Code No: NR411809 **NR**

IV B.Tech I Semester Supplementary Examinations, April/May 2005
SUPER ALLOYS
(Metallurgy & Material Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Describe the characteristics of cobalt based cast and wrought super alloys.
   (b) Discuss the role of elements on nickel based super alloys.
2. (a) Describe the metallurgical structures of cobalt based super alloys.
   (b) What are the applications of cobalt based heat resistant alloy castings?
3. (a) Discuss the heat treatment of Ni-based wrought alloys.
   (b) Elaborate the effect of several elements on Fe-Ni based alloys.
4. (a) Discuss the precipitation hardening of cobalt based alloys.
   (b) Explain the effect of temperature on fatigue crack growth of super alloys.
5. (a) What are the effects of oxidation on material integrity? Discuss the effect of oxidation on mechanical properties of super alloys.
   (b) Explain the nature of oxidation of complex Ni- based alloys.
6. (a) Discuss the vacuum arc double electrode remelting process with the help of neat sketch.
   (b) Describe the de oxidation and nitrogen remelting in vacuum melting.
7. (a) Discuss the metallurgical aspects of Hot Isostatic pressed super alloy products.
   (b) Describe the recent developments in powder metallurgical processing of super alloy products.
8. Write a brief account on:
   (a) Heat treatment of CO-based alloys.
   (b) Solidification and structure control in super alloys.

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