Indian Mareitime University

(A Central University, Govt of India)

End Semester Examinations – June 2025

Programme Name: B Sc (NS)

Semester: IV

Subject Code: UG21T5404

Subject Name: MARINE ENGINEERING, AUTOMATION & CONTROL SYSTEMS - II

Date: 06.06.2025	Max Marks: 70
Duration: 03 Hrs	Pass Marks: 35

General Instructions

(i) All Sections (A, B & C) are to be attempted.
(ii) Options, if any, are specified in respective section.

Section A

Ten MCQs/Fill in the Blanks of 01 Mark each – Choose the correct answer as applicable.

1. What are required to be used as remotely operated shut off valves to safeguard against serious hazards due to oil leakage, spills or fire.
a. Swing check valves
b. Quick closing valves
c. Gate valves
d. Ball valves

2. If the propulsion engine is non-reversible then how many air starts are required, as per regulations?
a. 12
b. 6
c. 10
d. 14

3. Maximum Oxygen content in the Inert Gas main system should not exceed
a. 3%
b. 5%
c. 8%
d. 11%

4. The theoretical power that is developed inside the engine cylinder is known as

a. Shaft power
b. Brake power
c. Indicated power
d. Friction power

5. Engine pistons are usually made of aluminium alloy because
   a. Is lighter
   b. Wear is less
   c. Absorbs shock
   d. Is stronger

6. Main steering gear must be able to steer the ship at maximum ahead service speed and be capable at this speed and its deepest draught of putting from 35 degrees on one side to 30 degrees on other side in not more than _____ seconds?

   a. 30
   b. 28
   c. 60
   d. 15

7. Which pump requires priming before starting?
   a. Centrifugal Pump
   b. Reciprocating Pump
   c. Gear Pump
   d. Screw Pump

8. As per MARPOL, comminuted and disinfected sewage may be discharged into
the sea beyond __ nautical miles from the nearest land
   a. 3
   b. 4
   c. 12
   d. 24

9. Checking for Hydrocarbons in a Tank Atmosphere just prior to Man-entry, we must use
   a. Tankscope
   b. Explosimeter
   c. Multigas Detector
   d. Oxygen Analyser

10. In Ship Automation, UMS Stands for
   a. Autonomous Vessel
   b. Un-Manned Ship
   c. Un Attended Machinery Spaces
   d. Un-Manned Navigation Bridge

Section B

Five Questions of 02 Marks each. (2 x 5 =10 Marks)

11. Name Any Four Clean and alternative fuels used on-board ships.
12. What is Thermal Efficiency and Maximum Continuous Rating?
13. What is a Control System?
14. List out any four desirable Properties of a Refrigerant.
15. What is a Scavenge Fire? How does it occur?

Section C

Attempt any Five questions out of Seven Questions. (10x5=50 Marks)

16.a) Explain Four stroke cycle with a diagram explaining all processes. (5 Marks)
16.b) Sketch and label Oil Water Separator. (5 Marks)

17.a) Draw and explain the IG System with neat and clean diagram. (6 Marks)
17.b) Explain with example of open and closed loop system? (4 Marks)

18.a) Describe the Ship Whistle Arrangement on board with a suitable Diagram (5 Marks)
18.b) Difference between Impulse and reaction turbine. (5 Marks)

19.a) What is the procedure for warming up Main engine? (5 Marks)

19.b) What are Turbochargers? What is their significance? (5 Marks)

20.a) Explain with a neat diagram using secondary refrigerant for cooling cargo holds. (5 Marks)
20.b) Draw and explain the working of a 2 Ram Electro Hydraulic Steering Gear? (5 Marks)

21.a) List out the Major components of a Centrifugal Pump and explain the Principle of Operation and Working Sequence of the Pump. (5 Marks)

21.b) List out the Tasks involved in Engine Room Watchkeeping. (5 marks)

22.a) Explain Gas Freeing, Purging and Inerting of Cargo Tank. (3 Marks)

22.b) What is Scavenge Fire? List out its Cause, effects and actions to be taken. (7 Marks)