

**III B.Tech I Semester Supplementary Examinations, November 2006**  
**HEAT TREATMENT TECHNOLOGY**  
**(Metallurgy & Material Technology)**

**Time: 3 hours**

**Max Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. (a) Explain the effect of Austenite grains size on the mechanical properties of steel? [7]  
(b) Discuss the methods for determination of Austenitic grain size? [9]
2. What is critical diameter? Explain the determination of hardenability of a given steel specimen by Grossman's critical diameter method? [16]
3. (a) Explain objectives and uses of surface hardening. Give the classification of surface hardening methods? [8]  
(b) Discuss any one case hardening method? [8]
4. What are stainless steels? What are the various types. Discuss the heat treatment of Ferrite stainless steels, martensitic stainless steels and Austenitic stainless steels. [16]
5. How are cast Irons classified on the basis of their manufacture, composition microstructure and appearance of fracture? Explain them. [16]
6. (a) What are ferritic - pearlitic malleable cast irons? Explain. [6]  
(b) What are black heart malleable cast irons? Explain [5]  
(c) What are white heart malleable cast irons? Explain [5]
7. Write short notes on the following with respect the composition, properties; microstructures and applications of [8+8]  
(a) Cartridge brass  
(b) Admiralty brass
8. (a) Explain the importance of Titanium in the modern industrial scenario? [6]  
(b) Explain the various properties of Titanium and its alloys? [5]  
(c) Explain the various applications of Titanium and its alloys? [5]

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