

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD

UNIVERSITY OF MALTA, MSIDA

MATRICULATION EXAMINATION
ADVANCED LEVEL
MAY 2014

SUBJECT:	GEOGRAPHY
PAPER NUMBER:	I
DATE:	13 th May 2014
TIME:	4.00 p.m. to 6.00 p.m.

Answer **THREE (3)** questions in total, one from each section. Questions carry equal marks.

Section A: Physical Geography of the Maltese Islands

Question 1

The northern part of the island of Malta is characterised by a sequence of parallel flat-topped ridges and flat-bottom valleys (Azzopardi, 1995).

- Describe the processes responsible for this landform evolution and, with reference to specific examples, describe in more detail the distribution of this landform sequence in Malta. (14 marks)
- In what way is the landscape of the higher ridges so different from that of the valleys found in between the ridges? (10 marks)

Question 2

The natural water resources of the Maltese Islands depend entirely on rainwater percolating through the islands' limestone rock.

- Elaborate further on the physical processes described in the above statement. (10 marks)
- Explain the type of infrastructure and measures that have been set up along the years in order to maximise water provision on the islands. (14 marks)

Question 3

Figure 1 shows the first three marine littoral zones distinguished from each other, namely by the depths in which different organisms survive.



Figure 1: Marine Littoral Zones (Source: MEPA, 2014)

- a. Refer to Figure 1 and explain the different environmental conditions present in each zone. (10 marks)
- b. Choose TWO of the above littoral zones. With reference to named examples, describe the organisms that specifically thrive and survive in the chosen littoral zones. (14 marks)

Section B: Human Geography of the Maltese Islands

Question 4

Table 1 illustrates demographic events in Malta between 2009 and 2012.

Year	Total Live births**			Crude birth rate*	Marriages	Crude marriage rate*	Deaths			Crude death rate*
	Males	Females	Total				Males	Females	Total	
2009	2,087	1,942	4,029	9.8	2,353	5.7	1,672	1,549	3,221	7.8
2010	2,000	1,898	3,898	9.4	2,596	6.3	1,489	1,521	3,010	7.3
2011	2,116	2,049	4,165	10.0	2,562	6.2	1,664	1,603	3,267	7.8
2012	2,141	1,989	4,130	9.8	2,823	6.7	1,746	1,672	3,418	8.1

* Per 1,000 mid-year population.

** Registered births occurring to mothers whose usual place of residence was not Malta at the time of birth have been excluded from these figures.

*** Crude birth/death rate: the number of live births/deaths occurring among the population of a given geographical area during a given year, per 1000 mid-year total population of the given geographical area during the same year (OECD,2013)

Table 1: Demographic events in Malta 2009-2012 (NSO, 2013).

- a. Explain the changes between the crude birth rate and crude death rate in Malta between 2009 and 2012. (4 marks)
- b. Given the data listed in Table 1, discuss what you envisage the population trends for Malta will be in the following decade. State reasons for your answers and provide examples where possible. (10 marks)
- c. List and discuss FIVE social impacts that the population will have in Malta in the following decade. (10 marks)

Question 5

Figure 2 shows the electricity generation and the maximum demand for electricity in Malta between 2009 and 2012.

