L-Università ta' Malta

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE
EXAMINATIONS BOARD

**ADVANCED MATRICULATION LEVEL
2024 SECOND SESSION**

SUBJECT:	**Geography**
PAPER NUMBER:	I
DATE:	29th August 2024
TIME:	9:00 a.m. to 12:05 p.m.

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

1. Figure 1 displays annual temperature and precipitation records in three European cities: Valentia (West of Ireland), London (south of United Kingdom) and Frankfurt (central Germany).
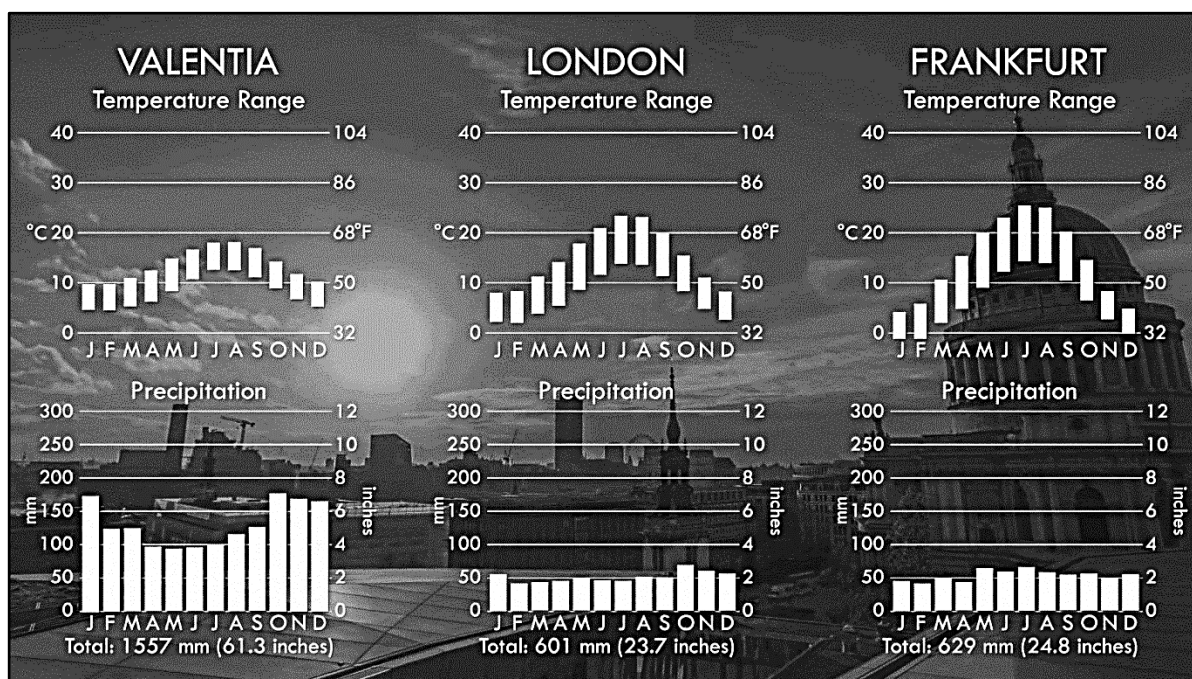

Figure 1: Annual temperature and precipitation records for Valentia, London and Frankfurt.
(Source: geodiode.com)

(a) Using the climate data provided in Figure 1, provide a detailed analysis of the annual temperature range and precipitation patterns for **each** European city. (12)

(b) With reference to Figure 1, name the city which best represents **each** of the following types of climates and explain the physical geographical factors that contribute to the differences in climate:
   i.   oceanic climate; and (6)
   ii. continental climate. (7)

(Total: 25 marks)

Please turn the page.

2. For **each** of the following statements (a) identify the predominant type of weathering and (b) discuss the specific weathering processes, and related factors, affecting such processes:
   i.   the formation of desert pavements in the Sahara Desert;   (5)
   ii.   the development of deep weathered soils in the Amazon Basin;   (5)
   iii. the disintegration of sandstone and limestone by salt deposits in the Atacama Desert;   (5)
   iv.   the sharp rugged landscapes in the Swiss Alps; and   (5)
   v.   cave formation and limestone karstic features in tropical Borneo.   (5)

   (Total: 25 marks)

3. Figure 2 illustrates one method of sand dune stabilisation.

Figure 2: A sand dune stabilisation method on Spencer Park Beach, New Zealand.
(Source: Photo by E. Kelland, https://creativecommons.org/licenses/by-sa/3.0)

   (a) Explain the physical processes that lead to the development of sand dunes.   (10)

   (b) Discuss the effectiveness of **THREE** methods used for sand dune stabilisation.   (15)

   (Total: 25 marks)

