



**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**FACULTY OF THE BUILT ENVIRONMENT**

**DEPARTMENT OF ARCHITECTURE**

**BUILDING CONSTRUCTION I**

**AAR 2102**

**Examination Paper**

**December 2017**

This examination paper consists of 3 pages

**Time Allowed: 4 hours**

**Total Marks: 100**

**Special Requirements: A1 Sheets, T-squares, Drawing Boards, Masking Tape.**

**Examiner's Name: Miss M. V. Mudombo**

**INSTRUCTIONS**

1. Answer Question 1 and any other two (2) questions.
2. Use an appropriate scale for drawings. Marks will be awarded to neatly presented work.
3. Illustrate answers with sketches. You can either draw in pencil or technical pen.

**MARK ALLOCATION**

<b>QUESTION</b>	<b>MARKS</b>
1.	50
2.	25
3.	25
4.	25
5.	25
6.	25
<b>TOTAL</b>	<b>100</b>

### QUESTION 1

- a. List any five functions of a roofing system. (5)
- b. Describe any 5 forms of steel trussing you have studied. (5)
- c. Using appropriate scales, draw and explain crucial details of the following types of roofs:
  - i. Butterfly roof (5)
  - ii. Tensile roof [5]
  - iii. Hipped roof (5)
  - iv. Flat concrete roof (5)
  - v. Parapet monopitch roof (5)
  - vi. Skylight (5)
- d. With the aid of scaled drawings, design two types of green roofing systems explaining using illustrations how they work. (10)

### QUESTION 2

- a. State ten temporary facilities/services a contractor can put in place on site to ensure the smooth flow of work. (10)
- b. Describe the functions of a site plan to a contractor on site stating how it achieves these functions. (5)
- c. In the construction of a three story building, the structural engineer would cover various components that make up the building. Discuss his role in five of these using diagrams where possible. (10)

### QUESTION 3

- a. Give five reasons why it is necessary to carry out soil investigations prior to laying a foundation. (5)
- b. Explain and illustrate with the aid of a diagram the setting out of a square building using a builder's square and profile boards. (10)
- c. Clearly illustrate and explain the circumstances under which pile foundations are used. (10)

#### **QUESTION 4**

- a. List any 5 factors to consider in choosing a flooring system. (5)
- b. With the aid of detailed drawings, differentiate between a suspended flooring system and a solid flooring system. (10)
- c. An old building in Bulawayo has a dilapidated suspended timber flooring system which has become a hazard to its users. What type of flooring system would you recommend for the renovation process stating reasons for your choice? Use illustrations to explain your recommendations. (10)

#### **QUESTION 5**

- a. List 5 methods of classifying walls giving examples of each. (5)
- b. Discuss using sketches any 2 recent innovative developments in wall construction techniques. (10)
- c. Explain with the aid of detailed drawings how a shipping container can be adopted for use in Zimbabwe's climate. (10)

#### **QUESTION 6**

- a. State any 3 advantages and 3 disadvantages of a metal roof. (6)
- b. Draw a detailed drawing of a flat steel deck roof showing how to prevent moisture penetration into the building. (4)
- c. Using the case study of the NUST Gate House construction project, discuss the various construction methods/techniques employed to ensure structural integrity of the building. Use annotated diagrams to illustrate your answer. (15)