



TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

Department of BUILDING & Civil engineering

UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

ECV 4512 : HARBOUR AND MARINE STRUCTURES

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: MARCH 2025

TIME: 2 HOURS

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 - COMPULSORY

- a) Differentiate between the following using relevant sketches;
 - i. Rubble mound and caisson breakwaters
 - ii. A pile and swing mooring
 - iii. Finger and T-head jetties

- iv. Monofunctional and polyfunctional ports (16 marks)
- b) Define dredging as applied in marine sciences (4 marks)
- c) Explain the various categories of ports according to their functions (10 marks)

QUESTION TWO

- a) Define the following as applied to marine sciences;
 - i. Gross tonnage
 - ii. Displacement tonnage (4 marks)
- b) What are the vital wave heights that can be useful in harbour design? (8 marks)
- c) Discuss the importance of geoscience in harbour design and operation. (8 marks)

QUESTION THREE

- a) Give situations that might necessitate dredging in marine engineering. (5 marks)
- b) Give any five characteristics of a port terminal. (5 marks)
- c) Discuss the importance of breakwaters in marine engineering (10 marks)

QUESTION FOUR

- a) Differentiate between a harbour, a port and a terminal (12 marks)
- b) Give the characteristics of the following;
 - i. A berth
 - ii. A jetty (8 marks)

QUESTION FIVE

- a) Explain how the following elements are phenomenal to a port site;

- i. Maritime access
- ii. Maritime interface
- iii. Infrastructure and equipment
- iv. Land access (12 marks)

b) Discuss conventionally the following parts of a commercial cargo ship

- i. Amura
- ii. Forecastle
- iii. Hold
- iv. Side (8 marks)