



SUBJECT:	<b>Geography</b>
PAPER NUMBER:	I
DATE:	1 <sup>st</sup> June 2021
TIME:	9:00 a.m. to 12:05 p.m.

Answer **FOUR** questions in total. Questions carry 25 marks each.

- For scientists to understand climate change, they must also determine what drives the changes within the Earth's radiation budget. (NASA, 2021).
  - With the help of an annotated diagram, explain the role of short-wave and long-wave radiation in maintaining the Earth's radiation budget. (10)
  - Discuss how human activities have influenced the Earth's radiation budget. (7)
  - Describe **TWO** impacts caused by the gradual imbalance in the Earth's radiation budget. (8)
- Figure 1 illustrates the seismically active system of East Africa.

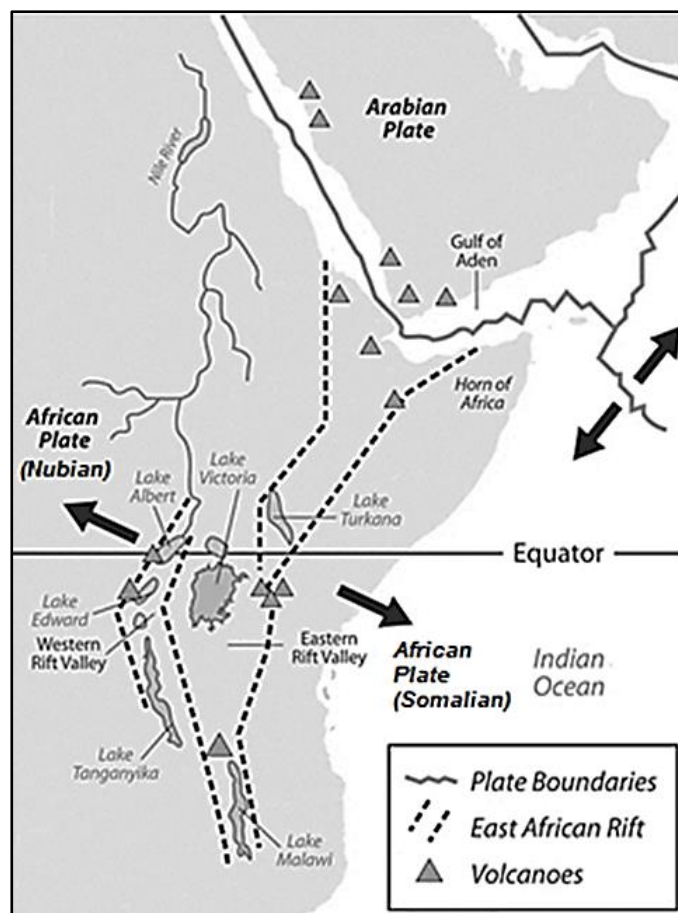


Figure 1: A tectonic map of East Africa.  
(Source: <https://questhollow.com/>)

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- (a) With reference to Figure 1, describe the tectonic features present in East Africa and name the plates responsible for the development of these features. (10)
- (b) With the help of an annotated sketch, describe the physical processes responsible for the tectonic landscape of East Africa. (10)
- (c) If the tectonic processes described in (b) continue, what type of continental changes will East Africa experience in its long-term evolution? (5)
3. 'In order to address the problem of coastal erosion, engineering solutions are based on the effectiveness of coastal protection structures'. Discuss this statement, with specific reference to the various examples of engineering strategies which are adopted to implement coastal erosion management. (25)
4. Malta is one of the top 10 water-scarce countries in the world, providing only half of the water needed by its population (European Environment Agency, 2018).
- (a) Explain how the geographical and hydrogeological conditions of Malta limit the natural availability of freshwater supply. (10)
- (b) Discuss the forms of fresh water harvesting and extraction practices which have developed over the years to increase water availability on the Maltese islands. (15)
5. Table 1 displays the mean monthly values of selected climatic parameters for the Maltese Islands.

