Name of Candidate: _____ (  ) Class: _____

**BUKIT PANJANG GOVERNMENT HIGH SCHOOL**

**Preliminary Examination 2021**

**SECONDARY 4 EXPRESS/ 5 NORMAL ACADEMIC**

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**Humanities**

Paper 2 Geography

**2272/02**

Date: 26 August, 2021
Duration: 1h 40 min
Time: 0745H – 0925 h

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**READ THESE INSTRUCTIONS FIRST**

An answer booklet will be provided with this question paper. You should follow the instructions on the front cover of the answer booklet. If you need additional answer paper ask the invigilator for foolscap paper.

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

This paper consists of three sections: **Sections A, B and C.**

**Section A (13 marks)**
Answer **one** question.

**Section B (12 marks)**
Answer **one** question.

**Section C (25 marks)**
Answer **one** question.

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

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

---

Setter: Ms Kaori Lizaso

**[Turn over]**

*This paper consists of* **15** *printed pages*

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## Section A

Answer **one** question from this section.

1 A class of students were investigating international tourism at a theme park in Japan. They decided to test the hypothesis 'International tourists will make a repeat visit to the theme park because of the theme park rides.'

Before starting their investigation, the students conducted a pilot survey on a small group of people.

(a) Why would a pilot survey be helpful to the students in this investigation? [2]

(b) The class was divided into groups and positioned at different sites in the theme park to conduct the investigation. They conducted their survey between 11:00am and 12:00pm on a Saturday.

Fig. 1 shows a part of the survey used by the students.

**Excerpt of survey for tourists visiting theme park**

Section A Personal Information

1 Are you a visitor to Japan (tourist)? Y / N

2 Which country do you come from?

_____

3 How old are you?

- ☐ 0 - 20 years old
- ☐ 21 - 40 years old
- ☐ 41 - 60 years old
- ☐ over 60 years old

Section B Background Information

4 Tick your travel arrangement

- ☐ alone
- ☐ with partner
- ☐ with family/ children
- ☐ with friends

5 What is the main reason for your visit to the theme park?

_____

6 Tick the length of your visit

- ☐ 1 day
- ☐ 2-3 days
- ☐ 4-6 days
- ☐ more than 6 days

**Fig. 1**

Comment on the suitability of the questions to the investigation. [2]



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(c) One of the survey questions asked was on the main activity carried out by the tourists in the theme park. The results are shown in Table 1.

**Results for question on main activity carried out by tourists**

| Main activity | Number of people surveyed | | | | |
|---|---|---|---|---|---|
| | **group 1** | **group 2** | **group 3** | **group 4** | **group 5** |
| taking theme park rides | 44 | 68 | 75 | 45 | 40 |
| eating theme park food | 12 | 14 | 15 | 13 | 10 |
| watching live shows | 6 | 10 | 12 | 10 | 6 |
| buying souvenirs | 3 | 5 | 6 | 3 | 3 |
| Total surveyed | 65 | 97 | 108 | 71 | 59 |

**Table 1**

Represent the results on the total number of tourists for each main activity as a bar graph. Use the graph paper provided in the answer booklet [3]



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(d) Another question asked in the survey was 'What factor(s) affect whether you will visit this theme park again?' The results from 4 countries are shown in Fig. 2.

**Results for question on factors affecting repeat visit**

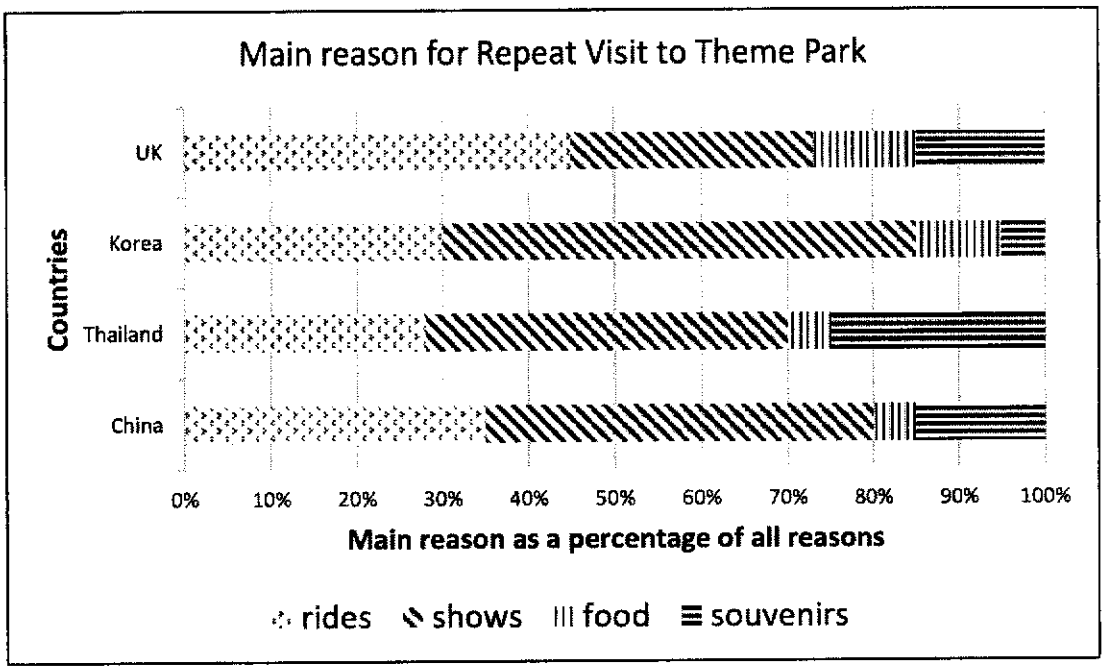



**Fig. 2**

Using evidence from Table 1 and Fig. 2, determine if the hypothesis 'International tourists will make a repeat visit to the theme park because of the theme park rides' is supported or rejected. [3]

(e) Explain factors which might have reduced the reliability of the data collected. [3]



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2 (a) A group of students were investigating air pressure and its possible effect on temperature. The results of their weather measurements are shown in Table 2.

**Results of weather measurements**

| Day | Air pressure (mb) | Temperature (°C) |
|---|---|---|
| 1 | 1007 | 10 |
| 2 | 1008 | 11 |
| 3 | 1013 | 13 |
| 4 | 1020 | 14 |
| 5 | 1021 | 14 |
| 6 | 1020 | 13 |
| 7 | 1013 | 12 |
| 8 | 1014 | 0 |
| 9 | 1020 | 15 |
| 10 | 1024 | 16 |
| 11 | 1018 | 14 |
| 12 | 1012 | 12 |
| 13 | 1014 | 11 |
| 14 | 1016 | 14 |

**Table 2**

(i) Calculate the average air pressure with the units, for the two-week period, to the nearest decimal place. [1]

(ii) Using data from Table 2, draw a scatter graph that will help students to determine the relationship between air pressure and temperature. Use the graph paper provided in the answer booklet. [3]

(iii) The students came up with the hypothesis 'The higher the air pressure, the higher the temperature.' Use data from Table 2 to determine the validity of this hypothesis. [4]

(b) Name the instrument that was used to measure air pressure and describe how it was used to collect the data for the investigation. [3]

(c) Describe the considerations students should keep in mind when measuring temperature to ensure the accuracy of the data collected. [2]



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## Section B

Answer **one** question from this section.

3 (a) Study Fig. 3, which shows a graph on the diurnal temperature range of inland and coastal areas.

**Diurnal temperature range of coastal and inland areas**

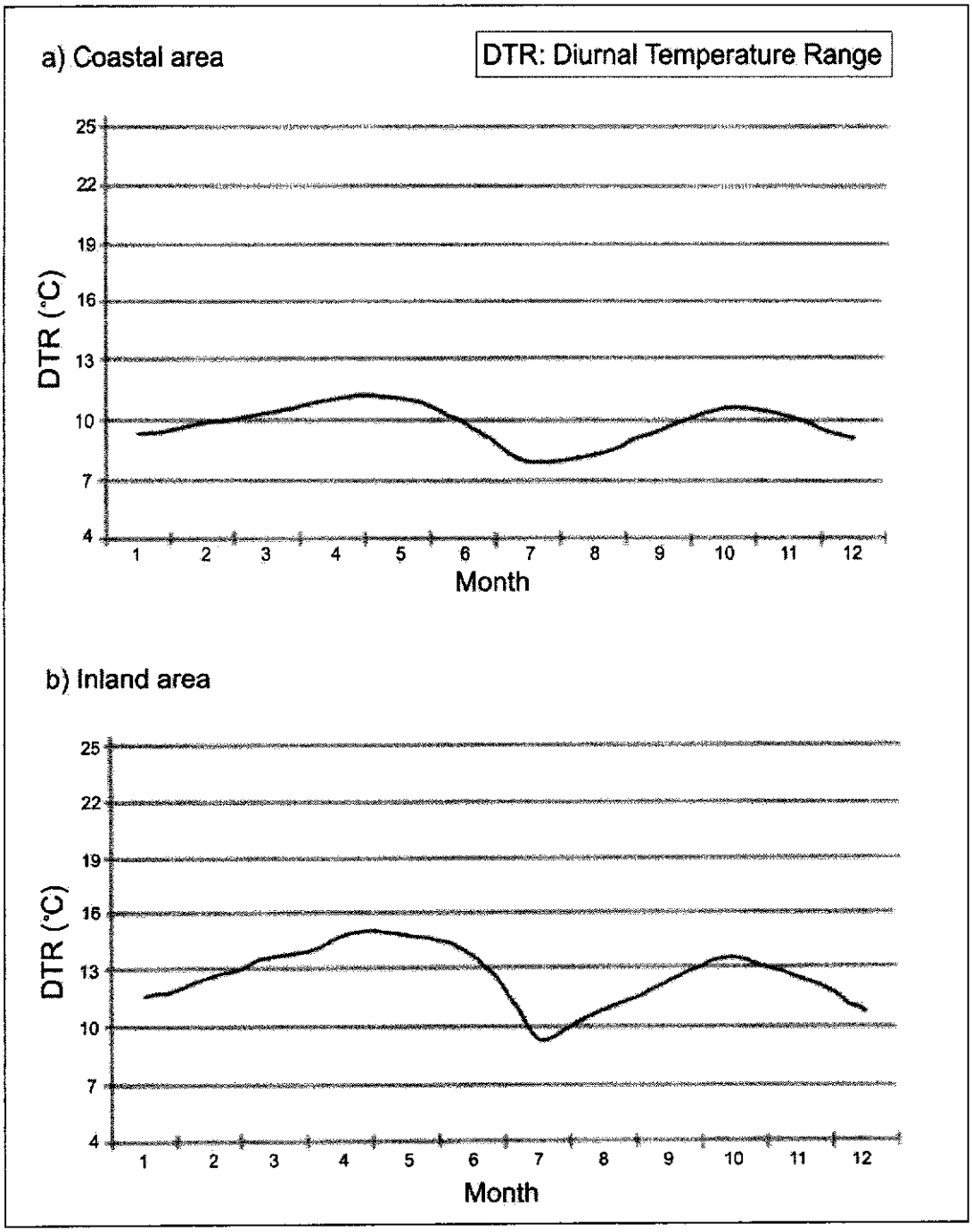



**Fig. 3**

Compare and account for the difference in diurnal temperature range as shown in Fig. 3. [4]



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(b) 'National responses are the best way to effectively deal with climate change.'

