

LAIKIPIA



UNIVERSITY

UNIVERSITY EXAMINATIONS

2ND SEMESTER 2023/2024 ACADEMIC YEAR

THIRD YEAR EXAMINATIONS FOR BACHELOR OF SCIENCE IN AGRICULTURAL EXTENSION AND EDUCATION

AGED 321: FARM STRUCTURES

STREAM: R

TIME: 2 HRS

DAY: THURSDAY (11.30-1.30PM) DATE: 18/4/23

THIS QUESTION PAPER CONSISTS OF THREE (3 PAGES)

PLEASE DO NOT OPEN UNTIL THE INVIGILATOR SAYS SO.

INSTRUCTIONS: Answer question **ONE** and any other **TWO** questions.

QUESTION ONE (30 MARKS)

- a) Define a farm [1 mark]
- b) State the two (2) principal analyses done on structures during design [2 marks]
- c) State the two (2) types of a spray race. [2 marks]
- d) Suggest **five (5)** factors that determine the size and type of store for grains [5 marks]
- e) Highlight **five** components of a zero-grazing unit. [5 marks]
- f) Describe the different variations of silo used for silage [6 marks]
- g) Calculate the amount of materials needed to construct a rectangular concrete floor 8.0 m by 3.5 m by 9 cm thick using a nominal mix of 1:3:6. Assume that 50 kg of cement equal to 37 litres. Take density of sand and ballast to be 1.45 and 1.69 tonnes/m³ respectively, and that cement does not affect the volume of the floor slab. The material normally has 40 % gravel volume than the concrete mix and 10% of material is allowed for waste and spill [9 marks]

QUESTION TWO (20 MARKS)

- a) Explain two limitations of a spray race? [4 marks]
- b) Highlight four common construction materials for farm structures. [4 marks]
- c) Describe **three (3)** types of soil stabilizers. [6 marks]
- d) Explain three significant features of a piggery [6 marks]

QUESTION THREE (20 MARKS)

- a) State the **two (2)** types of a spray race. [2 marks]
- b) Mention any **four (4)** suitable features of a poultry house. [4 marks]
- c) Explain **four (4)** factors considered in construction of a cattle structure [4 marks]
- d) Discuss **five (5)** qualities of concrete. [10 marks]



QUESTION FOUR (20 MARKS)

- a) Outline the main components of a cattle dip [3 marks]
- b) State **five (5)** general requirements for pig housing. [5 marks]
- c) Explain three factors that affect
- i) Location of a farm workshop? [3 marks]
- ii) Design of a farm workshop? [3 marks]
- d) Describe the **two** types of fences giving examples. [6 marks]

QUESTION FIVE (20 MARKS)

- a) Outline five (5) common types of milking parlours [5 marks]
- b) Design an economical diameter and depth of a silo to store sufficiency quantity of silage for a herd of 150 dairy cows having an average body weight of 420 kg each? The cows are fed silage for 180 days annually.

Given that:

- Density of silage: 650 kg/m³
- Thickness of silage fed daily: 10 cm
- Feeding rate per cow: 4 kg silage per 100 kg body weight

Assume losses to be 15%

[15 marks]

