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ST. MARGARET'S SECONDARY SCHOOL

Preliminary Examinations 2021

CANDIDATE NAME

CLASS

REGISTER NUMBER

COMBINED HUMANITIES 2272/2

Paper 2 Geography Elective

Secondary 4 Express / 5 Normal (Academic)

19 August 2021

1 hour 40 minutes

INSERT

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Castle Square, Warsaw

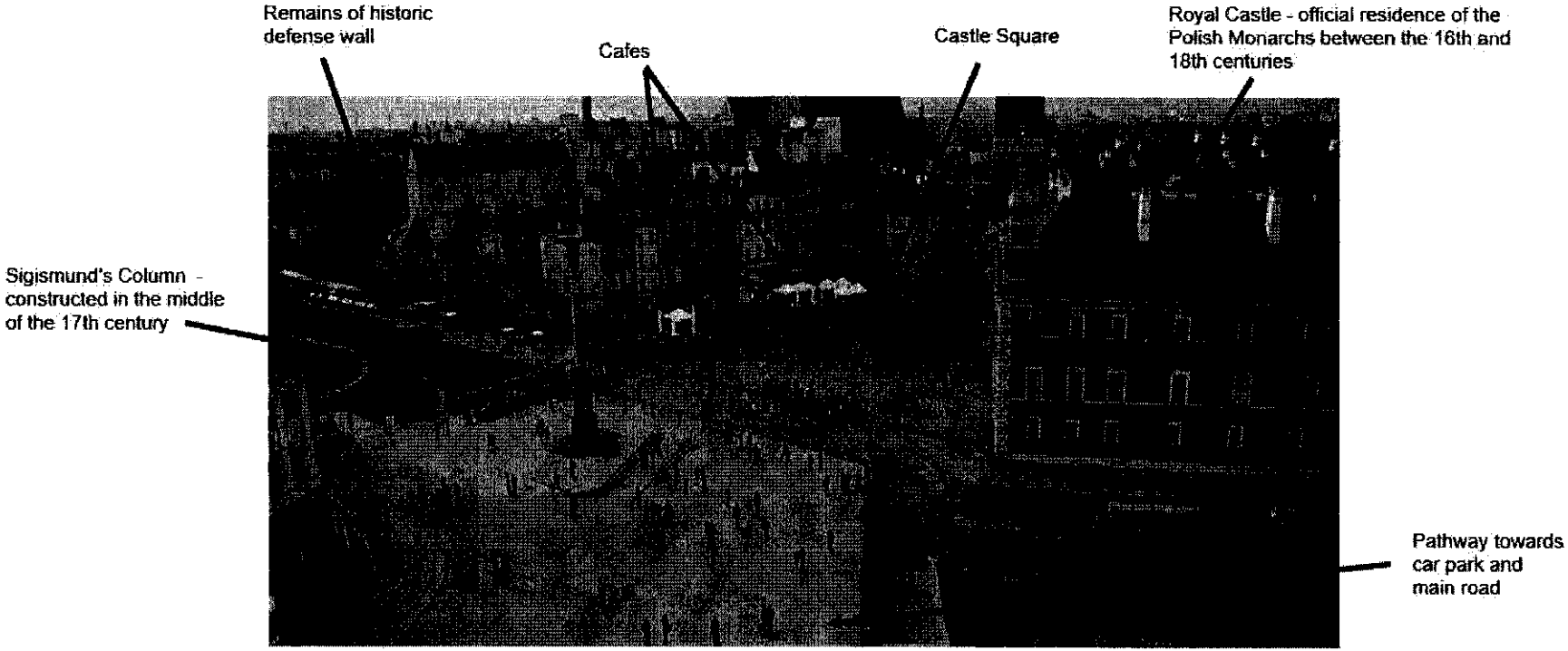


Fig. 1

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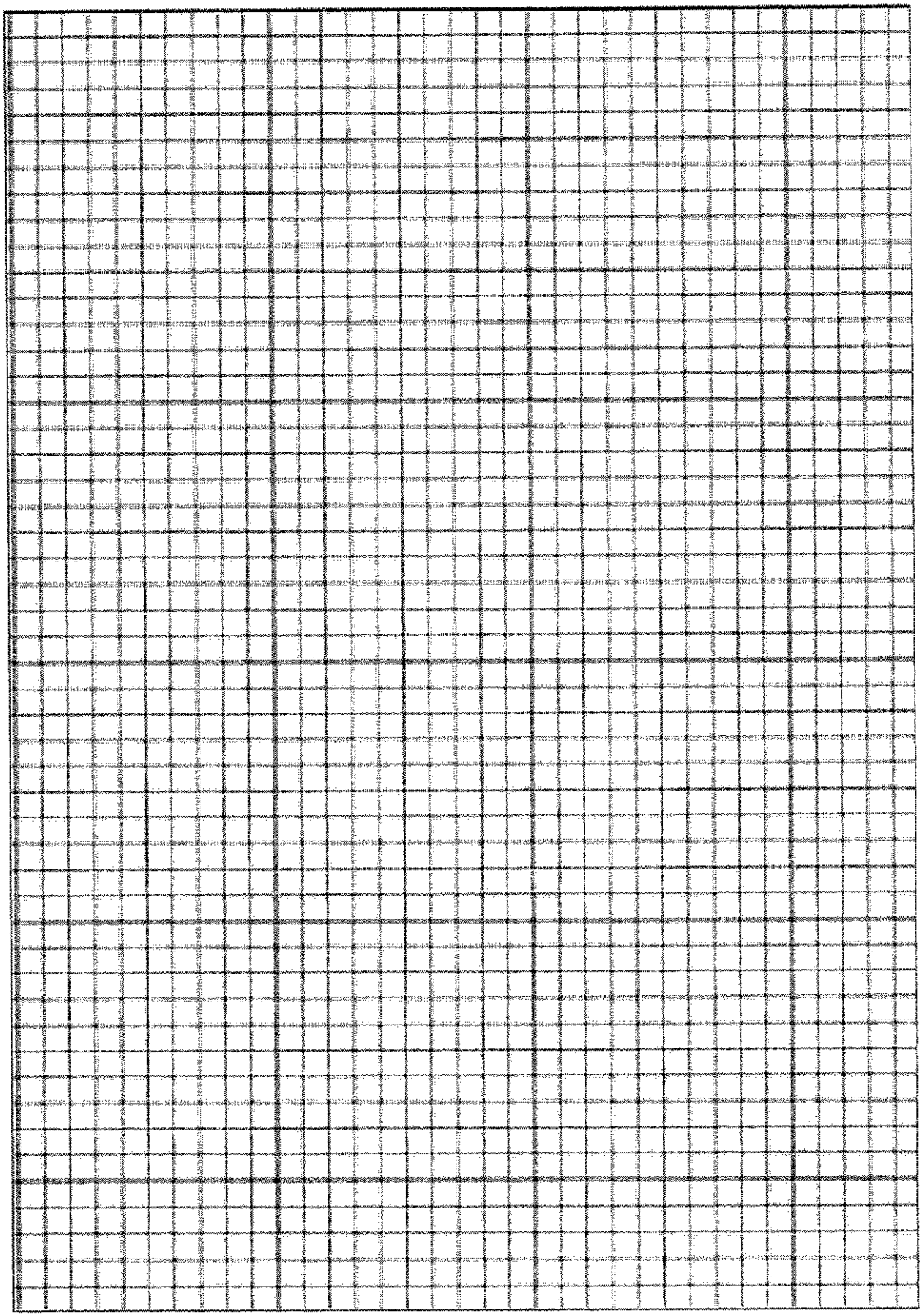


Fig. 3

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Fertiliser use per hectare of cropland, 2015

