nearly 90% and even the national carriers are mostly stalled in Singapore or in Australia.

FINAL PARAGRAPH
Compare scale of disruption and give a paragraph on which factor caused the most significant disruption to tourism.

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

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

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	Level 3 (7-8 marks) Answers will be comprehensive and supported by sound knowledge. Both agree and disagreement are considered and well supported. Reasoning is clear and logical with good expression of language. Examples or other evidence are presented in more than one place in the answer. L1: One sided essay (i.e. only given factor: natural hazards) L1/1-2: One factor only (e.g. disaster), weak L1/2-3: One factor only (e.g. disaster), strong L2: Both sides are presented (i.e. given factor and other factors) L2/4: Given factor and one other factor (weak) L2/5-6: Given factor and one other factor (strong)/ Given factor and two other factors (weak) L2/6: Given factor and two other factors (strong) L3: Both sides must be weighed. L3/7: Evidence of weighing but weak reasoning/ support. L3/8: Evidence of weighing with sound reasoning and support.	

4a.	Explain the difference in annual temperature range between coastal areas and inland areas. 3^ -Coastal areas have much smaller temperature range compared to inland areas and this is due to maritime and continental effects -The maritime effect is the effect that large sea bodies have on climate and cause coastal areas to have smaller annual temperatures. - In summer, the sea heats up and cools down more slowly than the land. The air over the sea is cooler than the air over the land. This cooler air over the sea lowers the temperature of coastal areas, therefore the coastal areas would be cooler than inland areas. - During winter, the sea cools more slowly than the land. The air over the sea is warmer than the air over the land. So the cooler air over the sea lowers the temperature of coastal areas, making the coastal areas cooler than inland areas. Hence coastal areas experience cooler summers and warmer winters. - On the other hand, when an inland area is too far from the sea, the temperature is not regulated by the sea. Hence the inland areas experience warmer summers and colder winters.	**[4]**
b.	"The problems presented by climate change are more economic than environmental for less developed countries. " How far do you agree with this statement? Support your answer with examples. **Economic**	**[8]**

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	[P/E]The problems presented by climate change can be economic. Higher temperatures have resulted in greater amounts of water vapor and latent heat in a warmer atmosphere as such, resulting in extreme weather events. [Eg]For example, the increase in temperatures will reduce the supply of cocoa beans in many countries in West Africa which produce half of the world's cocoa beans to make chocolates. When the demand for this crop exceeds the supply, the food price will increase. The producing countries may suffer economic loss due to a smaller profit margin from the sale of crops. [Eg]Increased temperatures also reduced the production of crops that require cooler weather conditions to grow such as fruits and nuts grown in Yunnan, China. Besides crops, the impact on grazing and welfare of domestic livestock are affected because of rise in temperature and countries that rely on these farming practices such as those in Sahara or tropics, have their livestock yields reduced. This will impede economic activities from taking place, causing economic losses. [P/E] Small changes in the climate could threaten people who live in areas less than 10m above sea level. Over 600 million people worldwide are known to live in low-lying areas and islands. In fact, two thirds of the world's largest cities are located in coastal areas and are at risk during to rising sea level. [Eg]Cities and countries in low lying areas such as Shanghai, Bangkok, Bangladesh, Maldives, Philippines and even islands such as Tuvalu and those in the Pacific regions will be affected. Infrastructure will be destroyed or disrupted as roads, electricity and other essential services will be affected. The governments of these cities will have to increase expenditure to ensure that these services are repaired. [Eg] Furthermore, tourism is one of the world's largest industry in many less developed countries such as Maldives and the Philippines. Many locals are hired to work in this industry. Thus with the rise in sea level due to climate change, many locals may lose their jobs and livelihood and this will affect the economic growth of the country. In some instances, farm lands could be destroyed, rotting crops and the livelihood of farmers. For example, in 1998, the worst flood in Bangladesh covered 60% of the land, and caused extensive economic damages such as killing half a million cattle and poultry. Some countries will also need to spend additional expenditure on constructing sea walls to reduce the impact of climate change. The loss of income, jobs, increased expenditure will be economic problems to less developed countries. **Environment** [P/E] Higher temperatures as a result of climate change, can cause the melting of glaciers in Greenland and Antarctica. Higher temperatures in the atmosphere cause water in seas and oceans to expand. These increase the sea level. Rising sea levels results in flooding which threaten low-lying areas and islands. Coastal lands and wetland habitats will face extinction if the sea level continues to rise.	

