Code No: 09A30306 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD
B.Tech II Year I Semester Examinations, June/July-2014
METALLURGY AND MATERIAL SCIENCE
(Common to ME, MCT, AME)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1.a) What are the particular characteristics of alloys of Cu-Zn system which contain only alpha solid solution?
b) Give the composition and uses of:
i) Catridge Brass
ii) Muntz Metal.

2.a) Explain the Hume Ruthery rules for the formation of solid solutions.
b) What is difference between random and ordered Solid Solutions? What is the role of energy of like bonds and unlike-bonds in them?

3. Discuss the effect of carbon on tempering based on:
a) Original Structured, Morphology of Martensite.
b) M_s-M_f temperature and thus resultant amount of phases.
c) Hardness of Martensite.

4.a) State and describe various factors effecting the properties of cast irons.
b) Distinguish between white heart and black-heart malleable Iron.

5.a) What is an interstitial solid solution? Name the five elements which commonly form interstitial solid solutions.
b) Explain the methods for grain size determination.

6.a) What is phase rule? What is the difference between Lever rule and the phase rule for metal systems?
b) Differentiate between equilibrium diagram and phase diagram.

7. Explain why:
a) S.G Iron is stronger and tougher than gray iron with same matrix
b) Ni-hard has high wear resistance
c) C.E.V of S.G Iron is lower than white cast Iron.

8. Write short notes on:
a) Crystalline Ceramics
b) Abrasive Materials
c) Nano materials.

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