UNIVERSITI KUALA LUMPUR
Malaysian Institute of Marine Engineering Technology

FINAL EXAMINATION

OCTOBER 2025 SEMESTER SESSION

SUBJECT CODE	:	**LDD21303**
SUBJECT TITLE	:	**MARINE ENGINEERING SYSTEM**
PROGRAMME NAME (FOR MPU: PROGRAMME LEVEL)	:	**DIPLOMA OF ENGINEERING TECHNOLOGY IN SHIP CONSTRUCTION AND MAINTAINENCE**
TIME / DURATION	:	**2.00 PM – 5.00 PM (3 HOURS)**
DATE	:	**27 JANUARY 2026**

INSTRUCTIONS TO CANDIDATES

1. Please **CAREFULLY** read 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 questions in Section A and TWO (2(questions in Section B.
5. Answer ALL in Section A, answer TWO (2) ONLY in section B.
6. Please write your answer on the answer booklet provided.
7. Answer all questions in English language only.

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

SECTION A (Total: 60 marks)

INSTRUCTION: Answer ALL questions.
Please use the answer booklet provided.

Question 1

Diesel engine can be categorized into three types which is slow, medium and high speed engine.

(a) Differentiate the three (3) types of the diesel engines.

(12 marks)

(b) List four (4) engines controlling devices.

(8 marks)

Question 2

Fuel supply system is one of the ancillary support systems for a diesel engine.

(a) Explain the fuel supply system of a slow speed engine complete with sketch and labels.

(12 marks)

(b) List four (4) functions of fuel injection system.

(8 marks)

Question 3

Propellers is an important component in ship used to generates thrust for the ship's propulsion system.

(a) List and describe six (6) types of marine propulsors.

(12 marks)

(b) Sketch and label the components of a power transmission system.

(8 marks)

SECTION B (Total: 40 marks)

INSTRUCTION: Answer TWO (2) question in Section B.
Please use the answer booklet provided.

Question 4

Propeller open water efficiency. The diameter of the propeller is at 4m, the sea water density is at 1025kg/m^3, in flow velocity V_A is at 11.5 m/s, and the following open water characteristics are given as in table 1;

Table 1: Open Water Characteristic

J	K_T	K_Q	η_0
0.56	0.155	0.023	(i)
0.58	0.141	0.022	(ii)
0.61	0.136	0.021	(iii)
0.63	0.112	0.018	(iv)

a) Calculated the corresponding open-water efficiencies. Given, $\eta_o = \frac{K_T}{K_Q} \cdot \frac{J}{2\pi}$

(8 mark)

b) Calculate the propeller RPM for the propeller to be at maximum efficiency at ship design speed. Given, $J = \frac{V_A}{N.D}$

(5 marks)

c) Calculate the delivered power at the propeller. Given, $Q = K_Q \cdot \rho \cdot n^2 \cdot D^5$ and $P_D = 2\pi \cdot n \cdot Q$

(7 marks)

Question 5

The steering gear system generates a torsional force at a certain scale which is then transmitted to the rudder stock that turns the rudder.

a) Describe three (3) main unit in the steering gear systems for the principal operation.

(6 marks)

b) State five (5) IMO Requirement on a ship's steering system for ship above 24 meters in length.

(10 marks)

c) List two (2) stabilizing systems commonly found in ship.

(4 marks)

Question 6

Each type of cargo varies in its requirements for carriage temperature, humidity, stowage arrangements and ventilation.

a) Explain the two (2) risks associated with carriage.

(8 marks)

b) Explain briefly the three (3) guidelines for the carriage of refrigerated cargoes.

(12 marks)

END OF EXAMINATION PAPER