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



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4 (a) Study Fig. 4, which shows two different locations on Earth, A and B.

**Two different locations on Earth**

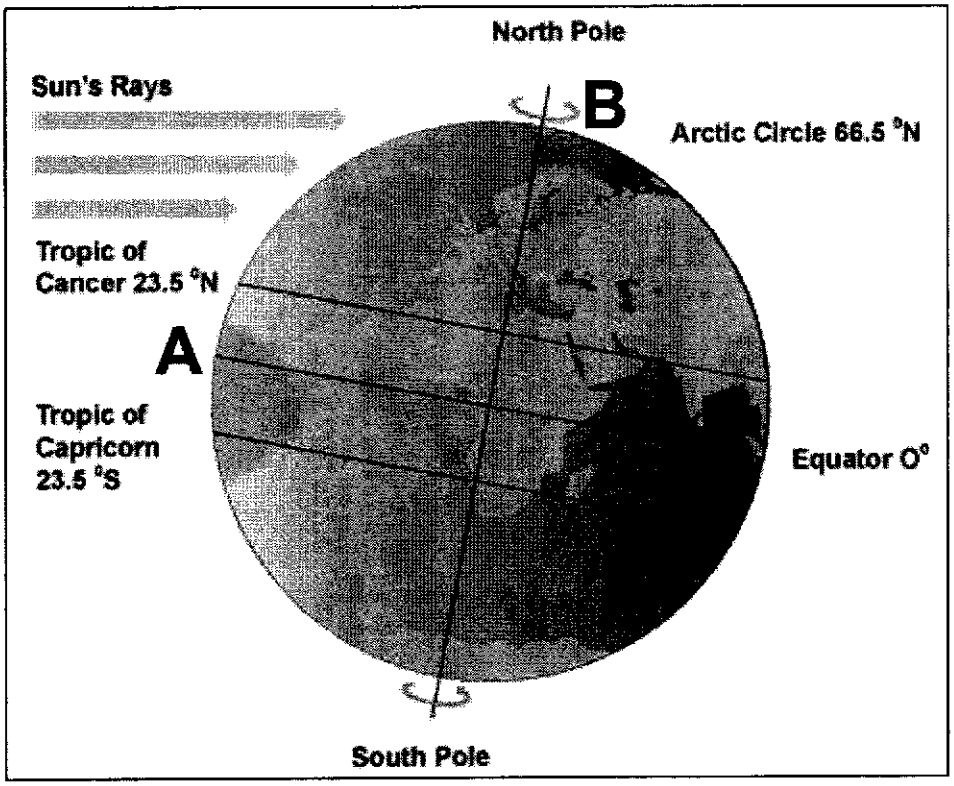



**Fig. 4**

With the help of Fig. 4, explain how latitude influences temperature in both locations A & B. [4]

(b) 'The economic advantages of tourism outweigh any disadvantages it might bring.'

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



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## Section C

Answer **one** question from this section.

5 (a) Study Fig. 5, which shows the daily meat consumption in gram per person per day in the United States of America (USA) and China between 1980 and 2013.

**Daily meat consumption in the USA and China, 1980-2013**

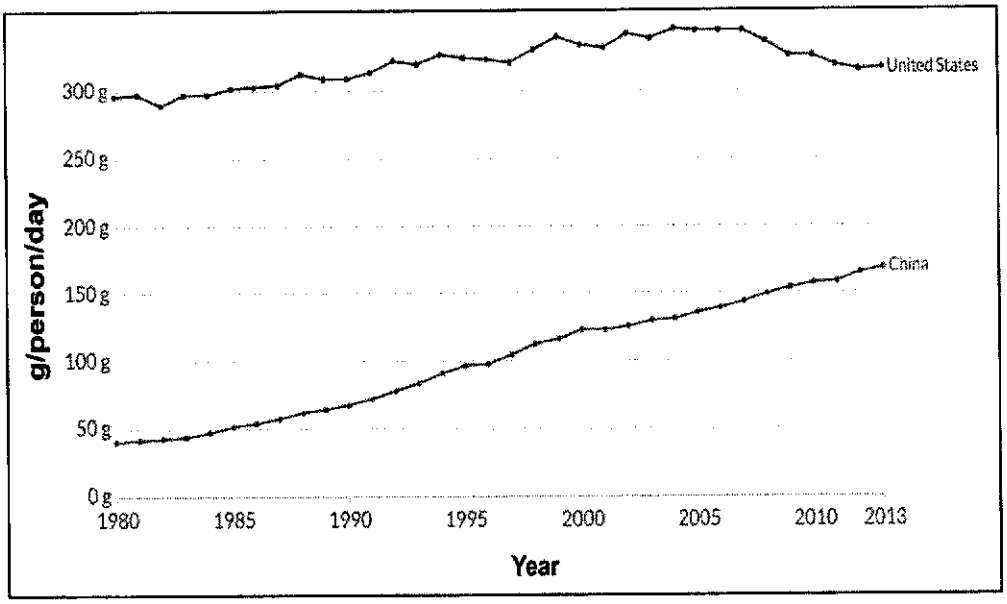



**Fig. 5**

Compare and account for the daily meat consumption in the two countries between 1980 and 2013. [4]



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(b) Study Fig. 6, which shows a cartoon about excess food consumption.

**A cartoon about excess food consumption**

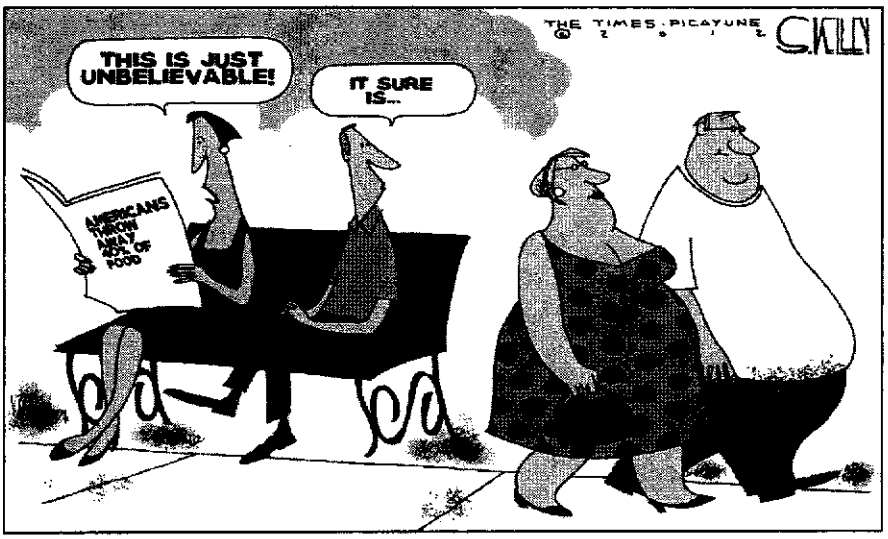



**Fig. 6**

With the help of Fig. 6, discuss how excess food consumption can negatively impact individuals and countries. [3]

(c) Explain the economic and political causes of food shortage. [4]



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(d) Study Fig. 7, which shows a flow chart on the effect of farming on mountainous areas.

**Flow chart on the effect of farming on mountainous areas**

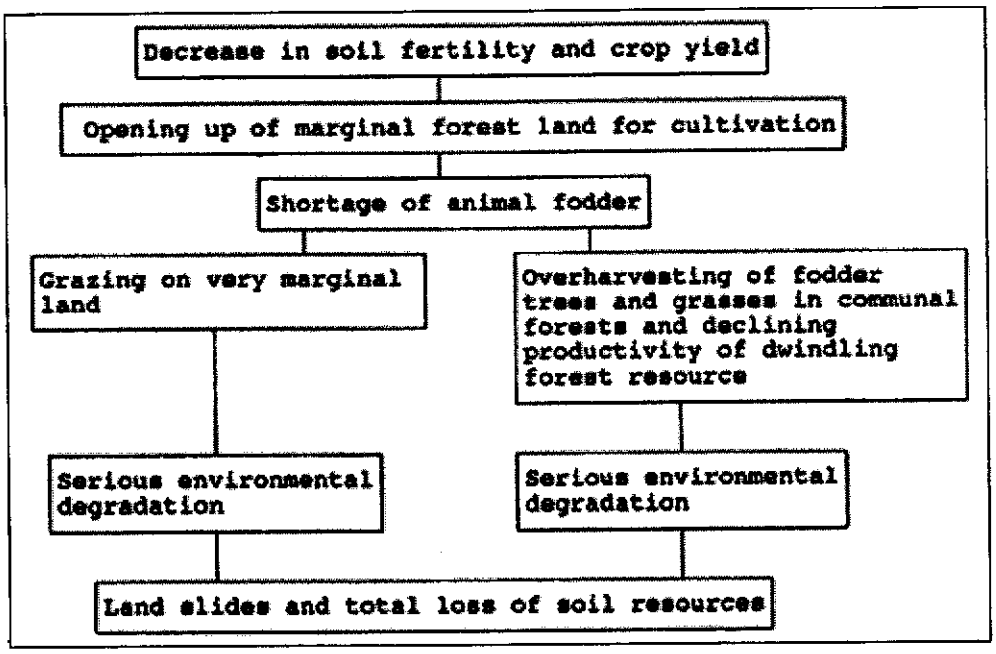



Fig. 7

With the help of Fig. 7, explain the influence of relief on the intensity of meat and crop production. [5]

(e) 'Eutrophication is the most serious impact of intensification of food production.'

To what extent do you consider this statement to be true? Support your answer with examples. [8]



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6 (a) Study Fig. 8, which shows the daily protein sources in gram per person per day for plant-based and animal products in Japan between 1961 and 2013.

