



UNIVERSITI KUALA LUMPUR
Malaysian Institute of Marine Engineering Technology

FINAL EXAMINATION
JULY 2025 SEMESTER SESSION

SUBJECT CODE : LMB11802

SUBJECT TITLE : INTRODUCTION TO MARINE ENGINEERING

PROGRAMME NAME : BACHELOR OF MARINE ENGINEERING
(FOR MPU: PROGRAMME LEVEL) TECHNOLOGY WITH HONOURS

TIME / DURATION : 2.00 PM - 4.30 PM
(2 HOURS 30 MINUTES)

DATE : 18 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 **THREE (3)** questions **ONLY** in Section B.
 5. Please write your answers on the OMR for Section A and on answer booklet provided for Section B.
 6. Answer should be written in blue or black ink except for sketching, graphic and illustration.
 7. Answer **ALL** questions in English language **ONLY**.
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THERE ARE 6 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 40 marks)**INSTRUCTION: Answer ALL questions.****Please use the objective answer sheet provided.**

1. Which of the following items is NOT a required piece of information to be communicated during a standard engine room watch handover?
 - A. Any special mode of operation due to emergency, damage, icy, or shallow water conditions.
 - B. The location and details of machinery under maintenance, including potential hazards and authorized personnel.
 - C. Standing orders from the Chief Engineer or the company.
 - D. The current market price of marine fuel oil (MFO) and recent changes in bunker suppliers.

2. Emergency shipboard response, what is the most important factor for a seafarer to be able to take correct actions during an emergency?
 - A. Having adequate supplies of emergency equipment and tools.
 - B. Having prior experience with a similar emergency condition.
 - C. Aware of the different types of emergencies that can occur on a ship.
 - D. The judgement ability to make hasty decisions without panicking.

3. When inspecting the carbon dioxide cylinder storage room, what is the purpose of opening the release box door?
 - A. To perform a visual examination of the stored cylinders and its fittings.
 - B. To confirm that carbon dioxide is properly contained and no leakage.
 - C. To verify the cylinders are correctly pressurized and well contained.
 - D. To test a specific alarm and ensure the machinery-space fans shut down.

4. What is the primary reason for performing periodic safety routines in addition to regular watchkeeping and maintenance?
 - A. To reduce the amount of daily watchkeeping duties.
 - B. To check and ensure the functionality of various safety and emergency equipment.
 - C. To improve and enhance the overall efficiency and effectiveness of the ship's operations.
 - D. To train and expose the crew on how to operate and maintain new machinery.

5. What is the initial event that starts the process of changing the propeller pitch?
- A. A pitch demand signal is received.
 - B. The main servo motor cylinder moves.
 - C. The valve rod admits high-pressure oil.
 - D. The auxiliary servo motor is supplied with low-pressure oil.
6. What is the fundamental principle by which a propeller generates thrust?
- A. By imparting momentum to the column of water passing through it.
 - B. By converting the water's heat energy into motion.
 - C. By reducing the water's density around the blades.
 - D. By creating a vacuum in front of the blades.
7. What is the defining characteristic of a 'fixed-pitch' propeller?
- A. It is made from a single, solid piece of metal without any moving parts.
 - B. The pitch is fixed at any given point, though it varies with the radius.
 - C. The pitch can be adjusted by the crew during a voyage.
 - D. The pitch is constant and uniform across the entire blade surface.
8. Which propulsion system requires a gearbox to operate efficiently
- A. Slow-speed diesel engine
 - B. Medium-speed diesel engine
 - C. Slow-speed steam turbine
 - D. Reciprocating steam engine
9. What is the typical efficient operating speed range for a ship's propeller?
- A. 80–100 RPM
 - B. 100–120 RPM
 - C. 250–750 RPM
 - D. Around 6000 RPM
10. The presence of flammable liquids like fuel oil (MFO, MDO) or various lubricants is classified under which type of engine room hazard?
- A. Chemical Hazards
 - B. Fire Hazards
 - C. Noise Hazards
 - D. Mechanical Hazards