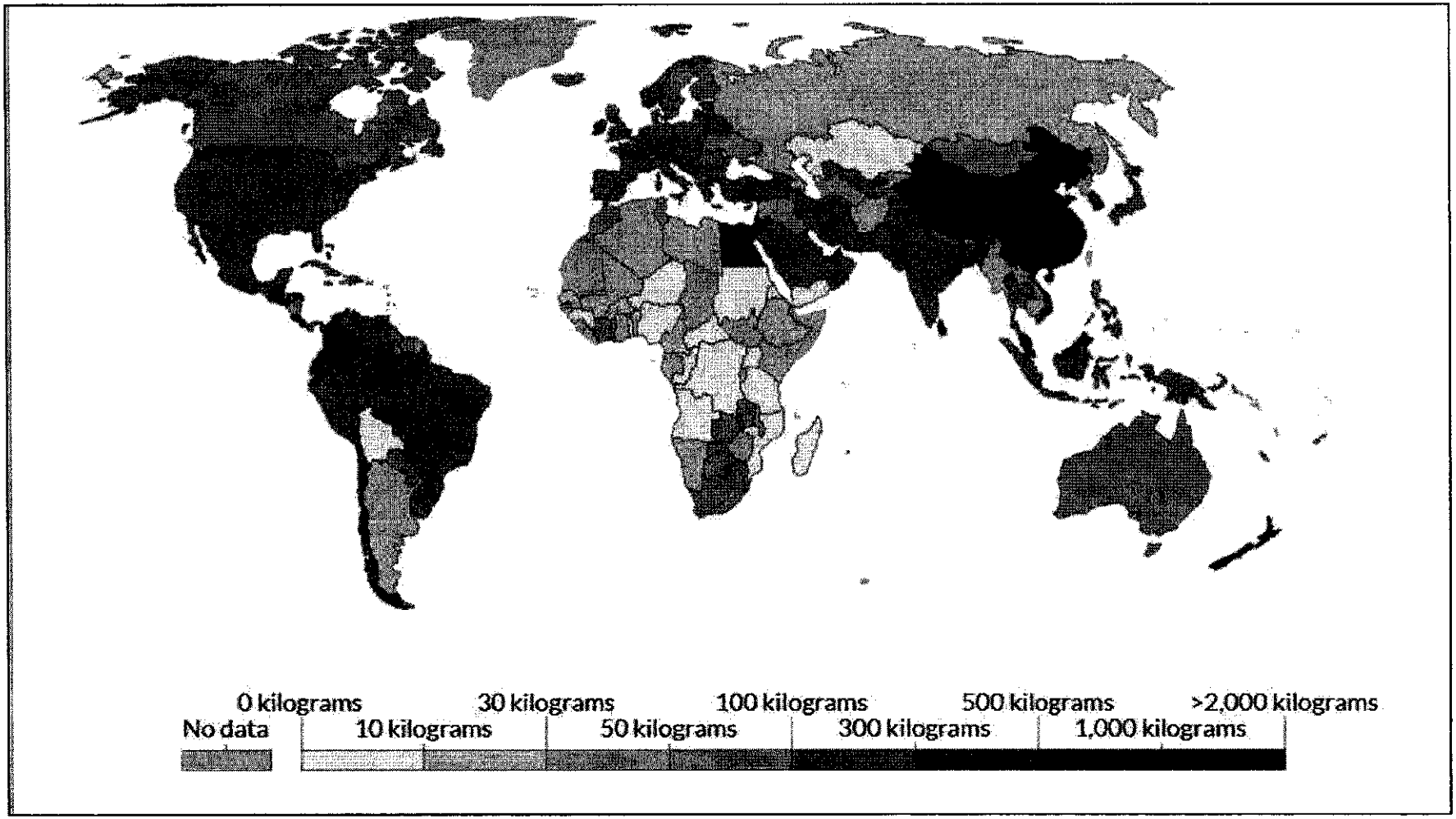


Fig. 8

Copyright Acknowledgements:

Question 1 (b)	**Fig. 1**	**https://www.lonelyplanet.com/poland/warsaw**
Question 6 (c) (i)	**Fig. 8**	**https://ourworldindata.org/fertilizers**

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ST. MARGARET'S SECONDARY SCHOOL

Preliminary Examinations 2021

CANDIDATE NAME

CLASS | | | | REGISTER NUMBER | | |

COMBINED HUMANITIES **2272/02**

Paper 2 Geography Elective **19 August 2021**

Secondary 4 Express / 5 Normal (Academic) **1 hour 40 minutes**

Additional Materials: INSERT

READ THESE INSTRUCTIONS FIRST

Do not open this Booklet until you are told to do so.

Write your Name, Class and Index number 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 diagram or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Section A
Answer **one** question.

Section B
Answer **one** question.

Section C
Answer **one** question.

Write all answers on the writing paper provided.
Candidates should support their answers with the use of relevant examples.
Sketch maps and diagrams should be drawn whenever they serve to illustrate an answer.
Begin your answer to each question on a fresh piece of paper.
The number of marks is given in brackets [ ] at the end of each question or part question.
At the end of the examination, fasten all your work securely together.

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Section A

Answer **one** question from this section.

1 Students from a school in Warsaw, Poland wanted to find out how Warsaw could be made more attractive to tourists. They decided to implement a survey on 50 visitors on a day in June at the Old Town, a popular tourist destination. The students decided that they would identify 25 male and 25 female tourists for the survey.

(a) State the sampling method that the students have chosen and describe the advantages of this sampling method. [3]

(b) Study Fig. 1 (Insert) which shows a photograph that the students have annotated to highlight attractions and amenities found at Old Town.

Add annotations to Fig. 1 to identify a data collection site and the characteristics of the site that make it suitable for carrying out the survey with tourists. [2]

(c) Study Table 1, which shows the results of one of the items in the survey.

Table 1

Survey Results

Item: I would like to have more of the following amenities in Warsaw

	Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
Tourist Information Centres	3	2	3	10	32
Train stations and bus stops	10	14	6	12	8
Money Changers	3	12	10	16	9
Souvenir shops and restaurants	25	4	7	12	2
Public toilets	17	8	5	13	7

(i) Describe how the students could calculate the positive and negative scores for each of the amenities in Table 1. [2]

(ii) Based on the data from Table 1, the students concluded that Warsaw needs to provide more souvenir shops and restaurants. Comment on the validity of this conclusion. [2]

(d) The students wanted to find out if the goods and services available at the Old Town catered to tourists' needs. They decided to conduct a land use survey and sketch a land use map of the area. Describe the steps the students need to take to complete the land use survey and the land use map. [4]

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2 Students from a school in Warsaw, Poland wanted to find out how distance from the sea affects the temperature of a place. They conducted a collaborative investigation with students from another school in Amsterdam, the Netherlands.

Both groups of students agreed to prove the hypothesis, 'Summer temperatures are lower in coastal areas than areas further inland'.

The two groups of students collected data in their own schools for a week during the month of July. A minimum and maximum thermometer was placed in a Stevenson Screen and sited in an open area in the each of the two schools. The students recorded the maximum and the minimum temperature for each day at 8 am the next morning.

(a) Study Fig. 2, which shows the location of Warsaw, Poland and Amsterdam, the Netherlands.

Location of Warsaw and Amsterdam

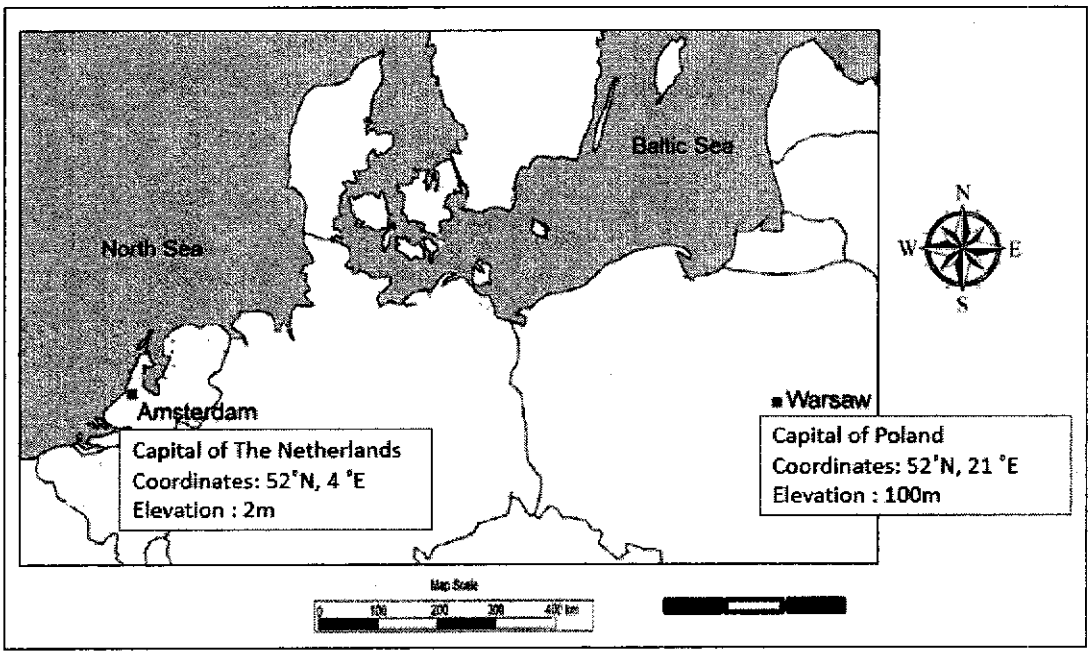


Fig. 2

(i) Identify the sea closest to Warsaw and measure the distance of the city of Warsaw from this sea. [2]

(ii) Suggest why the students from Warsaw chose to collaborate with a school in Amsterdam for this investigation. [3]

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(b) Study Table 2, which shows the mean daily temperatures of Warsaw and Amsterdam.

Table 2

Mean daily temperature of Warsaw and Amsterdam (05 – 11 July)

	05 July	06 July	07 July	08 July	09 July	10 July	11 July
Warsaw	28°C	31°C	33°C	29°C	27°C	23°C	22°C
Amsterdam	18°C	19°C	22°C	21°C	19°C	18°C	18°C

(i) Describe how the students could have calculated the mean daily temperature for each day. [1]

(ii) Present the data using a suitable type of graph on Fig. 3 (Insert). [3]

(c) At the end of the investigation, the students concluded that the hypothesis is true. Justify this conclusion and suggest how the reliability of this investigation could be further improved. [4]

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Section B

Answer **one** question from this section

3 (a) Explain how temperature could affect the relative humidity of a place. [4]

(b) 'A growing economy is the main factor that spurred the growth of the global tourism over the last few decades.'

How far do you agree with this statement?

Support your answer with evidences. [8]

4 (a) Differentiate the characteristics of monsoon rain from convectional rain. [4]

(b) 'The most devastating impact of global warming is the increasing frequency of extreme weather events.'

To what extent do you agree with this statement?

Provide examples to support your answer. [8]

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Section C

Answer **one** question from this section

5 (a) Study Fig. 4, which illustrates the occurrence of a large earthquake in Izmit, Turkey in 1999 and Fig. 5 which describes the impact of the earthquake.

