FOR OFFICIAL USE

Total

X043/101

NATIONAL QUALIFICATIONS 2007

THURSDAY, 24 MAY
1.00 PM – 2.30 PM

GEOLOGY
INTERMEDIATE 1

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Date of birth
Day Month Year

Scottish candidate number

Number of seat

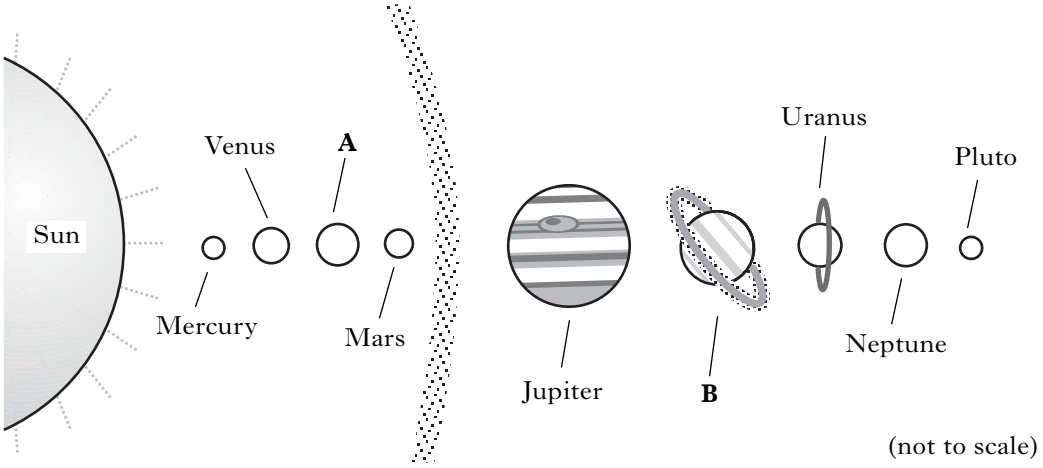
1 You should attempt **all** of the questions.
2 All answers should be written in the spaces provided in this answer book and should be written clearly and legibly in ink.
3 The marks allocated to each question or part of a question are shown at the end of each question or part of a question.
4 Before leaving the examination room you must give this book to the invigilator. If you do not, you may lose all the marks for this paper.

DO NOT WRITE IN THIS MARGIN

All questions should be attempted.

Marks

1. The diagram below shows the planets in the solar system.



(not to scale)

(*a*) Name Planet A .....

Name Planet B **2**

(*b*) Which planet takes the longest time to go round the Sun?

..... **1**

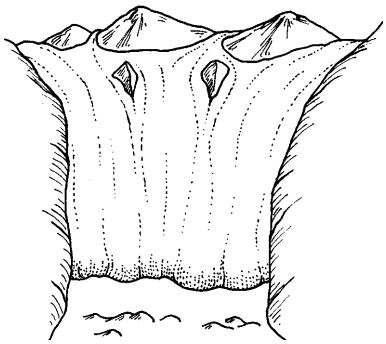
Marks

2. The diagrams below show stages in the history of the Earth.

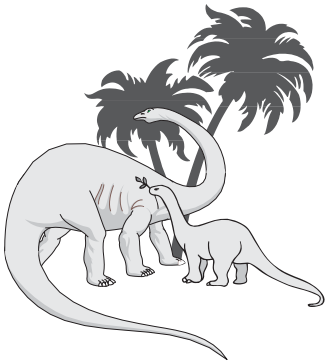
A Tropical jungle forms coal

B First continents form

C Ice covers Scotland



D Dinosaurs roam Scotland



Place the stages in the history of the Earth in order from oldest to youngest.

Give only the letters: ..... → ..... → ..... → .....
Oldest — Youngest

2

3. Use the word box to complete the table below, showing information about minerals.

Pyrite; Red-brown; White; Mica; Silver colour; Green in colour

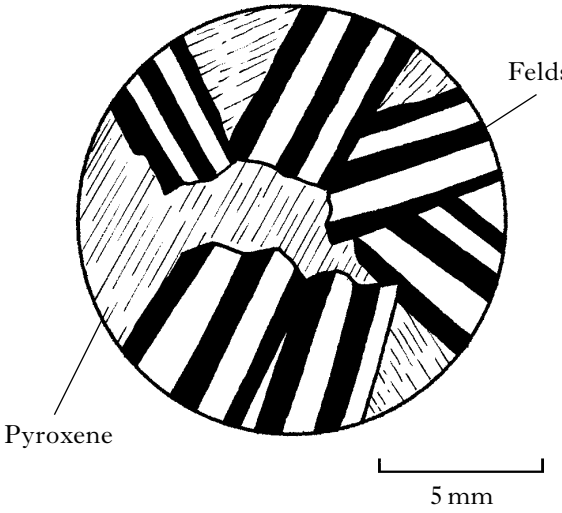
Mineral Name	*Description*	*Streak Colour*
	Shiny gold colour	Green-black
Malachite		Pale green
Haematite	Dark red, feels heavy	
	Splits into flakes	White

