OCR
RECOGNISING ACHIEVEMENT

ADVANCED SUBSIDIARY GCE

GEOLOGY

Economic and Environmental Geology

2833/01

WEDNESDAY 21 MAY 2008

Afternoon
Time: 45 minutes

Candidates answer on the question paper
Additional materials (enclosed): None

Additional materials (required):
Electronic calculator
Ruler (cm/mm)

CUP/T38452

Candidate Forename		Candidate Surname	
Centre Number		Candidate Number	

INSTRUCTIONS TO CANDIDATES

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided.

INFORMATION FOR CANDIDATES

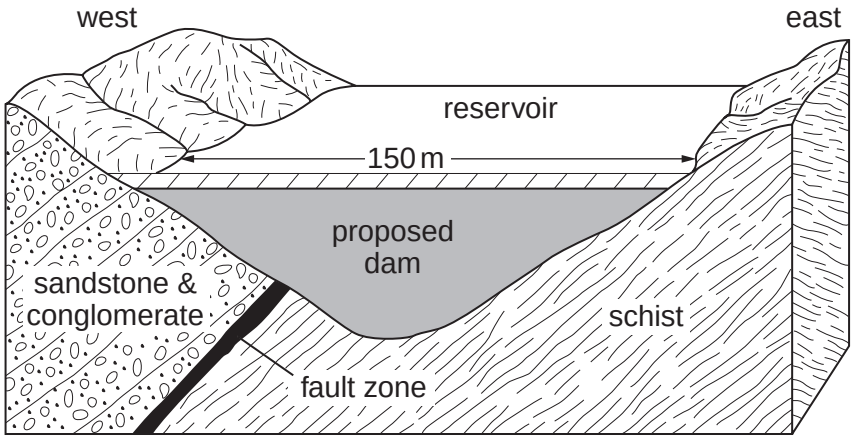
- The number of marks for each question is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **45**.
- You will be awarded marks for the quality of written communication where this is indicated in the question paper.
- You may use an electronic calculator.
- You are advised to show all the steps in any calculation.

FOR EXAMINER'S USE		
Qu.	**Max.**	**Mark**
1	**12**	
2	**12**	
3	**21**	
TOTAL	**45**	

This document consists of **10** printed pages and **2** blank pages.

Answer **all** the questions.

1 **(a)** The block diagram below shows the geology of a site which has been proposed for the construction of a dam and reservoir for water supply.



(i) Describe **two** different geological problems that could affect the stability of the foundations of the dam.

1 .....

.....

2 .....

.....[2]

(ii) State **two** reasons why leakage of water may occur from the reservoir.

.....

.....

.....

.....[2]

(iii) Although the area is usually earthquake free, explain why there are concerns that seismic activity may start as the reservoir fills with water.

.....

.....

.....

.....[2]

(b) Groundwater and springs are also used for water supply.

(i) Draw a fully labelled diagram to show how a spring can occur at an unconformity.

[3]

(ii) Give **one** scientific reason why some people prefer to drink bottled spring water rather than drinking surface water supplied from rivers and reservoirs.

.....

.....[1]

(c) Explain how water resources can be both renewable and sustainable if carefully developed and used.

.....