Izmit earthquake of 1999

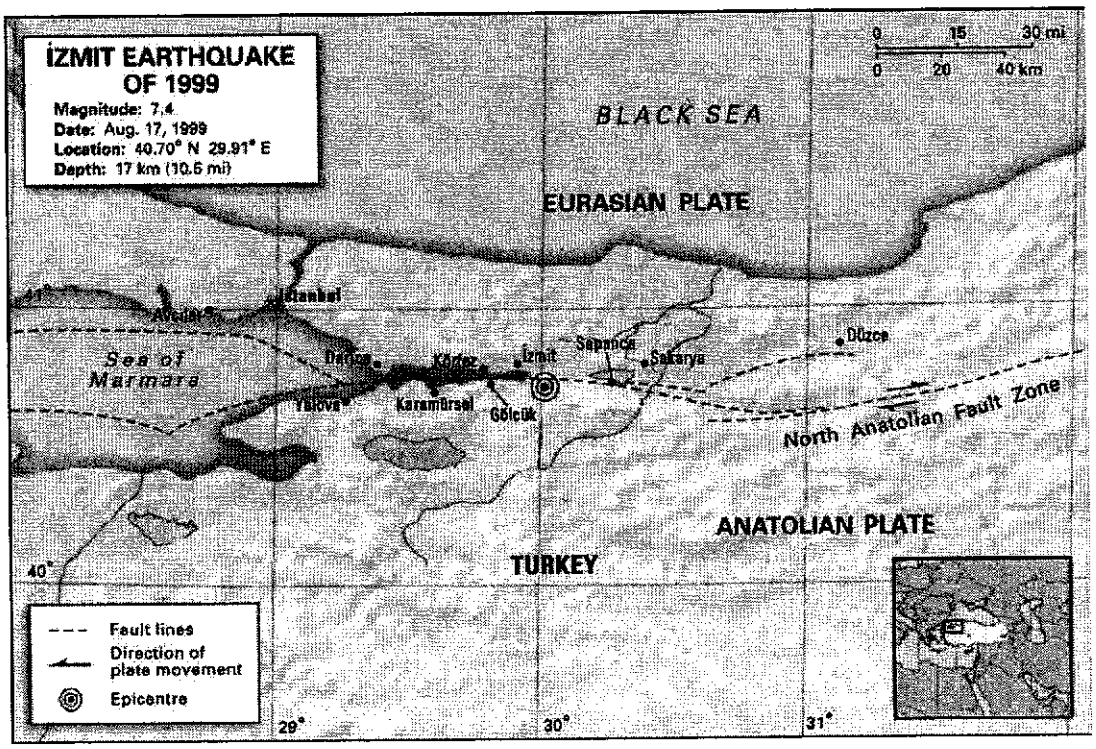


Fig. 4

Impact of Izmit Earthquake of 1999

The earthquake struck just after 3:00 am local time. Its epicentre was about 11 km southeast of İzmit. The initial shock lasted less than a minute and registered a magnitude of 7.4. It was followed by two moderate aftershocks on August 19, about 80 km west of the original epicentre. More than 17,000 people were killed and an estimated 500,000 left homeless as thousands of buildings—chief among them the Turkish navy headquarters in Gölcük and the Tüpraş oil refinery in İzmit—collapsed or were heavily damaged. High casualty figures were reported in the towns of Gölcük, Derince, Darıca, and Sakarya. Farther west, in Istanbul, the earthquake caused hundreds of fatalities and widespread destruction.

Fig. 5

(i) Using Fig. 4, describe the processes that led to the Izmit earthquake in 1999. [3]

(ii) Using Fig. 4 and Fig. 5, explain why Izmit suffered a high death rate in the earthquake and suggest how the government could have reduced the number of fatalities. [6]

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(b) With the aid of a well-labelled diagram, explain the formation of oceanic trenches. [5]

(c) Study Fig. 6, which shows perceived characteristics of organic food.

Perceived characteristics of organic food



Fig. 6

Account for the characteristics of organic food as shown in Fig. 6 [3]

(d) 'Political factors have a greater influence than social factors on the food consumption patterns in a country'.

How far do you agree with this statement?

Support your answer with examples. [8]

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6 (a) Study Fig. 7, which shows changes in the consumption of major food items in Bangladesh between 2005 and 2010.

Per capita daily consumption of major food items in grams

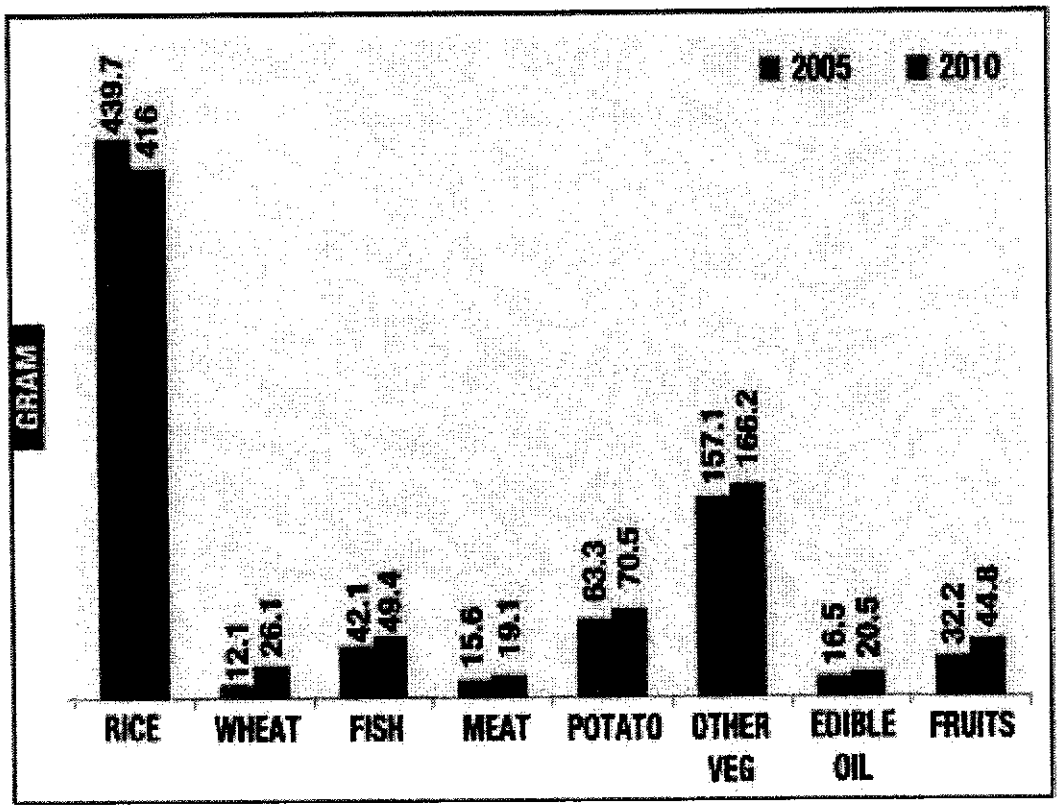


Fig. 7

Describe how the consumption of major food items in Bangladesh has changed between 2005 and 2010. [4]

(b) Discuss the economic and social impacts of excessive food consumption. [5]

~~(c) (i) Study Fig. 8 (Insert) which shows total fertiliser used per hectare of land in the world in 2015.~~

~~Describe the patterns in the use of fertiliser in the world in 2015. [3]~~

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(ii) Study Fig. 9, which shows the process of eutrophication that results from excessive use of fertilisers in farming.

Eutrophication

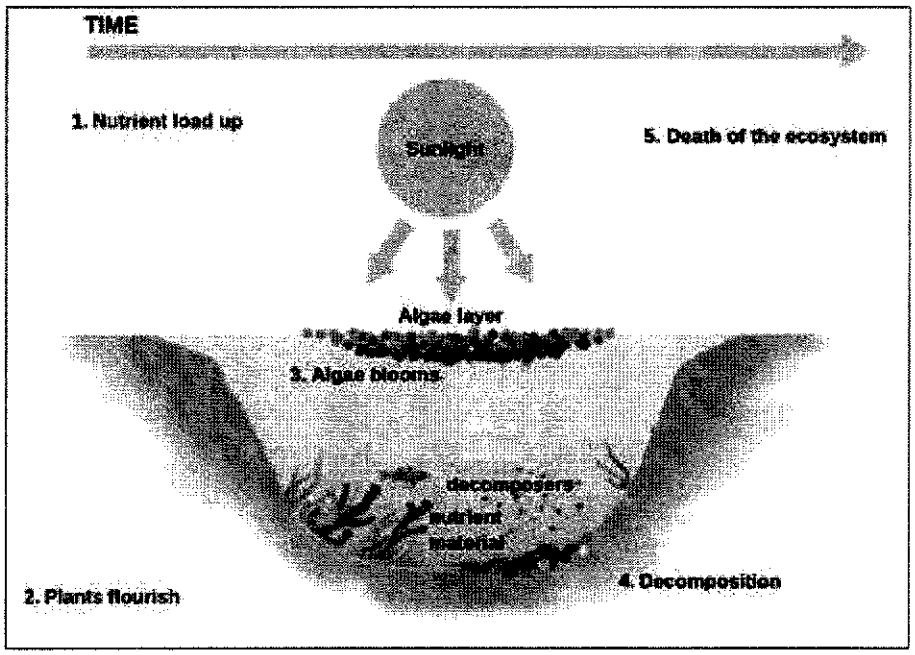


Fig. 9

Using Fig. 9, explain how excessive use of fertilisers could lead to eutrophication in water bodies. [5]

(d) 'Climate and soil fertility are the more important than technology in determining the intensity of food production.'

Do you agree with the statement?

Support your answer with examples. [8]

Copyright Acknowledgements:

Question 2 (a)	Fig. 2	https://www.printablee.com/post_black-and-white-printable-europe-map_45718/
Question 5 (a) & (b)	Fig. 4 & Fig. 5	https://www.britannica.com/event/Izmit-earthquake-of-1999
Question 5 (c)	Fig. 6	Adapted from: https://www.pureecoindia.in/organic-food-is-not-extra-expense/
Question 6 (a)	Fig. 7	https://www.thedailystar.net/news-detail-191843
Question 6 (c) (ii)	Fig. 9	https://theory.labster.com/eutrophication/

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Preliminary Examinations 2021

CANDIDATE NAME	**MARKING SCHEME**		
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COMBINED HUMANITIES **2272/02**

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Section A

Answer **one** question from this section.

