



UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF MARINE ENGINEERING TECHNOLOGY

FINAL EXAMINATION
OCTOBER 2025 SEMESTER

COURSE CODE : LKB20503
COURSE TITLE : OFFSHORE SYSTEM DESIGN 1
PROGRAMME NAME : BACHELOR OF ENGINEERING TECHNOLOGY (OFFSHORE) WITH HONOURS
DATE : 24 JANUARY 2026
TIME : 9:00AM - 12:00PM
DURATION : 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. This question paper consist of ONE sections.
4. Section A consist of five questions. Answer FOUR (4) questions only.
5. Please write your answer on the answer booklet provided.
6. Please answer all questions in English only.
7. Refer to the attached Formula/ Appendies. Tick if applicable

THERE ARE 3 PAGES OF QUESTIONS INCLUDING THIS PAGE

SECTION A (Total: 100 marks)

Answer FOUR (4) questions.

Please use the answer booklet provided.

Question 1

Stability is one of the most critical aspects of offshore engineering, as well as the cornerstone of naval architecture. Add the sketch to explain stability according to Archimedes' principle.

(25 marks)

Question 2

The stability of floating offshore structures is crucial for ensuring their safety and reliability. The center of buoyancy (CB) and center of gravity (CG) play critical roles in determining the stability of these structures. Describe in detail the center of buoyancy, the center of gravity, and the metacentric height by adding the sketch.

(25 marks)

Question 3

Stability is one of the most critical aspects of offshore engineering, and the cornerstone of naval architecture. Describe the center of buoyancy and gravity of the transverse plan, middle planes and waterplane of the platform by adding a sketch.

(25 marks)

Question 4

The intact stability of a unit refers to its ability to withstand external overturning moments through its inherent righting moment, which is induced by the unit's inclined orientation. **Determine** the Intact Stability Code and Second Generation Intact Stability Criteria and **explain** the curve of intact statical stability with a sketch.

(25 marks)

Question 5

Environmental loads are loads induced by environmental parameters externally to the offshore system. Environmental consist of wind loads, wave loads, current loads, ice load and water retention from wave splashing and rain. Explain FIVE (5) environmental loads.

(25 marks)

END OF EXAMINATION PAPER