

**W1-2-60-1-6**

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2018/2019**

**YEAR I SEMESTER I EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN ARCHITECTURAL STUDIES**

**ABA 2202: STRUCTURES FOR ARCHITECTS II**

**DATE: DECEMBER 2018 TIME: 2 HOURS**

**INSTRUCTIONS: Answer question one (compulsory) and any other two questions.**

**All workings must be clearly shown. Use neat sketches.**

**QUESTION ONE**

a. i. Differentiate between softwood and hardwood (1 mark)

ii. Explain the term Engineered Lumber. (1 mark)

iii. What do you understand by the term Tensegrity. (1 mark)

b. i. Using the Ndarugo river bridge along Thika Road as an example, describe the structural system used in its construction. (3 marks)

ii. Discuss the following types of Arches and their applicability.

* Pointed Arch (2 marks)
* Semi-circular Arch (2 marks)
* Segmented Arch (2 marks)
* Bucket Arch (2 marks)

c. Using neat sketches, describe the following tensile structures.

i. Air supported membranes. (2 marks)

ii. Cable Nets (2 marks)

iii. Shell structures. (2 marks)

iv. Monocoque structures. (2 marks)

d. A timber beam has a unformed load of 4km/mwith a required span of 4.5m. Given 4kN/m2, find the section modulus for the beam. (4 marks)

e. Using a 300 ground slope, describe the concept of using a retaining wall in design.

(2 marks)

**QUESTION TWO**

a. What is a suspended floor. (2 marks)

b. State and briefly discuss the functional requirements of a suspended floor.(6 marks)

c. Using neat sketches, describe the types of suspended concrete slabs. (12 marks)

**QUESTION THREE**

a. i. The following information is indicated on a structural detail of a slab. 19r 10-01- 200 B1. Explain the meaning of this information. (2 marks)

ii. Toppings are important in the structural design of beams and slabs. Explain.

(1 mark)

b. Using neat sketches, describe the following as used in structures.

i. Post and lintel (2 marks)

ii. Grain vault. (2 marks)

c. Differentiate between a one way and two way slabs. (4 marks)

d. Discuss the various classifications of walls. (9 marks)

**QUESTION FOUR**

a. Define the terms

i. Foundation. (2 marks)

ii. Column. (2 marks)

b. Discuss the design consideration for foundations. (6 marks)

c. Using neat sketches, discuss the various structural column types. (4 marks)

d. Disucss the terms

i. Slenderness Ratio (2 marks)

ii. Compression stress. (2 marks)

iii. Buckling. (2 marks)