CONFIDENTIAL

UNIVERSITI KUALA LUMPUR
Malaysian Institute of Marine Engineering Technology

FINAL EXAMINATION
FEBRUARY 2025 SEMESTER SESSION

SUBJECT CODE	:	**LMB41003**
SUBJECT TITLE	:	**MARINE CONTROL SYSTEM**
PROGRAMME NAME (FOR MPU: PROGRAMME LEVEL)	:	**BACHELOR OF MARINE ENGINEERING TECHNOLOGY WITH HONOURS**
TIME / DURATION	:	**09.00 AM - 11.30 AM (2 HOURS 30 MINUTES)**
DATE	:	**2 JULY 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)** section; section A and Section B.
4. Answer **ALL** question in Section A, and **TWO (2)** question 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 or black ink except for sketching, graphic and illustrations.

THERE ARE 5 PAGES OF QUESTIONS, INCLUDING THIS PAGE.

INSTRUCTION:

Section A consist of TWO (2) Question, Answer ALL **(Total: 40 marks)**

Please use the answer booklet provided.

Question 1

With reference to the control system.

(a) Explain THREE (3) application elements of device used in control systems.
(9 marks)

(b) Identify FIVE (5) application sensor types used in control systems.
(5 marks)

(c) Explain THREE (3) types of actuators (final control element) with example devices name.
(6 marks)

Question 2

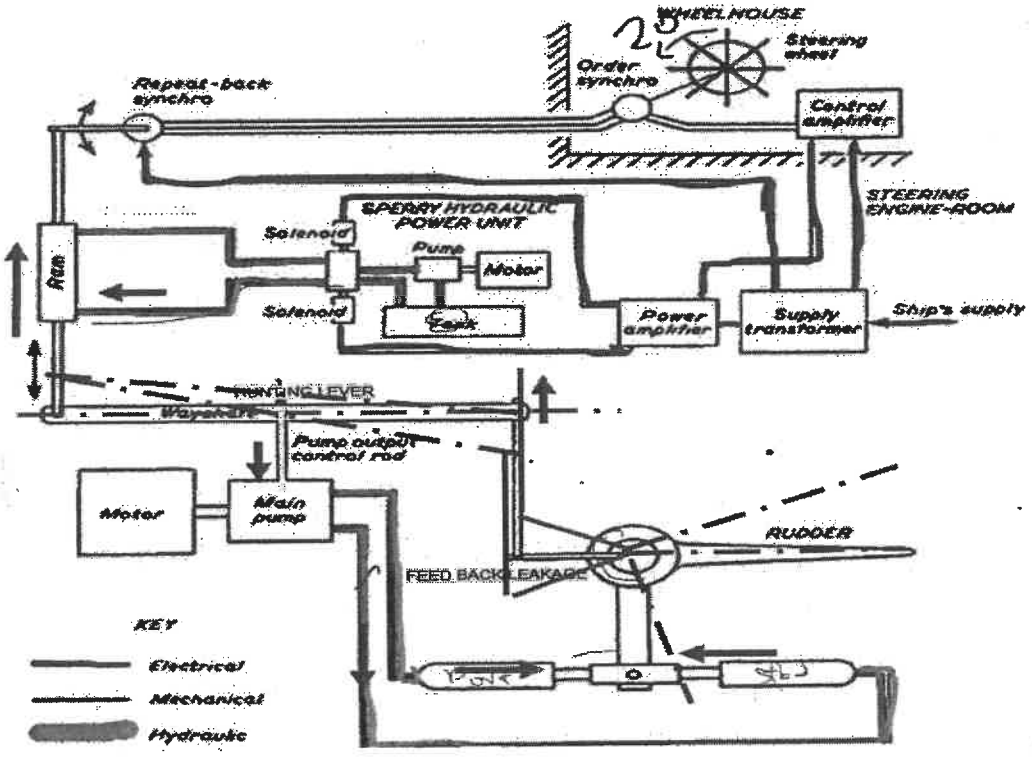


Figure A

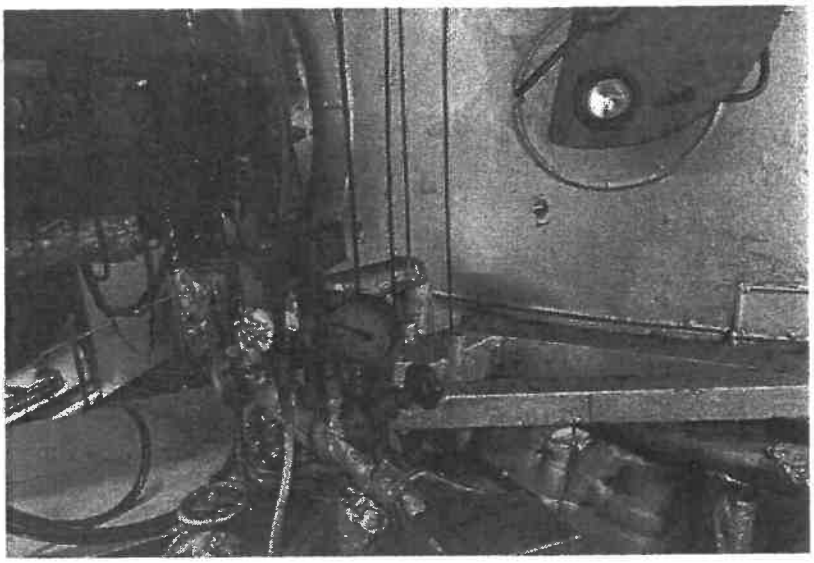
With reference to hydraulic transmitters of the steering gear control systems shown in Figure A:

(a) Explain the application of hydraulic systems in the marine steering gear control and their operation.
(8 marks)

(b) Describe the regulation standard and design selection for an ocean-going vessel.
(12 marks)

Section B consists of FOUR (4) QUESTION
Answer THREE (3) QUESTION **(Total: 60 marks)**

Question 3



Marine auxiliary boiler burner unit

A marine auxiliary boiler failed to ignite during normal startup frequently. The burner fan is operational, fuel is being supplied, and the control shows no alarms except for a misfire indication.

