

INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

End Semester Examination Dec 2019/Jan 2020

B.Sc. (Nautical Science)

Semester -III

UG21T4303- 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.

1. a) Define Hook's Law. (2 Marks)
b) What are the uses of ceramics? Write down. (2 Marks)
c) What are the services to which power is supplied from the emergency generator? List down. (2 Marks)
d) Name the different methods used for generating fresh water from sea water onboard a ship. (2 Marks)
e) State the "Principle of Refrigeration". (2 Marks)

2. a) Explain the following:
(i) Stress (2½ marks)
(ii) Strain (2½ marks)

b) Explain the following:
(i) Tensile force (2½ marks)
(ii) Compressive force (2½ marks)

3. a) Describe the following:
(i) Hardness (2½ Marks)
(ii) Malleability (2½ Marks)

b) Name the different types of steels and their uses. (5 Marks)

4. a) With the help of an "Iron-Carbon diagram" show the role of carbon in steels and its effect on properties. (5 Marks)

b) Explain various methods of heat treatment of steels. (5 Marks)

5. a) Explain the procedure for maintenance of batteries onboard ship. (5 Marks)
b) Explain the procedure for starting emergency generator manually. (5 Marks)

6. a) Explain "short circuit trip". (5 Marks)
- b) Explain the paralleling operation of alternators. (5 Marks)
7. a) List out the following:
- (i) Machineries found onboard a ship. (2½ Marks)
 - (ii) Supporting systems for the Main Engine Plant. (2½ Marks)
- b) Explain the working of any one type of fresh water generator used onboard a ship. (5 Marks)
8. a) Draw sketch and explain the construction and working of a boiler. (5 Marks)
- b) Explain the working of an air compressor. (5 Marks)
9. a) Explain the working of 2 ram electro hydraulic steering gears. (5 Marks)
- b) Explain the working of a compressor in refrigeration cycle. (5 Marks)