
SUBJECT: GEOGRAPHY
PAPER NUMBER: I
DATE: 4th September 2017
TIME: 9.00 a.m. to 11.05 a.m.

Answer **THREE** questions in total, one from each section. Questions carry equal marks.

SECTION A: PHYSICAL GEOGRAPHY OF THE MALTESE ISLANDS

Choose **ONE** question from this section.

1. Sand dunes are amongst the rarest and most threatened of local ecosystems. Despite this they are of exceptional ecological value.
 - (a) Briefly describe how coastal dunes are formed and mention **TWO** examples of relatively intact sand dune ecosystems in the Maltese Islands. (8 marks)
 - (b) Describe the main characteristics of a coastal dune habitat and state why they are considered to be of exceptional ecological value. (8 marks)
 - (c) Outline the main threats that coastal dune ecosystems in the Maltese Islands are facing. (8 marks)

2. About 80% of Malta's groundwater resources are abstracted from sea level fractured limestone aquifers (FAO, 2006).
 - (a) With the help of Figure 1 explain the formation and distribution of these sea level fractured limestone aquifers (mean sea level aquifers) in the Maltese Islands. (14 marks)

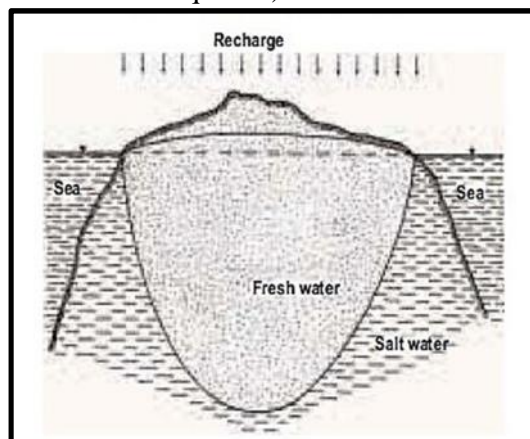


Figure 1: A Ghyben-Herzberg groundwater body in an island (FAO, 2006)

- (b) The above mentioned aquifers are in a precarious state, both quantitatively and qualitatively. Discuss this statement. (10 marks)

3. Figure 2 is a structural map of the Maltese Islands showing the major fault lines.

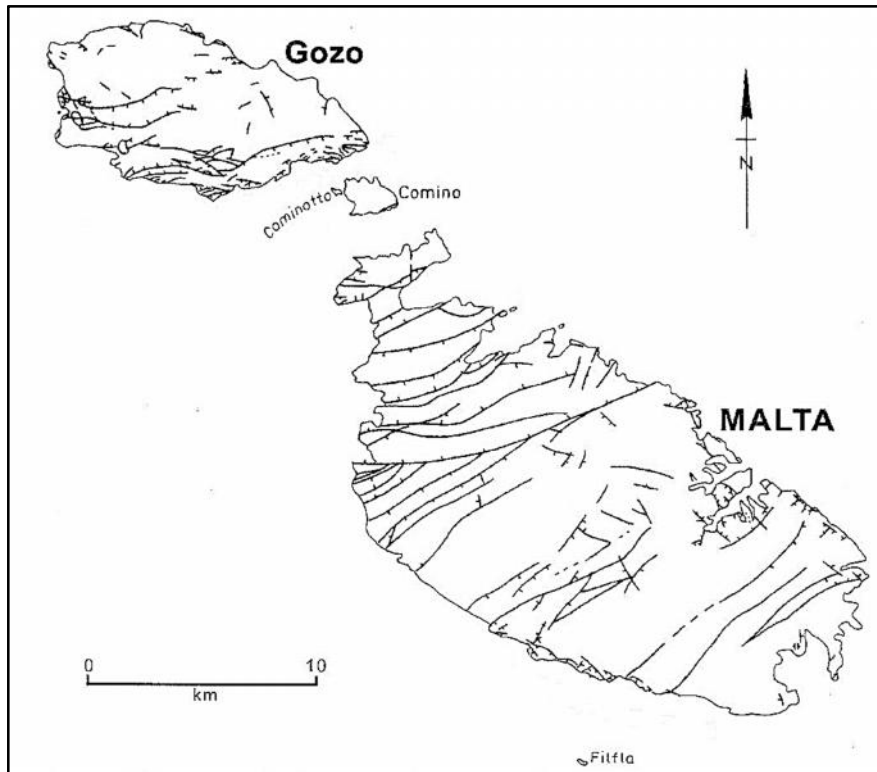


Figure 2: Map of fault lines in the Maltese Islands (Pedley, 2002)

- (a) Analyse Figure 2 and describe the distribution and orientation of faults in the Maltese Islands. (10 marks)
- (b) Faulting has had a major effect on the topography of mainland Malta. Describe the resultant characteristic topographic features and their distribution. Mention specific examples to support your answer. (14 marks)

SECTION B: HUMAN GEOGRAPHY OF THE MALTESE ISLANDS

Choose ONE question from this section.

