L-Università ta' Malta

SUBJECT:	**Geography**
DATE:	21st May 2018
TIME:	9:00 a.m. to 12:05 p.m.

Directions to Candidates

Answer a total of **FIVE** questions: **ONE** question from **EACH** of the four Sections and a fifth question from any Section.
The use of non-programmable calculators is permitted.
ALL questions carry equal marks.

SECTION 1: PHYSICAL GEOGRAPHICAL PROCESSES

1. Figure 1 shows an incompletely labelled, generalised model of atmospheric circulation in the Northern Hemisphere.
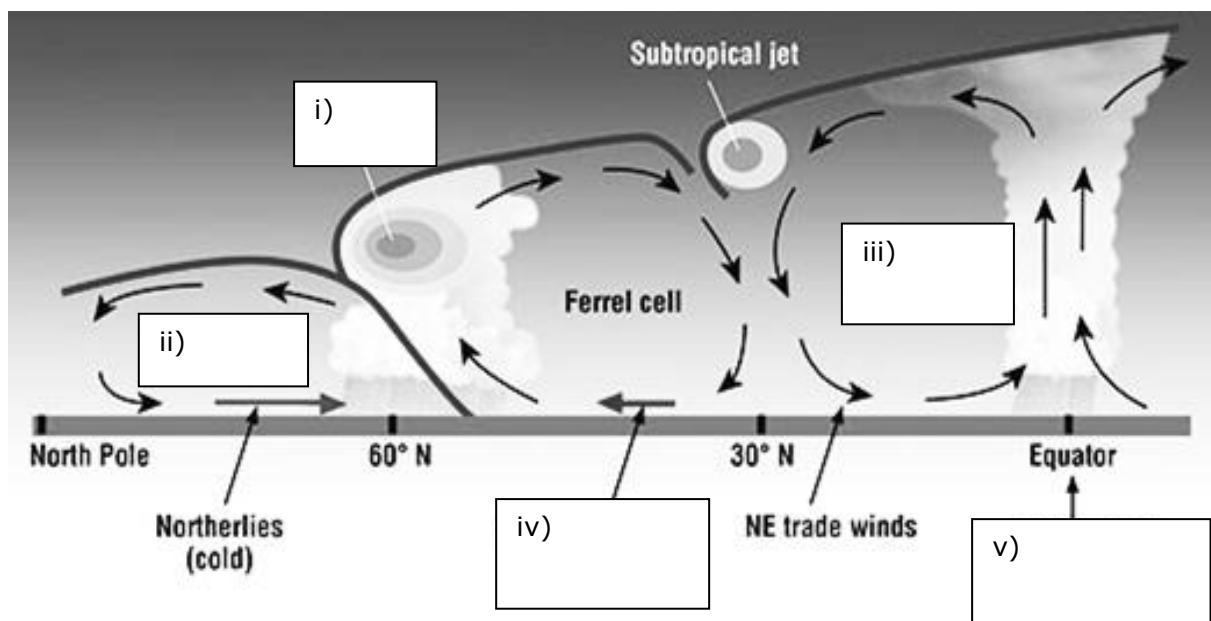

Figure 1 – Cross latitudinal atmospheric circulation within the Northern Hemisphere.

   (a) Complete the labels of the diagram in figure 1.   (10)
   (b) Define the acronym ITCZ, and explain how it is formed.   (7)
   (c) Briefly explain the effects of the ITCZ on free-moving objects like flying aircraft.   (3)
   (Total: 20 marks)

2. (a) Explain in detail the drainage basin hydrological cycle, and draw an annotated sketch to support your answer.   (10)
   (b) Briefly explain how global warming can influence the drainage basin hydrological cycle.
                                                                                              (10)
   (Total: 20 marks)

3. *The earth was formed about 4600 million years ago* (Waugh, 1995).

