

COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY

B.TECH. DEGREE IV SEMESTER EXAMINATION IN MARINE ENGINEERING JUNE 2020

MRE 1403 METALLURGY AND MATERIAL SCIENCE (2013 Scheme)

Time: 2hrs 30 Minutes [30 Minutes for Answering and Scanning/Uploading the page of the Answer Sheet per module]

Max. Marks: 70 (14 per module)

INSTRUCTIONS

1. You have to be available in Google Meet on demand by the faculty.
2. You have to share your 'live location' to the faculty before uploading the answer sheet.
3. You have to answer only one question.
4. Answer may not exceed one page of an A4 size paper in a standard handwriting, as far as possible.
5. If at all an answer goes beyond one page, (due to your handwriting) another page can also be used. In such a situation, the page number should be given as 1/2, 2/2.
6. You have to put dated signature along with Register Number, Subject Code, Module/Group Number (as given in the Question Paper) in each page.
7. You have to put the Question Number correctly.
8. After answering the question, you have to scan and upload the answer page.

MODULE - I

(Answer *ANY ONE* question)

- I(1). (a) Explain point defect and line defect. (7)
(b) Explain twist and twin boundaries. (7)

OR

- I(2). (a) Explain the following : (i) Space lattice and unit cell (ii) Miller indices (7)
(b) Sketch the following plane and directions in a cubic crystal (2 2 2), [2 3 4], [1 0 0].

MODULE - II

(Answer *ANY ONE* question)

- II(1). Draw and explain all the regions of Fe-C diagram. (14)

OR

- II(2). (a) Draw and explain phase equilibrium diagram of Cu -Ni system. (7)
(b) Explain Invariant Reactions. (7)
(7)

MODULE - III

(Answer *ANY ONE* question)

III(1). Draw TTT diagram explain its use. (14)

OR

III(2). (a) Write short notes on: (7)

(i) Nitriding

(ii) Carburizing

(b) Explain Gray and Malleable cast irons. (7)

MODULE - IV

(Answer *ANY ONE* question)

IV(1). Explain hot working and cold working in detail. (14)

OR

IV(2). (a) Explain the mechanism of creep. (7)

(b) Write short note on fatigue failure. (7)

MODULE - V

(Answer *ANY ONE* question)

V(1). Explain applications of chromium and ceramics in shipboard. (14)

OR

V(2). (a) What is destructive test? Explain any one in detail. (7)

(b) What is Nondestructive test? Explain any one in detail. (7)
