

**R09****Code: 9A03301**

B.Tech II Year I Semester (R09) Supplementary Examinations June 2016

**MATERIALS SCIENCE & ENGINEERING**

(Common to AE, ME &amp; MCT)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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- 1 (a) Explain the principle of bond formation in solids with suitable examples.  
(b) What is dendrite and explain the formation of dendrite.
- 2 (a) Explain the relative valence factor to form the substitutional solid solution.  
(b) What is a solid solution, draw and explain the cooling curve of 50% Antimony and 50% Bismuth alloy.
- 3 Explain the experimental methods to find the data for the construction of equilibrium diagrams.
- 4 (a) What effect would the addition of 1% chromium have on the properties of low carbon steel and on high carbon steel?  
(b) Explain the purpose of alloying and classify the alloy steels.
- 5 Define critical cooling rate? Explain factors influencing the critical cooling rate?
- 6 How does the addition of lead to brass improve its machinability?
- 7 Explain the following:  
(a) Cermet.  
(b) Abrasive materials.
- 8 Explain dispersion strengthened composites.

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