

INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

End Semester Examination Dec 2019/Jan 2020

B.Sc. (Nautical Science)

Semester -III

UG21T3303- Marine Engineering, Automation & Control System Paper-I

Date: 13.12.2019

Max Marks: 70

Time: 3 Hours

Pass Marks: 35

Note: Question No. 1 is compulsory.

Answer any 6 questions from remaining 8 questions (each of 10 marks).

Scientific Calculator is permitted if required.

- Q1 Answer the following: (5 x 2 = 10 marks)
- (a) Define Hooke's law?
 - (b) Distinguish between Mild steel and Cast Iron?
 - (c) Enumerate any two protective devices used in marine electrical system.
 - (d) What are the general classifications of marine Steam boilers?
 - (e) What is "safe-matics Steering gear" system?
- Q2 (a) What are the various types of stresses that cause failure of engineering components?
(b) Explain the phenomenon of Fatigue failure with suitable examples in the marine field? (5 + 5 = 10marks)
- Q3 (a) What are the important mechanical properties of common engineering Materials?
(b) Explain the purpose of Heat treatment of steel? (5+5=10 marks)
- Q4 (a) What are important alloying materials used to improve quality of steel
(b) Explain any one of the steel making processes? (5+5=10 marks)
- Q5 (a) Why emergency generator is required in ship? What are the services/equipments that should be powered from emergency generator?
(b) What are the various checks conducted on battery to assess its condition? (5+5=10 marks)
- Q6 (a) What is synchronization of alternators? What are the condition for synchronization? Explain.
(b) What are the various types of Transformers? Write down. (5+5=10 marks)
- Q7 (a) How vessels are classified on the basis of propulsion system?
(b) Write names of any four auxiliary machines that are common in a merchant vessel and their purpose. (5+5=10 marks)
- Q8 (a) What are the various types of pumps used in ships? Specify their field of application?
(b) Explain important parts of a centrifugal pump? (5+5=10 marks)
- Q.9 (a) Enumerate any Four Boiler Mountings and their function.
(b) Sketch and Label a simple 4 ram steering gear system. (5+5=10 marks)