NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF THE BUILT ENVIRONMENT

DEPARTMENT OF PROPERTY STUDIES AND URBAN DESIGN

BCM 1101 CONSTRUCTION MATERIALS

Examination Paper

December 2024

This examination paper consists of 3 pages

Time Allowed: **3 hours**

Total Marks: **100**

Special Requirements: **None**

Examiner : **A. Lunga/ K. Maponga**

INSTRUCTIONS

1. **All questions in Section A are compulsory.**
2. **Answer any three (3) questions from Section B.**
3. Each question carries 25 marks each.
   Importance is attached to accuracy, clarity, good writing skills and depth of thought, NOT LENGTH

MARK ALLOCATION

QUESTION	MARKS
1.	**25**
2.	**25**
3.	**25**
4.	**25**
TOTAL	**100**

SECTION A

Question 1

In construction materials, metals play various roles. In the case of electrical systems or applications. The resistance of 5m length of wire is 600 ohms. Determine:

i) the resistance of an 8m length of the same wire

ii) the length of the same wire when the resistance is 420 ohms (5)

iii) A wire of length 8m and cross sectional area 3m2 has a resistance of 0.16 ohms. If the wire is drawn out until its cross sectional area is 1mm2, determine the resistance of the wire. (5)

b) With the aid of a diagram, describe the manufacturing process of clay bricks. (10)

[25]

Question 2

ai) Define shock absorbing construction materials. (5 marks)

aii) Discuss any four properties of shock absorbing materials make use of real life examples. (10)

b) 'Construction materials can be categorized into three engineering categories. Discuss (10)

[25]

Question 3

Outline the mechanical properties of structural steel. (7)

List and discuss the advantages of metals that make it ideal in the building construction industry? (18)

[25]

Question 4

List any four admixtures and explain their functions. (8)

With the use of a diagram detail the manufacturing process of cement. (17)

[25]

Question 5

a) Describe any four (4) types of Engineering Wood Products (EWPs) you learnt in class. (8)
b) Discuss methods for enhancing the durability and longevity of timber products in outdoor or exposed environments. (17)

[25]

Question 6

a) Define sustainable design. (5)
b) Outline any five (5) principles of sustainable design stating examples where possible. (10)
c) "The goal of Life Cycle Assessment is to assess the environmental burdens associated with all stages of a construction materials' lifecycle". Discuss any (five) 5 stages involved in this process. (10)

[25]

END