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(a) State the sampling method that the students have chosen and describe the advantages of this sampling method. [3]

A **The sampling method chosen is stratified sampling. (1)**

Advantages:

As a proportionate number of respondents is taken from each sub-set, stratified sampling can generate results which are more representative of the whole population. (1)

Correlations and comparisons can be made between sub-sets. (1)

(b) Study Fig. 1 (Insert) which shows a photograph that the students have annotated to highlight attractions and amenities found at Old Town.

Add annotations to Fig. 1 to identify a data collection site and the characteristics of the site that makes it suitable for carrying out the survey with tourists. [2]

A **Suitable site: Pathway towards car park and main road. (1)**
This is quite a contained area so the students will be able to carry out sampling more effectively. (1) OR
Tourists will pass this area after visiting Old Town and therefore will be able to give some feedback based on their experience of visiting Old Town. (1)
***Accept other locations if students provide a valid reason.**

(c) Study Table 1, which shows the results of one of the items in the survey.

Table 1

Survey Results

Item: I would like to have more of the following amenities in Warsaw

	Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
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		(i)	Describe how the students could calculate the positive and negative scores for each of the amenities in Table 1. [2]
A			**Give weightage to each of the options, eg: give 'Strongly Agree' a score of 2, 'Agree' a score of 1, 'Neutral' a score of 0, 'Disagree' a score of -1 and 'Strongly Disagree' a score of -2.** **Multiply the number of each respondent for each of the options by the weighted score, eg: for 'Tourist Information Centres', the positive score should be (3x2)+(2x1) = 8 and the negative score should be (10x-1) + (21x-2) = -32**
		(ii)	Based on the data from Table 1, the students concluded that Warsaw needs to provide more souvenir shops and restaurants. Comment on the validity of this conclusion. [2]
A			**The conclusion lacks validity as the item 'Souvenir shops and restaurants' is double barreled. (1)** **There are 2 issues in the item, - souvenir shops' and 'restaurants' and this may confuse the respondents. They may choose this option even if they only agree to part of the item. (1)**
	(d)	The students wanted to find out if the goods and services available at the Old Town catered to tourists' needs. They decided to conduct a land use survey and sketch a land use map of the area. Describe the steps the students need to take to complete the land use survey and the land use map. [4]	
A		**Identify the categories of goods and services that tourists would like to have at the tourist destinations, for example, fashion retail, food and beverages, financial services, convenience stores etc. (1)** **Walk down both sides of the main street in Old Town. Count the number of units for each category of landuse and record it on a recording sheet. The traditional tally method may be used. (1)** **Using the street map as reference, plot the names of the shops at the ground level along the assigned street and annotate the type of goods and services provided by the respective shops. (1)** **Mark the points of accessibility and transport along the assigned street, for example, look out for bus stops or places where taxis are hailed along that street and mark them on their map. (1)**	
2	Students from a school in Warsaw, Poland wanted to find out how distance from the sea affects the temperature of a place. They conducted a collaborative investigation with students from another school in Amsterdam, the Netherlands. Both groups of students agreed to prove the hypothesis, 'Summer temperatures are lower in coastal areas than areas further inland'. The two groups of students collected data in their own schools for a week during the month of July. A minimum and maximum thermometer was placed in a Stevenson Screen and sited in an open area in the each of the two schools. The students recorded the maximum and the minimum temperature for each day at 8 am the next morning.		

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(a) Study Fig. 2, which shows the location of Warsaw, Poland and Amsterdam, the Netherlands.

Location of Warsaw and Amsterdam

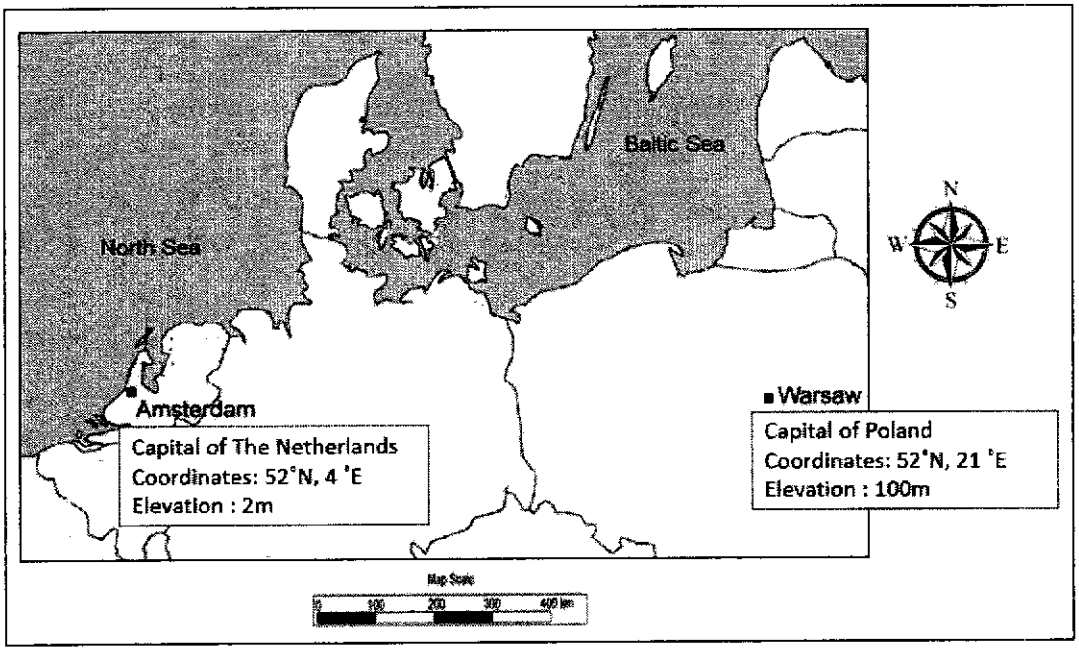


Fig. 2

(i) Identify the sea closest to Warsaw and measure the distance of the city of Warsaw from this sea. [2]

A **The sea closest to Warsaw is the Baltic Sea. (1)**
Warsaw is about 250 km away from this sea. (1)

(ii) Suggest why the students from Warsaw chose to collaborate with a school in Amsterdam for this investigation. [3]

A **Amsterdam is a coastal city and would make a good comparison with Warsaw which is further inland. (1)**
To improve validity, the other variables should be kept constant, such as latitude. Thus, since Amsterdam is along the same latitude as Warsaw, Amsterdam is a good choice for this investigation. (1)
Amsterdam has an altitude of 2m while Warsaw has an altitude of 100m. The difference in altitude is small and will not have a significant impact on the temperature difference between the two cities, thus making Amsterdam a suitable choice for this investigation. (1)

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(b) Study Table 2, which shows the mean daily temperatures of Warsaw and Amsterdam.

Table 2

Mean daily temperature of Warsaw and Amsterdam (05 – 11 July)

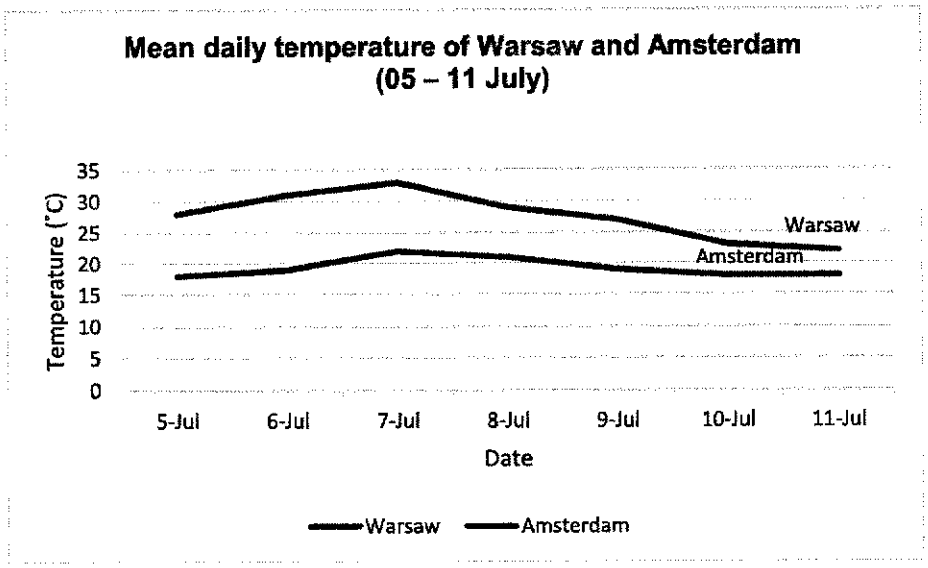
	05 July	06 July	07 July	08 July	09 July	10 July	11 July
Warsaw	28°C	31°C	33°C	29°C	27°C	23°C	22°C
Amsterdam	18°C	19°C	22°C	21°C	19°C	18°C	18°C

(i) Describe how the students could have calculated the mean daily temperature for each day. [1]

A **Max temperature for the day + Minimum temperature for the day / 2**

(ii) Present the data using a suitable type of graph on Fig. 3 (Insert). [3]

A



Correct choice of graph, ie: line graph (1m)
Correct labeling of x-axis and y axis (1m)
Accurate plotting of data for both Warsaw and Amsterdam (1m)

(c) At the end of the investigation, the students concluded that the hypothesis is true. Justify this conclusion and suggest how the reliability of this investigation could be further improved. [4]