**Daily protein sources in Japan, 1961 to 2013**

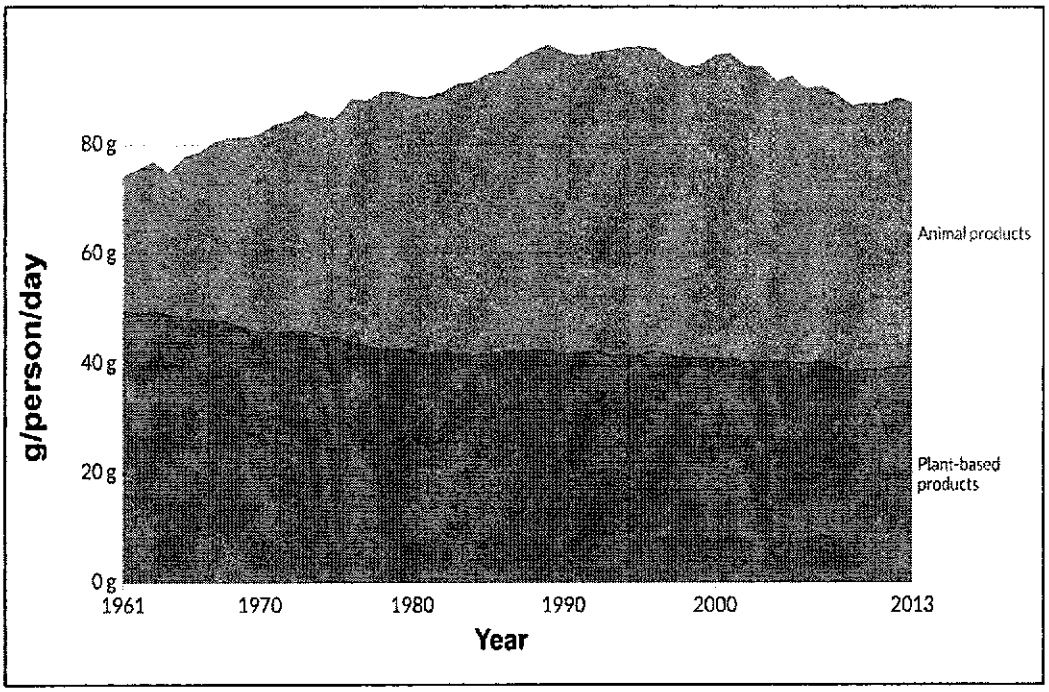



**Fig. 8**

Describe and suggest reasons for the changes in food preferences in Japan from 1961 to 2013 as shown in Fig. 8. [5]



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(b) Study Fig. 9, which shows a section through the Earth from the mantle to the crust.

**A section through the Earth from the mantle to the crust**

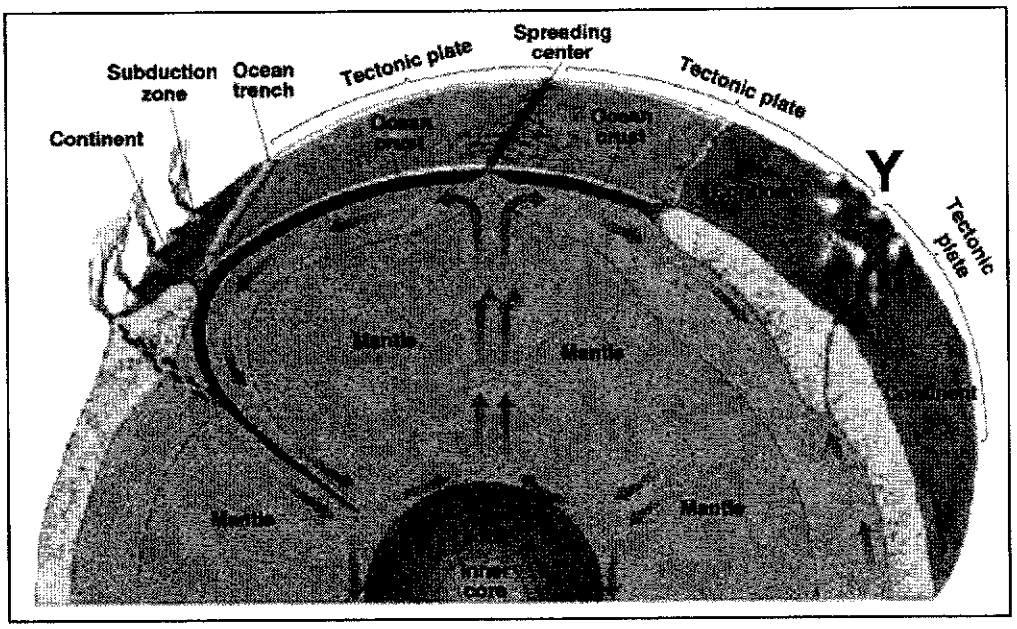



**Fig. 9**

(i) Explain the formation of landform(s) at Y as shown in Fig. 9. [4]

(ii) With the help of an annotated diagram, compare the characteristics of the Earth's core and mantle. [4]



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(c) Study Fig. 10, which shows a map of a plate boundary.

**A map of a plate boundary**

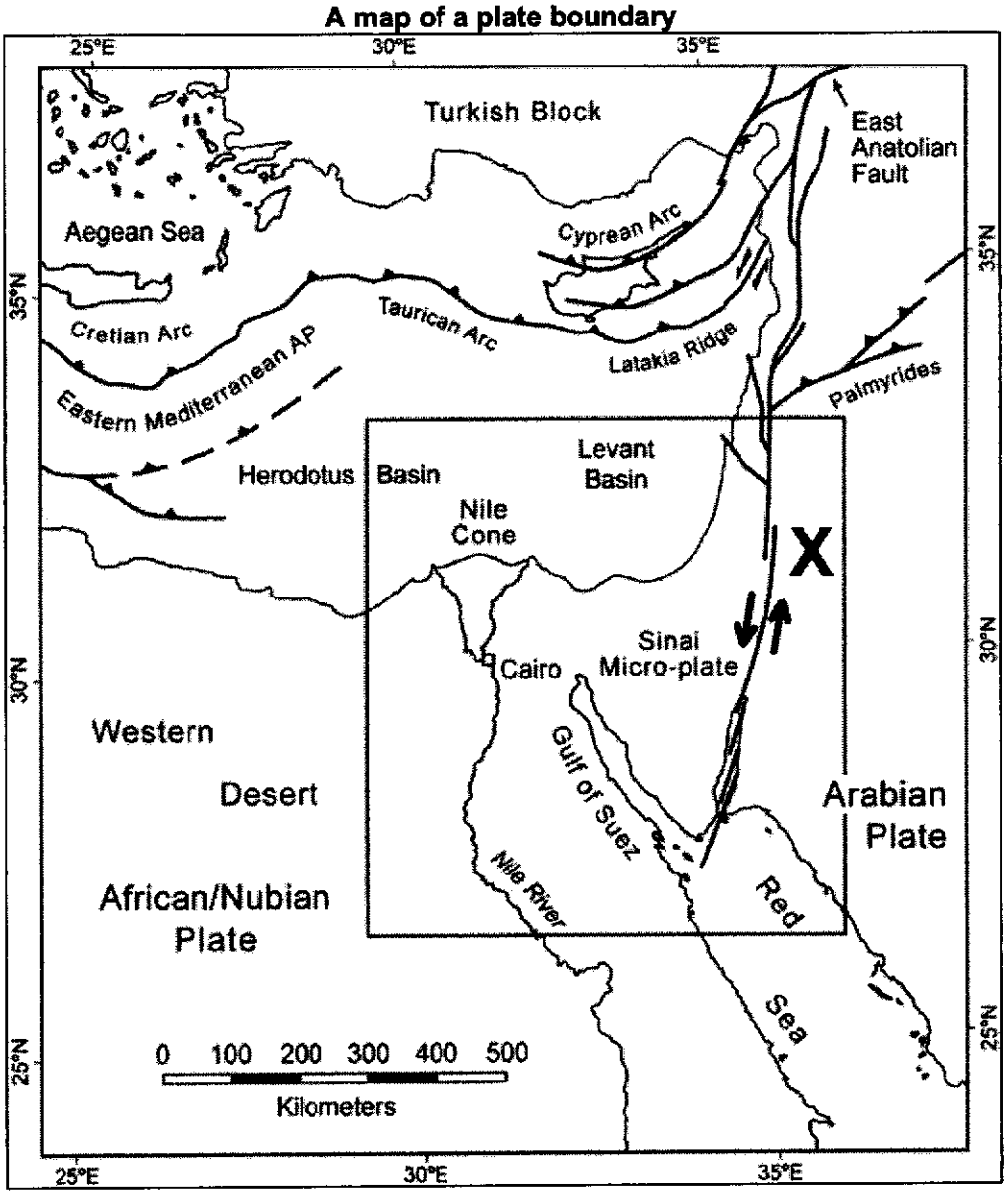



**Fig. 10**

With reference to Fig. 10, identify the plate boundary labelled X, and explain how the plate movements at X can lead to earthquakes. [4]

(d) 'The advantages of living in volcanic areas exceed the disadvantages of living there.'

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

**END OF PAPER**



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**Preliminary Examination 2021**

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**Humanities**

Paper 2 Geography

**2272/02**

Date: 26 August, 2021
Duration: 1h 40 min
Time: 0745H – 0925H

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# ANSWERS

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Setter: Ms Kaori Lizaso

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## Section A

Answer **one** question from this section.

1 A class of students were investigating international tourism at a theme park in Japan. They decided to test the hypothesis 'International tourists will make a repeat visit to the theme park because of the theme park rides.'

Before starting their investigation, the students conducted a pilot survey on a small group of people.

(a) Why would a pilot survey be helpful to the students in this investigation? [2]

Award 1m each for any, max 2m:
a. To test / change methodology / find out if any problems / make improvements
b. Check sample size reliability / viability
c. Gain confidence in doing fieldwork / practice / gain experience
*Accept other possible answers

(b) The class was divided into groups and positioned at different sites in the theme park to conduct the investigation. They conducted their survey between 11:00am and 12:00pm on a Saturday.

Fig. 1 shows a part of the survey used by the students.

**Excerpt of survey for tourists visiting theme park**

Section A Personal Information

1 Are you a visitor to Japan (tourist)? Y / N

2 Which country do you come from?

_____

3 How old are you?
- ☐ 0 - 20 years old
- ☐ 21 - 40 years old
- ☐ 41 - 60 years old
- ☐ over 60 years old

Section B Background Information

4 Tick your travel arrangement
- ☐ alone
- ☐ with partner
- ☐ with family/ children
- ☐ with friends

5 What is the main reason for your visit to the theme park?

_____

6 Tick the length of your visit
- ☐ 1 day
- ☐ 2-3 days
- ☐ 4-6 days



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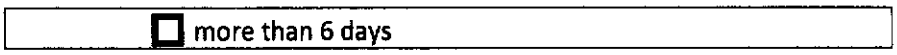



**Fig. 1**

Comment on the suitability of the questions to the investigation. [2]

Award 1m each for any, max 2m:

a. Q4 is not suitable as it is not relevant to the investigation (not enough context to know whether information is needed) OR there can be an "others" option to allow for other travel arrangements to be stated
b. Q5 is suitable as it helps to confirm/reject the hypothesis regarding the factor that determines whether international tourists will make a repeat visit to the theme park
c. Q6 is not suitable as it is not relevant to the investigation (not enough context to know whether information is needed) OR is suitable because tourists who stay longer may have time to enjoy more theme park attractions/ amenities and have less reason to make a repeat visit
d. Table 1, which indicates the main activity carried out by tourists when they visited, states majority of those surveyed (272 people) went to the theme park to take theme park rides. As such, these people may not return to the theme park just to take rides they have already tried in the past.

*Accept other possible answers

(c) One of the survey questions asked was on the main activity carried out by the tourists in the theme park. The results are shown in Table 1.