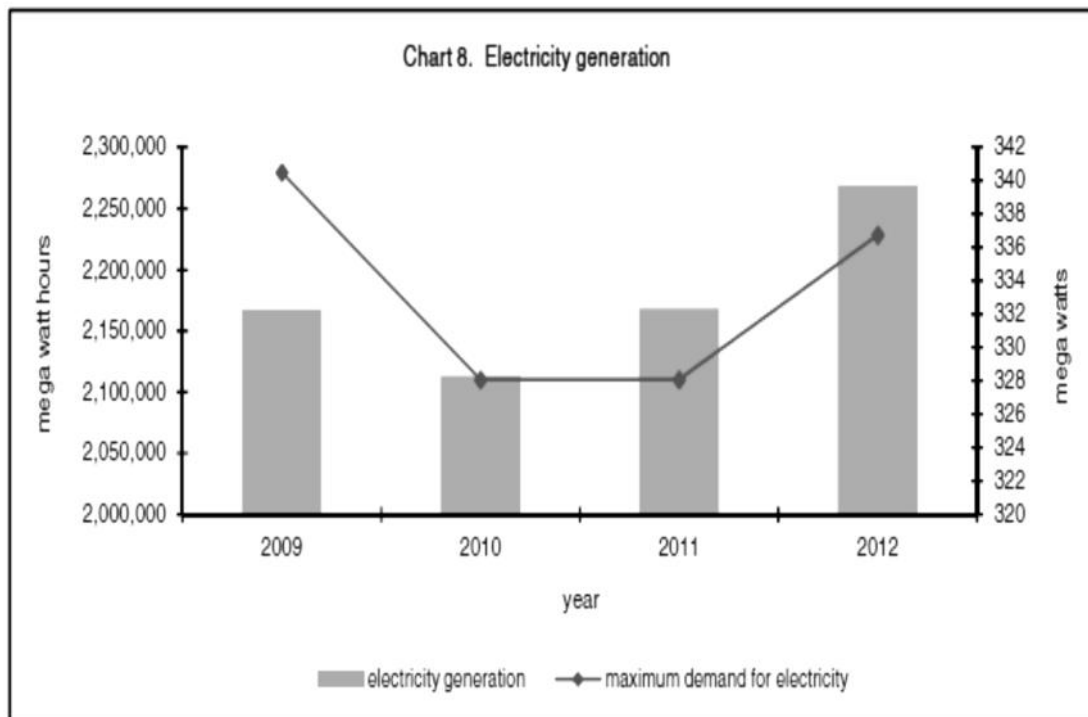


Figure 2: The Electricity Generation and Maximum Demand for Electricity in Malta 2009-2012 (NSO, 2013).

- a. Describe and discuss the trends displayed in Figure 2. (10 marks)
- b. List and explain TWO human impacts related to electricity generation in Malta. (6 marks)
- c. List and discuss TWO types of sustainable energy measures that are currently being implemented in Malta in order to reduce the use of the power stations. (8 marks)

Question 6

Figure 3 shows a typical street that forms part of the Urban Conservation Area (UCA) in Mosta.



Figure 3: Typical Street that forms part of the Urban Conservation Area in Mosta (MEPA, 2013)

- a. Define the term “Urban Conservation Area”. (4 marks)
- b. List and explain FIVE benefits of UCAs. (10 marks)
- c. Discuss the present socio-economic challenges and development issues found in UCAs. (10 marks)

Section C: Fieldwork and Statistical Techniques

Question 7

“Maps are like campfires – everyone gathers around them, because they allow people to understand complex issues at a glance, and find agreement about how to help the land.” – (Sonoma Ecology Center, GIS/IS Program Web Site)

With reference to the above statement, explain in detail the FOUR different types of maps that one can use. Illustrate your answers with diagrams. (24 marks)

Question 8

During a fieldwork, students were expected to have the following distribution of barnacles (E) at 10 cm intervals away from the sea, as illustrated in Table 2 below:

Distance (cm)	Observed Frequencies (O)	Expected Frequencies (E)
10	40	35
20	32	30
30	27	25
40	18	10
50	11	7
60	2	5
70	1	2

Table 2: The number of observed and expected barnacles

- a. State the null and alternative hypothesis. (4 marks)
- b. Using the formula below, work out the Chi Square. You are required to show all your workings (16 marks)

$$\chi^2 = \sum \frac{(o-e)^2}{e}$$

where

χ^2 is Chi-squared,
 \sum stands for summation,
 o is the observed values, and
 e is the expected values.

Chi Squared Formula

- c. Calculate the degrees of freedom from Table 3, using the critical value at the 0.1 significance level. State which hypothesis is being accepted and which is being rejected and give reasons to support your answer. (4 marks)

