NAME:		( )
CLASS:	TEACHING GROUP:	MARKS /50

PEI HWA SECONDARY SCHOOL

PRELIMINARY EXAMINATIONS 2022

Secondary Four Express / Five Normal (Academic)

Humanities **2272/02**

Paper 2 Geography **30 August 2022**

1 hour 40 minutes

MARKING SCHEME

Section A (13 Marks)

Answer **ONE** question from this section.

1		A group of students from Pei Hwa Secondary School, Singapore, visited Nairobi, Kenya after the year-end examinations. As part of their Geographical Investigation project, they decided to find out the impact of tourism on the Kenyan people.	
	(a)	State a suitable hypothesis for their research	[1]
		Marker's Comments: A hypothesis is a statement of claim about the intent/focus of the GI. Suggested hypothesis must be related to the intent/focus of the GI. Statement or claim should have a **judgement on impact and audience of impact** (Kenyan people). For example:	

- Tourism leads to positive impact *(judgment on impact)* on the Kenyan people *(audience)*. [1]
- Tourism leads to positive environment impact on the Kenyan people. [1]

Accept any other plausible responses.

Figure 1 (insert) is a map of Kenya showing some attractions. The students collected primary data the locations marked A and B in **Figure 1 (insert).** They devised a **Table 1**, bi-polar survey to measure the quality of the environment for both areas.

Bi-polar scoring system

Negative variables	-2	-1	0	+1	+2	Positive variables
Dirty from litter						Clear from litter
Noisy						Quiet
Unmaintained roads and pavements						Well maintained roads and pavements
Crowded						Few people
Unattractive						Attractive

Table 1

(b) Describe how data for the bi-polar survey should be collected. [3]

D4 (Reserved Mark) + Any other 2:

D1 *(Audience):* Locals/residents [1]

D2 *(Location - must have BOTH locations):* Go to Area A and B locals or students to collect data [1]

D3 *(Time/sample size):* [1] e.g. Collect data twice a day every week to reduce bias results/fluke results/ensure greater representation.

D4 *(Recording Process):*

- to observe the variables and score areas using the recording sheet *RESERVED*[1]
- then average the data to get final scores [1]

Table 2 shows the tabulated average scores of the bi-polar survey.

Tabulated average survey scores for quality of environment.

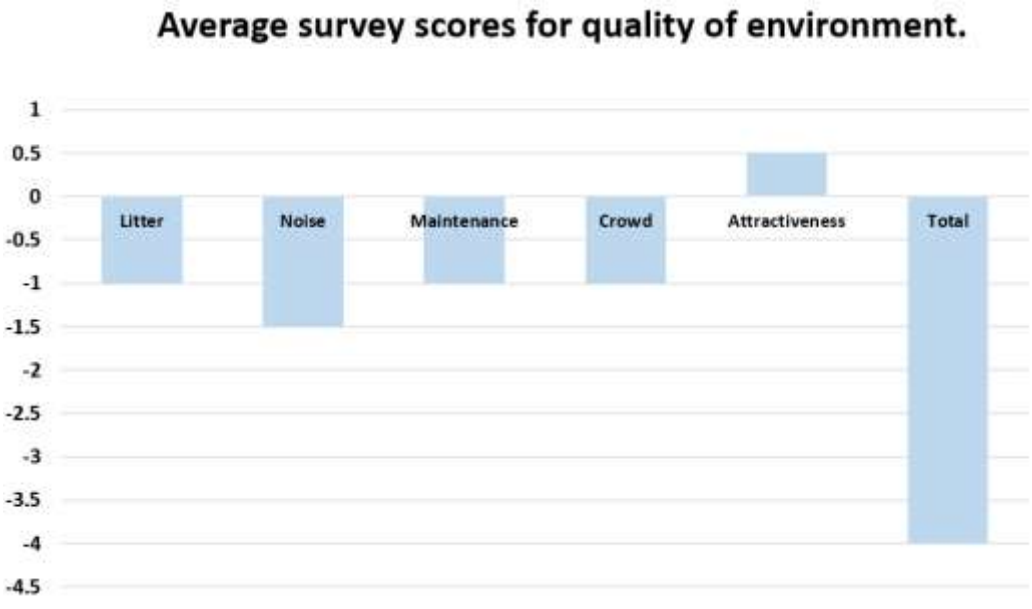
	Variables of survey	Location A	Location B	Average Score
1	Litter	-1	-1	-1
2	Noise	-2	-1	-1.5
3	Maintenance	-1	-1	-1
4	Crowd	-1	-1	-1
5	Attractiveness	-1	2	0.5
	Total	-6	-2	-4