4

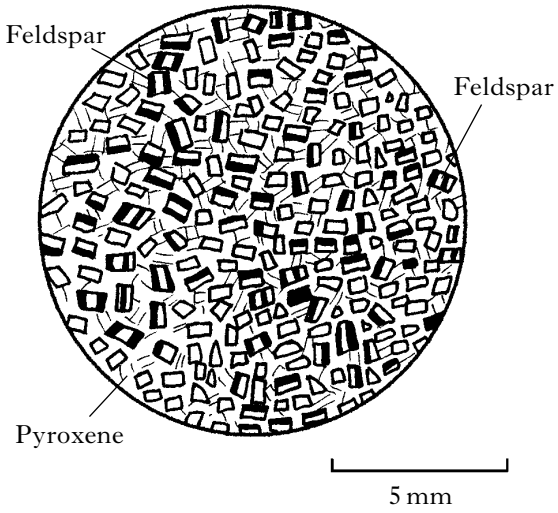
Marks

4. Look at the diagrams showing views of two rocks seen under the microscope.

Rock X
COARSE GRAINED



Rock Y
FINE GRAINED



(*a*) Which rock has cooled deep inside the Earth?

Rock **1**

(*b*) Give **two** reasons why Rock X has larger crystals than Rock Y.

Reason 1 .....

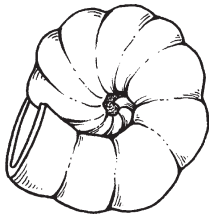
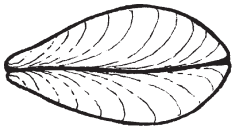
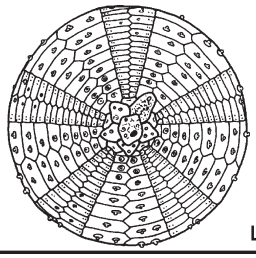
.....

Reason 2 .....

..... **2**

Marks

5. (*a*) Complete the table by naming the fossil and saying where the organism lived.

Fossil	*Name of Fossil*	*Did the organism live on the land or in the sea?*
 15 cm		
 10 cm		
 5 cm		
 10 cm		

4

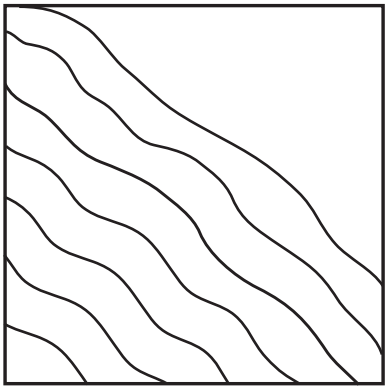
[Turn over

Marks

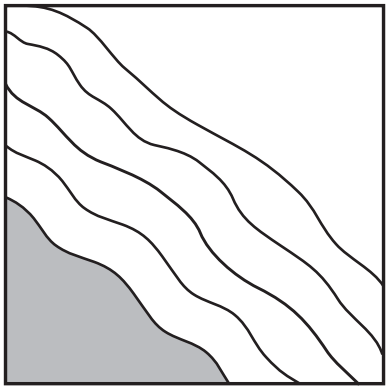
5. (continued)

(*b*) The diagrams below show how dinosaur footprints and tail mark were preserved.

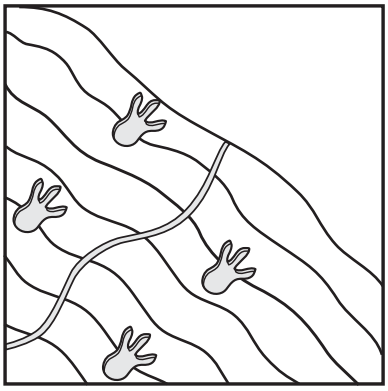
A Sand deposited with ripple marks



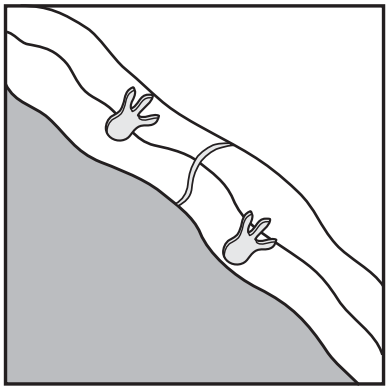
B Water deposits mud



C Dinosaur walks on sand



D Wind erodes mud layer



Put the letters of the diagrams in the correct order.