11. The risk of rupture in ****high-pressure systems****, such as steam or hydraulic lines, is classified under which main hazard group?
- A. Chemical Hazards
 - B. Noise Hazards
 - C. Hazards
 - D. Fire Hazards
12. The inherent presence of fuel or lubricating oil, which might drip from a leaking flange onto an insulation blanket, falls under which principal cause of engine room fires?
- A. Heat Sources
 - B. Human Error
 - C. Flammable Materials
 - D. Mechanical Failures
13. What is the critical parameter checked by the *** 3-way valve*** system to decide the final destination of the condensed water?
- A. Temperature of the condensed water
 - B. Flow rate from the freshwater pump
 - C. Salinity (salt content)
 - D. Pressure inside the condenser
14. Which steering gear sub-system utilizes a transmitter and a receiver to convey a signal of the desired rudder angle from the bridge?
- A. Control System
 - B. Power Transmission System
 - C. Power Unit
 - D. Hydraulic System
15. The 'head' developed by a pump can be thought of as a measure of the energy imparted to the fluid. This energy is a combination of two main forms.
- A. Electrical and magnetic energy.
 - B. Kinetic and potential energy.
 - C. Thermal and chemical energy.
 - D. Sound and light energy.

16. Which of the following statements about a reciprocating displacement pump is incorrect?
- A. The pump operates by reducing or increasing the volume of a space.
 - B. The discharge stroke forces liquid out through the discharge non-return valve.
 - C. When starting the pump, the suction and discharge valves should be opened.
 - D. Acceptable to have a closed valve in the discharge line when the pump is running.
17. In a typical twin-screw ship, what is the most common configuration for the propellers?
- A. Both are right-handed
 - B. Both are left-handed
 - C. The starboard propeller is right-handed, and the port propeller is left-handed
 - D. The starboard propeller is left-handed, and the port propeller is right-handed
18. What is the primary reason the relieved engineer officer must provide the right information to the relieving officer?
- A. To prevent any interruptions to ongoing work and avoid unexpected issues during the new watch.
 - B. To ensure that the relieving officer doesn't have to follow the chief engineer's instructions.
 - C. To make it easier for the relieving officer to check every single piece of machinery in the engine room.
 - D. To demonstrate that the relieved officer has completed all their duties for the day.
19. What are the primary purposes of machinery space onboard a ship?
- A. To store cargo for transport.
 - B. To house passenger cabins and amenities.
 - C. To house the machinery and system for ship operation.
 - D. To provide recreational facilities for the crew.
20. The acronym MARPOL stands for what international agreement?
- A. Maritime Authority for Regulations and Policies
 - B. Marine Pollution Control Organization
 - C. International Convention for the Prevention of Pollution from Ships
 - D. Marine Alliance for Responsible Operations

SECTION B (Total: 60 marks)**INSTRUCTION: Answer three (3) questions.****Please use the answer booklet provided****Question 1.**

With reference to ship engineering watch:

- a) Describe the primary responsibilities of the personnel standing on an engineering watch based on its definition as a designated timeframe where specific personnel are accountable for the safe and efficient operation and upkeep of the ship's machinery. (10 marks)
- b) Describe the essential information an outgoing engineer officer must verbally communicate to the relieving engineer officer during a standard engine room watch handover, focusing on the critical categories of data as outlined in the standing orders. (10 marks)

Question 2

With reference to fire fighting and safety system onboard ships:

- a) Describe the hazard and the four primary categories of hazards an engineer officer must be aware of in the engine room, providing one key example for each category. (12 marks)
- b) Describe the description of principal causes of engine room fires and provide one brief, relevant example for each cause. (08 marks)

Question 3

With reference to ship propulsion and arrangements:

- a) Describe ship propulsion systems. (2 marks)
- b) Explain THREE (3) types of propulsions system. (6 marks)
- c) Sketch and outline typical arrangement of a 4-stroke engine. (12 marks)

Question 4

The Fresh Water Generator (FWG) is a crucial onboard plant, fulfilling a dual and indispensable role. It produces potable water vital for all domestic applications such as drinking, cooking, and washing, while simultaneously supplying the high-quality water necessary for the critical operational needs of machinery like the boiler, where it is converted into steam for propulsion or power generation.

- a) Sketch and label the freshwater generator system. (10 marks)
- b) Describe the working principle of the Fresh water generator that you have sketch above. (10 marks)

END OF QUESTION