4. (a) Explain the process of rainwater percolation through the various rock layers of the Maltese Islands, with particular reference to the formation and characteristics of the Islands' main aquifers.   (15)

   (b) Discuss the importance of precipitation as a natural source of water in the Islands' hydrogeological system.   (10)

   (Total: 25 marks)

5. (a) With reference to the process of plant succession in the Maltese Islands, describe the major vegetation communities that form part of the successional sequence towards the climatic climax community. (12)

    (b) Evaluate the factors influencing the successional sequence mentioned in (a) and the resultant ecological significance of **each** community in the context of Malta's biodiversity and environmental conservation. (13)

(Total: 25 marks)

6. (a) Describe how the movement of water in a wave differs when transitioning from deep to shallow water. Include, in your response, how this alteration in movement influences the steepness of the wave. (10)

    (b) Coastal erosion is a direct consequence of wave breaking processes along the shoreline. Discuss **FIVE** factors that can influence the extent of coastal erosion along a coast. (15)

(Total: 25 marks)

L-Università
ta' Malta

SUBJECT:	**Geography**
PAPER NUMBER:	II
DATE:	30th August 2024
TIME:	9:00 a.m. to 12:05 p.m.

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

1. The Demographic Transition Model (DTM) describes a sequence of changes in birth rates, death rates and total population over a period of time.

   (a) With the help of a labelled diagram of the DTM, name the **FIVE** stages and describe the birth and death rate in **each** stage. (20)

   (b) With reference to **ONE** named developed country, briefly discuss the applicability of the DTM in contemporary realities. (5)

   (Total: 25 marks)

2. Weber's Least-Cost Location Theory, formulated by German economist Alfred Weber in 1909, focuses on determining the optimal location for manufacturing facilities by minimising production costs.

   (a) Explain **THREE** driving forces that affect the optimum location for industry in Weber's location theory. (9)

   (b) Briefly describe the applicability of Weber's location theory in contemporary conditions. (4)

   (c) Discuss **FOUR** transnational environmental impacts of manufacturing industries. (12)

   (Total: 25 marks)

3. Petroleum, or crude oil, is a primary fossil fuel and a leading non-renewable resource in meeting the global demands for energy.

   (a) Describe the formation of petroleum and explain its main usages. (6)

   (b) Outline **THREE** factors which influence the location of oil power stations. (6)

   (c) The total volume of oil lost to the environment from tanker spills in 2022 was approximately 15,000 tonnes (ITOPF, 2023). With reference to this statement, discuss **FOUR** worldwide environmental problems brought about by oil spillages. (8)

   (d) Briefly describe the role of OPEC, the Organization of the Petroleum Exporting Countries. (5)

   (Total: 25 marks)

   Please turn the page.

4. The Central Place Theory, devised by Christaller in 1933, explains why some cities are larger than others.

   (a) Define the following terms:
       i.   settlement hierarchy; (2)
       ii. threshold; and (2)
       iii. range. (2)

   (b) Christaller produced three different patterns of service, termed K=3, K=4, and K=7. Explain Christaller's Central Place Theory and with the help of labelled diagrams, describe the **THREE** patterns of service. (15)

   (c) List **TWO** limitations of Christaller's Central Place Theory. (4)

   (Total: 25 marks)