    (a) Provide a detailed description of Wegener's theory of continental drift. (10)
    (b) Briefly explain **TWO** scientific-based pieces of evidence that support the theory of continental drift. (10)

    (Total: 20 marks)

SECTION 2: HUMAN GEOGRAPHICAL PROCESSES

4. (a) Define the term 'urbanisation'. (2)
   (b) Discuss **THREE** factors that lead to urbanisation. (9)
   (c) Discuss **THREE** problems association with rapid urbanisation. (9)

    (Total: 20 marks)

5. (a) Identify **FIVE** factors that are useful when planning the location of a manufacturing industry. (10)
   (b) Discuss **TWO** advantages of grouping manufacturing industries in one location. (6)
   (c) Describe **TWO** measures that could be taken to improve the appearance of these locations. (4)

    (Total: 20 marks)

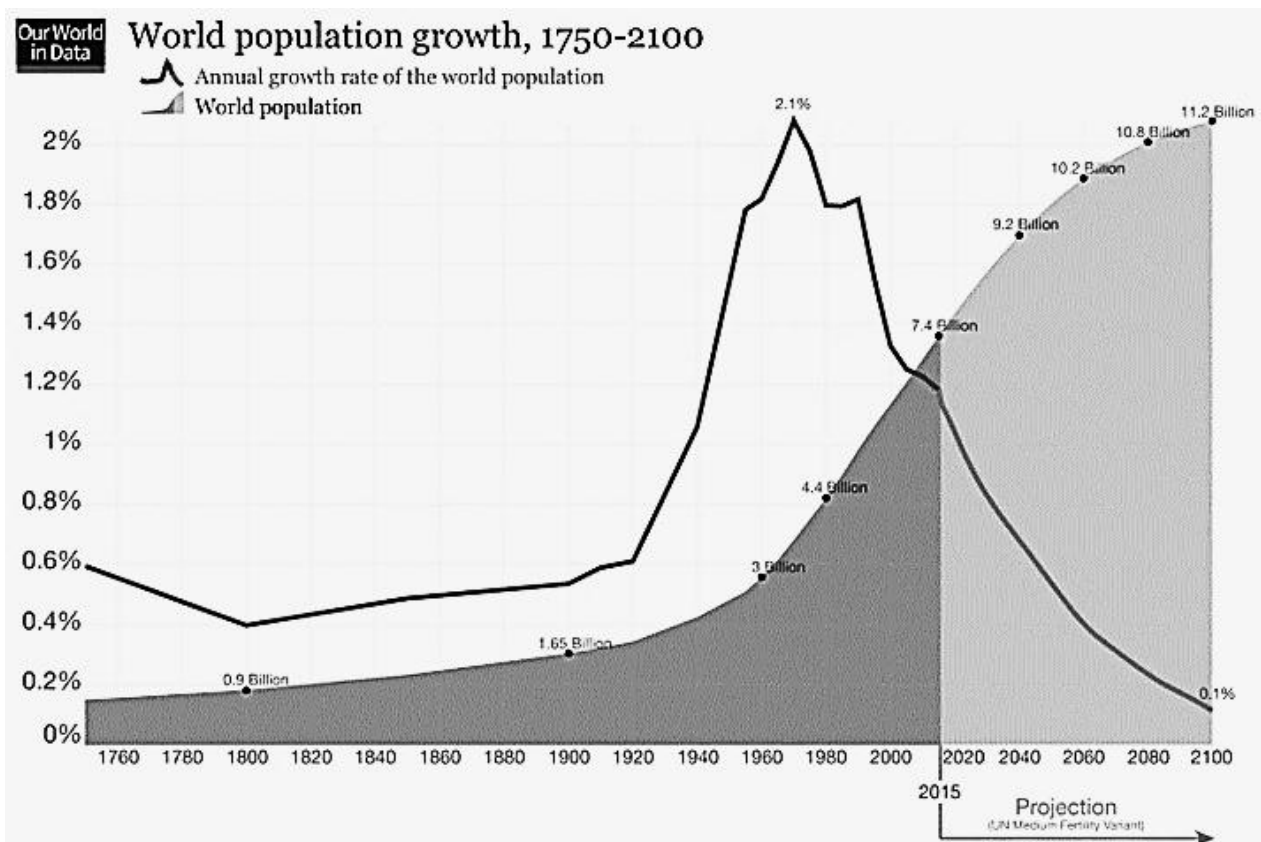6. Figure 2 illustrates the world population growth between the years 1750 and 2100.

