Uganda Martyrs University

Faculty of Agriculture

Semester I Final Assessment: 2015/2016

B. Agriculture 1

Course Unit: SOIL FERTILITY AND PLANT NUTRITION

Time: 9:30 am – 12:30 pm

Date: Thursday, 03rd December, 2015

Instructions:

- *Please read the instructions carefully before answering the questions.*
- *Answer **Four (4) questions**. All answers should be precise and clear.*

1. a) What is **soil fertility** and how is it measured?

   b) What is the difference between **soil fertility** and **soil productivity** and how is the later measured?

   c) Giving advantages and disadvantages for each, describe 2 methods that a farmer can use to assess soil fertility on his land.

   d) For an element to be considered **essential for plant growth and development** it must meet three criteria; name the three criteria.

e) **In terms of figures**, what is the main difference between **primary macronutrients, secondary macronutrients**, and **micronutrients**?

2. a) Describe **4 ways** through which plant nutrients are made available to crops in the soil and **4 major** processes through which they are lost from the soil.

   b) In view of your answers in a), suggest **4 possible ways** a farmer can use to sustain soil fertility as he cultivates his land every season.

   c) What does the phrase 'integrated soil fertility management, (ISFM)' mean and what does it involve?

3. The earth's atmosphere contains **78% nitrogen**, making it the largest pool of nitrogen on earth. However this large pool of nitrogen is not available for biological use, leading to scarcity of **usable nitrogen** in many ecosystems.

   a) Using a diagram, explain clearly why this large pool of nitrogen in the earth's atmosphere is not available for biological use.