

Code No: R22035

R10**SET - 1****II B. Tech II Semester Supplementary Examinations, April/May-2017****METALLURGY AND MATERIAL SCIENCE**

(Com. to ME, AME, MM)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. a) Explain the bonds in solids and their properties.  
b) What is the effect of grain boundaries on the properties of metallic alloys?
2. Define the following
  - (i) Electronic compound
  - (ii) Interstitial solid solution
  - (iii) Inter metallic compoundsb) Distinguish between solid substitutional and interstitial solid solutions.
3. a) What is lever rule?  
b) What is coring and how it can be minimised.  
c) What are the applications of phase diagrams?
4. Write explanatory notes on
  - a) Tool steels
  - b) Cast Irons
  - c) Die steels
5. a) Explain the cryogenic treatments of alloys.  
b) Explain briefly the effect of alloying elements on Fe-Fe<sub>3</sub>C diagram
6. Give the properties and applications of the following alloys
  - a) muntz metal
  - b) cupro nickels
  - c) Al-Cu
  - d) Ti - $\alpha$  alloys
7. Give the definition, properties and applications of the following with suitable examples
  - a) Cermets
  - b) Glasses
8. a) What are the general requirements of a reinforcing phase?  
b) What are natural composites? Give examples.