Table 2

(c) On the graph paper provided**,** draw a suitable graph to represent the average findings shown in Table 2. [3]

Focus of graph is on the AVERAGE FINDINGS. *Graphs that portray data for location A and B separately are not accepted.*

- Title + Type (bipolar bar graph) [1]
- Axis with labels [1]
- Data accurately plotted. [1]



	(d)	The students also collected secondary data from a Kenyan government tourism report. **Figure 2 (insert)** shows a summary of their researched findings.	
		Describe what is meant by secondary data and state a benefit of making reference to secondary data in research.	[2]
		Definition: Idea of other sources of data + compiled prior to current research State: D: Secondary data is information from other sources that have already been compiled in written, statistical or mapped forms. [1] Any 1: [1] S: examine an alternative perspective on the original question of a previous study. S: access to larger volume of data that would have been difficult for the researcher to amass themselves over such a short period. S: allows for triangulation of data to increase reliability. Accept other plausible responses	
	(e)	Using evidence from **Table 2** and **Figure 2 (insert),** draw a suitable conclusion for their research.	[4]
		C1: State a suitable conclusion for economic [1] S1: Support C1 conclusion with data from Fig. 2 [min 1] C2: State a suitable conclusion for environment [1] S2: Support conclusion with data from Figure 2 [min1] Float S3: Comment on unreliability of data collected. [1] C1: Tourism in Kenyan brought about positive economic benefits S1: international tourist receipts had brought about increasing income for the country which would benefit the locals amounting between $0.5 billion in 2020 to about $17.7 (+/-0.2) billion in 2018. C2: but the impact of tourism on the environment is inconclusive from the research. S2: Environment impact of tourism is inconclusive because the students had only done the research for one day-results unreliable S3: Impact of environment only collected at 2 locations, does not reflect all tourist areas in Kenya-unreliable. S3: Environment perception survey done by students, accurate. Locals should have been asked for their opinion, able to evaluate better. OR	

		C1: From the data provided, tourism in Kenya has brought about positive economic impacts S1: international tourist receipts had brought about increasing income for the country which would benefit the locals amounting between $0.5 billion in 2020 to about $17.7 (+/-0.2) billion in 2018. C2: but negative environment impact to the Kenyan people based on data collected by the students. S2: Overall survey scores for quality of environment is negative of -4, indicating generally poor maintenance of the areas researched. S3: But environment impact of tourism is unreliable because the students had only done the research for one day/ only collected at 2 locations, does not reflect all tourist areas in Kenya.	

2		A group of students from Pei Hwa Secondary School, Singapore, visited Lamu, Kenya after the year-end examinations. They wanted to investigate if there was a relationship between wind and atmospheric pressure in Lamu, Kenya.	
	(a)	Suggest a suitable guiding question for their research.	[1]
		Question must include both variables and location, can be on specific wind measurement or not. For e.g. • Is atmospheric pressure in Lamu, Kenya affected by wind? • Does wind speed affect atmospheric pressure? • Does atmospheric pressure affect wind? Accept other plausible responses.	
	(b)	The students took turns to collect results every hour for wind speed, wind direction and atmospheric over a period of 2 days at the location marked “x” on **Figure 3 (insert).** **Figure 4** shows the instrument used to measure atmospheric pressure.	

		 **Figure 4**	
		Name the instrument shown in **Figure 4** and describe the steps taken to collect atmospheric pressure data.	[3]
		I: Barometer [1] S1: Reset/Set the movable pointer/index pointer to the area's atmospheric pressure at the same time each day.[1] S2: Read and record the measuring hand/needle that moves according to the current pressure every 2 hours.[1] *reserve 1 mark for needle names	
	(c)	**Figure 5 (insert)** shows data collected by the students. Using information from **Figure 5 (insert)**, describe how a suitable graph can be drawn to show the relationship between atmospheric pressure and wind speed at location X.	[3]
		Type of graph [1]: Students to draw a scatter graph with best fit line if applicable. [1] Axis and title labels [1]: X axis should be labelled with atmospheric pressure while the Y axis could be labelled wind speed and the graph can be titled graph showing relationship between atmospheric pressure and wind speed at location "x" [1] Data [1]: Students can then plot the corresponding values of the atmospheric pressure and the corresponding wind speed for each time frame. [1]	
	(d)	Using evidence from **Figure 5 (insert) only,** draw a suitable conclusion for their research.	[4]
		C: State a suitable conclusion. [1] S1: Support conclusion with data from Figure 5 [1]	

