

**REPUBLIC OF SOUTH AFRICA  
DEPARTMENT OF MINERALS AND ENERGY  
EXAMINATION FOR THE MINE SURVEYORS CERTIFICATE OF COMPETENCY**

DATE: 21 April 2006 (Friday)  
TIME: 12:30 to 14:30 (2 Hours)

TOTAL MARKS: 100  
TO PASS: 50

**GEOLOGY**

Note: (1) Answer all questions

**QUESTION 1**

- 1.1 Draw a section along the line A-B on the attached plan , which must be returned with your answer book.
- 1.2 Give a brief description of the geological history of the area. (20)

**QUESTION 2**

Write short notes on the following Geophysical Prospecting methods :

- 2.1 Gravimetric Surveying  
2.2 Magnetometric Surveying  
2.3 Seismic Methods  
2.4 Radiometric Surveying (10)

**QUESTION 3**

Minerals can be classified by their various properties.  
Complete the attached tabulation to indicate some of these properties. (15)

**QUESTION 4**

- 4.1 Define the “the process of coalification”.  
4.2 Name the four agents of coalification.  
4.3 What is meant by the “rank of coal” ? (8)

**QUESTION 5**

“Hardness” is a Physical Characteristic of a Mineral.  
Define Hardness and discuss (table form) in detail the “Mohs Hardness Scale”. (5)

## QUESTION 6

There are three agents that bring about Metamorphism :

- 6.1 Name the three agents.
- 6.2 Name and discuss the three types of Metamorphism. (12)
- 6.3 List six metamorphic rocks.

## QUESTION 7

Igneous Rocks can be divided into five family groups.

- 7.1 Name the five family groups.
- 7.2 Give a South African example where each of these family groups occur. (10)

## QUESTION 8

When confined and subjected to immense forces that slowly build up , rocks can be folded. Name ten (10) types of folding that can occur in strata. (5)

## QUESTION 9

Define or describe the following terms :

- 9.1 Calorific value (c.v.) and give it's unit of measurement.
- 9.2 Moisture content.
- 9.3 Streak of a mineral.
- 9.4 Lustre of a mineral. (5)
- 9.5 Normal fault.

## QUESTION 10

Discuss copper in South Africa with reference to the following:

- 10.1 Uses and properties.
- 10.2 Main copper ore minerals. (10)
- 10.3 The location of major copper deposits.

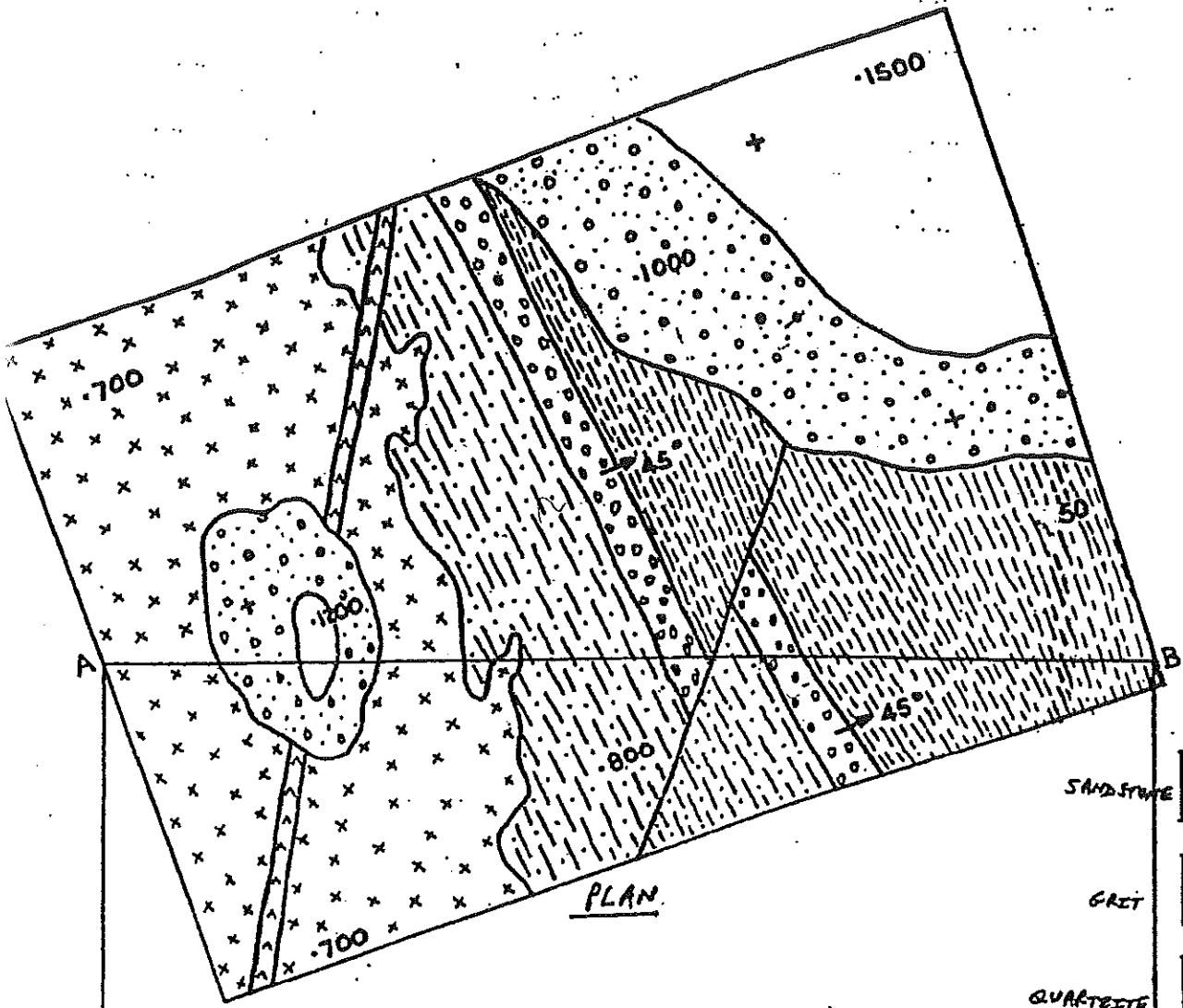
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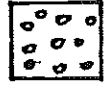
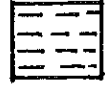

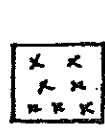
QUESTION 3

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EXAM NO.

MINERAL					
Physical Properties	Bornite	Apatite	Magnetite	Graphite	Gold
Crystal System					
Streak					
Lustre					
Fracture					
Density					
Uses					



- SANDSTONE 
- GRAIT 
- QUARTZITE 
- CONGLOMERATE 
- SHALE 
- SOLERITE 
- GRANITE 

1400  
1200  
1000  
800  
600  
400  
200  
SL.

ELEVATIONS ABOVE  
SEA LEVEL

SECTION ON A-B