

***B.Tech. Degree IV Semester Examination in
Marine Engineering June 2013***

MRE 403 METALLURGY AND MATERIAL SCIENCE

Time : 3 Hours

Maximum Marks : 100

(5 x 20 = 100)

- I. Write notes on: (20)
- (i) Miller indices
 - (ii) Atomic packing factor
 - (iii) Point defect and line defect
 - (iv) Twist and Twin boundaries
- OR**
- II. (a) Describe the process of solidification of metals. (10)
(b) What are dislocations? Explain the different types. (10)
- III. Draw Fe-C equilibrium diagram and show and explain eutectic, eutectoid, peritectic and peritectoid reaction on it. (20)
- OR**
- IV. (a) Draw and explain the equilibrium diagram for (10)
(i) Cd-Bi
(ii) Cu-Ni
(b) Describe the different types of solid solutions. (10)
- V. Draw a line diagram starting from the product of blast furnace to cast iron and steel for various purposes. Show different processes, furnaces etc. on it. (20)
- OR**
- VI. (a) Draw TTT diagram and explain its purpose. (10)
(b) What is Jomini test? Explain. (10)
- VII. (a) Explain “work hardening”. (10)
(b) Differentiate between hot working and cold working. (10)
- OR**
- VIII. (a) Explain: (i) Brittle fracture (10)
(ii) Mechanism of creep
(b) Explain: (i) SN curve (10)
(ii) Griffith’s theory
- IX. Briefly explain the selection of material for ship building and marine engineering. (20)
- OR**
- X. (a) Write notes on “Destructive tests”. (10)
(b) Explain : (i) Magnetic duct test (10)
(ii) Radiography test