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90190

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

Level 1 Science, 2006

90190 Describe aspects of geology

Credits: Three
9.30 am Tuesday 28 November 2006

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should answer ALL the questions in this booklet.

If you need more space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–10 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

For Assessor's use only	**Achievement Criteria**	
Achievement	**Achievement with Merit**	**Achievement with Excellence**
Describe aspects of geology.	Explain aspects of geology.	Discuss aspects of geology.
Overall Level of Performance		

You are advised to spend 25 minutes answering the questions in this booklet.

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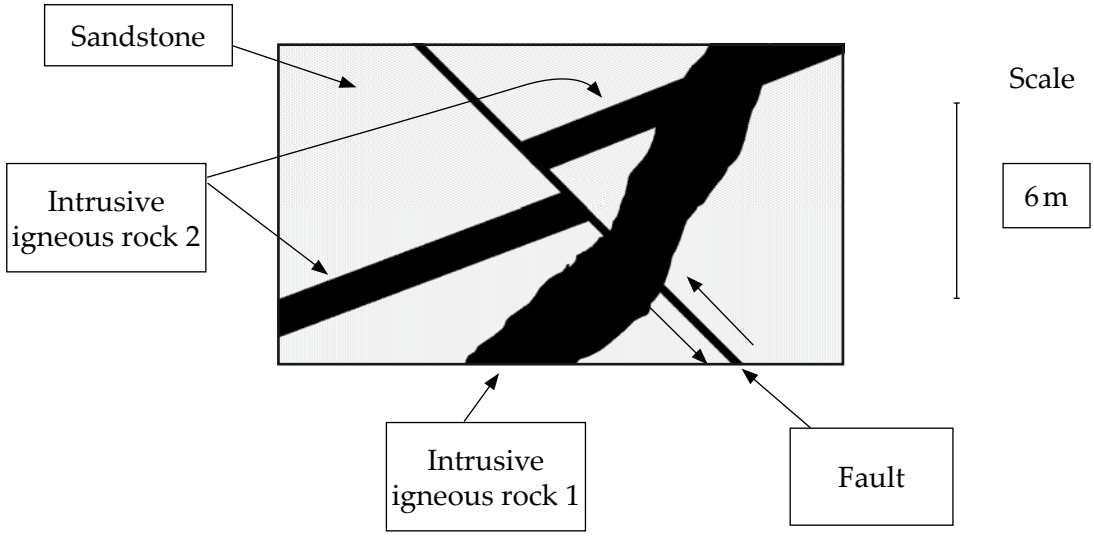
QUESTION ONE: GEOLOGICAL EVENTS

The diagram below illustrates a rock cliff exposure showing intrusive igneous rocks and a fault. Faults are planes of weakness where rock is broken and displaced.



(a) What major class of rock does sandstone belong to?

_____

(b) Explain what an igneous intrusion is.

_____

_____

_____

_____

_____

(c) State the order of the **geological events** that have occurred to produce the pattern of rocks shown in the diagram on page 2, and discuss how you were able to work out this order.

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QUESTION TWO: FORMATION OF ROCKS

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Metamorphic Rocks

(a) Name TWO physical conditions involved in the formation of metamorphic rocks.

(b) Name THREE examples of metamorphic rock.

(i)

(ii)

(iii)

(c) Metamorphic rocks are formed by either **contact** or **regional** metamorphism. Compare and contrast these TWO methods of formation. You should include ideas on scale, the physical conditions needed, and give some examples of rocks formed by regional metamorphism.

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Sedimentary Rocks

(d) Name TWO examples of sedimentary rock, other than conglomerate.

(e) Name a geological process that produces sediment.

(f) Explain how a conglomerate is formed.

Igneous Rocks

Igneous rocks are often classified on the basis of grain or crystal size, what minerals they are made of and whether the rock is dark or light or intermediate in colour.

(g) Name an igneous rock that has very small crystal size **and** is poor (low) in silica content.

Granite is light in colour and **gabbro** is dark in colour.

(h) Explain why these two rocks differ in colour.

The photographs below show examples of granite and basalt.