Degrees of freedom	Significance level				
	0.1	0.05	0.01	0.005	0.001
1	2.71	3.84	6.64	7.88	10.83
2	4.60	5.99	9.21	10.60	13.82
3	6.25	7.82	11.34	12.84	16.27
4	7.78	9.49	13.28	14.86	18.46
5	9.24	11.07	15.09	16.75	20.52
6	10.64	12.59	16.81	18.55	22.46
7	12.02	14.07	18.48	20.28	24.32
8	13.36	15.51	20.09	21.96	26.12
9	14.68	16.92	21.67	23.59	27.88
10	15.99	18.31	23.21	25.19	29.59
11	17.28	19.68	24.72	26.76	31.26
12	18.55	21.03	26.22	28.30	32.91
13	19.81	22.36	27.69	30.82	34.53
14	21.06	23.68	29.14	31.32	36.12
15	22.31	25.00	30.58	32.80	37.70
16	23.54	26.30	32.00	34.27	39.29
17	24.77	27.59	33.41	35.72	40.75
18	25.99	28.87	34.80	37.16	42.31
19	27.20	30.14	36.19	38.58	43.82
20	28.41	31.41	37.57	40.00	45.32
21	29.62	32.67	38.93	41.40	46.80
22	30.81	33.92	40.29	42.80	48.27
23	32.01	35.17	41.64	44.18	49.73
24	33.20	36.42	42.98	45.56	51.18
25	34.38	37.65	44.31	46.93	52.62
26	35.56	35.88	45.64	48.29	54.05
27	36.74	40.11	46.96	49.65	55.48
28	37.92	41.34	48.28	50.99	56.89
29	39.09	42.56	49.59	52.34	58.30
30	40.26	43.77	50.89	53.67	59.70
40	51.81	55.76	63.69	66.77	73.40
50	63.17	67.51	76.15	79.49	86.66
60	74.40	79.08	88.38	91.95	99.61
70	85.53	90.53	100.43	104.22	112.32
80	96.58	101.88	112.33	116.32	124.84
90	107.57	113.15	124.12	128.30	137.21
100	118.50	124.34	135.81	140.17	149.45

Table 3: Critical values of the Chi-Square distribution

Question 9

- a. Define the term ‘sampling’. (3 marks)
- b. Discuss in detail THREE sampling techniques. Illustrate your answers with suitable diagrams. (21 marks)

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 UNIVERSITY OF MALTA, MSIDA
 MATRICULATION EXAMINATION
 ADVANCED LEVEL
 MAY 2014

SUBJECT: GEOGRAPHY
PAPER NUMBER: II
DATE: 14th May 2014
TIME: 4.00 p.m. to 6.00 p.m.

Answer **THREE (3)** questions in total, one from each section. Questions carry equal marks.

SECTION A: Atmospheric Processes

Question 1

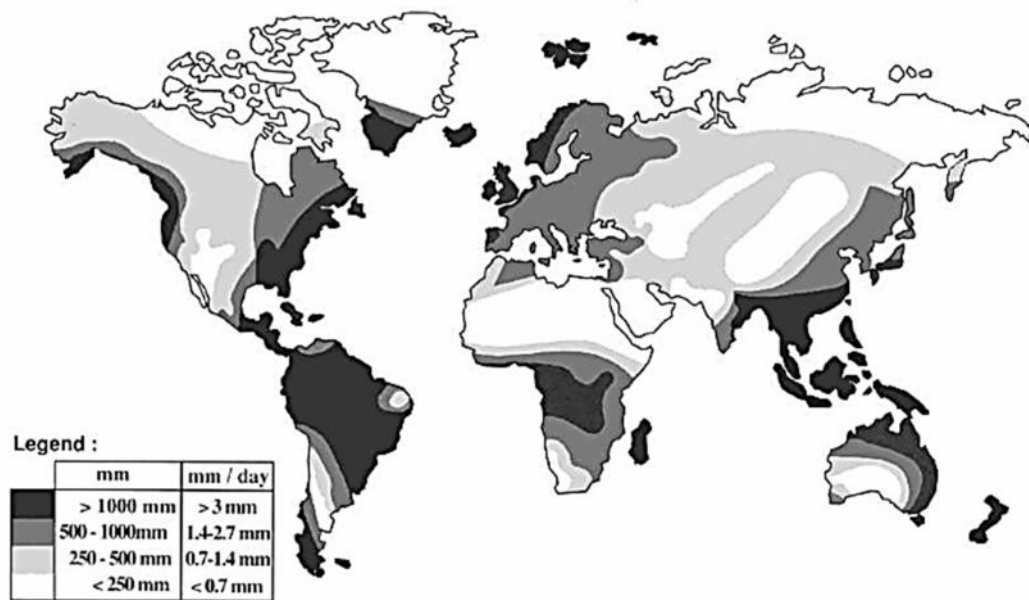


Figure 1: Approximate global precipitation (Source: Food and Agriculture Organisation).