<b>Climate data for Malta (Luqa, 1981-2010)</b>												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily mean °C	12.8	12.5	13.9	16.1	19.8	23.9	26.6	27.2	24.7	21.5	17.7	14.4
Average high temperature °C	15.6	15.6	17.3	19.8	24.1	28.6	31.5	31.8	28.5	25.0	20.7	17.1
Average low temperature °C	9.9	9.4	10.6	12.4	15.5	19.1	21.7	22.6	20.8	18.1	14.6	11.6
Average sea temperatures °C	15.4	14.9	15.0	15.9	17.5	21.1	24.1	25.8	25.2	23.2	20.6	17.4
Average precipitation mm	98.5	60.1	44.2	20.7	16.0	4.6	0.3	12.8	58.6	82.9	92.3	109.2
Average precipitation days (≥ 1.0 mm)	10.0	7.0	5.0	4.0	1.0	1.0	0.0	1.0	4.0	6.0	9.0	10.0
Mean monthly sunshine hours	169.3	178.1	227.2	253.8	309.7	336.9	376.7	352.2	270.0	238.8	195.0	161.2

Table 1: Mean monthly values of selected climatic parameters for the Maltese Islands.  
 [(Source: Meteo Climate (1981-2010 Data); MaltaWeather.com (Sun and Sea Data)]

- (a) Using the data displayed in Table 1, demonstrate that the Maltese Islands have a typical Mediterranean climate. (15)
- (b) Explain and provide reasons for each of the following climatic conditions stated hereunder:
  - (i) land temperatures show a higher annual variability compared to sea temperatures; (5)
  - (ii) annual trends of sunshine hours and rainfall levels are inversely proportional. (5).

