MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRIBUSINESS MANAGEMENT AND TRADE

FIRST YEAR SPECIAL/ SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

AEN 112/AGN373: FARM STRUCTURES

DATE: 22/01/2021 **TIME: 8.30-10.30 AM**

INSTRUCTIONS;

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

SECTION A: COMPULSORY

SECTION A (30 MARKS)

QUESTION ONE

a) Differentiate between the following terms;

i. Particle density and bulk density (4 marks)

ii. Slump test and silt test (4 marks)

iii. Tender and contract (4 marks)

iv. Farm plan and farmstead (4 marks)

b) Using examples outline any three reasons why farm structures are important in any agricultural production process. (6 marks)

c) Assume a 1:3:5 cement- sand- stone concrete mix by volume using naturally moist aggregates and adding 62 litres of water. Two bag of cement are used and take the following additional assumptions:

i. Moisture content of sand: 4%

ii. Moisture content of stones: 1.5%

iii. Bulk density of the sand: 1400 kg/m³

iv. Bulk density of the stones: 1600 kg/m³

v. Solid density of aggregate materials: 2650 kg/m³

vi. Solid density of cement: 3100 kg/m³

vii. Density of water: 1000 kg/m³

Calculate the following:

i. water- cement ratio (3 marks)

ii. cement - aggregate ratio (3 marks)

iii. solid volume (4 marks)

SECTION B: ANSWER ANT TWO QUESTIONS (40 MARKS)

QUESTION TWO (20 MARKS)

a) In respect to the following structures, describe any five functional design requirements

i. Milking parlour (5 marks)

ii. Grain store (5 marks)

iii. Farm workshop (5 marks)

b) A five strand barbed wire fence has been planned for a 4ha rectangular plot. Compute the number of posts required if the spacing between the posts is 10m (5 marks)

QUESTION THREE (20 MARKS)

a) Discuss main forces that act on a farm structure and give their cardinal characteristics (6 marks)

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

c) Explain five advantages of soil as a building material (5 marks)

d) Describe three methods used in planning of a new farmstead (4 marks)

QUESTION FOUR (20 MARKS)

a) Explain three methods used for carrying out the following:

i. Improving the soil bearing capacity (6 marks)

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

iii. Applying wood preservatives (6 marks)

b) Define Bill of Quantities (BQ) in relation to building production (2 marks)

QUESTION FIVE (20 MARKS)

a) Explain any three (3) desirable characteristics of hardwood and softwood as agricultural building materials (any 3 pairs) (6 marks)

b) With the aid of a sketch describe the herringbone milking parlour (6 marks)

c) Describe how to make concrete building blocks outlining the materials, tools, equipment and skills required. (8 marks)