A **The hypothesis is true as the summer temperatures are in fact lower in coastal areas than areas further inland. (1)**
On all seven days in June, the mean daily temperatures in Amsterdam are lower than that in Warsaw. On 06 July, for example, the mean daily temperature in Amsterdam is 12°C lower than in Warsaw. (1)
The reliability of the investigation could be further improved by:
- **measuring the mean daily temperatures of more coastal cities along the same latitude as Warsaw (1)**

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		- **taking hourly temperature reading at each location and calculating the mean daily temperatures by adding all the readings in 24 hours and dividing by 24. (1)** - **Extending the period of investigation to cover more days and months during summer. (1)** ***any 2 points for reliability**

Section B

Answer **one** question from this section

3	(a)	Explain how temperature could affect the relative humidity of a place. [4]
A		**If the actual amount of water vapour in the air remains the same, relative humidity decreases as temperature increases (1)** **When temperature increases, air expands and the air molecules are more spread out, which makes room for more water vapour to fill the spaces. (1)** **Hence, a rise in temperature makes air more able to hold water vapour. (1)** **RH will decrease since the actual amount of water vapour present will be a smaller percentage of the maximum amount of water vapour the air can actually hold. (1)**
	(b)	'A growing economy is the main factor that spurred the growth of the global tourism over the last few decades.' How far do you agree with this statement? Support your answer with evidences. [8]
A		

Level 1 (1 – 3m)	**At this level answers will be generalised or with minimal support if any given at all.** **Reasoning is rather weak and expression are unclear.** **A basic answer that has little development.** **Answers lack examples or other evidence, or it is so sketchy that it adds little support to the answer.**
Level 2 (4 – 6m)	**Disagreement or agreement will be supported by appropriate detail or, both agreement and disagreement are considered, but support is so patchy so that the answer is not full.** **Good reasoning and logic in parts of the answer with good expression in places.** **Some examples or other evidence will be presented to support answers in at least one place in the answer.**
Level 3 (7 – 8m)	**At this level answers will be comprehensive and supported by sound knowledge.** **Both agreement and disagreement are considered and well supported. Reasoning is clear and logical with good expression of language. Examples or other evidence to support answers will be extensive.**

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Answers may include the following:

Growing Economy - Increase in disposable income

- **Has allowed people to be better able to afford spending more on goods, services or activities that improve their quality of life.**
- **One of these activities is travelling.**
- **Disposable income has been increasing globally because of rapid economic growth. Countries such as China and India have experienced rapid economic growth. In these countries, the number of people in the middle and high income groups has been growing, resulting in more people being able and willing to travel.**

Ease of access to information

- **Has helped promote air travel and global tourism.**
- **Developments in information technology has made information more readily available and accessible.**
- **It has also made current, updated information, such as transport routes, schedules, weather conditions and available accommodation, available.**
- **For example, online booking and research has enabled travellers to buy their own tickets without going through travel agents.**
- **Signs found in many tourists destinations are now displayed in many languages. This has allowed more tourists to understand the information signs, giving them the confidence to travel and encouraging the growth of tourism.**
- **Alternatively, ease of internet access allows tourists to use online translating apps to understand signs even without them being translated.**
- **An example are information signs/ announcements that are written/ made in 4 different languages in the MRT stations in Singapore.**
- **Local tour guides and travel agents trained to answer questions to help meet the needs of tourists has also helped to encourage tourist arrivals.**

Changing lifestyle

- **As the pace of life today is much faster, many people in the workforce find themselves spending long hours at work.**
- **Therefore, travelling has become a way for people to relax and take a break from their fast-paced lifestyles at work.**
- **With advances in medical technology and knowledge, people are more health conscious and lead healthier lifestyles. This means more people are fit enough to travel.**
- **People live longer and are more physically fit to travel**
- **Travelling is a way for retirees to spend their healthy years productively**
- **Retirees are major contributors to the growth of tourism**
- **A survey conducted in 2011 showed that over 50% of the people surveyed travel for leisure, recreation and holidays.**

Better and affordable transport

- **Great improvements in safety**
- **Shorter travelling time**

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- Lower travelling costs (more affordable)
- Commercial air travel has revolutionised global tourism due to ongoing technological developments in jet aircraft since the 1950s
- Rise of budget airlines
  - Budget airlines are airlines with low fares. Such airlines made air transport affordable, *e.g. Jetstar Asia and Tiger Airways*
  - Rapid expansion within Europe, North and South America, and Southeast Asia since the 1980s
  - Cheaper than major commercial airlines (smaller and more fuel-efficient aircraft)
  - Typically fly to short-haul destinations
  - Costs further reduced by selling tickets online
- Has helped increase the number of international travellers by:
  - Enabling more people to travel internationally and more frequently
  - Giving travellers opportunity to go on holidays further away from home
  - Enabling travellers to go to destinations not covered by major commercial airlines, *e.g. Bhutan, the Pacific islands, Northern Thailand, and many islands in the Mediterranean region (Corsica and Crete)*

Leisure time

- Leisure time: Part of a day, week or year when people have no work commitments (time for relaxation)
- Comes in the form of paid leave for the middle to high income groups
- With more income and paid leave, people are more inclined to travel
- In many DCs and LDCs since the 1950s, people have enjoyed shorter working weeks, more public holidays and more paid annual leave
- Increased availability of leisure time has allowed more people to travel
- *Example: Australia*
  Many employees can exchange paid overtime work for leave which increases their chances of taking longer weekend breaks
- *Example: Canada*
  Increase in additional breaks and extended weekends

Attractions

- Promoted and enhanced by the tourism industry to attract even more tourists
- Some are natural attractions (e.g. scenic beauty) while others are built attractions (e.g. medical services, educational facilities, theme parks)
- Without built attractions, tourists are less likely to visit a place
- *Example: Dubai*
  - A city in the United Arab Emirates in the Middle East
  - Major destination and stopover location between Europe and Asia
  - Received more than 9 million travellers in 2011
  - Tourists visit for shopping, business and entertainment
- Governments, tourist authorities and tourism businesses know the value of investing in attractions
- Attractions offer something spectacular, unique and interesting for tourists
- Tourists might return repeatedly to spend their tourist dollars

Investment in infrastructure and services

- *Example: Airport expansion in Southeast Asia*

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- **Southeast Asia experienced rapid growth in international tourist arrivals over the last three decades**
- **Airports have undergone considerable expansion to facilitate increased international tourist arrivals, e.g. *Changi Airport (Singapore), Suvarnabhumi Airport (Bangkok)***
- **Changi Airport's Budget Terminal was closed to make way for the construction of a new Terminal 4**

- **Sufficient hotels must be built to receive rising number of tourists**
- **Hotels must serve a range of tourist budgets**
- ***Example: Hong Kong***
  49 hotels to be built from 2012 to 2016
  Plan is to accommodate 70 million visitors a year (from previous 42 million)

Sample Conclusion:
I totally agree with this statement. While there are many other factors that have made it attractive for tourists to travel, many of these factors, such as development of infrastructure and more attractions, may not be able to make a difference if people did not have the extra income to spend on this non-essential indulgence. Even if people had less leisure time, they may still be able to travel by reducing time spent on the journey such as by going on direct flights if they could afford to do so.

4 (a) Differentiate the characteristics of monsoon rain from convectional rain. [4]

A

	Monsoon Rain	Convectional Rain
Scale	Large scale regional wind system that spans the two tropics / between 30°N and 30° South of the equator.	Small scale localized wind system.
Period of occurrence	During summer - Northern hemisphere experiences monsoon rain between May and Aug, southern hemisphere experiences monsoon rain between Nov to Feb.	Throughout the year in the equatorial region and in other region between the tropics. In temperate regions, convectional rain often occurs during the warm, summer season.
Conditions for formation	Difference in air pressure due to the seasonal variation in temperature between Central Asia in the northern hemisphere and Australia in the southern hemisphere.	Air instability due to the intense heating of the ground from shortwave radiation that causes air to heat up, expand and rise.
Rainfall characteristics	Long periods of rain that can last for days, occurring throughout the season.	Short but intense rainfall that normally occurs in the late afternoons. Often accompanied by thunder and lightning.

1m for each point.

(b) 'The most devastating impact of global warming is the increasing frequency of extreme weather events.'

To what extent do you agree with this statement?

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Provide examples to support your answer. [8]

A

Level 1 (1 – 3m)	At this level answers will be generalised or with minimal support if any given at all. Reasoning is rather weak and expression are unclear. A basic answer that has little development. Answers lack examples or other evidence, or it is so sketchy that it adds little support to the answer.
Level 2 (4 – 6m)	Disagreement or agreement will be supported by appropriate detail or, both agreement and disagreement are considered, but support is so patchy so that the answer is not full. Good reasoning and logic in parts of the answer with good expression in places. Some examples or other evidence will be presented to support answers in at least one place in the answer.
Level 3 (7 – 8m)	At this level answers will be comprehensive and supported by sound knowledge. Both agreement and disagreement are considered and well supported. Reasoning is clear and logical with good expression of language. Examples or other evidence to support answers will be extensive.

Answers may include the following:

<u>Extreme weather events:</u>
Severe and rare weather phenomenon that results in significant economic losses and the loss of lives.
-Eg. Heat waves, floods, droughts and tropical cyclones.
- Increasing frequency of occurrence due to higher land & sea surface temperatures.
- Results in greater amounts of water vapour & latent heat in the atmosphere, the driving force for extreme weather events.
- Over the last 40 years, major floods have more than doubled, the number of severe storms has risen 40 percent, and there have been major increases in droughts, wildfires, and heatwaves.