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[Eg] As the sea level rises, mangroves found in Bangladesh, Indonesia, India, and Thailand will have to compete for space to colonize as human activities such as construction of sea defenses shift further inland.
[Eg] Many forms of wildlife which make their home on the beaches will be affected. Some animals will find their habitats disrupted and may no longer survive in the environment, resulting in endangered animals. Sea turtles such as those found in Malaysia and Indonesia may be endangered and this could impact not only the environment but the ecosystem. Furthermore, the rise in sea level will allow more water to seep into the ground and the soil near the coasts will become saltier. Some plants may not be able to cope with the change in soil salinity and may disappear from the shoreline.

Conclusion
The problems presented by climate change have the ability to wreak havoc on many countries. While the economic problems will impact the survival of the countries, the environmental problems impact the ecosystem which provides the resources for survival of these countries. For example the mangrove environment is a breeding ground and habitat for varied marine life, providing food for the countries or protecting less developed countries from coastal disasters such as tsunamis. On the whole, whether economic or environmental, the detrimental effects of climate change are felt more on less developed countries, as these countries are least equipped to adapt, socially or economically.

Section C

5(a) Fig. 8 shows Mount St. Helens, a volcano in Portland, Oregon in the United States of America. Surrounding the volcano are the national park, hunting grounds and many cities.

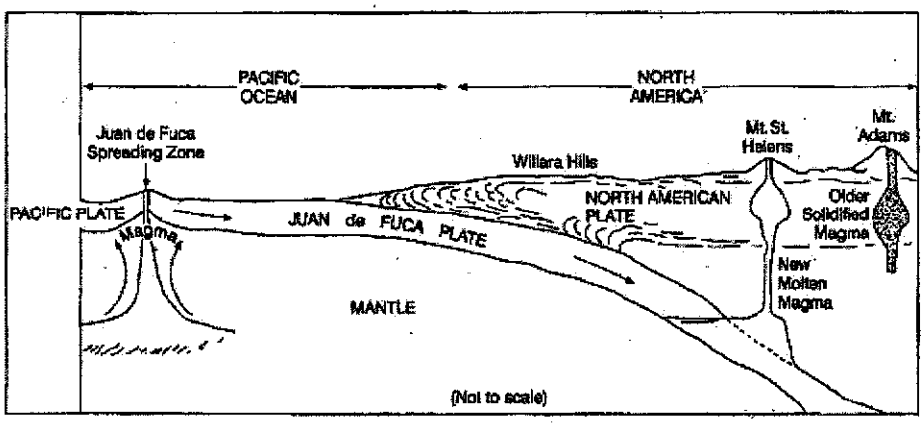


Fig. 8

(i) Use Fig. 8 to explain why Mount St Helens is an active volcano. **[4]**

- Juan de Fuca Plate and North American Plate are converging. (1m)
- Juan de Fuca plate is subducted under the North American Plate at a destructive boundary (1m)

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	- Magma production in the subduction zone, some of which are forced to rise because of weaknesses and destruction in the crust (1m) - As magma under Mount St Helens is not solidified, the pressure continues to build up and causes the volcano to erupt periodically. (1m)		
	On 18 May 1980 Mount St. Helens erupted. Photographs A and B (INSERT) show Mount St. Helens before and after the eruption.		
	(ii)	With reference to the photographs, describe the changes in the volcano.	**[3]**
	With reference to the photographs, describe the changes in the volcano - Peak blown off - Lower in height - Big caldera - Absence of glaciers		
	(iii)	Why do people still want to live in volcanic areas such as those shown in Photograph B?	**[3]**
	- Variety of activities for tourists - eg hiking, outdoor camping, mountaineering, or enjoy the beautiful lakes - Provision of jobs for those who live in volcanic areas eg tour guides, small business/shops - Fertile soils suitable for growth of crops eg pumice and ash are fertile soils for growth of crops.		
(b)	Fig. 9 (INSERT) shows photographs of an earthquake in Turkey on 3 October 2020.		
	(i)	Use Fig. 9 to describe the risks associated with living in earthquake prone areas such as those in Turkey.	**[3]**
	- Destruction to properties and infrastructure (eg buildings, cars, roads) - Destruction to services (water supply) - Loss of lives and homes (from the damaged buildings)		
	(ii)	Identify the short-term response shown in Fig. 9 and another short-term response and explain the effectiveness of short-term responses to cope with the effects of earthquakes.	**[4]**
	Identify: Search and rescue operations (2m) - These operations are coordinated to locate and free victims who are trapped under collapsed buildings and many lives can be saved from swift actions. Sometimes sniffer dogs and heat sensors are used to rescue trapped victims. - However such efforts can be hindered by damaged communications infrastructure caused by fires from earthquakes. Moreover there are time constraints as victims usually may not survive after 3 days of being trapped without food and water. Provision of emergency food, water and medical supplies (2m) - To ensure hunger, dehydration and the spread of diseases are kept to a minimum, these immediate provisions provide relief and allow survivors to live longer		