Figure 2: World population growth between the years 1750 and 2100.
(Source: https://ourworldindata.org/world-population-growth)

(a) Describe the world population growth in terms of annual growth rate and world population figures. (5)

(b) Discuss **THREE** reasons for the rapid increase in population in the mid-1900s (9)

(c) Give **THREE** reasons for a decline in annual growth rate in the projected years. (6)

(Total: 20 marks)

SECTION 3: THE MAN-ENVIRONMENT RELATIONSHIP

7. Forests cover 31% of the land area on our planet. Around 1.6 billion people rely on resources provided by forests, including food, fresh water, clothing, traditional medicine and shelter.

(a) Define the term 'deforestation'. (3)

(b) Name **TWO** world regions or areas where deforestation is currently underway. (2)

(c) With reference to specific examples, describe **THREE** different ways by which human-induced deforestation can take place. (9)

(d) Explain in some detail **TWO** ways how deforestation can influence climate change. (6)

(Total: 20 marks)

8. Treated water from the *Iċ-Ċumnija* Sewage Treatment plant in Mellieħa is now being made available to industry. The *Iċ-Ċumnija* plant is designed to treat an average of 6,700 m³ of sewage per day.

(a) Name the location of **TWO** other sewage treatments plants in Malta and Gozo. (2)

(b) Prior to the construction of sewage treatment plants, it was common practice to dispose of raw sewage in the sea surrounding Maltese shores. Outline **THREE** negative environmental and/or economic outcomes brought about by this practice. (6)

(c) Discuss **TWO** concrete examples to explain how the utilisation of treated sewage water can help mitigate the serious fresh water shortage issue the Maltese archipelago is facing. (12)

(Total: 20 marks)

Please turn the page.

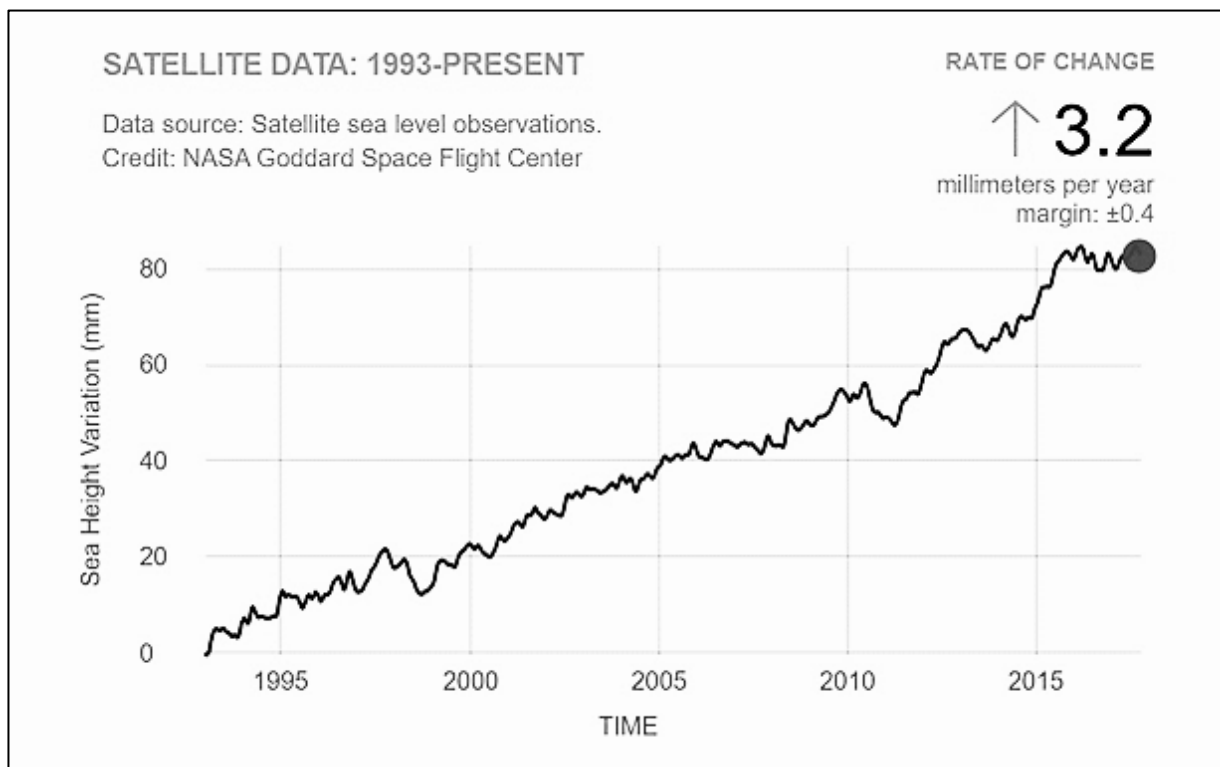9. Figure 3 shows sea level rise due to ocean warming over a period of two decades.

