



BOWEN UNIVERSITY
(Of the Nigerian Baptist Convention)
IWO

College of Environmental Science (COEVS)
FIRST SEMESTER EXAMINATION, 2023/2024
ARCHITECTURE PROGRAMME
ARC 209: BUILDING STRUCTURES I (2 UNITS)

INSTRUCTION: Answer question ONE (1) and any THREE (3) Questions.

TIME ALLOWED: 2 and half hours

Use well labeled diagram(s) where applicable

WARNING: Please note that you are not allowed to bring mobile phone(s) into the examination hall. Non-compliance will amount to examination misconduct and attract stiff penalty.

- 1a. Discuss steel as a structural material with respect to its properties and composition, with three (3) advantages and three (3) disadvantages. **(8 marks)**
- 1b. State and briefly explain three (3) disadvantages of Timber as a structural material. **(3 marks)**
- 1c. Explain what Pre-cast and Cast-in-situ concrete are. **(6 marks)**
- 1d. Explain the two (2) classifications of trees with respect to their uses as Timber. **(6 marks)**
- 1e. Differentiate between Tensional force and Compressional force. **(2 marks)**
2. Discuss the following constituents of reinforced concrete:
 - a) Reinforcement Bars **(3 marks)**
 - b) Aggregate **(3 marks)**
 - c) Cement **(3 marks)**
 - d) Sand. **(3 marks)**
 - e) Water **(3 marks)**
- 3a. Describe five (5) structural loads you know. **(5 marks)**
- 3b. Name five (5) types of structural members in buildings. State the kind of loads they carry. **(10 marks)**
- 4a. Briefly write on the following:
 - a) Steel Columns. **(3 marks)**
 - b) Beams. **(3 marks)**
 - c) Concrete floor slabs. **(3 marks)**
 - d) Building foundations. **(3 marks)**
 - e) Torsional Force. **(3 marks)**
- 5a. The concept of Force is commonly explained in terms of Isaac Newton's three (3) laws of motion. State the Laws. **(6 marks)**
- 5b. Briefly explain three (3) properties of forces to be considered in structures. **(6 marks)**
- 5c. What are the three (3) basic equations that must hold for a structure to be at equilibrium? **(3 marks)**
6. Briefly write on the following:
 - a) Expansion Joints **(3 marks)**
 - b) Retaining Wall **(3 marks)**
 - c) Cantilevered floor **(3 marks)**
 - d) Suspended Slab **(3 marks)**
 - e) Shear Force **(3 marks)**