**Results for question on main activity carried out by tourists**

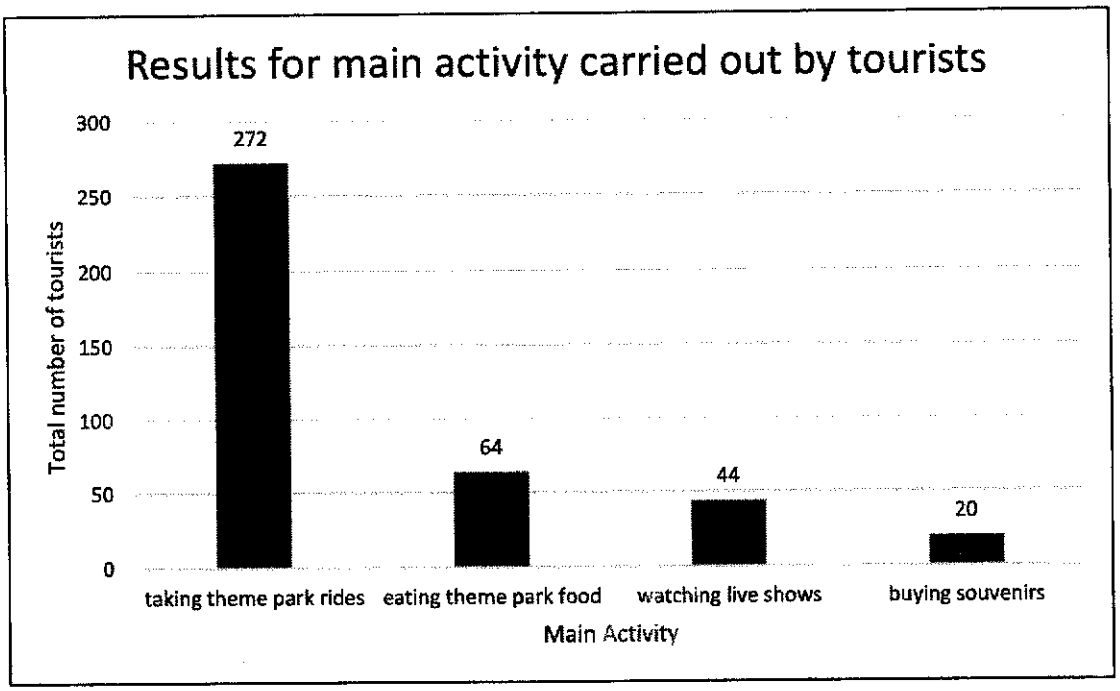
| Main activity | Number of people surveyed | | | | |
|---|---|---|---|---|---|
| | **group 1** | **group 2** | **group 3** | **group 4** | **group 5** |
| taking theme park rides | 44 | 68 | 75 | 45 | 40 |
| eating theme park food | 12 | 14 | 15 | 13 | 10 |
| watching live shows | 6 | 10 | 12 | 10 | 6 |
| buying souvenirs | 3 | 5 | 6 | 3 | 3 |
| Total surveyed | 65 | 97 | 108 | 71 | 59 |

**Table 1**



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Represent the results on the total number of tourists for each main activity as a bar graph. Use the graph paper provided in the answer booklet. [3]




Award 1m each:

a. correct values for bar graphs [1]
b. correct axes with labels (x-axis: main activity, y-axis total number of tourists) [1]
c. graph title [1]

*Accept if axes are switched (horizontal bar graph)



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(d) Another question asked in the survey was 'What factor(s) affect whether you will visit this theme park again?' The results from 4 countries are shown in Fig. 2.

**Results for question on factors affecting repeat visit**

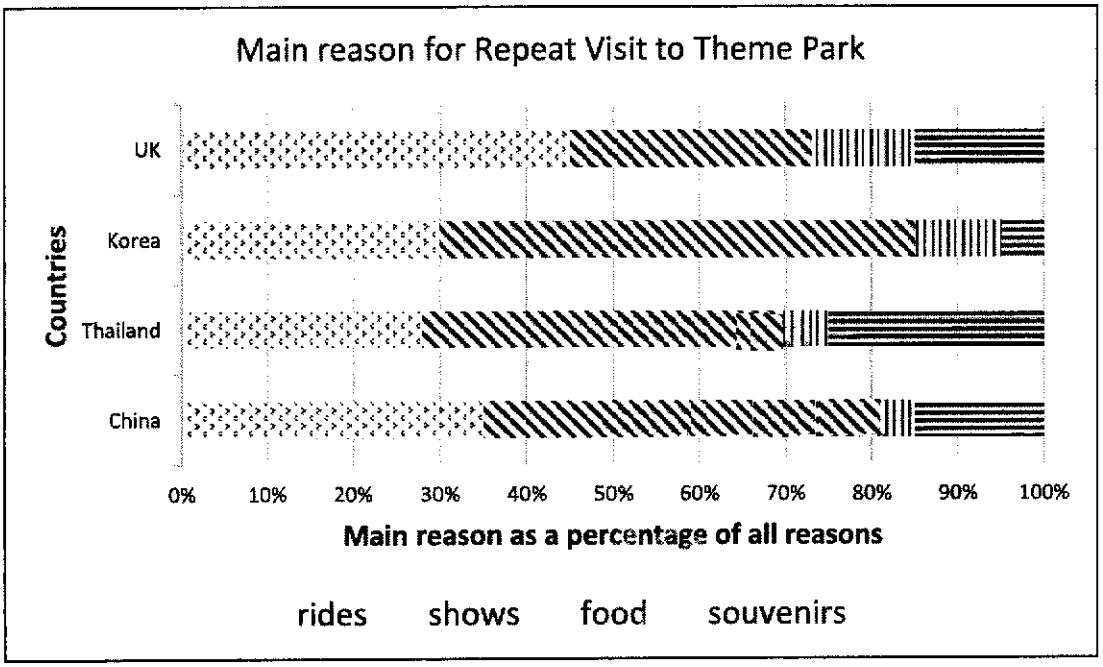



**Fig. 2**

Using evidence from Table 1 and Fig. 2, determine if the hypothesis 'International tourists will make a repeat visit to the theme park because of the theme park rides' is supported or rejected. [3]

Award 1m each, max 3m:

a. The hypothesis is rejected i.e. most tourists are most likely to come back because of the shows, not the rides [reserve 1m]
b. Across three countries, Korea, Thailand and China, the main reason for visiting again is the shows and not the theme park rides e.g. 55% for Korea, 42% Thailand, 45% China
c. Only data from people from the UK support the hypothesis as 45% will return to the theme park for the theme park rides
d. Table 1 which indicates the main activity carried out by tourists when they visited, states that majority of those surveyed (272 people) went to the theme park to take theme park rides. As such, these people may not return to the theme park just to try the rides again.

*accept other possible evidence

(e) Explain factors which might have reduced the reliability of the data collected. [3]

Award 1m each, max 3m:

a. tourists inaccurately report their preferences
b. tourists misunderstand the survey question(s) / incorrect survey responses leading to data being voided
c. sampling method is not strictly followed (systematic sampling becomes convenience sampling)
d. data may be skewed towards a certain age range because of sampling method used



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e. different number of people were interviewed at each site
*accept other possible answers

2 (a) A group of students were investigating air pressure and its possible effect on temperature. The results of their weather measurements are shown in Table 2.

**Results of weather measurements**

| Day | Air pressure (mb) | Temperature (°C) |
|---|---|---|
| 1 | 1007 | 10 |
| 2 | 1008 | 11 |
| 3 | 1013 | 13 |
| 4 | 1020 | 14 |
| 5 | 1021 | 14 |
| 6 | 1020 | 13 |
| 7 | 1013 | 12 |
| 8 | 1014 | 0 |
| 9 | 1020 | 15 |
| 10 | 1024 | 16 |
| 11 | 1018 | 14 |
| 12 | 1012 | 12 |
| 13 | 1014 | 11 |
| 14 | 1016 | 14 |

**Table 2**

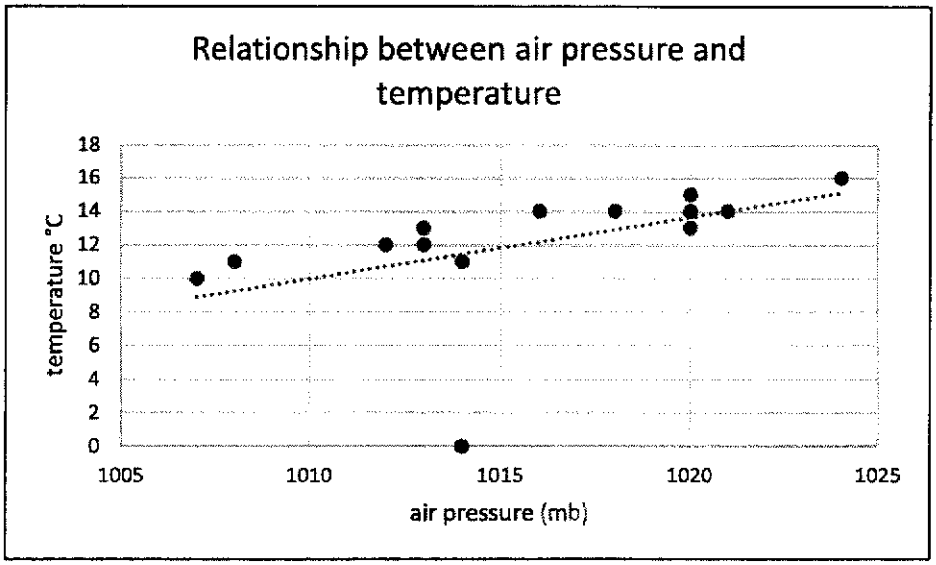
(i) Calculate the average air pressure with the units, for the two-week period, to the nearest decimal place. [1]

1015.71429 = **1015.7 mb**
*0m if unit is missing or answer is not rounded off to nearest decimal place



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(ii) Using data from Table 2, draw a scatter graph that will help students to determine the relationship between air pressure and temperature. Use the graph paper provided in the answer booklet. [3]




Award 1m each:
a. correct plotting of points
b. correct line of best fit & title
c. correct axes [x-axis: air pressure (mb), y-axis: temperature °C]
*max 2m if axes are switched (independent variable being tested is air pressure)
*0m for (c) if units are missing

(iii) The students came up with the hypothesis 'The higher the air pressure, the higher the temperature.' Use data from Table 2 to determine the validity of this hypothesis. [4]

Award 1m each, max 4m:
a. The hypothesis is valid (reserve 1m)
b. *Generally, as air pressure increases, the temperature increases e.g. 1007mb  10°C then at 1024mb  16°C
c. Anomaly: at 1020mb  13°C, 14°C and 15°C, same pressure but different temperature readings
d. Anomaly: at 1013mb  12°C and 13°C , same pressure but different temperature readings
e. Anomaly: at 1021mb  14°C, does not follow upward trend of temperature

reserve 1m for stating hypothesis is valid
reserve 1m for an anomaly, max 2m
*accept other possible evidence, max 2m

(b) Name the instrument that was used to measure air pressure and describe how it was used to collect the data for the investigation. [3]

Award 1m each:
a. Instrument: barometer
b. Check that the movable pointer is arranged over the measuring hand to mark the current pressure.
c. Determine the pressure by reading the measuring hand.