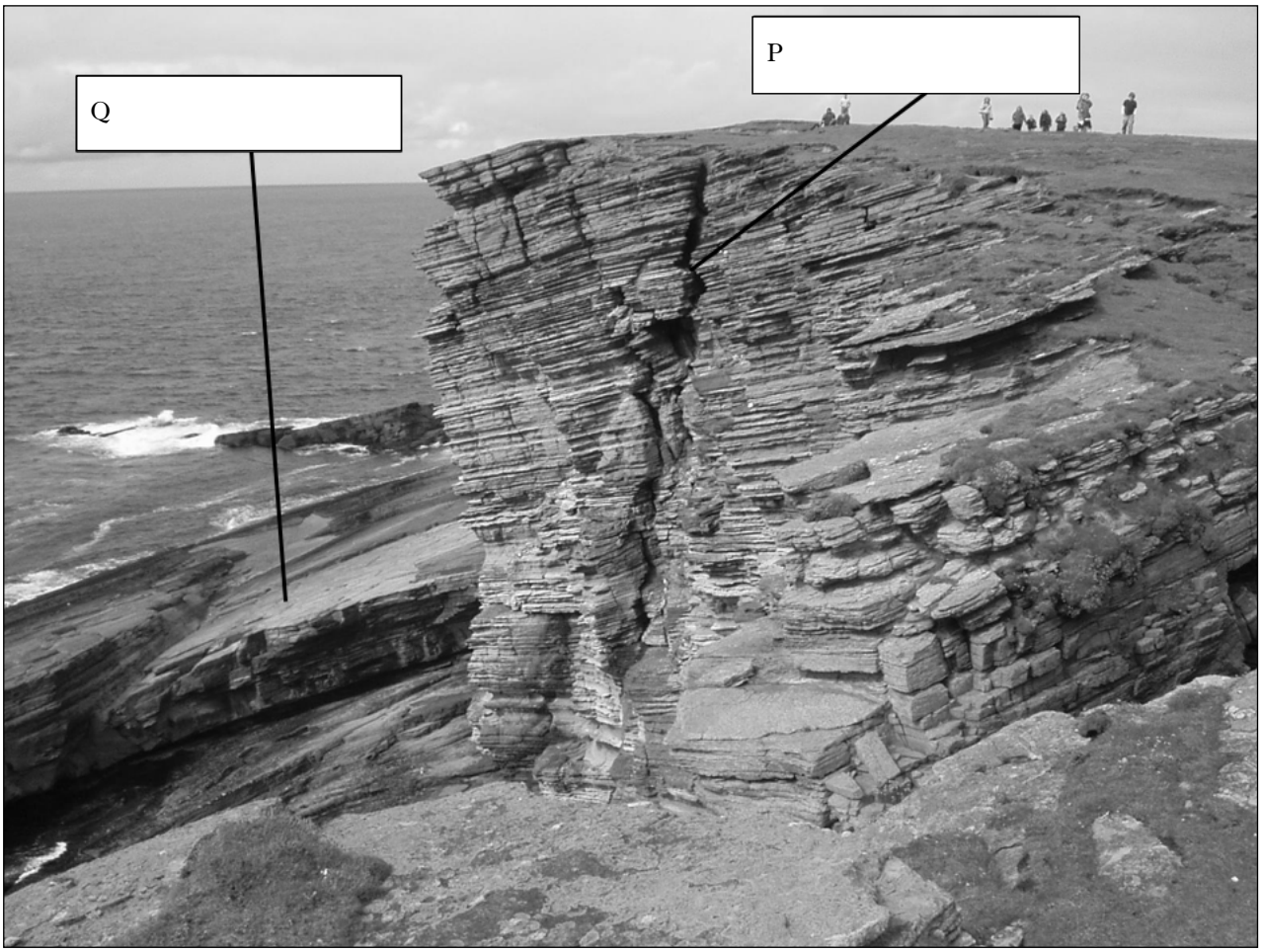
Give only the letters: ..... → ..... → ..... → .....
Oldest Youngest

2

[Turn over for Question 6 on *Page eight*

Marks

6. Look at the photograph below.



(*a*) Label structure P and feature Q on the photograph. **2**

Marks

6. (continued)

(*b*) Draw a sketch with labels in the box below to show what the area might look like in the future.

2

(*c*) Explain the processes which would cause these changes.

.....

.....

.....

.....

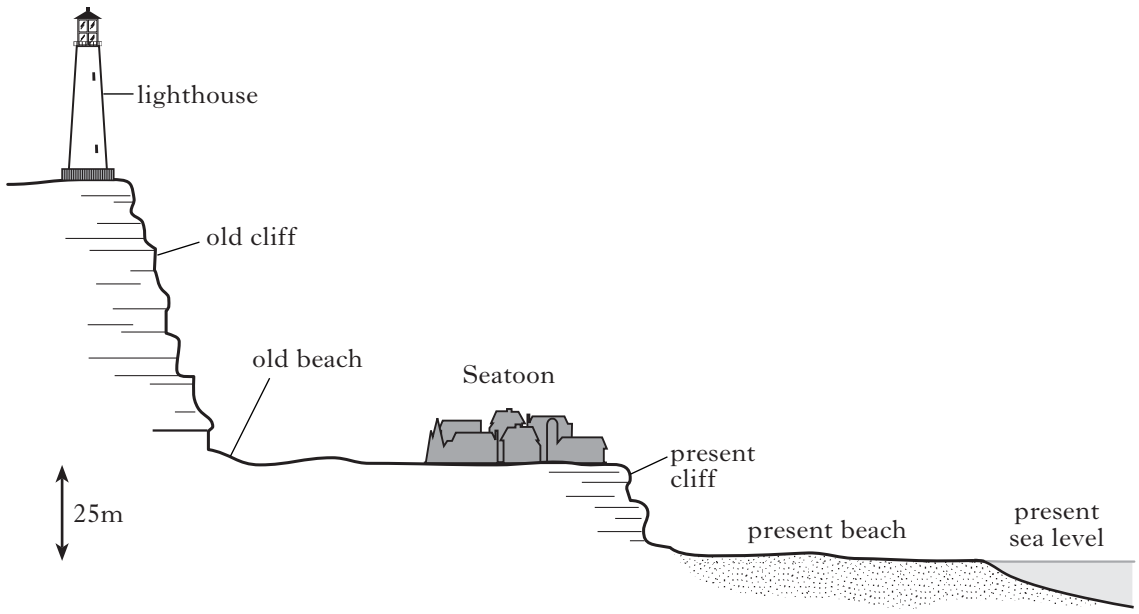
..... **2**

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks

7. Look at the diagram below.



(*a*) Explain why the old beach is 25 m above present sea level.

