



MACHAKOS UNIVERSITY

University Examinations for 2018/2019 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

FIRST/ SECOND YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR
BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

AEN 112 FARM STRUCTURES

AGN 373 FARM STRUCTURES

DATE: 24/9/2019

TIME: 8.30-10.30 AM

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)