B.Tech. Degree IV Semester Examination in Marine Engineering May 2016

MRE 1403 METALLURGY AND MATERIAL SCIENCE

Time : 3 Hours   Maximum Marks : 100

$(5 \times 20 = 100)$

I.	(a)	Explain Miller indices of crystal planes.	(8)
	(b)	Describe the solidification process of metals.	(12)

OR

II.	(a)	Explain edge dislocation and screw dislocation.	(8)
	(b)	Describe crystal imperfections in detail.	(12)

III.	(a)	Explain Gibb's phase rule.	(8)
	(b)	Draw and explain the equilibrium diagram for pb-Sn.	(12)

OR

IV.	(a)	Explain Hume-Rothery rules.	(8)
	(b)	Draw and explain the equilibrium diagram for Cd-Bi.	(12)

V.	(a)	Explain jominy test.	(8)
	(b)	Describe the preparation of TTT diagram and its use.	(12)

OR

VI.	(a)	Write notes on any two alloys of Cu.	(8)
	(b)	How is steel made from cast iron? Explain each process.	(12)

VII.	(a)	What is creep? Explain creep curves.	(8)
	(b)	Differentiate between hot working and cold working.	(12)

OR

VIII.	(a)	Explain Griffith's theory.	(8)
	(b)	Write notes on (i) S.N. curve. (ii) Visco elastic behavior.	(12)

IX.	(a)	What are the uses of titanium in ship board?	(8)
	(b)	Explain any two types of non-destructives test in detail.	(12)

OR

X.	(a)	What are the uses of chromium in shipboard?	(8)
	(b)	Explain any two types of non-destructive test in detail.	(12)

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