



UNIVERSITI KUALA LUMPUR
Malaysian Institute of Marine Engineering Technology

FINAL EXAMINATION
OCTOBER 2025 SEMESTER SESSION

SUBJECT CODE	: LGB32003
SUBJECT TITLE	: INTRODUCTION TO MARINE MACHINERY
PROGRAMME NAME (FOR MPU: PROGRAMME LEVEL)	: BACHELOR IN MARITIME OPERATIONS (HONOURS) (FLEXILEARN)
TIME / DURATION	: 2.00 PM - 5.00 PM (3 HOURS)
DATE	: 24 JANUARY 2026

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper **CAREFULLY**.
2. This question paper has information printed on both sides of the paper.
3. This question paper consists of **ONE (1)** section.
4. Answer **FOUR (4)** questions from a total of FIVE (5) questions.
5. Please write your answer in the answer booklet provided.
6. Answer **ALL** questions in English language **ONLY**.

THERE ARE 3 PAGES OF QUESTIONS, EXCLUDING THIS COVER PAGE.

TOTAL: 100 MARKS

INSTRUCTION: ANSWER FOUR (4) QUESTIONS ONLY

Please use the answer sheet provided.

Question 1

- a) Critically assess the operational process of a low-pressure vacuum freshwater generator used on board marine vessels. Using a well-labelled diagram, justify how the working principles and sequential operations of the system contribute to reliable freshwater production.

(15 marks)

- b) Develop and justify a structured preventive maintenance strategy for the freshwater generator. Evaluate potential operational failures by identifying their root causes and recommend effective measures to prevent their recurrence.

(10 marks)

Question 2

- a) Construct a well-labelled diagram of a marine steam turbine engine, identifying its key components. Critically evaluate the arrangement of these components and justify how their integration enhances overall engine efficiency and operational performance.

(15 marks)

- b) Analyse the primary components of a marine steam turbine system. For each component, evaluate its function and justify its significance in ensuring reliable and efficient turbine operation.

(10 marks)

Question 3

A D-type high-pressure marine boiler, manufactured by Alfa Laval and operating at 60 bars, is installed on board a vessel. Effective operation and preventive maintenance are essential for ensuring safety, reliability, and efficiency during voyage.

- a) Examine and justify the operational mechanism of the D-type marine boiler operating at 60 bars. With the support of a labelled diagram, evaluate the step-by-step process and explain how each component and stage contribute to the system's high-pressure steam generation.
- (15 marks)
- b) Propose and justify a structured preventive maintenance plan for the D-type boiler. Evaluate at least three common operational faults, analyse their possible causes, and recommend suitable preventive actions to mitigate associated risks.
- (10 marks)

Question 4

- a) Assess the different types of pumps commonly used on board ships. Evaluate their design characteristics and justify their selection based on specific shipboard systems and operational demands.
- (15 marks)
- b) Examine the working principles of marine pumps and critically evaluate their effectiveness in typical onboard applications. Provide justification for their use in particular systems based on performance and operational suitability.
- (10 marks)

Question 5

- a) Assess the functional stages of a 4-stroke diesel engine using relevant diagrams. Critically evaluate how each stage contributes to overall engine performance and justify the effectiveness of this mechanism in marine operations.

(15 marks)

- b) Compare and contrast the operating cycles of 2-stroke and 4-stroke diesel engines. Highlight and justify at least four significant differences in their design and performance and evaluate how these differences influence their application in marine engineering.

(10 marks)

END OF FINAL EXAMINATION QUESTION