4. Figure 3 shows internet access in households by district.

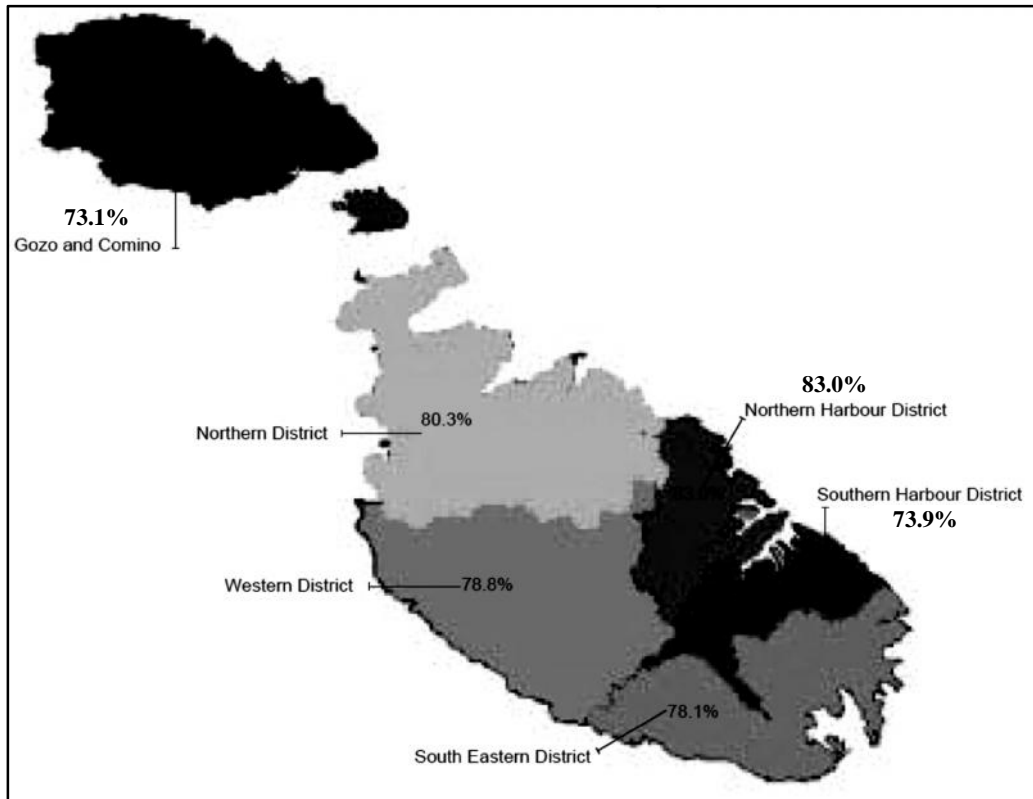


Figure 3: Internet access in households by district (NSO, 2015).

- (a) Describe Figure 3, and provide **TWO** possible reasons for this pattern of internet access in households in Malta. (10 marks)

- (b) The internet is a form of communication that does not involve physical contact, meaning that geographic space is lost. Explain in detail **ONE** disadvantage and **ONE** advantage that is linked to loss of geographic space. (14 marks)

Questions continue on next page

5. Malta has two operational gas-fired power stations at present – the Delimara III (known as the BWSC plant) and the Delimara IV (Electrogas) Power Stations. On the other hand, the Marsa oil-fired Power Station was decommissioned in 2016 and finally shut down in March 2017.
- (a) Comment on the location of the former Marsa Power Station and the present location of the gas-fired power stations in Delimara and discuss the problems and benefits associated with them. Your answer should make reference to possible reasons for decommissioning the Marsa Power Station. (15 marks)
- (b) Provide **THREE** reasons why it is important to have more than one source of electricity. Briefly explain each reason. (9 marks)
6. (a) List and explain the **THREE** R's in waste management. (9 marks)
- (b) List **FIVE** reasons why it is important to eliminate packaging waste. (5 marks)
- (c) Discuss how a country like Malta can benefit from the management of waste. (10 marks)

SECTION C: FIELDWORK AND STATISTICAL TECHNIQUES

Choose ONE question from this section.

