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***B.Tech. Degree IV Semester Examination in
Marine Engineering June 2015***

MRE 1403 METALLURGY AND MATERIAL SCIENCE

Time : 3 Hours

Maximum Marks : 100

- I. (a) Explain three types of crystal structure of metals in detail. (12)
(b) Differentiate between planar defects and stacking faults. (8)
- OR**
- II. (a) Explain solidification of metals in detail. (12)
(b) Explain edge dislocation and screw dislocation. (8)
- III. (a) Explain eutectic, eutectoid, peritectic, peritectoid reactions with examples. (12)
(b) Draw and explain the equilibrium diagram for Cu-Ni. (8)
- OR**
- IV. (a) Draw and explain all regions of Fe-C equilibrium diagram. (12)
(b) What is Gibb's phase rule? (8)
- V. (a) Explain TTT diagram and its use. (12)
(b) Discuss on the alloys of Cu. (8)
- OR**
- VI. (a) Explain different types of cast irons their properties and use. (12)
(b) Write notes on (i) case hardening (ii) austempering (8)
- VII. (a) Explain deformation of metals. (12)
(b) Differentiate between hot working and cold working. (8)
- OR**
- VIII. (a) Explain in depth. "The fatigue failure". (12)
(b) Explain mechanism of creep. (8)
- IX. (a) Write notes on tension test and compression test. How do they differ? (12)
(b) What are the applications of titanium in shipboard? (8)
- OR**
- X. Write notes on – non destructive tests. (20)