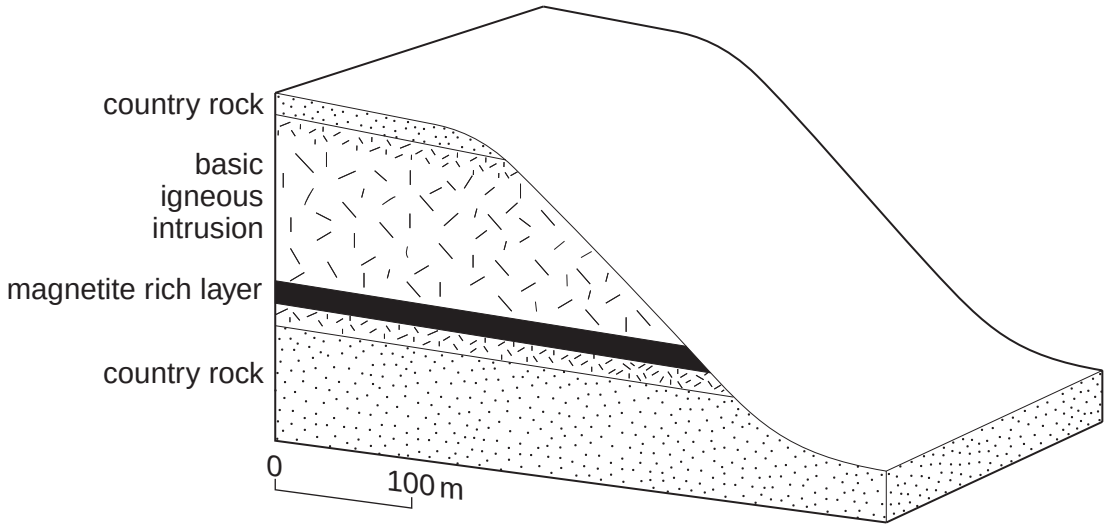
.....

.....

.....[2]

[Total: 12]

2 **(a)** The block diagram below shows the geology of an area which includes a basic igneous intrusion containing an iron ore deposit of magnetite.



(i) Describe the process that concentrated the magnetite in a layer just above the base of the intrusion.

.....

.....

.....

.....[2]

(ii) Describe how a magnetic survey could be carried out to determine the extent of the ore deposit.

.....

.....

.....

.....[2]

(iii) A soil sampling geochemical survey has also been completed. On the diagram above, shade the area where there will be a geochemical anomaly for iron. [1]

(iv) Explain why there is a geochemical anomaly in this area.

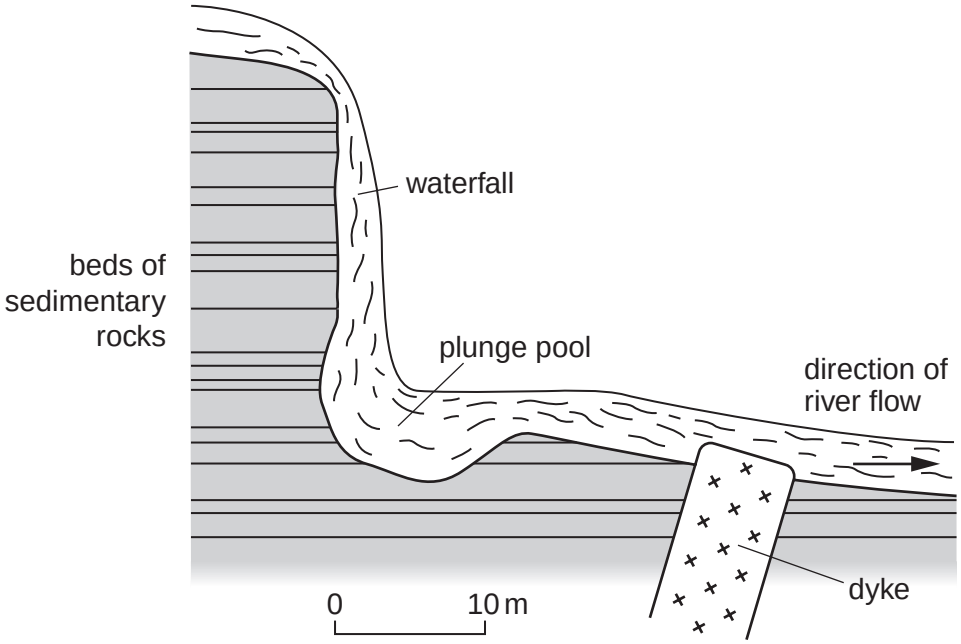
.....

.....

.....

.....[2]

(b) The diagram below shows a cross section through a waterfall.



(i) Shade and label **two** different sites where placer deposits of cassiterite may be found. [2]

(ii) State **one** property of cassiterite that allows it to form placer deposits.

.....

