L-Università ta' Malta

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD

ADVANCED MATRICULATION LEVEL
2020 FIRST SESSION

SUBJECT:	**Geography**
PAPER NUMBER:	I
DATE:	1st September 2020
TIME:	9:00 a.m. to 12:05 p.m.

Answer **FOUR** questions in total. Questions carry equal marks.

1. Figure 1 illustrates Hurricane Dorian, which struck on the 24th of August 2019 and is considered the most intense tropical cyclone to ever strike the Bahamas. Today it is regarded as the worst natural disaster in the country's history.

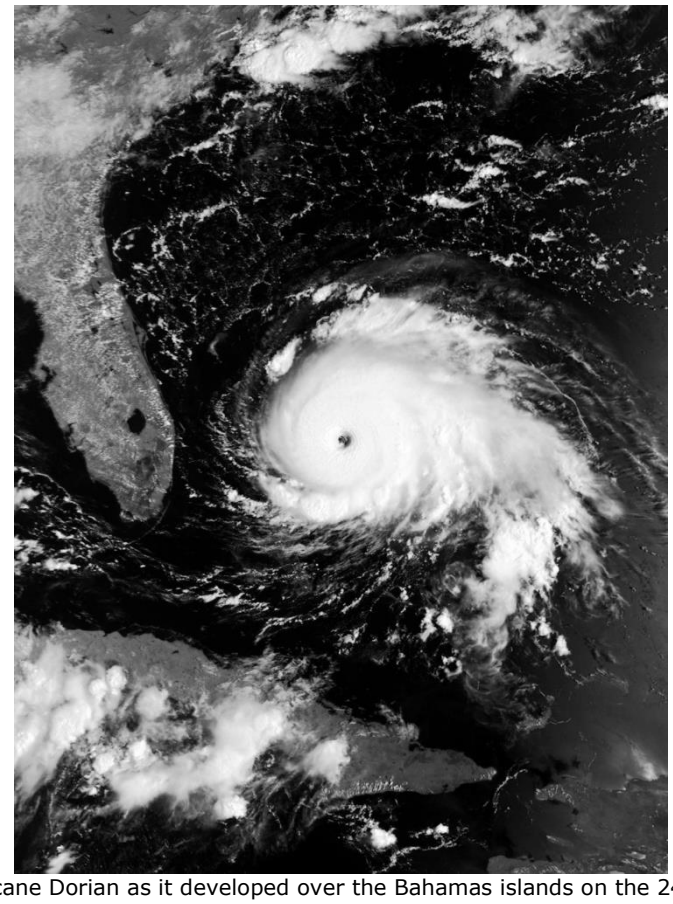

Figure 1: Hurricane Dorian as it developed over the Bahamas islands on the 24th August 2019.
(Source: Adapted from https://commons.wikimedia.org)

(a) Describe the physical origin and weather conditions associated with cyclone formation. (10 marks)

(b) Explain why tropical and subtropical areas experience a greater frequency and risk of cyclones. (5 marks)

(c) What are the hazards associated with cyclones? (5 marks)

(d) Briefly discuss how climate change may affect the development of cyclones. (5 marks)

2. (a) Rocks are broadly classified into three groups based on their process of formation. Describe the origins and most important physical and chemical composition of:
   (i) igneous rocks; (6 marks)
   (ii) metamorphic rocks. (7 marks)

   (b) Chemical weathering processes can lead to the disintegration of rocks by altering the chemicals that compose the same rocks. Explain how **TWO** chemical weathering processes lead to the breakdown of rock and for each outline the main factors affecting the rate of chemical weathering. (12 marks)