7. (a) Explain the use of the following:
- (i) Pie charts;
 - (ii) Bar graphs;
 - (iii) Line graphs. (6 marks)
- (b) Felicity wants to study age patterns within a group of 20 people. She carries out a questionnaire and collects the following data:
Ages: 25, 29, 45, 19, 36, 17, 60, 51, 39, 24, 15, 13, 31, 18, 24, 32, 37, 27, 23, 53.
- (i) Ages are continuous data. Explain how you would manage this problem to represent the ages in a table. (4 marks)
 - (ii) Define how you would represent diagrammatically the ages. Your answer should include the type of diagram you would use to represent the results of this variable, the reason why you selected that diagram and the diagram drawn with the data in percentages. (14 marks)

8. Paul is sitting for his Advanced level Geography exam. He has to undertake a fieldwork in physical geography. His interests are coasts and their formations. Paul carries out an exercise where he takes transects along Mistra Bay and measures the size of pebbles, starting from the shoreline and moving inland. In one of his transects the data shown in Table 1 was recorded.

Table 1 Readings of one of the transects

Distance (in cm)	0	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Pebble diameter (in cm)	1	5.4	8	4	3	9	7	8.5	6	7.2	5	4.1	6.4	7.5	8.2

Paul uses a Spearman Rank correlation coefficient to analyse his data. Figure 4 shows the graph used to identify the significance of this test.

- (a) Define Spearman Rank correlation coefficient. (8 marks)

- (b) Work out the Spearman Rank correlation coefficient of the data shown in Table 1. Your answer should include the hypothesis, workings (including any tables) and your result. (16 marks)

