MACHAKOS UNIVERSITY

University Examinations for 2018/2019 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

SECOND YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

AEN 112 FARM STRUCTURES

DATE: 22/7/2019 **TIME: 2.00-4.00 PM**

INSTRUCTIONS;

*Answer **ALL** questions in **SECTION A** and any other **TWO** questions in **SECTION B***

SECTION A (Total 30marks)

QUESTION ONE

a) Differentiate between the following terms;

(i) Slump test and silt test (4 marks)

(ii) Tender and contract (4 marks)

(iii) Farm plan and farmstead (4 marks)

(iv) Zone planning and factor of safety (4 marks)

b) List four soil stabilizers common in use (4 marks)

c) A 10m by 15m by 40mm floor slab of a milking parlour unit is to be constructed. The slab is to be made of concrete with a nominal mix ratio of 1:3:6 by volume. Calculate (i) water/cement ratio and (ii) Aggregate/cement ratio, assuming the following conditions;

(i) Shrinkage and waste allowance of 20% and 10% respectively

(ii) Moisture content of sand 3%

(iii) Moisture content of ballast 2%

(iv) Litres of water added 80

(v) Density of water, sand and ballast is 1000kgm^{-3}, 1400kgm^{-3} and 1600kgm^{-3} respectively

(vi) 50kg of cement is equivalent to 37Litres (10 marks)

SECTION B (Total 40marks for any TWO questions)

QUESTION TWO

a) Explain any six methods for;

(i) Improving the soil bearing capacity (6 marks)

(ii) Preserving and protecting the steel from rusting and corrosion (6 marks)

b) List three methods applied in wood preservation (3 marks)

c) Explain three methods applied in the farmstead planning (5 marks)

QUESTION THREE

List five functional design requirements for each of the following structures;

a) Poultry house (5 marks)

b) Grain store (5 marks)

c) Farm workshop (5 marks)

d) Milking parlour (5 marks)

QUESTION FOUR

a) Highlight four factors considered in comprehensive economic planning (4 marks)

b) Explain five factors considered in the selection of building materials (5 marks)

c) State five merits why soil remains an essential building material (5 marks)

d) Indicate three ways in which particle density is different from bulk density (6 marks)