6. Figure 2 illustrates the precipitation patterns over the Sierra Nevada Mountains in central California.

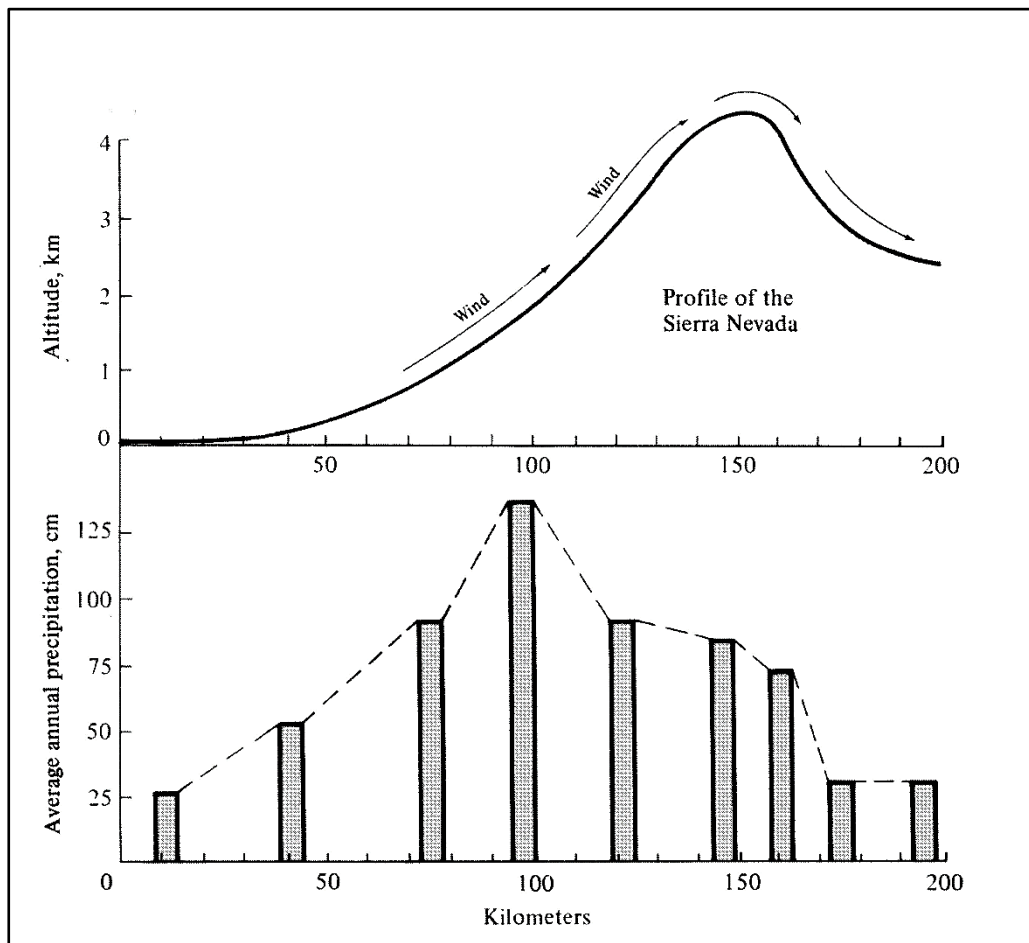


Figure 2: Precipitation patterns on the Sierra Nevada Mountains  
 (Source: <http://utexas.edu>)

- (a) With reference to the information provided in Figure 2, discuss how the precipitation patterns were influenced by the following local factors:
  - (i) the topography of the Sierra Nevada Mountains; (10)
  - (ii) the position of the Sierra Nevada Mountains along the North American continental margin; (10)
  - (iii) the direction of the prevailing winds. (5)

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7. Malta's biodiversity continues to experience various pressures and threats. (State of the Environment Report, 2018).
- (a) Describe the species community associated with valley watercourses, making reference to their specialist adaptations to this terrestrial environment. Provide examples to illustrate your answer. (15)
  - (b) What forms of pressures and threats have specifically been encountered by this ecological community over the years? (10)
8. "It is the inequalities of heating of different parts of the Earth which set the atmosphere in motion" (Lamb, 1975).
- (a) With reference to the above statement, discuss the following:
    - (i) the atmospheric processes responsible for the distribution of global surface winds; (10)
    - (ii) the resultant sub-division of global wind zones and their characteristics. (10)
  - (b) Provide an annotated schematic diagram of the global wind zones to support your explanation in (a) (ii). (5)



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Answer **FOUR** questions in total. Questions carry 25 marks each.