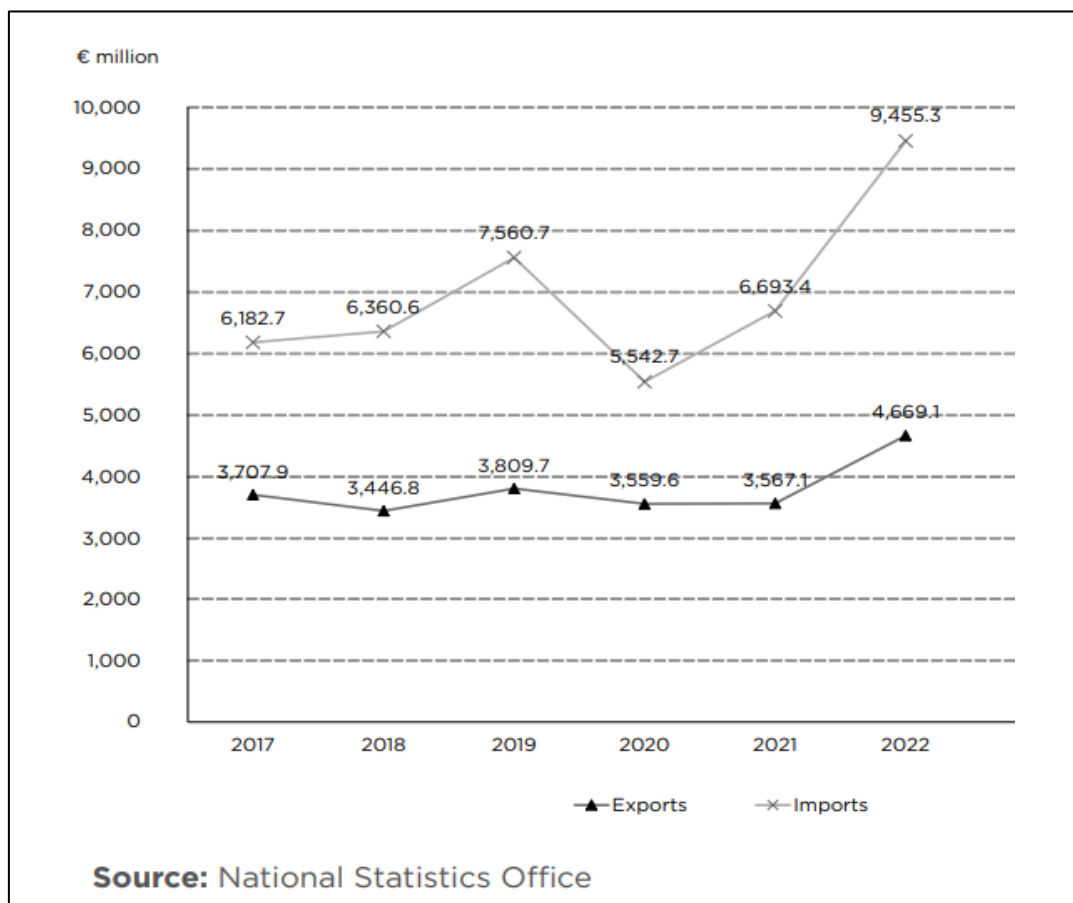5. Figure 1 is a line graph showing the value of exports and imports of the Maltese Islands from 2017 till 2022.

Figure 1: The value of exports and imports from 2017 till 2022.
(Adapted from: https://finance.gov.mt/)

   (a) Explain the main findings of Figure 1. (6)

   (b) Define the terms visible trade and invisible trade. (4)

(c) Table 1 shows the direction of trade for Malta from January to October 2022 compared to the same period in 2023. Describe the key trends of Malta's imports and exports as shown in Table 1. (8)

Table 1: Direction of trade for Malta in 2022 and 2023 from January to October.

	January – October			
	€ million			
Continent/Region/Country	2022[p]		2023[p]	
	Imports	Exports	Imports	Exports
Europe	**4,938.1**	**1,461.6**	**4,811.5**	**1,566.3**
of which:				
European Union	**4,234.5**	**1,244.1**	**3,894.0**	**1,385.4**
of which:				
Euro area	4,031.0	975.4	3,722.9	1,142.0
of which:				
Italy	1,598.9	148.8	1,422.4	130.2
France	444.7	223.0	505.7	50.7
Spain	417.1	46.6	406.3	40.9
Germany	361.5	399.8	594.8	713.3
EFTA Countries	**44.7**	**27.2**	**69.0**	**44.5**
Other European Countries	**658.9**	**190.2**	**848.4**	**136.4**
of which:				
United Kingdom	300.4	147.4	457.1	88.1
Africa	**234.2**	**311.5**	**253.3**	**308.3**
of which:				
Tunisia	63.7	27.1	65.6	29.7
Asia	**1,507.4**	**612.2**	**1,447.4**	**552.2**
of which:				
China	331.6	48.6	320.0	32.0
India	223.4	20.8	193.6	33.8
North and Central America	**1,030.1**	**148.4**	**574.3**	**139.5**
of which:				
United States Of America	192.7	119.8	205.9	103.4
Canada	466.9	12.4	78.8	18.1
South America	**47.6**	**39.9**	**23.0**	**38.9**
Oceania	**70.1**	**11.7**	**20.3**	**25.9**
Grand Total	**7,827.5**	**3,758.9**	**7,129.8**	**3,646.5**

[p] Provisional
[1] As of 1 January 2023, the euro area includes Croatia.
Notes:
  1. The selection of countries is based on the highest values of imports in the month under review.
  2. Totals may not add up due to rounding.

(Adapted from: https://nso.gov.mt)

(d) Explain how the developments in container terminal transport have helped trade in Malta. (7)

(Total: 25 marks)

Please turn the page.

6. Figure 2 shows Donghai Bridge Wind Farm, near Shanghai, the first commercial offshore wind farm in China.

Figure 1: The Donghai Bridge Offshore Wind Farm, near Shanghai, China.
(https://www.researchgate.net/)

(a) Discuss **FOUR** advantages of wind energy.   (16)

(b) Discuss **THREE** negative environmental impacts of the use of wind power.   (9)

(Total: 25 marks)