



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF THE BUILT ENVIRONMENT

DEPARTMENT OF LANDSCAPE ARCHITECTURE AND URBAN DESIGN

Introduction to Materials and Construction I

AAR 1104

SUPPLEMENTARY EXAMINATION PAPER

JULY 2016

This examination paper consists of 3 pages

Time Allowed: 3 hours

Total Marks: 100

Special Requirements:

Examiner's Name: Miss Chrisselda Ndlovu

INSTRUCTIONS

1. Answer any four (4) questions
2. Each question carries 25 marks
3. Where required give examples and draw illustrations and diagrams

MARK ALLOCATION

QUESTION	MARKS
1.	25
2.	25
3.	25
4.	25
5.	25
6.	25
TOTAL	100

Question 1

With your knowledge of various materials and their construction, justify the notion that “a building is a response to the environment”. Provide sketches and illustrations to aid your explanations. [25]

Question 2

- a) Efflorescence is one of the defects of brickwork. Explain the term efflorescence, citing examples of how it can be identified. (12¹/₂)
- b) With the aid of diagrams, outline the stages in the brick manufacturing process.(12¹/₂) [25]

Question 3

- a) Discuss the following properties in concrete blocks and explain their importance to the building’s fabric. Provide illustrations.
 - i. Density and strength
 - ii. Thermal insulation
 - iii. Fixability
 - iv. Fire resistance
 - v. Sound insulation [25]

Question 4

- a) Explain the causes of deterioration of stone buildings.(5)
- b) Briefly describe structural straw-bale construction, and post and beam construction.(10)
- c) Compare and contrast the benefits of using locally available materials over imported materials.(10) [25]

Question 5

- a) What steps and measures should be observed when curing concrete? (5)
- b) What are the advantages and disadvantages of brick walls over concrete walls?(10)
- c) Identify common defects that can be found in concrete works and give recommendations of what can be done to rectify the defects. (10) [25]

Question 6

- a) Discuss the chemical composition of Portland cement. (10)
- b) Explain the differences between pre-cast concrete and in-situ cast concrete. (10)
- c) Justify the need to reinforce concrete in construction.(5) [25]