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(c) Describe the considerations students should keep in mind when measuring temperature to ensure the accuracy of the data collected. [2]

Award 1m each, max 2m

a. Thermometer should not have contact with the ground or warmed objects OR should be 1.5m above ground or at an arm's length away, to prevent data misreading
b. Thermometer should not be under direct sunlight OR is inside a Stevenson Screem to prevent data misreading
c. Temperature should be recorded at the same time throughout the fieldwork as different times of the day would have a different temperature
d. Take readings at eye level to avoid parallax error
e. Take at least 3 readings and take the average to ensure that the data is accurate



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## Section B

Answer **one** question from this section.

3 (a) Study Fig. 3, which shows a graph on the diurnal temperature range of inland and coastal areas.

**Diurnal temperature range of coastal and inland areas**

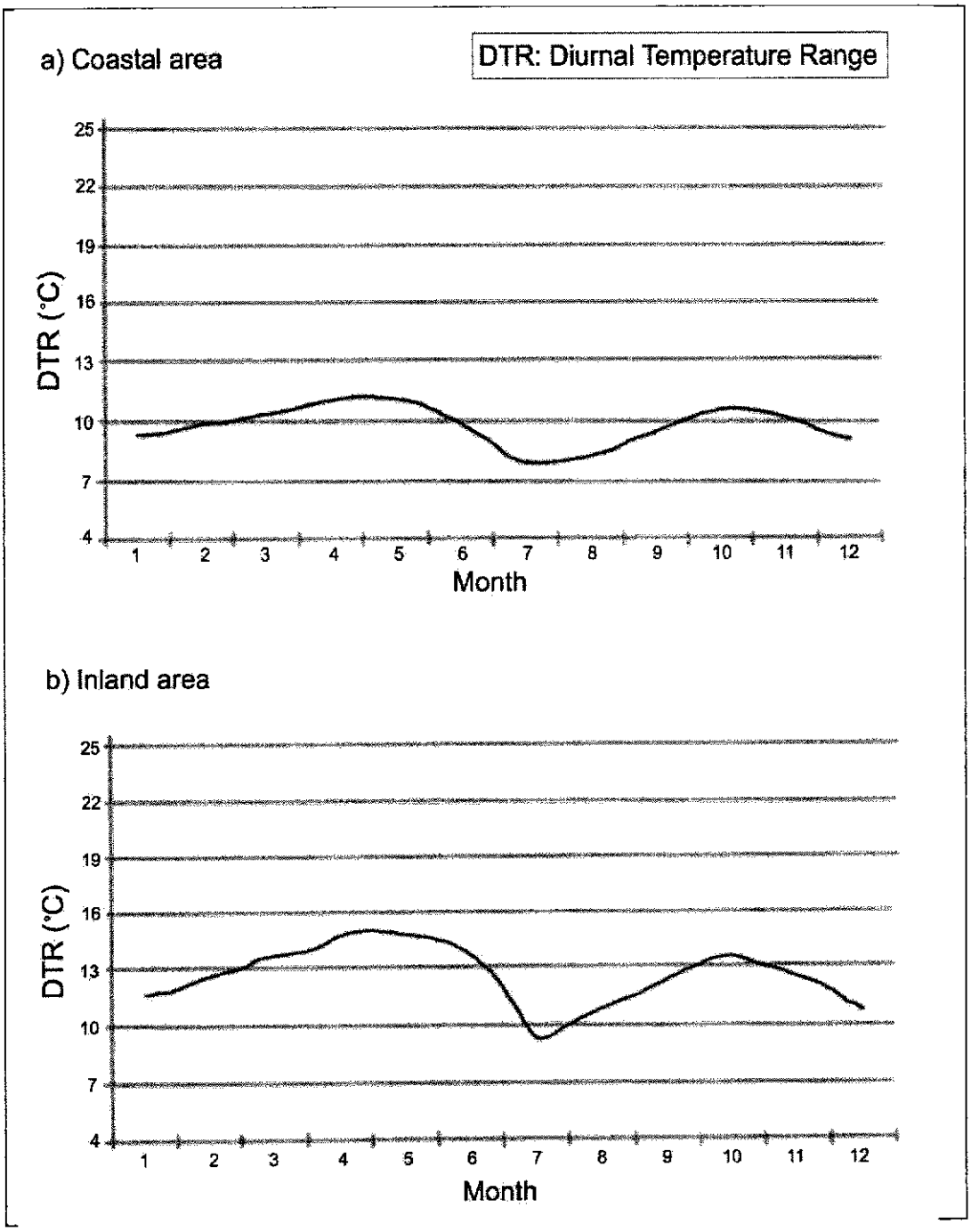



**Fig. 3**



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Compare and account for the difference in diurnal temperature range as shown in Fig. 3. [4]

a. Coastal areas have a smaller diurnal temperature range of between 7 to 12°C while inland areas have a higher diurnal temperature range of between 7 to 15°C. (reserve 1m)
b. Coastal areas have a moderating effect due to the difference in heating and cooling of land and sea.
c. During the day, sea breeze lowers the temperature of the coastal area, while land breeze moderates the temperature of the coastal area at night.
d. Inland areas are not affected and thus experience hotter days and cooler nights.

(b) 'National responses are the best way to effectively deal with climate change.'

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

| Level 1 (0-3m) | Level 2 (4-6m) | Level 3 (7-8m) |
|---|---|---|
| Brief explanation of points/ out of point | Detailed explanation of 1 point<br><br>OR<br><br>Somewhat detailed explanation of at least 2 responses, 1 international and 1 national | Detailed explanation of at least 2 points including 1 international and 1 national |
| No evaluation is done – No mention of advantages and/or disadvantages | Some evaluation is done – some mention of advantages and disadvantages | Detailed evaluation is done – advantages and disadvantages are well-discussed |
| No examples | General examples used to support points | Specific examples and/or statistics used to support points |
| No sharing of opinion | Weak opinion/ No support of opinion/ Purely summary | Sharing and support of mature opinion/ view with regards to the issue in essay |

Level 1 (0 – 3 marks)

1m – brief statement that answers the question, but no description of factors

Eg.
I disagree with the statement as international responses have been less effective in solving climate change than national responses.

2m – brief description of a national response OR an international response

Eg.
At the national level, individual countries implement policies to achieve the international goal of reducing greenhouse gas emissions. The Singapore Green Plan



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| |
|---|
| 2012 seeks to reduce greenhouse gas emissions by using natural gas as an energy source.<br><br>3m – brief description of 1 national response AND 1 international response, but missing limitations, examples and/or opinion |
| Level 2 (4 - 6 marks)<br><br>4m – detailed explanation of a national response OR an international response with limitations, brief examples and opinion (but opinion is merely a summary of points)<br><br>5m – detailed explanation of a national response OR an international response with limitations, case-specific examples and opinion (but opinion is merely a summary of points)<br><br>OR<br><br>detailed explanation of 2 national responses with limitations, case-specific examples and opinion (but opinion is merely a summary of points)<br><br>6m – somewhat detailed explanation of a national response AND an international response with most limitations, case-specific examples and opinion (but opinion is not fully supported)<br><br>E.g.<br><br>At the national level, individual countries implement policies to achieve the international goal of reducing greenhouse gas emissions. The Singapore Green Plan 2012 seeks to reduce greenhouse gas emissions by using natural gas as an energy source. As early as 2010, about 79% of Singapore's electricity was being generated from using natural gas. This exceeded the government's target ahead of schedule, which shows that the response has been successful in reducing greenhouse gas emissions. However, high maintenance costs due to pipelines being laid underground that have to be checked regularly for leakage may limit its success. |
| Level 3 (7 – 8 marks)<br><br>7m – detailed explanation of at least 1 national response AND an international response with limitations, case-specific examples and opinion (opinion is supported but not fully convincing)<br><br>8m – detailed explanation of at least 1 national response AND an international response with limitations, case-specific examples and opinion (opinion is well-supported and convincing)<br><br>Sample Opinion:<br>I agree that the national responses to climate change have been more effective than international responses. Singapore has embarked on various national responses to meet the target agreed upon at the Kyoto Protocol. Among the responses was the Singapore Green Plan 2012, which aimed to reduce greenhouse gas emissions by using natural gas. It has been quite successful in helping Singapore to meet its international target. Without national responses, international responses will not be achieved. In addition, while Singapore was on track to meet its targets, other countries were not, limiting the effectiveness of international responses like the Kyoto Protocol. |



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International response: Kyoto Protocol

National responses (compulsory, elaborate on any one):

- Plant-A-Tree Programme
- Green mark scheme
- Singapore Green Plan 2012



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4 (a) Study Fig. 4, which shows two different locations on Earth, A and B.

**Two different locations on Earth**

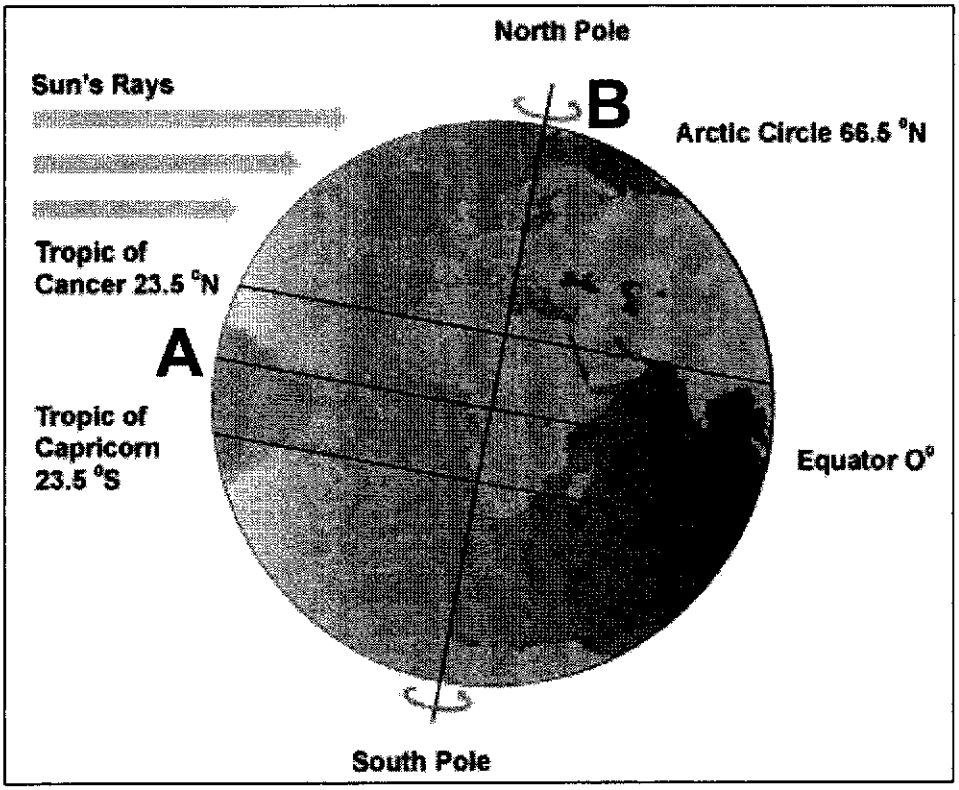



**Fig. 4**

With the help of Fig. 4, explain how latitude influences temperature in both locations A & B. [4]

Award 1m each:

a. temperatures are lower at B, higher latitudes, because the solar angle is lower (~0°)
b. sun strikes at a lower angle  solar energy is spread out over a wider area  lower temperature
c. temperatures are higher at A, because the solar angle is higher (~90°)
d. sun strikes at higher angle  solar energy is concentrated on a small area  higher temperature

*0m awarded for (a) and (c) if A/B and angle of incidence are not stated

(b) 'The economic advantages of tourism outweigh any disadvantages it might bring.'