Figure 3: Average sea level rise from 1993 to the present
(Source: https://climate.nasa.gov/vital-signs/sea-level/)

(a) Describe **THREE** human actions which may bring about global warming. (9)
(b) Explain the relationship between global warming and sea level rise. (6)
(c) Name an area on the planet which will be adversely affected by a rise in sea level. (1)
(d) Suggest **TWO** measures which can be undertaken to mitigate the influence of sea level rise. (4)

(Total: 20 marks)

SECTION 4: FIELDWORK AND MAPWORK SKILLS

10. (a) Explain the difference between random sampling and systematic sampling. (6)
    (b) Give a detailed description of a field investigation where one of the sampling methods mentioned in part (a) can be employed. (10)
    (c) Bias in data sampling is a potential pitfall every field investigation should cater for. With reference to the field investigation described in (b) above:
        (i) indicate how bias in your data sampling method might jeopardise the validity of the field investigation;
        (ii) state how bias can be avoided. (4)

(Total: 20 marks)

11. A student has recorded temperature and rainfall readings for a whole year and listed these readings in the table below.

	J	F	M	A	M	J	J	A	S	O	N	D
Temperature (^{0}C)	12	13	13	15	18	23	27	28	24	21	18	14
Rain (mm)	84	57	40	23	8	5	0	9	38	97	84	98

(a) For each set of data (temperature and rainfall) calculate:
   (i) Range;
   (ii) Mean;
   (iii) Median; and
   (iv) Mode. (4)
(b) What type of climate would you associate with these readings? Give evidence from the table for your answer. (4)
(c) Illustrate these readings in a graph. (8)
(d) State **TWO** limitations that the temperature and rainfall data collected by the student may have. (4)

(Total: 20 marks)

Please turn the page.