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.....

.....

..... **2**

(*b*) Explain how climate change might affect the area.

.....

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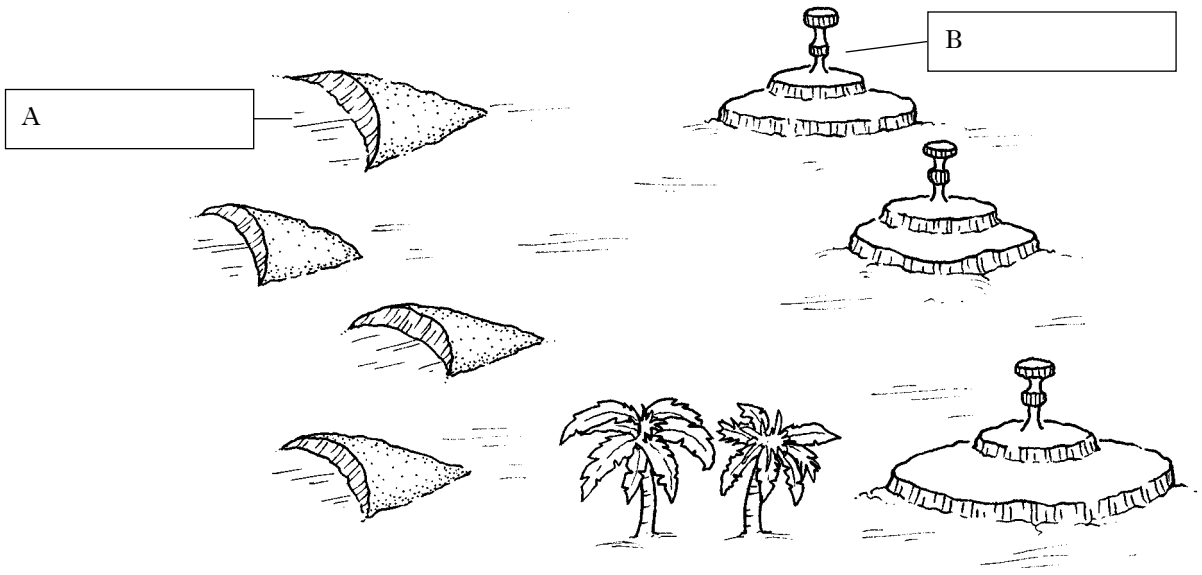
.....

..... **2**

Marks

8. Look at the diagram below.



(*a*) Label Feature A and Feature B on the diagram. **2**

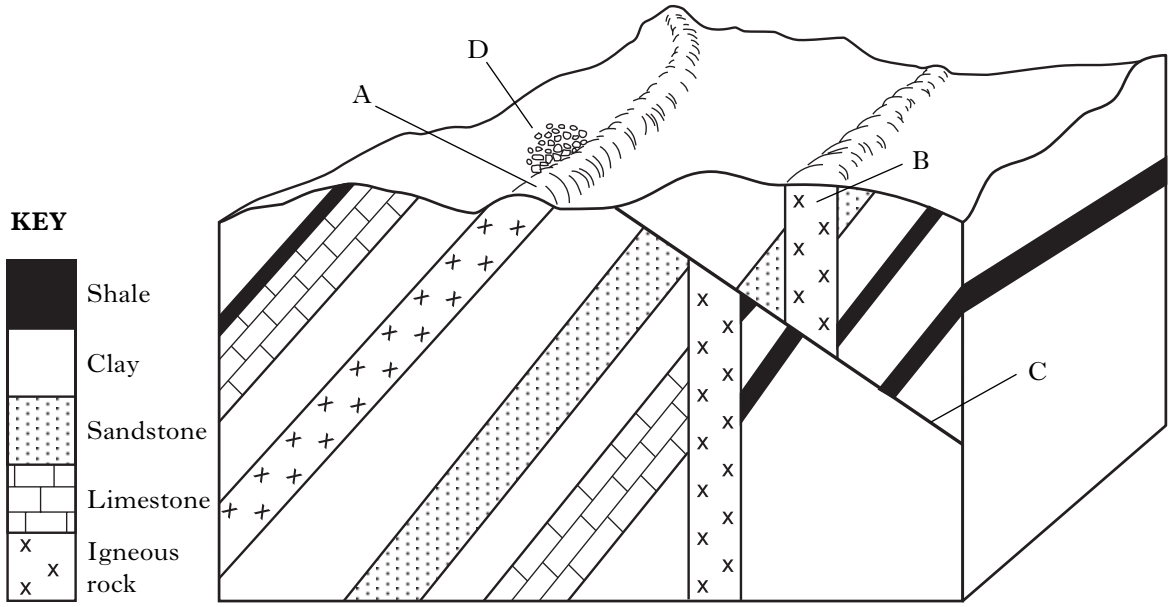
(*b*) Draw an arrow on the diagram to show the main wind direction. **1**

(*c*) Use a diagram to describe how Feature A formed.

3

Marks

9. Look at the diagram below.



(*a*) Use the Word Box and the Table below to name Features A, B, C and D.