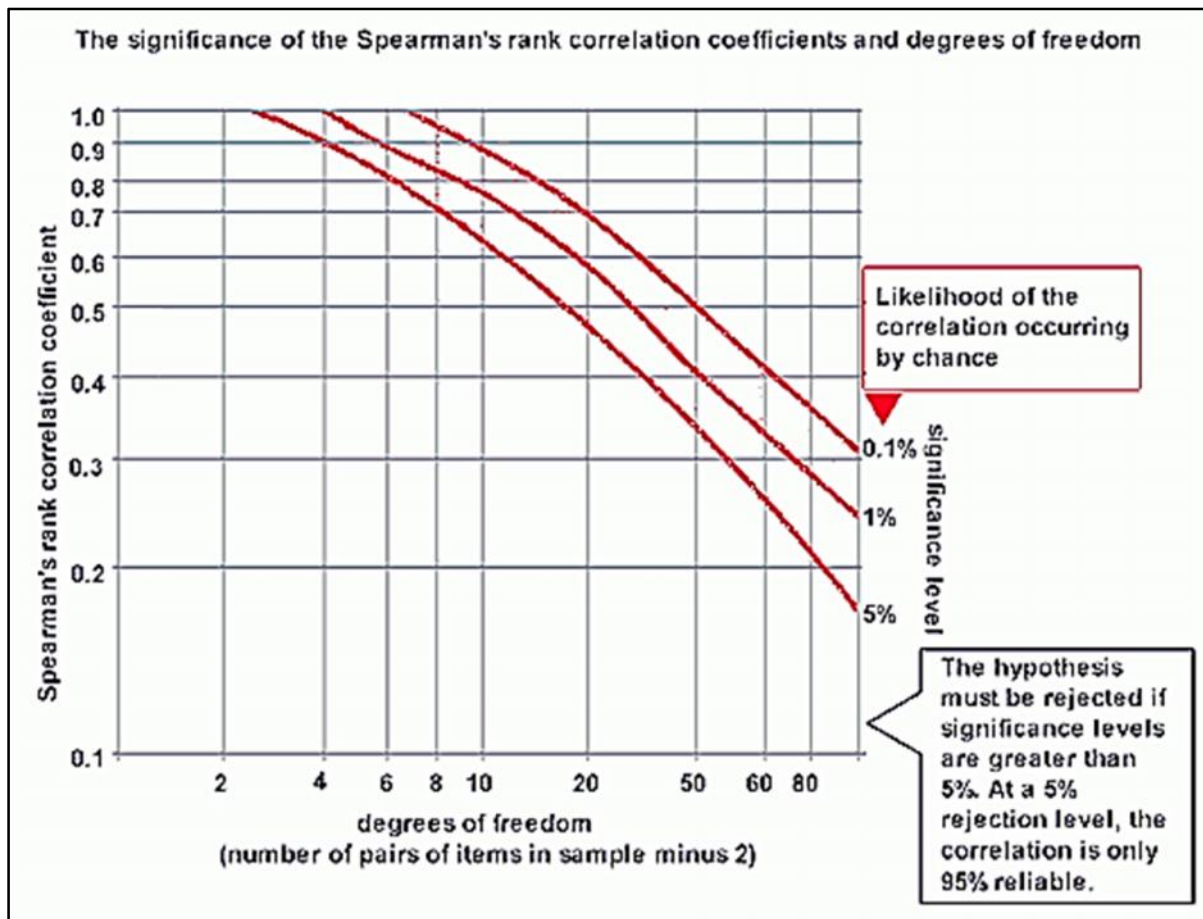


Figure 4: Graph showing the significance of the Spearman’s rank correlation coefficient.

9. Figure 5 is a soil profile.

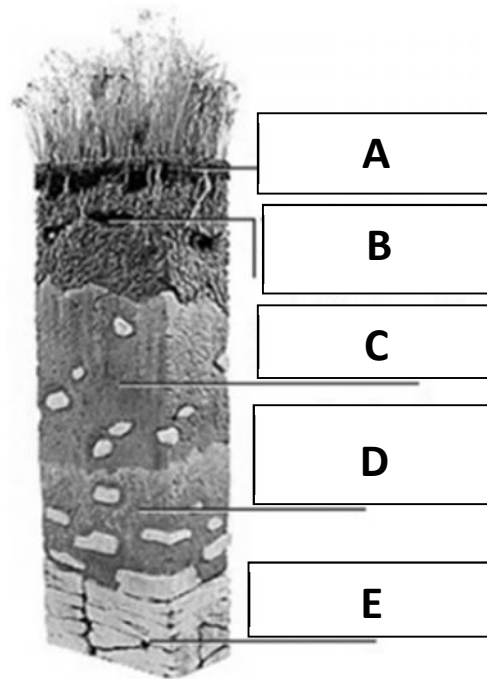


Figure 5: Soil profile (Source: <https://www.factmonster.com/dk/encyclopedia/earth/soil>)

- (a) Mention **FOUR** soil characteristics commonly associated with soil profiling. (4 marks)
- (b) List the most appropriate term/s representing letters **A** to **E**. (5 marks)
- (c) Describe the principal features of each of the terms lettered **A** to **E**. (15 marks)

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD

UNIVERSITY OF MALTA, MSIDA

MATRICULATION EXAMINATION

ADVANCED LEVEL

SEPTEMBER 2017

SUBJECT:	GEOGRAPHY
PAPER NUMBER:	II
DATE:	5 th September 2017
TIME:	9.00 a.m. to 11.05 a.m.

Answer **THREE** questions in total, one from each section. Questions carry equal marks.

SECTION A: ATMOSPHERIC PROCESSES

Choose ONE question from this section.

1. The atmosphere is an envelope of transparent odourless gases held to the Earth by gravitational attraction. Depending on changes in temperature, the atmosphere can be divided into four layers moving outwards from the Earth's surface. Two of these layers are the troposphere and the stratosphere.
 - (a) Describe the key characteristics of the troposphere and the stratosphere layers. (10 marks)
 - (b) Define and briefly explain the term 'dew point'. (3 marks)
 - (c) Give a brief description of how clouds form. (3 marks)
 - (d) Describe the cloud types below by making reference to their shape, height (low-clouds, middle-clouds, high-clouds) and associated precipitation type (if any). (8 marks)
 - (i) Stratus;
 - (ii) Cumulus;
 - (iii) Cirrus;
 - (iv) Cumulo-nimbus.

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2. Figure 1 shows the annual average rainfall in the British Isles between 1971 and 2000. Different air masses and fronts are a key cause for the main weather conditions in the British Isles.

