Indian Maritime University

(A Central University, Govt of India)

End Semester Examinations – December 2022

Programme Name: M Tech (DHE)

Semester: First

Subject Code: PG12T1104

Subject Name: Marine Materials and Corrosion

Date: 28.12.2022	Max Marks: 60
Duration: 03 Hrs	Pass Marks: 30

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 correct answer as applicable.

1. Tank's underdeck, where air has been trapped, appears to have a _____ corrosion rate than other areas of the tank where they are submerged and have a lower availability of oxygen.
2. In ICCP, signal from _____ is sent to controller which allows cathodic protection system to adjust to changing conditions.
3. Malleable Cast Iron can be obtained by annealing _____.
4. _____is a surface heat treatment process which results in both carbon and nitrogen in case.
5. The structure of martensite is _____
6. _____ is obtained by the process of Austempering.
7. _____ should never be the final heat treatment for hypereutectoid steel.
8. As the amount of cold working increases, the strength and hardness will _____.
9. Ledeburite is a mixture of _____.

10. Fouling in way of underwater area of hull will _____ ship resistance?

Section B

Five Questions of 02 Marks each

11. Write down the difference between mechanical properties of ordinary strength steel and high strength steel.

12. Explain carburising surface heat treatment method.

13. What are the required properties of aluminium alloy in marine applications?

14. Explain the application of AWS D1.1 pertaining to hull fabrication.

15. Write down the advantages of composite material.

Section C

Seven Questions of 08 Marks each of which any 05 questions to be answered.

16. Explain hypoeutectoid and hypereutectoid steel microstructure with help of iron-iron carbide diagram.

17. Explain the effect of cooling rate on hardness and TTT diagram of eutectoid steel.

18. Compare the process and effectiveness of sacrificial anode and ICCP for corrosion control.

19. Compare the difference between pack, gas and liquid carburising.

20. Explain the microstructure of ferritic malleable cast iron, ferritic ductile cast iron and ferritic grey cast iron.

21. Explain the concept of different types of composite materials and their applications.

22. Explain the classification requirement of resins and core for composite materials.