



MACHAKOS UNIVERSITY

University Examinations 2023/2024

SCHOOL OF AGRICULTURE, ENVIRONMENT AND HEALTH SCIENCES

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

THIRD YEAR SECOND SEMESTER EXAMINATIONS FOR
BACHELOR OF SCIENCE IN AGRICULTURAL EXTENSION

AGN 373: FARM STRUCTURES

DATE:

TIME:

INSTRUCTIONS

This paper contains **FIVE** questions

Question **ONE** is **COMPULSARY** and carries **30 Marks**

Questions **TWO – FIVE** carries 20 Marks each. **Answer question ONE and any other TWO questions**

QUESTION ONE -COMPULSARY (30 MARKS)

- a) Briefly discuss the importance of farm structures in agricultural production. **(6 Marks)**
- b) The transformation of agriculture and other rural enterprises and livelihoods will require *innovation, planning, design, construction, operation and maintenance* phase. Briefly discuss what each phase involves. **(6 Marks)**
- c) A zero grazing unit is to be constructed by a farmer which is rectangular in shape with a concrete floor measuring 8.0 m by 5.0 m and 75 mm thick. If a farmer is to use a nominal mix of 1:2:4, 30% decrease in volume and 5% wastage, calculate the volume of materials required. Take the bulk density of sand and ballast to be 450 kg/m³ and 1600 kg/m³ respectively. **(7 Marks)**
- d) Discuss the important factors to consider when choosing the site for a farmstead location **(6 Marks)**
- e) Explain what you understand by the following.
 - i) Regional planning
 - ii) CADD
 - iii) Stiffness of wood

- iv) Aggregate of concrete
- v) Greenhouse

(5 Marks)

QUESTION TWO (20 MARKS)

- a) Sketch the following three types of foundations and briefly explain the circumstances under which they are used.
 - i) Curtain wall
 - ii) Pole
 - iii) Floating slab

(6 Marks)
- b) Why is concrete reinforced and which are some the the four common materials used for its reinforcement? (4 Marks)
- c) Differentiate between hydraulic and non-hydraulic binders. (4 Marks)
- d) Outline the three categories that components that require off-site prefabrication fall into (6 Marks)

QUESTION THREE (20 Marks)

- a) What are the specific characteristics considered during the manufacturing of building boards? (2 Marks)
- b) State three types of aggregates based on their shape which are important constituents of the concrete. (9 Marks)
- c) Briefly explain using sketches how slump test is carried out. (9 Marks)

QUESTION FOUR (20 MARKS)

- a) Briefly explain what you understand by the following.
 - i) Tendering
 - ii) General guidance costing
 - iii) Right-off life

(6 marks)
- b) State **FOUR** properties of good construction material for the cover of a green-house. **(4 marks)**
- c) Discuss **THREE** types of tests performed on cement before mixing the cement at construction sites (6 marks)
- d) List any ten general contents of a standard contract. (4 marks)

QUESTION FIVE (20 MARKS)

a) As an intern working in a farm that consists of several units of zero grazing, you are expected to receive and take visitors around the farm while explaining to them various aspects of the farm. Some of the visitors want to know the meaning of zero grazing. What would be your explanation. **(3 marks)**

b) Describe the following types of milking parlours and briefly explain their main design features.

- i. Tandem parlour
- ii. Herringbone parlour
- iii. Abreast parlour

(9 Marks)

c) From a farm manager point of view discuss why careful animal waste management is critical. **(3 Marks)**

d) Discuss of the plaster defects and their solutions which can be implemented in some of the farm structures. **(5 marks)**