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

| Level 1 (0-3m) | Level 2 (4-6m) | Level 3 (7-8m) |
|---|---|---|
| Brief explanation of points/ out of point | Detailed explanation of 1 point<br><br>OR | Detailed explanation of at least 2 points including 1 advantage and 1 disadvantage |



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| | | |
|---|---|---|
| | Somewhat detailed explanation of at least 2 points including 1 advantage and 1 disadvantage | |
| No evaluation is done – No mention of advantages and/or disadvantages | Some evaluation is done – some mention of advantages and disadvantages | Detailed evaluation is done – advantages and disadvantages are well-discussed |
| No examples | General examples used to support points | Specific examples and/or statistics used to support points |
| No sharing of opinion | Weak opinion/ No support of opinion/ Purely summary | Sharing and support of mature opinion/ view with regards to the issue in essay |

Level 1 (0 – 3 marks)

1m – **brief statement** that answers the question, but **no description of factors**

Eg.
I agree tourism benefits the economy as tourists spend money in the host country.

2m – **brief explanation** of economic advantage OR any disadvantage of tourism

Eg. Employment is work performed for a wage or salary, in cash or in kind. Employment in the tourism industry forms part of the service sector of an economy. The growth of tourism has led to an increase in the number of tourism-related jobs.

3m – **brief description** of 1 economic advantage AND 1 disadvantage of tourism, but missing **examples** and/or **opinion**

Level 2 (4 - 6 marks)

4m – **detailed explanation** of 1 economic advantage OR 1 disadvantage of tourism with **brief examples** and **opinion (but opinion is merely a summary of points)**

5m – **detailed explanation** of 1 economic advantage OR 1 disadvantage of tourism with **case-specific examples** and **opinion (but opinion is merely a summary of points)**

OR

detailed explanation of 2 advantages, case-specific examples and opinion (but opinion is merely a summary of points)

6m – **somewhat detailed explanation** of 1 economic advantage AND 1 disadvantage of tourism, with some **case-specific examples** and **opinion (but opinion is not fully supported)**

Eg.



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| |
|---|
| Employment is work performed for a wage or salary, in cash or in kind. Employment in the tourism industry forms part of the service sector of an economy. The growth of tourism has led to an increase in the number of tourism-related jobs. For example, in 2011, UNWTO estimated that the tourism industry employed over 235 million people worldwide. This is roughly 6 to 8 percent of all the jobs in the world. Therefore, tourism does bring advantages to the economy as it helps create jobs for residents. |
| Level 3 (7 – 8 marks)<br><br>7m – **detailed explanation** of at least 1 economic advantage AND 1 disadvantage of tourism with **case-specific examples** and **opinion (opinion is supported but not fully convincing)**<br><br>8m – – **detailed explanation** of at least 1 economic advantage AND 1 disadvantage of tourism with **case-specific examples** and **opinion (opinion is well-supported and convincing)** |

**Note: impact question  does not require discussion of limitations**

Sample Opinion:

I am of the opinion that tourism brings about greater economic advantages than disadvantages. Tourism does have its negative economic impacts such as seasonal unemployment and under-use of facilities at certain times of the year. However, these impacts can be managed with careful planning and economic diversification in the host countries. Tourism can potentially bring in very high revenues from tourists. Such revenues can be used to increase the economic prosperity of the country and will have a trickle-down effect to many of its citizens.

Positive economic impact:
- employment opportunities
- growth in income
- development of infrastructure and facilities

Negative economic impacts:
- Seasonal unemployment
- Under-use of facilities at certain times of the year
- Shortage of services e.g. water supply

Other negative impacts:
- Socio-cultural: dilution of local customs and heritage, increased crime
- Environmental: vandalism, littering and pollution, destruction of habitats, carbon footprint, increased congestion



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## Section C

Answer **one** question from this section.

5 (a) Study Fig. 5, which shows the daily meat consumption in gram per person per day in the United States of America (USA) and China between 1980 and 2013.

**Daily meat consumption in the USA and China, 1980-2013**

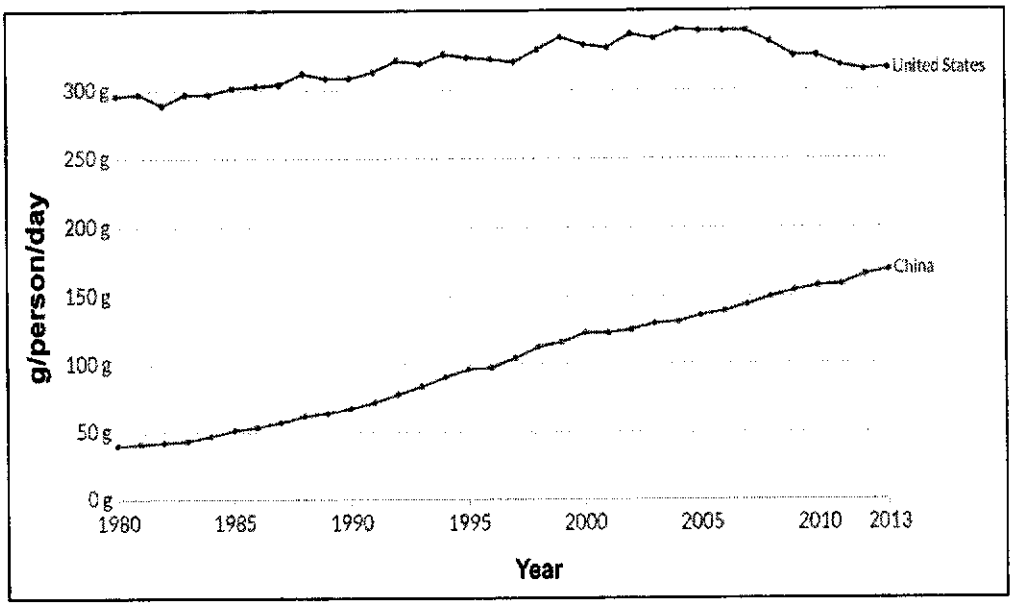



**Fig. 5**

Compare and account for the daily meat consumption in the two countries between 1980 and 2013. [4]

Award 1m each (compare):

a. similarity: generally, USA and China increased e.g. USA 290 g/person/day in 1980 to 310 g/person/day in 2013, China 40 g/person/day in 1980 to 170 g/person/day in 2013
b. difference: USA declined after 2007, China still increasing e.g. USA 350 g/person/day in 2007 to 310 g/person/day in 2013, China 140 g/person/day in 2007 to 170 g/person/day in 2013 OR
c. difference: USA daily meat consumption is always higher than China e.g. USA 290 g/person/day in 1980 to 310 g/person/day in 2013, China 40 g/person/day in 1980 to 170 g/person/day in 2013
d. difference: USA increased less than China e.g. USA 290 g/person/day in 1980 to 310 g/person/day in 2013 [40g difference], China 40 g/person/day in 1980 to 170 g/person/day in 2013 [130g difference]

Award 1m each (account for):

a. In LDCs like China, demand for livestock/meat has increased due to rising incomes
b. Even though livestock/ meat consumption in DCs is still high, people are starting to consume less meat because this has been linked to health problems such as obesity and heart disease, thus the increase is less / stagnant.

*max 2m for no data cited (marks for 'account' only)



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(b) Study Fig. 6, which shows a cartoon about excess food consumption.

**A cartoon about excess food consumption**




**Fig. 6**

With the help of Fig. 6, discuss how excess food consumption can negatively impact individuals and countries. [3]

Award 1m each, max 3m:

a. Health: excess food consumption may lead to health problems like obesity e.g. man and woman/ couple/ husband and wife on the right of the cartoon who are clearly overweight, affecting health and life expectancy.
b. Social: excess food consumption often leads to food wastage e.g. woman on left holding a newspaper stating "Americans throw away 40% of food". This leads to more land needed for waste, leaving less land for other purposes in the country.
c. Economic: lower productivity because obesity causes complications that result in employees being absent from work
d. Economic: diversion of financial resources to healthcare in the form of a country's public health expenditure (i.e. government pays more for healthcare) to treat obesity-related health conditions
e. Economic: lower taxes collected due to lower productivity (inability to work more and earn more)

(c) Explain the economic and political causes of food shortage. [4]

Award 1m each, max 4m:

a. Political: Civil strife means a country faces major internal conflicts, like riots, unrest or civil war  disputes over the control of resources that affect food production, such as land and water, and lead to food shortage OR
b. Political: Governance is the exercise of economic and political authority to manage a country's affairs  poor governance such as corruption, policy errors and inability to implement policy can cause food shortages
c. Economic: Rising demand for meat and dairy products from emerging economies like China and India due to a rise in disposable income  sustained growth in demand for food from these countries is believed to be depleting global food inventories



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d. Economic: Soaring costs of fertilisers and transport can directly affect the cost of food, causing it to increase  increases in food prices are generally transferred to the consumer low-income/poor not being able to afford enough food to meet their basic nutritional needs
e. Conversion of farmland to industrial crop production to produce biofuel crops which are more profitable  rising demand for biofuels has caused significant reduction in food supply due to land unavailability

(d) Study Fig. 7, which shows a flow chart on the effect of farming on mountainous areas.