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	- However if transport infrastructure is destroyed, the provision of items will be delayed or prevented from reaching the victims.	
(c)	"The greatest risk for people living in tectonic disaster areas is physical in nature." How far do you agree with this statement? Explain your answer with the use of examples.	[8]
	Tectonic disasters refer to disasters from earthquakes, tsunami, volcanic eruption **Environmental risks** [E] When a volcano erupts, the materials that are ejected include lava, steam, gaseous sulphur compounds, ash and broken rock pieces. Volcanic eruptions damage the environment because of a number of toxic gases such as carbon dioxide and sulphur dioxide gas and so forth. Sulphur dioxide can be converted to sulphuric acid and bring about acid rain. (Link to risk to people) Eg]. During the extensive volcanic eruption that happened in 1991 when Mt Pinatubo erupted in the Philippines, it released 17 million tonnes of sulfur dioxide into the atmosphere and had effects on global climate. [Eg] Acid rain is responsible for severe environmental destruction across the world and occurs most commonly in the North Eastern United States, Eastern Europe and increasingly in parts of China and India. China had its worst spell of acid rain in August in 2006 with Beijing among the hardest hit. Change to Air Pollution **Physical risks (eg to the environment)** [P/E]*Landslides* happen when violent volcanic eruptions moved large and rapid movement of soil, rocks and vegetation and this can obstruct the flow of rivers, causing flooding, and road blocks and bury villagers. [Eg]For example the eruption of Nevado del Ruiz in South America (Colombia) triggered lahars which are landslides of pyroclastic flows mixed with water. The lahars of wet volcanic debris engulfed the town of Armero [Eg] For example the volcanic eruption from Mt Merapi (Indonesia) covered villages in ash, destroyed livestock and farmland [Eg]*Tsunamis,* which are giant waves because of earthquake that strike underwater or underwater explosive volcanic eruption, released massive amounts of water to the land at high speed of around 800 per km. For example, the 2004 Indian Ocean earthquake and tsunami was recorded to be the deadliest in history as it buried the whole city of Sendai in Tohoku, Japan. **Social risks** [P/E] The pollutants from a volcanic eruption can be highly toxic for human and pose health risks. These tiny particles can irritate the eyes and get into	

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people's lungs and can cause **health problems**, or can make existing health problems worse. These include upper respiratory problems, like pneumonia and bronchitis, and even permanent lung damage.

[Eg] The 2010 Eyjafjallajokull volcano ejected extensive cloud ash clouds causing people to suffer respiratory problems

[P/E] Volcanic materials such as lava and pyroclasts (ash, rock fragments and volcanic bombs) are extremely hot and can damage anything in its paths. **Deaths** resulting from major earthquakes can be instantaneous (due to severe crushing injuries to the head or chest, external or internal haemorrhage) or delayed (occurs within days and can be due to dust inhalation of collapsed building, dehydration, hypothermia, hyperthermia, crush syndrome
[Eg] For example the volcanic eruption from Mt Merapi (Indonesia) covered villages in ash, killed people, destroyed farmland and affected the livelihood of the rural population. In East Java, Mt Kelud ruptured and displaced more than 130 000 people

OR

[Eg] The earthquakes in Sichuan in 2008 took almost 70 000 lives while the earthquake in Haiti in 2010 took more than 300 000 lives and caused the population to suffer from water-borne diseases.
OR
[Eg] Landslides as a result of earthquake in Nepal in 2015 killed 8000 people and injured many.
[Eg]The tsunami in Indian Ocean in 2004 took nearly 230 000 lives and displaced thousands across 14 countries.

Economic risks
[P/E]Many businesses will be unable to trade because of destruction to premises, stock, machinery, facilities, transport networks, supplies and more
[Eg] For example the volcanic eruption from Mt Merapi (Indonesia) covered villages in ash, killed livestock, destroyed farmland and affected the livelihood of the rural population.
[Eg]The earthquake in Haiti in 2010 destroyed massive properties
[Eg] The 2004 **tsunamis which** swept across the **Indian Ocean** within hours hit 14 **countries** and affected sources of livelihood.
[Eg] The 2010 Eyjafjallajokull volcanic eruption posed danger to aircraft engines, caused closure of air space in parts of Europe, disrupted air travel and caused the airline industry to lose billion in revenue

Additionally, any natural disaster will impact the economy as there will be damage to transport infrastructure, health facilities, and basic services. Additional costs will be required to rebuild infrastructure, provide health care, and compensate people who lose their land and properties. This can be a setback to the economies as more funds will be required, slowing down economic growth.

CONCLUSION

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	Weighing of factors based on impact of risks on the people	

End of suggested answer scheme

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