

## Critical Thinking – Relative and Absolute Dating

Your Name \_\_\_\_\_

The figure shows a section of crust consisting of a complex geologic history. Sedimentary, metamorphic, and igneous rocks are all present as well as faulting, intrusions, and unconformities.

Your job is to derive a complete geologic history of this region using a combination of relative and absolute dating. The rock types are defined using various symbols that are explained in the legend. The data table provides you with the half-life and the measured ratio of daughter to parent isotopes in a number of samples. The numerical ages you calculate can be assigned to geologic events, and they provide a framework for estimating the timing of other events that are recognized using relative dating. We will assume the following relationship holds true for all the samples in this problem.

$$\text{AGE} = \text{Measured Ratio} \times 1/\lambda$$

$$\lambda = 0.69 / \text{half-life}$$

Once you have calculated the ages of samples A-H, construct a history of geologic events, and assign them to their proper geologic periods, in historical order (youngest on top, oldest on bottom of your list). You will have to estimate the age of some events, but that is the nature of critical thinking. Be sure you have a reason for each of your estimates. There may be some geologic events that are not obvious to see, but must exist in order to provide a complete history.