3. Figure 2 illustrates the geology and geomorphology of the northern part of Malta, Comino and Gozo.

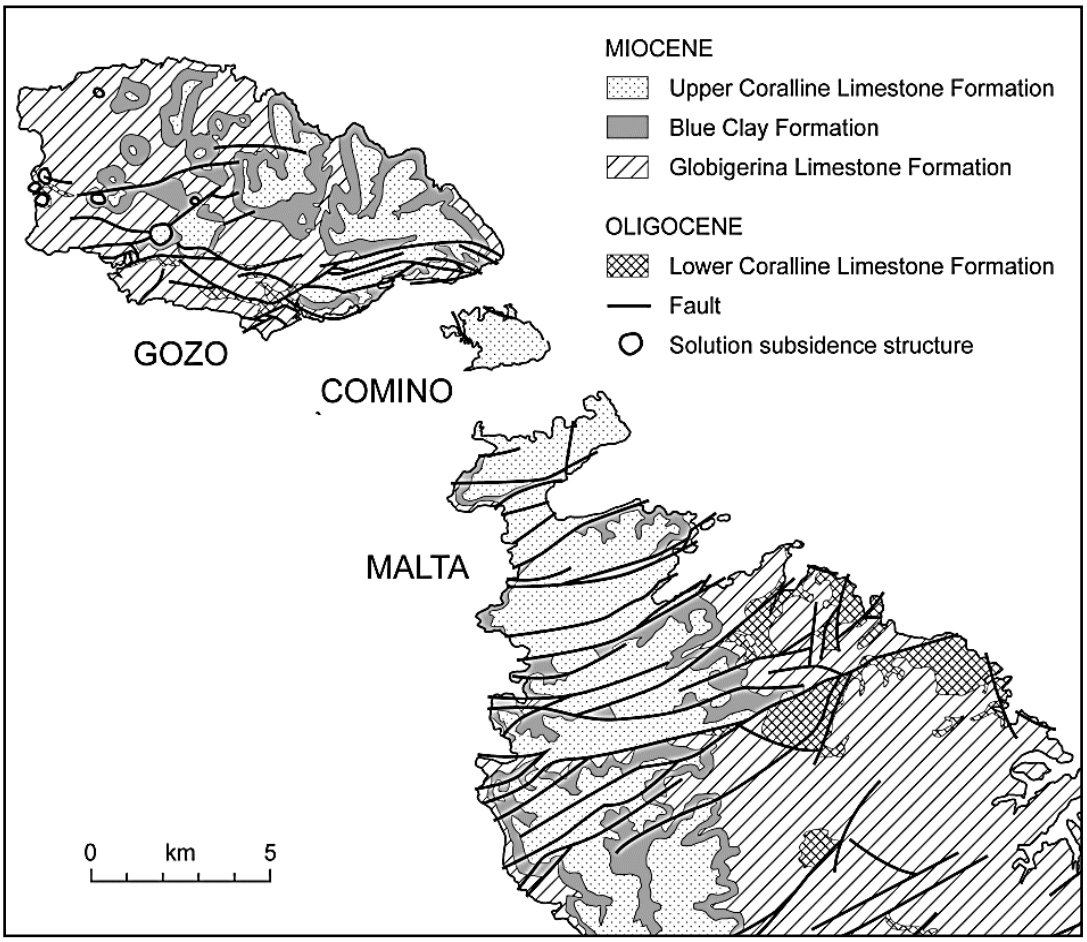

Figure 2: Geology and fault systems in northern Malta, Comino and Gozo.
(Source: Adapted from Main et al, 2018)

   (a) Describe the distribution of (i) rock type and (ii) rock structure in the upper part of Malta, Comino and Gozo. (10 marks)

   (b) With reference to the explanation provided in (a), explain how the above two physical properties are responsible for the development of the following coastal landforms:
   (i) headlands and bays; (5 marks)
   (ii) coastal clay slopes; (5 marks)
   (iii) shore platforms. (5 marks)

4. Figure 3 illustrates how a high percentage of the river's energy is not only used to transport water through the river channel, but is also lost due to the transportation and deposition of large quantities of sediment in the channel.