1. Figure 1 is a dot density map.

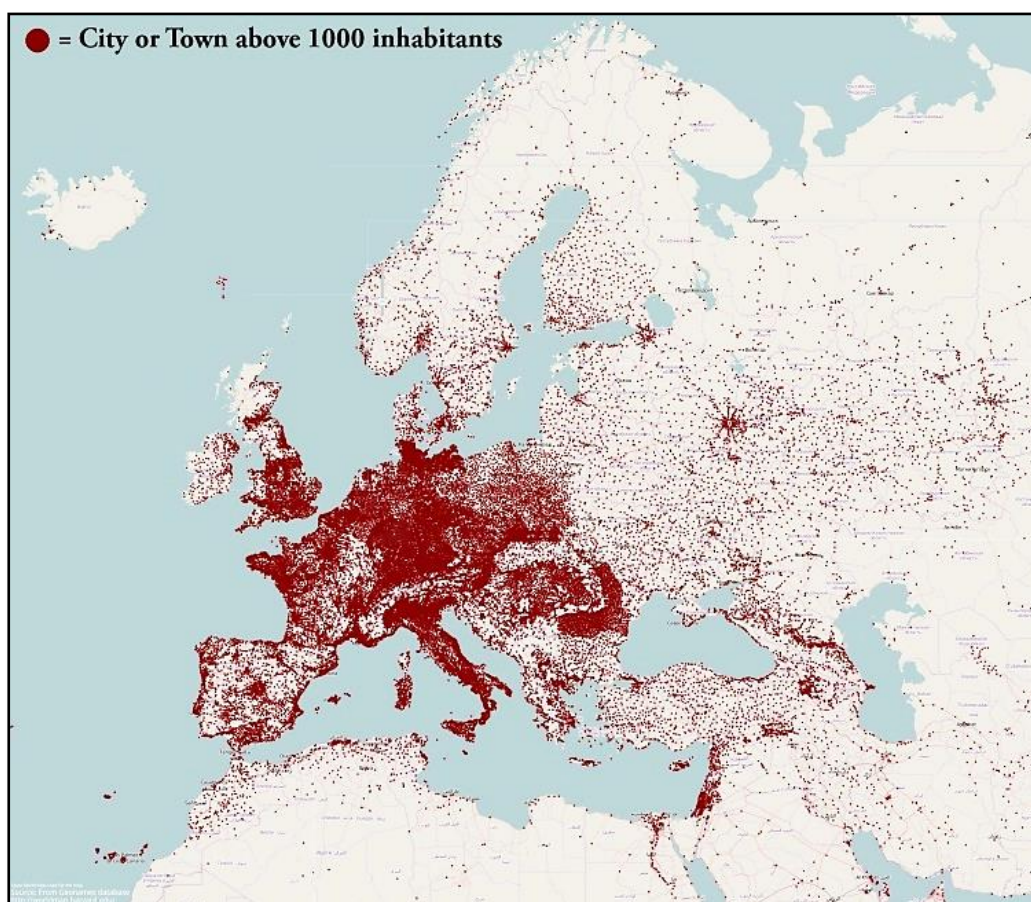


Figure 1: Dot Density Map  
(<https://imgur.com/gallery/Y9jqOvz>)

- (a) Explain the purpose of a dot density map and describe the key characteristics of Figure 1. (5)
- (b) Discuss **THREE** physical and **THREE** human factors affecting population density. (12)
- (c) Populations are dynamic and there are constant changes over time and space. Population change is, in fact, usually referred to as an open system with inputs, processes and output. With the help of a simple diagram, explain this concept by making reference to the main factors that affect the population of an area. (8)

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2. Agricultural development is one of the most powerful tools to end extreme poverty, boost shared prosperity and feed a projected 9.7 billion people by 2050 (World Bank, 2020).
- (a) Describe the key characteristics of these **TWO** farming types:
- (i) Intensive subsistence farming; (3)
  - (ii) Shifting cultivation. (3)
- (b) Explain **THREE** physical and **THREE** human factors that have a strong influence on agricultural activities in the EU. (12)
- (c) Discuss the impact that the Common Agricultural Policy (CAP) has on agricultural activities in the EU. (7)
3. Figure 2 shows the Three Gorges Dam in China, which is the biggest Hydro Power station in the world.



Figure 2: The Three Gorges Dam  
([www.wsj.com](http://www.wsj.com))

- (a) Briefly explain how a Hydro Power station works. Mention **TWO** countries (apart from China) that are leaders in hydroelectric energy production. (7)
- (b) Discuss **THREE** important factors that determine the site selection of a Hydro Power station. (6)
- (c) Discuss **THREE** benefits and **THREE** costs of a multi-purpose river project. (12)
4. "The Brandt Report offers a strategy for resolving the present crisis of the financial system of international capitalism" (Williams, 1980).
- (a) By referring to the Brand Report, explain the key characteristics and the relevancy of the North-South divide in the contemporary world. (12)

- (b) With reference to the key economic development characteristics discussed in part (a), define the concepts of Free Trade and Fair Trade and explain their main advantages and disadvantages. (13)
5. A central place is usually defined as a settlement that provides goods and services. Central places vary in size and form a link in a hierarchy.
- (a) By using a hierarchy diagram to support your answer, explain the **FOUR** generalisations usually made with regards to the spacing, size and functions of settlements. (10)
- (b) Three important factors that affect functions in central places are range, threshold and sphere of influence. Explain these **THREE** factors. (6)
- (c) In 1933 Christaller introduced a sense of order in the spacing and provision of services by settlements. He produced three different patterns of service or trading areas, which he called **K=3**, **K=4** and **K=7**. By using diagrams, explain these **THREE** patterns. (9)
6. Table 1 shows the largest ten companies by market capitalization as of 3<sup>rd</sup> November 2020.

