



The Open University of Sri Lanka

Faculty of Engineering Technology

Industrial Studies (Agriculture) & Technology (Agricultural Engineering)

Program of Study

Final Examination – 2014/2015

AEX3232/AEX4240 Plant & Soil Science

Date : 05/09/2015  
 Time : 09.30 a.m. – 12.30 p.m.  
 Duration : Three (03) hours

Registration number: .....

**Section 02 – Answer any four (04) out of the six (06) questions. You may use answer books and/or sheets to answer this section.**

- 1) Define the term “Rock Weathering” and explain how water and temperature cause physical weathering of rocks.
- 2) What is “Humification”? Explain how humification affects chemical properties of soil.
- 3) a) Define the terms “Saline Soil” and “Sodic Soil”.  
 b) Discuss the practices used to control soil salinity.
- 4) a) A low-fertile field with an area of 1 ha requires following nutrients for soy bean cultivation: N-73 kg, P<sub>2</sub>O<sub>5</sub>-56 kg, K<sub>2</sub>O-62 kg, and S-60 kg. Calculate how much urea, triple super phosphate (TSP), muriate of potash (MOP), and CaSO<sub>4</sub> a farmer should add in order to fulfil the nutrient requirements for soybean. (Contents of N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O, and S in urea, TSP, MOP, and CaSO<sub>4</sub> are 46%, 45%, 60%, and 17%, respectively.)  
 b) If the farmer decides to replace CaSO<sub>4</sub> with (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>, calculate the following:
  - the amount of (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> he should add to fulfil the S requirement
  - the amount of urea he should add to fulfill the N requirement
 {Note that (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> has 21% N and 24% S}
- c) Briefly state the constraints associated with the application of (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> on to soil.
- 5) Discuss the different phases of organic matter decomposition.
- 6) The C:N ratios of clover and straw residues are 12:1 and 80:1, respectively. Which crop residue is best suited as an organic matter for a N-deficient soil? Justify your answer.