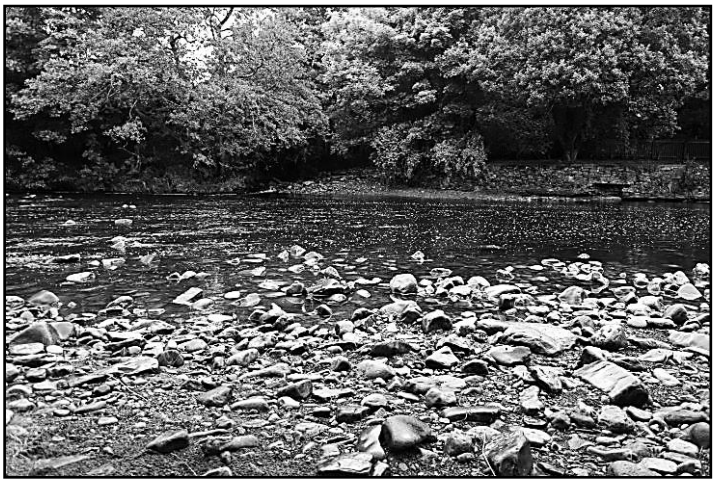

Figure 3: Sediment load (in the foreground) transported by river flow.
(Source: Adapted from https://shutterstock.com)

(a) How is sediment load produced in a river channel? (6 marks)

(b) With reference to the transportation of sediment load, describe the difference between river 'competence' and 'capacity'. (10 marks)

(c) With the help of an annotated diagram, describe the origin and character of the **THREE** different types of sediment load present in a river channel. (9 marks)

5. Temporary rainwater pools are a very common characteristic of a Mediterranean terrestrial ecosystem. Figure 4 illustrates a temporary rainwater pool which developed at Baħar iċ-Ċagħaq in December 2019.

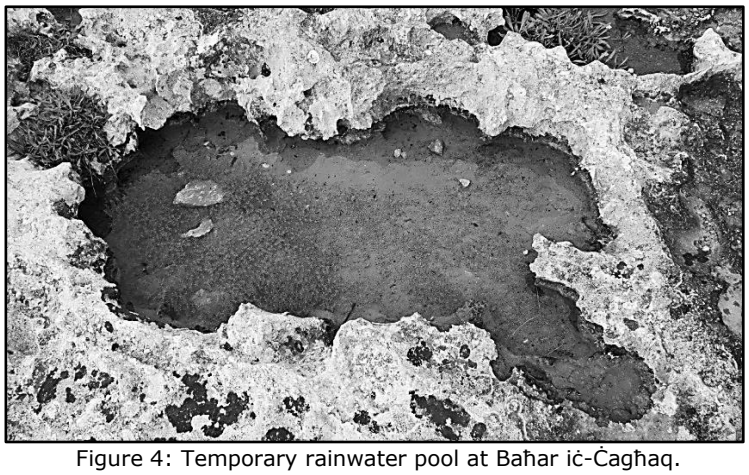

Figure 4: Temporary rainwater pool at Baħar iċ-Ċagħaq.
(Photo by Gauci R., 2019)

(a) Explain the physical conditions which lead to the development of temporary rainwater pools. (9 marks)

Question continues on next page

(b) The ecological communities which thrive in this minor terrestrial habitat are considered to be highly specialised in order to survive in harsh environmental conditions.

(i) Describe the harsh environmental conditions present in temporary rainwater pools. (8 marks)

(ii) In what way have the ecological communities become specialised to survive in this habitat? (8 marks)

(

6. Coastal sea level rise is among the most severe societal consequences of anthropogenic climate change (World Climate Research Programme, 2019).