		S2: Support conclusion with data from Figure 5 [1] S3: Float mark, any additional conclusion/support/plausible reasoning for the conclusion [1] C: Generally, wind speed seems to be higher when atmospheric pressure is lower/ inversely proportional relationship. [1] S1: When atmospheric pressure dipped below 970mb at 12am to about 930mb at 4am, wind speed increase from about 8km/hr to 38km/hr from 12am to 4am. [1] S2: When atmospheric pressure started to increase from 930mb after 4am, windspeed also started to dip shortly after, from about 35km/hour to about 10km/hr, from 6am to 12pm of 16 Oct respectively. C2/S3: When atmospheric pressure dipped drastically, winds tend to be blowing from the west/southwestern region/from 180 to 300 degrees [1] Accept other plausible responses.	
	(e)	Describe two ways how the validity of this investigation could have been improved.	[2]
		Suggestions must link to increasing the validity Any 2 of the following: • Longer duration of data collection→greater representation of results→More reliable • Data collection should be done at more locations → to reduce variable impact on findings→more reliable results • Triangulated with secondary data→more reliable results.	

Section B (12 Marks)

Answer **ONE** question from this section.

3 (a)	**Figure 6 (insert)** shows information about the annual precipitation distribution in New Zealand.	
	Using **Figure 6 (insert)**, account for the annual precipitation distribution for the transect marked X to Y on South Island, New Zealand.	[4]
	Account for distribution Data reference of distribution (must include an adjective to describe the precipitation distribution): D: The area X will experience relief rain, receiving higher rainfall of more than 1500mm compared to Y that has a lower rainfall of less than 799mm. [1] Sequenced elaboration to explain distribution: E1: This is because prevailing winds from the Tasman Sea blow warm moist air inland towards the windward side of the southern Alps / towards X first. [1] E2: Moist air is forced to rise to the higher altitudes, air cools and condenses at dew point temperature, forming clouds on the windward side. When the clouds become too heavy, relief rainfall occurs at X. [1] E3: Fewer clouds/small clouds after relief rainfall blows over to Y the area to experience lower/no rainfall at the leeward side, at Y **OR** By the time the clouds reach Y, it will be dry as most of it would have fallen on the windward side, causing the leeward side at Y to have lower / no rainfall. [1]	
(b)	"The economic benefits of tourism outweigh the problems it brings."	
	How far do you agree with the statement? Support your answer using relevant examples.	[8]

Level 1 (0-3marks)	**Level 2 (4-6marks)**	**Level 3 (7-8 marks)**
At this level answers will be generalised or with minimal support if any stand (agree/disagree) were given at all.	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.	At this level answers will be supported by sound knowledge. Both agreement and disagreement are considered and well supported.
Reasoning rather weak and expression may be unclear. A basic answer has little development.	Good reasoning and logic in parts of the answer with good expression in places.	Reasoning is clear and logical with good expression of language.
Answers lack examples or other evidence, or it is so sketchy that it adds little support to the answer.	Some examples or other evidence will be presented to support answers in at least one place in the answer.	Examples or other evidence to support answer will be extensive.

Sample Essay:

I disagree to the statement as the benefits to tourism can be considered short term gains that are unsustainable in the long run because some of the problems they bring about could be irreversible.

The economic advantages of developing tourism is most obvious to any country with resources in the country to attract visitors so that the tourist arrivals and receipts spent on hotels, food, domestic transportation and entertainment will bring in the tourist dollars. Besides the foreign exchange which tourism brings to the country, tourism also creates employment for the locals. An example of this is the fishermen on Pamilacan Island in the Philippines. There, local tour companies hire fishermen to take domestic and international tourists on their boats to look for and swim with whale sharks and dolphins and they are paid between US $80 and US $100 per boat for their service. The income earned by the locals will allow them to buy necessities as well as any imported goods.
The country itself not only benefits from improved incomes and revenues, tourism creates a virtuous cycle where the development of tourism will create a multiplier effect of employment opportunities and increase revenue for other developments in the country such as health, education, transport services and the construction of infrastructures for the country to develop its economy further. Industries such as the delivery sector that are not directly related to tourism will also benefit from tourism when they offer services to facilitate tourist activities. For example, the UNWTO estimated that tourism industry employs over 235 million people worldwide, which is 6-8% of the jobs in the world.

However, the economic advantages may not always outweigh the disadvantages. LDCs will experience leakages in the form of payment for airline tickets as well as the hotel stays as both these ancillary services are mostly owned by foreign companies. What is left for spending in the country of destination is on food, local consumables, and souvenirs all of which do not provide large profits especially in LDCs like Thailand, Philippines, China, India and Indonesia. The locals earn much less, hence there may not be much economic advantage as compared to the salaries of other service industries. For example, in Phuket, Thailand where profits made by hotels are sent to another country as the money spent by tourists may not stay in the local economy and may bring few benefits to local businesses and workers such as US$1 – 70 cents go to the global economy, 24 cents to the Thai economy and only 6 cents to the Phuket economy.