.....[1]

(iii) Describe how placer deposits form.

.....

.....

.....

.....[2]

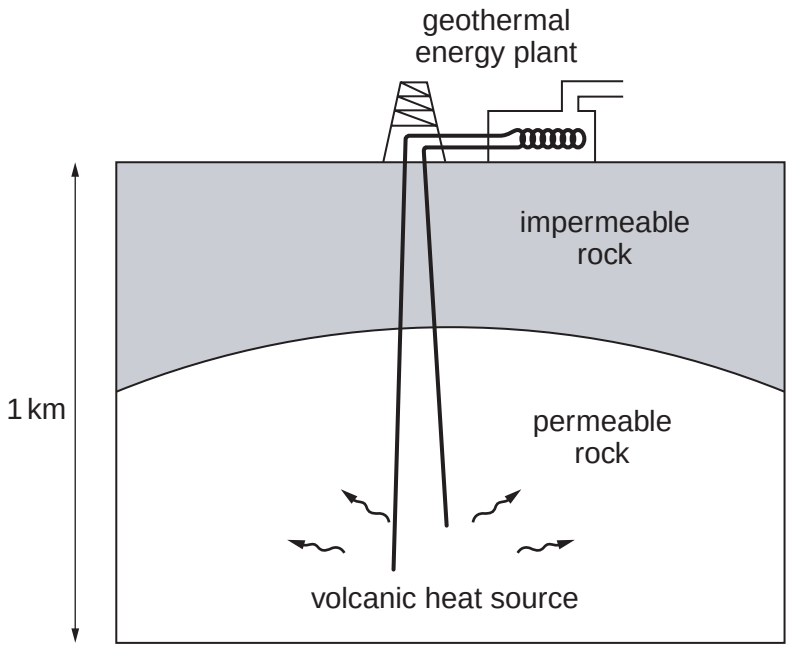
[Total: 12]

3 **(a)** Geothermal energy can be extracted from volcanic sources around the world. In an area of Iceland, geothermal waters at a temperature of 100 °C are found at a depth of 2000 m.

Calculate the geothermal gradient for this area. Give your answer in °C per km. Assume the surface temperature is 0 °C

..... °C / km [1]

(b) The diagram below shows the rocks beneath a geothermal energy plant.



(i) Use the diagram to describe how geothermal energy is extracted from this site.

.....

.....

.....

.....[2]

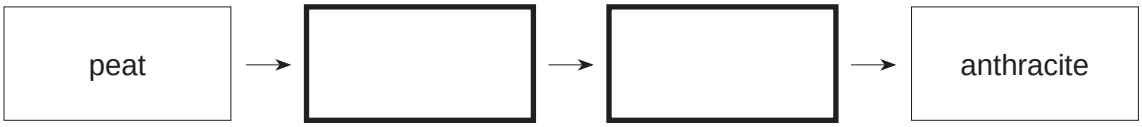
(ii) Suggest **one** problem that may occur in the pipes in the geothermal energy plant.

.....

.....[1]

(c) Coal originates in cyclothems in deltaic sequences.

(i) Complete the flow diagram below to show the coal series of increasing rank.



[2]

(ii) As the rank of the coal increases, its volume reduces. Name and describe the process responsible for this volume reduction.

name .....

description .....

.....[2]

(iii) Describe **two** other properties of coal that change as the rank increases.

.....

.....

.....

.....[2]

(d) The formation of oil and gas deposits requires specific geological conditions.

(i) Describe how oil and gas form in a source rock.

.....

.....

.....

.....[2]

(ii) Define the terms *reservoir rock* and *cap rock*.

reservoir rock .....

.....

cap rock .....

.....[2]

(e) Describe, with the aid of labelled diagrams, **three** different trap structures where oil and gas could accumulate.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....[7]

[Total: 21]

END OF QUESTION PAPER

Optional extension sheet. If you use this lined page to complete an answer to any question, the question number **must** be clearly shown.

BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE

BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE

PLEASE DO NOT WRITE ON THIS PAGE