



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ARCHITECTURE & BUILT ENVIRONMENT

UNIVERSITY EXAMINATION FOR:
BACHELOR OF ARCHITECTURAL STUDIES/BACHELOR OF
ARCHITECTURE

EAR 4402: SUSTAINABLE DESIGN
SPECIAL/SUPPLEMENTARY EXAMINATION
YEAR TWO SEMESTER I

SERIES: JULY 2025

TIME: 2 HOURS

DATE: Pick Date JULY 2025

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

QUESTION ONE (30 MARKS)-COMPULSORY

- a) Distinguish between embodied and operational energy. (6marks)
- b) Explain the reasons for passive and low energy architecture. (8marks)
- c) Describe any FOUR phases of energy consumption in the built environment. (10marks)
- d) Explain the factors to consider for the successful technological transfer in the built environment with a view of achieving sustainable design. (6marks)

QUESTION TWO (20 MARKS)

- a) Explain the challenges towards sustainable architecture in the East African cities. (10 marks)
- b) Explain the proposed way forward in order to achieve sustainable architecture/design in Kenya. (10 marks)

QUESTION THREE (20 MARKS)

“Mandhari Architects” a Green Building Consultant has engaged you to undertake design research for a proposed school project in Kilifi. With the aid of sketches, explain the recommended strategies for designing, constructing and using green buildings in tropical countries. (20marks)

QUESTION FOUR (20 MARKS)

Discuss the various forms of energy derived from inexhaustible sources that can be utilized in the built environment. (20marks)

QUESTION FIVE (20 MARKS)

Well-designed Green Buildings are beneficial in many ways. Discuss. (20 Marks)