Furthermore, many LDC governments may need to borrow loans to build the infrastructure, to negotiate for airspace for their local airline to attract international tourists to their country, and to strike business deals with international hoteliers, these are the countries and situations where the economic benefits promised by tourism may not materialise. The factors of leakage, stiff-competition, poor currency exchange rate, lack of local talent in the tourism trade and industry present the disadvantages which eventually might erode the earnings from the tourist industry, when all things are considered.

In addition, tourism opens the door for social costs which might erode the economic advantages too. E.g., the traditional beliefs and customs of tribesmen might be challenged by conflicting values of modernisation brought in by tourism. The disadvantages of increased tourism bring about increased pollution in terms of traffic congestion, litter, solid

	and liquid wastes, all of which can be very costly for the country. An example of a tourist attraction in Italy, Naples, a city which attracts tourists for its volcanoes and Mediterranean climate has become a city of dump as the city council cannot provide the waste disposal for both the locals and tourist leading to health and environment issues that drag on without being able to be resolved. Another environment impact would be the large carbon footprint that is almost inevitable with tourism over long distances, leading to negative global climate impacts that affect people and industries adversely. For example, an economy class short one-way trip from Singapore to Kuala Lumpur already emits 30kg of carbon dioxide per person, the carbon footprint for travels to longer distance would cause even greater emission levels. In addition, with more tourists travelling, a larger amount of greenhouse gases will be emitted exacerbating the global issues caused by climate change that could reach a stage of no return. In conclusion the economic advantages of tourism may appear to outweigh any problems it might bring in short term. However, in the long run, the problems might be too costly for any economic advantage to pay, especially when the impacts of tourism are not well-managed, leading to environment unsustainability.	
4 (a)	**Figure 7 (insert)** shows the ten places with the most visitors to Mauritius in six months in 2016.	
	Using the information in **Figure 7 (insert)** describe and suggest reasons for the distribution of places with the most visitors to Mauritius.	[4]
	Distribution + Reason (any 2) (Reserve distribution mark for overall trend. Need to group the areas together.) Majority of the visitors were from: D: Europe [1] /Countries in the Northern hemisphere like France, Germany + R: affluent enough to travel, higher purchasing power to afford long haul flights/want to experience tropical climate/tourism in exotic places. [1] D: countries with emerging economy like China, India [1] + R: increased disposable income, higher purchasing power to travel to exotic location for vacation. D: South Africa and Reunion [1] + R: due to close proximity, makes travelling there more convenient/affordable/accessible [1] Accept other plausible answers.	

(b)	"The government plays the main role in promoting sustainable tourism."	
	How far do you agree with the statement? Support your answer using relevant examples. Please note: - responses must be related to promoting SUSTAINABLE tourism	[8]

Level 1 (0-3marks)	**Level 2 (4-6marks)**	**Level 3 (7-8 marks)**
At this level answers will be generalised or with minimal support if any stand (agree/disagree) were given at all.	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.	At this level answers will be supported by sound knowledge. Both agreement and disagreement are considered and well supported.
Reasoning rather weak and expression may be unclear. A basic answer has little development.	Good reasoning and logic in parts of the answer with good expression in places.	Reasoning is clear and logical with good expression of language.
Answers lack examples or other evidence, or it is so sketchy that it adds little support to the answer.	Some examples or other evidence will be presented to support answers in at least one place in the answer.	Examples or other evidence to support answer will be extensive.

Sample essay:

I agree to a large extent. Although the role of ensuring that tourism is sustainable requires the corporation of different groups, like the tour operators, the tourists and the even the non-government organisation, the government's role in implementing and monitoring the supporting policies and laws will provide the direction and influence the actions of these groups, thus playing the main role in ensuring that tourism is sustainable.

The government can greatly influence the future quality of environments by drafting laws and policies that help improve the quality of tourism sites. This includes determining the visitor capacity of a site and allocating space for infrastructure such as roads and hotels. For example, Machu Picchu's tourism arrivals had to be managed after it became known as a UNESCO world heritage site. Despite being a major source of income for the Peruvian Government grossing an estimated amount of 40 million dollars every year, the government limited the number of visitors to Machu Picchu to just 2500 people per day to reduce the environmental threats to this ancient citadel. The government are also in the capacity to work with other government agencies to manage the impact of tourism. For example, the Singapore Tourism Board (STB) ensures that while attracting large numbers of tourists to Singapore, its development plans also consider the need to conserve national heritage. The STB has conserved the ethnic districts of Singapore, enhancing the cultural zones of Chinatown, Kampong Glam and Little India. This way, visitors and locals will have a greater appreciate of Singapore's rich heritage and will continue to attract more tourists to come to the country. Hence, through policies and laws, the government has the authority to set the guidelines and expectations required to ensure that sustainable tourism is achieved, if they are convicted and committed to accept the potential economic trade-offs that some of these measures may bring.