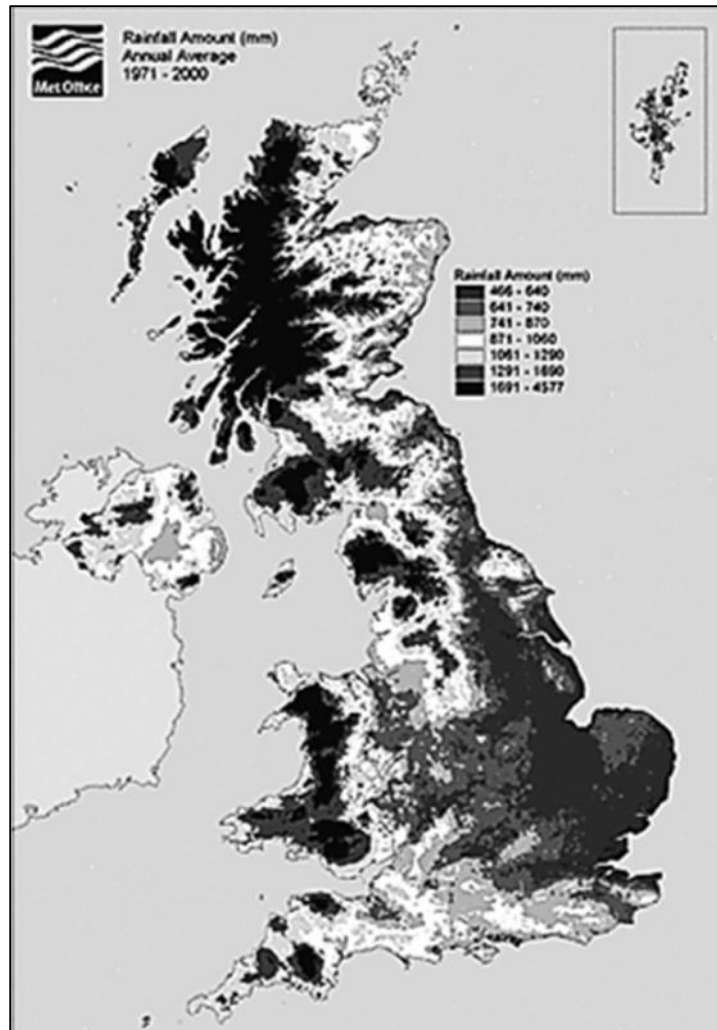


Figure 1: Annual average rainfall in the British Isles between 1971 and 2000
(<http://thebritishgeographer.weebly.com/the-climate-of-the-british-isles.html>)

- (a) Define the term 'air mass'. (3 marks)
- (b) Give **THREE** examples of air masses that approach the British Isles. Briefly explain the main characteristics of **EACH**. (12 marks)
- (c) Briefly describe the **TWO** main types of fronts. (6 marks)
- (d) Describe how air masses and fronts affect the weather of the British Isles. (3 marks)

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3. Global warming is the unusually rapid increase in Earth's average surface temperature over the past century primarily due to the release of greenhouse gases into the atmosphere. The global average surface temperature rose by 0.6°C to 0.9°C between 1906 and 2005, and the rate of temperature increase has nearly doubled in the last 50 years. (Source: NASA, 2010).
- (a) List **FOUR** major greenhouse gases. (2 marks)
 - (b) Choose **TWO** greenhouse gases listed in (a) and identify anthropogenic sources of emissions for each. (2 marks)
 - (c) Explain the greenhouse effect and its relevance to global warming. Use a sketch diagram to support your answer. (8 marks)
 - (d) Global climate change has already had observable effects on the environment. In fact, "the range of published evidence indicates that the net damage costs of climate change are likely to be significant and to increase over time." (IPCC, 2014). Discuss **FOUR** consequences of global warming on the natural environment and state how these could affect human populations. (12 marks)

SECTION B: GEOMORPHOLOGY

Choose ONE question from this section.