(a) Briefly explain the relationship between the phenomenon of climate change and the resultant sea level rise. (10 marks)

(b) With reference to highly urbanised coastal zones on the Maltese Islands, such as that illustrated in Figure 5, discuss how sea level rise would impact these types of urban coasts. (15 marks)

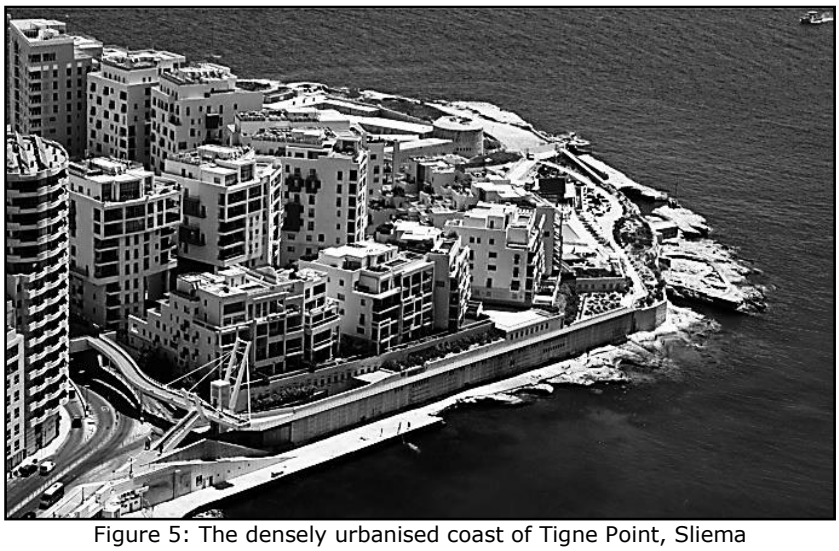

Figure 5: The densely urbanised coast of Tigne Point, Sliema
(Source: Adapted from https://tignepoint.com)

L-Università ta' Malta

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD

ADVANCED MATRICULATION LEVEL
2020 FIRST SESSION

SUBJECT:	**Geography**
PAPER NUMBER:	II
DATE:	2nd September 2020
TIME:	4:00 p.m. to 7:05 p.m.

Answer **FOUR** questions in total. Questions carry equal marks.

1. The older population in Malta (people over the age of 60) has increased by 21% from 2011 to 2017 (NSO, 2018).

   (a) Discuss **THREE** impacts that the increase in the older population is having on Maltese society. (6 marks)

   (b) Figure 1 shows the distribution of the older population across the six districts of the Maltese Islands in 2017.

District	Older population in 2017
Gozo	9,413
Northern	16,376
Northern Harbour	38,203
Western	15,608
South Eastern	15,933
Southern Harbour	24,017

Figure 1: The distribution of the older population in Malta in 2017 (Adapted from NSO, 2018)

   (i) Describe the purpose of a Lorenz Curve and explain how it can be used with reference to the data in Table 1. (4 marks)
   (ii) By showing all your workings, work out the rank, the older population percentage and the cumulative percentages of the data. (8 marks)
   (iii) By using the result obtained for the cumulative percentages, plot a Lorenz curve on the graph paper provided and comment on the results. (7 marks)

2. Shanty settlements are defined as residential buildings built on "planned" and "unplanned" areas which do not have formal planning approval (Ali and Sulaiman, 2006).

   (a) Discuss **FOUR** causes of shanty settlements. (8 marks)

   (b) Discuss **FOUR** consequences of shanty settlements. (8 marks)

   (c) Discuss **THREE** ways how governments can reduce the problems of shanty settlements. (9 marks)

3. Von Thunen's model of agricultural land use (also called Location Theory) was created by the German farmer and economist Johann Heinrich Von Thunen before industrialisation. The main aim was to identify trends of people's economic relationship with the landscape surrounding them (Rosenberg, 2019).

   (a) Describe Von Thunen's model. Use a diagram/s to support your answer. (15 marks)

   (b) Outline **THREE** limitations of the Von Thunen's model. (6 marks)

   (c) Briefly discuss the applicability of Von Thunen's model in the contemporary world. (4 marks)

4. Figure 2 is a triangular graph showing the economic structure of three countries in 2017.

   (a) Outline **ONE** advantage and **ONE** limitation when using triangular graphs. (4 marks)

   (b) Interpret and discuss the key findings of Figure 2. (7 marks)

