



MACHAKOS UNIVERSITY

University Examinations for 2016/2017

SCHOOL OF AGRICULTURE AND NATURAL RESOURCES MANAGEMENT

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

FIRST YEAR SECOND SEMESTER EXAMINATION FOR BACHELOR OF SCIENCE
IN AGRICULTURAL EDUCATION AND EXTENSION

AEN 112: FARM STRUCTURES

DATE: 2/6/2017

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 (COMPULSORY) (30 MARKS)

- 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 (20 MARKS)

- 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 (20 MARKS)

- a) List five functional design requirements for each of the following structures;
 - i. Poultry house (5 marks)
 - ii. Grain store (5 marks)
 - iii. Farm workshop (5 marks)
 - iv. Milking parlour (5 marks)

QUESTION FOUR (20 MARKS)

- 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)