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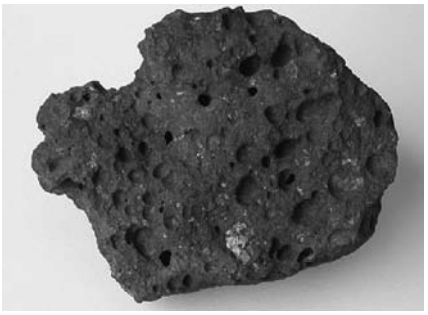
Granite

Basalt



(i) Discuss the **differences** in the formation of granite and basalt.

QUESTION THREE: RELATIVE DATING

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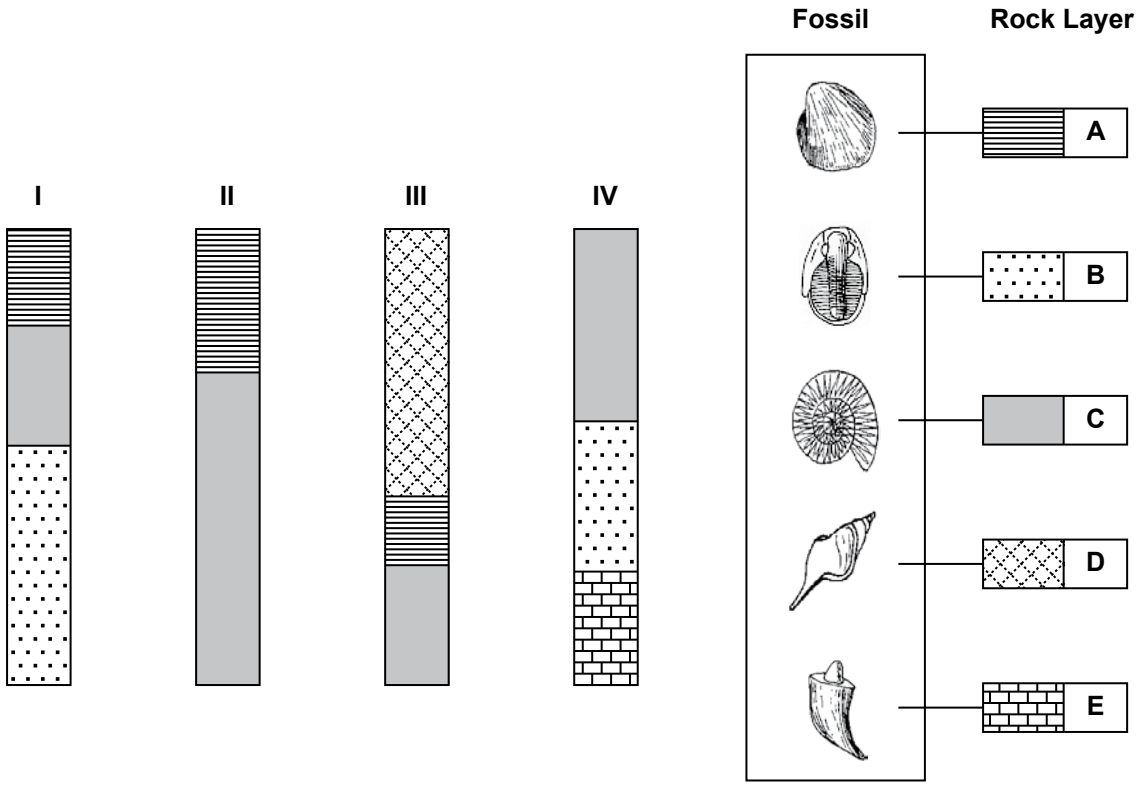
(a) Describe what is meant by the geological term 'stratigraphic column'.

The columns **I** to **IV** below represent rock layer sequences encountered in drill holes at four different locations. Rock layers are the correct way up.

Using the rock layer letters **A–E**, determine the correct age order from oldest to youngest of the rock layer sequences. Each different rock layer contains the kind of fossils as shown.



(b) Write the letters of each rock layer in age order from **oldest** to **youngest**.

_____ _____ _____ _____ _____

Oldest Youngest

(c) **Explain your reasoning** for the order of rock layers you have chosen in question 3(b) on page 7.

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Extra paper for continuation of answers if required.
Clearly number the question.

Assessor's use only

Question number	

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