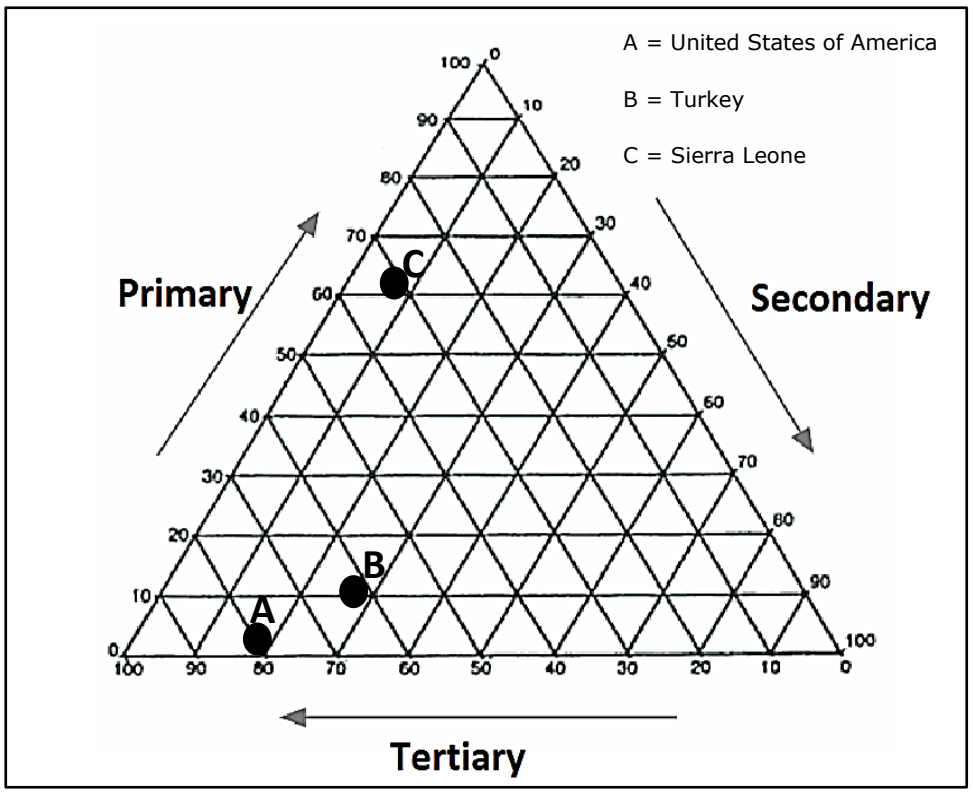

Figure 2: Economic structure of three countries in 2017 (Adapted from Central Intelligence Agency, 2018)

   (c) With specific reference to the secondary and tertiary sectors of the economy, Gunnar Myrdal came up with a model of cumulative causation. Outline the main characteristics of such a model. (8 marks)

   (d) Discuss **THREE** environmental impacts of manufacturing industries. (6 marks)

5. In 2017, nuclear energy was the second largest source of low-carbon power (29% of the total). Around 10% of the world's electricity was generated by about 450 nuclear power reactors (OECD, 2018).

   (a) Explain **FOUR** factors that affect the siting of a nuclear power plant. (8 marks)

   (b) Explain the role of the International Atomic Energy Agency (IAEA). (4 marks)

   (c) Solar power rose to a record prominence in 2017, as the world installed 98 gigawatts of new solar power projects, more than the net additions of coal, gas and nuclear plants put together (Frankfurt School-UNEP Centre/BNEF, 2018). Such an investment in solar energy and other renewable resources is an instigator for job creation. With reference to Figure 3 discuss the distribution of jobs in renewable energy and outline how employment in this sector will be affected in the next 10 years. (7 marks)