(a) Explain the standard procedure to troubleshoot boiler burner misfiring.

(12 marks)

(b) Identify FOUR (4) safety precaution and measures boiler misfiring.

(8 marks)

Question 4

A ship's Engine Telegraph System (ETS) intermittently fails to register command changes from the bridge to the engine control room. The vessel uses a conventional low-speed diesel engine propulsion system with a pneumatic starting system.

(a) Determine the potential failure of this ETS to register command from bridge to engine control room.

(3 marks)

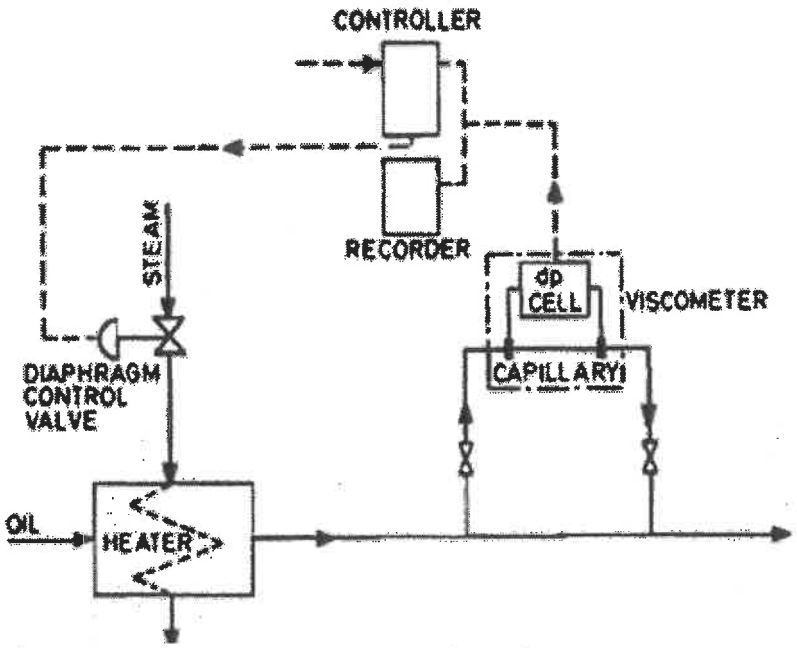
(b) Analyse the causes of ETS failure.

(11 marks)

(c) Identify the standard procedure to prevent failure.

(6 marks)

Question 5



With referent to the marine diesel engine fuel viscosity monitoring control system.

(a) Analyse possible causes for the failure of the marine diesel engine fuel viscosity monitoring control system to accurately monitor viscosity.

(10 marks)

(b) Identify THREE (3) root cause of the fuel viscosity monitoring failure.

(6 marks)

(c) Explain TWO (2) corrective actions to resolve the issue and restore the fuel viscosity monitoring system.

(4 marks)

Question 6

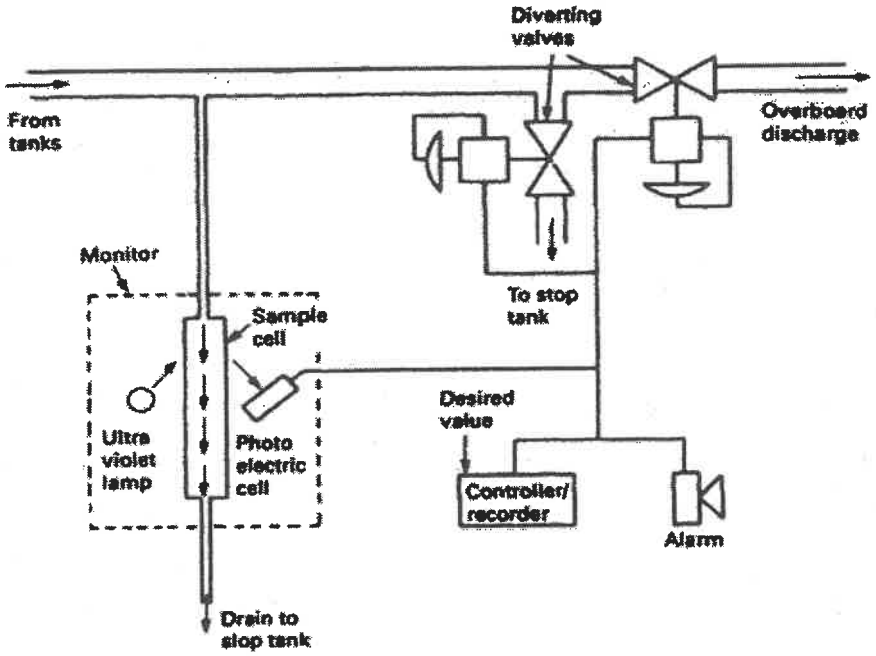


Figure 15.25 Oil-in-water monitoring system

The Oily Water Separator (OWS) monitoring system is used to monitor the bilge water discharge under MARPOL Annex 1 regulation.

(a) Analyse the potential failure of an oily water separator (OWS) monitoring system.

(15 marks)

(b) Explain IMO regulation regarding pumping out bilge water

(5 marks)

END OF QUESTION