CONFIDENTIAL

UNIVERSITI KUALA LUMPUR
Malaysian Institute of Marine Engineering Technology

FINAL EXAMINATION

JULY 2025 SEMESTER SESSION

SUBJECT CODE	:	**LMB31403**
SUBJECT TITLE	:	**MARINE AUTOMATION AND CONTROL**
PROGRAMME NAME (FOR MPU: PROGRAMME LEVEL)	:	**BACHELOR OF MARINE ENGINEERING TECHNOLOGY WITH HONOURS**
TIME / DURATION	:	**9.00 AM - 11.30 AM (2 HOURS 30 MINUTES)**
DATE	:	**22 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** questions in Section A. For Section B, answer **THREE (3)** questions **ONLY**.
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 or black ink except for sketching, graphic and illustration.

THERE ARE 3 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

INSTRUCTION:

Section A consists of TWO (2) QUESTION

Answer ALL QUESTION **(Total: 40 marks)**

Question 1

With reference to the automation control system.

(a) Sketch and labels FIVE (5) a basic closed loop control system.

(8 marks)

(b) Explain the function of FOUR (4) main components closed loop control system

(12 marks)

Question 2

With reference to the control signal in control system.

(a) Sketch and labels FIVE (5) a pneumatic transducer employing the flapper-nozzle mechanism and DP Cells.

(8 marks)

(b) Explain flapper-nozzle mechanism and DP Cells operation refer to your sketch in Q (b).

(12 marks)

Section B consists of FOUR (4) QUESTION

Answer THREE (3) QUESTION ONLY **(Total: 60 marks)**

Question 3

With reference to the control measurement devices.

(a) Sketch and label FIVE (5) any type of pick-up tachometer.

(7 marks)

(b) Sketch, label FOUR (4) and explain the bubble type (pneumercator) tank level.

(13 marks)

Question 4

With reference to the controller's action.

(a) Explain the THREE (3) types of controller action commonly used in control system.

(12 marks)

(b) Sketch and labels THREE (3) a diagram showing the deviation relative to a process change.

(8 marks)

Question 5

With reference to the controller action and final control element in control system.

(a) Sketch and label FIVE (5) a diaphragm valve with positioner.

(10 marks)

(b) Explain diaphragm valve with positioner operation. (Refer to Q4(a))

(10 marks)

Question 6

With reference to engine room machinery automation control system on board ship;

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

(6 marks)

(b) Sketch and labels FOUR (4) of main engine jacket water temperature cooling split range control.

(7 marks)

(c) Sketch and label FOUR (4) of main engine jacket water temperature cooling cascade control.

(7 marks)

END OF QUESTION