Rank	Company	Country	Sector
1	Apple	U.S.	Technology
2	Saudi Aramco	Saudi Arabia	Energy
3	Amazon	U.S.	Consumer Services
4	Microsoft	U.S.	Technology
5	Alphabet	U.S.	Consumer Services
6	Alibaba	China	Technology
7	Facebook	U.S.	Technology
8	Tencent	China	Technology
9	Berkshire Hathaway	U.S.	Financial
10	Taiwan Semiconductor	Taiwan	Semiconductors

Table 1: Largest 10 company by market capitalization  
 (Adapted from: <https://www.gfmag.com/global-data/economic-data/largest-companies>)

- (a) Describe the key trend shown in Table 1. (4)
- (b) List and briefly explain **FIVE** factors that have led to the growth of multinational companies throughout the past years. (5)
- (c) Discuss the key factors that determine the ideal location where multinational companies choose to site their organisation. (8)
- (d) Discuss **FOUR** advantages and **FOUR** disadvantages of multinational companies. (8)

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7. Figure 3 shows oil consumption by region from 1965 to 2019, measured in terawatt-hour (TWh) equivalents.

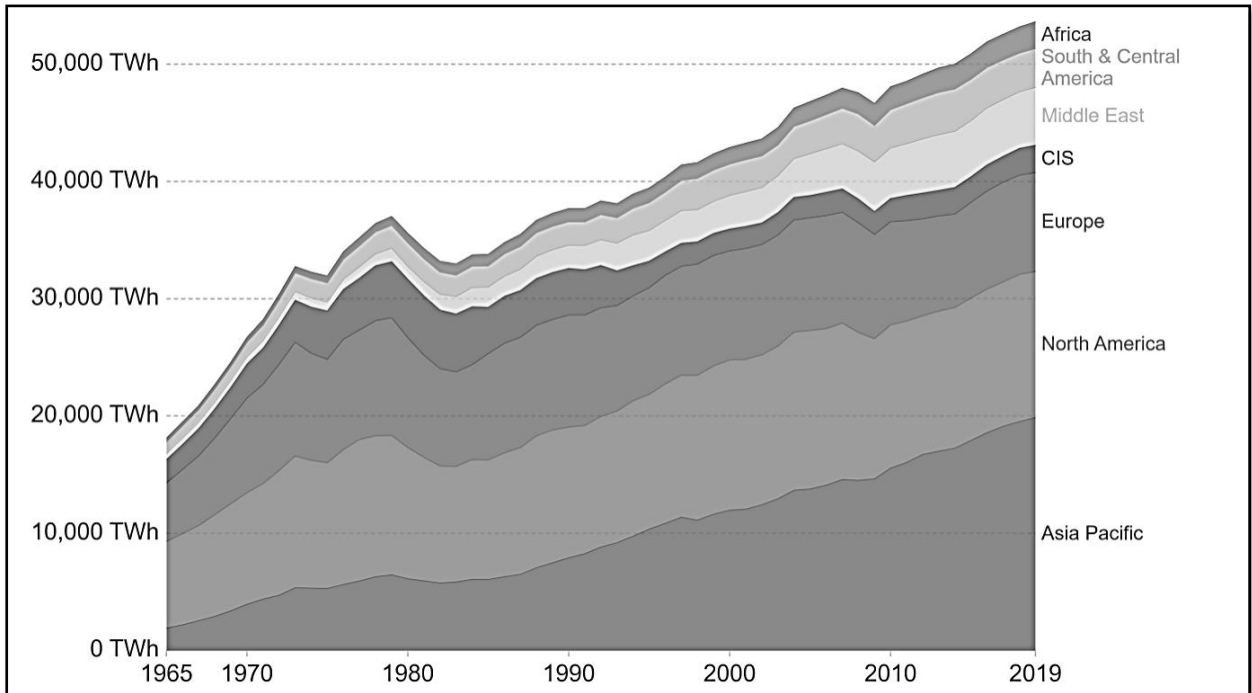


Figure 3: Oil Consumption by region between 1965 and 2019  
 (<https://ourworldindata.org/grapher/oil-consumption-by-region-terawatt-hours-twh?time=earliest..latest>)

- (a) Explain the main findings of Figure 3. (6)
- (b) Discuss **THREE** negative impacts linked to oil consumption. (6)
- (c) 'The transportation of oil has always been problematic because of the risks it involves'. Discuss the risks referred to in this statement. (7)
- (d) Describe the role and purpose of the OPEC. (6)



