



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND
TECHNOLOGY**

SCHOOL OF AGRICULTURAL AND FOOD SCIENCES

**SECOND YEAR FIRST SEMESTER UNIVERSITY EXAMINATION FOR
THE DEGREE OF BACHELOR OF SCIENCE IN SOIL SCIENCE**

2016/2017 ACADEMIC YEAR

REGULAR

COURSE CODE: ALS 3212

COURSE TITLE: Soil Genesis and Morphology

EXAM VENUE:

STREAMS: BSc. Soil Science

DATE:

EXAM SESSION:

TIME: 2 HOURS

Instructions:

- 1. Answer ALL questions in section A and ANY other 2 Questions in section B.**
- 2. Candidates are advised not to write on question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

SECTION A [30 MARKS]

Answer ALL questions from this Section.

1. What are the FOUR basic functions of agricultural soils? **(4 Marks)**

2.
 - a) Explain the process of biological weathering. **(3 Marks)**

 - b) Using the appropriate mineral reactions, outline the processes that take place during chemical weathering in;
 - i. Alkaline environment **(3 Marks)**
 - ii. Acid environment **(3 Marks)**

3. Give the morphological characteristic for each of the following horizon designations
 - a) Cmq **(1 Mark)**
 - b) Bts **(1 Mark)**
 - c) Ahp **(1 Mark)**
 - d) Bwy **(1 Mark)**
 - e) Cwr **(1 Mark)**

4. Define each of the following processes as used in soil formation
 - a) Laterization **(2 Marks)**
 - b) Salinization **(2 Marks)**
 - c) Calcification **(2 Marks)**

5. Discuss the following processes of horizon development.
 - a) Swelling and shrinking processes **(3 Marks)**
 - b) Oxido-reduction processes **(3 Marks)**

SECTION B [40 MARKS]

Answer ANY TWO questions from this Section.

6.
 - a) Discuss FIVE factors influencing soil formation. **(10 Marks)**
 - b) Discuss the processes which led to the formation of each of the following groups of soils **(10 Marks)**
 - i. Gleysols in alluvial lowlands
 - ii. Vertisols developed from smectites

7. Give a descriptive overview of each of the following diagnostic horizons.
 - a) Cambic horizon **(5 Marks)**
 - b) Mollic horizon **(5 Marks)**
 - c) Chernic horizon **(5 Marks)**
 - d) Vertic horizon **(5 Marks)**

8. Discuss TWO World Reference Base (WRB) soil groups in each of the following categories.
 - a) Soils conditioned by Parent Material **(10 Marks)**
 - b) Soils conditioned by Topography **(10 Marks)**