Geophysics 4133
Introduction to Geophysical Methods
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Name: _____

For each of the following problems neatly show all steps of your work (partial credit may be given if your work can be easily followed). Clearly indicate your final answers and answer all parts of the question including the 'describe' and 'why' questions.

1. For sample #1: *(20 pt.)*

   a) Describe the sample in a few sentences. Type, makeup, homogeneity, mineraology, petrology, etc.

   b) Would this sample be more or less dense than average upper crust? Would gravity be a useful method to locate this rock in such average upper crust? Why or why not?

   c) Would the minerals in the rock likely produce a strong magnetic susceptibility signature? Why or why not?

   d) Would seismic be a useful method to locate this type of rock if embedded in a surrounding structure? Why or why not?

2. For sample #2: *(20 pt.)*

a) Describe the sample in a few sentences. Type, makeup, homogeneity, mineraology, petrology, etc.

b) Would this sample be more or less dense than average upper crust? Would gravity be a useful method to locate this rock in such average upper crust? Why or why not?

c) Would the minerals in the rock likely produce a strong magnetic susceptibility signature? Why or why not?

d) Would seismic be a useful method to locate this type of rock if embedded in a surrounding structure? Why or why not?

3. For sample #3: *(20 pt.)*

a) Describe the sample in a few sentences. Type, makeup, homogeneity, mineraology, petrology, etc.

b) Would this sample be more or less dense than average upper crust? Would gravity be a useful method to locate this rock in such average upper crust? Why or why not?

c) Would the minerals in the rock likely produce a strong magnetic susceptibility signature? Why or why not?

d) Would seismic be a useful method to locate this type of rock if embedded in a surrounding structure? Why or why not?

4. For sample #4: *(20 pt.)*

   a) Describe the sample in a few sentences. Type, makeup, homogeneity, mineraology, petrology, etc.

   b) Would this sample be more or less dense than average upper crust? Would gravity be a useful method to locate this rock in such average upper crust? Why or why not?

   c) Would the minerals in the rock likely produce a strong magnetic susceptibility signature? Why or why not?

   d) Would seismic be a useful method to locate this type of rock if embedded in a surrounding structure? Why or why not?

5. Consider a region where sandstone has been faulted up and is exposed next to the granite basement. *(9 pt.)*

   a) What physical property constrasts are evident at this contact?

   b) What geophysical methods would you use to detect this contact? Why?

   c) What geophysical methods would likely not be useful? Why?

6. You are traversing a region of granitic basment and notice mafic dikes cutting the section. Interested in locating the dikes and determining their orientation you decide to design a geophysical survey. *(9 pt.)*

   a) What physical property constrasts are evident at this contact?

   b) What geophysical methods would you use to detect this contact? Why?

   c) What geophysical methods would likely not be useful? Why?

7. Which geophysical method are you most interested in learning about? Why? *(2 pt.)*