

# 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

AEN 112 PARM STRUCTURES

## **INSTRUCTIONS**;

DATE: 22/7/2019

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)

TIME: 2.00-4.00 PM

(ii) Tender and contract

(4 marks)

(iii) Farm plan and farmstead

(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<sup>-3</sup>, 1400kgm<sup>-3</sup> and 1600kgm<sup>-3</sup> 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)