Dyke; Sill; Scree; Fault; Syncline

Letter	*Name of Feature*
A	
B	
C	
D	

4

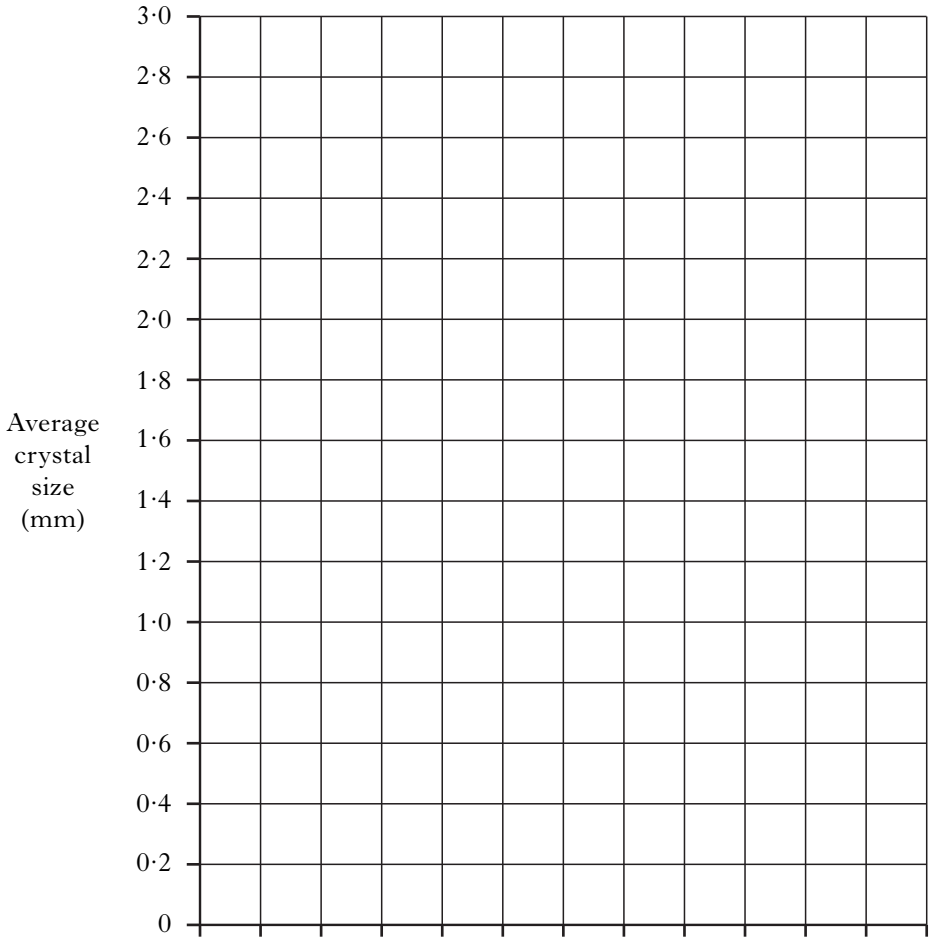
Marks

9. (continued)

(*b*) The table below shows average crystal size in igneous rock A from its contact with the clay.

Distance from contact with clay (m)	*Average crystal size* (mm) *in igneous rock A*
0	0·5
5	0·9
10	1·4
15	2·6
20	2·8
25	2·8
30	3·0

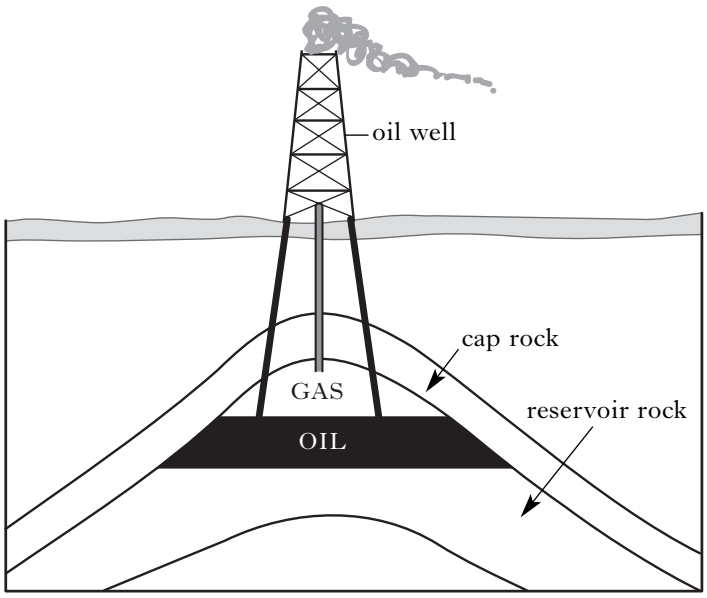
Using the table above, draw a line graph on the graph paper below, showing distance from contact with clay and average crystal size in igneous rock A.



3

Marks

10. Look at the diagram below.



(*a*) Which **three** statements are correct?

A Reservoir rocks are impermeable.

B Cap rocks do not allow oil, water or gas to pass through.

C Reservoir rocks have pore spaces in them.

D Shale is an example of a reservoir rock.

E Sandstone is an example of a reservoir rock.

Give only the letters: **3**

(*b*) Using the Word Box below, choose **three** products made from oil.

