

**REPUBLIC OF SOUTH AFRICA  
DEPARTMENT OF MINERAL RESOURCES  
EXAMINATION FOR THE MINE SURVEYORS CERTIFICATE OF COMPETENCY**

DATE: 16 April 2010 (Friday)  
TIME: 12:30 to 14:30 (2 Hours)

TOTAL MARKS: 100  
TO PASS: 50

**GEOLOGY**

**Note:** (1) Answer all questions

**QUESTION 1**

The attached plan, on 10 level horizon, shows fault X which has displaced a reef.  
The direction of movement on fault X is shown on the plan.  
Graphically determine (in metres) the amount of:

- a) True movement.
- b) The vertical component of movement.
- c) The horizontal component of movement. (20)

**QUESTION 2**

Regarding the formation of economic deposits name five (5) deposits formed by mechanical concentration. Discuss each deposit (Placer) giving an example associated with each. (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"?. (5)

**QUESTION 5**

"Hardness" is a Physical Characteristic of a Mineral.  
Define Hardness and discuss (table form) in detail the "Mohs Scale of Hardness". (10)

### QUESTION 6

South Africa is divided into a number of Stratigraphic sub-divisions.  
The rocks in the Swazian are placed in several sequences and groups.

6.1 Name and briefly discuss the three Swazian Sequences.

6.2 Name the groups in the Swazian. (10)

### QUESTION 7

7.1 Explain what is meant by “Denudation of the earth’s crust”.

7.2 Describe fully the agents which are responsible for the denudation of the earth’s crust considering both the mechanical and the chemical processes. (10)

### QUESTION 8

8.1 When confined and subjected to immense forces that slowly build up, rocks can be folded. Name five types of folding that can occur in strata.

8.2 Name five different types of coal. (5)

### QUESTION 9

Define or describe the following terms:

9.1 Calorific value (CV) and give it’s unit of measurement.

9.2 Moisture content.

9.3 Streak of a mineral.

9.4 Lustre of a mineral.

9.5 Normal fault. (5)

### QUESTION 10

Discuss “Tin” in South Africa with reference to the following:  
uses, properties and location of tin deposits. (10)

**TOTAL 100**

**QUESTION 3**

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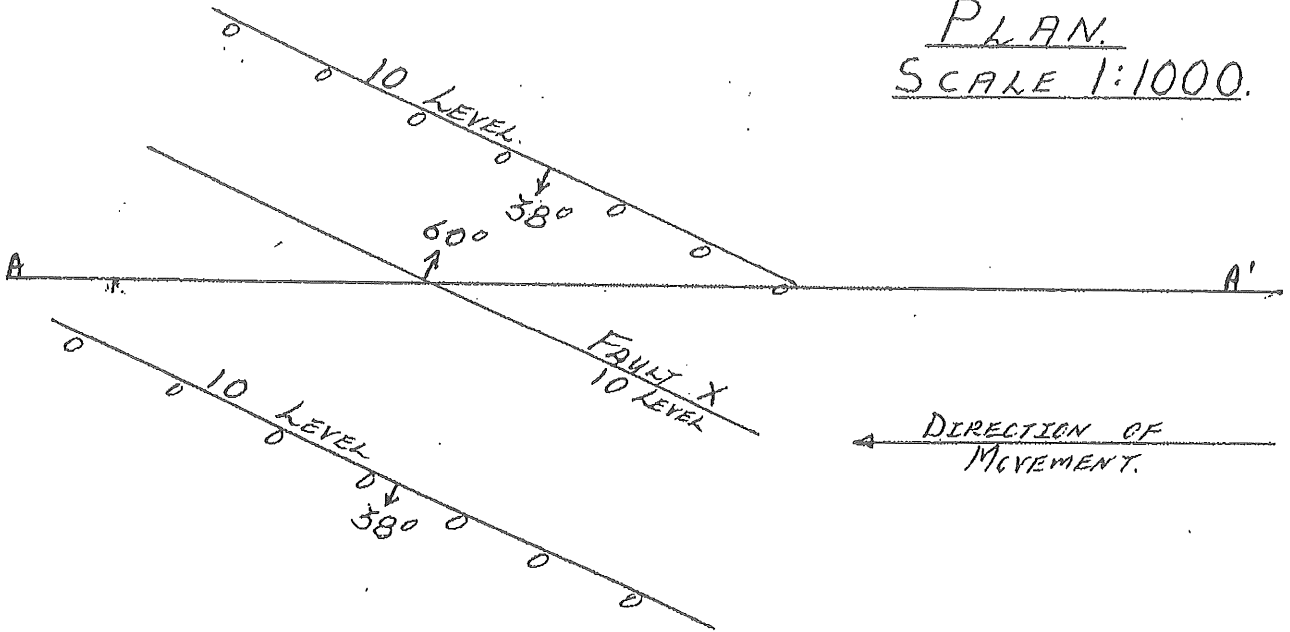
	<b>MINERAL</b>				
<b>Physical Properties</b>	<b>Diamond</b>	<b>Gold</b>	<b>Gypsum</b>	<b>Quartz</b>	<b>Magnetite</b>
<b>Crystal system</b>					
<b>Colour</b>					
<b>Lustre</b>					
<b>Density</b>					
<b>Use</b>					
<b>Common South-African occurrence</b>					

QUESTION 4

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PLAN.  
SCALE 1:1000.



10' LEV ELEV

11' LEV ELEV

SECTION A-A' ON DIRECTION OF MOVEMENT