FEDERAL UNIVERSITY OF TECHNOLOGY, OWERRI

DEPARTMENT OF SOIL SCIENCE AND TECHNOLOGY

2014/2015 HAMATTAN SEMESTER FOR SST 409 (PLANT NUTRITION MANAGEMENT) TIME: 3HRS

INSTRUCTION: ANSWER **FIVE QUESTIONS** WITH AT LEAST **ONE QUESTION** FROM EACH SECTION

SECTION A

1a. Define the following (i) Plant nutrition (ii) Liebig's Law (iii) Critical Nutrient Range (iv) Fertilizer Efficiency

1b. Briefly explain the term "appropriate nutrient management"

1c.The growth of a plant is a function of genetic and environmental factors. Discuss.

2a. Explain the conditions a nutrient must satisfy to be deemed essential

2b. With the aid of a diagram, explain yield response of a plant to applied nutrient

2c. Discuss the factors which influence and determine the nutrient rates required by plants

SECTION B.

3a. Soil samples collected 2 mm and 100 mm away from the root zone of the same plant were subjected to routine analyses by a soil science student. Laboratory results showed that the soils had different physico-chemical properties. Discuss.

3b. Discuss in detail the mechanism of Mg^{2+} uptake in plants.

4a. Discuss in detail with examples nutrient interactions in plants

4b. Write short note on the functions of nitrogen, phosphorus and potassium in plants.

SECTION C

5a. What do you understand by the terms "crop root zone" and "soil moisture balance"?

5b. Discuss five irrigation methods that could improve crop productivity

6a. State five advantages and disadvantages of fertigation over fertilization methods

6b. Discuss in full the methods of fertigation.

6c. What does effective nutrient management plain entails with respect to soil fertility restoration?