

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN
AGRICULTURE AND BACHELOR OF SCIENCE IN HORTICULTURE**

AGEN 341: FARM STRUCTURES

STREAMS: BSC. AGRIC, BSC HORTICULTURE Y4S1

TIME: 2 HOURS

DAY/DATE: TUESDAY 11/12/2018

11.30 A.M. – 1.30 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) ANSWER ALL QUESTIONS

QUESTION ONE

- (a) Discuss five factors to be considered in choosing the materials for a construction job. (5 marks)
- (b) Describe two types of defects in wood. (4 marks)

QUESTION TWO

- (a) Discuss five advantages of earth as a building material. (5 marks)
- (b) Describe the term “batching” as it applies in concrete works. (4 marks)

QUESTION THREE

- (a) Explain the importance of the slump test in concrete. (2 marks)
- (b) With the aid of diagrams, explain how the slump test is carried out in wet concrete. (4 marks)

QUESTION FOUR

- (a) Define the term “mortar” in concrete works. (2 marks)
- (b) Describe two types of mortar used in building construction. (4 marks)

SECTION B (40 MARKS): ANSWER TWO QUESTIONS

QUESTION FIVE (20 MARKS)

- (a) Describe the following types of thermoplastics.
- (i) Polythene (2 marks)
 - (ii) Polyvinyl chloride PVC (2 marks)
 - (iii) Acrylics (2 marks)
- (b) A rivet is connecting two pieces of flat steel. If loads are large enough, the rivet could fail in shear i.e not breaking but sliding of its fibres. Calculate the shear stress of the rivet when the steel bars are subjected to an axial pull of 6KN. The rivet has a diameter of 10mm. (4 marks)

- (c) With the aid of diagrams, show the following types of trusses for pitched roofs
- (i) Palladium truss (2 marks)
 - (ii) Pratt truss (2 marks)
 - (iii) Fan truss (2 marks)
- (d) Describe two types of pitched roofs used in buildings. (4 marks)

QUESTION SIX (20 MARKS)

- (a) Describe four advantages of galvanized corrugated steel sheets. (8 marks)

- (b) (i) Illustrate corrugated roofing with an overlap. (2 marks)
- (ii) Describe a greenhouse as applied in agriculture. (2 marks)
- (iii) Illustrate three designs for greenhouse frames or shapes. (6 marks)
- (c) Define the following types of farm structure:
 - (i) Cattle crush (1 mark)
 - (ii) Cattle race (1 mark)

QUESTION SEVEN (20 MARKS)

- (a) Discuss two main objectives of fencing a farm. (6 marks)
 - (b) With the aid of a diagram, name the basic parts of a double horizontal stay strainer assembly used to tension a fence. (4 marks)
 - (c) Calculate the amount of materials needed to construct a rectangular concrete floor for cattle shed measuring 12 metres by 6 metres and 10 centimetres thick. Use a nominal mix of 1:3:6. 50 kg of cement is equal to 37 litres. Assume the following densities for different materials:
 - Bulk density of sand 1400kg/ m^3
 - Bulk density of ballast 1600kg/ m^3(10 marks)
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