

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

DATE: 15<sup>th</sup> April 2005 (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**

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**

There are three agents that bring about metamorphism:

- 4.1 Name the three agents.
- 4.2 Name and discuss the three types of metamorphism.
- 4.3 List six (6) metamorphic rocks. (12)

### QUESTION 5

Give the relative densities of the following minerals:

Gold, Pyrite, Galena, Limonite, Quartz and Copper. (6)

### QUESTION 6

Discuss volcanic eruptions under the following headings:

- 6.1 Describe how a volcano is formed.
- 6.2 Types of volcanic eruptions (name and discuss).
- 6.3 Products produced from a volcanic eruption.
- 6.4 Some famous eruptions that have occurred. (12)

### QUESTION 7

Name the five family groups into which igneous rocks can be divided. (5)

### QUESTION 8

Define and discuss the coalification process. (5)

### QUESTION 9

In regards to the physical characteristics of a mineral, define or describe the following terms:

- 9.1 Tenacity
- 9.2 Brittle
- 9.3 Flexible
- 9.4 Fusibility
- 9.5 Malleable (5)

### QUESTION 10

Discuss "Diamonds" in South Africa with reference to the following:

- 10.1 uses
- 10.2 location
- 10.3 types of deposit. (10)

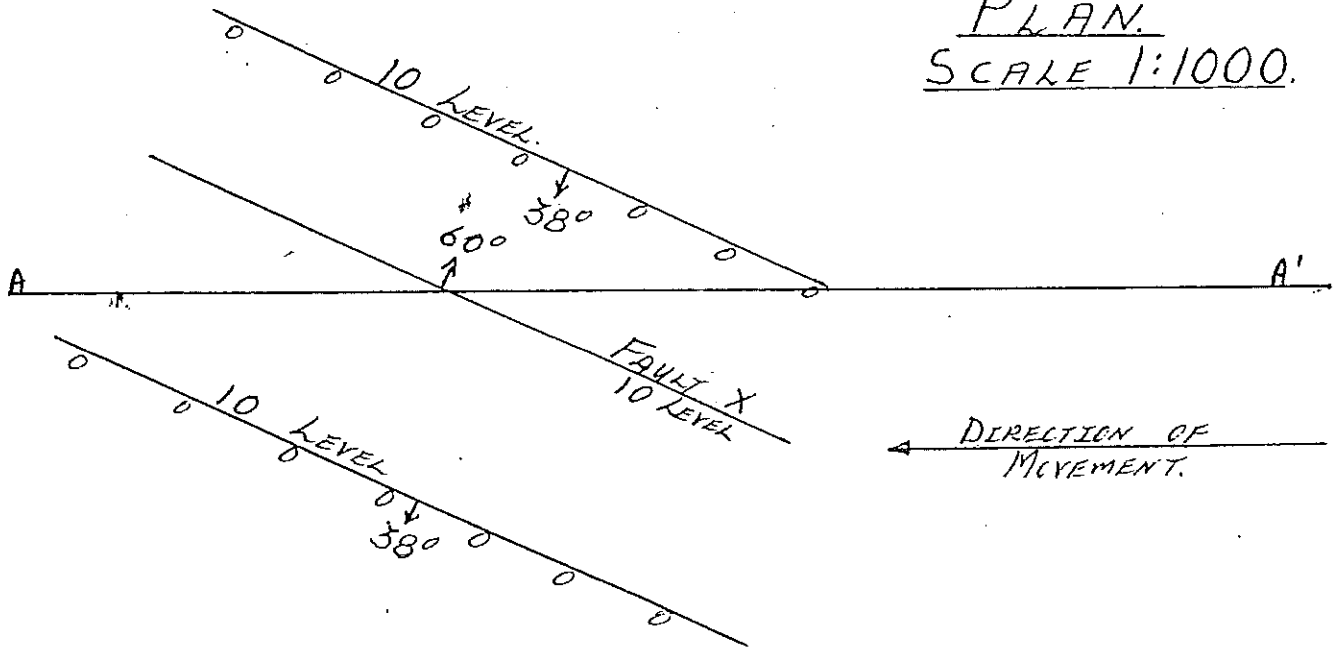
TOTAL 100

QUESTION 1

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EXAM NO.

PLAN.  
SCALE 1:1000.



10 LEV ELEV

11 LEV ELEV

SECTION A-A' ON DIRECTION OF MOVEMENT

QUESTION 3

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EXAM NO.

MINERAL					
Physical Properties	Graphite	Cuprite	Cassiterite	Calcite	Malachite
<i>Crystal System</i>					
<i>Streak</i>					
<i>Lustre</i>					
<i>Fracture</i>					
<i>Cleavage</i>					
<i>Hardness</i>					

(15)