

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

THIRD YEAR EXAMINATION FOR THE AWARD OF DEGREE  
OF BACHELOR OF SCIENCE IN ANIMAL SCIENCE, BACHELOR  
OF SCIENCE IN HORTICULTURE AND BACHELOR OF SCIENCE IN  
AGRICULTURE

AGEN 341: FARM STRUCTURES

STREAMS: BSC (ANSC/HORT & AGRIC)

TIME: 2 HOURS

DAY/DATE: MONDAY 09/12/2019

2.30 P.M. – 4.30 P.M.

INSTRUCTIONS:

- This paper contains seven questions
- Answer all questions in section A and any other TWO questions in section B

SECTION A (30 MARKS)

QUESTION ONE

Discuss five factors that need to be considered in choosing the materials for a construction job

[10

marks]

QUESTION TWO

Describe the following wood characteristics:

- (a) Strength in wood [2 marks]
- (b) Hardness [2 marks]
- (c) Warping in woods [2 marks]

QUESTION THREE

Describe the procedure for determining the destiny of wood

[6 marks]

**QUESTION FOUR**

- (a) Describe the method for hand mixing concrete recommended on small jobs [5 marks]
- (b) What is the importance of the slump test in wet concrete? [1 mark]
- (c) Describe the procedure for carrying out the slump test [2 marks]

**SECTION B (40 MARKS) (ANSWE ANY TWO QUESTIONS)**

**QUESTION FIVE (20 MARKS)**

- (a) In the construction of a rectangular concrete floor, assume a 1:3:5 cement – sand – stone (gravel) concrete mix by volume. The aggregate is naturally moist and 62 litres of water is added to the mix.

Additional assumptions:

Moisture content of sand: 2.5%

Moisture content of stones: 1.5%

Bulk-density of the sand: 100kg/m<sup>3</sup>

Bulk density of the stones: 1550kg/m<sup>3</sup>

Solid density of aggregate materials: 2500 kg/m<sup>3</sup>

Solid density of cement: 3100 kg/m<sup>3</sup>

Density of water: 1000 kg/m<sup>3</sup>

- (i) Calculate the volume of the aggregate in the mix
- (ii) Calculate the weight of the aggregate [4 marks]
- (iii) Calculate the amount of water contained in the aggregate [4 marks]
- (b) With the aid of a diagram, name the basic components of a truss [4 marks]
- (c) Describe the following types of buildings walls:
  - (i) Monolithic wall [2 marks]
  - (ii) Frame wall [2 marks]
  - (iii) Masonry wall [2 marks]

**QUESTION SIX (20 MARKS)**

- (a) With the aid of a diagram, describe the following types of roofs used on buildings:
  - (i) Gable roof (double pitched roof) [3 marks]

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- (ii) Hip roof [3 marks]
  
- (b) Discuss two major requirements for safe handling and storage of grains [5 marks]
- (c) Briefly discuss the general housing requirements for cattle [5 marks]
- (d) Describe the following cattle handling facilities on the farm:
  - (i) Cattle crush [2 marks]
  - (ii) Cattle race [2 marks]

### QUESTION SEVEN (20 MARKS)

- (a) Describe “fence” as a type of farm structure [2 marks]
  - (b) Discuss two main objectives of fencing on a farm [6 marks]
  - (c) (i) With the aid of a diagram, name the basic parts of a horizontal stay in a wire fence [4 marks]
  - (ii) Describe two types of greenhouse covering materials [4 marks]
  - (d) Sketch a three bedroom farm dwelling (living house) with a kitchen, store, living room (table room) and a verandah. [4 marks]
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