

Indian Maritime University
(A Central University, Govt of India)

Supplementary Examinations – March/April 2025

Programme Name: B Sc (NS)

Semester: IV

Subject Code: UG21T5404

Subject Name: Marine Engineering, Automation and Control System
Paper II

Date: 28.03.2025

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.
- (iii) Scientific Calculator is permitted if required.

Section A

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

1. Classification of Internal Combustion Engines on basis of strokes are
 - A) 2 stroke & 3 Stroke Engines
 - B) Single and Multi-Stroke Engines
 - C) 2 and 4 strokes Engines
 - D) none of the above
2. Excess pressure in any pipes or systems can be relieved with the help of
 - A) Globe Valve
 - B) Gate Valve
 - C) Relief Valve
 - D) Butterfly Valve
3. What is UMS?
 - A) Autonomous Vessel
 - B) Un-Manned Ship
 - C) Periodically Un Attended Machinery Spaces
 - D) Un-Manned Navigation Bridge
4. 2 stroke and 4 stroke engines can work on?
 - A) Petrol engines
 - B) Diesel engines

- C) Both petrol and diesel engines
- D) None of the above

5. The refrigerant coming out of the evaporator should be in _____ form?

- A) Liquid
- B) Gaseous
- C) Mixture of liquid and gas
- D) Not specific requirement

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. The minimum concentration of a particular combustible gas or vapour necessary to support its combustion in air is defined as

- A) LEL /LFL – Lower Explosive Limit / Lower Flammable Limit
- B) UEL/UFL – Upper Explosive Limit/Upper Flammable Limit
- C) Flammable Range of that gas or vapour
- D) None of the Above

8. Open loop control system is a control system where

- A) Control system is totally independent of Output
- B) Control system is totally dependent of Output
- C) Control system is 50% dependent and 50% independent of Output
- D) Control system is 60% dependent and 40% independent of Output

9. A bow thruster is most effective when vessel is _____?

- A) Moving
- B) Moving astern
- C) Moving at high speed
- D) Stationary

10. If the propulsion engine is *non-reversible* then how many air starts are required, as per regulations?

- A) 12
- B) 14
- C) 10
- D) 6

Section B

Five Questions of 02 Marks each

11. What is compounding in steam turbine & Different types of Compounding.
12. Name the various types of pumps.
13. Define Brake or Shaft Power.
14. What are the properties of marine fuel oil used on-board ship?
15. Name Any four Clean and alternative fuels used on-board ships.

Section C

Seven Questions of 10 Marks each of which any 05 questions to be answered.

16. a) Difference between CPP and fixed pitch propeller? 5 Marks
b) Draw and explain the arrangement of shafting system on board a ship? 5 Marks
17. a) Explain Four stroke cycle with a diagram explaining all processes? 6 Marks
b) Draw a P-V diagram of a Two stroke cycle engine? 4 Marks
18. a) Explain in brief requirement of the engine room watchkeeping. 5 Marks
b) Write down any 4 difference between Centrifugal Pumps and Positive Displacement pumps, based on its classifications. 5 Marks
19. a) Draw and explain the vapour compression cycle for on board refrigeration system. 7 Marks
b) Advantages of 4 ram steering over 2 ram steering gear? 3 Marks
20. a) Draw and explain the IG System with neat and clean diagram. 6 Marks
b) What are the advantages and disadvantages of Controllable Pitch Propeller System (CPP) 4 Marks
21. a) Explain Open Loop Control System with an example 5 Marks
b) Describe the Ship whistle Arrangement on board with a suitable Diagram 5 Marks
22. a) What are Turbochargers? What is their significance? 5 Marks

b) A 6 Cylinder two stroke diesel engine has a cylinder diameter of 560 mm and a stroke of 2240 mm. Calculate the total indicated power of the engine when the mean effective pressure in each cylinder is 15 bars. And the speed is 90 rpm.

5 Marks

