

**III B.Tech II Semester Supplementary Examinations, April/May 2005**  
**FOUNDARY TECHNOLOGY**  
**(Metallurgy & Material Technology)**

Time: 3 hours

Max Marks: 70

Answer any FIVE Questions  
All Questions carry equal marks

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1. (a) Compare the advantages and limitations of wood as pattern material to metals and plastics.  
(b) What is the purpose of colouring patterns? Explain the common pattern colour code.
2. (a) Explain the types or classification of molding sands.  
(b) Explain the effect of clay content and temper water on the following.  
(i) green compressive strength (ii) Permeability.
3. (a) Compare the Hot chamber and cold chamber methods of Die casting with respect to operation; advantages; limitations, & applications.  
(b) Compare horizontal die casting Machine and vertical die casting Machines.
4. Explain the important functions of a riser. Explain with neat sketches the various types of risers designed. What are the advantages, disadvantages/ limitations of each one of them?
5. (a) Distinguish fully between Homogeneous Nucleation and Heterogeneous Nucleation.  
(b) Calculate the size of critical radius and the number of atoms in the critical radius the number of atoms in the critical nucleus when solid copper forms by homogeneous nucleation for the following data.  
Surface free energy  $\sigma = 177 \times 10^{-3} J/m^3$   
Freezing temp of copper =  $1085^{\circ}C$   
Latent heat of fusion =  $1628 \times 10^6 J/m^3$   
Under cooling temp =  $236^{\circ}C$   
Lattice parameter of Cu =  $3.61 \text{ SoA}$
6. (a) Explain the advantages and limitations of hot blast cupola and water cooled cupola.  
(b) Explain with a neat sketch, the electric arc furnace and mention its relative merits and demerits.
7. Write an essay on the 'Full mold process'. Explain their advantages, limitations and application of the above process.
8. (a) From which source do Blowholes appear to originate most frequently? Explain them.

- (b) Explain specifically how mold restraint could contribute to hot tears in castings.

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