



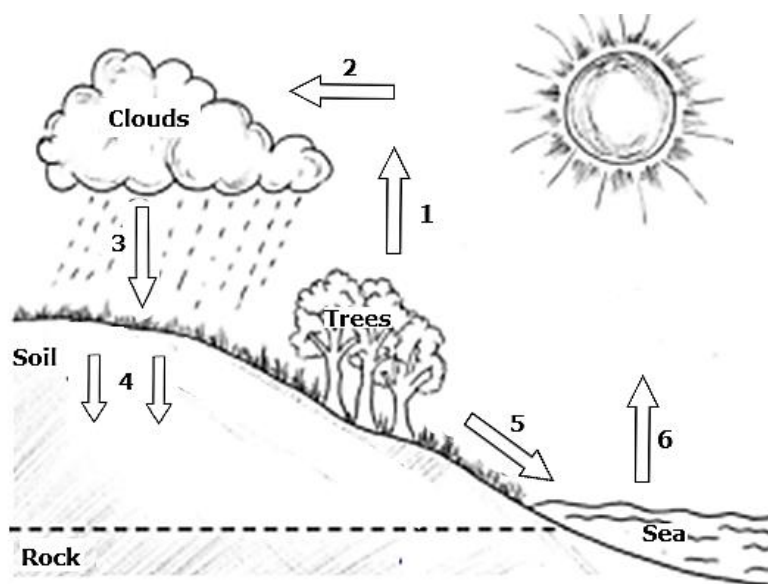
SUBJECT: **Environmental Science**
 DATE: 11th October 2021
 TIME: 4:00 p.m. to 7:05 p.m.

Answer **ALL** questions in Section A and any **TWO** questions from Section B.

Section A carries 80 marks and Section B carries 40 marks. You are advised to spend about two hours on Section A and one hour on Section B.

SECTION A: Answer ALL questions from this section.

1. The diagram below shows part of the hydrologic cycle. The numbered arrows indicate the movement of water from the earth's surface to the atmosphere and then back to the ground.



Adapted from: <https://quizlet.com/297452263/water-cycle-label-diagram/>

- (a) Name the processes that enable the flow of water indicated by **each** number. (6)

1. _____	4. _____
2. _____	5. _____
3. _____	6. _____

- (b) Briefly explain how tides are caused.

_____ (3)

This question continues on next page.

(c) Name **TWO** consequences of the over-exploitation and depletion of ground water.

_____ (2)

(Total: 11 marks)

2. (a) Define the term atmosphere.

_____ (2)

(b) Give **TWO** differences between the troposphere and the stratosphere.

_____ (2)

(c) For **each** of the activity listed below, state whether it will increase or decrease the global albedo of the Earth. (3)

Activity	Effect on Albedo
Volcanic eruption	
Burning of fossil fuels	
Reforestation	

(Total: 7 marks)

3. Name and briefly describe the **THREE** types of plate boundaries.

(i) _____ : _____ (3)

(ii) _____ : _____ (3)

(iii) _____ : _____ (3)

(Total: 9 marks)

4. Complete the following passage about different forms of air pollution, by choosing the appropriate term from the list below. Each term must only be used **once**.

- | | | | |
|-------------|----------------|-----------------|-----------------------|
| yield | air pollutants | nitrogen oxides | summer |
| primary | brown haze | ozone | sunlight |
| fossil | coal | petrol | temperature inversion |
| industrial | diesel oil | photochemical | urban areas |
| respiratory | sulfur dioxide | water vapour | volatile organic |

_____ smog forms when smoke and emissions of _____ from the burning of _____ combine with _____ under the right conditions. One factor that can intensify the production of such smog is _____ created during the day which can trap _____ near the surface of the earth. A combination of other _____ fuels such as _____ and _____ used by motor vehicles and industry, releases _____ pollutants such as _____ compounds and _____ which lead to _____ smog. Such atmospheric pollution is visible as a _____. It is most prominent during _____ due to increased _____ especially in densely populated _____. One component of such smog is _____ which reduces crop _____ and can lead to serious _____ problems in humans and animals.

(Total: 10 marks)

5. (a) Explain the term greenhouse gas.

 _____ (3)

(b) Name **THREE** examples of greenhouse gases.

 _____ (3)

(c) Give **TWO** examples of gases that are present in the atmosphere but are **not** considered as greenhouse gases.

 _____ (2)

Question continues on next page.

(d) What are the **TWO** main consequences of having excessive amounts of greenhouse gases in the atmosphere?

_____ (2)

(e) Name **TWO** human activities that contribute significantly to the enhanced greenhouse effect.

