CONFIDENTIAL

UNIVERSITI KUALA LUMPUR
Malaysian Institute of Marine Engineering Technology

FINAL EXAMINATION

JULY 2025 SEMESTER SESSION

SUBJECT CODE	:	**LEB11202**
SUBJECT TITLE	:	**INTRODUCTION TO MARINE ENGINEERING**
PROGRAMME NAME (FOR MPU: PROGRAMME LEVEL)	:	**BACHELOR OF ELECTRICAL AND ELECTRONICS ENGINEERING TECHNOLOGY (MARINE) 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 **ALL** questions in English language **ONLY**.

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 the 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 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