**Flow chart on the effect of farming on mountainous areas**

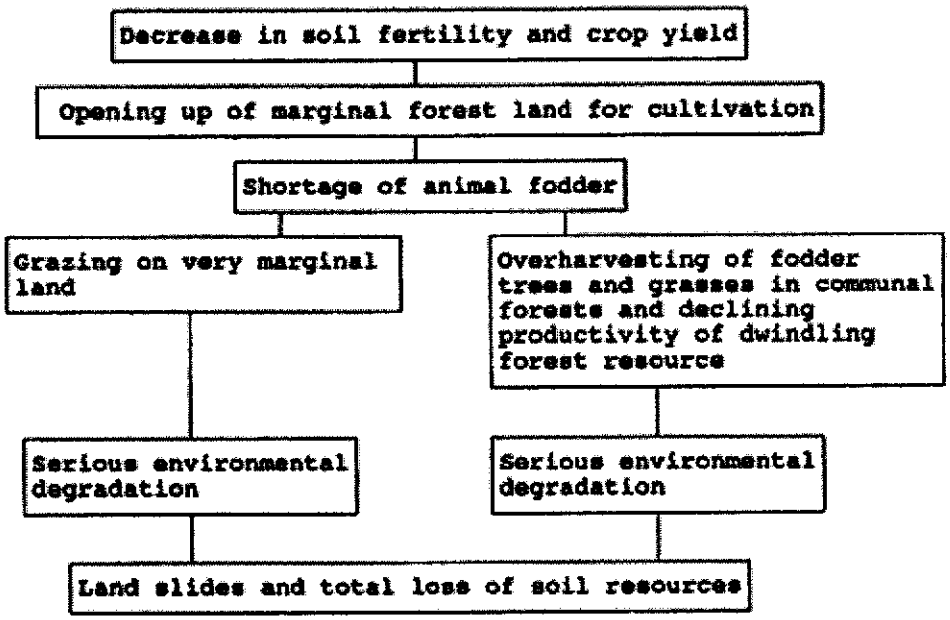



**Fig. 7**

With the help of Fig. 7, explain the influence of relief on the intensity of meat and crop production. [5]

Award 1m each:
a. Steeper relief  harder to use machines  lower intensity of crop production
b. Steeper relief  water flows down the slope  not enough water/moisture in soil  lower intensity of crop production
c. Higher altitudes  colder  only certain crops such as tea can be grown  varying intensity of crop production depending on crop
d. Limited land for grazing -> farming is limited -> food production of meat is limited.
e. Landslides may be common -> crops grown on the slopes may be destroyed -> food production decreases.

*accept other plausible answers



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(e) 'Eutrophication is the most serious impact of intensification of food production.'

To what extent do you consider this statement to be true? Support your answer with examples.

[8]

| Level 1 (0-3m) | Level 2 (4-6m) | Level 3 (7-8m) |
|---|---|---|
| Brief explanation of points/ out of point | Detailed explanation of 1 point<br><br>OR<br><br>Somewhat detailed explanation of at least 2 points, eutrophication (impact of chemicals) and salinisation/ waterlogging (impact of irrigation) | Detailed explanation of at least 2 points, eutrophication (impact of chemicals) and salinisation/ waterlogging (impact of irrigation) |
| No evaluation is done – No mention of impacts on individuals and/or countries | Some evaluation is done – some mention of impacts on individuals and/or countries | Detailed evaluation is done – impacts on individuals and/or countries are well-discussed |
| No examples | General examples used to support points | Specific examples and/or statistics used to support points |
| No sharing of opinion | Weak opinion/ No support of opinion/ Purely summary | Sharing and support of mature opinion/ view with regards to the issue in essay |

Level 1 (0 – 3 marks)

1m – **brief statement** that answers the question, but **no description of factors.**

Eg.
Eutrophication is a more serious effect of intensification of food production than irrigation-related impacts like salinisation or waterlogging.

2m – **brief explanation** of eutrophication OR 1 impact of irrigation on water and soil quality (salinisation/ waterlogging)

Eg.
The use of chemicals can have a negative impact on water and soil quality. The overuse of pesticides and fertilisers causes chemicals to become concentrated in the soil which can reach streams and rivers, causing algal blooms in a process called eutrophication.

3m – **brief description** of eutrophication AND 1 impact of irrigation on water and soil quality (salinisation/ waterlogging), but missing **examples** and/or **opinion**



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Eg.
The use of chemicals can have a negative impact on water and soil quality. The overuse of pesticides and fertilisers causes chemicals to become concentrated in the soil which can reach streams and rivers, causing algal blooms in a process called eutrophication. On the other hand, extensive irrigation can cause problems when not properly managed and may cause ground to be waterlogged. Waterlogging occurs when too much water seeps into the soil and causes the soil to be over-saturated.

Level 2 (4 - 6 marks)

4m – **detailed explanation** of eutrophication OR 1 impact of irrigation on water and soil quality (salinisation/ waterlogging) with **brief examples** and **opinion (but opinion is merely a summary of points)**

5m – **detailed explanation** of eutrophication OR 1 impact of irrigation on water and soil quality (salinisation/ waterlogging) with **case-specific examples** and **opinion (but opinion is merely a summary of points)**

6m – **somewhat detailed explanation** of eutrophication AND 1 impact of irrigation on water and soil quality (salinisation/ waterlogging) with some **case-specific examples** and **opinion (but opinion is not fully supported)**

E.g.
The overuse of pesticides and fertilisers causes chemicals to become concentrated in the soil which can then be washed away into streams and rivers. Eutrophication is the presence of excess nutrients in water, leading to algal blooms. Algal blooms kill off aquatic plants and animals. In the USA for example, it was found that pesticides from farmland had contaminated groundwater. This is a serious concern for the USA since about 23% of freshwater used in the country comes from groundwater sources.

Level 3 (7 – 8 marks)

7m – **detailed explanation** of eutrophication AND 1 impact of irrigation on water and soil quality (salinisation/ waterlogging) with **case-specific examples** and **opinion (opinion is supported but not fully convincing)**

8m – **detailed explanation** of eutrophication AND 1 impact of irrigation on water and soil quality (salinisation/ waterlogging) with **case-specific examples** and **opinion (opinion is well-supported and convincing)**

Sample Opinion:

Both eutrophication and salinisation have serious consequences for water and soil quality. It is difficult to quantify which is of greater consequence as each have its own devastating effects which have to be dealt with by individuals or countries. However, the scale of the impact of eutrophication can be seen as greater. Eutrophication affects water sources and water is considered one of the most valuable resources on Earth as our survival depends on its availability. On the other hand, the negative effects of irrigation may be isolated in areas of agricultural land. Therefore, it is arguable that eutrophication bears a greater consequence than salinisation as it eventually leads to the destruction of the environment and is a threat to the survival of humans.



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6 (a) Study Fig. 8, which shows the daily protein sources in gram per person per day for plant-based and animal products in Japan between 1961 and 2013.

**Daily protein sources in Japan, 1961 to 2013**

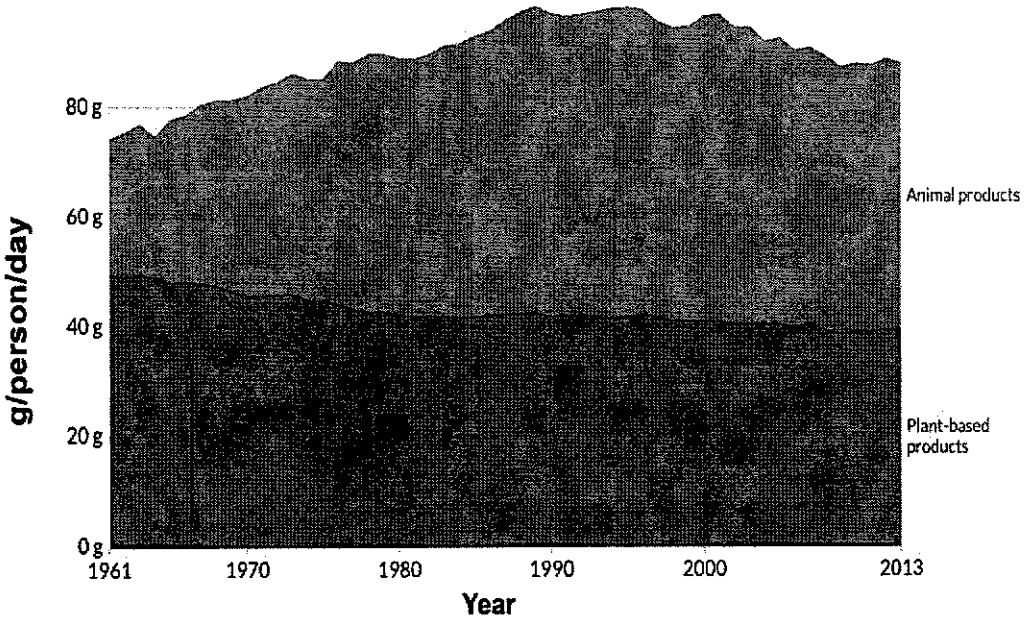



**Fig. 8**

Describe and suggest reasons for the changes in food preferences in Japan from 1961 to 2013 as shown in Fig. 8. [5]

Award 1m each:

a. Generally, from 1961 to 2013, the consumption of animal products increased while the consumption of plant-based products decreased e.g. 25□51 g/person/day for animal products, 50□39 g/person/day for plant-based products
b. In 1961, the proportion of plant-based products is higher/ majority of Japan's diet was plant-based e.g. 50 g/person/day plant-based products vs (75-50) 25 g/person/day animal products
c. In 1990, consumption of animal products reached its peak e.g. (95-42) 53 g/person/day animal products vs 42 g/person/day plant-based products
d. By 2013, the proportion of animal products has surpassed/ is larger than plant-based products e.g. (90-39) 51 g/person/day animal products vs 39 g/person/day plant-based products
e. Reason: From 1961 to 1990, when Japan was still considered a developing country, and demand for livestock/meat increased due to rising incomes
f. Reason: After 1990, even though livestock/ meat consumption in Japan was still high, people were starting to consume less meat because this has been linked to health problems such as obesity and heart disease.

*accept other plausible answers
* max 3m for description, max 2m for reasons



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(b) Study Fig. 9, which shows a section through the Earth from the mantle to the crust.

**A section through the Earth from the mantle to the crust**

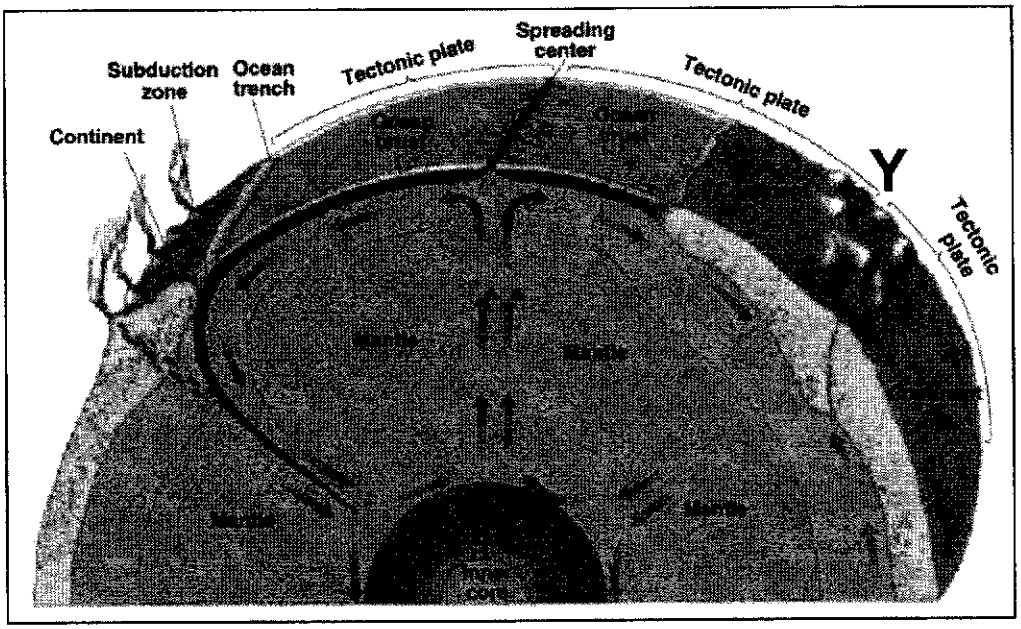



**Fig. 9**

(i) Explain the formation of landform(s) at Y as shown in Fig. 9. [4]

