



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2010/2011

INSTITUTIONAL BASED PROGRAMME (IBP) DECEMBER SESSION

EXAMINATION FOR THE DEGREE OF MASTER OF SCIENCE IN INTEGRATED SOIL FERTILITY MANAGEMENT (ISFM)

KRM 500: SOIL GENESIS AND CLASSIFICATION

DATE: Wednesday, 27th April, 2011

TIME: 2.00p.m. – 5.00p.m.

INSTRUCTIONS:

Answer Question **ONE** and any other **THREE** questions.

1. (a) Differentiate between
 - (i) The term rock and the term mineral. (4 Marks)
 - (ii) Weathering and soil formation. (4 Marks)
 - (iii) Land capability classification and land suitability evaluation. (4 Marks)
- (b) Describe the major characteristics of the master soil horizons. (4 Marks)
- (c) (i) What is isomorphous substitution? (2 Marks)
 - (ii) What are the principles on which the identification of vermiculite and montmorillonite are based? (6 Marks)
- (d) Identify two *Soil Reference Groups* in The World Reference Base for Soil resources whose formation were conditioned by
 - (i) Parent material
 - (ii) Topography/relief
 - (iii) Climate. (6 Marks)

2. (a) State 4 reasons why soil classification is important. (4 Marks)
- (b) Explain how the following horizons form in soil
- (i) Mollic horizon
- (ii) Albic horizon (6 Marks)
3. (a) Give a detailed account of weathering processes that take place below and within the soil solum. (6 Marks)
- (b) Using relevant examples, explain the difference between primary minerals and secondary minerals. (4 Marks)
4. Discuss briefly the nature of the pedogenic processes that are operating in the following four major soil orders – Ultisols, Inceptisols, Aridisols, and Entisols order. (8 Marks)
- (a) What are the major uses of each soil order? (2 Marks)
5. Discuss the role of climate as one of the factors of soil formation. (10 Marks)