Plastics; Paint; Bricks; Glass; Paraffin; Pottery

Product 1 .....

Product 2 .....

Product 3 ..... **3**

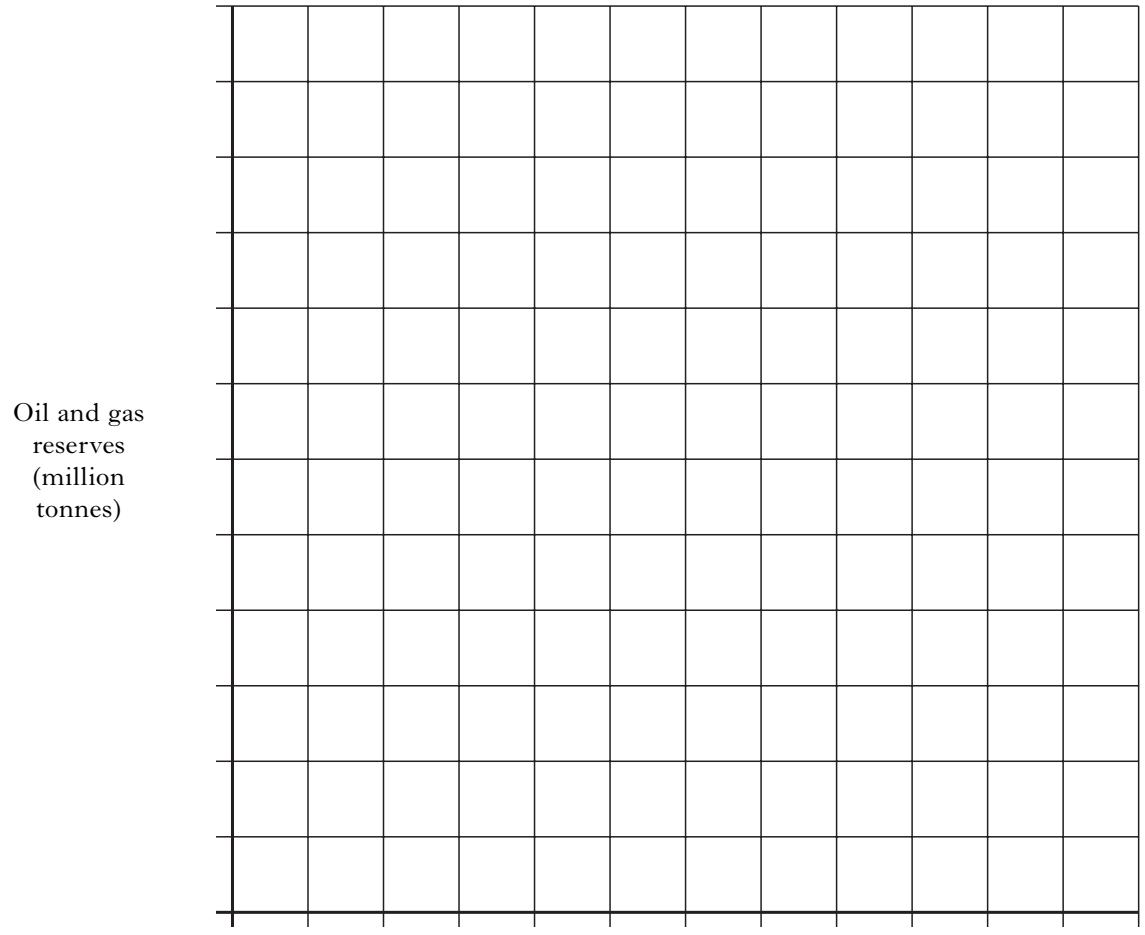
[Turn over for Question 11 on *Page sixteen*

Marks

11. The table below shows oil and gas reserves from 1994–2002.

Year	*Oil and Gas Reserves* (million tonnes)
1994	5·7
1995	5·2
1996	5·1
1997	5·0
1998	4·5
1999	4·4
2000	4·0
2001	3·5
2002	3·3

(*a*) Using the information from the table, draw a bar graph on the graph paper below.



4

(*b*) What happened to the oil and gas reserves between 1994 and 2002?

.....

1

DO NOT WRITE IN THIS MARGIN

Marks

11. (continued)

(*c*) Calculate the difference in oil and gas reserves between 1994 and 2002.
(*Show your working.*)

2

(*d*) Give a reason why oil and gas reserves may increase in the future.

.....