<u>Sea level rise</u>:
Increase in the mean height of the sea's surface between high and low tide relative to land.
- Higher temperatures causes water to expand.
- Higher temperatures causes glaciers in Greenland & Antarctica to melt, adding melt water to the sea.
- 600m people worldwide live in areas <10m above sea level.
- 2/3s of the world's largest cities located in coastal areas are at risk.
- 33% of coastal land & wetland habitats are likely to be lost if sea levels continue to rise at the current rates.
- Increase varies from place to place, over 50m people are at risk in South Asia, 10 - 50m in SE Asia & below 10m in Africa. The worst hit will be Majuro Atoll in the Pacific Ocean which will lose 80% of its land if sea level rises by half a metre.

<u>Longer growing seasons for some regions.</u>

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Cool regions are now getting hotter, less conducive for crop growing.
- Apples and cherries, almond & walnut production in Yunnan has reduced as they need cool conditions.
- Wheat yield has decreased in Canada.
- earlier springs & warmer autumns have made grapes in Valtellina in northern Italy sweeter, leading to more alcoholic wines causing problems for winemaker

Cold regions are now warmer, more conducive for crop growing
- Increase in types of crops eg blackberries & maize can be grown in UK.
- Increase in fruit, soybeans, potatoes and wheat in Canada.
- Climate change is favourable for Germany which was too cold for wine-making in the past.

<u>Spread of Infectious Diseases</u>
Climate change could result in increase in temperature and increase in rainfall in various parts of the world, creating favourable conditions for breeding of insects.

Higher temperatures - Malaria mosquitoes digest blood quicker and feed more often → lead to faster transmission of malaria disease

Higher rainfall - create more breeding grounds for mosquitoes as there are stagnant water → more mosquitoes to transmit malaria and dengue to humans

Diseases like malaria and dengue fever used to be confined to the tropics. With global warming, dengue is spreading beyond the tropics into parts of North America & Europe.

In Nepal & Bhutan, there used to be no such occurrence of dengue fever in the cool climate areas before 2004.
Due to global warming, the temperature of both countries rose and reached the optimum temperature for mosquitoes to breed.
•Now, people experience the risk of getting infected by such insect-borne diseases. At the same time, they lack the medical facilities to deal with such diseases → people suffer a higher chance of dying/infection.

Sample Conclusion:
I agree that the most devastating impact of global warming is the increasing frequency of extreme weather events. Increased frequency and magnitude in floods and tropical storms, for example, have caused destruction to agricultural land and settlements and have led to massive economic losses in many parts of the world. The extent of damage caused by extreme weather event has already been observed, unlike the other effects such as the rising sea level, which notably can still be mitigated. Furthermore, effects such as the lengthening of the growing season has brought about some benefits despite the observed reduction in agricultural productivity.

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Section C

Answer **one** question from this section

5 (a) Study Fig. 4, which illustrates the occurrence of a large earthquake in Izmit, Turkey in 1999 and Fig. 5 which describes the impact of the earthquake.

Izmit earthquake of 1999

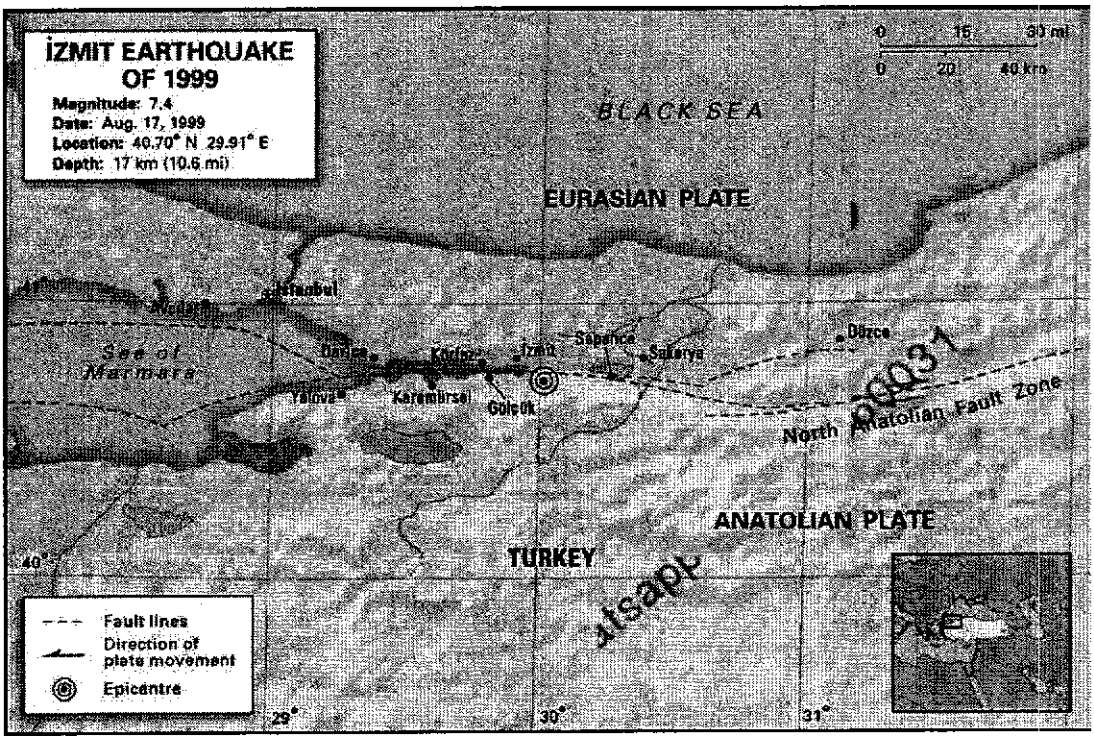


Fig. 4

Impact of Izmit Earthquake of 1999

The earthquake struck just after 3:00 am local time. Its epicentre was about 11 km southeast of İzmit. The initial shock lasted less than a minute and registered a magnitude of 7.4. It was followed by two moderate aftershocks on August 19, about 80 km west of the original epicentre. More than 17,000 people were killed and an estimated 500,000 left homeless as thousands of buildings—chief among them the Turkish navy headquarters in Gölcük and the Tüpraş oil refinery in İzmit—collapsed or were heavily damaged. High casualty figures were reported in the towns of Gölcük, Derince, Darıca, and HYPERLINK "https://www.britannica.com/place/Sakarya"

Fig. 5

(i) Using Fig. 4, describe the processes that led to the Izmit earthquake in 1999. [3]

A **Izmit is located on the North Anatolian Fault which is along a transform plate boundary. (1)**

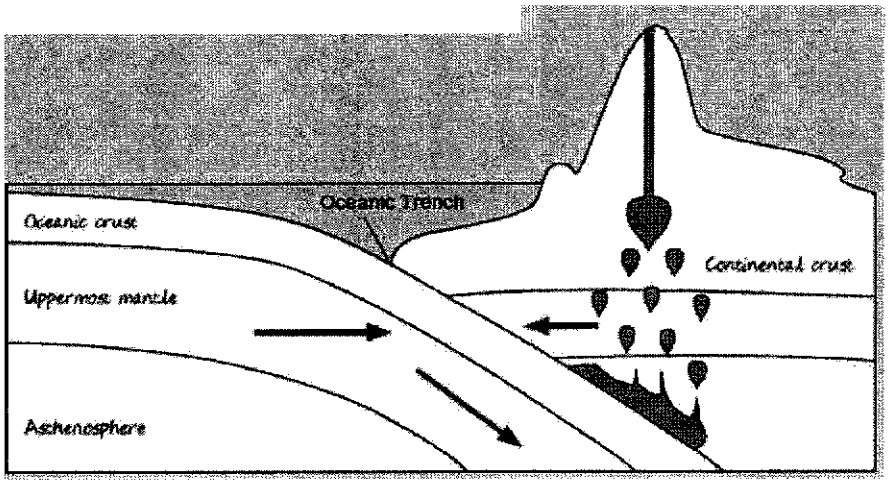
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			At this plate boundary, the Anatolian Plate is moving east while the Eurasian Plate is moving west which resulted in the formation of this transform fault. (1) **The transform plate movement leads to tremendous stress build up and this is eventually released in the form of violent earthquakes such as the one in Izmit in 1999. (1)**
		(ii)	Using Fig. 4 and Fig. 5, explain why Izmit suffered a high death rate in the earthquake and suggest how the government could have reduced the number of fatalities. [6]
A			**Reasons for high death rate** **Magnitude: The earthquake in Izmit measured 7.4 on the Richter Scale. For each increasing magnitude of an earthquake on the Richter Scale, the impact of the earthquake is 10 times greater. A magnitude of 7.4 has the ability to cause severe damage and destruction to buildings that could trap and injure the residents causing many deaths.** **Time of occurrence: The earthquake occurred just after 3.00 am in the morning. Most of the residents of Izmit were probably indoors and sleeping and this reduced their ability to react. There is a higher chance for them to be trapped under the collapsed building thus resulting in high death rate.** **Population density: The earthquake and the aftershocks occurred in a region where there are many towns such as Izmit, Gölcük, Körfez, Darıca, and Sakarya. Towns tend to have higher population densities and therefore a lot more people were be injured and killed.** **How government could have reduced the death rate (Any 3 points):** **Strengthening Infrastructure – The infrastructure and buildings could have been improved with advanced engineering to withstand the vibration of earthquakes. Effective building design could have reduced the collapse of buildings and thus minimised the number of people trapped and eventually being injured or killed. (1)** **Warning Systems – By installing earthquake sensors in earthquake-prone zones, the ground motions could have been monitored, which could have allowed scientists to predict the occurrence of an earthquake. With such a system, a warning could be sounded to alert the people about the incoming earthquake, which would allow them to quickly escape from dangerous situations. This could have reduced the death rate. (1)** **Emergency drills – The government could implemented regular emergency drills, where the people could practice the steps they should take when an earthquake occurs. By creating awareness and reducing the panic and irrational behavior that people exhibit during earthquakes, the high death rate could have been reduced. (1)** **Landuse regulations – The government could have implemented stricter rules on developments in certain areas. The could have prevented the construction of buildings and infrastructure on unconsolidated soil that could amplify the vibrations or experience soil liquefaction so as to reduce damages that increase the death rate. (1)** ***Accept other plausible answers with clear explanation**

