CONFIDENTIAL

UNIVERSITI KUALA LUMPUR
Malaysian Institute of Marine Engineering Technology

FINAL EXAMINATION

JULY 2025 SEMESTER SESSION

SUBJECT CODE	:	**LMD31603**
SUBJECT TITLE	:	**MARINE AUTOMATION AND CONTROL**
PROGRAMME NAME (FOR MPU: PROGRAMME LEVEL)	:	**DIPLOMA OF ENGINEERING TECHNOLOGY IN MARINE ENGINEERING**
TIME / DURATION	:	**2.00 PM - 4.30 PM (2 HOURS 30 MINUTES)**
DATE	:	**16 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**.
7. Answer should be written in blue of black ink except for sketching, graphic and illustration.

THERE ARE 4 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 60 marks)

INSTRUCTION: Answer ALL questions.

Question 1

With reference to the marine automation control system.

(a) Define the automation control system.

(5 marks)

(b) Sketch and label a basic closed loop control system.

(10 marks)

(c) Explain a basic closed loop control system.

(5 marks)

Question 2

With reference to the control measuring instrumentation.

(a) Sketch, label and describe thermocouple temperature measuring devices.

(10 marks)

(b) Sketch, label and describe viscosity measurement devices.

(10 marks)

Question 3

With reference to the controller action in control system.

(a) Explain two-step or on/off for heating system control system action and system response.

(6 marks)

(b) Draw and label a graph to show the 2-step controller action and system response.

(4 marks)

(c) Explain a proportional controller operating a feedwater valve supplying a boiler drum control system action and system response.

(6 marks)

(d) Draw and label a graph to show the proportional controller action and system response.

(4 marks)

SECTION B (Total: 40 marks)

INSTRUCTION: Answer TWO questions only.

Please use the answer booklet provided.

Question 4

With reference to the control signal in control system.

(a) Define what is meant by telemetering in control system.

(6 marks)

(b) In telemetering system controllers may be either pneumatic or electronic. The former has generally been used because of proven reliability and ease of application to final power transmission

List three (3) advantages of each system

i) Pneumatic

ii) Electronic / electric

(6 marks)

(c) Describe flapper-nozzle mechanism and DP Cells operation

(8 marks)

Question 5

With reference to engine room machineries monitoring and automatic control system.

(a) Identify SIX (6) engine room machineries process control system.

(6 marks)

(b) With the sketches, explain one example single terms process control system for a main engine.

(14 marks)

Question 6

With reference to the unattended machinery space (UMS) operations

(a) Briefly discuss the requirements of unattended machinery space operations onboard modern ships.

(10 marks)

(b) Sketch, label and describe a data logger and alarm system installed in modern engine control rooms.

(10 marks)

END OF QUESTION