Tour operators are also another important group in ensuring sustainable tourism in tourist site. Tour guides offer valuable feedback to tour operators about the social and environmental conditions of a tourist attraction. Their inputs are often used by local communities and the government to plan tourism management strategies in a tourist attraction. Besides that, tourists spend much of their time in a tourist attraction with tour guides or other staff of a tour operator. Therefore, tour operators are often in a good position to regulate tourist behaviour. This includes preventing tourists from littering, from wandering into restricted areas or making too much noise to prevent damage to a tourist site. An example is the Phuket Alternative Tours (PAT) set up in 2006. Tour operators who want to operate under PAT are required to sign an Environment and Cultural Code of Practice which commits members to operate in an environmentally sustainable way, seek to enhance the natural environment and the way that the industry uses it, and create awareness about environmental conservation for visitors to Phuket. This will ensure the physical and cultural landscape can be conserved for the future generations by regulating tourist behaviour like preventing them from littering, wandering into restricted areas or making too much noise. Therefore, tour operators who work closely with the tourists, tourist sites and locals play an important role in ensuring sustainable tourism. However, most tour operators are driven by economic profits that may not lead to environmentally sustainable practices, thus the role of the government becomes more vital in ensuring that laws and guidelines are implemented and acted upon to ensure environment sustainability in tourism.

Visitors are also play a role in ensuring sustainable tourism in a particular tourist site. Visitor spending can provide funds to help conserve environments, preserve culture or maintain a tourist

attraction. The entrance fee of entering Angkor Wat, Siem Reap, Cambodia is used to conserve and upkeep the historical site. Visitor spending can also provide the locals with employment and businesses like hotel workers, hotel staff, waitresses and tour guides. Tourists' considerations to minimise their carbon footprint while touring would ultimately reduce environmental impact, ensuring sustainability. This will help sustain the economic, cultural, and physical landscape of the destination. However, these choices are largely dependent on personal preference and not mandated, thus the impact is uncontrolled. While tourists have a responsibility to visit without causing damage or offence to the locals, government intervention through laws and guidelines on environment preservation in tourists' sites would mean more certain outcomes and has a higher chance to be followed through, leading to more environmentally responsible tourist behaviour.

In conclusion, the role of each group does play a role in ensuring that tourism is sustainable, but the outcome will tend to be more optimal if the government is committed to driving the processes that assures it because they have the authority to set laws to implement sustainable practices more uniformly across the country. Despite this, it is acknowledged that in some areas where the governments may not prioritise sustainable tourism practices, other stakeholders may step up to intervene but may not have a uniform implementation across the nation/sectors compared to when the government leads.

[Turn Over

They should also try to collect temperature data at the same time at each location to ensure that results are fairly comparable.**Section C (25 Marks)**

Answer **ONE** question in this section.

5(ai)	**Figure 8** is an excerpt from the Global Report on Food Crises by the World Food Programme about the impact of the war in Ukraine on global food security.	
	The 2022 war in Ukraine triggered alarm among the international community, as a result of its effects on the Ukrainian population and its implications for food security at the global and regional levels. Some food-crisis countries are of particular concern due to their high dependency on both food and fertiliser imports from Ukraine and the Russian Federation, and their vulnerability to global food price shocks. **Figure 8**	
	With the help of **Figure 8**, explain possible reasons why the war in Ukraine would affect food security in Ukraine and other parts of the world.	[5]

	Marker's Feedback: Students need to note that they will need to explain reasons for both **Ukraine** and **other parts of the world**. Some students wrote about Russia instead of Ukraine. R1: Local production falls: Local farmers can't farm/food crops destroyed[1] R2: Local Distribution hindered: Shops run out of produce/can't open/road block/rations run out/price increase[1] R3: Regional/global distribution of inputs hindered: food/fertiliser can't ship out due to low accessibility/low or halted output. [1] R4: Price increase Outcome of R linking to food security (sufficient supply/nutrition): Alternative sources cost more/ higher demand from elsewhere shortage **Outcome:** people cannot afford the food. Outcome of R linking to food security: Lower/inconsistent/poorly distributed food threaten food security. Accept other plausible responses.	
(ii)	Outline the possible social impacts that the locals may face due to low food security.	[4]
	Marker's Feedback: Note that **"Outline"** requires you to either give a **brief** description or explanation. Many instead gave detailed explanations of 2 impacts. Please note: 1. "fighting/protest" are considered political impacts, but awarded marks this time. Please include "worsen social relationships" before your elaboration to turn it "social" 2. Starvation does not happen overnight→prolonged periods of extremely low food consumption/severe malnutrition Low food security any 4 of the following, accept other plausible responses.	

