Eighth Semester B.E. Degree Examination, December 2010
Foundry Technology

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART - A

1. a. Define fluidity. Briefly explain the factors affecting fluidity. (10 Marks)
   b. Write short notes on: i) Hot tearing; ii) Measuring fluidity. (10 Marks)

2. a. With necessary figures, explain the design considerations for minimum casting stresses in a sand casting. (10 Marks)
   b. What is meant by directional solidification? Explain the design aspects to be considered for the directional solidification for a sand casting. (10 Marks)

3. a. Distinguish clearly between homogeneous nucleation and heterogeneous nucleation. Explain how, the solidification in an alloy is different from that of a pure metal. (10 Marks)
   b. Explain the role of temperature gradient and growth rate on the structure of solid solution alloys. (05 Marks)
   c. Explain briefly the importance of chvorinov’s rule in the approximation of the solidification time. (05 Marks)

4. a. Explain any three of the methods employed to promote riser efficiency and directional solidification. (09 Marks)
   b. Explain briefly, with diagrams the end effect and riser effect. (04 Marks)
   c. Consider a steel bar of following dimensions:
      i) Find the theoretical feeding distances $D_H$ and $D_L$
      ii) Prove the effect of heavy section (H) and light section (L) on each other, in terms of feeding distances. (07 Marks)

Fig. Q.4(c).

PART - B

5. a. Name any five types of molding techniques. Explain briefly the investment molding. (08 Marks)
   b. With a labeled neat sketch, explain various zones of cupola furnace. Include the processes taking place in these zones in brief. (12 Marks)

6. a. What are the types of melting furnaces employed in a ferrous foundry? With a schematic diagram, explain open hearth melting practice. (10 Marks)
   b. What are cast irons? Classify the cast irons based on their chemical composition. Describe any three micro structural components of the cast iron. (10 Marks)

7. a. List out the advantages and limitations of aluminum castings. Describe the high frequency induction melting practice of aluminum alloys. (10 Marks)
   b. Explain the molding and gating practices for magnesium castings. (10 Marks)

8. a. With a flow chart, explain the process of sand circulation, taking place in a mechanized foundry. (10 Marks)
   b. Write short notes on:
      i) Dust control in foundries (10 Marks)
      ii) Layout for a small mechanized foundry.

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