



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ARCHITECTURE & BUILT ENVIRONMENT

UNIVERSITY EXAMINATION FOR:
BACHELOR OF ARCHITECTURAL STUDIES
EAR 4308: BUILDING ENVIRONMENT SCIENCE III
(ACOUSTIC DESIGN)

END OF SEMESTER EXAMINATION

YEAR THREE SEMESTER II

SERIES: MAY 2025

TIME: 2 HOURS

DATE: Pick Date MAY 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) Describe the following acoustic terminologies.
 - i. Specular reflection of sound. (2 marks)
 - ii. Diffusion reflection of sound. (2 marks)
 - iii. Sound masking. (2 marks)
- b) Explain FOUR key strategies in noise control. (12 marks)

- c) Building materials can affect the quality of acoustic comfort and careful consideration should be taken when selecting acoustic materials. Describe SIX properties of good acoustic materials. (12 marks)

QUESTION TWO (20 MARKS)

Sound measurement is a crucial part of acoustic research and determination of acoustic standards. It is therefore vital that accurate acoustic data are collected during measurement. Explain FIVE factors that may influence the accuracy of measured sound.

QUESTION THREE (20 MARKS)

- a) Describe a sound reinforcement system. (4 marks)
b) Installation of a sound reinforcement system involves various key steps. Explain the key steps taken during the installation of sound reinforcement systems. (16 marks)

QUESTION FOUR (20 MARKS)

Theatres provide immersive and enjoyable spaces for plays and dramatic performances. With the aid of well annotated sketches explain FIVE key design principles crucial for achievement of this.

QUESTION FIVE (20 MARKS)

One of the notable properties of sound waves is reflection often resulting in sound echo or reverberation. Reflection of sound has a great impact on not only the behavior of sound waves but also the acoustic comfort of varying architectural spaces.

- a) Explain FOUR uses of sound reflection in the application of various devices. (8 marks)
b) Describe SIX differences between Echo and Reverberation. (12 marks)