Surname

Centre Number Candidate Number

2

Other Names

GCE A Level – LEGACY



1215/02

# GEOLOGY – GL5 Thematic Unit 2 Geology of Natural Resources

THURSDAY, 7 JUNE 2018 - 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.		
	3.	25	
	4.		
	Total	40	

## ADDITIONAL MATERIALS

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

## 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.

## **SECTION A**

2

Figure 1a is a cross-section through the Bushveld Complex in South Africa, a significant source of chromite ore (FeCr<sub>2</sub>O<sub>4</sub>). Figure 1b is a photograph of part of the chromite-rich ore body. Table 1 is a table of properties of some of the minerals found within the Bushveld Complex.







plagioclase-rich layer

chromite-rich layer (concentration factor of chromite is 2,250)

## Figure 1b

Mineral	Relative density	Approximate crystallisation temperature	Average concentration in crust (parts per million)
chromite	4.5-4.8	1400 – 1200°C	160
plagioclase feldspar	2.62-2.75	1550 – 1275°C	N/A

## Table 1



Turn over.

(c) For **one** named environmental problem that might be caused by the extraction of chromite from the Bushveld Complex, suggest a suitable planning control that could be used to limit the adverse effects of **this** problem.

	environmental problem: planning control:		[2]
(d)	Refer to <b>Figures 1a</b> , <b>1b</b> an Explain how the propertie different geophysical prosp 1.	nd <b>Table 1</b> . It is of chromite deposits enable them to be detected becting techniques.	ed by <b>two</b> [4]
	2		

15

Examiner only

### **SECTION B**

5

#### Answer one question only.

#### Write your answer in the remaining pages of this booklet.

- 2. Evaluate the use of **geophysical** surveying techniques in prospecting for:
  - (i) non-metalliferous mineral resources
  - (ii) hydrocarbon resources.
- 3. Evaluate the role of water in the processes of formation of **two** of the following:
  - (i) china clay
  - (ii) hydrothermal minerals
  - (iii) sedimentary metalliferous ores
- "The formation of economic deposits of hydrocarbons and coals solely results from the thermal alteration of organic material."
  Evaluate this statement with reference to geological processes.

[25]

[25]

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## **END OF PAPER**

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#### Acknowledgements

**Figure 1a:** S268 Physical Resources and Environment – Metals 1 Ore Deposits. The Open University, 1995.

**Figure 1b:** "Chromitite Bushveld South Africa" by kevinzim / Kevin Walsh – originally posted to Flickr as xBushveld\_Chromite1 http://www.flickr.com/photos/86624586@N00/85262560/. Licensed under CC BY 2.0 via Commons – https://commons.wikimedia.org/wiki/File:Chromitite\_Bushveld\_South\_ Africa.jpg#/media/File:Chromitite\_Bushveld\_South\_Africa.jpg