- a. With reference to Figure 1, describe the precipitation patterns in the following three regions and give a reason to support your answer:
- i. Tropical regions
 - ii. Polar regions
 - iii. Mid-latitude regions
- (9 marks)
- b. With the help of labelled diagrams, discuss the three different conditions which are responsible for air to rise, saturate and finally form precipitation.
- (15 marks)

Question 2

Figure 2 shows the heat budget of the Earth along different latitudes.

- a. Describe how the diagram illustrates the latitudinal behaviour of the following:
 - i. Radiation balance at the Earth's surface
 - ii. Radiation balance in the atmosphere
 - iii. Combined radiation balance.

(9 marks)

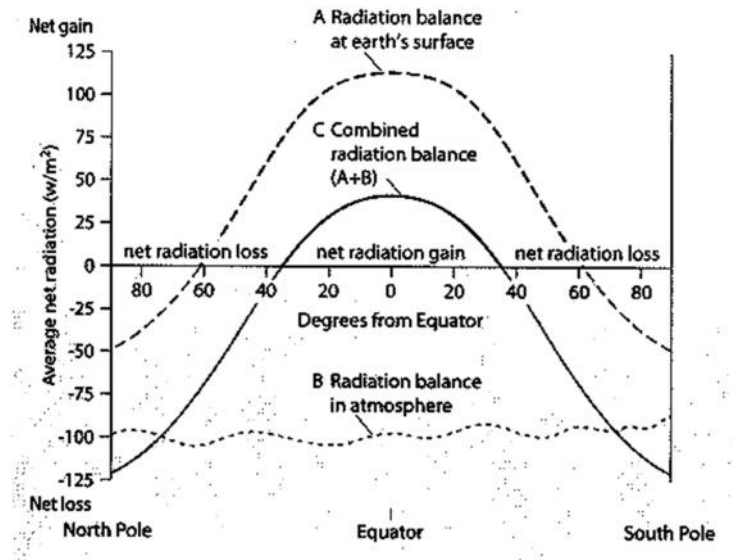


Figure 2: Heat budget

- b. The Earth's heat balance is influenced by other factors, which determine the amount of insolation received at any point and may vary considerably over time and space. Discuss three of these factors.

(15 marks)

Question 3

- a. With reference to sea-level change, define the terms 'eustatic' and 'isostatic'. (6 marks)
- b. Discuss how the following could be responsible for both the above mentioned types of sea-level change:
 - i. an ice age
 - ii. human-induced global warming.

(18 marks)

SECTION B: Geomorphology

Question 4

- a. In arid environments, wind can move material by three processes. Explain each process and discuss the effectiveness of each process in relation to particle size. (12 marks)
- b. In deserts, once sand grains are deposited, dunes may form. With reference to any TWO types of dunes, answer the following questions:
 - i. Draw an annotated diagram to show the main features of each dune type.
 - ii. Explain how each dune type has been formed.

(12 marks)

Question 5

- a. Explain the difference in water movement in a wave between deep water and shallow water. In your answer indicate how change in this type of movement affects wave steepness. (12 marks)
- b. Once the waves break on shore, coastal erosion is considered as one of the resultant impacts. Discuss the factors which may determine the rate of erosion experienced on the coast. (12 marks)

Question 6

Figure 3 displays a storm hydrograph for two drainage basins, A and B.