4. Malta has lost a geological, geomorphological and geographic landmark following the collapse of the Azure Window on 8th March 2017.
- (a) List **FOUR** coastal erosional landforms. Using diagrams to support your answer, explain how such landforms develop. (20 marks)
 - (b) Briefly explain what led to the collapse of the Azure window. (4 marks)
5. (a) Define the term 'arid environment' and provide **TWO** examples of such an environment. (5 marks)
- (b) Arid environments experience rain in isolated instances that are often characterised by heavy downpours. List and explain in detail **THREE** characteristics of arid environments that generate high levels of discharge. (9 marks)
 - (c) List and explain the main characteristics of **TWO** types of land formations deriving from water activity in arid environments. Supplement your explanation with a sketch of each landform. (10 marks)

6. Figure 2 shows an aerial view of the River Thames in London. Erosional processes led to the shape of this important river flowing through London.

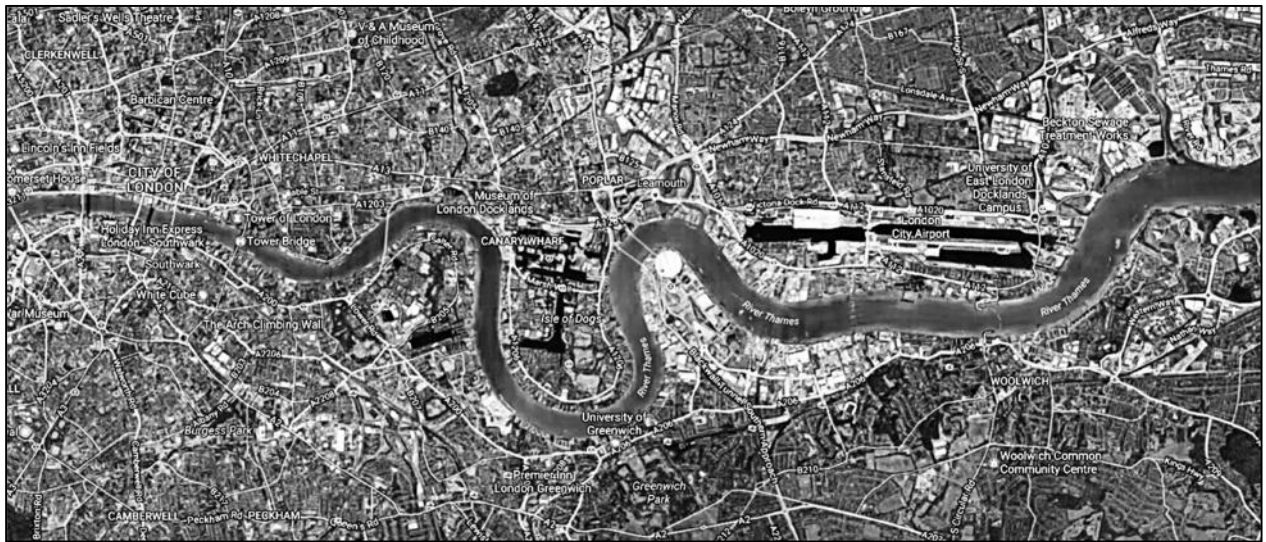


Figure 2: Aerial view of the Thames in London (Source: Google Maps, 2017)

- (a) Identify and describe **FOUR** types of river erosion processes. (12 marks)
- (b) Identify and explain **THREE** physical processes that lead to erosional landforms by rivers. (12 marks)

SECTION C: BIOSPHERIC PROCESSES

Choose ONE question from this section.

- 7. Soil formation is the result of different factors including climate type, topography and human activity.
 - (a) Define the term leaching, and outline its relevance within climate as a main soil formation determinant. (6 marks)
 - (b) Define and explain the concept of soil catenas. Use a sketch diagram to support your answer. (10 marks)
 - (c) Discuss **FOUR** ways that human activity can impact the main factors affecting soil formation. (8 marks)

AM 13/II.17s

8. A biome is a naturally occurring organic community of plants and animals which is normally defined through the dominant type of climate and vegetation found within its environment. One such example is the Mediterranean biome.
- (a) Define the term 'climax vegetation'. List the most common climax vegetation found in the Mediterranean biome. (4 marks)
 - (b) Describe the vegetation and the associated soils which are commonly found in Mediterranean climates. (12 marks)
 - (c) Explain, with reference to particular examples, **TWO** causes of land degradation and soil erosion in the Mediterranean region. (8 marks)
9. Extreme climatic conditions as those in arid regions often require human intervention as an adaptation technique. However, this can also have its drawbacks. A case in point is the practice of irrigation.
- (a) Define the term irrigation and outline different circumstances where it could be needed. (4 marks)
 - (b) Discuss **THREE** reasons why irrigation has potential and is needed in arid regions. List a country **or** region where irrigation in arid areas occurs. (8 marks)
 - (c) Discuss **FOUR** problems resulting from the practice of irrigation in arid regions. (12 marks)

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD
UNIVERSITY OF MALTA, MSIDA
MATRICULATION EXAMINATION
ADVANCED LEVEL
SEPTEMBER 2017

SUBJECT:	GEOGRAPHY
PAPER NUMBER:	III
DATE:	6 th September 2017
TIME:	9.00 a.m. to 11.05 a.m.

