

**IV B.Tech I Semester Supplementary Examinations, November 2005**  
**ADVANCED METAL CASTING**  
**(Production Engineering)**

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

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

\*\*\*\*\*

1. (a) What type of refractories you suggest for the construction of the following furnaces at different regions. Give your answer with suitable explanation. [12]
  - i. Basic open-hearth furnace.
  - ii. Induction furnace
  - iii. Electric arc furnace.
- (b) What are the raw materials that are used for the manufacture of silica and fire clay refractions. Where are these available in India. [4]
2. (a) With a help of a sketch explain the steel making by basic electric arc furnace giving important reactions; and process details. [10]
- (b) Compare and Contrast gray cast Iron and Malleable Cast-Iron and with respect to structure; properties and applications. [6]
3. (a) Discuss the need for **degassing** of Aluminium melt. What are the various methods of **degassing**? Explain any one method of **degassing**. [8]
- (b) Describe important ways in which the natural contraction of a casting on cooling might markedly affect it's design. [8]
4. (a) What are the functions of a riser? Explain different types of risers designed. [8]
- (b) Differentiate between permanent mold casting and semi-permanent mold casting. Describe in detail permanent mold casting process. Which metals / alloys are cast by this process. [8]
5. (a) Explain with sketches how a shell mold is made. List the unique advantages of making castings in shell molds. [8]
- (b) Differentiate between directional and unidirectional solidification. Why is directional solidification essential in castings? [8]
6. (a) How is Plaster molding done. Explain in detail. Give its applications. [8]
- (b) Distinguish between gravity die casting and pressure die casting process. [8]
7. (a) Explain the destructive testing methods to asses the quality of castings? Briefly indicate their significance. [8]
- (b) With proper illustrations distinguish among mechanization automation and modernisation with particular reference to foundaries. [8]

8. Write short note on any four of the following:

[16]

- (a) Sand reclamation
- (b) Exothermic sleeves
- (c) Casting modulus
- (d) Gating ratio
- (e) Material handling equipment.

★ ★ ★ ★ ★