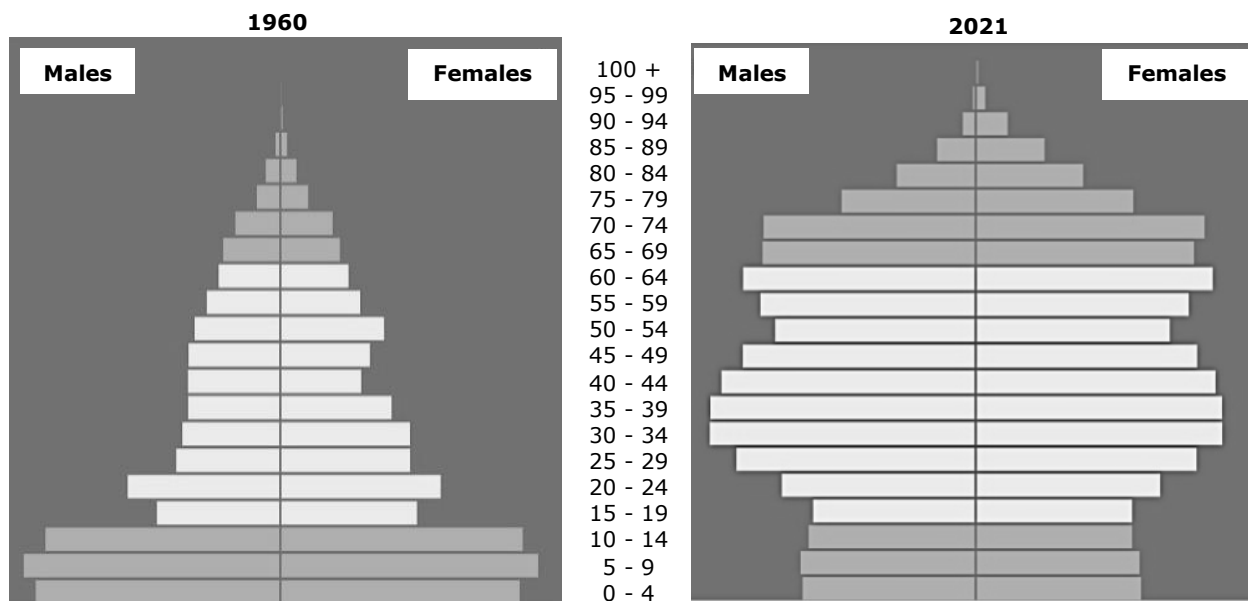
_____ (2)

(f) Name **THREE** measures that can be taken to minimise the consequences of the enhanced greenhouse effect.

_____ (3)

(Total: 15 marks)

6. The diagrams below show Age-Gender Graphs for Malta in 1960 and 2021 respectively.



Source: <https://population-pyramid.net/en/pp/malta>

Year	1960		2021	
Total Population	312,973	100.00%	442,789	100.00%
Young Population	120,261	38.43%	63,856	14.42%
Working Age Population	167,829	53.62%	282,348	63.77%

(a) What is an Age-Gender Graph?

_____ (2)

(b) Use the Age-Gender Graphs shown to compare between the different age group populations in 1960 and 2021. Give **TWO** reasons for your answers.

(i) Young population: _____

_____ (1)

Reasons: _____

_____ (2)

(ii) Elderly population: _____

_____ (1)

Reasons: _____

_____ (2)

(c) According to the United Nations – World Population Prospects, the crude birth rate in 1960 was 24.42. In the space below, calculate the number of live births born in the year 1960. Show all your working. (4)

(d) It is projected, that in less than 20 years, the elderly population will double. However, other factors might affect the Maltese population dynamics and hinder a declining population.

(i) Explain the term declining population.

_____ (2)

(ii) Mention and explain **ONE** factor that might keep the Maltese population in a state of stable equilibrium and prevent a declining population.

_____ (3)

(Total: 17 marks)

Please turn the page

7. The photograph below shows two wild dogs fighting over a freshly killed animal.



Source: <https://biologydictionary.net>

(a) Identify the **TWO** biological relationships shown in the photograph. Give a reason for your answer.

(i) Relationship 1: _____ (1)

Reason: _____

_____ (2)

(ii) Relationship 2: _____ (1)

Reason: _____

_____ (2)

(b) In the space below, sketch a graph to show the population changes over time experienced by the interspecific interaction shown in the photograph above.

(5)

(Total: 11 marks)

SECTION B: Answer any TWO questions from this section.

Write your answers in the space provided in this booklet. If you need more space to continue your answers you may request another booklet from your invigilator.

1. (a) Draw a diagram of a typical soil profile and briefly describe **each** layer. (10)
 (b) Describe **TWO** agricultural practices that can be used to reduce soil erosion. (4)
 (c) Briefly explain the **THREE** types of weathering (physical, chemical and biological). (6)
(Total: 20 marks)

2. Give brief explanations for the following:
 - (a) Biogenic sedimentation (with reference to Maltese rocks). (4)
 - (b) The carbon cycle (support your explanation with a simple diagram). (6)
 - (c) Strategies used in Malta for providing freshwater supplies. (6)
 - (d) Environmental impacts when extracting fossil fuels. (4)**(Total: 20 marks)**

3. (a) Distinguish between renewable and non-renewable sources of energy. (2)
 (b) Name **TWO** positive aspects and **TWO** environmental concerns in the use of traditional non-renewable energy resources. (4)
 (c) Describe **THREE** of the following forms of renewable energy. Your answer should include **ONE** benefit and **ONE** limitation in the use of **each** type of energy.
 - (i) solar energy;
 - (ii) geothermal energy;
 - (iii) biomass energy;
 - (iv) wind energy. (12)
 (d) Suggest **TWO** ways how an average household can use energy sustainably. (2)
(Total: 20 marks)

4. (a) Explain why a section of the atmosphere is labelled as the ozone layer. (3)
 (b) Explain the importance of the ozone layer for life on earth. (2)
 (c) Ozone-depleting Gases (ODG) are a group of manufactured chemical substances that cause ozone layer depletion. Explain briefly to the origin of ODG, their properties and their role in the depletion of the ozone layer. (9)
 (d) Name **TWO** different types of ODG. (2)
 (e) Describe **TWO** concrete measures that may be taken to minimize the effects of stratospheric ozone depletion and to protect the ozone layer. (4)
(Total: 20 marks)

5. Briefly explain the following statements:
 - (a) Irrespective of the size of a country, its crude death rate is always measured as the annual number of deaths per 1000 individuals. (2)
 - (b) Generally, secondary succession happens at a faster rate than primary succession. (3)
 - (c) Energy transfer in a food chain is inefficient. (4)
 - (d) In the industrial revolution human population experienced an exponential growth. (4)
 - (e) Conserving life on Earth is important **not** only for ecological purposes. (7)**(Total: 20 marks)**

Questions continue on next page.

