EMBU UNIVERSITY COLLEGE

(A CONSTITUENT COLLEGE OF THE UNIVERSITY OF NAIROBI)

TRIMESTER EXAMINATIONS 2013/2014

SECOND YEAR EXAMINATION FOR THE DEGREES OF BACHELOR OF SCIENCE IN AGRICULTURE

AEB 202A: STRUCTURES AND MATERIALS

DATE: AUGUST 8, 2014 **TIME: 8.30 – 10.30AM**

INSTRUCTIONS:

Answer Question ONE and ANY Other TWO Questions.

QUESTION ONE

a) i) Discuss the importance of farm buildings and structures as parts of integrated rural development. (5 marks)

ii) Describe briefly factors to be considered in farmstead planning. (5 marks)

b) i) Discuss the advantages and disadvantages of using earth (soil) as a building material. (5 marks)

ii) Explain FIVE desirable characteristics of roof surfacing materials for pitched roofs. (5 marks)

c) A farm house concrete floor was constructed using a nominal mix of 1:3:5.
Cement – Sand – Stone concrete by volume.

Naturally moist aggregate is used in the construction job. 62 litres of water is added in the mix. Two bags of cement are used.
Assumptions:

Moisture content of sand:	4%
Moisture content of stones:	1.5%
Bulk density of the sand:	1400kg/m3
Bulk density of stones:	1600kg/m3
Solid density of aggregate materials:	2650kg/m3
Solid density of cement:	3100kg/m3
Density of water:	1000kg/m3
One bag of cement 50kgs:	37 litres

i.) Calculate the volume of the aggregate in the mix. (4 marks)

ii.) Calculate the weight of the aggregate (3 marks)

iii.) Calculate the amount of water contained in the aggregate (3 marks)

QUESTION TWO

a) i) Discuss the main advantages of Galvanized Corrugated Steel Sheets used in building construction (4 marks)

ii) Describe THREE types of roofs used in building construction. (6 marks)

b) A concrete floor measuring 8.0 metres by 5 metres and 7 centimetres thick is constructed using a nominal mix of 1:3:6

Calculate the amount of materials used to construct this floor. 50kgs of cement is equal to 37 litres (10 marks)

QUESTION THREE

a) i) Describe briefly the environmental and housing requirements for dairy Cattle. (5 marks)

b) With the aid of a diagram, name the main truss components. (5 marks)

c) Define the following heat terminologies.

i.) Ambient temperature (1 mark)

ii.) Specific heat (1 mark)

iii.) Thermal capacity (1 mark)

iv.) Latent heat (1 mark)

d) Describe the following types of nails used in building construction.

i.) Roofing nails (2 marks)

ii.) Concrete nails (2 marks)

iii.) Clout nails (2 marks)

QUESTION FOUR

a) With the aid of a diagram, name and give dimensions of the basic parts of a zero-grazing unit to accommodate FOUR cows. (10 marks)

b) Discuss the importance of the foundation footing in building construction. (5 marks)

c) Describe the following types of paint.

i.) Priming paints (2 marks)

ii.) Undercoating paints (2 marks)

iii.) Finishing paints (2 marks)

QUESTION FIVE

a) Explain the following housing systems for layers.

i.) Semi-intensive systems (5 marks)

ii.) Deep litter systems (5 marks)

b) Draw and name the basic parts of a sheep/goat pen used in intensive production. (10 marks)

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