	• insufficient food consumption leading to increase crime rates to obtain food illegally[1] • scavenge for food due to hunger leading to disease/illness due to consumption of unhygienic/ bacteria laden food. [1] • malnutrition could lead to health-related illnesses such as weakened immune system, lack of vitamin C.[1] • If issue is prolonged over a few years, frequent illnesses may lead to children missing school, lowering education levels [1] • If issue is prolonged over a few years, frequent illnesses absentism from work, lowers standard of living and quality of life.[1]	
(bi)	**Figure 9 (insert)** shows the distribution of earthquakes in and around Japan.	
	With reference to **Figure 9 (insert)**, describe the distribution of earthquakes shown.	[4]
	Marker's Feedback: Students should use map details to aid description e.g. scale, cardinal points Accept any 4 plausible responses. O: Most earthquake happened about 100km west of the destructive/converging Eurasian and Pacific plate boundary. [1] Off the east/northeast coast of Japan [1]	

	N: Earthquake with highest magnitude of 9 on the Ritcher scale occurred east of Japan, about 450km northeast of Tokyo. E: However, 2 earthquakes with a magnitude of about 5 on the Ritcher scale 400km north of Kobe, were in the middle of the Eurasian plate (not at the boundary) O: Fewer earthquakes happened on land. /Most of the earthquake are offshore earthquakes.[1] O: Fewer earthquakes at the western coast of Japan. [1]	
(bii)	Suggest and explain the formation of another tectonic hazard likely to occur near to the plate margins shown in **Figure 9 (insert).**	[4]
	Marker's Feedback: Students should make reference to figure. Weak/No links to hazard TMR: When the continental Eurasian and oceanic Pacific plate converges, compressional force will occur [1] P1: Force will lead to the denser plate subducting beneath the less dense plate. [1] P2: materials above the subducted plate will melt and rise through cracks and fissures of the other plate leading to the L: formation of volcanoes on Japan that could erupt and affect people adversely. [1] OR	

TM: When the continental Eurasian and oceanic Pacific plate converges [1]

P1: the seismic force, forces up a mass of water that travels at high speeds as high as 800 km/hour. [1]

P2: Upon reaching shallower water/near the coast, greater friction slows down the waves and forces it to increase in height while still at speeds as high as 30-50km/hr,

L: it would then hit the land as a large wave known as a tsunami destroying things along its path. [1]

(d) The main factor of an earthquake determines the extent of earthquake damage is population density."

How far do you agree with the statement? Support your answer using relevant examples. [8]

Level 1 (0-3marks)	**Level 2 (4-6marks)**	**Level 3 (7-8 marks)**
At this level answers will be generalised or with minimal support if any stand (agree/disagree) were given at all.	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.	At this level answers will be supported by sound knowledge. Both agreement and disagreement are considered and well supported.
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Answers lack examples or other evidence, or it is so sketchy that it adds little support to the answer.	Some examples or other evidence will be presented to support answers in at least one place in the answer.	Examples or other evidence to support answer will be extensive.

Indicative content:

Sample essay:

I agree with the statement to a large extent because population density of a place will determine the potential damage that a place might have. Even when a country has high level of preparedness, the risk of damage will also tend to be higher as long as population density is higher.

When population density is high, the larger the extent of damage tends to be higher because the number of people living in a square metre land is higher → more

buildings and houses → when there is earthquake → more injuries and damage to more infrastructure larger impact is expected. This large cost of damage is documented regardless of how developed or prepared the country is. For example, the 7.7 Gujarat earthquake, that occurred on 26 January 2001 in Ahmedabad, the commercial capital city where density was high led to a large extent of damage. As many as 50 multi-storey buildings collapsed and several hundred people being killed. High total property damage was estimated at $7.5 billion due to the extent of damage in the built-up city. The extent of damage was similarly high for a 6.9 magnitude earthquake struck densely populated Kobe Japan, an area that is relatively developed and well known for its earthquake preparedness, on January 17, 1995. The earthquake resulted in more than 6,000 deaths and 45,000 people homeless, and the damage cost more than $100 billion despite the seismic design structures and building policies. The Kobe government then spent years reconstructing new facilities and infrastructure.