8. Figure 4 shows the number of inbound tourists by quarter in Malta between 2017 and 2019.

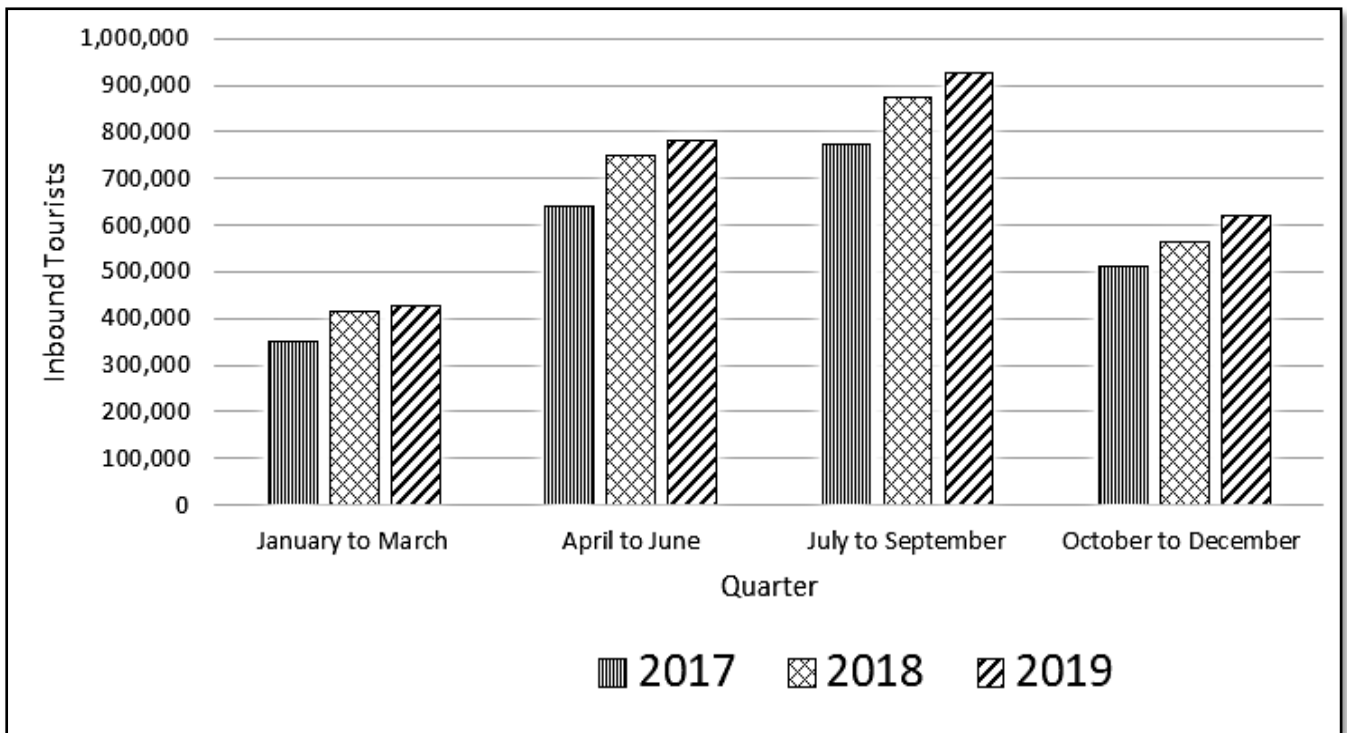


Figure 4: Inbound tourists by quarter in 2017, 2018 and 2019 in Malta  
 (Adapted from: <https://www.mta.com.mt/en/file.aspx?f=32328>)

- (a) Describe the distribution of inbound tourists in Malta between 2017 and 2019 as shown in Figure 4. (5)
- (b) Explain **FOUR** main factors that have led to the overall trend described in part (a) above. (8)
- (c) List **THREE** positive and **THREE** negative impacts of the tourism industry in the Maltese Islands. (6)
- (d) Briefly explain the role that the EU has in supporting sustainable tourism in its member countries. (6)