



KRM 502: SOIL FERTILITY AND EVALUATION

TIME: 9.00 a.m. – 12.00 p.m.

1.
 - a) Differentiate between
 - i) Nitrogen fixation and phosphorus fixation (3 marks)
 - ii) Essential and beneficial elements (2 marks)
 - iii) Deficient and Insufficient nutrient status (2 marks)
 - b) Describe the fate of applied P-fertilizer in both acidic and calcareous soils (4 marks)
 - c) Explain five (5) environmental factors affecting plant growth (5 marks)
 - d) State the soil and environmental conditions under which sulfur deficiencies are most likely to occur in the field (5 marks)
 - e) Explain the concept of ISFM and its importance in smallholder agriculture (5 marks)
 - f) What practices would you take to maximize N₂ assimilation by rhizobium bacteria in soil? (4 marks)
2. Discuss the factors affecting nitrification of NH₄⁺ -N in soils. (10 marks)

3. Using chemical equations, explain the role of liming materials (CaCO_3 / CaO) added to the soil in ameliorating agricultural land (10 marks)
4. Briefly discuss appropriate soil fertility replenishment strategies available for smallholder farmers in Central Kenya. (10 marks)
5. a) Why is soil testing important? (3 marks)
- b) What are the disadvantages of bulk blending of fertilizers (2 marks)
- c) Discuss the factors you would consider in deciding the rate of fertilizer application for a maize crop (5 marks)