However, I do acknowledge that other factors like magnitude of an earthquake and preparedness measures will also affect the extent of damage. A high magnitude earthquake releases stronger seismic waves, thus it has the potential to do more severe damage to infrastructure like buildings and roads, it could also lead to more deaths compared to lower magnitude earthquakes. For E.g: For example, the 9.0 magnitude earthquake in Tohoku, Japan, in 2011 had a death toll of 28,000 people and 155,000 homes were lost. However, if the high magnitude earthquake had occurred in an area with low population density, there will be lower risk of collapse and destruction of infrastructure and thus lower extent of damage. On the other hand, in places of lower population density, damage is low regardless of the magnitude of earthquake. For e.g, the magnitude 9.2 Great Alaska Earthquake, near Anchorage, of 1964 resulted in only 131 deaths because at that time, few people lived in the area. If a place is prepared, damages will also tend to be lower than one that is not prepared. Well-prepared fitted with earthquake proof buildingsreinforced steel pillars, base isolators, counterweights to absorb/withstand seismic waveslowers risk of collapse in earthquake events, reducing damage but does not eliminate the risk as effectiveness as it is only limited to the largest earthquake experienced. Huge damage could still occur if unexpectedly high magnitude hits the area. In addition, the preparedness measures are usually more applicable to places like DCs that have the resources to afford the costly preparedness measures, like

	having shock absorbers in buildings compared to poor nations that may not have the financial ability to reinforce their buildings. In conclusion, extent of damage is indeed dependent on population density, as when population density is high, maximum potential damage also tends to be high regardless of other factors like magnitude, level of preparedness, type of soil because a lower population density will always have less to potential damage to begin with in any scenario.	

6(ai)	**Figure 10 (insert)** shows meat consumption information for some countries of the world in 2017.	
	With reference to **Figure 10 (insert),** compare the meat consumption patterns between the countries.	[4]
	Marker's Feedback: Make reference to data. Use comparison words. Select data that are noteworthy, for e.g. most/least. Not those in the middle. Comparison of common criteria x4 OC1 (reserve): Developed countries like Australia, USA, tend to consume more meat of more than 140kg/per person than LDCs like Ethiopia, Afghanistan, India, consuming less than 10 kg per capita OC2: Emerging economies like China and Brazil also consumed more meat of more than 90kg/capita compared to Ethiopia, Afghanistan and India consuming less than 10 kg. However, despite India being considered an emerging economy, its total meat consumption pattern remains low, below 10kg per capita TC1 (reserve): Larger proportions of poultry and beef are consumed in Aust, USA whereas seafood formed the main source of diet in countries like China and Japan. TC2: Aust and US also tend to have a larger amount + variety of meat compared to other areas. For e.g. Ethiopia , India and Afghanistan with small numbers of meat consumption per capita. Accept other plausible comparisons	

(ii)	Outline possible reasons for the meat consumption patterns shown in **Figure 10 (insert).**	[4]
	Marker's Feedback: Note that **"Outline"** requires you to either give a **brief** description or explanation. Many instead gave detailed explanations of 2 reasons. Reason shld link back to consumption pattern shown in fig. Any 4 brief plausible reasoning linking to meat consumption trends: Economic factors (at least 1): ● Developed countries such as USA and Australia□higher purchasing power to purchase meat products that are more expensive ● Emerging economies like China and Brazil□higher disposable income□higher purchasing power to purchase meat that is more expensive ● Poorer countries/LDCs like Afghanistan and Ethiopia□less disposable income□lower spending (due to affordability) tends to be allocated on food in general (includes meat)/lower spending on expensive food types like meat. Social-cultural (at least 1): ● India: Religious beliefs□ tends to be vegetarian thus less meat consumption ● Food preference/heritage/geographical location lead to trend□e.g. seafood featured strongly in their dishes like sushi□Japan highest seafood consumption. Poultry/beef featured strongly in western meals/fast food□higher meat consumption in areas with strong fast food culture e.g. USA.	

(b)	**Figure 11 (insert)** show the Global Hunger Index for Asia in 2021.	
	Describe the distribution of Global Hunger Index for Asia.	[4]
	Marker's Feedback: Map of Asia but some students could not recognise the major countries in the region. Response can be of overall general regions of specific noteworthy examples of countries in that category. Any 4: Accept other plausible responses O: Majority of Asia/northern Asia tends to have low global hunger index N: China, Mongolia, Kazakhstan, Saudi Arabia O: Southeast Asia most tend to have a moderate global index N: Malaysia, Thailand, Myanmar, Cambodia, Indonesia O/N: Yemen and Syria only 2 countries classified under extremely alarming on the Global Hunger Index O/N: South Asian countries like India, Pakistan and Afghanistan's hunger situation is classified as serious.	

