

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

Supplementary Examinations – September/October 2024

Programme Name: B Sc (NS)

Semester: IV

Subject Code: UG21T5404

Subject Name: Marine Engineering, Automation and Control Systems - II

Date: 28.09.2024

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

MCQs of 01 Mark each – Choose the correct answer as applicable.

1. The theoretical power that is developed inside the engine cylinder is known as (i) Shaft power (ii) Brake power (iii) Indicated power (iv) Friction power
2. In a diesel engine the piston is connected to the crank shaft by (i) cam shaft (ii) governor (iii) tail shaft (iv) connecting rod
3. Which one of the following is the minimum temperature at which the fuel may get ignited? (i) flash point (ii) fire point (iii) pour point (iv) cloud point
4. Thrust of the propeller is transmitted to the hull by (i) stern tube (ii) propeller key (iii) Plummer bearing (iv) thrust bearing
5. The amount by which the input signal value must change to move the correcting unit between its extreme positions is known as (i) proportional band (ii) error (iii) deviation (iv) none of the above.
6. As per MARPOL, comminuted and disinfected sewage may be discharged into the sea beyond ___ nautical miles from the nearest land (i) 3 (ii) 4 (iii) 12 (iv) 24
7. Oily water separator works on _____ principle (i) centrifugal separation (ii) emulsification (iii) difference in density between water and oil (iv) all the above
8. In emission control areas (ECA) sulphur limit in fuel used for main and auxiliary engines on board ship is limited to.....% (i) 0.1 (ii) 0.2 (iii) 0.5 (iv) 1
9. Maximum Oxygen content in the Inert Gas main system should not exceed _____ (i) 3% (ii) 5% (iii) 8% (iv) 11%
10. Alternate fuel for the shipping industry is _____ (i) Hydrogen (ii) Ammonia (iii) Liquefied Natural Gas (iv) all the above

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)