

CHUKA

UNIVERSITY



UNIVERSITY EXAMINATIONS

SECOND YEAR EXAMINATION FOR THE AWARD OF DEGREE
OF BACHELOR OF DEGREE IN PHYSICS

GPHY224: GEOPHYSICS PRACTICAL IV

STREAMS: GPHY224

TIME :2 HOURS

DAY/DATE: DAY DATE TIME

INSTRUCTIONS: Answer all questions

QUESTION ONE (20marks)

- a. Is glass a mineral? Frame your answer in terms of the criteria used to define a mineral.
[5marks]
- b. What 'special' physical properties are used to identify and classify a mineral?
[3marks]
- c. Why is colour a poor criteria for the recognition of most minerals [2marks]
- d. Do all minerals with metallic luster look like shiny metal? Comment in detail.
[2marks]
- e. What is streak? Would streak be a useful physical property in the identification of hard minerals such as diamond? Explain your answer in detail [2marks]
- f. What is specific gravity? Minerals with what type of luster will tend to have a higher specific gravity? [2marks]
- g. What Moh's minerals are softer than a natural fingernail? [2marks]
- h. Quartz has a very simple chemical formula (SiO_2) and yet has about 120 known varieties. Why? [2marks]

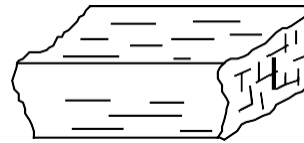
QUESTION TWO (20marks)

- a. Describe the difference between cleavage and crystal form as a physical property that can be used to identify a mineral. [2marks]
- b. Comment on the validity of the following statement “When breaking a crystal with a hammer the resulting fragments will have the same shape as the original crystal.” [2marks]
- c. The presence of cleavage in a mineral indicates what about the nature of chemical bonding at the atomic scale within a mineral? [2marks]
- d. Describe the difference in the physical appearance of a cleavage versus a fracture surface. [2marks]
- e. Identify the types of mineral cleavage fragments and give an example [12marks]

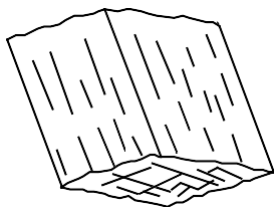
i)



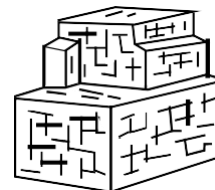
ii)



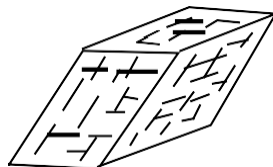
iii)



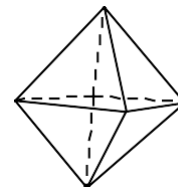
iv)



v)



vi)



QUESTION THREE (20 marks)

- a. Name two analytical Equipment for Identifying Minerals. [2 marks]
- b. What are the basic components of a polarized light microscope (PLM)? [3marks]
- c. Name three types of evidence that could be examined with the PLM. [3marks]
- d. What types of evidence would not be examined with the PLM? Why? [2marks]
- e. Explain plane polarized light. [2marks]
- f. What is isotropic? Give examples [2marks]
- g. Giving relevant examples define anisotropic material. [2marks]
- h. What is birefringence? [1mark]
- i. What is pleochroism? [1mark]
- j. Name the mineral classes that the following belong [2marks]
 - i. Calcite and fluorite
 - ii. Muscovite and biotite