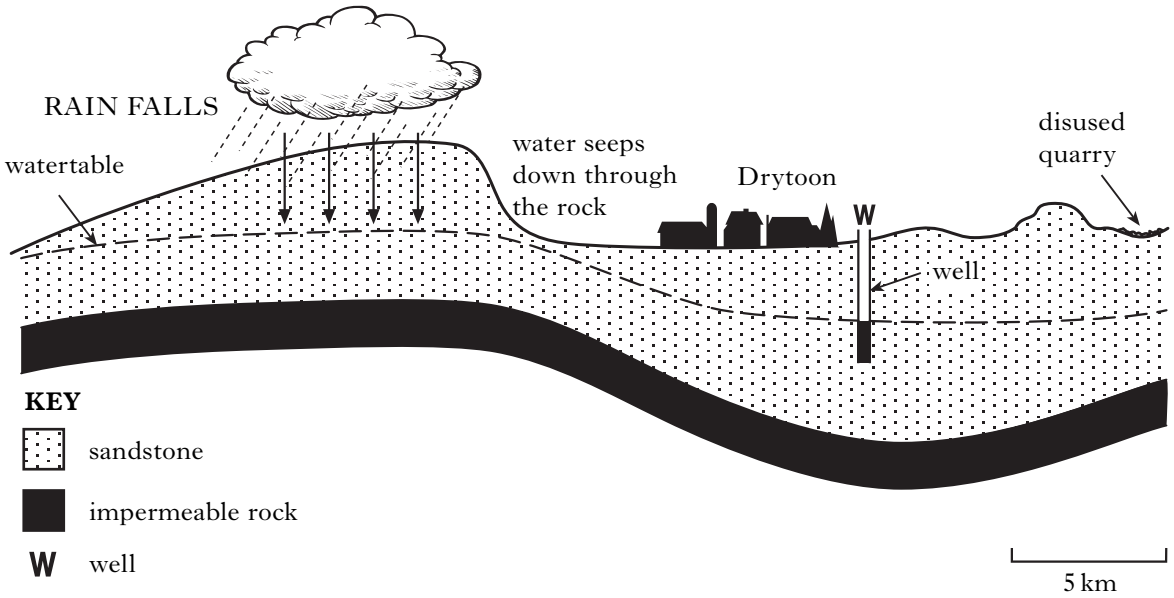
..... **1**

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks

12. Look at the diagram below.



(*a*) Explain how Drytoon gets its water supply.

.....

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.....

..... **3**

(*b*) Drytoon is expected to double in size. Explain how this would affect its water table.

.....

.....

..... **2**

Marks

12. (continued)

(*c*) Give **three** ways in which the residents of Drytoon can conserve water.

1 .....

.....

2 .....

.....

3 .....

..... **3**

(*d*) Drytoon Council plans to open the disused quarry as a landfill site for waste. Explain why geologists are against this idea.

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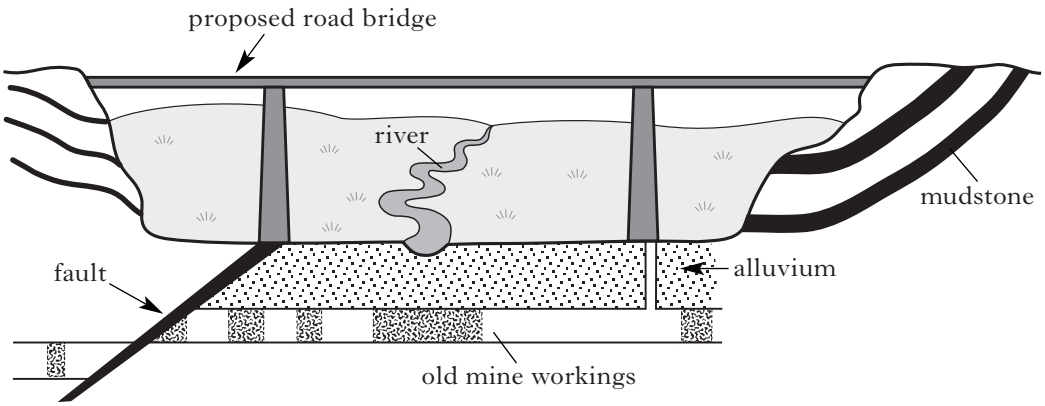
..... **2**

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks

13. A bridge is to be built across the valley as shown in the diagram below.



Give **two** geological reasons why this site should not be chosen. Explain your answers.

Reason 1 .....

.....

Explanation 1 .....

.....

Reason 2 .....

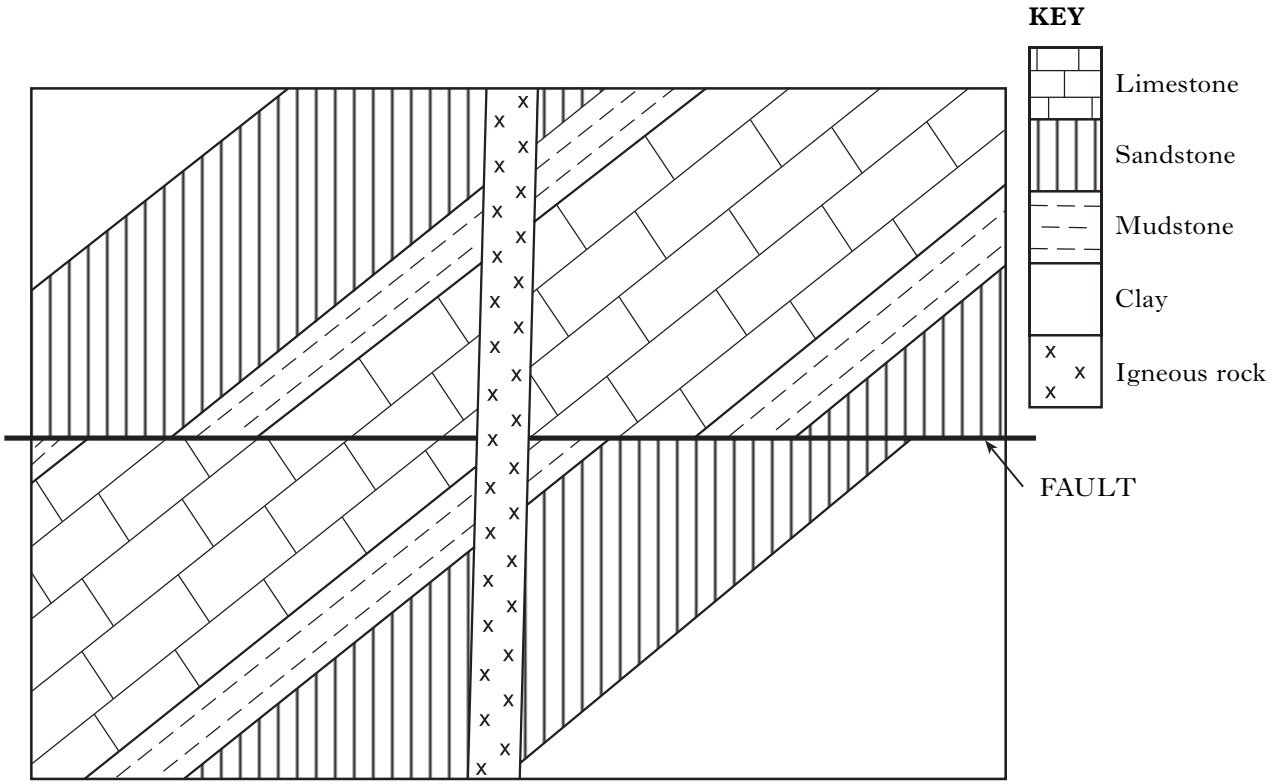
.....