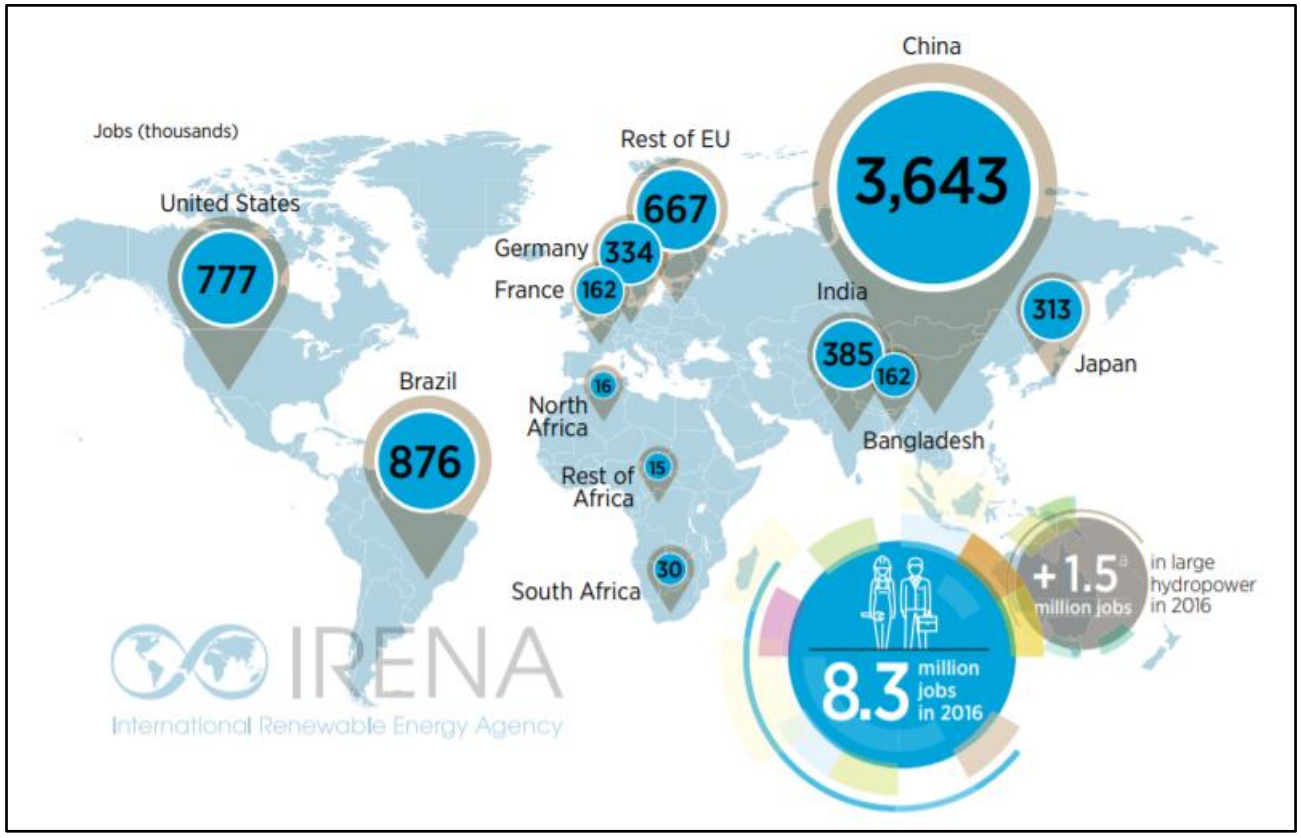

Figure 3: Renewable energy employment (in thousands) in selected countries in 2016 (IRENA, 2017)

   (d) In addition to direct job creation, explain **THREE** other socio-economic advantages of renewable energy. (6 marks)

Please turn the page

6. Sun and sea tourism, ecotourism and religious tourism are three popular types of tourism.

   (a) Describe the key characteristics of **EACH** of these types of tourism. (6 marks)

   (b) Mention and briefly explain **TWO** examples for **EACH** of these types of tourism in the Maltese Islands. (4 marks)

   (c) With reference to ecotourism, explain how the local authorities are promoting this particular type of tourism. (5 marks)

   (d) Discuss **THREE** positive and **TWO** negative impacts that the tourism industry has on the Maltese Islands. (10 marks)