(c)	Explain the impacts of widespread hunger on people and the country.	[5]
	Marker's Feedback: Starvation not does happen overnight→prolonged periods of extremely low food consumption/severe malnutrition 3P and 2 matching E OR 2P and 3 matching E. Reserve 1 PE each for on people and country P: Chronic starvation / malnutrition leads to health issues/pain and suffering that could lead to death [1] E: Organ deterioration and failure as body burns muscle tissue and fat in the effort to survive / stay alive/ Could cause deformation of bones etc in the absence of certain vitamins and minerals like Vitamin C / D [1] E: May drive people to scavenge for wild fruits and vegetables may stave off hunger, but may be poisonous as scavenged food may contain high levels of bacteria or chemicals, such as heavy metals of mercury and lead, from the landfill's rubbish. [1] P: leading to health issues/food poisoning due to scavenging [1] P: Countries can also suffer from lower productivity [1] E: When workers consume imbalanced amounts of nutrients, they fall sick more often. This will lead to them being unable to work as productively/ low levels of nutrition intake over a long term was associated with lower levels of productivity. This will negatively impact the economy/lead to lower income/GDP [1]	

P: Lower literacy rate in country [1]
E: Children suffering from inadequate food consumption will fall sick more often, leading to loss of school days and loss of educational opportunities when they grow up. [1]

(d) "Using technology to intensify food production is key to eradicating world hunger."

How far do you agree with the statement? Explain your answer with relevant examples. [8]

Level 1 (0-3marks)	**Level 2 (4-6marks)**	**Level 3 (7-8 marks)**
At this level answers will be generalised or with minimal support if any stand (agree/disagree) were given at all.	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.	At this level answers will be supported by sound knowledge. Both agreement and disagreement are considered and well supported.
Reasoning rather weak and expression may be unclear. A basic answer has little development.	Good reasoning and logic in parts of the answer with good expression in places.	Reasoning is clear and logical with good expression of language.
Answers lack examples or other evidence, or it is so sketchy that it adds little support to the answer.	Some examples or other evidence will be presented to support answers in at least one place in the answer.	Examples or other evidence to support answer will be extensive.

Indicative content

Disagree to some extent. While use of technology is necessary to intensifying food production and thus food yields that is necessary to feed the increasing world population, it will not help eradicate world hunger if other factors leading to hunger are not resolved. This includes poor distribution or poor governance that could lead to those vulnerable to hunger issues still not being able to gain from the increased food production despite the technologically advanced farming methods that increase food production.

Use of technology provides the opportunity to increase food supply regardless of climate constraints e.g. use of cross bred HYVs in green revolution shorter growing season e.g Wonder Rice grows in 100 days instead of 120 days multiple cropping a year higher yield lowers price affordability of food even among the poor lowers risk of hunger.

In addition, use of irrigation with HYV crops can overcome physical constraints of not being able to grow crops during dry season or on usually dry land For example, IR8

enabled farmers to produce twice as much grains, in the 1960s, growing crops even during the dry monsoon season, saved India from famine in 1960s higher yield, reducing hunger.

But the increase in yields due to technological advancement does not resolve other issues that contribute to world hunger. This includes poor distribution, political unrest that could hinder amount of food consumption, leading to hunger. Only when all factors leading to hunger is tackled, then can world hunger be eradicated.

Even if the government had invested in technology for the country to increase food production, a poorly executed food and agricultural policies to ensure food security for its people would still lead to its people being vulnerable to hunger when issues to their current food supply source arise. This includes not channelling resources to ensure the maintenance of farmland or to educate farmers on more efficient ways of farming. Without proper drainage systems and education the farmers may not know how to operate machineries, use fertilisers, irrigation treatment, pesticide treatment etc), issues arising from poor farming methods like waterlogging would eventually surface, reducing crop yields, eventually leading to hunger. The application of excess irrigation in Punjab over extended periods around the year 2000 which resulted in fertile agricultural land being waterlogged and thus infertility. It is noted that in certain agricultural patches, not a single crop could be grown for more than a decade. More than 200,000 farmers also eventually lost their primary income source from agriculture as their lands have become unproductive due to waterlogging and desalinisation, possibly lead to hunger issues in the region.

Political conflicts could also cause distribution and production of food to be hindered, despite increased food productivity arising from technological use elsewhere, leading to hunger issues in these regions. Among the 815 million people suffering from chronic malnutrition in 2016, 60 percent lived in areas affected by armed conflict. Conflict can cause food shortages and the severe disruption of economic activities, threatening the means of survival of large populations. Additionally, wars commonly trigger the displacement of huge numbers of people, cutting them off from their food supplies and livelihoods. Refugees are often vulnerable to acute food insecurity.
