

**Indian Maritime University**  
**(A Central University, Govt of India)**  
**End Semester Examinations – June 2023**  
**Programme Name: B Sc (NS)**  
**Semester: IV**  
**Subject Code: UG21T5404**

**Subject Name: Marine Engineering Automation and Control system - II**

Date: 31.05.2023

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 most correct answer as applicable.

1. 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
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

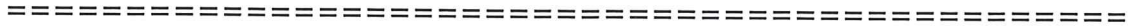
### **Five Questions of 02 Marks each**

11. Name the uses of PV diagram?
12. What do you understand by black water?
13. Write short notes on heat balance of diesel engines.
14. What are the advantages of closed loop system?
15. What are the disadvantages of using fossil fuel?

## Section C

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

16. (a) With neat sketches explain the working of a diesel engine working on 4 stroke cycle (7marks)  
(b) How are the diesel engines classified? (3 marks)
17. (a) Draw and explain the working of reaction turbine (7 marks)  
(b) Mention few important properties of fuel oil used in ships. (3 marks)
18. (a) Define the terms real slip and apparent slip. (4 marks)  
(b) Explain how apparent slip can be negative (3 marks)  
(c) Define (i) Hull efficiency (ii) propeller efficiency (3marks)
19. (a) With a neat sketch explain the working of biological sewage treatment plant (7 marks)  
(b) What are regulations for discharging oily water residue from an oil tanker cargo space (3 marks)
20. (a) Draw and explain the fuel oil storage and transfer system (7marks)  
(b) Mention the advantages of automation (3marks)
21. (a) Explain the terms gas freeing, purging and inerting of a cargo oil tank (6 marks)  
(b) State different rules and regulations regarding steering gear system (4 marks)
22. (a) What do you understand by auto tension arrangement of a mooring winch? Explain how it is useful to the mooring of a ship. (5 marks)  
(b) Explain with a neat diagram using secondary refrigerant for cooling cargo holds (5 marks)



Tolani