



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF THE BUILT ENVIRONMENT

DEPARTMENT OF ARCHITECTURE

INTRODUCTION TO MATERIALS AND CONSTRUCTION I

AAR 1104

Examination Paper

December 2016

This examination paper consists of 3 pages

Time Allowed: 3 hours

Total Marks: 100

Special Requirements: NONE

Examiner's Name: Mr M Sibanda

INSTRUCTIONS

1. Answer any four (4) questions
2. Each question carries 25 marks
3. Illustrate your answers with sketches where appropriate

MARK ALLOCATION

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

QUESTION 1

- a) Describe the historical and modern uses of the following construction materials.
 - i. grass
 - ii. earth (10)
- a) Outline the characteristics of timber that make it a desirable building material. (5)
- b) Explain how timber is processed and prepared for use in building construction. (5)
- c) Illustrate with the aid of sketches the defects that can be found in timber. (5)

QUESTION 2

- a) Provide a detailed classification of building stone. Provide examples of those used in building construction. (10)
- b) Explain how wall stability is achieved in dry stone walling. (3)
- c) Compare and contrast bricks and blocks. (2)
- d) Describe how bricks are manufactured. (5)
- e) Discuss the various techniques of wall construction using earth. (5)

QUESTION 3

- a. Outline the difference between thermo plastics and thermosetting plastics. (2)
- b. Briefly describe any three methods of the fabrication of plastics. (3)
- c. State and explain why PVC pipes are more widely used than other conventional drainage materials. (8)
- d. Briefly describe with the aid of illustrations the manufacture and use of rubber in construction. (4)
- e. Describe with illustrations the use of damp proof membranes and damp proof courses in construction. (8)

QUESTION 4

- a) State and explain the characteristics of five non ferrous metals used in the building construction industry. (15)
- b) Describe preventative measures for corrosion on metals mainly used in construction. (3)
- c) Explain with the aid of sketches how steel is fire-proofed in construction. (3)
- d) Write brief notes on the characteristics and application of safety glass. (4)

QUESTION 5

- a) Name and describe 4 types of roofing materials. (8)
- b) Describe the use of bitumen and mastic asphalt in construction. (4)
- c) Explain any two methods of manufacture of asphalt. (6)
- d) Illustrate with sketches how flashings and ridge cappings prevent water entry into the interior of a building. (7)

QUESTION 6

- a) Define the term foundation. (2)
- b) What factors should be considered in the selection of a foundation type. (4)
- c) Illustrate 4 different types of foundations, stating where each type is normally used. (8)
- d) Name 2 types of loads that act on buildings, giving an example of each. (2)
- e) State the constituents of concrete, and explain the role of water in the concrete manufacturing process. (5)
- f) State and explain the use of any 2 admixtures that are used in concrete. (4)