



UNIVERSITI KUALA LUMPUR
Malaysian Institute of Marine Engineering Technology

FINAL EXAMINATION
JULY 2025 SEMESTER SESSION

SUBJECT CODE : LMD26703

SUBJECT TITLE : MARINE AUXILIARY MACHINERY

PROGRAMME NAME : DIPLOMA OF ENGINEERING TECHNOLOGY IN
(FOR MPU: PROGRAMME LEVEL) MARINE ENGINEERING

TIME / DURATION : 09.00 AM - 11.30 AM
(2 HOURS 30 MINUTES)

DATE : 24 DECEMBER 2025

INSTRUCTIONS TO CANDIDATES

1. Please read **CAREFULLY** the instructions given in the question paper.
2. This question paper has information printed on both sides of the paper.
3. This question paper consists of **TWO (2)** sections; Section A and Section B.
4. Answer **ALL** question in Section A, and **TWO (2)** questions **ONLY** in Section B.
5. Please write your answers on this answer booklet provided.
6. Answer **ALL** questions in English language **ONLY**.

THERE ARE 3 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 60 marks)

INSTRUCTION: Answer ALL questions.

Please use the answer booklet provided.

Question 1

With reference to refrigerant gas in refrigeration system onboard ship:

- a) Define refrigerant gas. (3 marks)
- b) Explain **FIVE (5)** good refrigerant characteristics. (5 marks)
- c) Explain **SIX (6)** characteristics of gas given below. (12 marks)
- i. Freon 12
 - ii. Ammonia

Question 2

With reference to marine pumps:

- a) Sketch and label **EIGHT (8)** double-acting reciprocating pump, indicating the main components. (7 marks)
- b) Explain the operating principle of a double-acting reciprocating pump during one complete cycle. (6 marks)
- c) A double-acting reciprocating pump on board a vessel delivers less flow than designed. Based on your knowledge, explain possible causes and suggest corrective actions. (7 marks)

Question 3

With reference to heat exchangers onboard ship:

- a) Sketch 3 types of flow used in heat exchanger. (6 marks)
- b) Sketch and labels a double pass heat exchanger and show the fluid flow direction. (10 marks)
- c) Describe effect of clogged tube of a shell and tube heat exchanger. (4 marks)

SECTION B (Total: 40 marks)

INSTRUCTION: Answer ONLY TWO (2) questions.

Please use the answer booklet provided.

Question 4

CLO3, PLO1, CI, DP1(DK3 & DK4), DP4 & DP5

With reference to Oily Water Separator (OWS) onboard ship:

- a) Sketch and labels a simple process flow diagram (PFD) of oily water separator. (12 marks)
- b) State **FOUR (4)** requirements for a ship with 400 GT and above to meet before discharging oily mixture. (8 marks)

Question 5

With reference to fuel oil treatment and purification systems onboard ships:

- a) State **FOUR (4)** characteristics of a purifier. (4 marks)
- b) Explain the difference between a purifier and a clarifier in terms of construction and operation. (7 marks)
- c) Explain **FIVE (5)** main common faults that can occur during operation. (8 marks)

Question 6

With reference to the marine distillation equipment reverse osmosis type:

- a) Define the osmosis process is required for producing fresh water from seawater. (4 marks)
- b) Sketch and labels reverse osmosis principal plant and cartridge, components and show the fluid flow. (8 marks)
- c) Describe the reverse osmosis plant and working principle. (8 marks)

END OF EXAMINATION PAPER

