



**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**FACULTY OF THE BUILT ENVIRONMENT**

**DEPARTMENT OF CONSTRUCTION MANAGEMENT**

**PRINCIPLES OF SUSTAINABLE CONSTRUCTION**

**BCM 4102**

**Main Examination Paper**

**December 2024**

This examination paper consists of **three (3)** pages.

**Time Allowed:** 3 hours  
**Total Marks:** 100  
**Special Requirements:** None  
**Examiner's Name:** Mr. B. Gaule

**INSTRUCTIONS**

1. Answer **any four (4)** questions.

**MARK ALLOCATION**

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

### Question One

- a) Define sustainability in the context of construction. [5 marks]
- b) Describe the lifecycle approach to sustainable construction and its benefits. [10 marks]
- c) Discuss the importance of using renewable resources in construction and provide examples. [10 marks]
- [25 marks]**

### Question Two

As the Construction Manager the client has requested you to be part of the design team.

- i. Discuss the importance of building orientation in sustainable design and its impact on energy consumption. [5 marks]
- ii. Outline any **five (5)** key considerations when selecting sustainable materials for a construction project. Provide examples. [5 marks]
- iii. Highlight the benefits and challenges of using prefabricated construction techniques in sustainable building projects? [5 marks]
- iv. Explain the role of green roofs and walls in sustainable building design and their environmental benefits. [10 marks]
- [25 marks]**

### Question Three

- a) Explain the concept of adaptive reuse in architecture and its benefits for sustainability. [5 marks]
- b) Discuss the effective implementation of natural ventilation in sustainable building design. [10 marks]
- c) Discuss how water conservation measures can be integrated into building design. [10 marks]
- [25 marks]**

### Question Four

- a) Outline challenges that are associated with the use of natural resources in construction and recommend corresponding mitigatory measures. [12 marks]
- b) Discuss strategies that can be implemented towards the reduction of the carbon footprint in a bid to achieve sustainable construction. [13 marks]
- [25 marks]**

### Question Five

- a) Explain the significance of 'green building' in sustainable construction. [10 marks]

- b) With the aid of examples, detail how sustainable construction can contribute towards addressing climate change.

[15 marks]

**[25 marks]**

**END OF EXAMINATION**