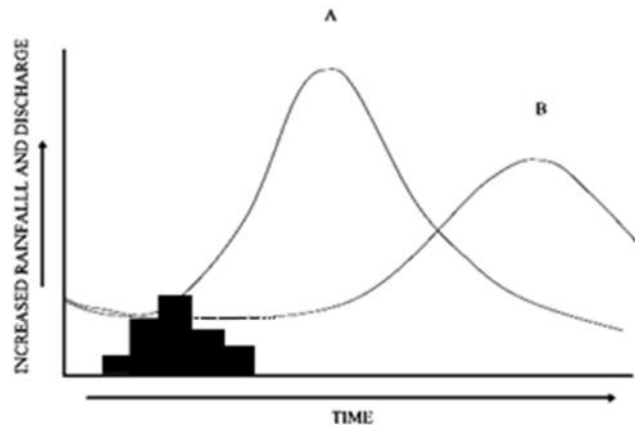


Figure 3: A storm hydrograph

- a. Describe the main components of a storm hydrograph. (6 marks)
- b. With reference to Figure 3, describe the difference in discharge between drainage basin A and drainage basin B. (10 marks)
- c. There are several factors which contribute to regulating the ways in which a river responds to precipitation. Discuss FOUR of these factors. (8 marks)

Section C: Biospheric Processes

Question 7

Figure 4 illustrates a typical tundra biome landscape.



Figure 4

Discuss the interaction between the climate, vegetation and soils of the Tundra biome. Illustrate your answer with diagrams where possible. (24 marks)

Question 8

“Pedologists have identified five main factors involved in soil formation”. (Waugh, 2002)

With reference to the above statement, describe in detail these FIVE main factors, illustrating your answer with suitable diagrams where necessary. (24 marks)

Question 9

- a. Define the term ‘desertification’. (2 marks)
- b. Figure 5 shows the situation of soil degradation around the world. With reference to Figure 5, comment on the main factors that cause desertification. (12 marks)

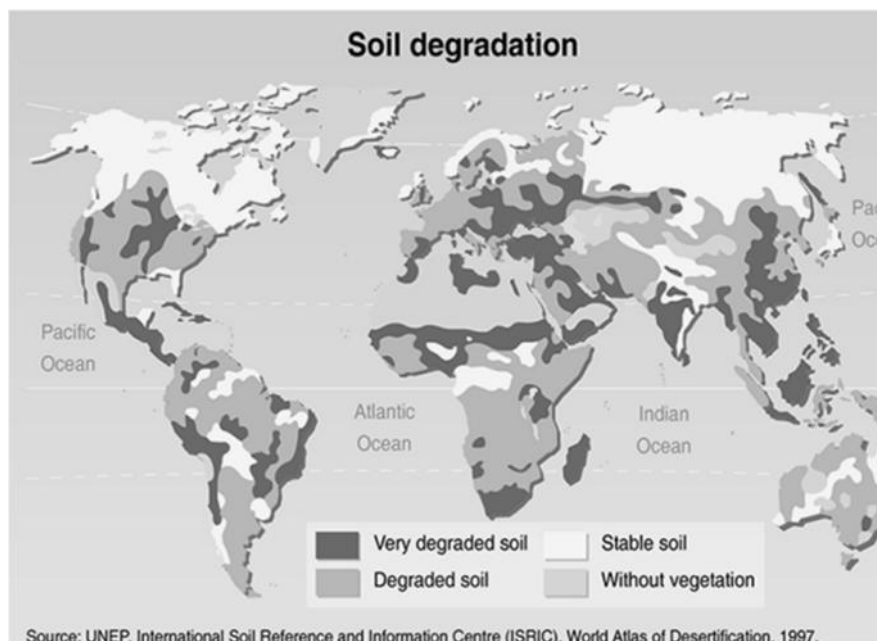


Figure 5: Soil degradation

- c. Identify possible solutions to prevent desertification. (10 marks)

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MAY 2014

SUBJECT:	GEOGRAPHY
PAPER NUMBER:	III
DATE:	19 th May 2014
TIME:	9.00 a.m. to 11.00 a.m.

Answer **THREE (3)** questions in total, one from each section. Questions carry equal marks.

Section A: Human Geography and the Developing World

Question 1

Figure 1 shows an infographic of the world's population growth by 2050.

