

**NATIONAL UNIVERSITY OF LESOTHO**

**BSc. SUPPLEMENTARY EXAMINATIONS**

**PG349: SOIL FERTILITY AND FERTILIZERS**

**JULY 2009**

**MARKS:100**

**TIME:3HRS**

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**INSTRUCTIONS:**

**Where possible illustrate your answer with diagrams/equations.**

### **Question 1**

Many developing countries including Lesotho do not produce enough food to feed their populations. Discuss why this is so. (25)

### **Question 2**

Discuss N,P,K and S as essential elements. Your discussion should include the forms in which they are available to plants, their functions and deficiency symptoms associated with them. (25)

### **Question 3**

Your field is located on the Leribe series, which is highly weathered soil in Lesotho. You are asked to make a phosphorus fertilizer recommendation, in terms of type of fertilizer (find powder or granules), method of application, time and frequency of application. Discuss. (25)

### **Question 4.**

Discuss the nitrification process. (25)

### **Question 5.**

Discuss the three methods by which plants nutrients reach plant roots. (25)

### **Question 6.**

- (a) Describe how the processes of mineralization and immobilization help to regulate the ammonium ion concentration in soils. (15)
- (b) Assume that microbes during the decomposition of organic matter use Carbon and Nitrogen in the ration of 8:1 and 35% Carbon is used. Would the incorporation of 2 000kg/ha of plant residue containing 45% C and 075%N result in net mineralization? Explain the implications of your answer. (10)