Answer **THREE** questions in total, one from each section. Questions carry equal marks.

SECTION A: HUMAN GEOGRAPHY AND THE DEVELOPING WORLD

Choose ONE question from this section.

1. Throughout the years, different geographers have developed models of land use to propose a better understanding of the structure and segregation in urban areas. One such example is the Burgess Model developed in 1924.
 - (a) Define the term ‘segregation’. (2 marks)
 - (b) List **TWO** factors that cause segregation in urban areas. (4 marks)
 - (c) List **FOUR** assumptions of the Burgess model. (4 marks)
 - (d) Use a sketch diagram to explain the key concepts of the Burgess Model. (8 marks)
 - (e) Describe the key limitations of the model with reference to its applicability in the contemporary world. (6 marks)
2. Migration refers to population movements which usually involve a permanent change of residence (for more than one year). There are different ways to classify such movements. One common distinction is that between internal and external migration.
 - (a) Explain the difference between internal and external migration and provide **TWO** examples of each. (6 marks)
 - (b) Discuss **FOUR** main causes of internal migration in developed countries. (12 marks)
 - (c) Describe the principal characteristics of internal migration in developing countries. (6 marks)

3. The Green Revolution had significant impacts on the agricultural productivity of developing countries.
- (a) Define the Green Revolution and briefly outline its origins. (4 marks)
 - (b) List **TWO** main types of changes that were associated with the Green Revolution. (2 marks)
 - (c) Discuss **SIX** negative environmental impacts that arose from the Green Revolution in developing countries. (18 marks)

SECTION B: ISSUES IN RESOURCE MANAGEMENT

Choose ONE question from this section.

4. Table 1 shows the top producers in 2015 and the top net importers of crude oil in 2014.

Table 1: Top producers (2015) and top net importers (2014) of crude oil
(Adapted from International Energy Agency, 2016)

Producers (2015)	% of world total	Net importers (2014)	Mt (Million tonnes)
Saudi Arabia	13.2	United States	344
United States	13.1	People’s Rep. of China	308
Russian Federation	12.3	India	189
Canada	5.1	Japan	165
People’s Rep. of China	5.0	Korea	126
Iran	4.0	Germany	86
Islamic Rep. of Iran	3.9	Spain	61
United Arab Emirates	3.7	Italy	59
Kuwait	3.7	France	54
Venezuela	3.3	the Netherlands	54
Rest of the world	32.7	Others	509
World	100	Total	1955

- (a) Describe the key findings of Table 1. (6 marks)
- (b) Discuss **TWO** negative environmental impacts associated with the use of petroleum and outline **TWO** ways how such impacts can be minimised. (12 marks)
- (c) Discuss economic and social factors favouring the use of renewable energy sources. (6 marks)

5. Hydro Electric Power (HEP) plants use falling water to generate electricity. A turbine converts the kinetic energy of falling water into mechanical energy, which is then converted into electrical energy. Figure 1 shows a dam used for HEP energy.



Figure 1: A dam used for HEP energy
(<http://www.thehea.org/basic-principle/hydro-power-plants/>)

- (a) List and briefly explain **FOUR** physical factors that are essential for the location of a HEP scheme. (6 marks)
- (b) Discuss **THREE** negative environmental impacts associated with the use of HEP. Use examples to substantiate your answer. (9 marks)
- (c) Discuss the benefits associated with HEP in a country of your choice and comment on why the country might have invested in such power generating plants notwithstanding the negative environmental impacts they can generate. (9 marks)

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6. The use of energy resources changes both geographically as well as with time. Figure 2 shows the global electricity generation by fuel in 1973 and 2014.