Explanation 2 .....

..... **2**

Marks

14. Look at the geological map below showing an ANTICLINE.



(*a*) Mark **two** strike and dip symbols on to the diagram to show the Anticline. **2**

(*b*) Place the following events in the correct order.

A Deposition of mudstone

B Folding of rocks

C Movement on fault

D Deposition of limestone

E Intrusion of dyke

Give only the letters: ..... → ..... →..... → .....→.....
oldest youngest **5**

[Turn over

Marks

15. The diagram below shows an existing ferry route and a proposed tunnel route to replace this ferry.

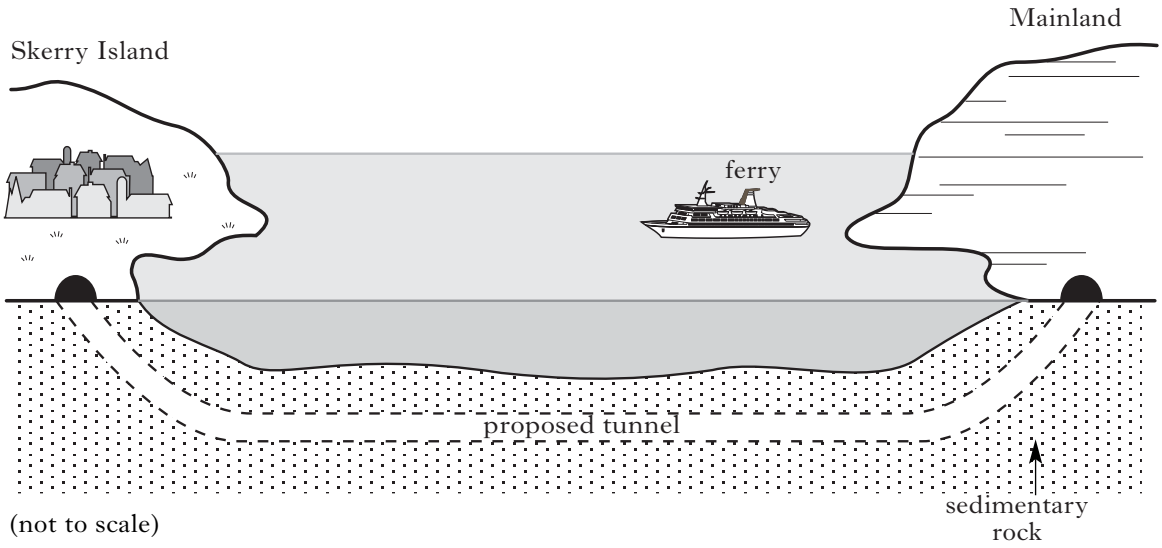


Table 1 below shows the cost each year of running a ferry. The ferry has to be replaced after five years. Table 2 shows the construction costs of building a tunnel.

Table 1		**Table 2**	
Yearly running cost of ferry (millions of £s)		*Tunnel construction costs each year* (millions of £s)	
Year 1	15	Year 1	20
Year 2	15	Year 2	40
Year 3	15	Year 3	40
Year 4	15	Year 4	80
Year 5	200 (Ferry replaced)	Year 5	100
Year 6	20	Year 6	0 (Tunnel complete)
Year 7	20	Year 7	0 (Tunnel complete)

(*a*) Calculate the total cost of running the ferry from year 1 to year 5.
(*Show your working here.*)

1

15. (continued)

Marks

(*b*) Calculate the total construction costs.
(*Show your working here.*)

1

(*c*) After how many years will total construction costs and total ferry costs be equal?
(*Show your working here.*)

2

(*d*) Rock fall from the tunnel roof is expected to be a problem. Give **two** ways in which engineers can solve this problem.

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..... **2**

[*END OF QUESTION PAPER*]

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