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	(b)	With the aid of a well-labelled diagram, explain the formation of oceanic trenches. [5]
A		**When a dense oceanic plate converges with a less dense oceanic plate or a continental plate, it will subduct. The area where this happens is called the subduction zone. (1)** **This subduction pulls along the edge of the outermost crust, causing it to bend. (1)** **This results in the formation of a long, linear depression on the bed of the sea called an oceanic trench. (1)** **Formation of oceanic trench**  **Accuracy of diagram – 1m** **Clear labeling of features and processes – 1m**
	(c)	Study Fig. 6, which shows perceived characteristics of organic food.
		Perceived characteristics of organic food

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Fig. 6

Account for the characteristics of organic food as shown in Fig. 6 [3]

A

Organic food is perceived to be better for health because the cultivation of organic food does not involve the use of chemical fertilisers and chemical pesticides that are deemed harmful for health. (1)

Organic food is however expensive because the cultivation of organic food requires more labour to manage and this increases production cost. This translates to higher prices for organic food. (1)
Organic food still has a small market and is therefore produced on a smaller scale. Thus, farmers are not able to increase production to benefit from economies of scale and reduce production costs. This also causes organic food to be sold at a higher price. (1)

(d) 'Political factors have a greater influence than social factors on the food consumption patterns in a country'.

How far do you agree with this statement?

Support your answer with examples. [8]

A

Level 1 (1 – 3m)	**At this level answers will be generalised or with minimal support if any given at all.** **Reasoning is rather weak and expression are unclear.** **A basic answer that has little development.** **Answers lack examples or other evidence, or it is so sketchy that it adds little support to the answer.**
Level 2 (4 – 6m)	**Disagreement or agreement will be supported by appropriate detail or, both agreement and disagreement are considered, but support is so patchy so that the answer is not full.**

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			Good reasoning and logic in parts of the answer with good expression in places. Some examples or other evidence will be presented to support answers in at least one place in the answer.	
		Level 3 (7 – 8m)	At this level answers will be comprehensive and supported by sound knowledge. Both agreement and disagreement are considered and well supported. Reasoning is clear and logical with good expression of language. Examples or other evidence to support answers will be extensive.	
		Answer may include the following: Political factors <u>Stability of Food Supply</u> A country has a stable food supply when safe and nutritious food is available to all people at all times. The stability of food supply is threatened when: - Conflict such as civil war increases the risk of food supply being depleted; and not replenished. For example, during the civil war in Libya in 2011, the United Nations World Food Programme (UNEP) reported that food stocks in the country were being depleted and were not being replenished. Cities and areas with heavy fighting reported food and water shortages, while safety concerns restricted people from venturing out to find or buy food. - Disasters such as drought and tsunamis decrease the amount of food available and reduce people's capacity to access food supplies. For example, Zimbabwe was faced with food shortage after a long-running drought. Extremely low rainfall destroyed most of the corn harvest. Governments may take action when faced with these threats in order to ensure the stability of food supply. This can be done by increasing food imports, adopting technologies that could increase agricultural productivity or by increasing agricultural land. A good government should be able to ensure sufficient availability of food for the country. <u>Food Safety</u> Food is avoided when it becomes unsafe. For example, food imports from Japan were negatively affected by news of nuclear contamination from the Fukushima Daiichi Nuclear Disaster in 2011. As a result, seafood imports from Japan to Singapore were restricted for many months. This caused many Japanese restaurants in Singapore to face a decline in their business. Another example is how outbreaks of bovine spongiform encephalopathy (BSE) reduced the consumption of beef. Humans contract this fatal and incurable disease when they eat meat from an infected cow. This disease was found in meat for consumption in Europe during the late 1990s and then again in the United States of America and Canada in 2005 to 2006. After each outbreak of BSE, beef consumption fell in the European Union The government of a country plays an active role in ensuring food safety in a country. Socio-cultural factors <u>Religious Beliefs</u>	

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Religious beliefs can influence food choices.
For instance, Islam promotes the consumption of *halal* foods, which may include meat from an animal that has been killed in a way that is approved by Islamic law. Buddhism and Hinduism promotes the adoption of a vegetarian diet or consumption of very little meat. This is because Buddhists and Hindus believe in not harming animals. Countries in South Asia such as Bangladesh, Iran, India and Sri Lanka, as well as Southeast Asia, consume the least meat per capita than any part of the world.
Judaism promotes the consumption of *kosher* foods, which are foods that conform to regulations stated in Jewish law.
Thus religious believes can cause variations in the type of food consumed in different communities and countries.

<u>Changing Food preferences</u>
Changing food preferences has resulted in large changes in food consumption. Modern society's emphasis on convenience has led to the emergence of many fast food outlets throughout DCs & LDCs. In LDCs, traditional diets are turning into fast-food, calorie-rich diets. These diets consist of the western burger-and-fries fast food or the readily available processed food versions of traditional dishes. Apart from its cheap price and convenience, fast food is becoming popular in LDCs because of globalisation, which has allowed fast food chains to set up restaurants in many countries. Due to this phenomenon, the consumption of fat has gone up in LDCs.

However, there are health concerns linked to the consumption of fast food. These concerns arise from the large amounts of oil, processed meats and chemicals used to prepare fast food. Due to the increasing awareness of the harmful effects of consuming fast food, people in DCs are trying to move away from their high levels of consumption of fast food. Food preferences within DCs are increasingly driven by health or ethical concerns. For example, in 2011 a survey among people in the United States America revealed that 58 per cent would prefer to eat organic food over non organic food.

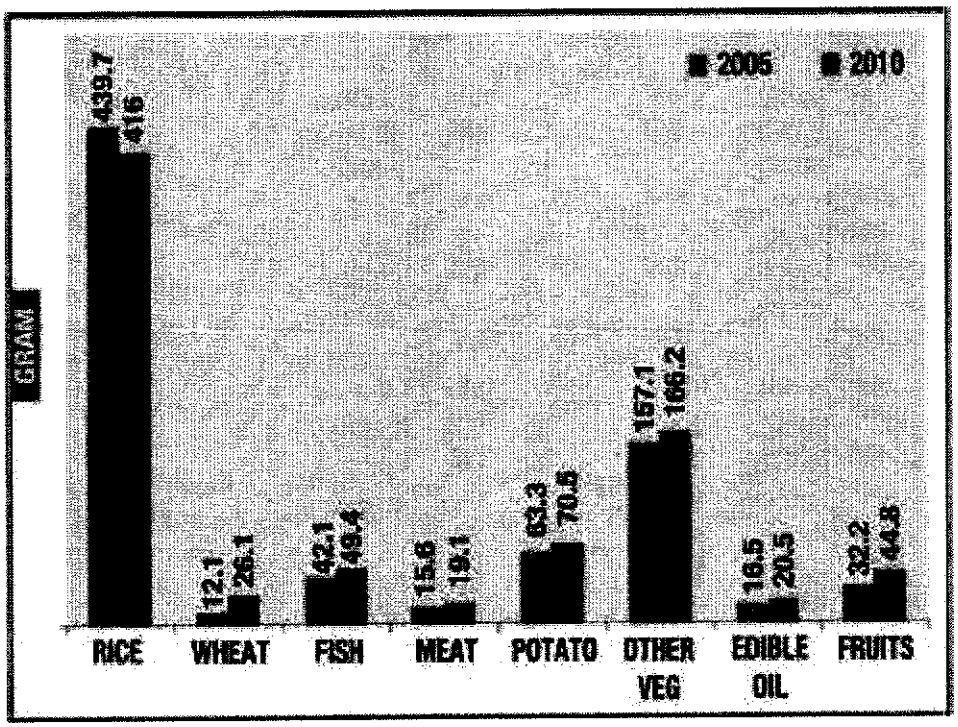
<u>Migration</u>
Migration continues to play a large role in the changes in global food consumption patterns. Migrants bring new foods to places and drive demand for new food preferences. When migrants relocate, they may adopt the food of the locals because they are exposed to the local cuisine. For example, Pakistanis living in Norway have reduced their consumption of cooked vegetables and increased their consumption of local Norwegian cuisines, which involve the use of animal products, sugars, processed grains and oil. Migrants also expose the local population of their new home to other types of food, making a wide variety of foods available in most urban areas throughout DCs and LDCs. Population growth is one of the key drivers in the increasing demand for food worldwide.

<u>Population Growth</u>
Population growth means more people need more food. The world population is expected to increase by 2 billion from 2012 to 2050.
Population growth rates have always been more significant in the LDCs than the DCs. By 2050, 72 per cent of the cereal and meat produced will be consumed by LDCs, up from current figures of 58 per cent.