12. Figure 4 shows a map of Wied il-Qlejgha (Chadwick Lakes). The estimated area is 2,119,751m^2. The presence of water leads to the establishment of the Great Reed, "il-Qasab" (*Arundo donax*). The figure illustrates the location of patches where this type of flora is found. Note that not all the information that is provided here is real.
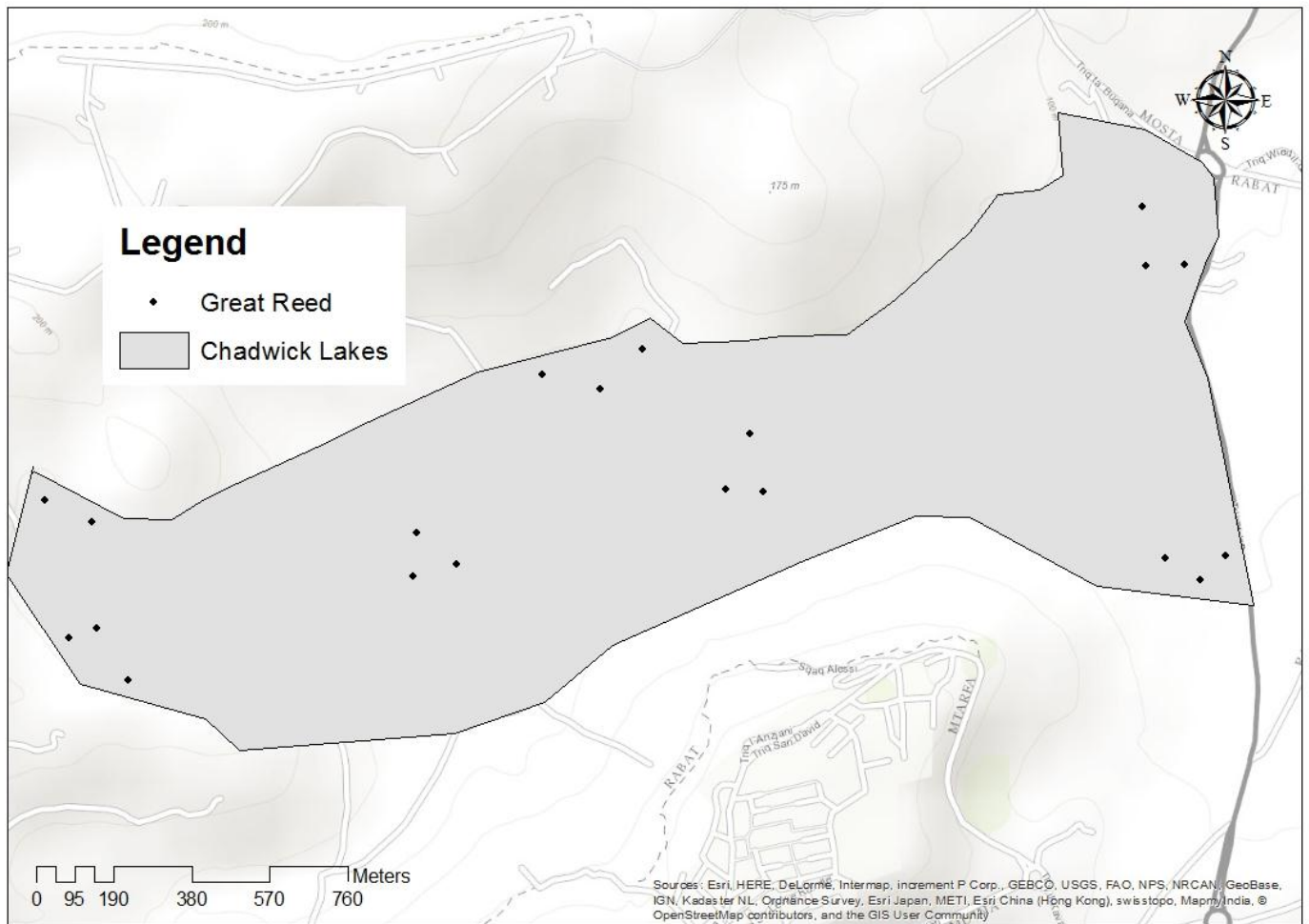

Figure 4: A map of Wied il-Qlejgha (Chadwick Lakes) with patches of *Arundo donax*

(Source: adapted from ESRI 2018)

(a) What does the statistical technique Nearest Neighbour Index show? (5)

(b) Work out the Nearest Neighbour Index for the information provided in figure 4. The formula is the following:

$$\text{NNI} = 2\overline{\text{D}} \ \sqrt{(\text{N/A})}.$$

The nearest neighbour formula will produce a result between 0 and 2.15, where the following distribution patterns form a continuum:

(10)
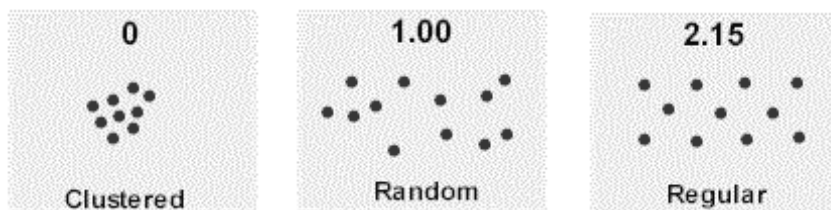
(c) Interpret the answer obtained in part (b) of this question. (5)

(Total: 20 marks)