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Total No. of Pages : 02

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M.Tech. (Mechanical Engineering) (Sem.-3)

**ADVANCED CASTING PROCESSES**

Subject Code : MTME-210

M.Code : 74986

Time : 3 Hrs.

Max. Marks : 100

**INSTRUCTIONS TO CANDIDATES :**

1. Attempt any FIVE questions out of EIGHT question.
2. Each question carries TWENTY marks.

- Q1 a) What are the effects of grain size and size distribution of the sand on main properties of molding sand?
- b) What are the types of cores used in green sand mould casting?
- Q2 a) Describe bonding mechanism of silica-water-clay system. What is A.F.S Clay and clay content test?
- b) Explain how the grain shape and size affect the permeability and strength of molding sand.
- Q3 a) Discuss the mechanism of nucleation and growth during solidification of metals.
- b) What is the effect of constitutional super cooling on the microstructure of the metal?
- Q4 a) Differentiate between progressive and directional solidification. What are the different methods to achieve the directional solidification? Explain any two of them.
- b) What are the main functions of a riser in casting? How risers are designed for castings? What are the essential conditions that are to be kept in mind while designing risers?
- Q5 a) Prove that h/d ratio of most compact economical riser for side placed riser is 1 and that for top placed riser is  $\frac{1}{2}$  and that in both cases, ratio of volume/area is d/6.
- b) What do you understand by metal penetration? Discuss its causes and remedies.

- Q6 a) What do you understand by effective feeding distances for simple shapes in sand casting, explain with suitable examples?
- b) What is investment casting? Mention the desirable properties of the wax used in investment casting process.
- Q7 a) Differentiate between true centrifugal casting and semi centrifugal casting? Explain with the help of diagram.
- b) With the help of a diagram explain the working of a vacuum casting process. List its main advantages. How this process differs from full mould process?
- Q8 a) Explain various casting defects giving neat sketches and also explain their causes and remedies.
- b) Write short note on repair and salvage of castings.

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