Sample Conclusion:
I do not agree that political factors have a greater influence than social factors on the food consumption patterns in a country. Food consumption patterns may vary in terms of quantity, quality and variety. In general, political factors affect the amount and the safety of food available for consumption social factors affect the

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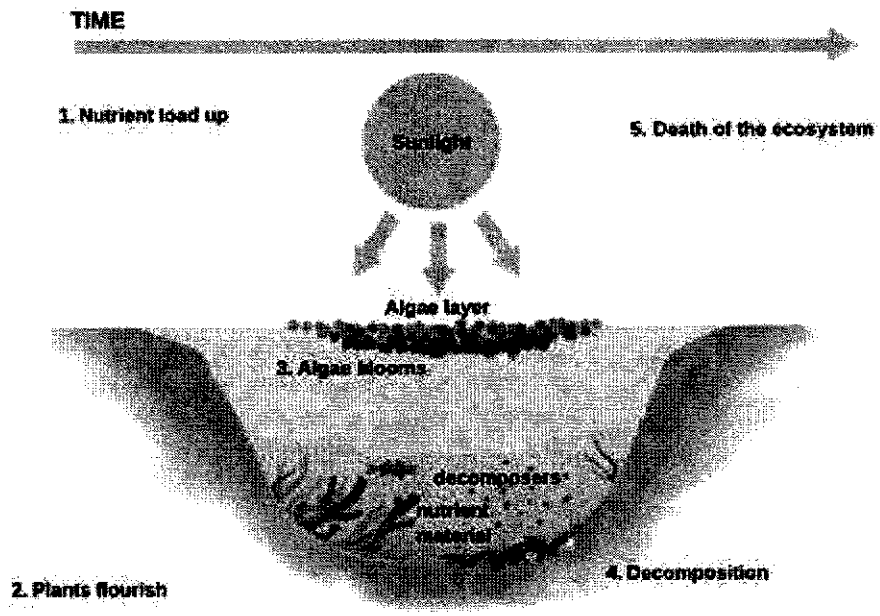
		variety and type of food consumed. As such both political and social factors influence the food consumption pattern in a country.
6	(a)	Study Fig. 7, which shows changes in the consumption of major food items in Bangladesh between 2005 and 2010.
		Per capita daily consumption of major food items in grams  **Fig. 7**
		Describe how the consumption of major food items in Bangladesh has changed between 2005 and 2010. **[4]**

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A			**The per capita consumption of major food items has increased between 2005 and 2010. (1)** **The greatest increase is in the consumption of wheat which has more than doubled (increased by 115.7%) between 2005 and 2010. (1)** **The lowest increase is in the consumption of other vegetables that increased by only 5.8%. (1)** **Rice is the only food item that experienced a reduction in consumption by 5.4% between 2005 and 2010. (1)**
	(b)		Discuss the economic and social impacts of excessive food consumption. [5]
A			**Economic Impacts:** **<u>Lower productivity</u>** **Excessive food consumption often leads to obesity, which is associated with several heath issues and diseases such as hypertension, coronary heart disease and diabetes. (1)** **The health impacts of obesity has resulted in workers being absent from work and taking more days of leave due to obesity-related health issues, thus leading to lower productivity. (1)** **On a national level, employees who are absent from work due to sickness may cost companies millions in productivity and insurance cost. (1)** **<u>Diversion of financial resources</u>** **Public health expenditure increases as a result of treating obesity-related health conditions, such as cardiovascular disease and diabetes. Government has to channel more funds to the health care system and this reduces the resources for other sectors such as education and defence. (1)** **Social Impacts:** **<u>Food wastage</u>** **When societies have excess food available for consumption, there may be large amounts of the food being wasted. This contributes to additional waste that the country must dispose and this may put a strain on landfills. (1)** **Food wastage also means that resources such as water and oil used in the cultivation and processing of the food is also wasted. (1)** **<u>Dieting</u>** **Excessive consumption of food may have a positive social impact as people who become overweight may resort to dieting to reduce their body weight. The weight loss industry contributes significantly to employment as many people could get jobs in medical facilities, gymnasiums and slimming centres. (1)** **The weight loss industry also increases the sale of goods and services such as diet books, medication and medical services. These sales also contribute to the economy of a country. (1)** ***Any 5 points. Reserve 2m for economic and social impact each.**
	(c)	(i)	Study Fig. 8 (Insert) which shows total fertiliser used per hectare of the land in the world in 2015.
			Describe the patterns in the use of fertiliser in the world in 2015. [3]
A			**Generally, most countries practice the application of a large amount of fertilisers, between 100 kg to 500 kg per hectare of land. As seen in Fig. 8,**

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			moderate application of fertilisers is observed is most ports of North and South America, in Europe and India. (1) **A smaller number of countries, such as China, Malaysia and New Zealand, apply a very high amount of fertilisers, amounts of more than 500kg. (1)** **In other parts of the world, a rather small amount of fertilizer, amounts of less than 50kg, is used per hectare of land. This includes many of the African countries, Australia and Russia. (1)** **No data on use of fertilisers per hectare of cropland can be gathered from a small number of countries such as in parts of Africa. (1)**
		(ii)	Study Fig. 9, which shows the process of eutrophication that results from excessive use of fertilisers in farming.
			Eutrophication  **Fig. 9**
			Using Fig. 9, explain how excessive use of fertilisers could lead to eutrophication in water bodies. [5]

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A			**Award 1m for the explantion of each of the stages:** **1. Excessive nutrients from the fertilisers are flushed from the land into rivers and lakes by rainwater. (1)** **2. The fertilisers cause rapid and excessive growth of aquatic plants such as algae and duckweeds. (1)** **3. When algae blooms, it prevents sunlight from penetrating and reaching other plants. The algae bloom also depletes the oxygen content in the water. As a result, aquatic plants and animals die. (1)** **4. Subsequently, the decomposition of the dead plants and animals in the water further depletes the oxygen content in the water. (1)** **5. Without oxygen, the water is not able to support any plant and animal life and eutrophication has thus led to the death of the ecosystem. (1)**
	(d)	'Climate and soil fertility are the more important than technology in determining the intensity of food production.' Do you agree with the statement? Support your answer with examples. [8]	
A			

Level 1 (1 – 3m)	**At this level answers will be generalised or with minimal support if any given at all.** **Reasoning is rather weak and expression are unclear.** **A basic answer that has little development.** **Answers lack examples or other evidence, or it is so sketchy that it adds little support to the answer.**
Level 2 (4 – 6m)	**Disagreement or agreement will be supported by appropriate detail or, both agreement and disagreement are considered, but support is so patchy so that the answer is not full.** **Good reasoning and logic in parts of the answer with good expression in places.** **Some examples or other evidence will be presented to support answers in at least one place in the answer.**
Level 3 (7 – 8m)	**At this level answers will be comprehensive and supported by sound knowledge.** **Both agreement and disagreement are considered and well supported. Reasoning is clear and logical with good expression of language. Examples or other evidence to support answers will be extensive.**

Answer may include the following:

<u>Climate</u>
Climate refers to the average condition of the atmosphere of a specific place over a long period of time, usually over 30 years.

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Temperature and rainfall affects plant growths & types of crops. High temperatures & high rainfall are more conducive for plant growth and can lead to more crop yields (food production is intensified)
For examples : Places in the Tropics have high mean daily temperatures ranging between 22°C and 32°C and a high total annual rainfall of 2000mm. In these places, the long growing season allows 2 or 3 harvests in a year.
However, in the temperate countries where winter is unsuitable for plant growth, the people may build greenhouses to allow certain crops to be grown throughout the year. E.g. USA, Canada and the Netherland.

<u>Soil fertility</u>
Soil and drainage will also affect the food production. The fertility of the soil depends on the amount of air, water and nutrients present in it. Fertile soil is usually found on floodplains, river deltas and in the areas surrounding volcanoes. E.g. Floodplains like Ganges Plain and Ganges Delta are fertile as it has alluvium brought down by rivers. The fertile soil will provide nutrients for the crop to grow well. Mekong Delta of Vietnam has fertile soil and large water supply to grow rice. This has led to high crop production in this area.

<u>Technology</u>
Technological advances also affects the intensity of food production. Technologies were first introduced during the Green Revolution in the later 1960s but they are still used today to increase agricultural productivity. These technologies include the use of high-yielding varieties; chemical fertilizers and pesticides; modern irrigation methods and machinery.

High yielding varieties refer to improved strains of rice, wheat and other cereals. The high yielding varieties have short growing season and are resistant to pest and diseases. For example, "Wonder rice" has a growing season of 100 days. The farmers can have two to three harvests per year. This will allow the farmers to increase in crop production.

Since the Green Revolution farmers have also been using modern irrigation methods to supply water to the land through artificial means such as human made dykes, dams, canals and water sprinklers. In the North African country of Libya, the Great Man-made River is one of the most extensive irrigation project which allow crops to be grown in the Sahara Deserts. Irrigation enables farmers to increase the amount of water that their crops receive. Thus farmers can grow more crops per year with irrigation. They are also able to open up farmland in areas that used to be dry and unsuitable for cultivation.

Chemical fertilisers, pesticides and herbicides have also been widely used in the cultivation of crops. Fertilisers provide nutrients for healthy plant growth, thus applying fertilisers will increase the output of crops. Pesticides will destroy pests which will affect crop growth. For example in California USA, the farmers use pesticides to remove the fruit fly problem in fruit orchards. With the removal of pests, crops is protected which will in turn increase the crop yield. Herbicides is used to remove weeds that will remove the nutrients from the plants. When the plants have enough nutrients, the crop production will increase.

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		Sample Conclusion **In conclusion, I disagree that climatic and soil fertility are more important than technology in determining the intensity of food production. The use of modern machines and farming methods have allowed farmers to have greater control over the physical limitations. Greenhouses and chemical fertilisers are widely and effectively used today to overcome the limitations posed by unsuitable climate and infertile soil. These are also technologies in agriculture and has helped to increase productivity in agriculture to a great extent.**

Copyright Acknowledgements:

Question 2 (a)	Fig. 2	https://www.printablee.com/post_black-and-white-printable-europe-map_45718/
Question 5 (a) & (b)	Fig. 4 & Fig. 5	https://www.britannica.com/event/Izmit-earthquake-of-1999
Question 5 (c)	Fig. 6	Adapted from: https://www.pureecoindia.in/organic-food-is-not-extra-expense/
Question 6 (a)	Fig. 7	https://www.thedailystar.net/news-detail-191843
Question 6 (c) (ii)	Fig. 9	https://theory.labster.com/eutrophication/

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