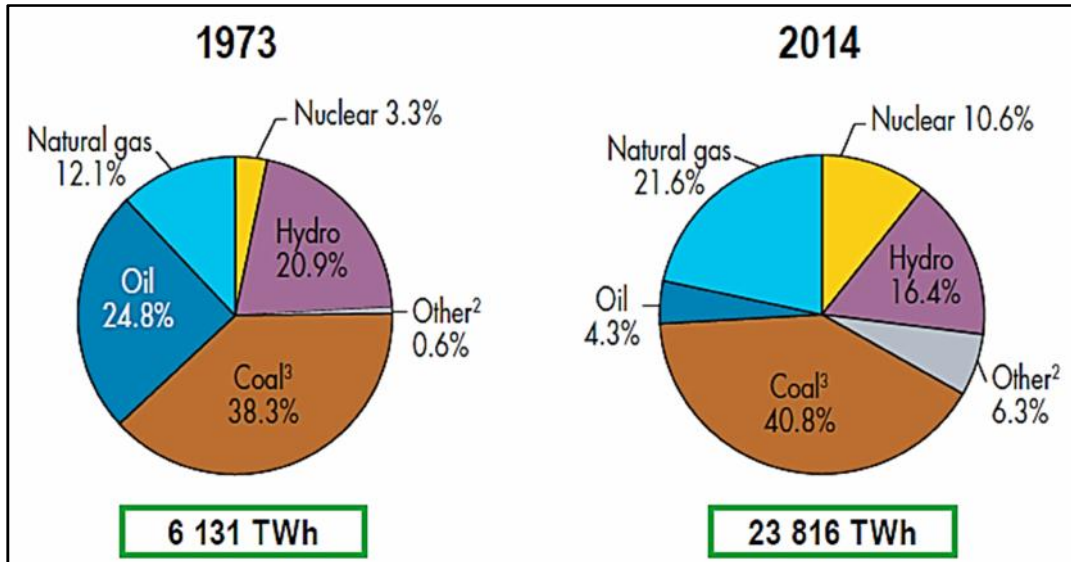


Figure 2: World electricity generation by fuel in 1973 and 2014
(International Energy Agency, 2016)

Notes: ² Includes geothermal, solar, wind, heat etc.

³ In these graphs, peat and oil shale are aggregated with coal.

TWh – terawatt hour.

- (a) Describe the key findings of Figure 2. (6 marks)
- (b) By focusing more on fossil fuels, describe how energy consumption varies across the globe. (4 marks)
- (c) Define the concept of energy resource combination and briefly outline the benefits that can arise from such a concept. (4 marks)
- (d) List **FIVE** ways how technology affects resource use in developed and developing countries. (10 marks)

SECTION C: THE GEOGRAPHY OF TOURISM AND RECREATION

Choose ONE question from this section.

7. Theme parks change the landscape of an area.
- (a) Discuss **FOUR** ways in which theme parks can have a negative effect on the landscape and environment of an area. Use examples to support your answer. (12 marks)
 - (b) Explain the possible reasons for the growth in demand for theme parks and comment on the effects these have on the local economy. (12 marks)
8. Increased leisure time provides people with the opportunity to indulge in more recreational activities, such as sport. Such activities require space to locate adequate sports grounds to accommodate the needs of the population.
- (a) Discuss **THREE** factors which have led to increased leisure time. (6 marks)
 - (b) Identify and elaborate on **TWO** factors that are required to have a football ground in a locality. (8 marks)
 - (c) Mention and explain **TWO** possible negative impacts a football ground might have on the surrounding natural environment. (6 marks)
 - (d) Briefly discuss how a community might benefit from a recreational place such as a football ground. (4 marks)
9. “On one hand, tourism yields tremendous economic positive outcomes: it is one of the world’s most significant sources of economic outcomes and employment. However, tourism is a very complex industry involving numerous stakeholders (sometimes with opposite interests) and requiring significant amount of resources. As such, tourism can have very opposite effects according to the way activities are managed. Managed well, tourism can play a positive role in the socio, cultural, economic, environmental and political development of the destination and as such represents a significant development opportunity for many countries and communities. On the contrary, unchecked tourism development can lead to very damageable impacts.”
- (UNEP, 2016)*
- (a) Tourism can have negative environmental and socio-cultural impacts. Identify and explain **FOUR** negative environmental and **FOUR** negative socio-cultural impacts of tourism. (16 marks)
 - (b) Discuss **TWO** ways in which tourism can help environmental conservation. (8 marks)