

FEDERAL UNIVERSITY OF TECHNOLOGY, DWERRI  
SCHOOL OF AGRICULTURE AND AGRICULTURAL TECHNOLOGY  
DEPARTMENT OF SOIL SCIENCE AND TECHNOLOGY  
2010/2011 RAIN SEMESTER EXAMINATION  
COURSE NO. SST 506- SOIL FERTILITY AND ORGANIC MATTER  
TIME ALLOWED: 3 HOURS

INSTRUCTIONS: ANSWER THREE (3) QUESTIONS FROM SECTION A AND 2 (TWO) QUESTIONS FROM SECTION B

SECTION A

1. Organic matters is very important in the fertility stage of  
a) tropical fragile soils, but the nitrogen content of that organic matter is more important, Discuss.
- b. Soil organic carbon content is a linear function of the amount of crop residues added to soils, yet we know that "In the tropics men live as long as their humus".

Discuss fully, what in your opinion is responsible for this contradiction.

- 2a) What are the agricultural and industrial importance of Humic acids in soil science studies?
- b) Briefly discuss the types of humic matter you know of.
- c) Define "Humic substances" and "Humic compounds".
- 3) The higher acidity of fulvic acid in comparison to humic acid is attributed to higher carboxyl content of the former (fulvic acid). Could you contrast and compare the carboxyl and total acidity in both fulvic and humic acids and how these differences affect their performance in the soil.
4. Discuss fully the importance of soil fertility and factors that determine qualitative and quantitative yield of plant production and status of soil fertility,

## SECTION B

- 1a) What is Soil Fertility?
- b) Explain fully the basic requirements needed by crops for better growth.
- 2a) Explain fully what you understand by "The law of the minimum" and how it is important in soil science studies.
- b) Classify with examples, the nutrients required by plants, their functions and deficiency symptoms in the plant by such nutrients.
- 3a) With specific examples, describe the concept of liming and how soil reaction (pH) will affect the absorption of nutrients from the soil.
- b) The importance of Legumes in the maintenance of soil fertility cannot be over emphasised. Discuss