Surname	Centre Number	Candidate Number
Other Names		2

GCE A Level – LEGACY

1215/04

S19-1215-04

GEOLOGY – GL5

Thematic Unit 4
Geology of the Lithosphere

THURSDAY, 6 JUNE 2019 – MORNING

ONE of TWO units to be completed in 2 hours

	For Examiner's use only		
	Question	**Maximum Mark**	**Mark Awarded**
Section A	**1.**	**15**	
Section B	**2.**	**25**	
	3.		
	4.		
	Total	**40**	

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ADDITIONAL MATERIALS

In addition to this and one other examination paper, you will need:
- a calculator
- a ruler.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.
Write your name, centre number and candidate number in the spaces at the top of this page.
Answer **question 1** in Section A (15 marks) and **one** question from Section B (25 marks).

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.
You are reminded of the necessity for good English and orderly presentation in your answers.

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SECTION A

1. **Figure 1a** is a graph showing the spreading rate for part of the South Atlantic Ocean based on the distance of magnetic anomalies from the spreading ridge compared to the geomagnetic polarity time scale for the last 4 Ma.

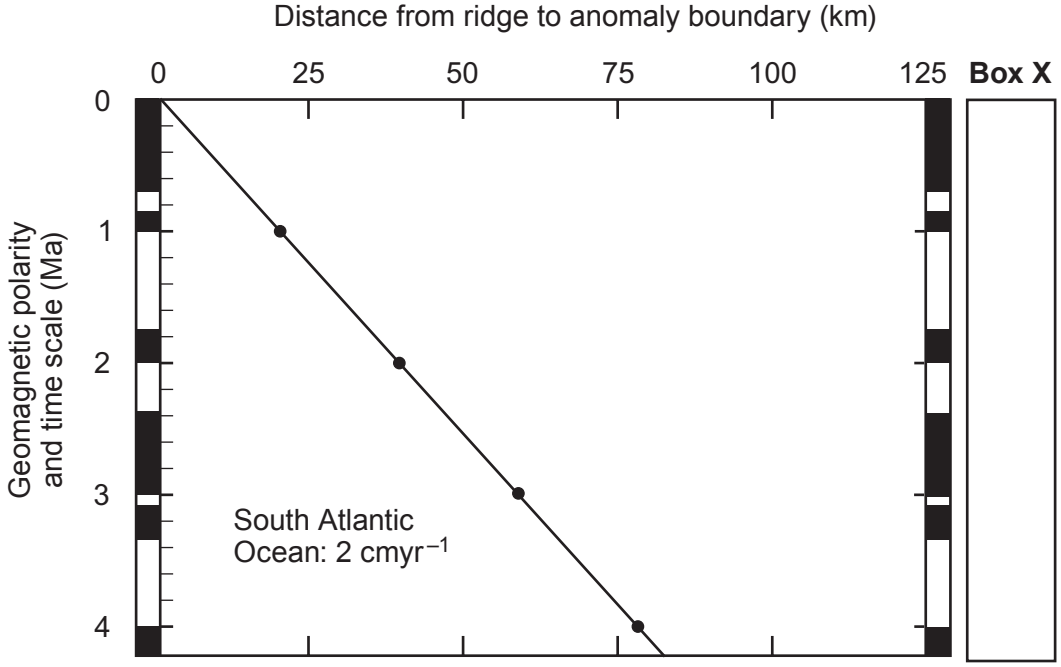

Figure 1a

Refer to **Figure 1a**.

(a) (i) Explain what is meant by the term **normal** polarity. [1]

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(ii) Mark in **Box X** on **Figure 1a**, with an arrow labelled (←**R**), a period of time showing **reversed** polarity. [1]

(iii) Part of the South Pacific Ocean is spreading at 2.5 times the rate of the part of the South Atlantic Ocean shown in **Figure 1a**. Draw a line on **Figure 1a** to show this spreading rate for the South Pacific Ocean for the past 2 Ma. [2]

(iv) Calculate the mean time between geomagnetic polarity reversals over the past 4 Ma. Show your working. [2]

..... Ma

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(v) Explain how the geomagnetic polarity time scale can be determined from **continental** rocks. [3]

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(b) **Figure 1b** is a map showing the main features of the Pacific and Atlantic Ocean basins. The two oceans are considered to be at different stages in the J. Tuzo Wilson cycle of ocean basin evolution.

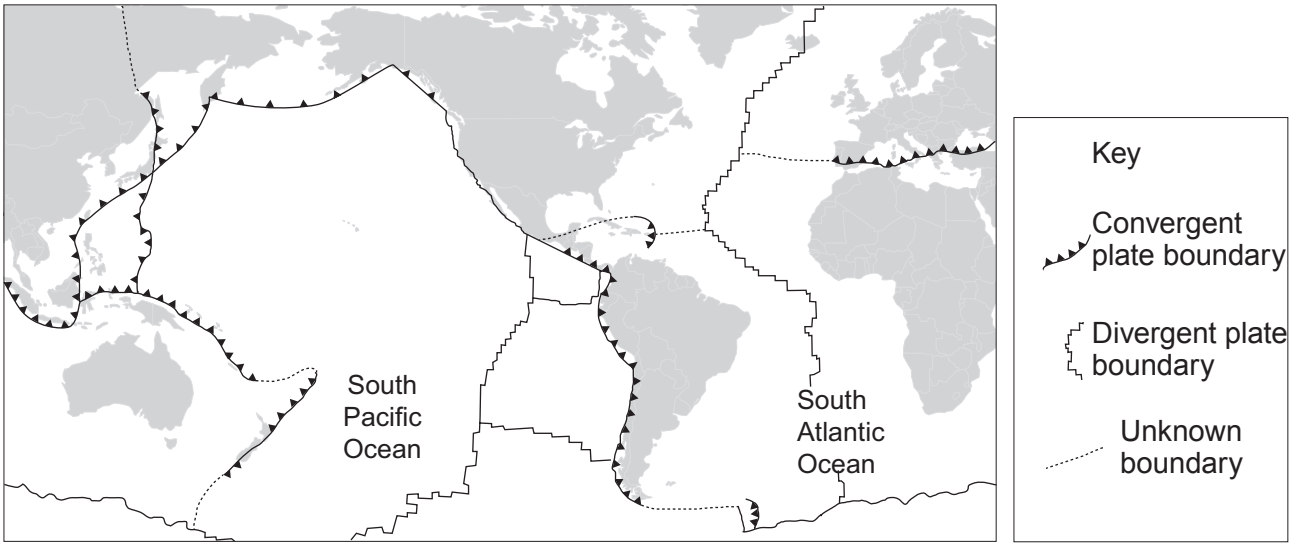

Figure 1b

(i) Mark on **Figure 1b**, the most likely position in the **Pacific Ocean** of:

- the youngest oceanic crust with an arrow labelled (←**Y**)
- the oldest oceanic crust with an arrow labelled (← **O**).

[2]

(ii) *'The Atlantic Ocean shows the most advanced stage in ocean basin development.'* Evaluate this statement using evidence from **Figure 1a** and **Figure 1b**. [4]

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SECTION B

Answer **one** *question only.*

Write your answer in the remaining pages of this booklet.

2. *(a)* Describe the characteristic geological processes that form orogenic belts.

(b) Evaluate the role of isostasy in controlling the altitude of orogenic belts. [25]

3. *(a)* Describe how tectonic stresses acting in the continental crust can cause a range of brittle and ductile tectonic structures.

(b) Evaluate the role of temperature in the formation of tectonic structures. [25]

4. Evaluate the use of seismology in understanding the structure and composition of the lithosphere. [25]

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