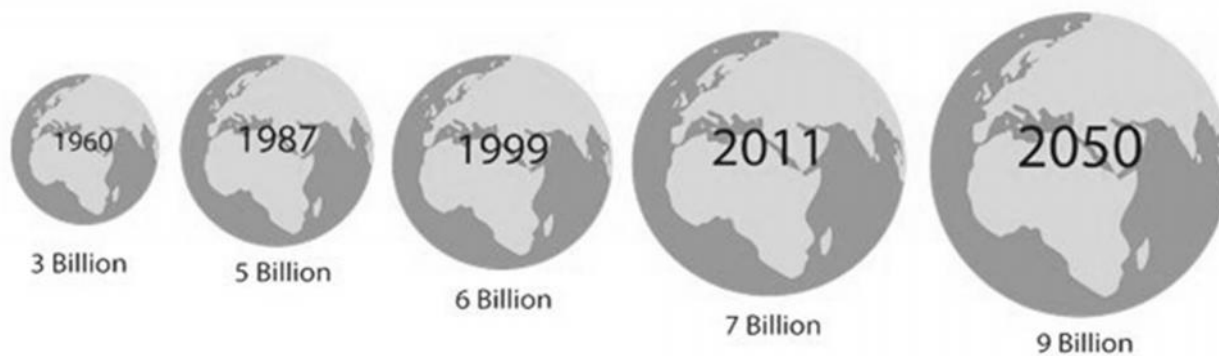


Figure 1. The world's population growth by 2050 (Farming 4R Future, 2013)

- a. Define:
 - i. Optimum population
 - ii. Overpopulation
 - iii. Underpopulation

(9 marks)
- b. Explain the "Rank-Size Rule". (5 marks)
- c. List FIVE population pressures that are exerted on the physical environment of an overpopulated country. Discuss FIVE possible measures that are implemented to reduce such pressures. (10 marks)

Question 2

- a. What was the "Green Revolution"? (4 marks)
- b. Discuss FIVE successes of the Green Revolution. (10 marks)
- c. Mention and discuss FIVE failures of the Green Revolution. (10 marks)

Question 3

- a. What does Weber's theory of industrial location state? Support your answer by using diagrams. (10 marks)
- b. List and discuss FIVE assumptions that were used by Alfred Weber in 1909, when he devised the Theory of Industrial Location. (10 marks)
- c. List four criticisms of Weber's model. (4 marks)

Section B: Issues in Resource Management

Question 4

- a. Define the following terms
 - i. Renewable resources
 - ii. Non-renewable resources
 - iii. Reserves (6 marks)
- b. With reference to a type of non-renewable energy, explain its main advantages and disadvantages. (18 marks)

Question 5

- a. Discuss the term 'overfishing'. (10 marks)
- b. As from December 2013, the EU adopted the reform for the Common Fisheries Policy. Explain some of the main objectives mentioned in the new Common Fisheries Policy. (14 marks)

Question 6

Renewable Resources are considered to be environmentally friendly when compared to non-renewable resources. However, they can still adversely impact the environment.

Discuss the above statement using wind energy, tidal energy and hydro-electricity power as examples. (24 marks)

Section C: The Geography of Tourism and Recreation.**Question 7**

Table 1 shows the top ten countries that had a rise in international tourism in 2012.

Top 10 countries	Percentage (%) increase
Japan	+37
India	+22
South Africa	+22
Sweden	+19
Republic of Korea	+19
Thailand	+18
Poland	+16
Hong Kong (China)	+16
USA	+10
United Kingdom	+6

Table 1: Top ten countries that had a rise in international tourism in 2012 (<http://harpwallen.wordpress.com>, 2013)

- Describe Table 1 and state possible reasons for the countries' rise in tourism. (8 marks)
- List and discuss FOUR possible factors that lead to increased tourism-related mobility. (8 marks)
- Discuss FOUR pressures from which the host countries in Table 1 suffer. (8 marks)

Question 8

Butler developed a model that shows the growth of a tourism resort.

- List and explain the FIVE stages of tourism development. (14 marks)
- One of the stages in Butler's model is the 'Stagnation Stage'. With reference to Europe, explain whether it is still in this stage and discuss its impact on the economy of European countries. (10 marks)

Question 9

- Define the term "Ecotourism". (4 marks)
- With particular reference to ecotourism in Africa, identify and discuss TWO economic benefits and TWO possible problems that arise from such practices. (8 marks)
- List and explain THREE mitigation measures that are used to help in the conservation of wildlife in African countries. (12 marks)