Award 1m each:

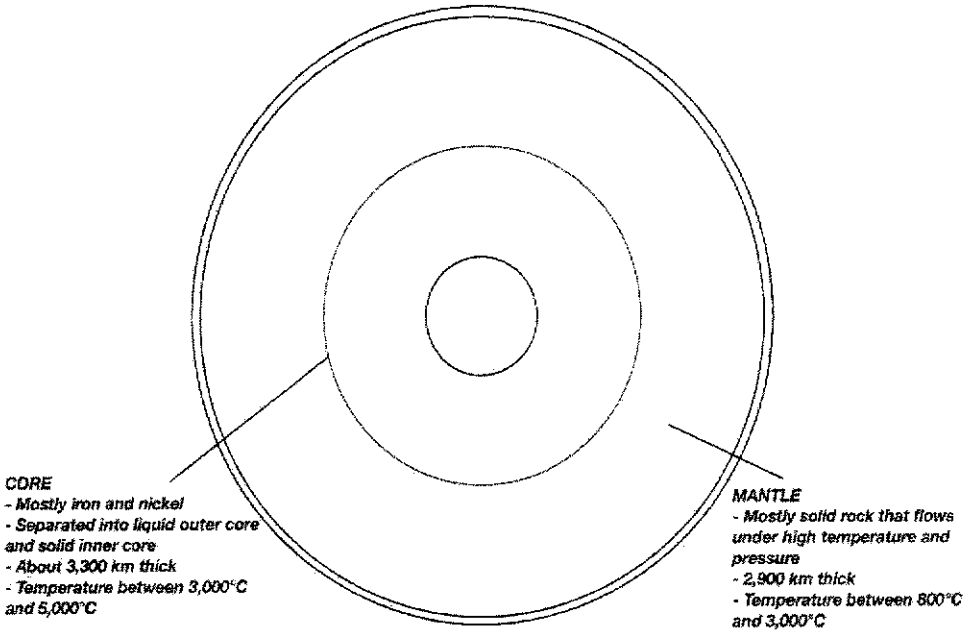
a. Convection currents in the earth's mantle pulls 2 continental plates together, causing a continental-continental plate convergence
b. The continental plates collide and push against one another, resisting subduction as both are too thick and buoyant for subduction
c. The plates break and slide along fractures in the crust
a. Layers of rock on the upper part of crust compress together and fold upwards, forming fold mountains



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(ii) With the help of an annotated diagram, compare the characteristics of the Earth's core and mantle. [4]




Award 1m each:

- comparison of solid vs liquid state
- comparison of thickness of layers
- comparison of temperature of layers
- correct diagram with correct layer labels (for mantle and core) and proportionally-drawn circles



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(c) Study Fig. 10, which shows a map of a plate boundary.

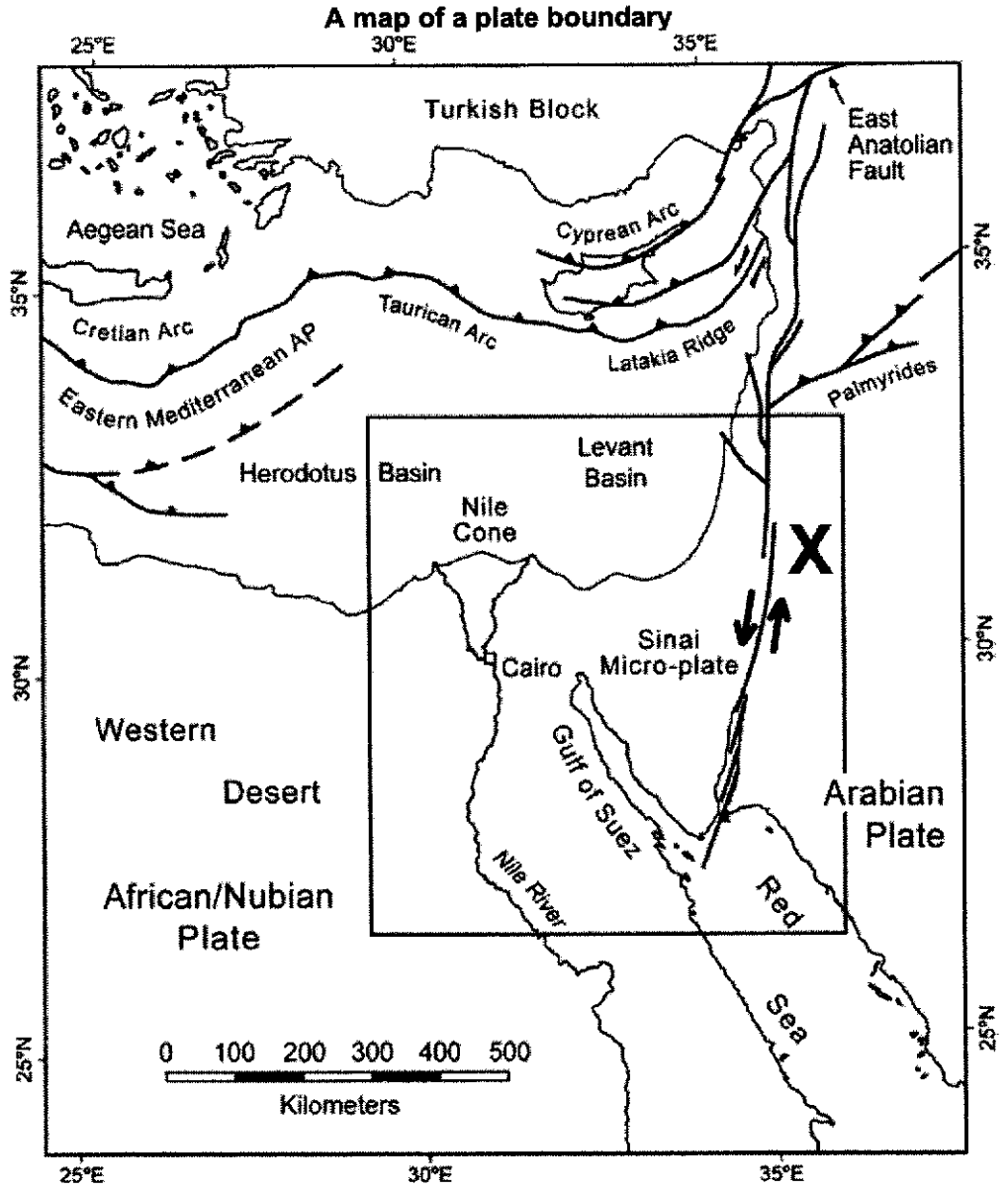



**Fig. 10**

With reference to Fig. 10, identify the plate boundary labelled X, and explain how the plate movements at X can lead to earthquakes. [4]

Award 1m each:

a. X is a transform boundary.
b. Convection currents in the mantle pull the Sinai micro-plate and Arabian plate in parallel and opposite directions (anti-parallel).
c. As plates slide past each other along the transform plate boundary, a transform fault is formed.
d. In the process, tremendous stress builds up and is eventually released, often in the form of earthquakes.



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(d) 'The advantages of living in volcanic areas exceed the disadvantages of living there.'

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

| Level 1 (0-3m) | Level 2 (4-6m) | Level 3 (7-8m) |
|---|---|---|
| Brief explanation of points/ out of point | Detailed explanation of 1 point<br><br>OR<br><br>Somewhat detailed explanation of at least 2 points including 1 advantage and 1 disadvantage | Detailed explanation of at least 2 points including 1 advantage and 1 disadvantage |
| No evaluation is done – No mention of advantages and/or disadvantages | Some evaluation is done – some mention of advantages and disadvantages | Detailed evaluation is done – advantages and disadvantages are well-discussed |
| No examples | General examples used to support points | Specific examples and/or statistics used to support points |
| No sharing of opinion | Weak opinion/ No support of opinion/ Purely summary | Sharing and support of mature opinion/ view with regards to the issue in essay |

Level 1 (0 – 3 marks)

1m – **brief statement** that answers the question, but **no description of factors**

Eg.
Volcanic eruptions bring both advantages and disadvantages, such as fertile soils and loss of lives respectively.

2m – **brief explanation** of advantage OR disadvantage of volcanic eruptions

Eg. Lava and ash from volcanic eruptions break down to form fertile volcanic soils. As the richest soils on the earth, volcanic soils are very favourable for agriculture.

3m – **brief description** of 1 advantage AND 1 disadvantage of volcanic eruptions, missing **examples** or **opinion**

Level 2 (4 - 6 marks)

4m – **detailed explanation** of 1 advantage OR 1 disadvantage of volcanic eruptions with **brief examples** and **opinion (but opinion is merely a summary of points)**

5m – **detailed explanation** of 1 advantage OR 1 disadvantage of volcanic eruptions with **case-specific examples** and **opinion (but opinion is merely a summary of points)**



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| |
|---|
| 6m – **somewhat detailed explanation** of 1 advantage AND 1 disadvantage of volcanic eruptions, with some **case-specific examples** and **opinion (but opinion is not fully supported)**<br><br>Eg.<br><br>Lava and ash from volcanic eruptions break down to form fertile volcanic soils. As the richest soils on the earth, volcanic soils are very favourable to agriculture, which could benefit the people living near the volcanoes as they could have better harvest on their crops with the rich fertile soil. For example, volcanic soils of Java and Bali in Indonesia support the cultivation of crops such as tea, coffee and rice. This is the main reason why these two islands have been able to support a large rural population over decades. |
| Level 3 (7 – 8 marks)<br><br>7m – **detailed explanation** of at least 1 advantage AND 1 disadvantage of volcanic eruptions with **case-specific examples** and **opinion (opinion is supported but not fully convincing)**<br><br>8m – **detailed explanation** of at least 1 advantage AND 1 disadvantage of volcanic eruptions with **case-specific examples** and **opinion (opinion is well-supported and convincing)** |

**A good opinion should provide some form of weighing of factors and how the main factors outweigh the others. Students are not to merely mention outweigh, they have to demonstrate HOW it outweighs other factors.**

**Note: impact question  does not require discussion of limitations**

Sample Opinion:

Volcanic eruptions bring both advantages and disadvantages, and I agree that the advantages exceed the disadvantages. The disadvantages are no doubt massive and cause much destruction, but these destructions can be minimized with early warning systems that can allow people to evacuate early. Moreover, each volcano does not erupt often, but the advantages each one brings are more long-lasting and provide much economic benefits to the people living in the area.

**Other points**

Advantages:
a. Fertile soil
b. Precious stones and minerals
c. Tourism
d. Geothermal energy

Disadvantages:
a. Massive destruction by volcanic material
b. Pollution

**END OF PAPER**



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